

**WATER PERMIT NO. 6438-3**

Name of Applicant: Wetlands America Trust c/o Ducks Unlimited

Address: 2525 River Road, Bismarck ND 58503-9011 Phone: 701 355-3500

Amount of Water Claimed: 84 AF Total Acres: NA

Source of Water Supply: runoff

Water to be used for: fish & wildlife propagation County: McPherson

Type of Waste Disposal System:

Location: 20 miles southwest of Leola

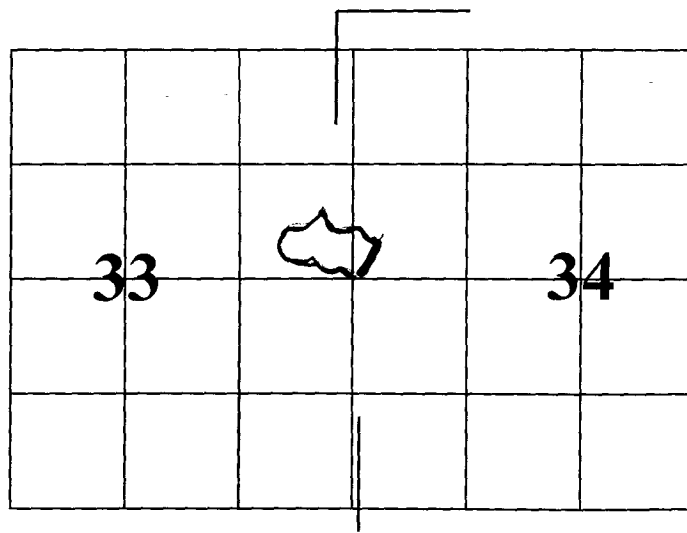
PRIORITY Date Received: 8-26-03 Application/License Fee: \$200

Corrected Application Received: Period of Annual Use: January 1 – December 31

Remarks: Reconstruction of an existing dam

Diversion Point: SW ¼ NW ¼ Sec 34-T125N-  
R69W

Water Impounded: SW ¼ NW ¼ Sec 34 and SE ¼  
NE ¼ Sec 33; all in T125N-R69W



Depth of Well: NA

Well Driller: : NA

Remarks:

Type of Map: topo

Prepared by: Roger C Smith, PE

Reviewed and the Number Assigned on: 8-26-03

By: Karen Schlaak

Notice of Hearing - date to intervene: \_\_\_\_\_

SD EForm - 1585 V1  
FORM 2: Application for uses other than irrigation  
(type or print)

|                                                                                                                    |                                                                        |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Mail to:<br>Water Rights Program<br>Joe Foss Building<br>523 E. Capitol<br>Pierre, SD 57501-3181<br>(605) 773-3352 | No. <u>6438-3</u> (office use only)<br>Hydrologic Unit <u>10160008</u> |
|                                                                                                                    | Basin <u>James River</u>                                               |
|                                                                                                                    | Newspaper <u>Northwest Blade, Eureka</u>                               |

RECEIVED  
AUG 26 2003  
WATER RIGHTS  
PROGRAM

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

### Check use(s) of water:

- |                                                 |                                           |                                                     |                                          |
|-------------------------------------------------|-------------------------------------------|-----------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Municipal              | <input type="checkbox"/> Suburban Housing | <input type="checkbox"/> Recreational               | <input type="checkbox"/> Institutional   |
| <input type="checkbox"/> Rural Water System     | <input type="checkbox"/> Commercial       | <input checked="" type="checkbox"/> Fish & Wildlife | <input type="checkbox"/> Geothermal Heat |
| <input type="checkbox"/> Domestic (over 18 gpm) | <input type="checkbox"/> Industrial       | <input type="checkbox"/> Other                      |                                          |

### Type of Application: (check one)

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

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

- Name of Applicant Wetlands America Trust in care of Ducks Unlimited Phone (701) 355-3500  
(check one) ☒ Owner ☐ Tenant/lessee  
Mailing Address 2525 River Road Bismarck State ND 58503-9011  
(Street, RR, or Box and City) (Zip Code)
- Amount of water claimed \_\_\_\_\_ \*CFS or \_\_\_\_\_ \*\*GPM 84.00 \*\*\*AF  
(\*Cubic Feet per Second) (\*\*Gallons per Minute) (\*\*\*Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply surface runoff with subsurface contributions
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County McPherson  
SW1/4 NW1/4, SECTION 34, TWP. 125 N RGE. 69W Lat 45° 36' 03." N Long 99° 09' 29" W  
Water Impounded: SW1/4 NW1/4 Sec 34 + SE1/4 NE1/4 Sec 33; all T125N-R69W
- County or counties where water will be used McPherson
- Annual period during which water is to be used annual, January - December
- Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Reconstruction of an existing dam. Although it is likely that the dam was constructed prior to 1955, as of yet no supporting evidence has been found. It is believed to have been operational since its construction. A Design Report accompanies this application. DESIGN REPORT FOR GOEBEL RANCH MAIN DAM.

STATE OF ~~SOUTH DAKOTA~~  
~~NORTH DAKOTA~~ SS  
County of BURLINGHAM

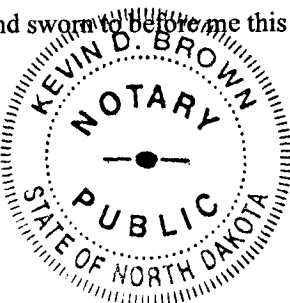
Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

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

Applicant's signature \_\_\_\_\_

Subscribed and sworn to before me this 25 day of August 20 03

KEVIN D. BROWN  
Notary Public State of North Dakota  
My Commission Expires OCTOBER 19, 2006



Notary Public signature \_\_\_\_\_



**SOUTH DAKOTA  
WATER PERMIT NO. 6438-3**

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Date of first receipt of application August 26, 2003.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 6438-3 to Wetlands American Trust, c/o Ducks Unlimited, 2525 River Road, Bismarck ND 58503-9011 authorizing the construction of the dam and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 6438-3 authorizes impoundment of 84 acre-feet of water from runoff by reconstructing a dam located in the SW ¼ NW ¼ Section 34 with water impoundment in the SW ¼ NW ¼ Section 34; SE ¼ NE ¼ Section 33; all in T125N-R69W.
2. The water appropriated shall be used for the purpose of fish and wildlife propagation and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 6438-3 is October 14, 2003.
5. The date from which applicant may claim right is August 26, 2003.
6. One-fifth of the construction is to be completed on or before April 14, 2006.
7. All construction is to be completed on or before October 14, 2008.
8. Water is to be put to beneficial use on or before October 14, 2012.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

**QUALIFICATIONS**

1. Water Permit No. 6438-3 authorizes a dam with a storage capacity of 84 acre feet of water and sufficient water annually to maintain the water level to an outlet elevation of 1,817.0 feet mean sea level.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

**WATER MANAGEMENT BOARD**

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

DEC 10 2003

date



(type or print in ink)

**1. Well Information - Proposed Construction**

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

**2. Wastewater Disposal System Information**

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

**3. Dugout Information**

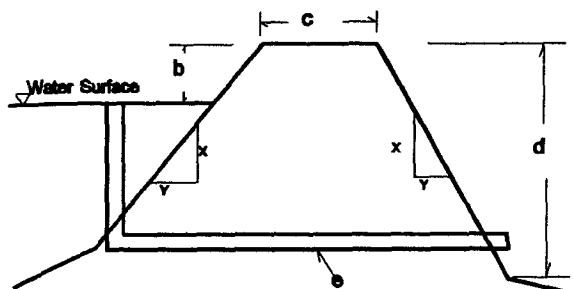
- a) Surface Dimensions \_\_\_\_\_ Depth \_\_\_\_\_
- b) Depth to water (ground surface to water level) \_\_\_\_\_

**4. Water Storage Dams**

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

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

Roger Smith, P.E. Regional Engineer, Ducks  
Unlimited, 2525 River Road, Bismarck, ND  
58503-9011



- b) Freeboard \_\_\_\_\_ 4.0'
- c) Crest Width \_\_\_\_\_ 12  
Crest Length \_\_\_\_\_ 497'
- d) Height \_\_\_\_\_ 12'
- e) Primary Outlet Capacity \_\_\_\_\_ 67 cfs  
If pipe, diameter \_\_\_\_\_ 30" CMP
- f) Secondary Spillway Capacity \_\_\_\_\_ 570 CFS  
Spillway Width \_\_\_\_\_ 100'
- g) X & Y Slope \_\_\_\_\_ 3:1  
Upstream \_\_\_\_\_ 3:1  
Downstream \_\_\_\_\_ 3:1
- h) Surface Area of Impoundment \_\_\_\_\_ 23.5
- i) Storage \_\_\_\_\_ 84.0 Acre Feet
- j) Drainage Area Above Dam \_\_\_\_\_ 640.0 Acres

# RECEIPT

## WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date AUGUST 26, 20 03

RECEIVED OF Ducks Unlimited Inc., One Waterfowl Way, Memphis TN 38120

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

|                                                                                                                        |       |        |
|------------------------------------------------------------------------------------------------------------------------|-------|--------|
| Fee for Application for Permit No. <u>6438-3</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. <u>6438-3</u>            | 50    | 00     |
| Fee for Filing Transfer Form _____                                                                                     |       |        |
| Fee for _____                                                                                                          |       |        |
| Fee for Issuing New Well Driller's License No. _____ for C.Y. _____                                                    |       |        |
| Fee for Renewal of Well Driller's License No. _____ for C.Y. _____                                                     |       |        |
| Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____                                                 |       |        |
| Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____                                              |       |        |
| (Any Other Work Provided by Law)                                                                                       | TOTAL | 200.00 |

No.

**000837**

By

Darland Erbe

Chief Engineer

*gn*

# **DESIGN REPORT**

For

**GOEBEL RANCH MAIN DAM**

**McPHERSON COUNTY, SD (SD-315-03)**

August 19, 2003



**Great Plains Regional Office  
Ducks Unlimited, Inc.  
Bismarck, ND**

**PROJECT:** Goebel Ranch Main Dam  
SD -315-3

**LOCATIONS:** SW¼, NW¼, SECTION 34, TWP. 125 N RGE. 69W  
Lat 45° 36' 03." N Long 99° 09' 29" W  
McPherson County, South Dakota

**MARSH DATA:** Full Service Level (FSL) @ 1817.0  
23.5 Surface Acres @ FSL  
83.8 Acre-Feet Capacity @ FSL  
Maximum Depth -12' (in what appears an excavated hole in basin)

**PROJECT DATA:** Top of Dam - elevation 1821.0 (Top of compacted fill add 4" for topsoil)  
Primary Spillway - elevation 1817.0  
Emergency Spillway - elevation 1818.0 (Top of finished grade)  
Upstream Berm - min 10' wide @ elevation 1817.0  
Side Slopes - 3 (horizontal): 1 (vertical)  
Existing embankment excavated to 1809 at structure location.

**CLASSIFICATION:** Based on the classification criteria outlined in Chapter 74:02:08 "Safety of Dams," it is recommended that the proposed reconstructed 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 2070. (230 acre-feet x 9.0').

**PRELIMINARY RISK ASSESSMENT:** Goebel Ranch is located on the eastern edge of the coteau, which is in the James River watershed. Flows from this dam would pass through numerous natural wetlands and lakes forming the headwaters for an unnamed tributary of Preachers Run, which empties into the Scatterwood Lakes complex. This complex will overflow into Snake Creek, which empties into the James River. There are no constructed features downstream of the proposed dam reconstruction for many miles. The storage capacity of the downstream lakes is such that should the dam fail, it would likely go unnoticed outside of the ranch.

**PROPOSED PROJECT:** The project consists of reconstructing an existing dam, installing a primary spillway, and excavating a new emergency spillway. The dam was likely constructed for cattle watering purposes. Although it is likely that the dam was constructed prior to 1955, as of yet no supporting evidence has been found. There is evidence that the basin was a natural wetland prior to dam construction. Erosion on the face of the dam and the constricted emergency spillway are jeopardizing the dam's integrity. The existing embankment will be excavated to elevation 1817 throughout its length. A controlled breach will be performed for the purpose of installing a primary spillway. Compacted fill will be placed to elevation 1821, one foot higher than the existing top of dam elevation. The primary spillway elevation of 1817.0 is at or near the existing control elevation. The only control that presently exists is a constricted emergency spillway in the left abutment.



Variable level drawdown capabilities will be included in the primary spillway. The new emergency spillway, constructed at elevation 1818.0, will be north of the existing spillway. The new embankment will extend across the existing spillway. The new embankment material will be compacted to 95% of the Standard Proctor at -1% to +3% of optimum moisture. The dam will be constructed having a top width of 12' and having a 10' berm at the upstream full service level. All slopes will be constructed to a 3:1 slope.

**PRIMARY SPILLWAY:** The structure will have a fixed level water control capability at elevation 1817.0. Variable level water control will be provided by a separate structure having the capability of retaining water at 4" increments between elevations 1810.0 and 1817.0. The structure will have a riser that will act as a circular weir and be 48" in diameter and made of 12 gage corrugated metal pipe. The outlet barrel will be a 30", 12 gage corrugated metal pipe at a 0% slope at elevation 1809.0. All corrugated metal pipe will be coated with a 10-mill polymeric film laminate both inside and outside. A protected plunge pool will be located at the discharge end of the outlet pipe.

**EMERGENCY SPILLWAY:** The emergency spillway will be excavated having a 100' bottom width and 3:1 slopes. The top of the finished spillway grade, after replacing 4" of topsoil, will be 1818.0 or 1 foot above the crest of the primary spillway. The length of the level crest at the spillway centerline is 120' feet. The new emergency spillway will outlet onto a 3% well vegetated slope.

