

WATER PERMIT NO. 2304-2

Phone: 895-2215

Name of Applicant: Perry Comp

Post Office Address: HC 80, Box 45, Presho SD 57568

Amount of Water Claimed: 37.8 acre-feet Total Acres: NA

Source of Water Supply: tributary of Medicine Creek

Water to be used for: fish and wildlife habitat County: Lyman

About 1 mile South of Presho

PRIORITY Date Received: 1-28-94 Fee: \$150.⁰⁰ Remarks: _____

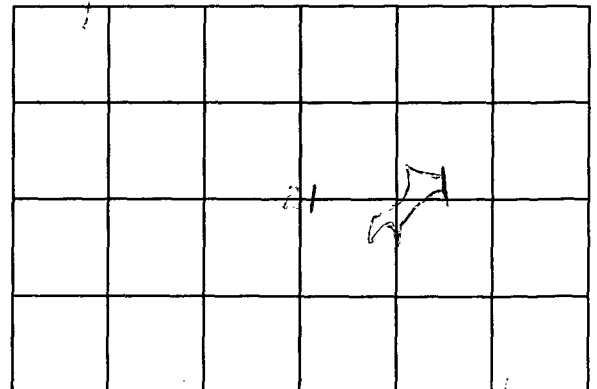
Corrected Application Received: 2-22-94 Period of Annual Use: Jan 1 - Dec 31

WATER QUALITY APPROVAL RECEIVED: NA APPROVED/CONDITIONAL (Circle one)

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

Diversion Point: SE 1/4 NE 1/4 Sec 21-T105N-R77W

Land to be Irrigated: _____



Well Log: Driller: _____ Licensed YES _____ NO _____

Depth of Well: _____ REMARKS: _____

Type of Map: topo PREPARED BY: Roger C. Smith Reviewed and the Number

Assigned on: 2-16-94 By: Karen Schlaak

No. <u>2304-2</u>	Hydrologic Unit <u>10140104</u>
Map No. <u>Lyman Co. Herald</u>	Basin <u>Missouri River</u>
Newspaper <u>Lyman Co. Herald</u>	<u>Presho</u>

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. _____

1. Name of Applicant Perry Comp Phone No. (605)895-2215

Post Office Address HC 80 Box 45 Presho State SD 57568
(Street, RR or Box) (City) Zip Code

2. Amount of water claimed (c.f.s.) Storage to 1803.0 MSL (FSL) 38AF

3. Source of water supply Unnamed tributary which enters Medicine Creek

4. Location of point of diversion 17.0 surface acres at full service level (FSL) located in
section 21, township 105N, range 77W (dam - SE 1/4 of the NE 1/4 S.21) Impoundment -
SE 1/4 of the NE 1/4 and ~~NE 1/4~~ ^{N 1/2} of SE 1/4, S.21 County Lyman

5. Counties where water will be used Lyman

6. Annual period during which water is to be used Year around Jan 1 - Dec 31

7. 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, upland game, furbearers, and also some stock watering.

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

STATE OF SOUTH DAKOTA)

County of Lyman) ss

I, Perry Comp 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 Perry Comp

Subscribed and sworn to before me this 27th day of JANUARY 1994

Dallas E. Probst

Notary Public
my Comm. Exp. 9-24-96



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

ROYER C. SMITH, P.E. #4325
Ducks Unlimited
3502 Franklin Ave, Bismarck, ND (701) 258-5599

b) Freeboard 5' FSL to Top of DAM

c) Crest Width 12'

Crest Length 666'

d) Height MAX HT IS @ STRUCTURE 7 18'

e) Primary Outlet Capacity 505 CFS @ EL. 1805
 If Pipe, diameter SEE DIAGRAM

f) Secondary Spillway Capacity 1540 @ EL. 1808
 Spillway width 130'

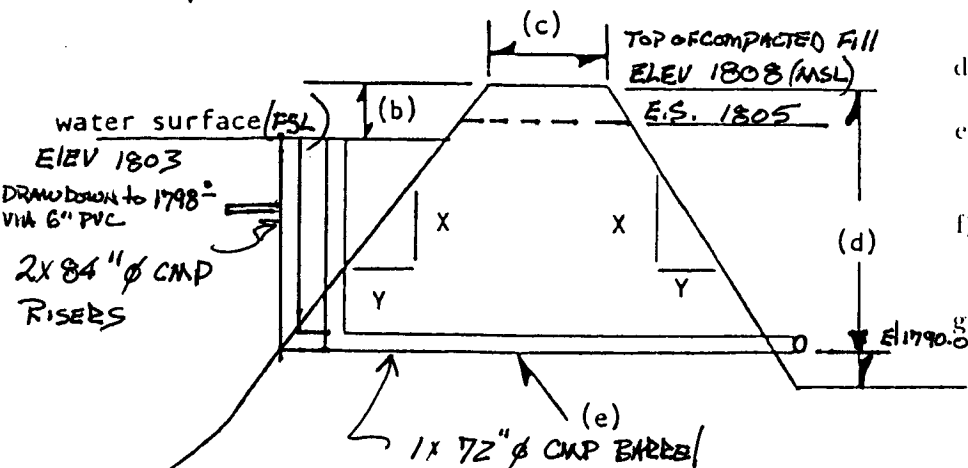
g) X & Y Slope
 Upstream 3:1 (CONTAINS A MIN 10' BEEM @ EL. 1803 (FSL))
 Downstream 3:1

Surface Area of Impoundment 17.2 AC @ EL. 1803

Storage 37.8 AC-FT @ EL. 1803 acre feet

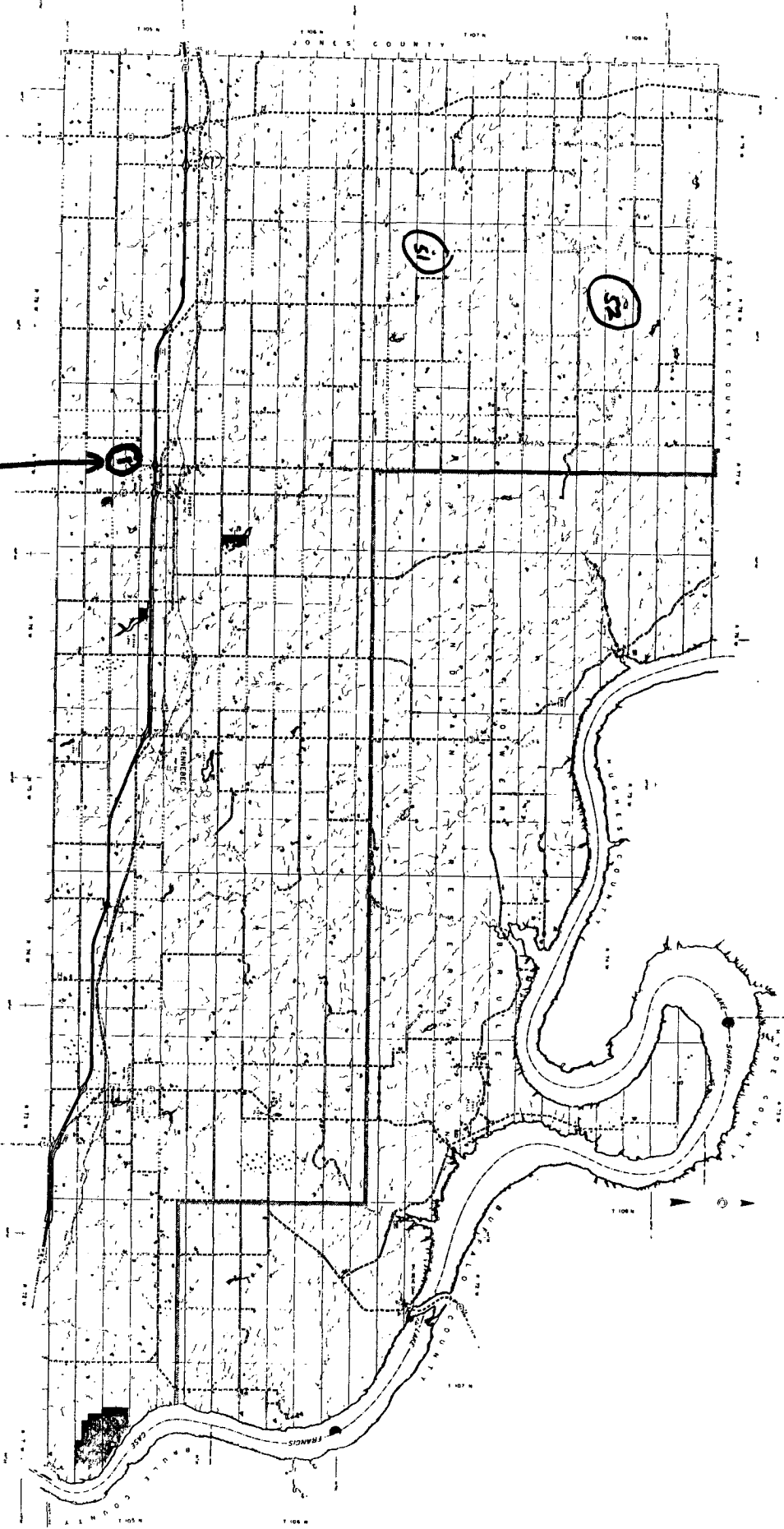
Drainage area above dam 5.91 sq. mi.

INFORMATION PROVIDED BY: RCS

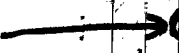


Signature of Applicant

NORTH HALE
LYMAN



Camp
Project



**SOUTH DAKOTA
WATER PERMIT NO. 2304-2**

Date of first receipt of application January 28, 1994.

Date of return to applicant for corrections, amendments or changes February 16, 1994.

Date of receipt of corrected application February 22, 1994.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2304-2 to Perry Comp, HC 80, Box 45, Presho SD 57568 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. 2304-2 authorizes impoundment of 38 acre-feet of water from a tributary of Medicine Creek and runoff by reconstructing a dam. The dam site will be located in the SE 1/4 NE 1/4 Section 21 with water impounded in the SE 1/4 NE1/4, N 1/2 SE 1/4 Section 21; all in T105N-R77W. Water will be stored annually to an elevation of 1803.0 feet mean sea level.
2. The water appropriated shall be used for the purpose of supplying water for fish and wildlife production and livestock watering and may not exceed the amount of water needed for beneficial use for fish and wildlife production and domestic use.
3. The water is to be used during the following described annual period: January 1 - December 31.
4. The date of approval of Permit No. 2304-2 is June 6, 1994.
5. The date from which applicant may claim right is January 28, 1994.
6. One-fifth of the construction is to be completed on or before December 6, 1996.
7. All construction is to be completed on or before June 6, 1999.
8. Water is to be put to beneficial use on or before June 6, 2003.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.
2. Approval of Water Permit No. 2304-2 authorizes storage of up to 38 acre-feet of water annually.

WATER MANAGEMENT BOARD

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

JUN 22 1994

date

RECEIPT

414054

Division of Water Rights

South Dakota Department of Environment and Natural Resources

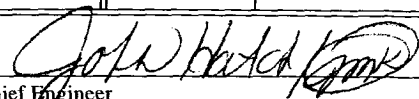
Pierre, _____ February 22, 19 94

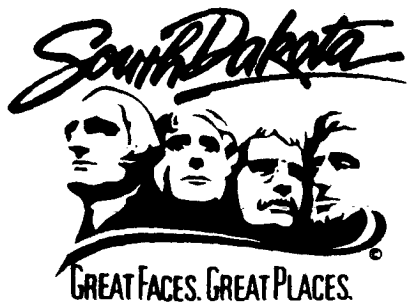
RECEIVED OF Lavonne J. Comp, HCR 80 Box 45, Presho, SD 57568

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

Fee for Application for Permit No. <u>2304-2</u> to Appropriate Water, to construct and to put water to beneficial use _____	150	00
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	150 00

By 
Chief Engineer



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

February 16, 1994

Perry Comp
HC 80 Box 45
Presho SD 57568

Dear Mr. Comp:

We received your water permit application for reconstruction of a dam in Lyman County. The filing fee for this application is \$150.00. Upon receipt of the fee, further processing of your application will continue.

If you have any questions, please contact this office.

Sincerely,

Karen Schlaak

Karen Schlaak
Environmental Scientist
605 773-3352

c: Tim Olson, Dept. of Game, Fish and Parks



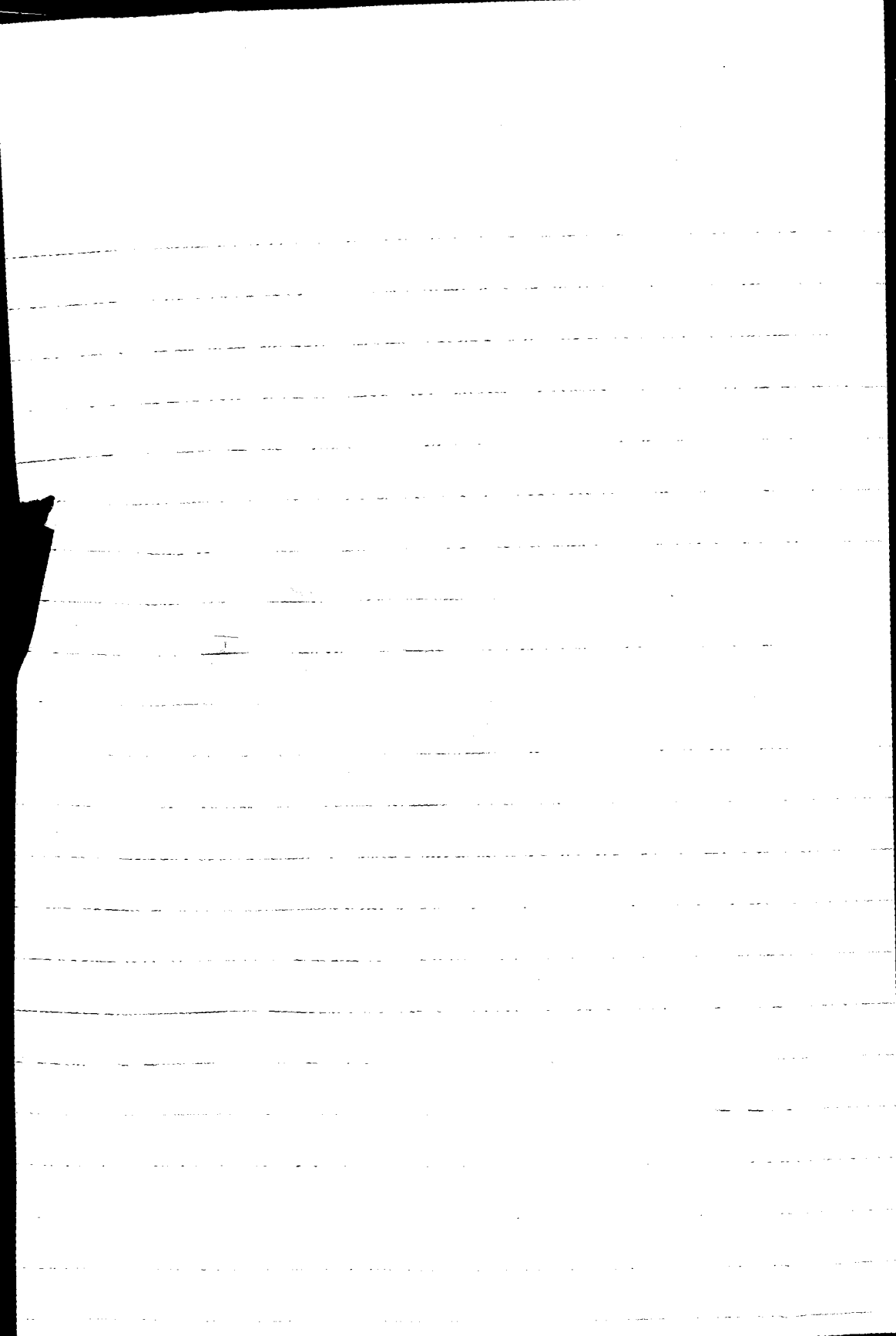
2-18-94

Dept. of Environment + Natural Resources.
Joe Ross Building
523 East Capital
Perry, S.D. 57501

Dear Sirs:

Enclosed you will find a
check for the filing fee for the application
for the dam which we want to build.

Sincerely,
Perry Comp
NCR 80 Box 45
Presho, S.D. 57568



Ducks Unlimited
Perry Comp. Impoundment
Water Permit Application # 2304-2

Cat. 3 Dam

Top of Dam Elev. = 1808
Primary Spillway = 1803 - Two 8' Risers w/ 72" Barrel CMP
2nd Spillway = 1805 - 130' wide Earthcut
Bottom = 1790 - Dam Height = 18 ft.

Normal Storage Capacity = 38 Ac.-Ft.
Int. " " = 80 Ac.-Ft.
Max. " " = 226 Ac.-Ft.