**HYDROLOGY / HYDRAULICS:** 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 USGS. The NRCS TR-20 METHOD was used to determine the inflow hydrograph. The hydraulic curve number used in the TR-20 METHOD was manipulated to create peak discharges similar to those developed from the regression equation. Other assumptions made in developing inflow hydrographs by the TR-20 METHOD were:

Rain Duration = 1.00  
Rain Table # = 1  
Antecedent moisture condition = 2

Inflow hydrographs developed from the TR-20 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 - 1.0 SQ MI

TIME OF CONCENTRATION - 0.5 HOURS

CURVE #'s - 68 (5 yr) 70 (10 yr) 72 (25yr) 74 (100 yr)

| Event<br>Frequency | Rainfall<br>(in.) | Runoff<br>(ac-ft) | Inflow*<br>(cfs) | Outflow<br>(cfs) | Max WSP<br>(el.) | Freeboard**<br>(ft.) | Flow in ES<br>(cfs) |
|--------------------|-------------------|-------------------|------------------|------------------|------------------|----------------------|---------------------|
| 5 yr 20%           | 3                 | 33                | 75               | 18               | 1817.57          | 3.43                 | 0                   |
| 10 10%             | 3.5               | 53                | 160              | 30.4             | 1817.84          | 3.16                 | 0                   |
| 25 25%             | 4.1               | 81                | 290              | 52.7             | 1818.14          | 2.86                 | 10                  |
| 100 yr 1%          | 5.2               | 134               | 543              | 117.2            | 1818.62          | 2.38                 | 57                  |

\*\*Calculated from top of compacted fill, excluding topsoil.

A spillway rating curve for the primary and emergency spillways is contained within this report.

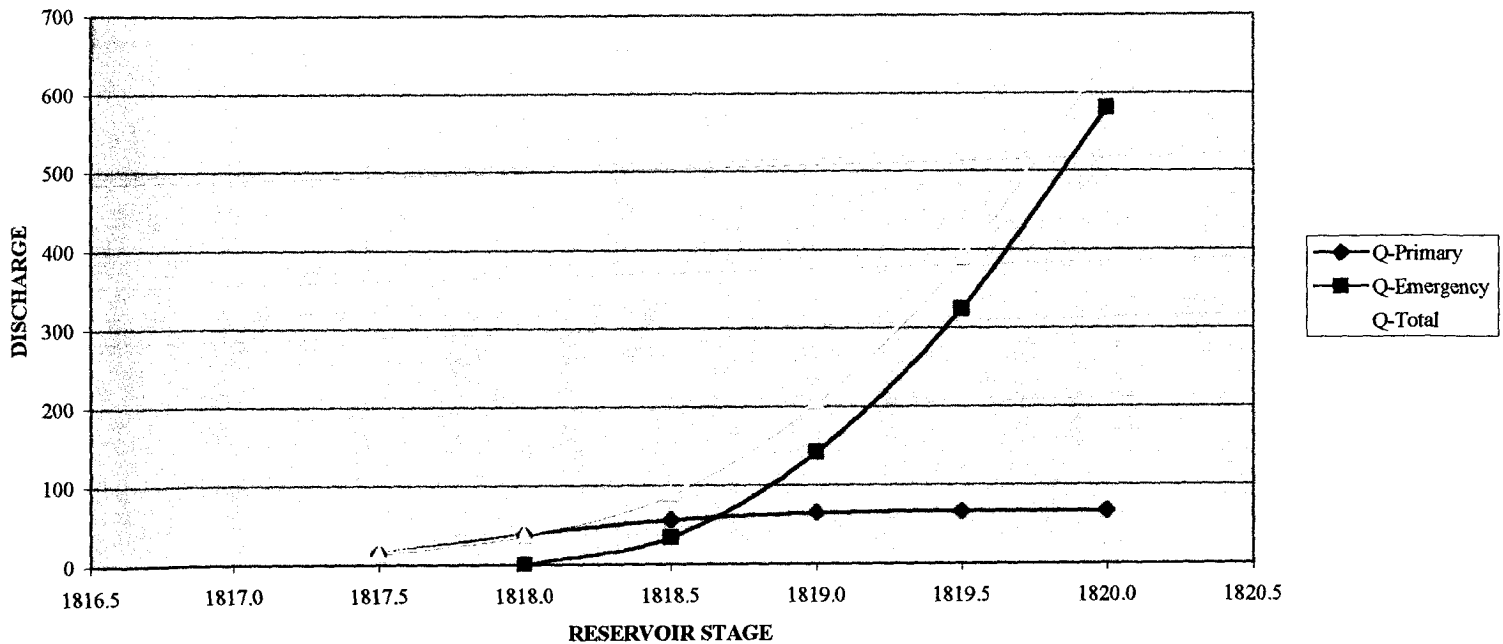
The primary spillway capacity was calculated by comparing discharges developed by the weir flow formula and formulas for calculating head loss through corrugated metal pipe. The emergency spillway capacity was estimated from FLOWCOMP, a computer-aided hydraulic program analyzing gradually varied flow profiles in prismatic open channels using the standard step method.

**DROUGHT ANALYSIS:** A drought analysis was not performed due to the reliability of the existing reservoir. It is apparent that subsurface contribution plays a large role in keeping the reservoir at, or near, full most years. In consecutive drought years water levels will fall but the basin is not know to go dry.

**SOIL INVESTIGATION:** Midwest Testing from Bismarck, ND, has completed a geotechnical investigation. A soil investigation report is available upon request. Material from within proposed borrow areas were classified as lean clay and are suitable for embankment construction. Borrow material will come mainly from the planned emergency spillway.

**IMPACTS TO SURROUNDING PROPERTY:** The planned construction and subsequent reservoir at the full service level will be contained within land owned by Wetlands America Trust, the landownership arm of Ducks Unlimited, Inc.

SPILLWAY RATING CURVE



Dated: August 19, 2003  
Submitted By:  
Roger Smith, P.E (#-4325)  
Regional Engineer  
Ducks Unlimited  
Great Plains Regional Office



Water Permit Application #6438-3  
Wetlands America Trust  
c/o Ducks Unlimited

Top of Dam Elev. - 1821  
2nd Spillway Elev. - 1818  
P. Spillway Elev. - 1817  
D/S Emb Toe Elev. - 1809

Cat. 3 - Low Hazard Dam

Ht. = 12 ft

Normal Storage Capacity - 84 Ac-Ft  
Int. Storage Capacity - 112  
Max. Storage Capacity - 230

Int. Capacity x Eff Ht. =  $112 \times 9 = 1008 < 3000 \therefore 25 \text{ yr}$   
Minimum Spillway Design

From USGS WRI 80-80 "Tech for Est. Flood Peaks ... in 50"

$$DA = 640 \text{ Ac} = 1 \text{ mi}^2$$

$$\text{Slope} = 6.0 \text{ ft/mi}$$

$$S_i = 3.16$$

$$\begin{aligned} Q_{25} &= 83.4 A^{.60} S_i^{.44} S_i^{-.72} \\ &= 83.4 (1)^{.60} (6.0)^{.44} (3.16)^{-.72} \\ &= 83.4 (1) \times 6.06 \times 0.4367 \\ &= \underline{220 \text{ cfs}} \end{aligned}$$

$$\begin{aligned} Q_{100} &= 132 A^{.65} S_i^{.46} S_i^{-.67} \\ &= 132 (1)^{.65} (6.0)^{.46} (3.16)^{-.67} \\ &= 132 (1) \times 6.58 \times 0.4626 \\ &= \underline{402 \text{ cfs}} \end{aligned}$$

Secondary Spillway Flow

$$\begin{aligned} Q &= C L H^{3/2} \\ C &= 2.6 \\ L &= 100 \text{ ft} \\ H &= 3 \text{ ft} \\ &= 2.6 (100) (3)^{1.5} \\ &= \underline{1350 \text{ cfs}} \end{aligned}$$

NRCS Annual Yield  
DA = 640 CN = 72 ISO = 2

Section 74:02:08:09

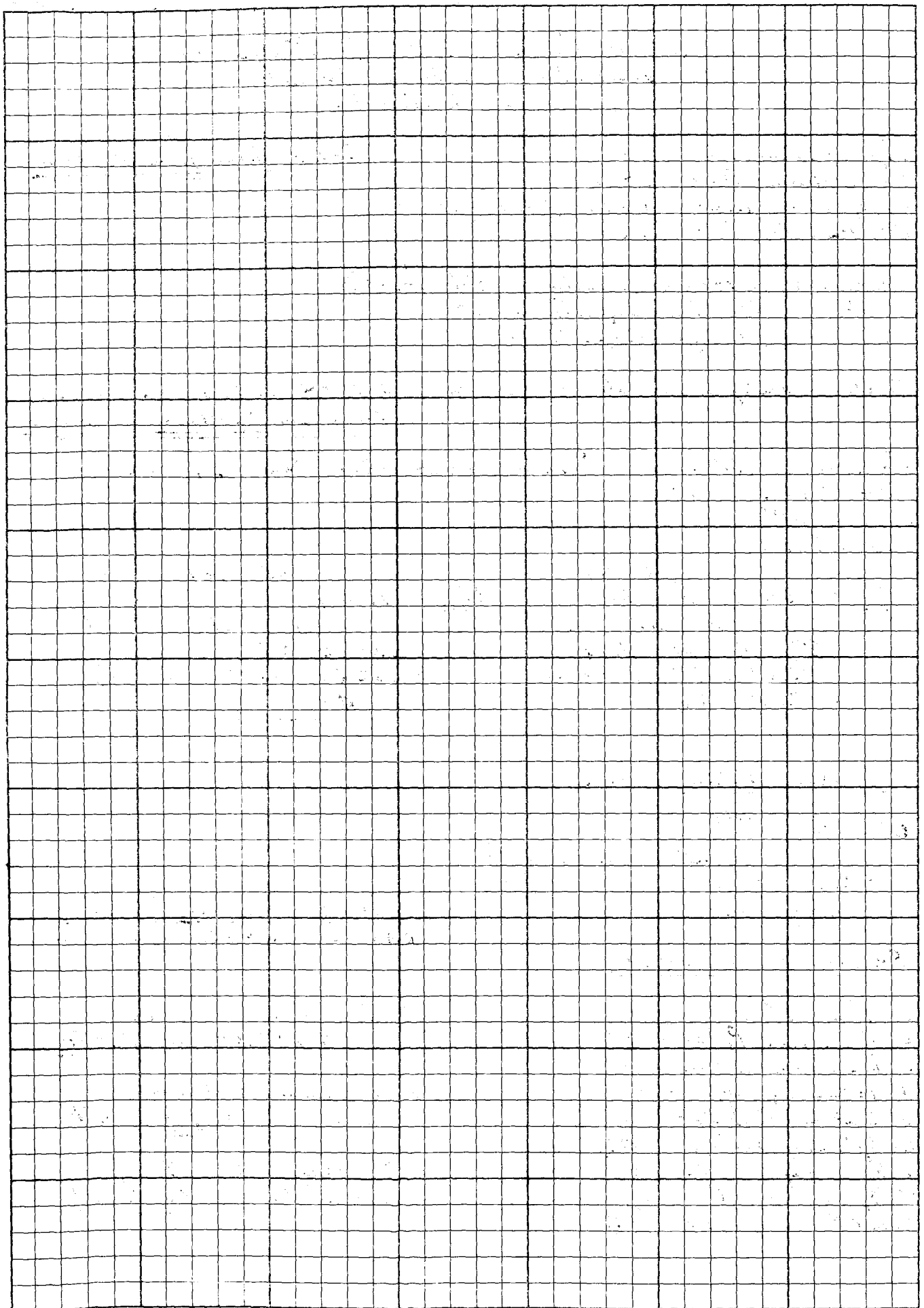
1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam Max X-sec. - OK
4. Area Capacity - OK
5. Outlet Details - OK
6. Spillway Rating - OK
7. Spillway Details - OK
8. Specs - st. DV - OK
9. EPP - N/A cat. 3 - OK

$$\begin{aligned} 80\% \text{ chance} &= 0.084 \\ 0.084 \times 640/12 &= \underline{5 \text{ Ac-Ft}} \end{aligned}$$

$$\begin{aligned} 50\% \text{ chance} &= 0.26 \\ 0.26 \times 640/12 &= \underline{14 \text{ Ac-Ft}} \end{aligned}$$

$$\begin{aligned} 10\% \text{ chance} &= 1.4 \\ 1.4 \times 640/12 &= \underline{75 \text{ Ac-Ft}} \end{aligned}$$







GREAT PLAINS REGIONAL OFFICE  
2525 River Road  
Bismarck, ND 58503-9011  
(701) 355-3500 Fax (701) 355-3575  
www.ducks.org

August 23, 2003

RECEIVED

AUG 26 2003

WATER RIGHTS  
PROGRAM

Eric Gronlund  
Water Rights Division  
SD Dept Water & Natural Resources  
523 E. Capitol  
Pierre, SD 57501

Re: Goebel Ranch – Main Dam (existing dam repair in McPherson County, SD)

Dear Mr. Gronlund:

Enclosed is a water right application for an existing dam repair on land owned by Wetlands America Trust, the land owning division of Ducks Unlimited, Inc. I was unable to determine if a water right existed on the dam. We suspect the dam has been in place since before 1955 but have no evidence of such. If your records show that any water rights have been granted to the dam, please let me know. The location can be found in the accompanying Design Report.

I have included the application (forms 2 and 2A), plans, Design Report, and a payment of \$200.

If you have any questions please feel free to contact me.

Sincerely,

Roger Smith, P.E.  
Regional Engineer  
Great Plains Regional Office

Cc: Randy Meidinger

REPORT ON  
WATER PERMIT APPLICATION No. 6438-3  
Wetlands America Trust  
c/o Ducks Unlimited, Inc.  
August 27, 2003

Water Permit Application No. 6438-3 has been filed by Wetlands America Trust c/o Ducks Unlimited Inc. to impound 84 acre-feet of water by reconstructing an existing dam, located in the SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  of Section 34-T125N-R69W, in McPherson County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation. The water will be used for fish and wildlife production.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. Ducks Unlimited, Inc. has designed the dam. The plans and specifications have been reviewed and will be approved.

The reconstructed dam will be 12 feet high with a normal storage capacity of 84 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 230 acre-feet with a reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25-year frequency event.

The dam has a drainage area of 640 acres or 1.00 square miles. The project is designed to have a 48 inch diameter CMP riser with a 30 inch diameter CMP barrel and four feet of freeboard serving as the primary spillway structure, and a 100 foot wide earthcut secondary spillway with 3.0 feet of available freeboard. A 25-year frequency event produces a peak runoff of approximately 220 cfs and a 100-year frequency event produces a peak runoff of approximately 402 cfs. The earthcut secondary spillway will have the capacity to pass approximately 1350 cfs.

The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 5 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 14 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 75 acre-feet.

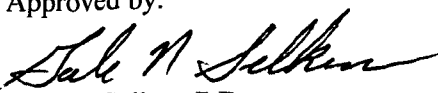
The Goebel Ranch Dam is located in the SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  of Section 34-T125N-R69W on an unnamed tributary near the headwaters of Preacher Run Creek. There are no existing Water Permit/Rights located in the immediate area of the reconstructed dam.

Conclusions:

1. Water Permit Application No. 6438-3 should be approved since unappropriated water is available and approval should not have an adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 6438-3.

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

Approved by:

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



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

PMB 2020  
JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182  
[www.state.sd.us/denr](http://www.state.sd.us/denr)

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT  
APPLICATION NO. 6438-3, Wetland America Trust**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 6438-3, Wetland America Trust, c/o Ducks Unlimited, Jeffrey W. Nelson, 2525 River Road, Bismarck ND 58503-9011.

The Chief Engineer is recommending APPROVAL of Application No. 6438-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Water Permit No. 6438-3 authorizes a dam with a storage capacity of 84 acre feet of water and sufficient water annually to maintain the water level to an outlet elevation of 1,817.0 feet mean sea level.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer  
September 15, 2003



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

PMB 2020  
JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182  
[www.state.sd.us/denr](http://www.state.sd.us/denr)

September 15, 2003

Roger Smith, P.E.  
Ducks Unlimited, Inc.  
Great Plains Regional Office  
2525 River Road  
Bismarck, ND 58503-9011

Dear Mr. Smith:

We have reviewed the plans and specifications for the Goebel Ranch Dam reconstruction project located in the NW 1/4 of Section 34-T125N-R69W, in McPherson County. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the dam. The construction of the dam may not begin until Water Permit No. 6438-3 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 Ducks Unlimited, Inc., as owner of the dam, from the responsibility for operating and maintaining the dam in good repair to ensure the safety of the dam.

The Goebel Ranch Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 12 feet and a normal storage capacity of 84 acre-feet and a maximum storage capacity of 230 acre-feet.

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

Sincerely,

Gale N. Selken, P.E.  
Natural Resources Engineer Director  
for Garland Erbele, Chief Engineer  
Water Rights Program  
(605) 773-3352



DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES

PMB 2020  
JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182  
[www.state.sd.us/denr](http://www.state.sd.us/denr)

September 16, 2003

Northwest Blade  
PO Box 797  
Eureka SD 57437-0797

ATTENTION: Legal Public Notice

Enclosed is a Notice of Hearing on Application No. 6438-3 to Appropriate Water to be published twice. Please publish the first notice on September 24, 2003 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 Wetlands America Trust % Ducks Unlimited, Jeffrey Nelson, 2525 River Road, Bismarck ND 58503-9011 (Ph # 701-355-3500).

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

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

Sincerely,

Eric Gronlund  
Natural Resources Engineer  
605 773-3352

enclosures

CUT HERE

No. 6438-3

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

Date \_\_\_\_\_  
We are in receipt of your letter of September 16, 2003 enclosing Notice of Hearing to Appropriate Water by Application No. 6438-3 which was first published in our issue of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name \_\_\_\_\_

Newspaper \_\_\_\_\_



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

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

[www.state.sd.us/denr](http://www.state.sd.us/denr)

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

September 16, 2003

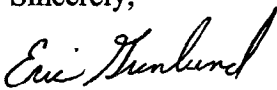
Wetlands America Trust % Ducks Unlimited  
Jeffrey Nelson  
2525 River Road  
Bismarck ND 58503

Dear Mr. Nelson:

Water Permit Application No. 6438-83 for fish & wildlife propagation 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 Northwest Blade printed at Eurkea, SD (Ph # 605-284-2631). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

  
Eric Gronlund  
Natural Resources Engineer  
(605) 773-3352

cc: Roger Smith, 2525 River Road, Bismarck ND 58503

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 September 24, 2003 with the second publication 7 days later. The applicant is responsible for payment.

---

NOTICE OF APPLICATION NO. 6438-3 to Appropriate Water

Notice is given that Wetlands America Trust c/o Ducks Unlimited, 2525 River Road, Bismarck ND 58503-9011 has filed an application for a water permit to impound 84 acre-feet of water from runoff by reconstructing a dam located in the SW ¼ NW ¼ Section 34 with water impoundment in the SW ¼ NW ¼ Section 34; SE ¼ NE ¼ Section 33; all in T125N-R69W. This application requests impoundment of sufficient water to maintain water to the outlet elevation 1817.0 feet mean sea level. The water is for fish and wildlife propagation.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6438-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 14, 2003.

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



# Affidavit of Publication

COUNTY OF McPHERSON

STATE OF SOUTH DAKOTA

Arlo C. Mehlhaff of said county being duly sworn, on oath says that he is the publisher of The Northwest Blade, a weekly newspaper published in Eureka in said County of McPherson and has full and personal knowledge of all the facts herein stated; that said newspaper is a legal newspaper and has a bona-fide circulation of at least 200 copies weekly, and has been published within said County for fifty-two successive weeks next to prior to the publication of the notice herein mentioned and was and is printed wholly or in part in an office maintained at said place of publication; that the advertisement, a printed copy of which, taken from the paper in which the same was published, is attached to this sheet, and is made a part of this Affidavit, was published in said newspaper at least once in each week for two successive weeks, on the day of each week on which said newspaper was regularly published, to wit:

|          |    |    |    |
|----------|----|----|----|
| Sept. 24 | 20 | 03 | 20 |
| Oct. 1   | 20 | 03 | 20 |
|          | 20 |    | 20 |
|          | 20 |    | 20 |
|          | 20 |    | 20 |
|          | 20 |    | 20 |

that the full amount of the fees for the publication of the annexed notice is \$ 42.80

Arlo C. Mehlhaff  
1st

Subscribed and sworn to before me this \_\_\_\_\_ day of

October, 20 03

Barry Lapp  
Notary Public

County of McPherson, South Dakota

**BARRY LAPP**

Notary Public, South Dakota  
My commission expires June 5, 2004

## NOTICE OF APPLICATION NO. 6438-3 TO APPROPRIATE WATER

Notice is given that Wetlands America Trust c/o Ducks Unlimited, 2525 River Road, Bismarck, N. D. 58503-9011 has filed an application for a water permit to impound 84 acre-feet of water from runoff by reconstructing a dam located in the SW 1/4 NW 1/4 Section 34 with water impoundment in the SW 1/4 NW 1/4 Section 34; SE 1/4 NE 1/4 Section 33; all in T125N-R69W. This application requests impoundment of sufficient water to maintain water to the outlet elevation 1817.0 feet mean sea level. The water is for fish and wildlife propagation.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6438-3 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 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 hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E. Capitol, Pierre, S.D. 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 October 14, 2003.

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

9-24-2003

10-1-2003

RECEIVED

OCT 15 2003

WATER RIGHTS  
PROGRAM



DEC 10 2003

**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

PMB 2020  
JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182  
[www.state.sd.us/denr](http://www.state.sd.us/denr)

Wetlands American Trust  
% Duck Unlimited  
2525 River Road  
Bismarck ND 58503-9011

Dear Sir:

Enclosed is Water Permit No. 6438-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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

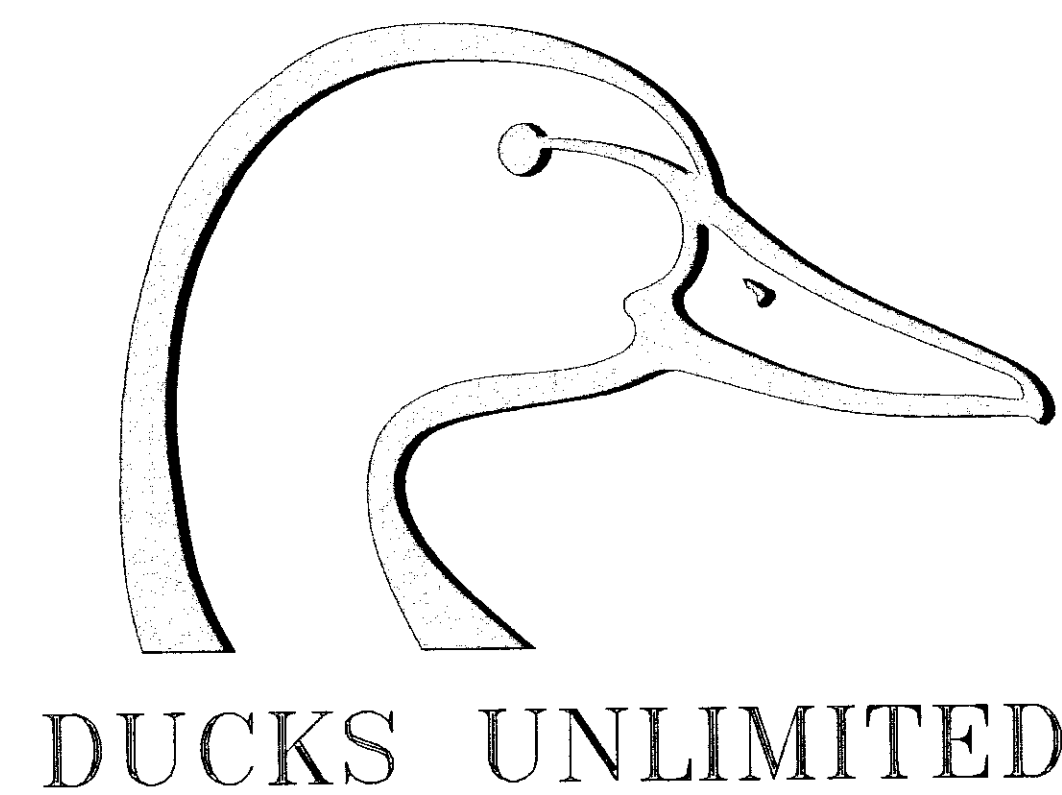
An informational sheet *Common Water Right Questions* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

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

enclosures



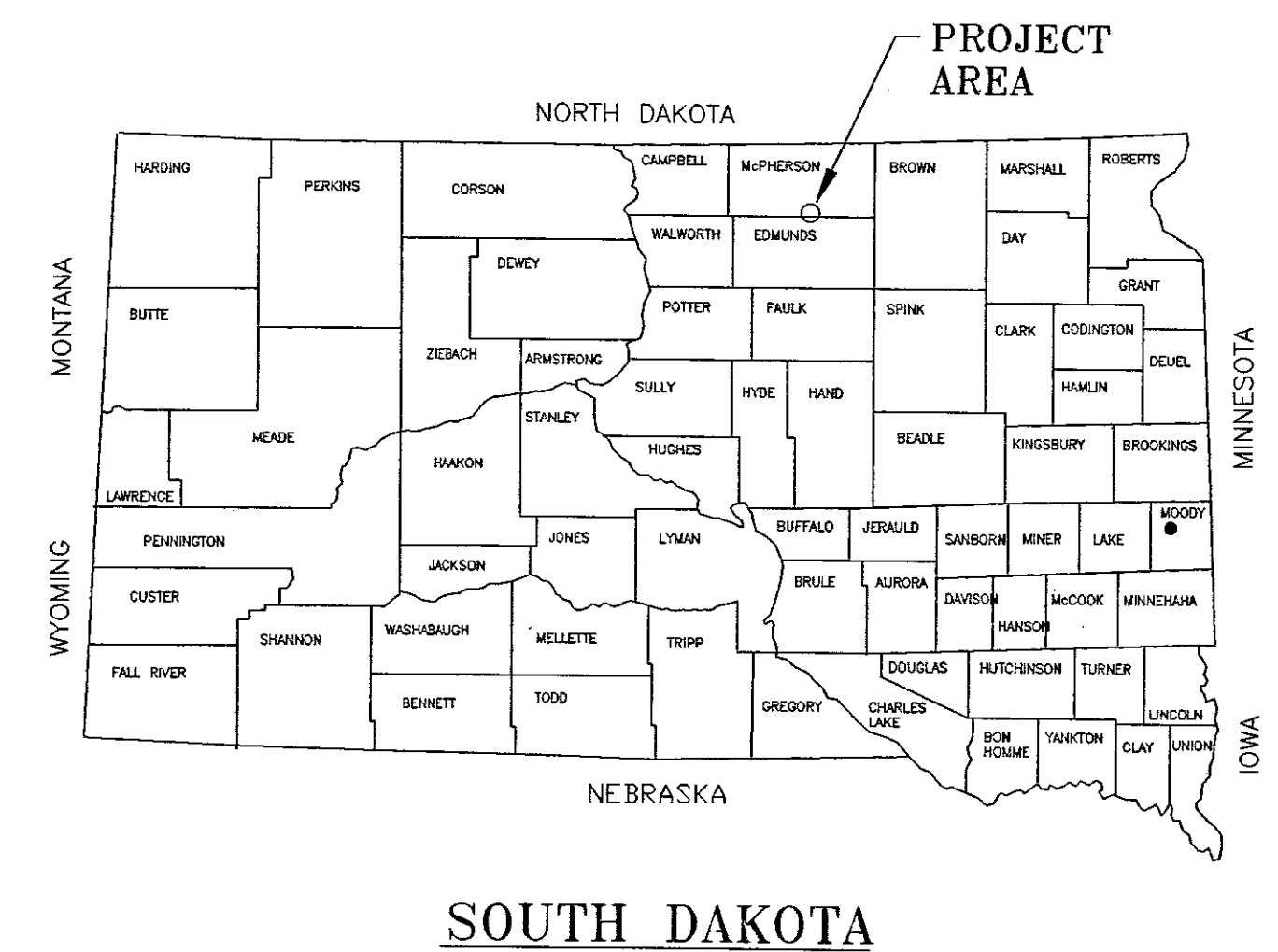
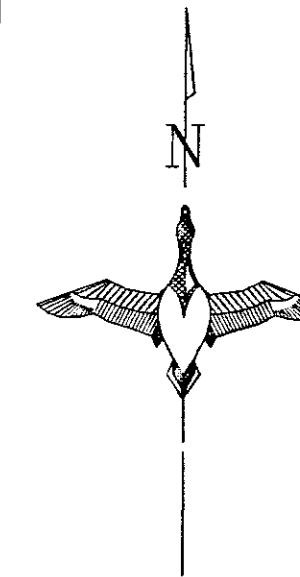