Int. Storage x Eff. H. = $80 \times 15 = 1200$
 $1200 < 3000 \therefore 25 \text{ yr. Min. Design Flood}$

DA = 5.91 mi.²
Slope = 50'/mi.
Si = 1.90

From USGS "Tech. for Est. Floods... in South Dakota"

$$Q_{15} = 83.4 A^{.60} S^{.44} S_i^{-.72}$$

$$= 83.4 (5.91)^{.60} 50^{.44} 1.90^{-.72}$$

$$= 83.4 (2.90) (5.59) (0.63)$$

$$= \underline{\underline{852 \text{ cfs}}}$$

$$Q_{100} = 132 A^{.65} S^{.46} S_i^{-.67}$$

$$= 132 (5.91)^{.65} 50^{.46} 1.90^{-.67}$$

$$= 132 (3.17) (6.05) (0.65)$$

$$= \underline{\underline{1645 \text{ cfs}}}$$

Secondary Spillway Flow

$$Q = CLH^{3/2} \quad L = 130 \quad Q = 2.6 (130) (3)^{3/2}$$

$$H = 3 \quad Q = 2.6 (130) (5.2)$$

$$C = 2.6 \quad Q = \underline{\underline{1750 \text{ cfs}}}$$

$$Q = 2.6 (130) (7.03)^{3/2}$$

$$= 2.6 (130) (2.89)$$

$$= \underline{\underline{950 \text{ cfs}}}$$

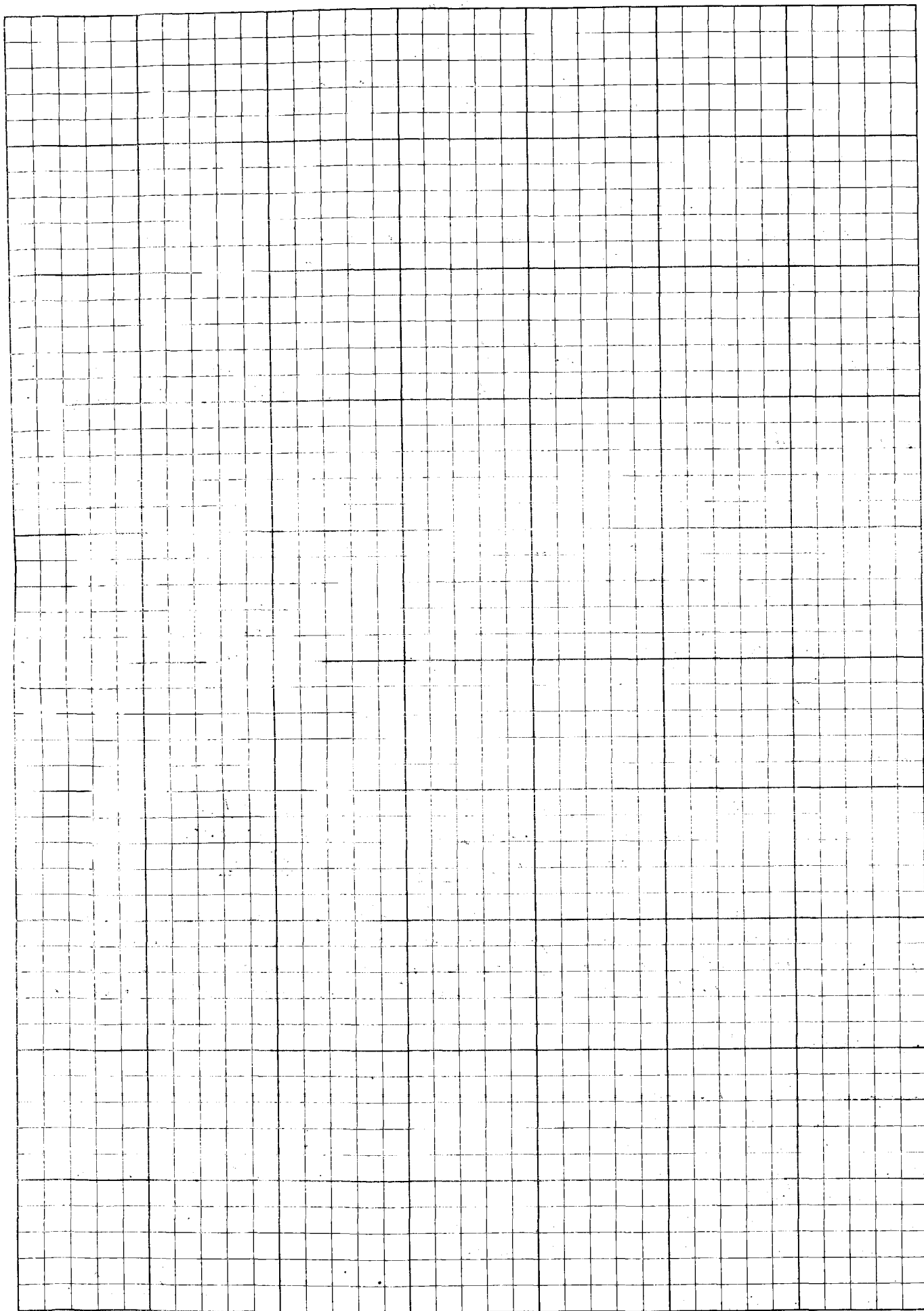
Ducks Unlimited uses the SCS TR-20 model to route the inflows thru the dam. They route a peak inflow of 317 cfs (Q_5) thru the primary with 3.80 ft. freeboard, and a Q_{100} peak inflow of 1617 cfs thru the dam with 950 cfs thru the Secondary with 0.97 ft freeboard.

Section 74:02:08:09

1. Topo Map & Legal Description - OK
2. Dam Axis Profile - OK
3. Max X-Sec. of Dam - OK
4. Area Capacity - OK
5. Outlet Detail - OK
- * 6. Spillway Rating - NO - Need Info. - Called
7. Spillway Detail - OK
8. Specs - Std. DV - OK
9. E-PP - Cat. 3 N/A - OK

SCS Annual Yield

CN = 70
Isogram - 2 1/2
DA = 3782 Ac. = 5.91 mi.²
50% = 0.28 Ac.-In/Ac.
 $.28 \times 3782 \div 12 = \underline{\underline{88 \text{ Ac.-Ft.}}}$





DUCKS UNLIMITED, INC.
GREAT PLAINS REGIONAL OFFICE

3502 Franklin Avenue
Bismarck, North Dakota 58501-0761
(701) 258-5599

March 17, 1994

Tim Schaal
Natural Resource Engineer
Water Rights Division
SD Dept. of Natural Resources
Foss Building
523 E. Capitol
Pierre, SD 57501

RE: Velda Ramser Impoundment
Perry Comp Impoundment

Tim:

Enclosed are the revised Design Reports for the above projects. They have been revised to include a Spillway Rating Curve, and a statement regarding the preliminary plans vs. final construction plans.

If you need anything else, please let me know.

Sincerely,

Roger Smith, P.E.
Regional Engineer

DESIGN REPORT



PROJECT: PERRY COMP IMPOUNDMENT
SD-133-01

LOCATIONS: SE¼, NE¼ SECTION 21 TWP. 105N RGE. 77W
Lyman County, South Dakota

MARSH DATA: Full Service Level (FSL) @ 1803.0 (MSL)
17.2 Surface Acres @ FSL
37.8 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 is expected should failure occur. The product of the "maximum storage capacity" times the "effective height" is 3390. (226 X 15 = 3390)

PRELIMINARY RISK ASSESSMENT:

The proposed reconstruction of the Perry Comp Impoundment is upstream of Interstate 90 approximately 3.35 miles as measured along the channel centerline from a USGS quad map. The channel crosses two unimproved section line roadways, at 800 feet and 7600 feet downstream of the reconstruction. These crossings were not investigated for structures but in all likelihood either small or no structures exist in the unimproved section line roads. Due to the distance downstream, Interstate 90 will not be impacted in the event of a total failure to the proposed dam.

DESIGN:

The embankment reconstruction will consist of excavating the existing dam to the FSL elevation of 1803.0, an excavation of approximately two feet. The new embankment will consist of compacted fill placed on the prepared downstream slope of the existing embankment. The finished dam will have a top width of 12 feet at elevation 1808.0. The old dam will act as a berm at the FSL elevation. All side slopes will be at a ratio of three feet horizontal to one foot vertical (3:1). In the area of the existing breach and in the area of the proposed structure the existing dam will be excavated at 3:1 slopes to insure proper compaction during the reconstruction. Material for the embankment will be from the emergency spillway excavation. Representative soil samples from the area of the planned emergency spillway was classified as fat clay in the soil investigation report. Four inches of topsoil will respread over the entire embankment and emergency spillway.

The primary spillway will function as a fixed level water control structure consisting of two 84 inch corrugated metal risers with draw down capabilities to elevation 1798.0 via a 6 inch gated pipe. The barrel will be a 72 inch corrugated metal pipe which will outlet into a rocked plunge pool. The risers and barrel will be coated as required in the construction specifications.

The emergency spillway will be excavated to elevation 1805.0, having a bottom width of 130 feet and a level crest along the centerline of approximately 100 feet. The spillway will outlet on natural ground at a slope sufficient to ensure supercritical flow. The expected flow velocity during the 100 year event is 4.0 feet per second.

HYDROLOGY/HYDRAULICS:

HYDROLOGY - A hydrologic analysis of surface water runoff was performed using two methods. A peak discharge was determined from regression equations developed in WATER-RESOURCE INVESTIGATIONS REPORT 80-80 U.S. GEOLOGICAL SURVEY.

The SCS METHOD was used to determine the inflow hydrograph. The curve number used in the SCS METHOD was manipulated to create peak discharges similar to those developed from the regression equation. In this way credibility is established in the curve number choice. Other assumptions made in developing inflow hydrographs by SCS METHOD were:

Rain Duration = 1.00
Rain Table # = 1
Antecedent moisture condition = 2
Rainfall from SCS charts

Inflow hydrographs developed from the SCS METHOD were routed through the primary and emergency spillways. This yielded outflow hydrographs revealing peak discharges at maximum reservoir elevations corresponding to various runoff events. The following table is a summary of that printout:

PARAMETERS:

WATERSHED - 5.91 SQ MI

TIME OF CONCENTRATION - 4.0 HOURS

SCS CURVE #'S 5 YR-70 10 YR - 72 100 YR - 81

EVENT	RAIN (IN)	RUNOFF (AC-FT)	RESER. ELEV. (MSL)	PEAK INFLOW (CFS)	PEAK OUTFLOW (CFS)	FREE- BOARD (FT)	FLOW IN E.S. (CFS)
5 YR	3.15	251	1804.53	317	259	3.80	0
10 YR	3.60	374	1805.18	518	414	3.15	0
100 YR	5.2	996	1807.36	1617	1440	.97	950

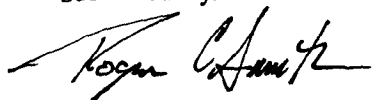
The primary spillway capacity was calculated by comparing discharges developed by the weir flow formula and formulas for calculating head loss through corrugated metal pipe. The emergency spillway capacity was calculated using Technical Release No. 39 Hydraulics of Broad-Crested Spillways developed by the SCS. A "Spillway Rating Curve" is attached to this report.

CONSTRUCTION PLANS:

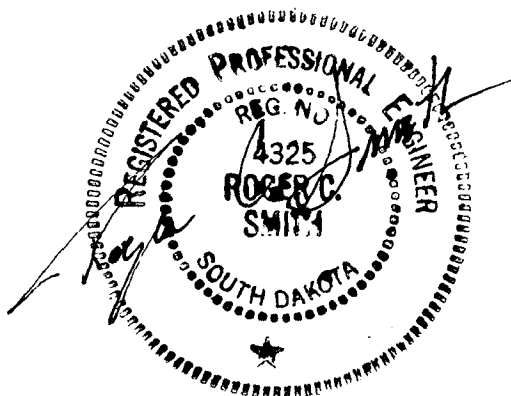
Constructions plans accompanying this report have been stamped "PRELIMINARY". The final construction plans will differ from the preliminary constructions plans only if error corrections or additional clarity is necessary.

Dated: March 17, 1994

Submitted By:

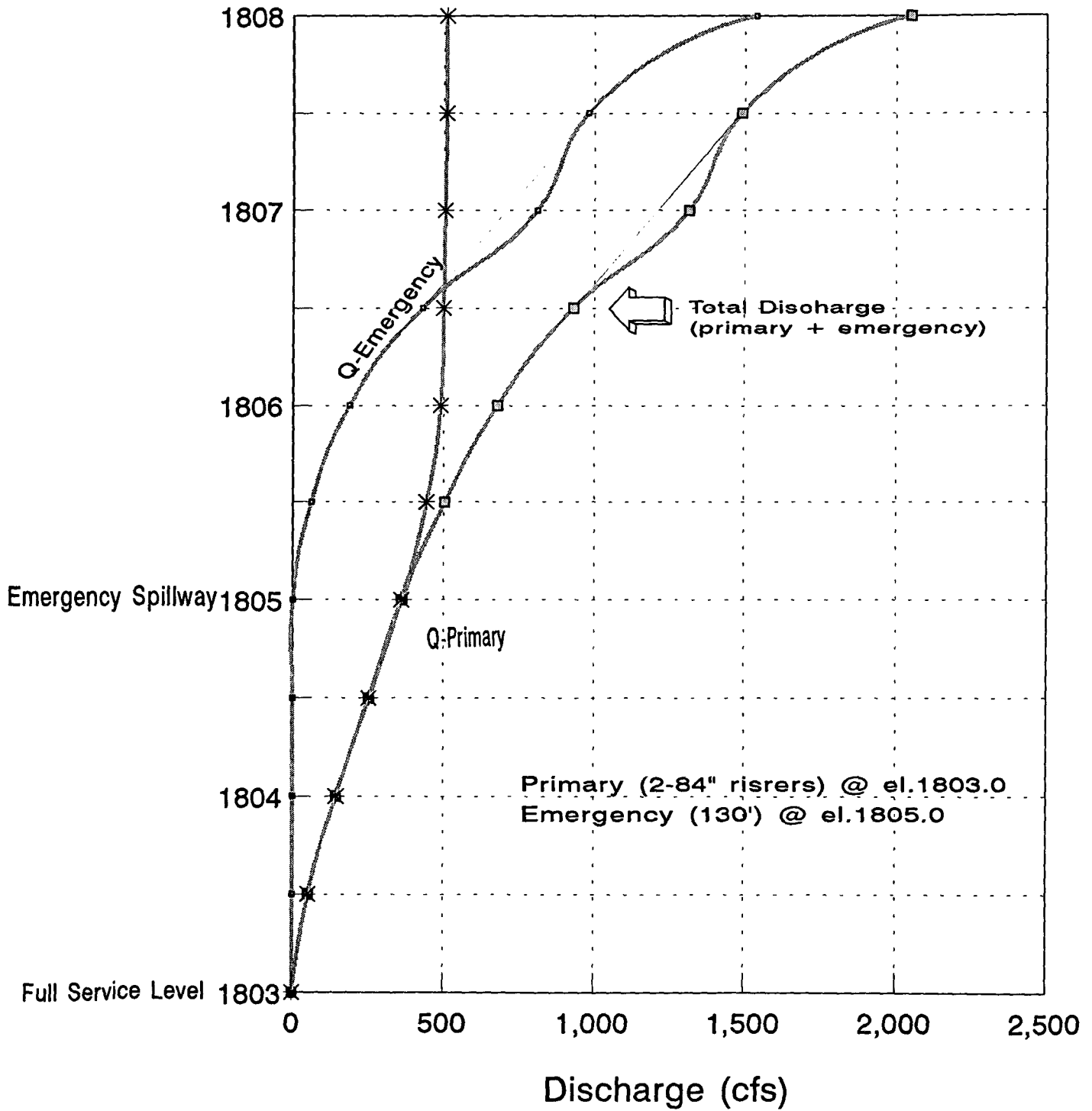


Roger Smith, P.E (PE-4325)
Regional Engineer
Ducks Unlimited
Great Plains Regional Office



Perry Comp Impoundment Spillway Rating Curve

Reservoir El.



* Q-Primary ◻ Q-Emergency ◻ Q-Total



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 4, 1994

Roger Smith, P.E.
Ducks Unlimited, Inc.
3502 Franklin Ave.
Bismarck, ND 58501

Dear Mr. Smith:

We have reviewed the plans and specifications for the Perry Comp Impoundment located in the SE 1/4 NE 1/4 of Section 21-T104N-R77, in Lyman County. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the project. No construction may begin until Water Permit Application No. 2304-2 is approved.

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

The Comp Dam will be classified as a small size Category 3 dam with a dam height of 18 feet and a normal storage capacity of 38 acre-feet and a maximum storage capacity of 226 acre-feet.

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

Sincerely,

Gale N. Selken, P.E.
Natural Resources Engineer IV
for John Hatch, Chief Engineer
Water Rights Division
(605) 773-3352

c: Perry Comp
Don McCrea, GF&P

REPORT ON
WATER PERMIT APPLICATION No. 2304-2
Perry Comp
March 31, 1994

Water Permit Application No. 2304-2 has been filed by Perry Comp to impound 38 acre-feet of water in a dam. The dam will be located in the SE 1/4 NE 1/4 of Section 21-T105N-R77W, in Lyman County. The water will be used for domestic use and fish and wildlife propagation.