# DUCKS UNLIMITED

PROJECT

## GOEBEL RANCH

SECTIONS 33 & 34, T-125-N, R-69-W  
MCPHERSON COUNTY, SOUTH DAKOTA



### SPECIFICATIONS

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

### PLAN INDEX

- 1 LOCATION MAPS
- 2 PROJECT TOPOGRAPHY
- 3 SITE EXCAVATION PLAN
- 4 SITE EMBANKMENT PLAN
- 5 WATER CONTROL STRUCTURE - PLAN & PROFILE
- 6 WATER CONTROL STRUCTURE - DETAILS
- 7 SOIL BORING INFORMATION

### QUANTITIES

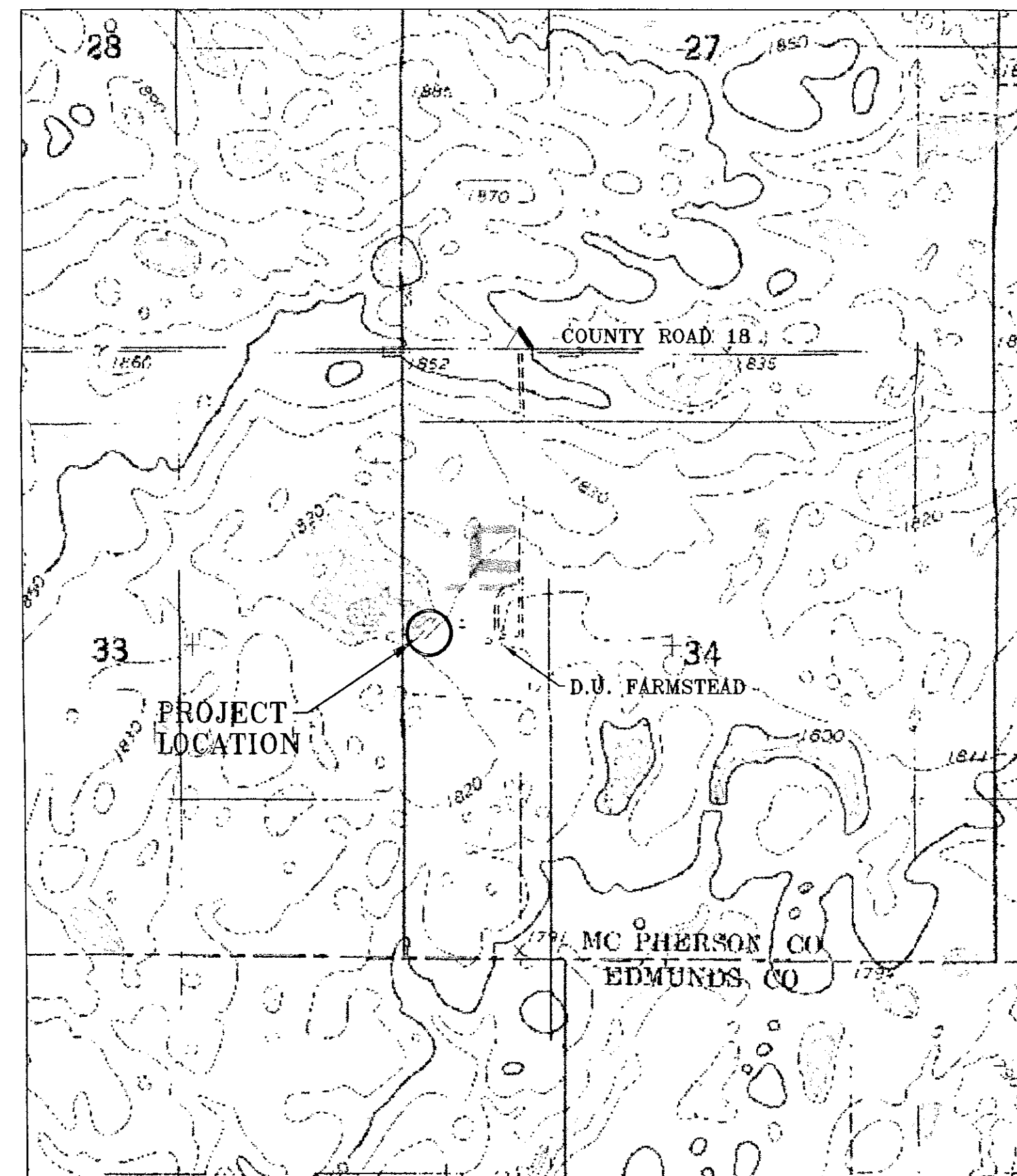
|                                                             |               |
|-------------------------------------------------------------|---------------|
| MOBILIZATION                                                | 1 L.S.        |
| SITE PREPARATION (6")                                       | 334 CY-P      |
| EXCAVATION                                                  |               |
| EXISTING DAM/STRUCTURE EXCAVATION                           | 921 CY (INC.) |
| EMERGENCY SPILLWAY EXCAVATION                               | 431 CY (INC.) |
| EMBANKMENT CONSTRUCTION                                     |               |
| EMBANKMENT RECONSTRUCTION<br>(INCLUDING STRUCTURE BACKFILL) | 2624 CY-S     |
| WATER (APPROX. 10 GAL./C.Y.)                                | 26± M-GAL.    |
| WATER CONTROL STRUCTURE INSTALLATION                        |               |
| 48"Ø CMP RISER                                              | 1 EA.         |
| AGRI-DRAIN INLINE DRAWDOWN STRUCTURE                        | 1 EA.         |
| CULVERT INSTALLATION                                        |               |
| 30"Ø CMP                                                    | 59 LF-P       |
| 12"Ø PVC                                                    | 54 LF-P       |
| RIPRAP PLACEMENT (CLASS I)                                  | 39 CY-P       |

#### NOTE TO CONTRACTOR:

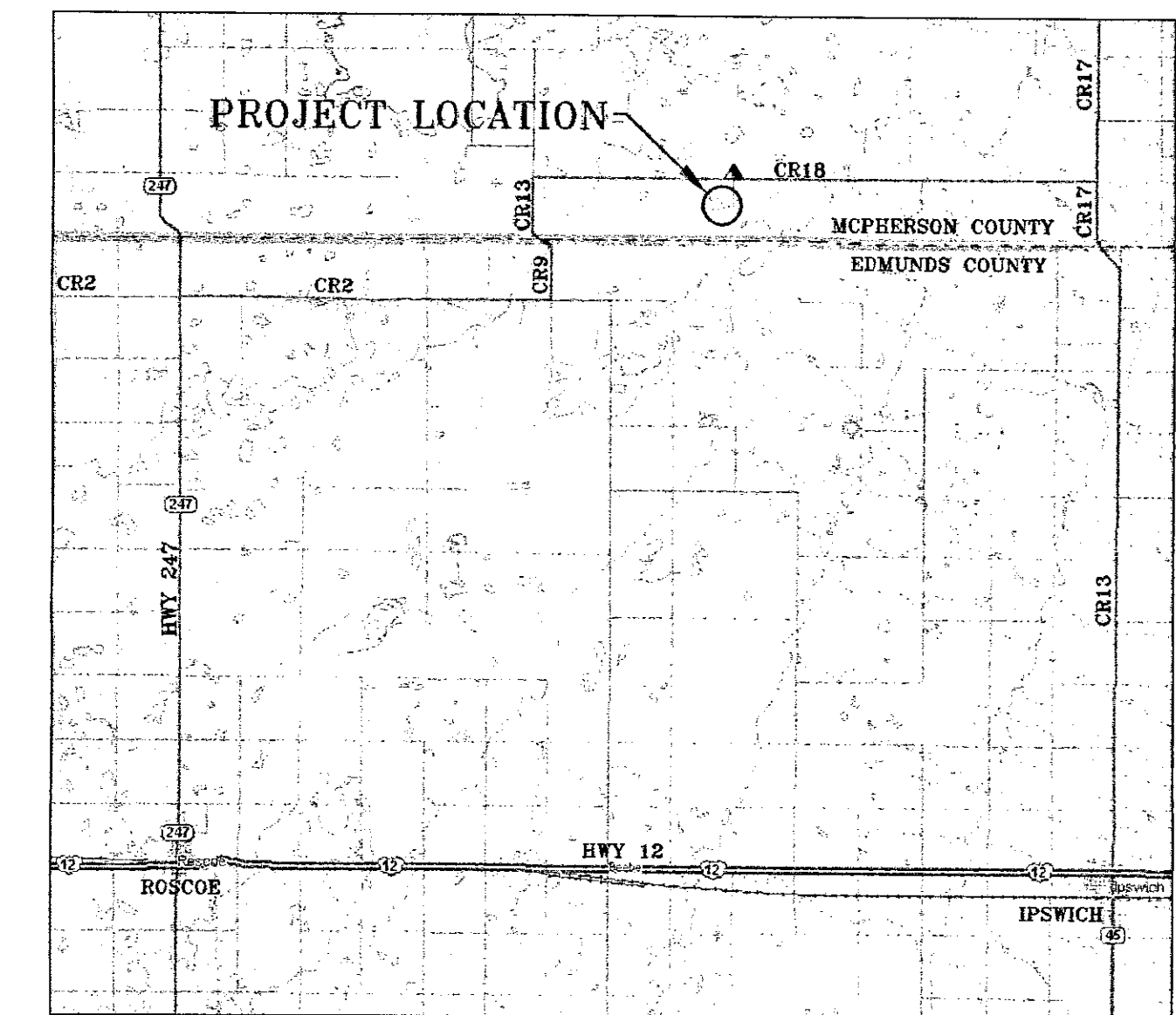
CY-P - PAYMENT WILL BE BASED ON THIS PLAN QUANTITY.

CY-S- PAYMENT WILL BE BASED ON AN AS STAKED QUANTITY AS CALCULATED FROM CONSTRUCTION STAKING DATA AND INCLUDES MATERIAL REMOVED FOR STRUCTURE INSTALLATION AND SITE PREPARATION. A 15% SHRINKAGE WAS APPLIED TO EMBANKMENT VOLUME.

WATER FOR COMPACTED FILL IS NOT ANTICIPATED HOWEVER, SHOULD WATER BE REQUIRED PAYMENT WILL BE BASED ON ACTUAL AMOUNT USED. SEE SPECIFICATION 205.



**PROJECT LOCATION MAP**  
NOT TO SCALE



**PROJECT LOCATION MAP**  
NOT TO SCALE

#### DRIVING INSTRUCTIONS:

FROM IPSWICH, SD ON HWY 12  
NORTH ON CR-13/17 11 MILES  
WEST ON CR-18 5.8 MILES

FROM ROSCOE, SD ON HWY 12  
NORTH ON HWY-247 9 MILES  
EAST ON CR-2 6 MILES  
NORTH ON CR-9/13 2 MILES  
EAST ON CR-18 3.2 MILES

FROM LEOLA, SD AT INT HWY 10 & 45  
WEST ON HWY-10 5 MILES  
SOUTH ON CR-17 8 MILES  
WEST ON CR-18 5.8 MILES

FROM HOSMER, SD AT INT OF HWY-253 & CR-7  
EAST ON CR-2 12 MILES  
NORTH ON CR-9/13 2 MILES  
EAST ON CR-18 3.2 MILES

RECEIVED  
AUG 26 2003  
WATER RIGHTS  
PROGRAM

THE PROJECT IS LOCATED ON PRIVATE LAND  
OWNED BY WETLANDS AMERICA TRUST  
THE MANAGER IS RANDY MEIDINGER  
PERMISSION IS REQUIRED PRIOR TO ENTERING SITE