Discussion:

This project is a cooperative effort between Ducks Unlimited, Inc., the South Dakota Department of Game, Fish and Parks and Perry Comp. The project involves the reconstruction of an existing breached dam at this location that failed some time ago.

The Comp Dam will be classified as a Category 3, Low Hazard dam. It has been designed by Ducks Unlimited, Inc. and the plans and specifications have been approved; although, construction can not start until Water Permit Application No. 2304-2 is approved.

The Comp Dam will be 18 feet high with a normal storage capacity of 38 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 226 acre-feet with the reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25 year frequency event.

The Comp Dam is designed to have two 84 inch CMP drop inlets with a 72 inch barrel as the primary spillway and a 130 foot wide earthcut secondary spillway. The dam has a drainage area of 5.91 square miles. Ducks Unlimited uses the Soil Conservation Service TR-20 Hydrology program to route the runoff through the dam. They route a 5 year-24 hour frequency event with a peak inflow of 317 cfs through the primary spillway with 3.8 feet of freeboard, and a 100 year-24 hour frequency event with a peak inflow of 1617 cfs through both spillways with 0.97 feet of freeboard. The 130 foot wide secondary spillway has a maximum capacity of approximately 1750 cfs.

The annual yield for the drainage area with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be approximately 88 acre-feet.

The Comp Dam is located on a tributary of Medicine Creek about 2 miles upstream of the confluence of the tributary and Medicine Creek. There are no existing Water Permits/Rights on this tributary.

Conclusions:

1. Water Permit Application No. 2304-2 should be approved since unappropriated water is available and approval will not have any adverse effects on existing Water Permits/Rights.

page 2
Application No. 2304-2

2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 2304-2.

Timothy G. Schaal 
Timothy G. Schaal, P.E.
Natural Resources Engineer III

Approved by:

Gale N. Selken 
Gale N. Selken, P.E.
Natural Resources Engineer IV

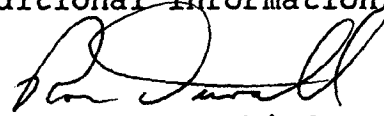
RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2304-2, Perry Comp

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Environment and Natural Resources concerning Water Permit Application No. 2304-2, Perry Comp, HC 80 Box 45, Presho, SD 57568.

The Chief Engineer is recommending APPROVAL of Application No. 2304-2 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) in the public interest with the following qualifications:

1. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.
2. Approval of Water Permit No. 2304-2 authorizes storage of up to 38 acre-feet of water annually.

See report on application for additional information.


for JOHN HATCH, Chief Engineer
April 18, 1994



**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.

May 10, 1994

Perry Comp
HC 80 Box 45
Presho, SD 57568

Dear Mr. Comp:

Water Permit Application No. 2304-2 for fish and wildlife habitat 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 Lyman Co. Herald printed at Presho, SD (Ph # 895-2505). 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.

c: Tim Olson, Water Permits Coordinator, Game, Fish and Parks, Pierre, SD



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

May 10, 1994

Lyman Co. Herald
Box 280
Presho, SD 57568-0280

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 2304-2 to be published twice. Please publish the first notice on May 18, 1994, 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 Perry Comp, HC 80 Box 45, Presho, SD 57568 (Ph # 895-2215).

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
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

Instruction to Newspaper - Publish first Notice on May 18, 1994, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 2304-2 to Appropriate Water

Notice is given that Perry Comp, HC 80 Box 45, Presho, SD 57568 has filed an application for a water permit to impound 38 acre-feet of water from a tributary of Medicine Creek and runoff by reconstructing a dam. The dam site is to be located in the SE 1/4 NE 1/4 Section 21 with water impounded in the SE 1/4 NE 1/4, N 1/2 SE 1/4 Section 21; all in T105N-R77W. Water is to be stored annually to an elevation of 1803.0 feet mean sea level and is to be used to provide habitat for fish and wildlife production and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2304-2 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the chief engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and chief engineer. The applicant must file a petition if contesting the chief engineer's recommendation. The Chief Engineer's address is "Water Rights 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 June 6, 1994.

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

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
 County of Lyman) ss

I, Patricia J. McNaughton

certify that the attached printed Notice was

taken from the Lyman Co.
Herald

printed and published in Presho

County of Lyman and State of

South Dakota. The notice was published in
 the newspaper on the following two dates:

5-18-94
5-25-94

Cost of Printing: 36.47

Patricia J. McNaughton
 (Signature)

Editor
 (Title)

6-7-94
 (Date Signed)

NOTICE OF APPLICATION NO. 2304-2 to Appropriate Water

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 5/18-25





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

JUN 22 1994

Perry Comp
HC 80 Box 45
Presho, SD 57568

Dear Mr. Comp:

Enclosed is Water Permit No. 2304-2 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,

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.

c: Tim Olson, Water Permits Coordinator, Dept. of Game, Fish & Parks, Joe Foss Bldg, Pierre, SD



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 19, 1996

2304-2

Perry Comp
HC 80, Box 45
Presho, SD 57568

Dear Mr. Comp:

The inspection of your water use system and the inspection of the extent of application of water to beneficial use, as developed under Water Permit No. 2304-2, has been completed. Your final water right document, the Water License, can now be issued.

Statutes require that we charge a \$50.00 fee for the inspection and issuance of the Water License. Upon receipt of the \$50.00 fee from you, we will begin processing your Water License.

**Please remit fee to:
Department of Environment & Natural Resources
Water Rights Program
523 E. Capitol
Pierre, SD 57501-3181**

Sincerely,

Cheryl F. Frost
Secretary
Water Rights Program
(605) 773-3352

NOTE: On check or money order, please specify your permit number. This will insure proper handling of the fee.

RECEIPT

415125

Division of Water Rights

South Dakota Department of Environment and Natural Resources

Pierre, _____ September 27, 19 96

RECEIVED OF Perry Comp, HCR 80, Box 45, Presho, SD 57568-9726

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

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use _____		
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>2304-2</u>	50	00
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	50 00

By John Hatch
Chief Engineer

Permit No. 2304-2
Missouri River - Water District

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

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

I have this day, **September 12, 1996**, made a thorough examination of the water use system constructed by **Perry Comp of HC 80, Box 45, Presho, SD 57568** holder of Permit No. **2304-2**, bearing the priority of **January 28, 1994** authorizing the storage of **38** acre-feet of the waters of **tributary of Medicine Creek** for **fish and wildlife habitat** purposes, in **Lyman** County.

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

A. Works used to divert the water:

Comp Dam--18 feet high, 38 acre-feet normal capacity, 226 acre-feet maximum capacity

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

N/A

C. Works used to apply water to beneficial use:

Comp Dam

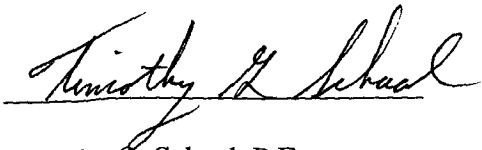
The system is in the following condition **Good**. The point of diversion is located **600 feet west & 2750 feet north of the SE corner of Section 21-T105N-R77W (SE 1/4 NE 1/4)**. The works are capable of storing **38** acre-feet of water which is to be used for **fish & wildlife habitat**. Water has been put to beneficial use to the maximum extent as follows:

Comp Dam-- 18 feet high, 38 acre-feet normal capacity, 226 acre-feet maximum capacity

and the license should be issued for **38** acre-feet of storage.

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

Exceptions to compliance are: **none** Date Report Completed: **September 17, 1996**



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



9/12/96

WR # 2304-2

Perry Comp Dan







REPORT ON INSPECTION OF PERMIT NO. 2304-2

Other permit(s) associated with the project: XXXX

DATE OF INSPECTION: September 12, 1996

NAME & ADDRESS OF INSPECTION CONTACT/ Perry Comp
RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: owner

NAME & ADDRESS OF PERMIT HOLDER: Perry Comp, HC 80, Box 45, Presho, SD 57568

DIVERSION POINT LEGAL LOCATION: 600 feet west & 2750 feet north of the SE corner of
Section 21-T105N-R77W (SE 1/4 NE 1/4)

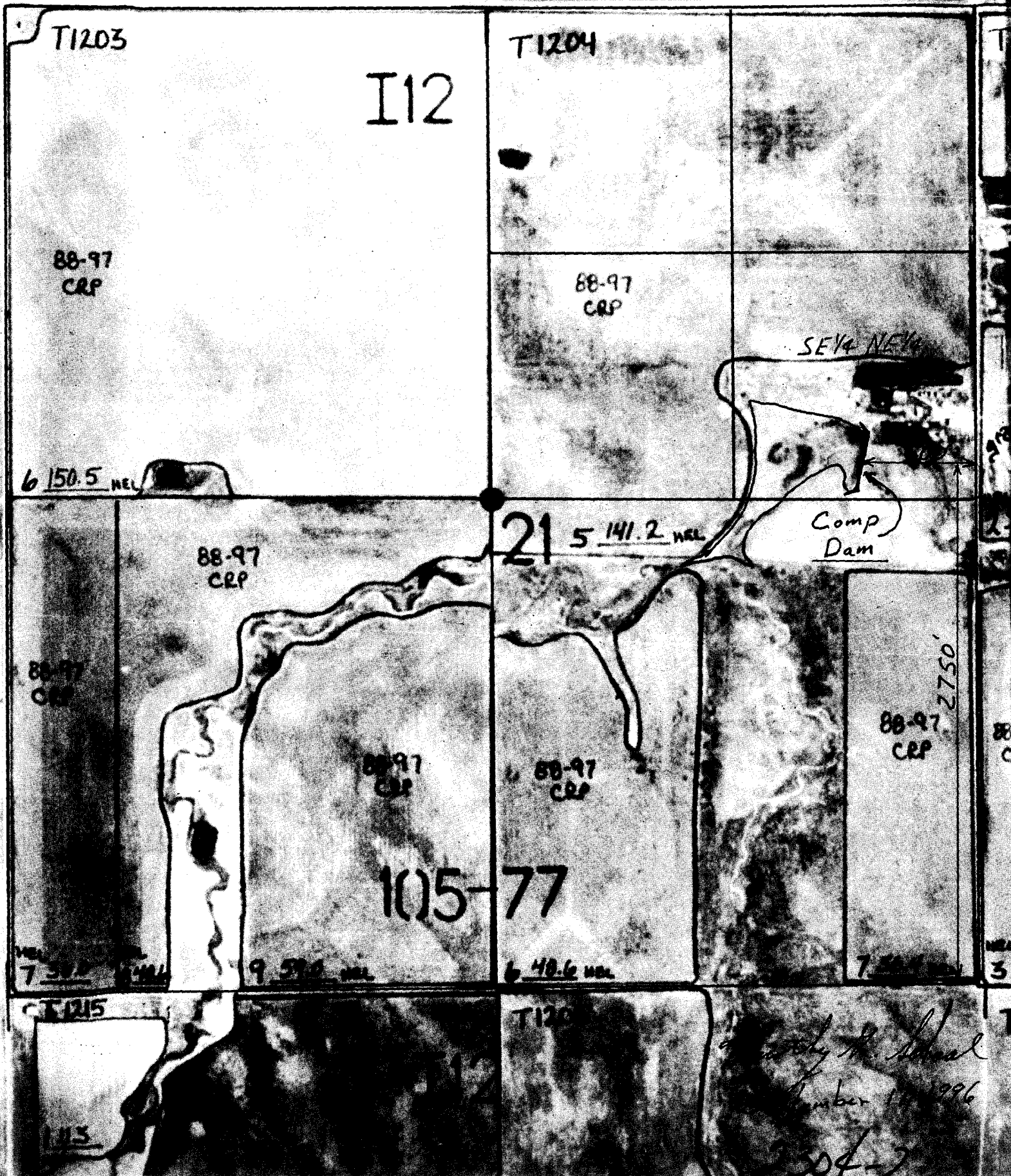
DAM INFORMATION:

- 1) Height to crest 18 feet
- 2) Height to primary spillway 13 feet
- 3) Height to secondary spillway 15 feet
- 4) Crest width 12 feet
- 5) Crest length 666 feet
- 6) Spillway length XXX feet
- 7) Spillway width primary-- two-7 ft. CMPs, secondary-- 130 feet
- 8) Approx. storage (Normal) 38 acre-feet
- 9) Approx. storage (Maximum) 226 acre-feet
- 10) Date constructed: 1994

PERMIT QUALIFICATIONS AND REGULATIONS:

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

NOT TO SCALE



STATE OF SOUTH DAKOTA

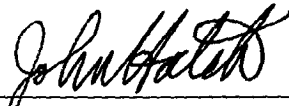
WATER LICENSE NO. 2304-2

(1) Perry Comp, HC 80 Box 45, Presho, SD 57568 made Application No. 2304-2, January 28, 1994 for a water permit to impound 38 acre feet of water from a tributary of Medicine Creek and runoff by reconstruction of a dam in, Lyman County, South Dakota for fish and wildlife production and domestic use purposes. Water will be stored annually to an elevation of 1803.0 feet mean sea level. Permit No. 2304-2, with a priority date of January 28, 1994 was approved June 6, 1994 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before June 6, 1999 and for the application to beneficial use of said water on or before June 6, 2003.

(2) It is certified that the applicant has complied with the provisions of South Dakota State Law relating to reconstruction of Comp Dam. The dam has a storage capacity of 38 acre feet of water and is located (spillway) 600 feet west and 2,750 feet north of the SE corner of Section 21, T105N, R77W (SE¼ NE¼).

(3) The applicant has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use for fish and wildlife habitat and domestic use.

(4) Pursuant to South Dakota Water Law 46-5-30.1 Perry Comp, HC 80 Box 45, Presho, SD 57568 the holder and/or owner of Water Permit No. 2304-2 is issued a license to appropriate water, the right to impound sufficient water annually from a tributary of Medicine Creek and runoff to maintain the water level in Comp Dam at an outlet elevation of 1803.0 feet mean sea level, with a priority date of January 28, 1994 from the location specified in (2) of this license, for fish and wildlife production and domestic use purposes. This license is subject to any limitations or qualifications listed in Water Permit No. 2304-2 and subject to South Dakota State Law.


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

OCT 17 1996

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

OCT 17 1996

2304-2

Perry Comp
HC 80, Box 45
Presho, SD 57568

Dear Mr. Comp:

Enclosed is Water License No. 2304-2 and Receipt No. 415125 for \$50.00 which was assessed for an investigation and issuance of the license. Water License No. 2304-2 is the final document which completes the process of obtaining a water right.

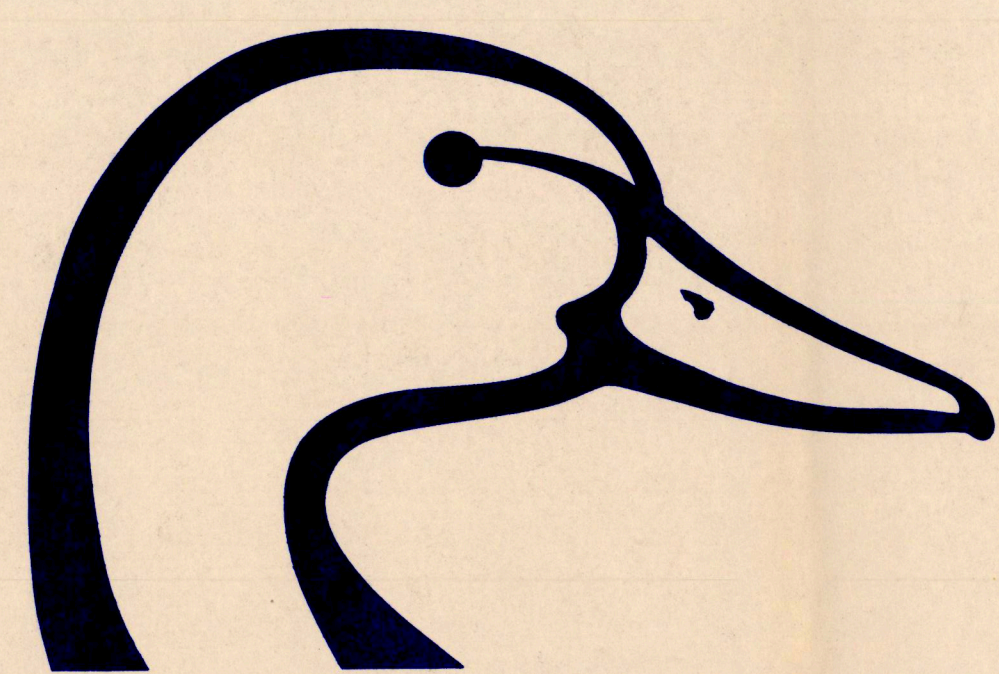
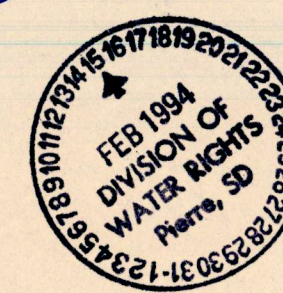
As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water.

Very truly yours,

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

gm
enclosures

2304-2



DUCKS UNLIMITED

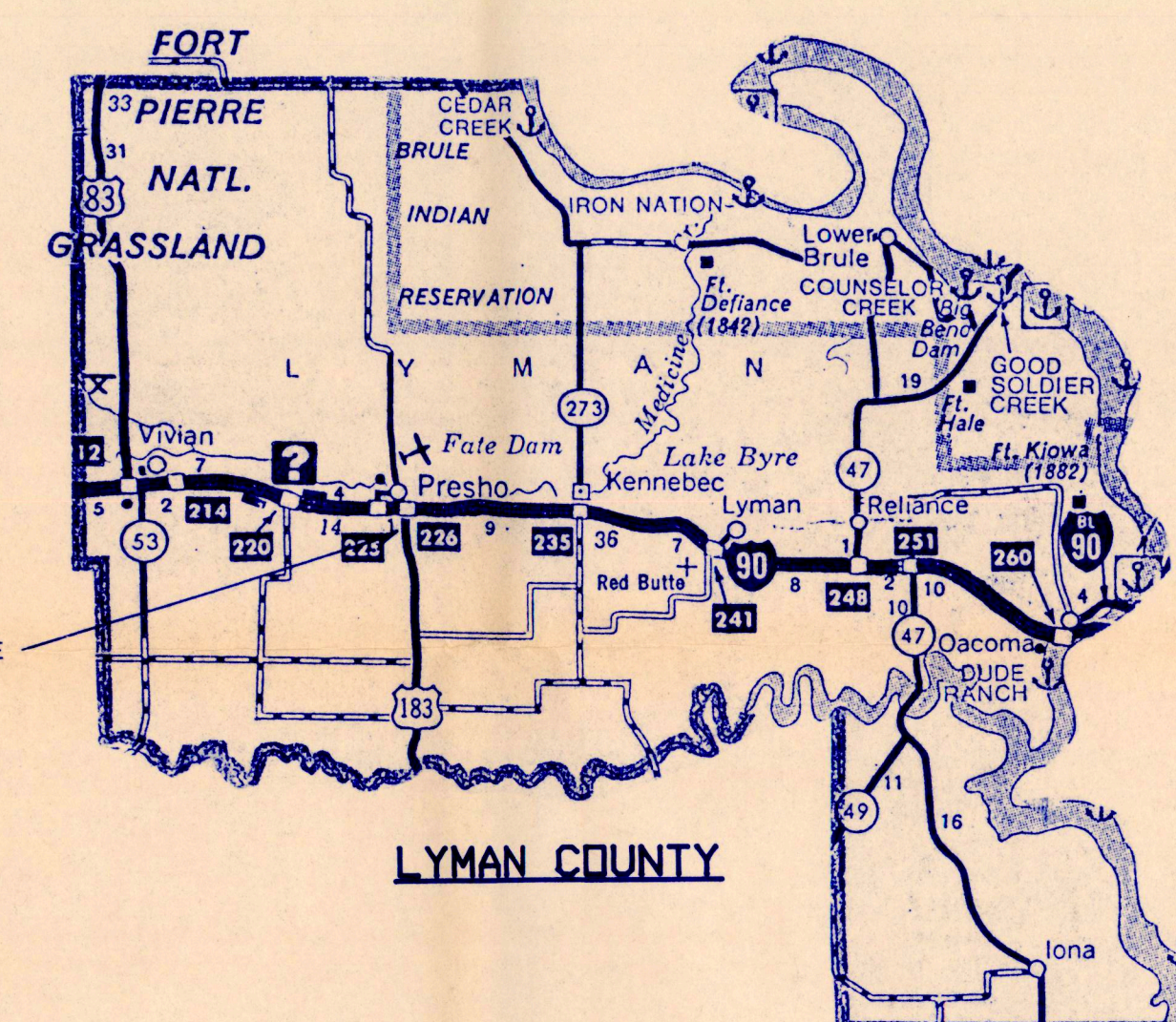
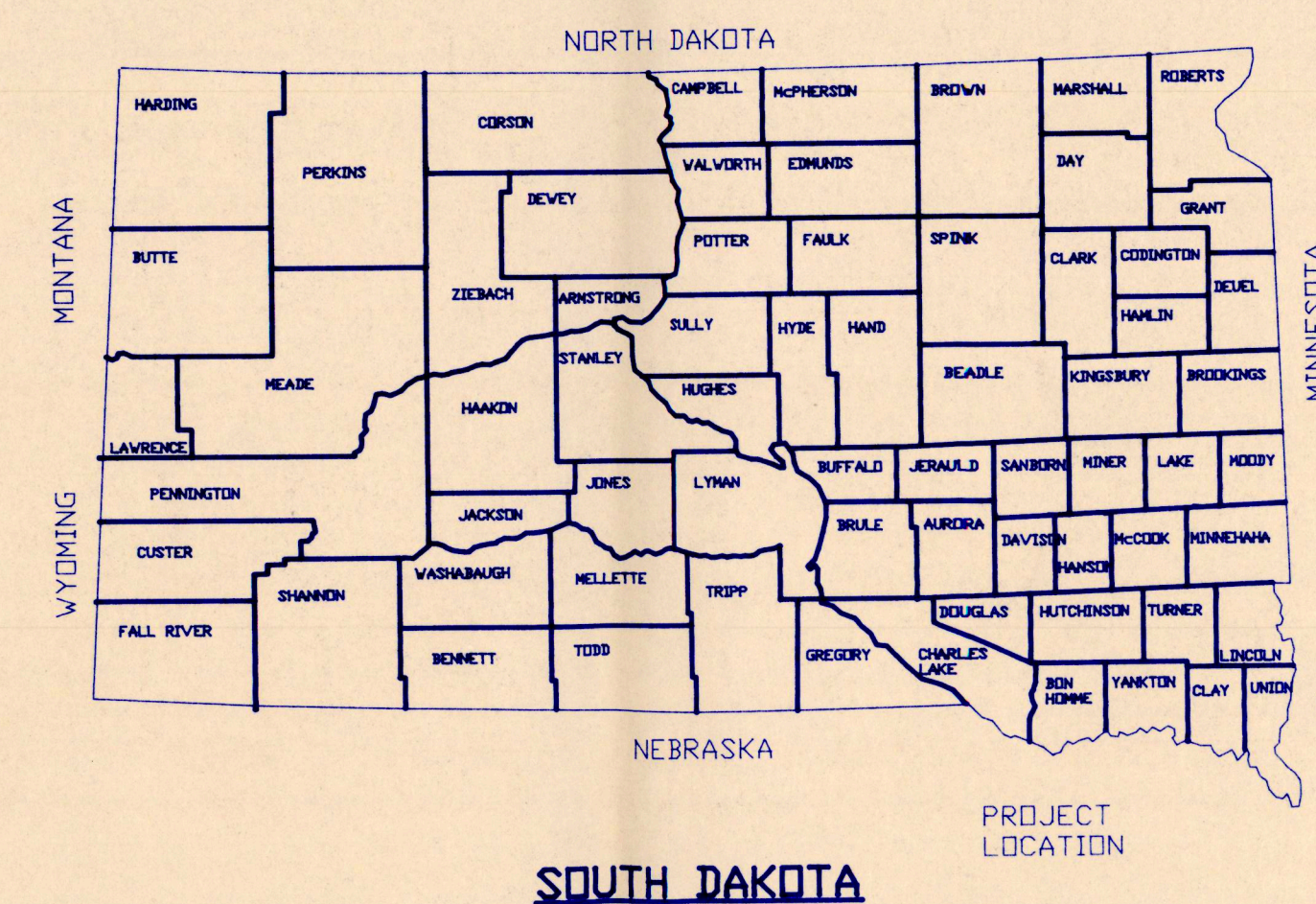
DUCKS UNLIMITED

PROJECT

PERRY COMP IMPOUNDMENT SECTION 21, T 105 N, R 77 W, LYMAN COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

SOUTH DAKOTA DEPT. OF GAME, FISH & PARKS



SPECIFICATIONS

GENERAL CONDITIONS	101
MOBILIZATION	201
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EXCAVATION	203
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EXISTING CULVERTS/STRUCTURES	307

PLAN INDEX

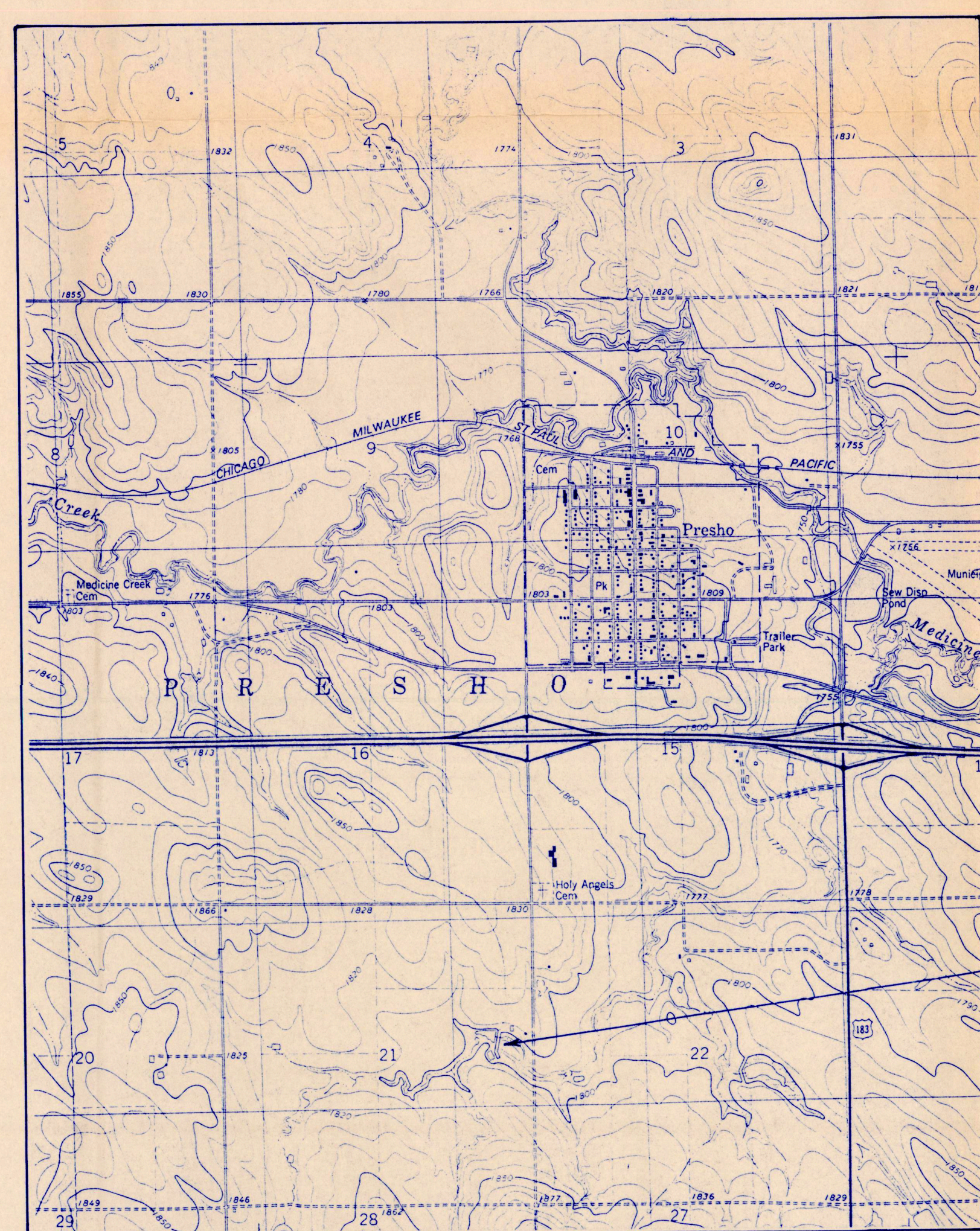
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PROJECT TOPOGRAPHY	2
PROJECT SITE PLAN	3
PROFILES & SECTIONS	4
STRUCTURE DETAILS	5
SOILS INFORMATION	6

ESTIMATED QUANTITIES

MOBILIZATION	1 L.S.
SITE PREPARATION	840 C.Y.-P
EXCAVATION	
BREACH CLEANOUT/EMBANKMENT EXCAVATION	1806 C.Y.-INC.**
EXCAVATION PIT	2930 C.Y.-INC.**
EMERGENCY SPILLWAY	2463 C.Y.-INC.**
EMBANKMENT	10,500 C.Y.-S*
WATER	160 M-GAL.
WATER CONTROL	
STRUCTURE INSTALLATION	1 EA.
WATER CONTROL STRUCTURE	
& CULVERT APPURTENANCES	1 INC.
CULVERT INSTALLATION	
72"Ø CMP	76 L.F.
6"Ø PVC	20 L.F.
ROCK RIPRAP	
CLASS I	21 C.Y.-P
CLASS II	40 C.Y.-P

*INCLUDES 5% FOR SHRINKAGE

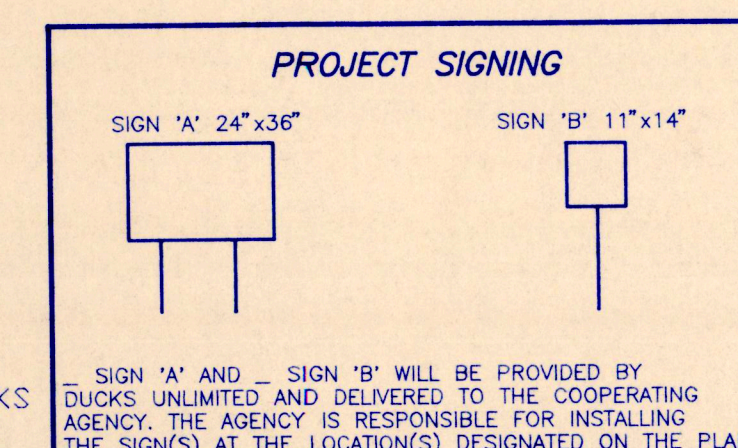
**EXCAVATION QUANTITIES LISTED FOR INFORMATIONAL.
SUITABLE EXCAVATION MATERIAL SHALL BE USED FOR
EMBANKMENT CONSTRUCTION.



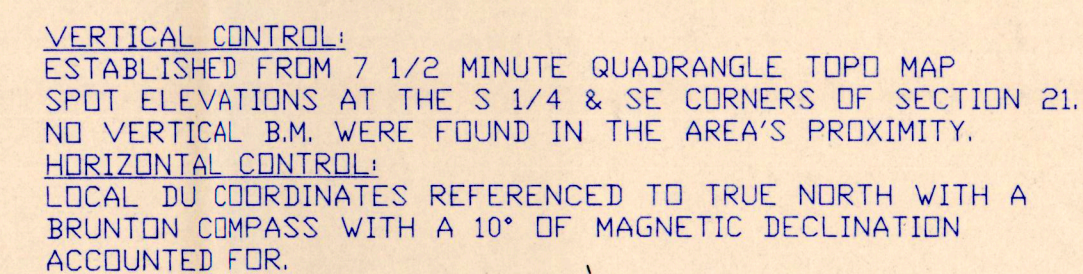
VICINITY MAP
SCALE: 1"=2000'

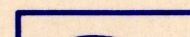
PRELIMINARY

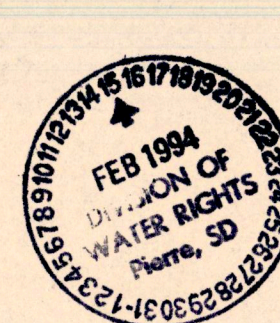
LANDOWNER CONTACT
PERRY COMP
PRESHO, SOUTH DAKOTA
605/895-2215
AGENCY CONTACT
DON MCCREA
SOUTH DAKOTA DEPT. OF GAME, FISH & PARKS
PIERRE, SOUTH DAKOTA
605/773-3658