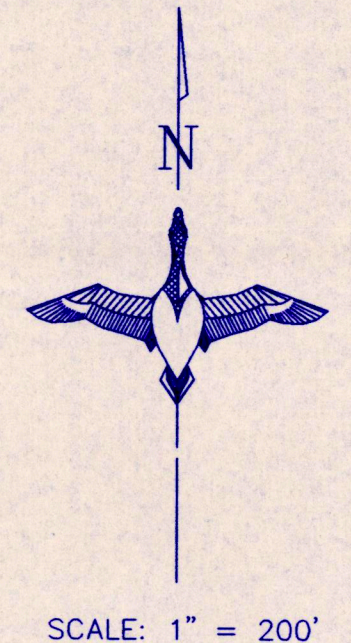
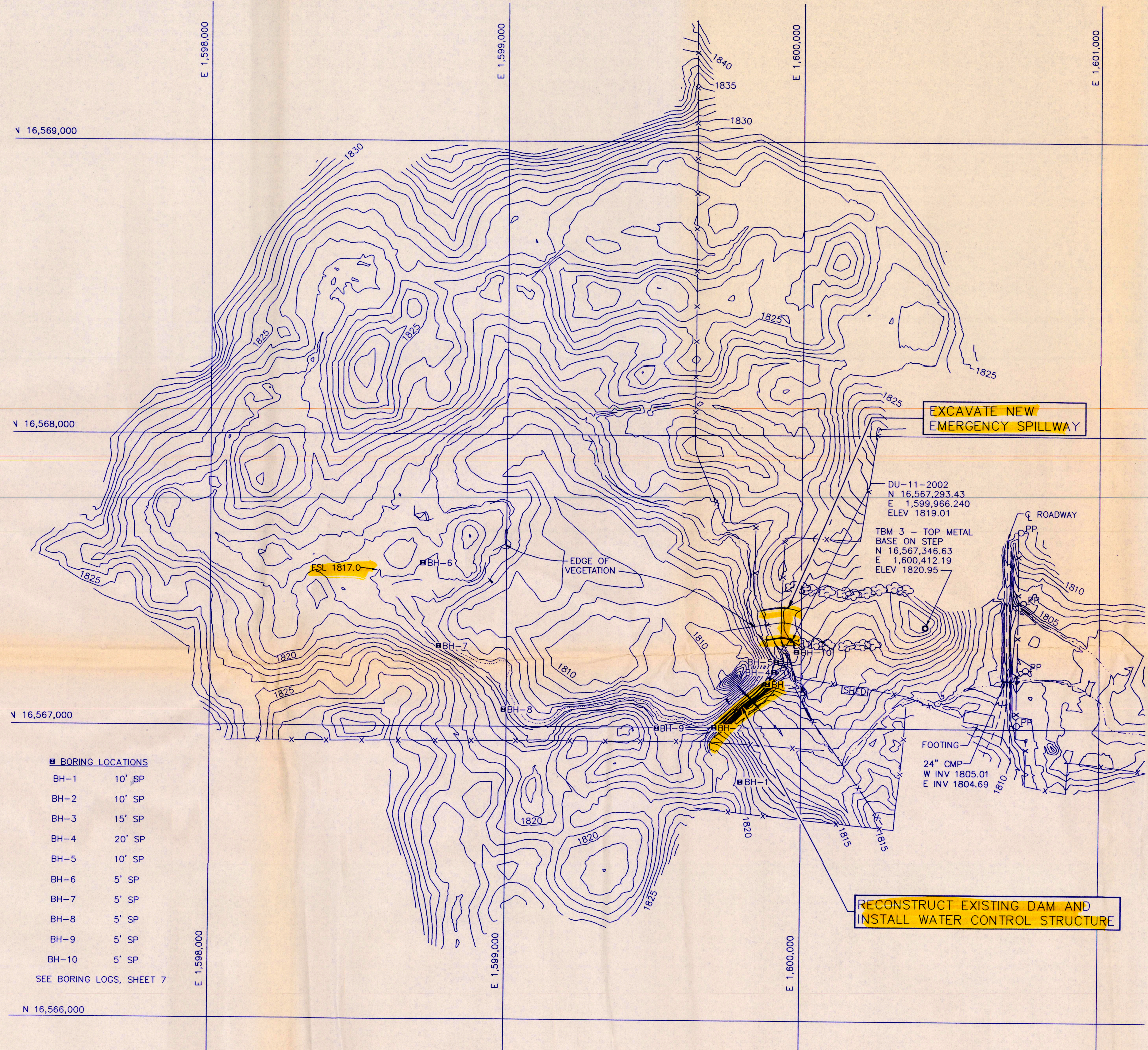
#### CONTACT INFORMATION:

RANDY MEIDINGER  
CELL - 605-380-0380  
OFFICE - 605-439-3329

|                                                         |                                 |                  |
|---------------------------------------------------------|---------------------------------|------------------|
| <p>DUCKS UNLIMITED<br/>GREAT PLAINS REGIONAL OFFICE</p> | PROJECT NO. SD-0315-003         | DESIGNED BY: RCS |
|                                                         | GOEBEL RANCH<br>LOCATION MAPS   | DRAWN BY: TSP    |
| DATE: 8-06-2003                                         | SHEET NO. 1 OF 7                | SURVEYED BY: GLJ |
| APPROVED BY: <i>[Signature]</i>                         | APPROVED BY: <i>[Signature]</i> | CHECKED BY: BRK  |







- BORING LOCATIONS
- BH-1 10' SP
  - BH-2 10' SP
  - BH-3 15' SP
  - BH-4 20' SP
  - BH-5 10' SP
  - BH-6 5' SP
  - BH-7 5' SP
  - BH-8 5' SP
  - BH-9 5' SP
  - BH-10 5' SP
- SEE BORING LOGS, SHEET 7

HORIZONTAL CONTROL:  
COORDINATES ARE UTM ZONE 14 COORDINATES IN US FEET (NAD 83 (1996)). THEY WERE ESTABLISHED FROM THE WGS84 ELLIPSOID WITH INFORMATION FROM TRIMBLE 4700 GPS RECEIVERS ON MARCH 4, 2002 AND CALIBRATED TO SDDT CBN STATION "10 251.19 1995" WHICH IS A HORIZONTAL ORDER "B" CONTROL STATION.

VERTICAL CONTROL:  
WAS ESTABLISHED FROM THE 99 GEOID CONUS AND CALIBRATED TO SDDT CBN STATION "10 251.19 1995" WHICH IS A GPS OBSERVED AND ADJUSTED POINT FOURTH ORDER CLASS 1 POINT WITH A PUBLISHED OBSERVED ELEVATION OF 1968 FEET ON THE NAVD 88.

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| MARSH DATA |                       |                     |
|------------|-----------------------|---------------------|
| ELEVATION  | SURFACE AREA<br>ACRES | VOLUME<br>ACRE-Feet |
| 1805       | 0.01                  | 1.00                |
| 1809       | 0.14                  | 1.29                |
| 1810       | 1.89                  | 2.31                |
| 1811       | 3.95                  | 5.23                |
| 1812       | 7.00                  | 10.70               |
| 1813       | 10.44                 | 19.42               |
| 1814       | 13.39                 | 31.34               |
| 1815       | 15.51                 | 45.79               |
| 1816       | 18.53                 | 62.81               |
| FSL 1817   | 23.45                 | 83.80               |
| 1818       | 33.33                 | 112.19              |
| 1819       | 35.29                 | 146.50              |
| 1820       | 42.12                 | 185.20              |
| 1821       | 45.0                  | 230.0               |

|                                                                                                                                                     |                              |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------|
| <br>DUCKS<br>UNLIMITED<br>INC.<br>GREAT PLAINS REGIONAL OFFICE | PROJECT NO. SD-0315-003      | DESIGNED BY: RCS  |
|                                                                                                                                                     | GOEBEL<br>PROJECT TOPOGRAPHY | DRAWN BY: DAK,TSP |
|                                                                                                                                                     | DATE: 8-04-2003              | CHECKED BY: BRK   |

|                  |              |              |
|------------------|--------------|--------------|
| SHEET NO. 2 OF 7 | APPROVED BY: | APPROVED BY: |
|------------------|--------------|--------------|



**SITE EXCAVATION PLAN**  
SCALE: 1" = 50'

**EMBANKMENT ALIGNMENT**

| STA                   | NORTHING   | EASTING   |
|-----------------------|------------|-----------|
| 0+00                  | 16566881.1 | 1599724.5 |
| CURVE #1 RADIUS POINT | 16566942.4 | 1599737.2 |
| 0+37.7 P.C.           | 16566909.4 | 1599699.6 |
| 1+16.2 P.T.           | 16566980.0 | 1599704.2 |
| 2+00                  | 16567035.3 | 1599767.2 |
| 3+00                  | 16567101.2 | 1599704.2 |
| 4+00                  | 16567167.2 | 1599917.4 |
| CURVE #2 RADIUS POINT | 16567224.7 | 1599907.1 |
| 4+30.1 P.C.           | 16567187.1 | 1599940.0 |
| 5+08.6 P.T.           | 16567257.6 | 1599944.6 |
| 5+58.6                | 16567295.2 | 1599911.6 |

**EMERGENCY SPILLWAY ALIGNMENT**

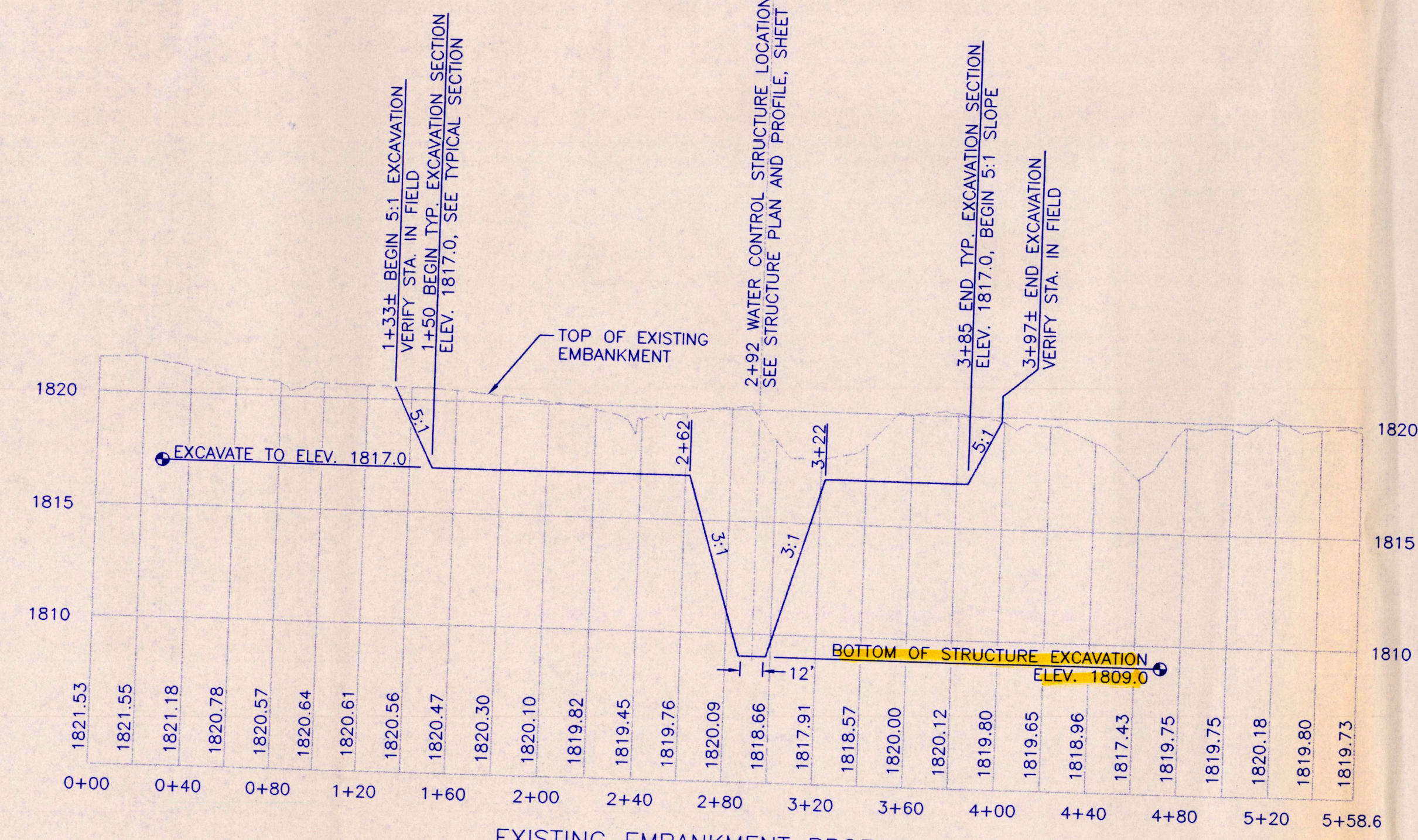
| STA              | NORTHING   | EASTING   |
|------------------|------------|-----------|
| 0+00             | 16567348.4 | 1599842.8 |
| CURVE RADIUS PT. | 16567262.3 | 1599939.6 |
| 0+82.5 P.C.      | 16567361.1 | 1599924.3 |
| 1+58.9 P.T.      | 16567344.2 | 1599996.9 |
| 2+34             | 16567301.2 | 1600058.5 |

**EMBANKMENT CURVE #1 DATA**

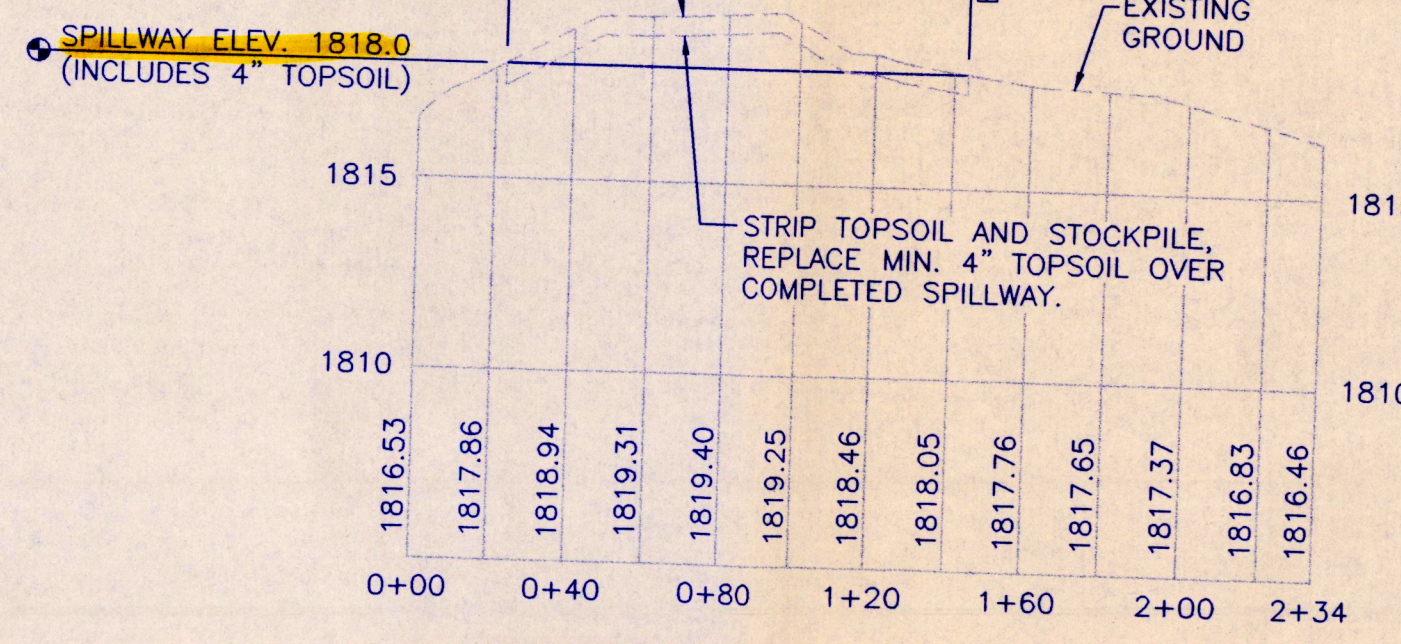
|    |           |
|----|-----------|
| Δ  | = 43° 45' |
| R  | = 100.0'  |
| L  | = 76.4'   |
| T  | = 40.2'   |
| Ch | = 74.5'   |
| E  | = 7.8'    |