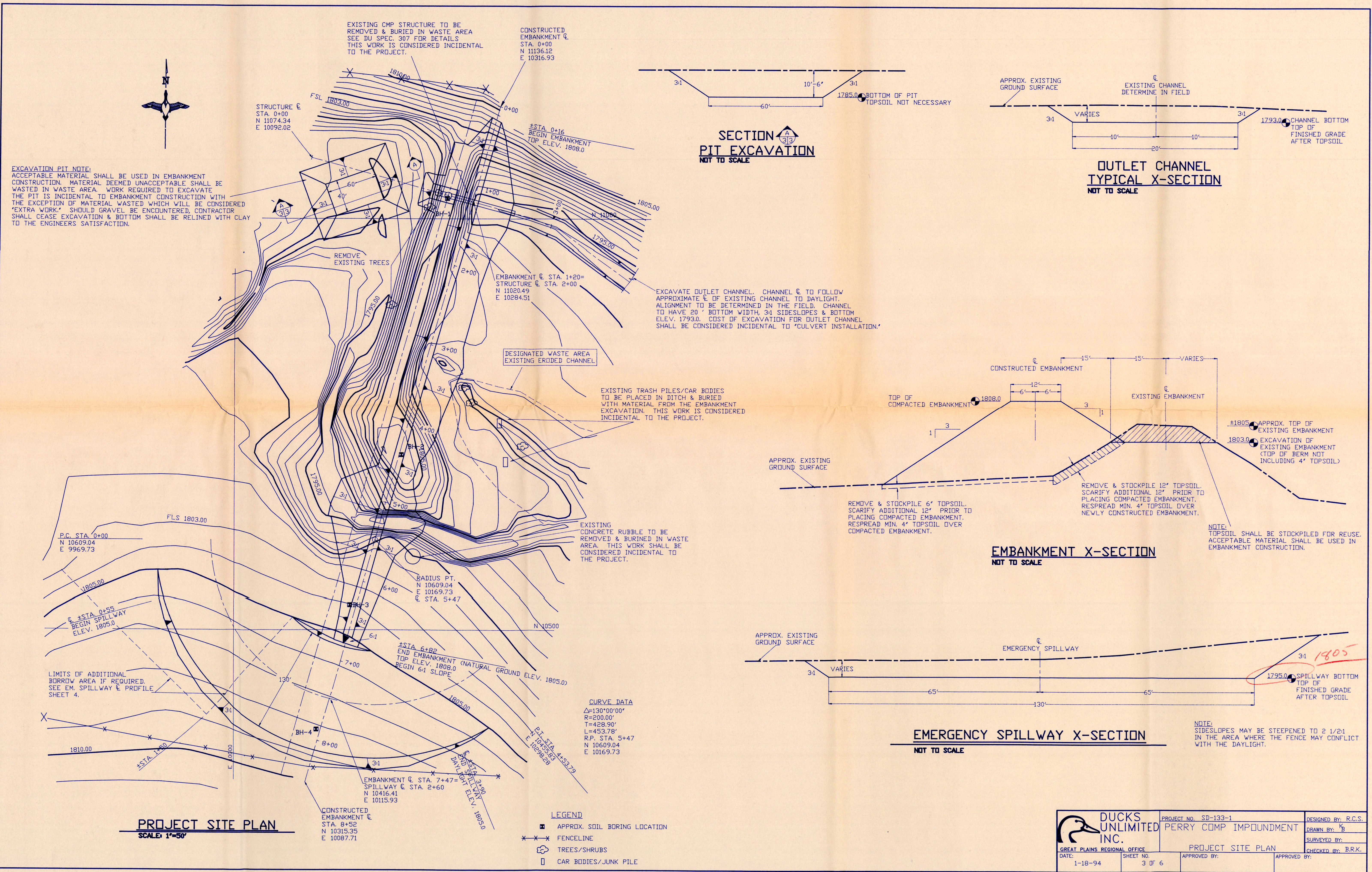
DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE DATE: 1-18-94	PROJECT NO. SD-133-1 PERRY COMP IMPOUNDMENT VICINITY MAP SHEET NO. 1 OF 6	DESIGNED BY: R.C.S. DRAWN BY: K SURVEYED BY: CHECKED BY: B.R.K.
	APPROVED BY: [Signature] DATE: [Blank]	APPROVED BY: [Signature] DATE: [Blank]



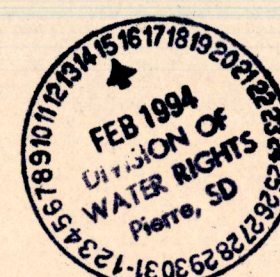
 DUCKS UNLIMITED INC.	PROJECT NO. SD-133-1 PERRY COMP IMPOUNDMENT	DESIGNED BY: R.C.S. DRAWN BY: B
	GREAT PLAINS REGIONAL OFFICE DATE: 1-18-94	PROJECT TOPOGRAPHY SHEET NO. 2 OF 6
APPROVED BY:		APPROVED BY:



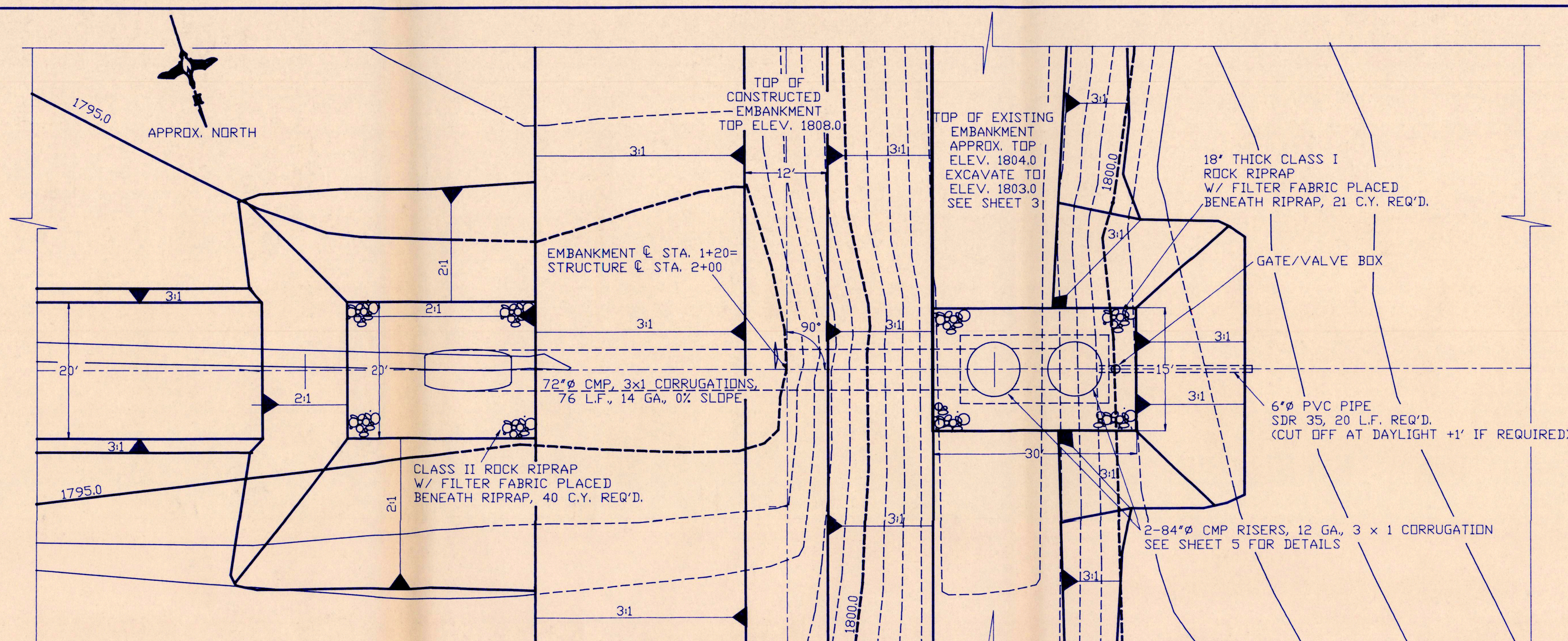
2304-2



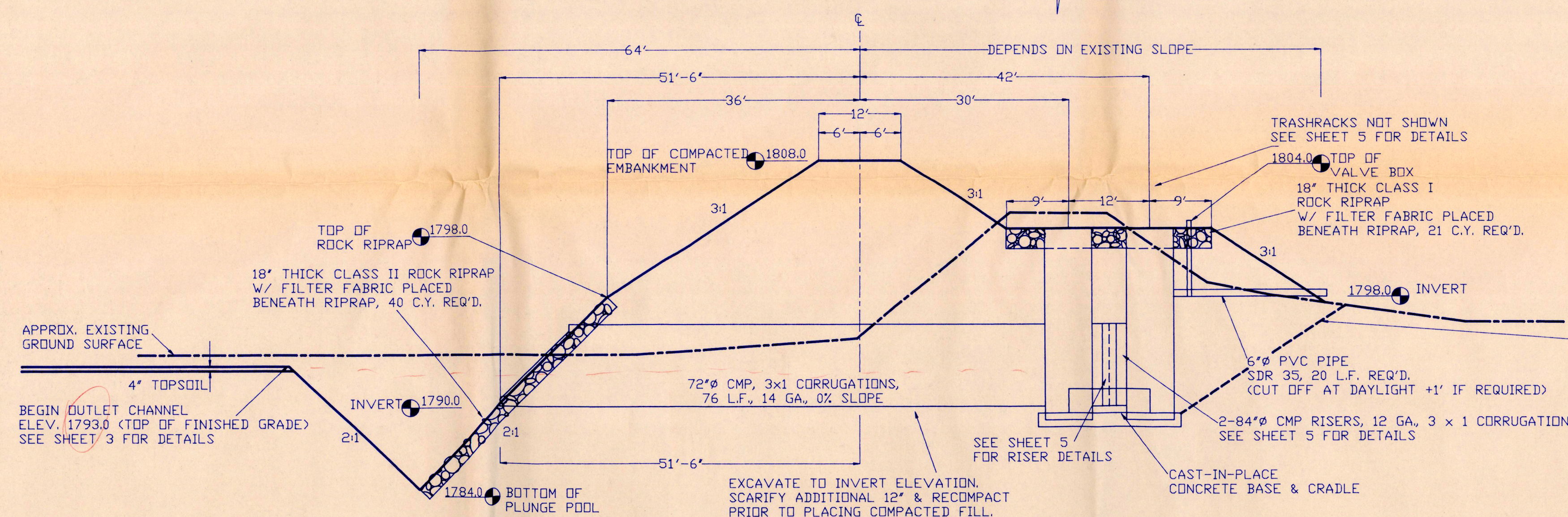
	PROJECT NO. SD-133-1		DESIGNED BY: R.C.S.
	PERRY COMP IMPOUNDMENT		DRAWN BY: JS
	PROJECT SITE PLAN		SURVEYED BY:
	APPROVED BY:		CHECKED BY: B.R.K.
GREAT PLAINS REGIONAL OFFICE		DATE: 1-18-94	
SHEET NO. 3 OF 6		APPROVED BY:	



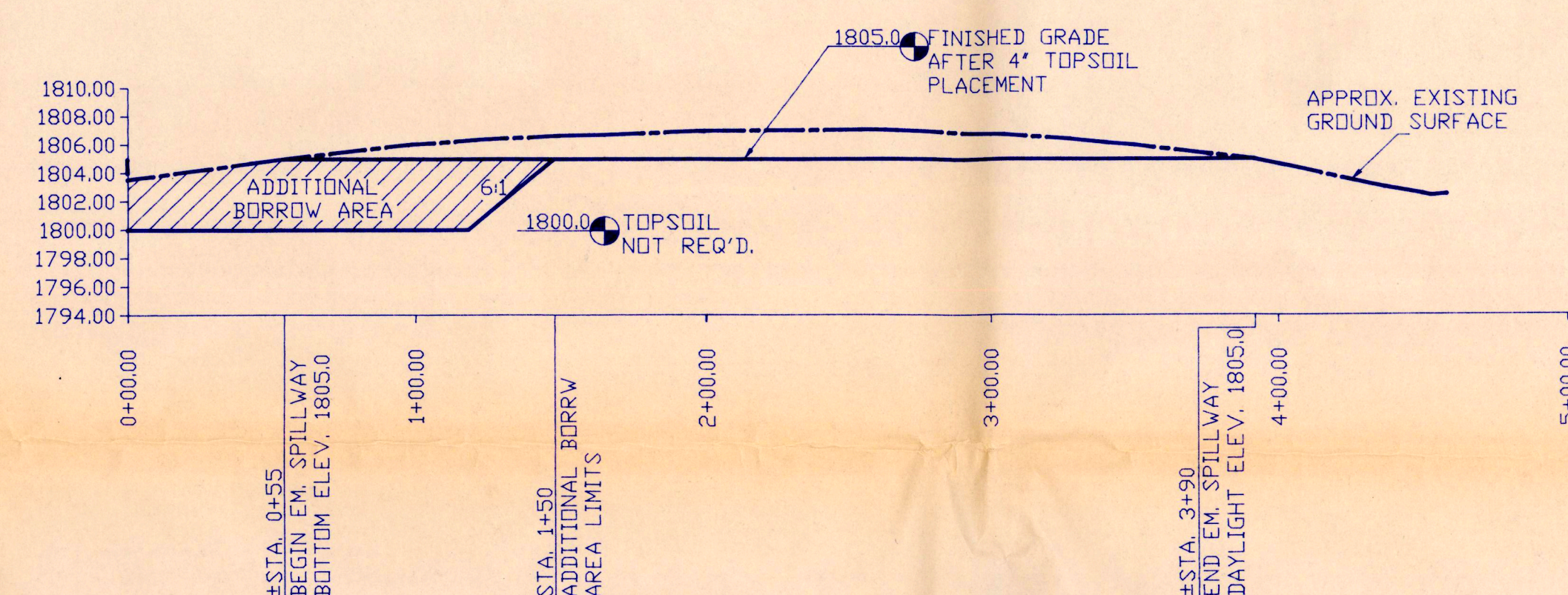
2304.2



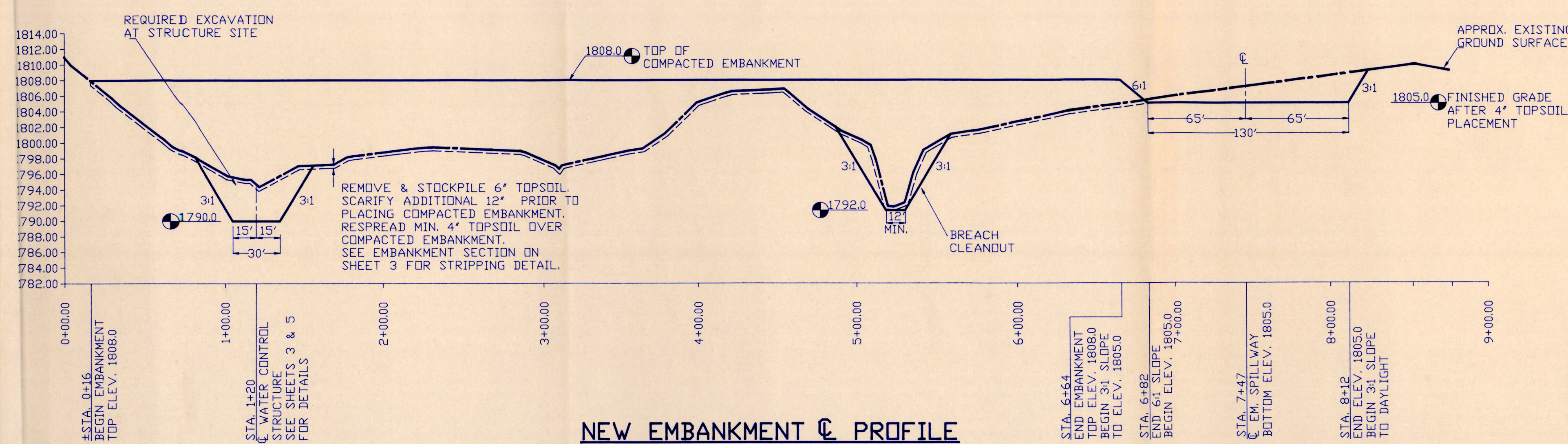
ALUMINUM PIPE
NOT ACCEPTABLE
FOR STRUCTURE