**EMBANKMENT CURVE #2 DATA**

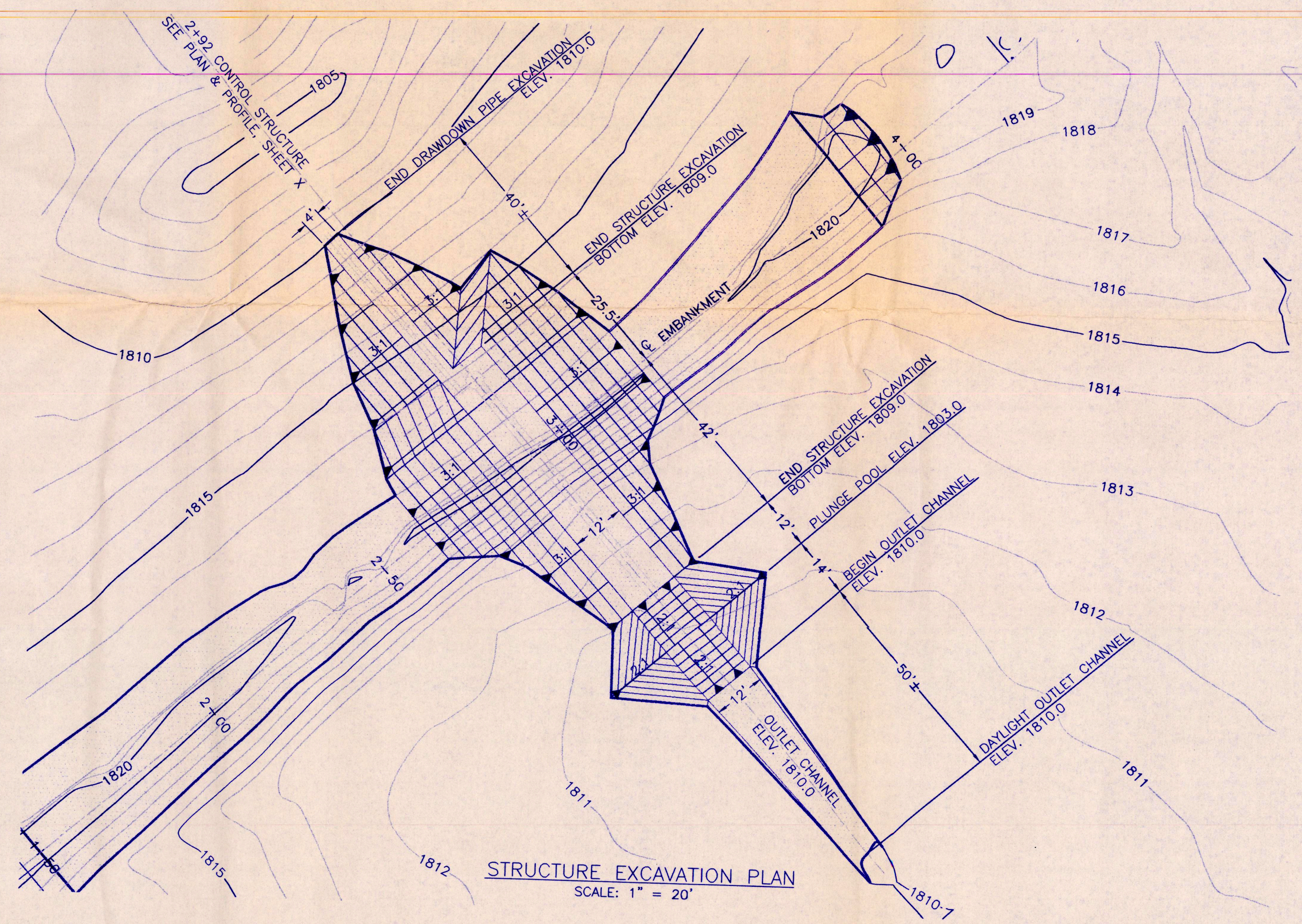
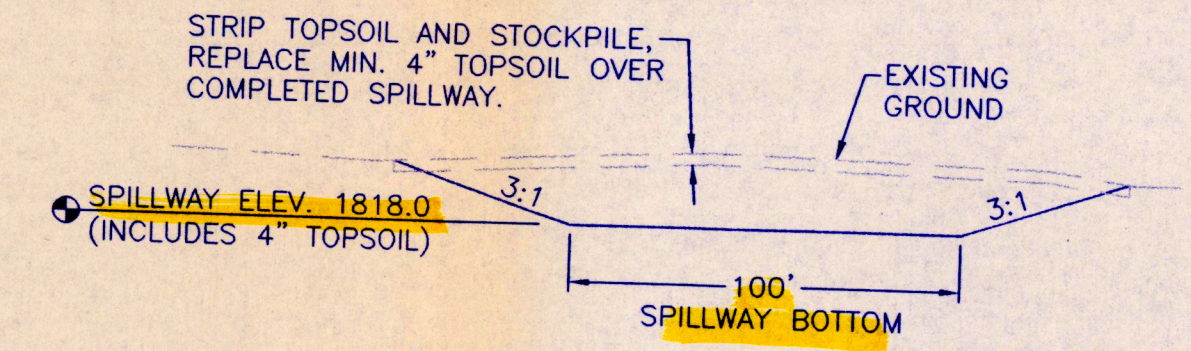
|    |         |
|----|---------|
| Δ  | = 90°   |
| R  | = 50.0' |
| L  | = 78.5' |
| T  | = 50.0' |
| Ch | = 70.7' |
| E  | = 20.7' |



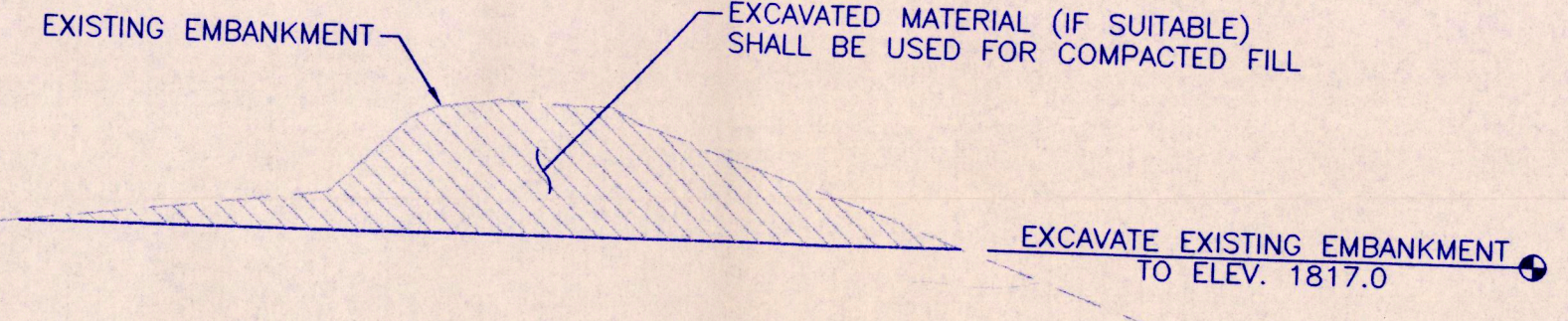
**EXISTING EMBANKMENT PROFILE**  
SCALE: 1" = 50' HORIZ.  
1" = 5' VERT.