WATER CONTROL STRUCTURE
PLAN & C PROFILE
NOT TO SCALE



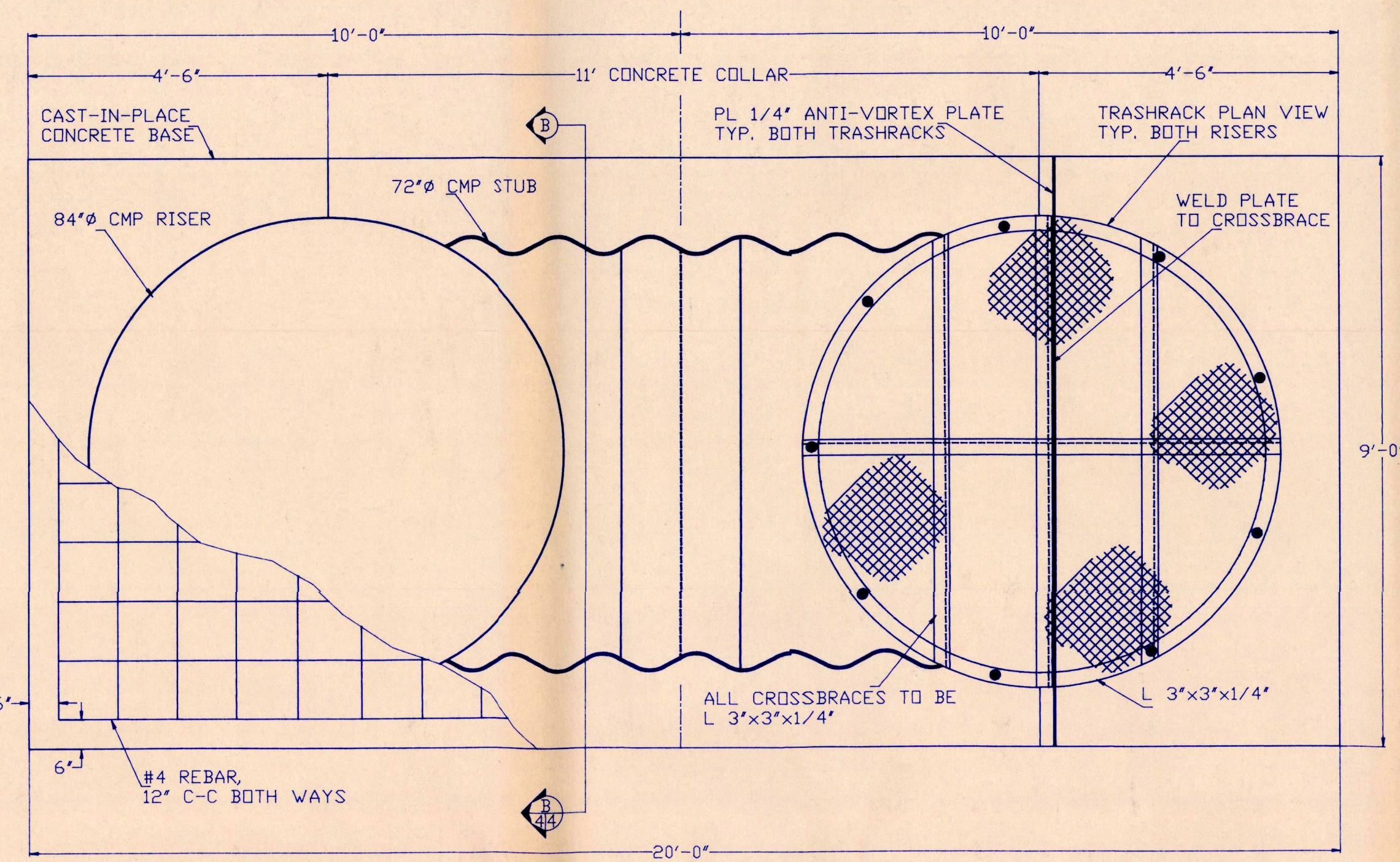
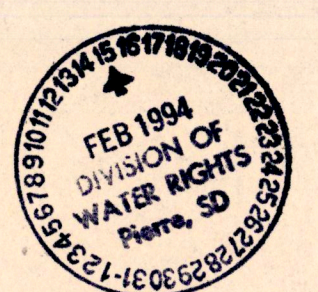
EMERGENCY SPILLWAY C PROFILE
SCALE: 1"=10' VERT., 1"=50' HORIZ.



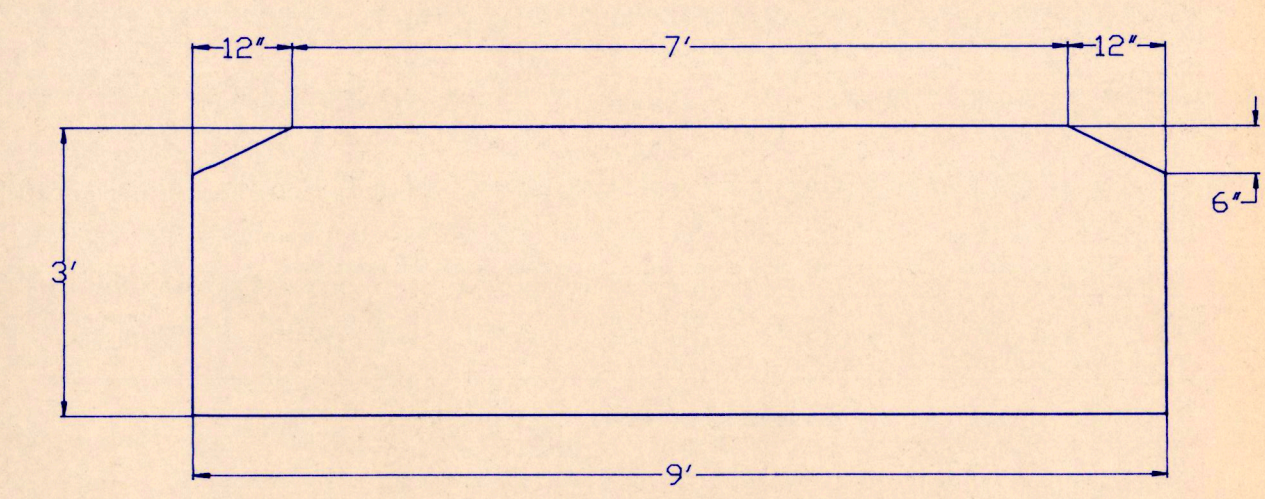
NEW EMBANKMENT C PROFILE
SCALE: 1"=10' VERT., 1"=50' HORIZ.

	PROJECT NO. SD-133-1	DESIGNED BY: R.C.S.
	PERRY COMP IMPOUNDMENT	DRAWN BY: B
	PROFILES	SURVEYED BY:
	GREAT PLAINS REGIONAL OFFICE	CHECKED BY: B.R.K.
DATE: 1-18-94	SHEET NO. 4 OF 6	APPROVED BY:

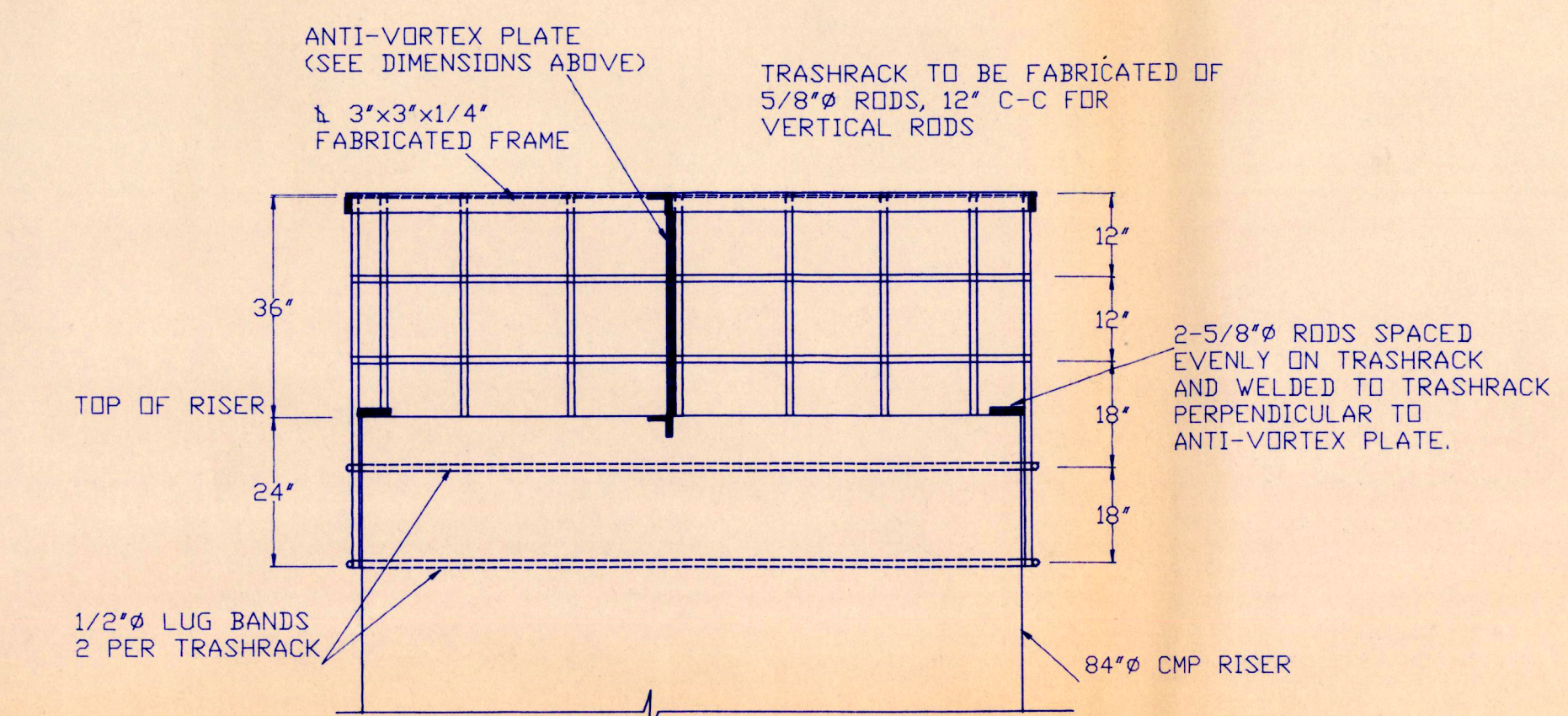
2304-2



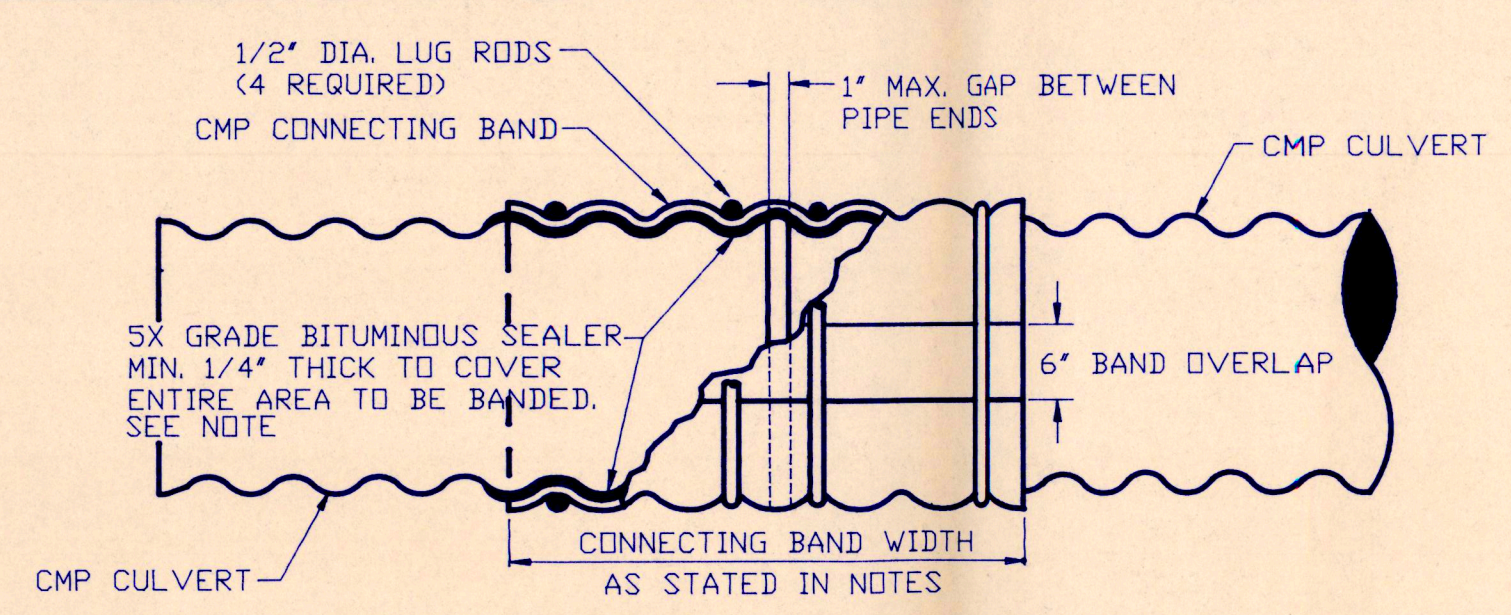
WATER CONTROL STRUCTURE PLAN
NOT TO SCALE



ANTI-VORTEX PLATE DETAIL
NOT TO SCALE



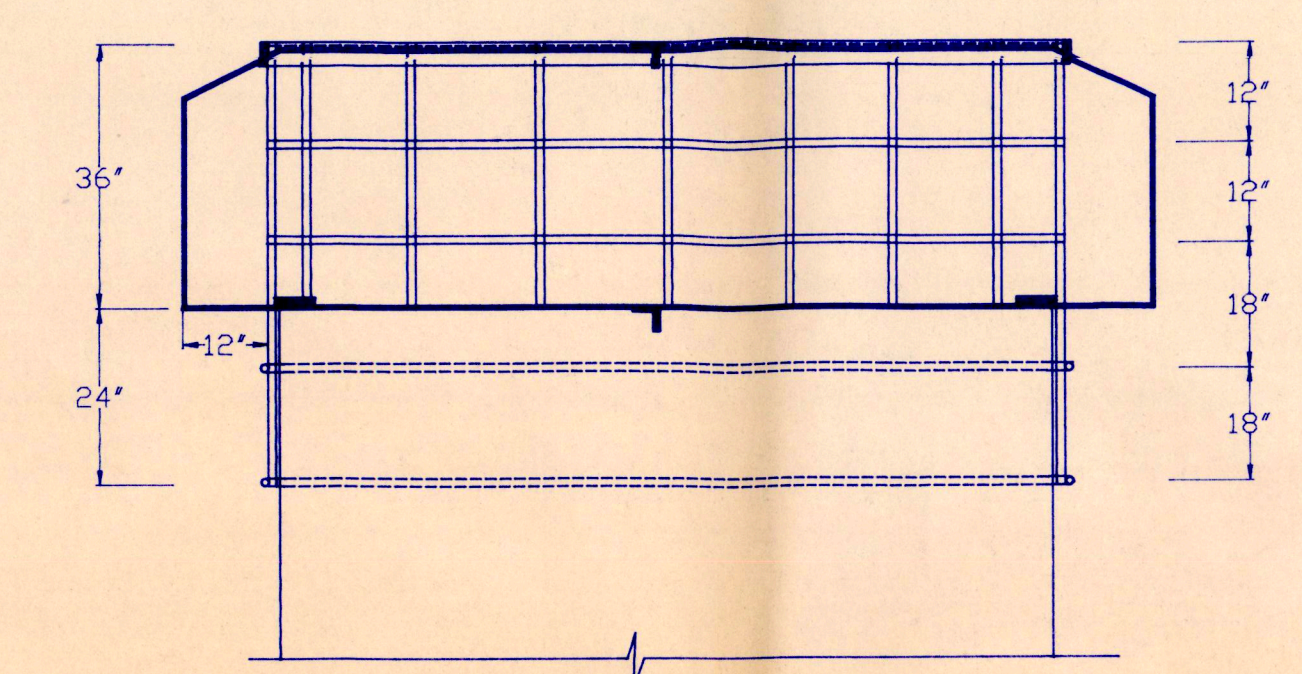
TRASHRACK DETAIL
NOT TO SCALE



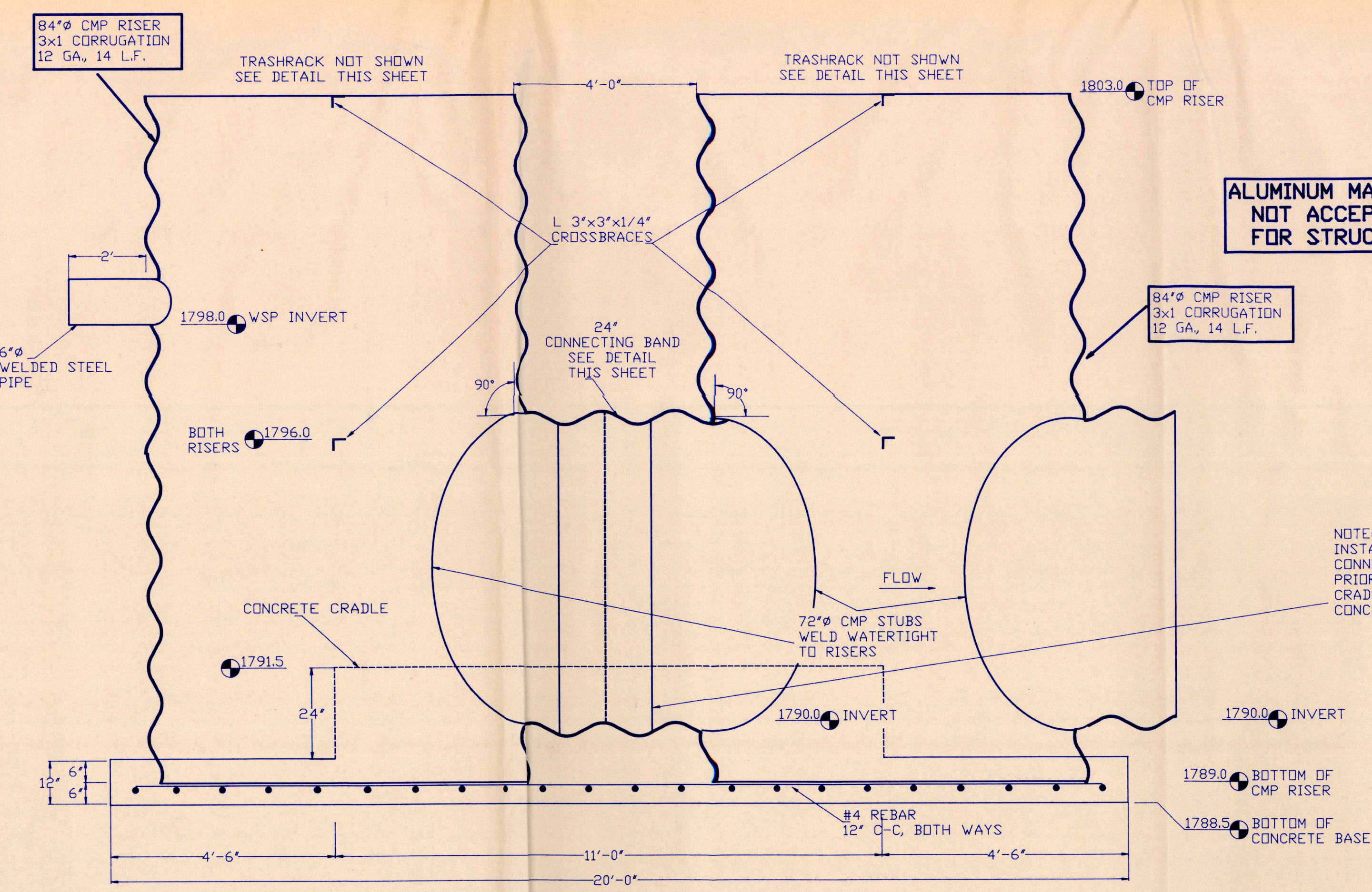
AFTER BANDS HAVE BEEN TIGHTENED, A COAT OF 5X SEALER SHALL BE APPLIED AROUND THE CULVERT AT THE ENDS OF THE CONNECTING BAND AND ALONG THE SEAM OF THE BAND OVERLAP.

NOTE TO SUPPLIERS:
IF ANNULAR PIPE IS USED, USE A 2 FT. WIDE ANNULAR BAND. IF HELICAL PIPE WITH 4 CORRUGATIONS ROLLED TO ANNULAR IS USED, USE A 21 INCH WIDE ANNULAR BAND. SEE SPECIFICATION 207.2.

CONNECTING BAND DETAIL
NOT TO SCALE

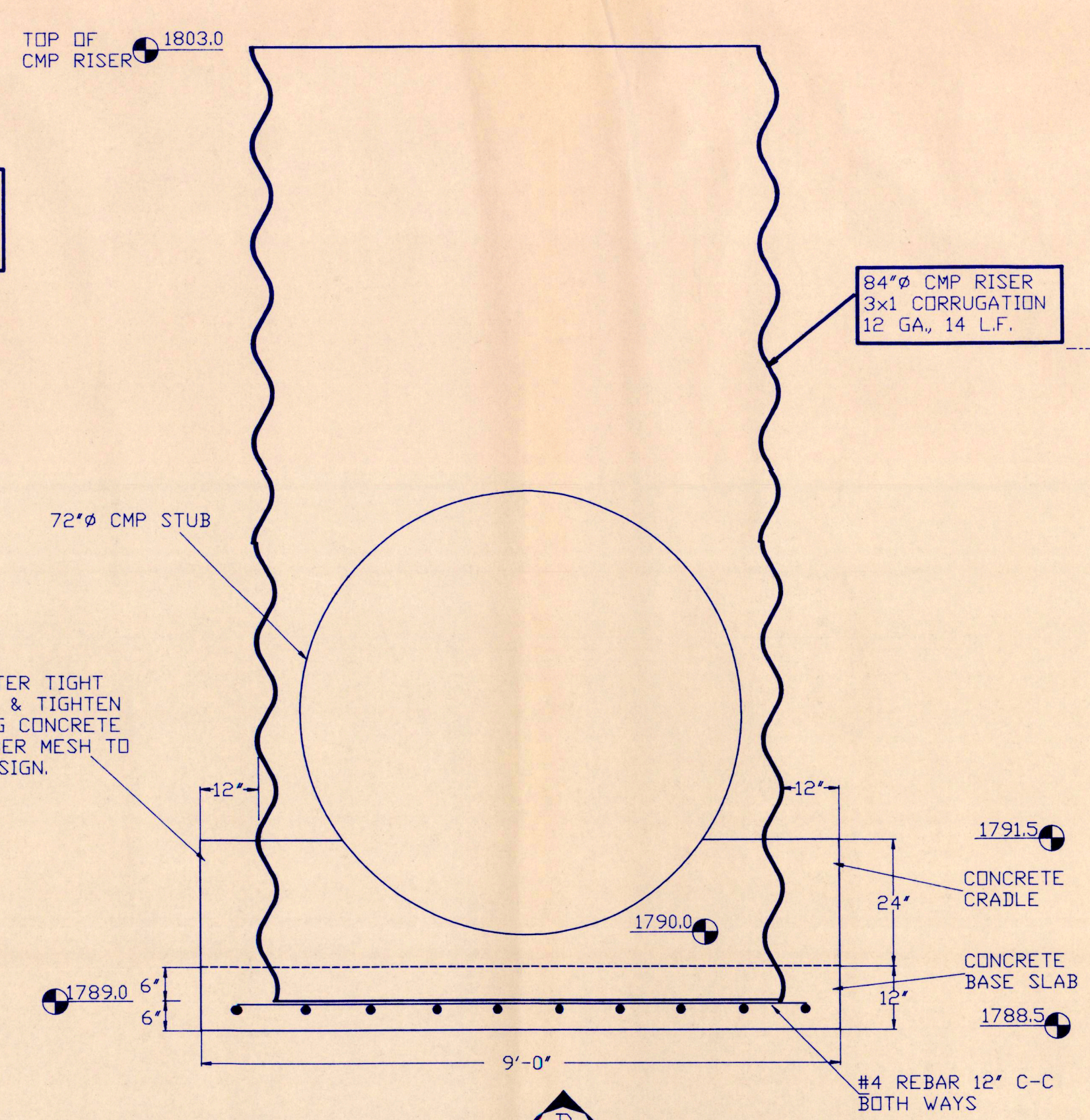


ANTI-VORTEX PLATE INSTALLATION DETAIL
NOT TO SCALE

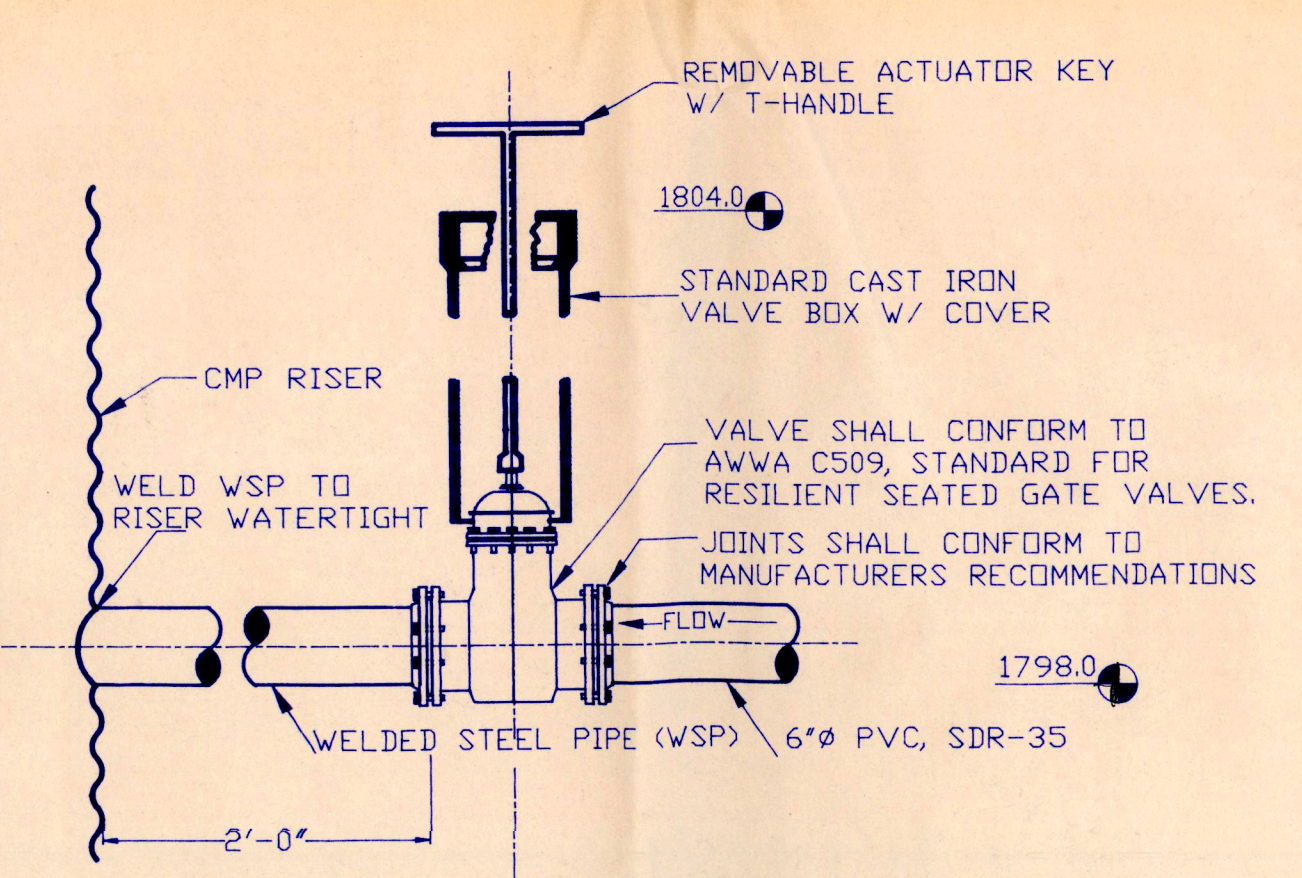


WATER CONTROL STRUCTURE PROFILE
NOT TO SCALE

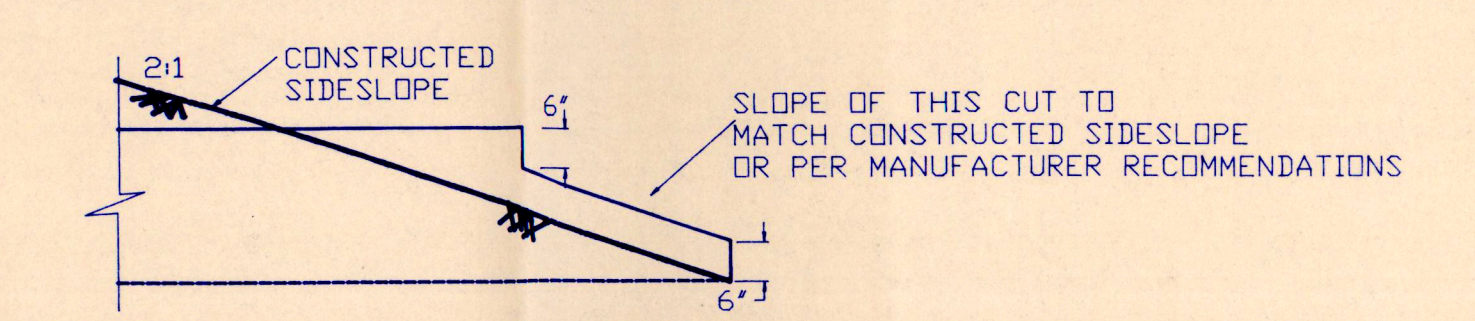
ALUMINUM MATERIALS NOT ACCEPTABLE FOR STRUCTURES



SECTION CONCRETE CRADLE SECTION
NOT TO SCALE

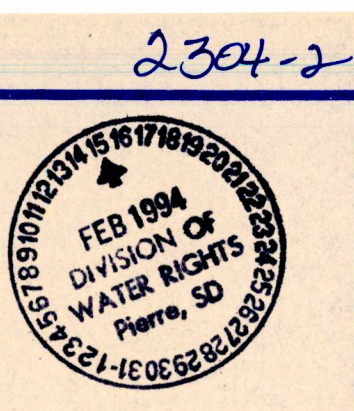


DRAWDOWN VALVE DETAIL
NOT TO SCALE



STEP BEVEL DETAIL
NOT TO SCALE

DUCKS UNLIMITED INC.		PROJECT NO. SD-133-1	DESIGNED BY: R.C.S.
GREAT PLAINS REGIONAL OFFICE		PERRY COMP IMPOUNDMENT	DRAWN BY: B
DATE: 1-18-94		RISER DETAILS	SURVEYED BY:
SHEET NO. 5 OF 6		APPROVED BY:	CHECKED BY: B.R.K.



MIDWEST TESTING LABORATORY
1900 Commerce St. / P.O. Box 2084 / Bismarck, ND 58502
Phone: (701) 255-0333 / Fax: (701) 255-0357

JOB NO. B3475 LOG OR TEST BORING NO. 1 VERTICAL SCALE

PROJECT: Proposed Embankment Rehabilitation, Perry Comp Site, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	NO.	TYPE	VALUE	MOISTURE	DENSITY	LL/PL	Q _c
1	FILL-FAT CLAY-grayish brown, stiff to rather stiff, sand inclusions, roots to 2"	1804.0	1	SB	30				
2			2	SB	18				
3			3	SB	14				
4			4	SB	13				
5			5	SB	13				
6	FAT CLAY-dark brownish gray, rather stiff, silt laminations (CH)		6	SB	14				
7	FAT CLAY-brownish gray, rather stiff, moist (CH)		7	SB	12	28.1	95.1	71/17	
8	FAT CLAY WITH SAND-grayish brown, stiff, trace of gravel (CH)		8	SB	16				
21	END OF BORING								

WATER LEVEL DATA
DATE: 11-2-93 TIME: 9:50 CAVE IN DEPTH: 11'4" WATER LEVEL: 141' NONE
11-2-93 9:55 33' NONE

BORING DATA
STARTED: 11-2-93 COMPLETED: 11-2-93 @ 9:30
METHOD USED: 3 1/4" HSA 0-19'
CREW CHIEF: M. Roberts

MIDWEST TESTING LABORATORY
1900 Commerce St. / P.O. Box 2084 / Bismarck, ND 58502
Phone: (701) 255-0333 / Fax: (701) 255-0357

JOB NO. B3475 LOG OR TEST BORING NO. 2 VERTICAL SCALE

PROJECT: Proposed Embankment Rehabilitation, Perry Comp Site, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	NO.	TYPE	VALUE	MOISTURE	DENSITY	LL/PL	Q _c
1	FAT CLAY WITH SAND-brown, stiff, trace of gravel, white mineral inclusions (CH)	1806.0	1	SB	30			74/22	
2			2	SB	16				
3			3	SB	16				
6	END OF BORING								

WATER LEVEL DATA
DATE: 11-2-93 TIME: 9:50 CAVE IN DEPTH: 33' NONE
11-2-93 9:55 33' NONE

BORING DATA
STARTED: 11-2-93 COMPLETED: 11-2-93 @ 9:50
METHOD USED: 3 1/4" HSA 0-43'
CREW CHIEF: M. Roberts

MIDWEST TESTING LABORATORY
1900 Commerce St. / P.O. Box 2084 / Bismarck, ND 58502
Phone: (701) 255-0333 / Fax: (701) 255-0357

JOB NO. B3475 LOG OR TEST BORING NO. 3 VERTICAL SCALE

PROJECT: Proposed Embankment Rehabilitation, Perry Comp Site, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	NO.	TYPE	VALUE	MOISTURE	DENSITY	LL/PL	Q _c
1	FAT CLAY-dark grayish brown, very stiff, roots (CH)	1804.0	1	SB	39				
2	FAT CLAY WITH SAND-grayish brown, stiff to very stiff, white mineral inclusions (CH)		2	SB	28	19.0	100.1	75/20	
3			3	SB	60				
6	END OF BORING								

WATER LEVEL DATA
DATE: 11-2-93 TIME: 8:45 CAVE IN DEPTH: 33' NONE
11-2-93 8:45 33' NONE

BORING DATA
STARTED: 11-2-93 COMPLETED: 11-2-93 @ 8:40
METHOD USED: 3 1/4" HSA 0-43'
CREW CHIEF: M. Roberts

MIDWEST TESTING LABORATORY
1900 Commerce St. / P.O. Box 2084 / Bismarck, ND 58502
Phone: (701) 255-0333 / Fax: (701) 255-0357

JOB NO. B3475 PROJECT: Embankment Rehabilitation, Perry Comp Site, Lyman Co. SD

BORING NO.	SOIL DESCRIPTION	SURFACE ELEV.	DATE	TIME	W.L.	CAVE IN
4	FAT CLAY-grayish brown	1807.5	11-2-93	9:00	None	None
0-4'	LL 71; PL 18		11-2-93	9:05	None	31'