**EMERGENCY SPILLWAY & PROFILE**  
SCALE: 1" = 50' HORIZ.  
1" = 5' VERT.



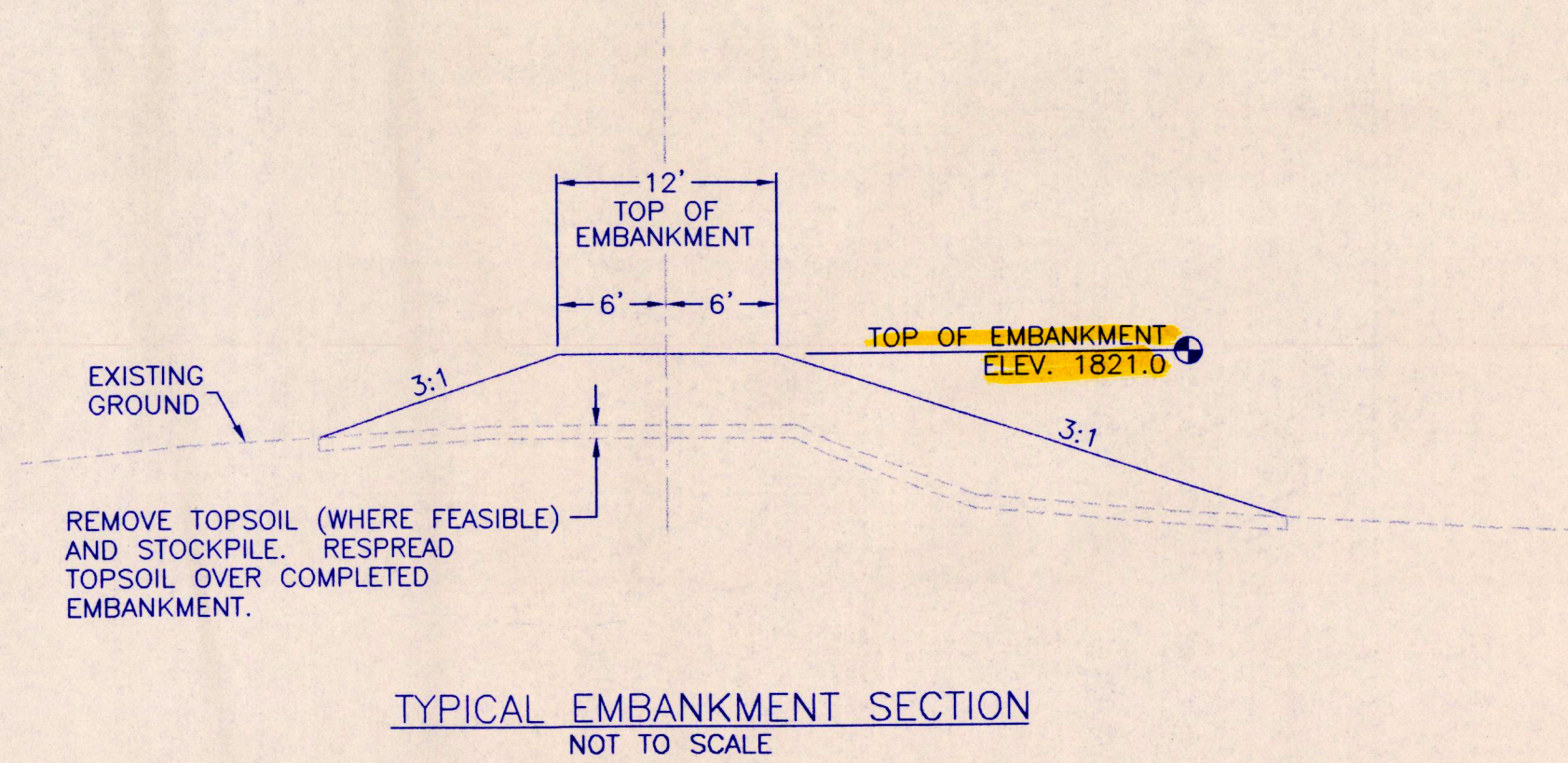
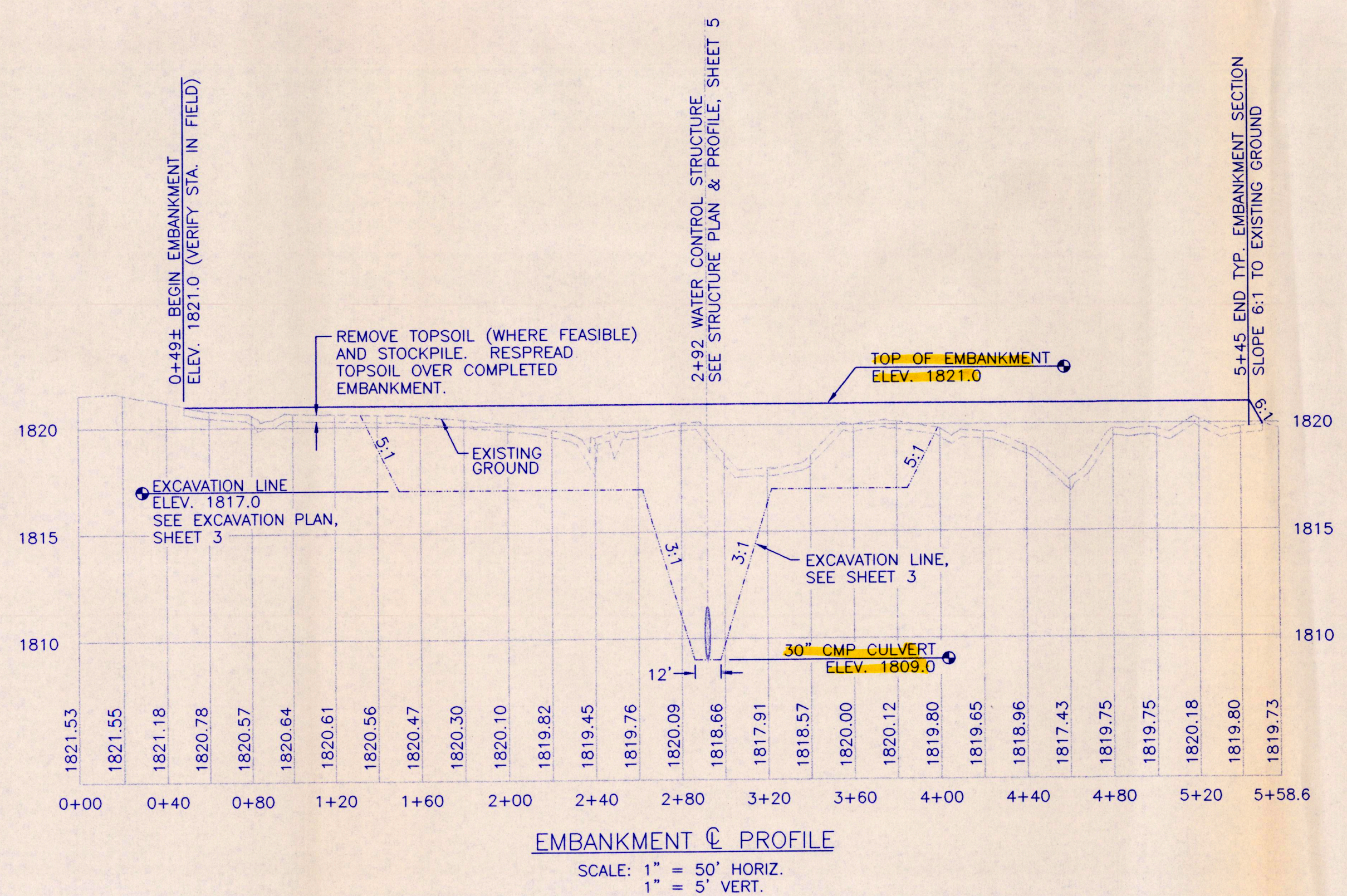
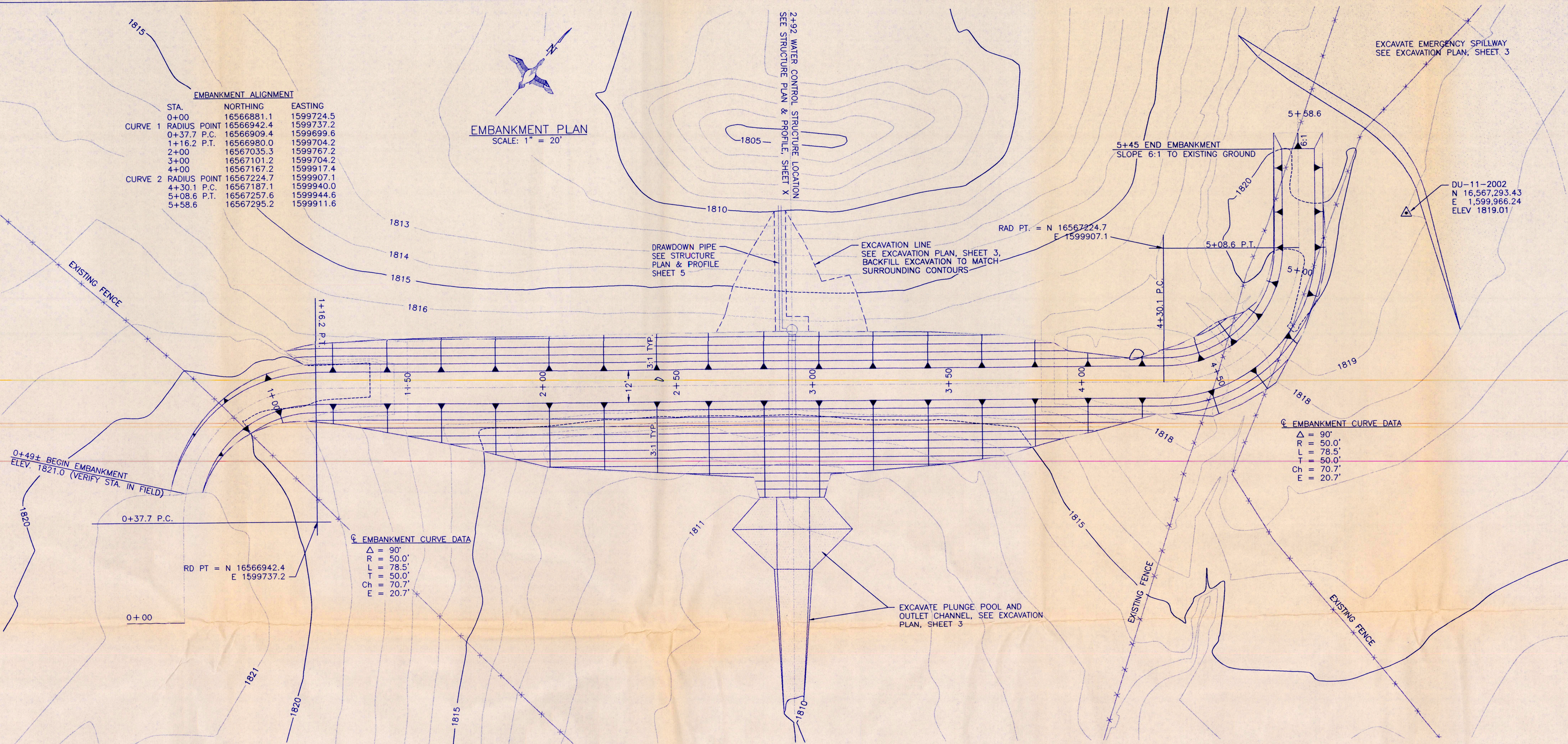
**STRUCTURE EXCAVATION PLAN**  
SCALE: 1" = 20'



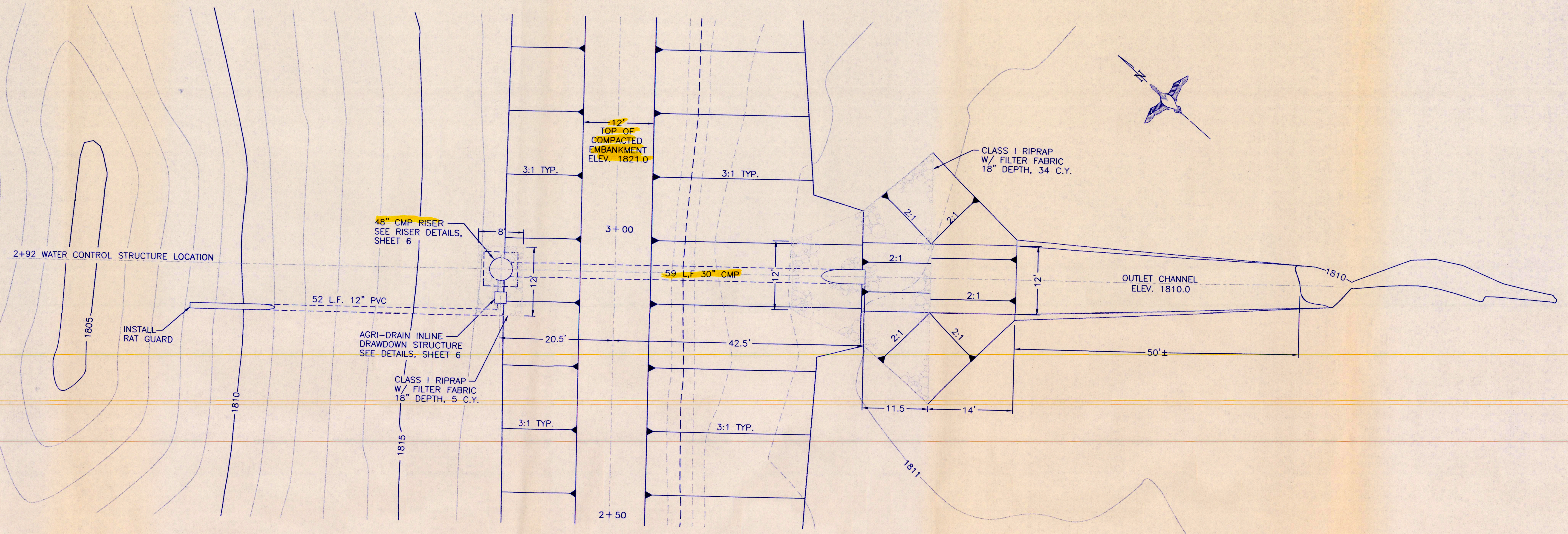
**TYPICAL EMBANKMENT EXCAVATION**  
STA. 1+50 TO 2+62, STA. 3+22 TO 3+85  
NOT TO SCALE

|                                                                                                        |                                                      |                                                                          |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------|
| <br><b>DUCKS UNLIMITED INC.</b><br>GREAT PLAINS REGIONAL OFFICE<br>DATE: 8-04-2003<br>SHEET NO. 3 OF 7 | PROJECT NO. SD-0315-003<br>GOEBEL<br>EXCAVATION PLAN | DESIGNED BY: RCS<br>DRAWN BY: TSP<br>SURVEYED BY: GLJ<br>CHECKED BY: BRK |
|                                                                                                        | APPROVED BY:                                         | APPROVED BY:                                                             |
|                                                                                                        |                                                      |                                                                          |
|                                                                                                        |                                                      |                                                                          |

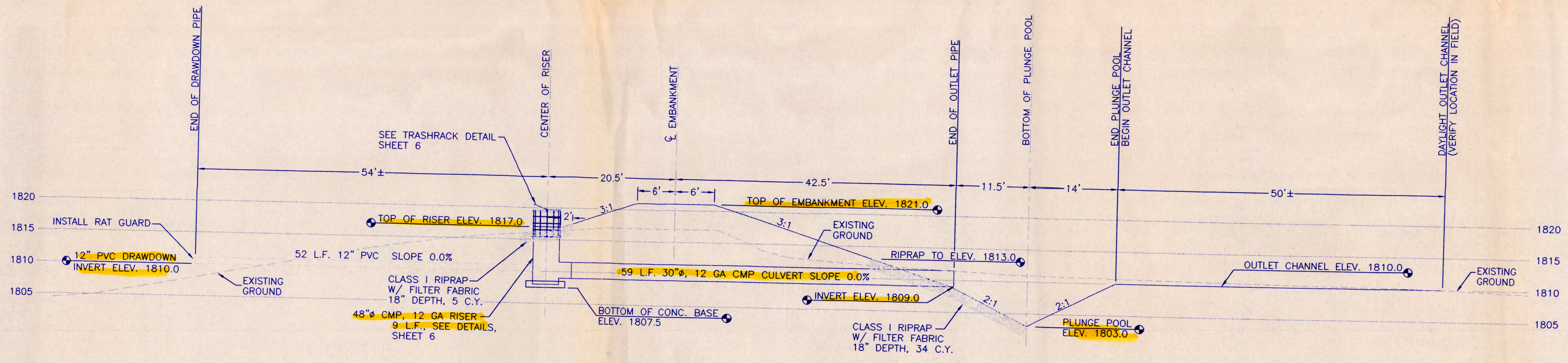








WATER CONTROL STRUCTURE - PLAN VIEW  
SCALE: 1" = 10'