BORING DATA
STARTED: 11-2-93 COMPLETED: 11-2-93 @ 9:00
CREW CHIEF: M. Roberts

WATER LEVEL DATA
DATE: 11-2-93 TIME: 9:00 CAVE IN DEPTH: 31' WATER LEVEL: 141' NONE

BORING DATA
STARTED: 11-2-93 COMPLETED: 11-2-93 @ 9:00
CREW CHIEF: M. Roberts

MIDWEST TESTING LABORATORY
1900 Commerce St. / P.O. Box 2084 / Bismarck, ND 58502
Phone: (701) 255-0333 / Fax: (701) 255-0357

REPORT OF: TESTS OF SOILS

PROJECT: Proposed Embankment Rehabilitation, Perry Comp Site, Lyman County, South Dakota

REPORTED TO: Ducks Unlimited, Inc. Attn: Roger Smith 3002 Franklin Ave Bismarck, ND 58501-9329

COPIES:

PROJECT NO. B3475

SAMPLE NUMBER: 1

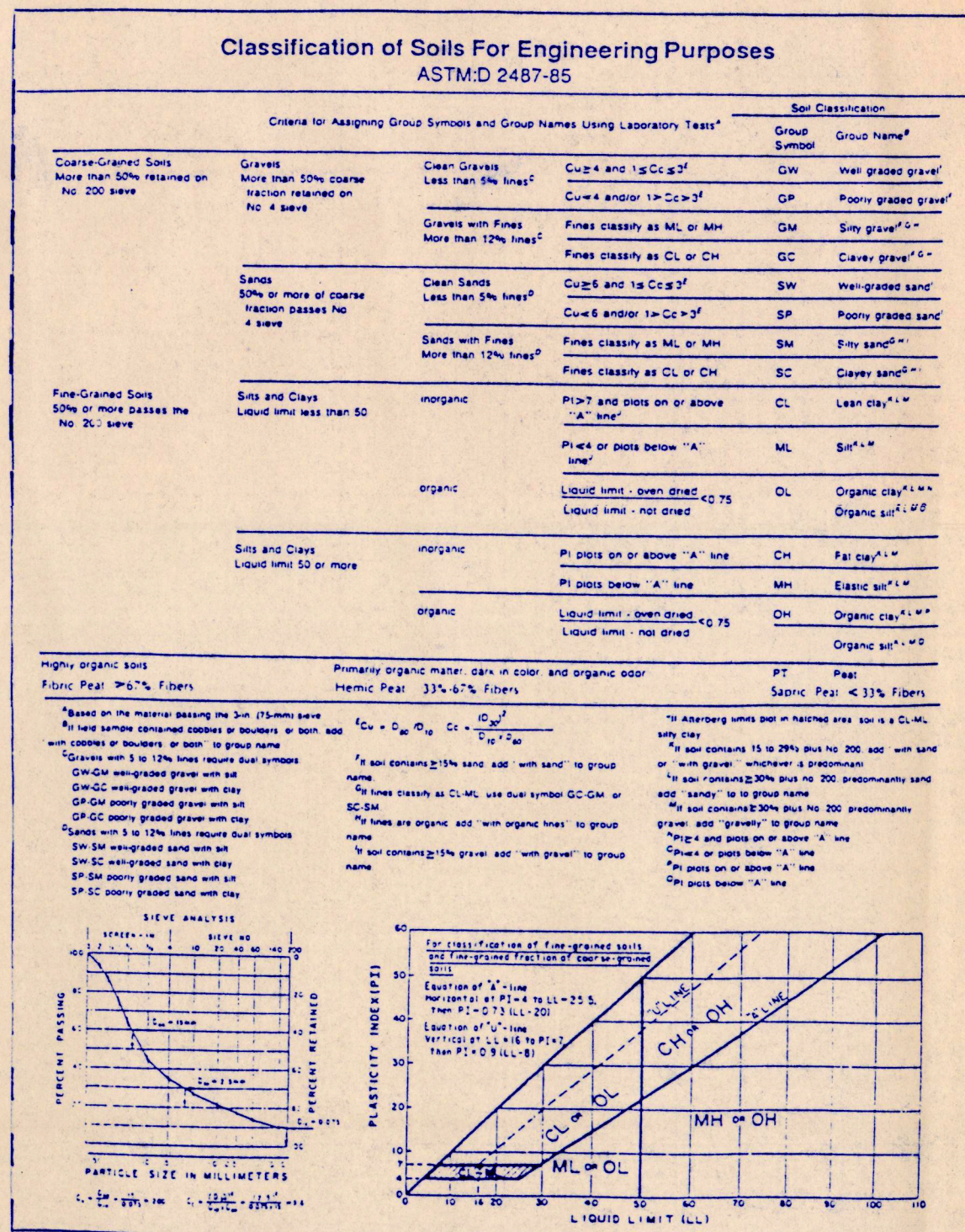
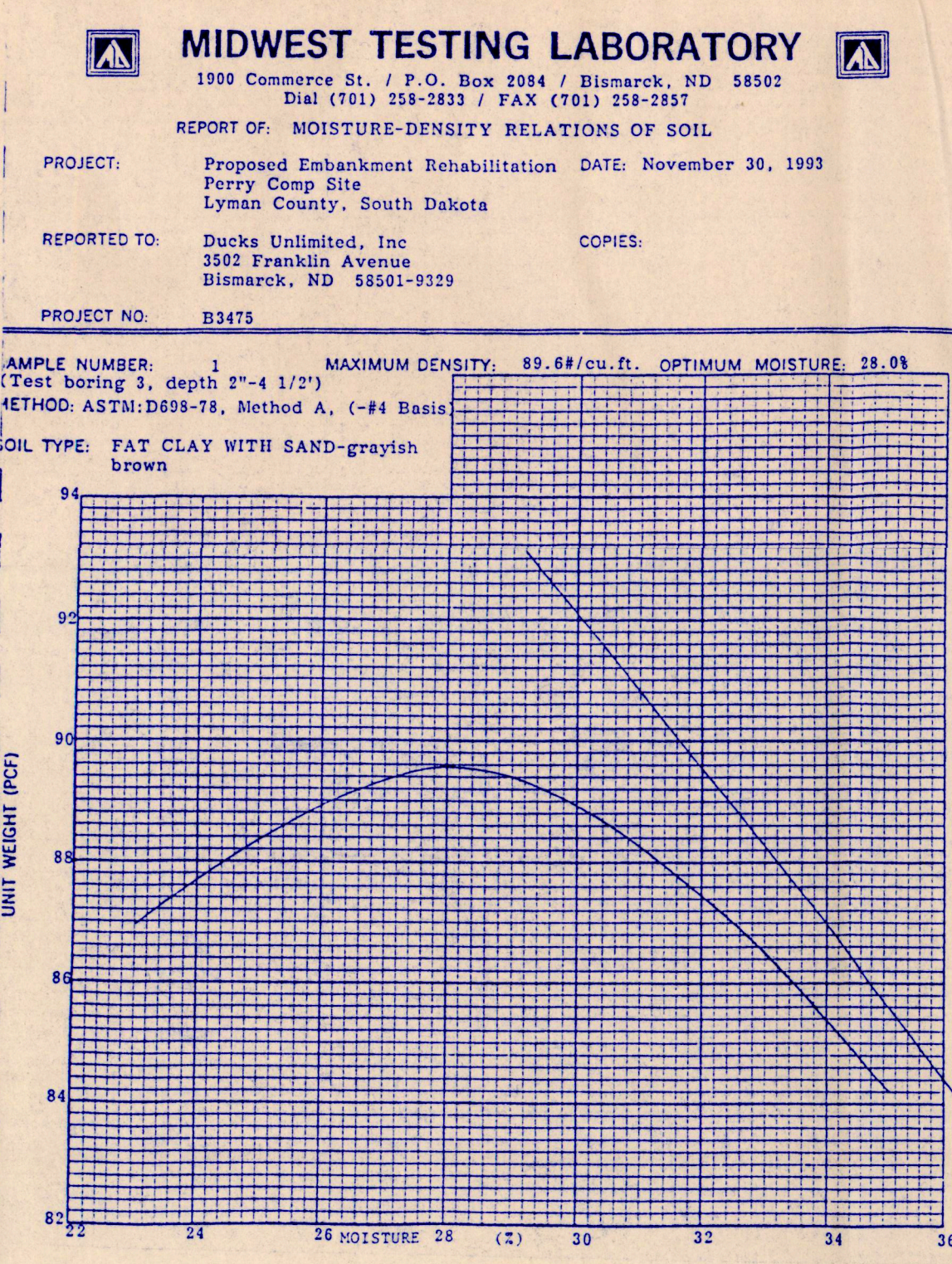
LOCATION: Boring 3, depth 2'-4 1/2'

CLASSIFICATION: FAT CLAY WITH SAND

COLOR: Grayish brown

LABORATORY MOISTURE-DENSITY RELATION (see attached curve):
Method: ASTM D698-78, Method A
Optimum Moisture (%): 28.0
Maximum Density (pcf): 89.6

LABORATORY PERMEABILITY:
Method: Falling head
Specimen Density (pcf): 85.1
Remolded Moisture Content (%): 30.0
Coefficient of Permeability (cm/sec): 6.4×10^{-9}
Saturated Moisture Content (%): 37.3



RELATIVE DENSITY OF COHESIONLESS SOILS		THICKNESS OF SOIL INTRUSIONS	
Term	"N" Value	Term	Range
Very Loose	0-5	Lens/Lamination	0-10"
Loose	5-10	Beam	10"-1'
Medium Dense	10-15	Layer	1'-12"
Dense	15-30		
Very Dense	Over 30		

CONSISTENCY OF COHESIVE SOILS		PARTICLE SIZES	
Term	"N" Value	Term	Range
Soft	0-4	Shoulders	Over 8"
Medium	5-8	Cobbles	3"-8"
Stiff	9-15	Gravel	3/4"-3"
Very Stiff	16-30	Coarse	3/4"-3"
	Over 30	Fine	#4-#20
		Medium	#20-#60
		Coarse	#60-#200
		Very Coarse	#200-#475
		Gravel	#475-#2000
		Coarse	#2000-#4750
		Very Coarse	#4750-#9500
		Gravel	#9500-#19000
		Coarse	#19000-#38000
		Very Coarse	#38000-#76000
		Gravel	#76000-#152000
		Coarse	#152000-#304000
		Very Coarse	#304000-#608000
		Gravel	#608000-#1216000
		Coarse	#1216000-#2432000
		Very Coarse	#2432000-#4864000
		Gravel	#4864000-#9728000
		Coarse	#9728000-#19456000
		Very Coarse	#19456000-#38912000
		Gravel	#38912000-#77824000
		Coarse	#77824000-#155648000
		Very Coarse	#155648000-#311296000
		Gravel	#311296000-#622592000
		Coarse	#622592000-#1245184000
		Very Coarse	#1245184000-#2490368000
		Gravel	#2490368000-#4980736000
		Coarse	#4980736000-#9961472000
		Very Coarse	#9961472000-#19922944000
		Gravel	#19922944000-#39845888000
		Coarse	#39845888000-#79691776000
		Very Coarse	#79691776000-#159383552000
		Gravel	#159383552000-#318767104000
		Coarse	#318767104000-#637534208000
		Very Coarse	#637534208000-#1275068416000
		Gravel	#1275068416000-#2550136832000
		Coarse	#2550136832000-#5100273664000
		Very Coarse	#5100273664000-#10200547328000
		Gravel	#10200547328000-#20401094656000
		Coarse	#20401094656000-#40802189312000
		Very Coarse	#40802189312000-#81604378624000
		Gravel	#81604378624000-#163208757248000
		Coarse	#163208757248000-#326417514496000
		Very Coarse	#326417514496000-#652835028992000
		Gravel	#652835028992000-#1305670057984000
		Coarse	#1305670057984000-#2611340115968000
		Very Coarse	#2611340115968000-#5222680231936000
		Gravel	#5222680231936000-#10445360463872000
		Coarse	#10445360463872000-#20890720927744000
		Very Coarse	#20890720927744000-#41781441855488000
		Gravel	#41781441855488000-#83562883710976000
		Coarse	#83562883710976000-#167125767421952000
		Very Coarse	#167125767421952000-#334251534843904000
		Gravel	#334251534843904000-#668503069687808000
		Coarse	#668503069687808000-#13370061393756160000
		Very Coarse	#13370061393756160000-#26740122787512320000
		Gravel	#26740122787512320000-#53480245575024640000
		Coarse	#53480245575024640000-#106960491150049280000
		Very Coarse	#106960491150049280000-#213920982300098560000
		Gravel	#213920982300098560000-#427841964600197120000
		Coarse	#427841964600197120000-#855683929200394240000
		Very Coarse	#855683929200394240000-#1711367858400788480000
		Gravel	#1711367858400788480000-#3422735716801576960000
		Coarse	#3422735716801576960000-#6845471433603153920000
		Very Coarse	#6845471433603153920000-#13690942867206307840000
		Gravel	#13690942867206307840000-#27381885734412615680000
		Coarse	#27381885734412615680000-#54763771468825231360000
		Very Coarse	#54763771468825231360000-#109527542937650462720000
		Gravel	#109527542937650462720000-#219055085875300925440000
		Coarse	#219055085875300925440000-#438110171750601850880000
		Very Coarse	#438110171750601850880000-#876220343501203701760000
		Gravel	#876220343501203701760000-#1752440687002407403520000
		Coarse	#1752440687002407403520000-#3504881374004814807040000
		Very Coarse	#3504881374004814807040000-#7009762748009629614080000
		Gravel	#7009762748009629614080000-#14019525496019259228160000
		Coarse	#14019525496019259228160000-#28039050992038518456320000
		Very Coarse	#28039050992038518456320000-#56078101984077036912640000
		Gravel	#56078101984077036912640000-#112156203968154073825280000
		Coarse	#112156203968154073825280000-#224312407936308147650560000
		Very Coarse	#224312407936308147650560000-#448624815872616295301120000
		Gravel	#448624815872616295301120000-#897249631745232590602240000
		Coarse	#897249631745232590602240000-#1794499263490465181204480000
		Very Coarse	#1794499263490465181204480000-#3588998526980930362408960000
		Gravel	#3588998526980930362408960000-#7177997053961860724817920000
		Coarse	#7177997053961860724817920000-#14355994107923721449635840000
		Very Coarse	#14355994107923721449635840000-#28711988215847442899271680000
		Gravel	#28711988215847442899271680000-#57423976431694885798543360000
		Coarse	#57423976431694885798543360000-#114847952863389771597086720000
		Very Coarse	#114847952863389771597086720000-#229695905726779543194173440000
		Gravel	#229695905726779543194173440000-#459391811453559086388346880000
		Coarse	#459391811453559086388346880000-#918783622907118172776693760000
		Very Coarse	#918783622907118172776693760000-#1837567245814236345553387520000
		Gravel	#1837567245814236345553387520000-#3675134491628472691106775040000
		Coarse	#3675134491628472691106775040000-#7350268983256945382213550080000
		Very Coarse	#7350268983256945382213550080000-#14700537966513890764427100160000
		Gravel	#14700537966513890764427100160000-#29401075933027781528854200320000
		Coarse	#29401075933027781528854200320000-#58802151866055563057708400640000
		Very Coarse	#58802151866055563057708400640000-#117604303732111126115416801280000
		Gravel	#117604303732111126115416801280000-#235208607464222252230833602560000
		Coarse	#235208607464222252230833602560000-#470417214928444504461667205120000
		Very Coarse	#470417214928444504461667205120000-#940834429856889008923334410240000
		Gravel	#940834429856889008923334410240000-#1881668859713778017846668820480000
		Coarse	#1881668859713778017846668820480000-#3763337719427556035693337640960000
		Very Coarse	#3763337719427556035693337640960000-#7526675438855112071386675281920000
		Gravel	#7526675438855112071386675281920000-#15053350877710224142773350563840000
		Coarse	#15053350877710224142773350563840000-#30106701755420448285547001127680000
		Very Coarse	#30106701755420448285547001127680000-#60213403510840896571094002255360000
		Gravel	#60213403510840896571094002255360000-#120426807021681791142188004510720000
		Coarse	#120426807021681791142188004510720000-#240853614043363582284376009021440000
		Very Coarse	#240853614043363582284376009021440000-#481707228086727164568752018042880000
		Gravel	#481707228086727164568752018042880000-#963414456173454329137504036085760000
		Coarse	#963414456173454329137504036085760000-#1926828912366908658275008072171520000
		Very Coarse	#1926828912366908658275008072171520000-#3853657824733817316550016144343040000
		Gravel	#3853657824733817316550016144343040000-#7707315649467634633100032288686080000
		Coarse	#7707315649467634633100032288686080000-#1541463129893526926620006477372160000
		Very Coarse	#1541463129893526926620006477372160000-#3082926259787053853240012954744320000
		Gravel	#3082926259787053853240012954744320000-#6165852519574107706480025909488640000
		Coarse	#6165852519574107706480025909488640000-#12331705039148215412960051818977280000
		Very Coarse	#12331705039148215412960051818977280000-#24663410078296430825920103637954560000
		Gravel	#24663410078296430825920103637954560000-#49326820156592861651840207275909120000
		Coarse	#49326820156592861651840207275909120000-#9