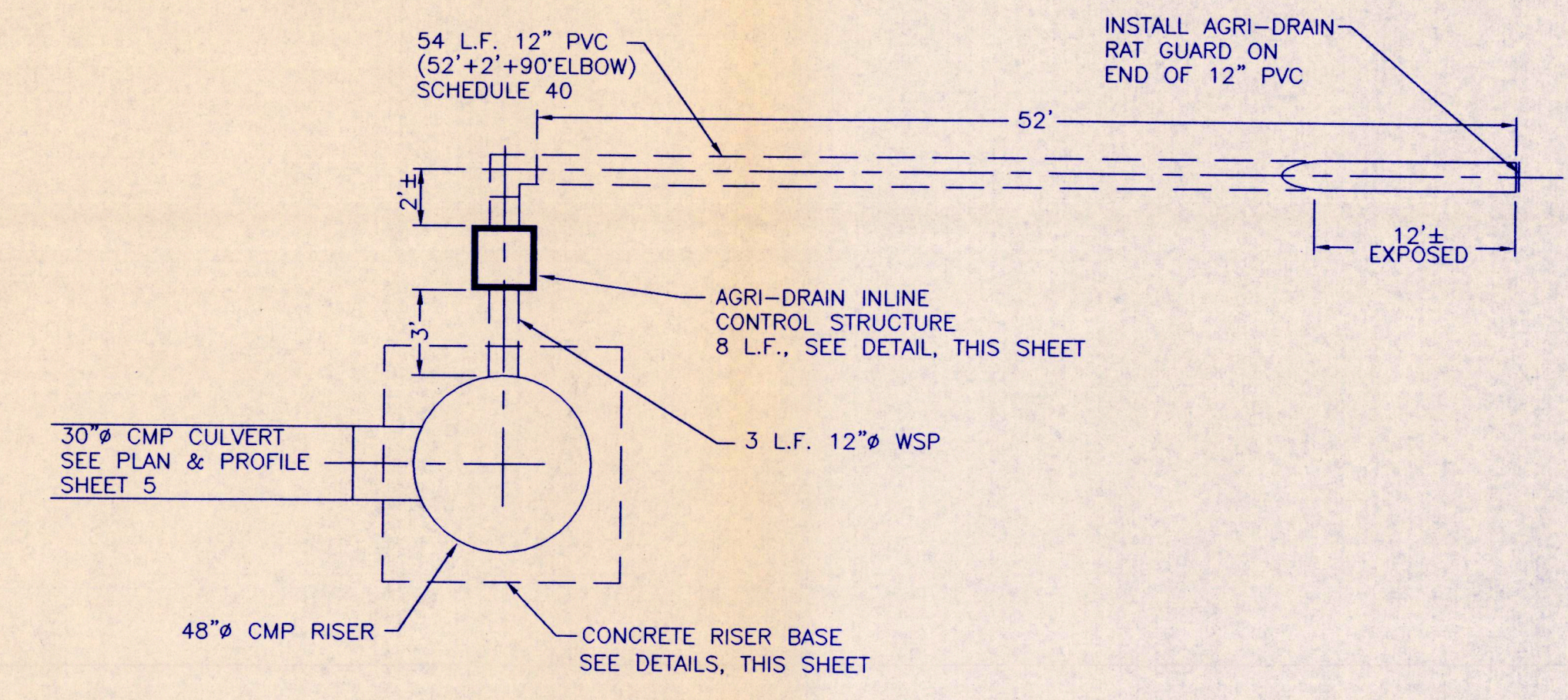
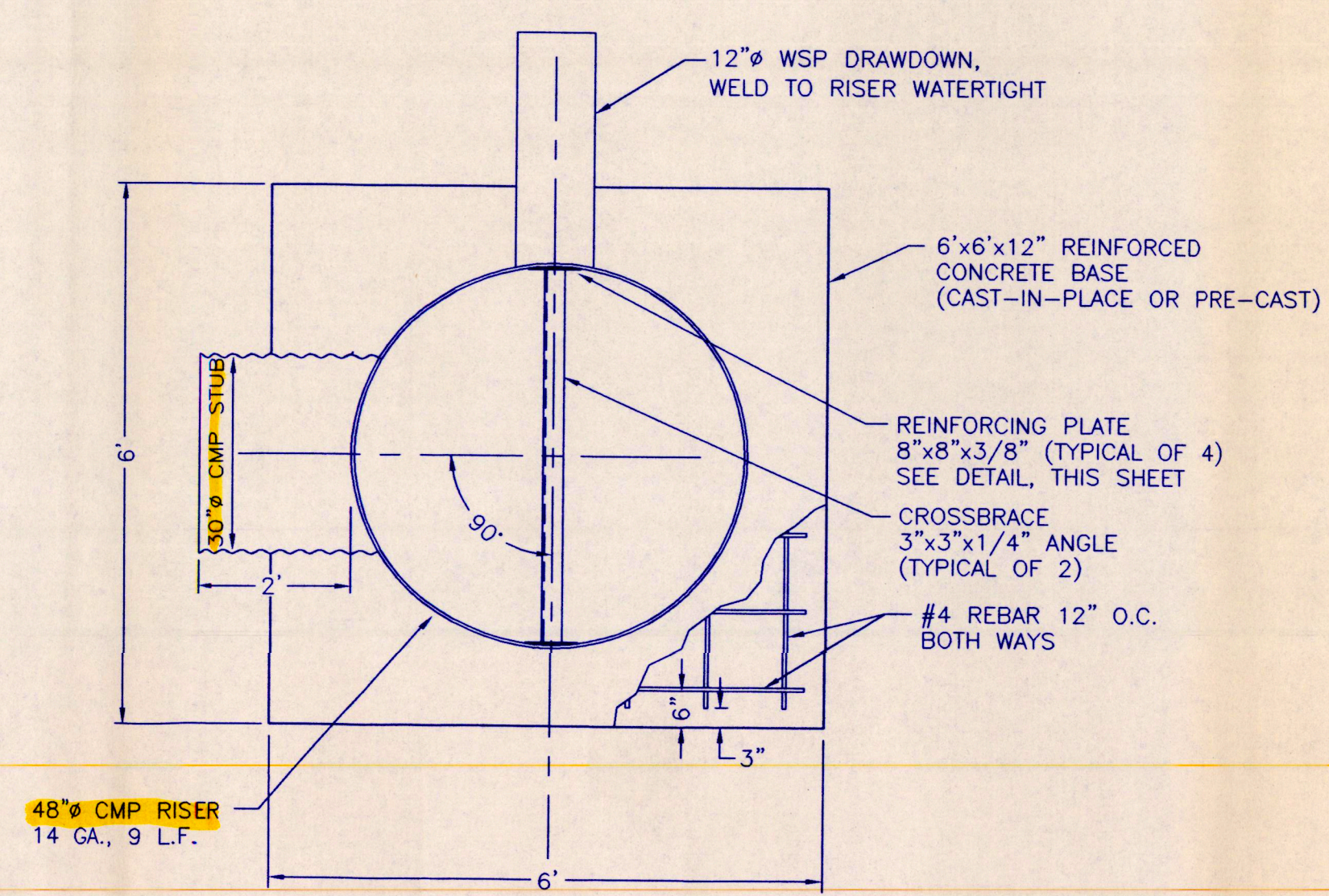
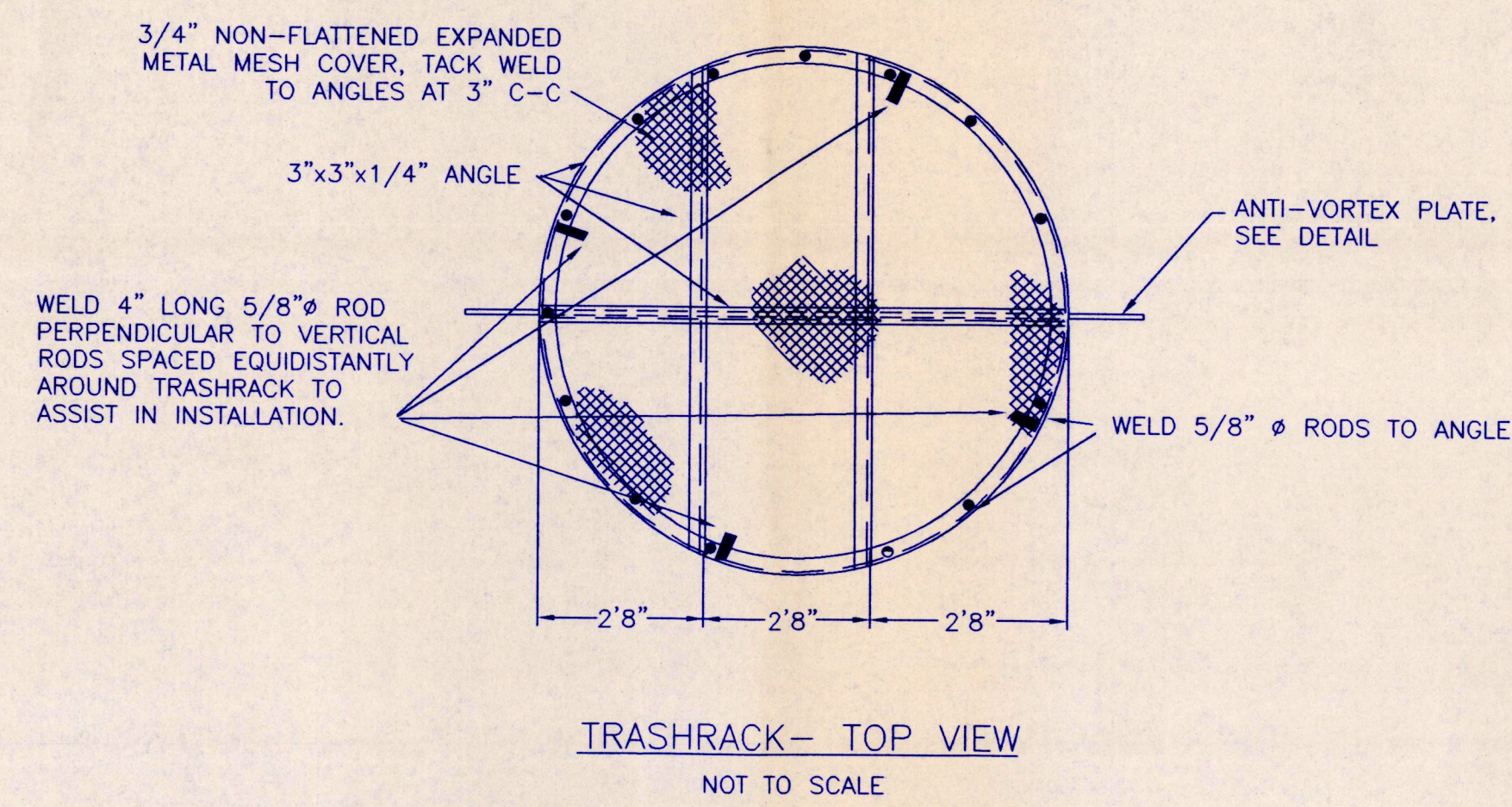
WATER CONTROL STRUCTURE - PROFILE  
SCALE: 1" = 10' HORIZ. & VERT.

NOTE CONCERNING STRUCTURE, CULVERT & PLUNGE POOL EXCAVATION:  
EXCAVATION REQUIRED FOR STRUCTURE, PIPE INSTALLATION, AND PLUNGE POOL CONSTRUCTION IS INCIDENTAL TO "CULVERT INSTALLATION." EXCAVATED MATERIAL DEEMED SUITABLE BY THE ENGINEER MAY BE USED IN EMBANKMENT OR GRADE 55 BENTONITE SHALL BE ADDED TO THE RESULTING MATERIAL PRIOR TO LAYING THE PIPE. EXCAVATION BELOW THE LINES AND GRADES, REQUIRED BY THE D.U. FIELD ENGINEER WILL BE CONSIDERED AS EXTRA WORK.

|                                                                                                |                         |                  |
|------------------------------------------------------------------------------------------------|-------------------------|------------------|
| <p>DUCKS<br/>UNLIMITED<br/>INC.</p> <p>GREAT PLAINS REGIONAL OFFICE</p> <p>DATE: 8-04-2003</p> | PROJECT NO. SD-0315-003 | DESIGNED BY: RCS |
|                                                                                                | GOEBEL                  |                  |
|                                                                                                | WATER CONTROL STRUCTURE |                  |
|                                                                                                | PLAN AND PROFILE        |                  |
| SHEET NO. 5 OF 7                                                                               | APPROVED BY:            | CHECKED BY: BRK  |

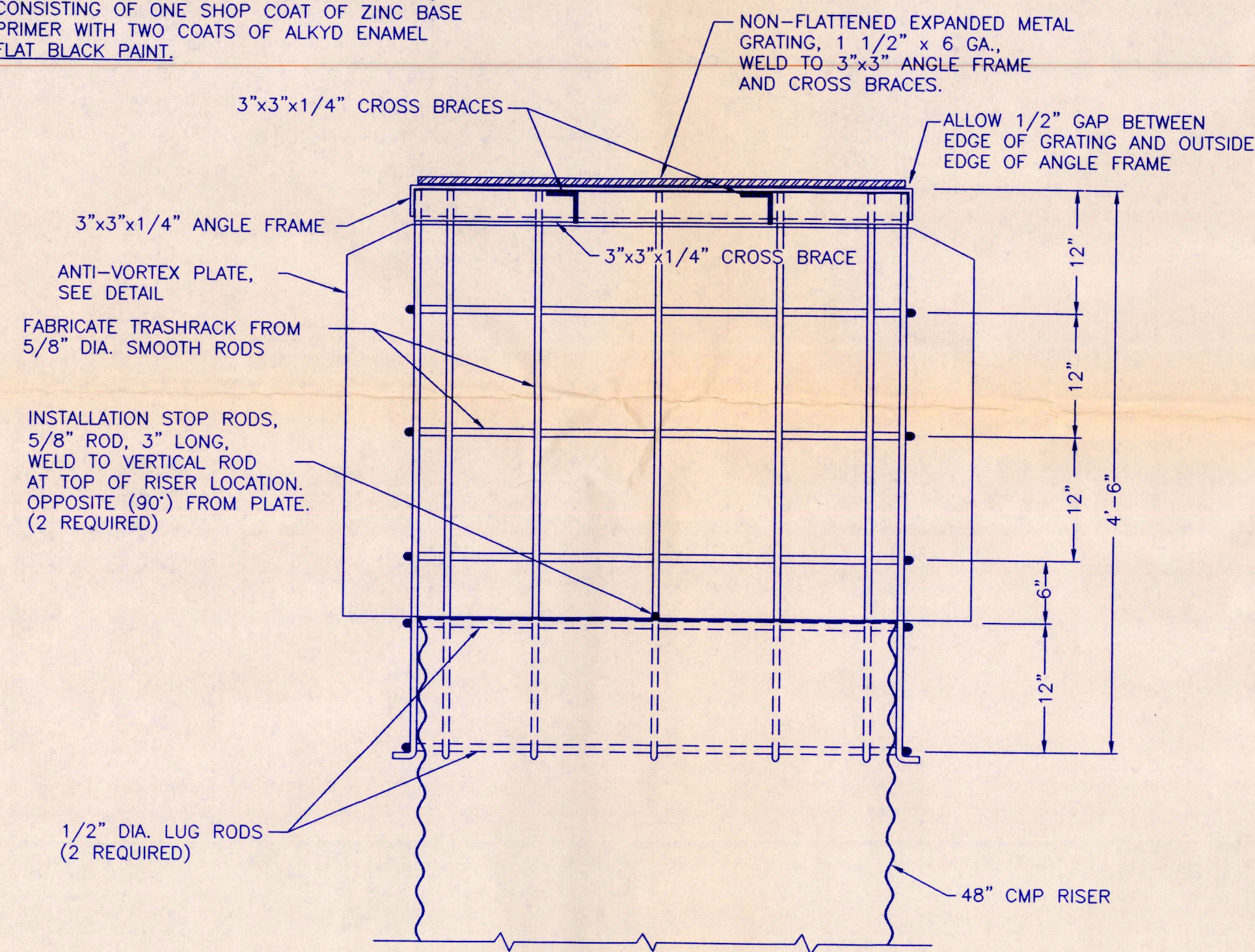


6438.3

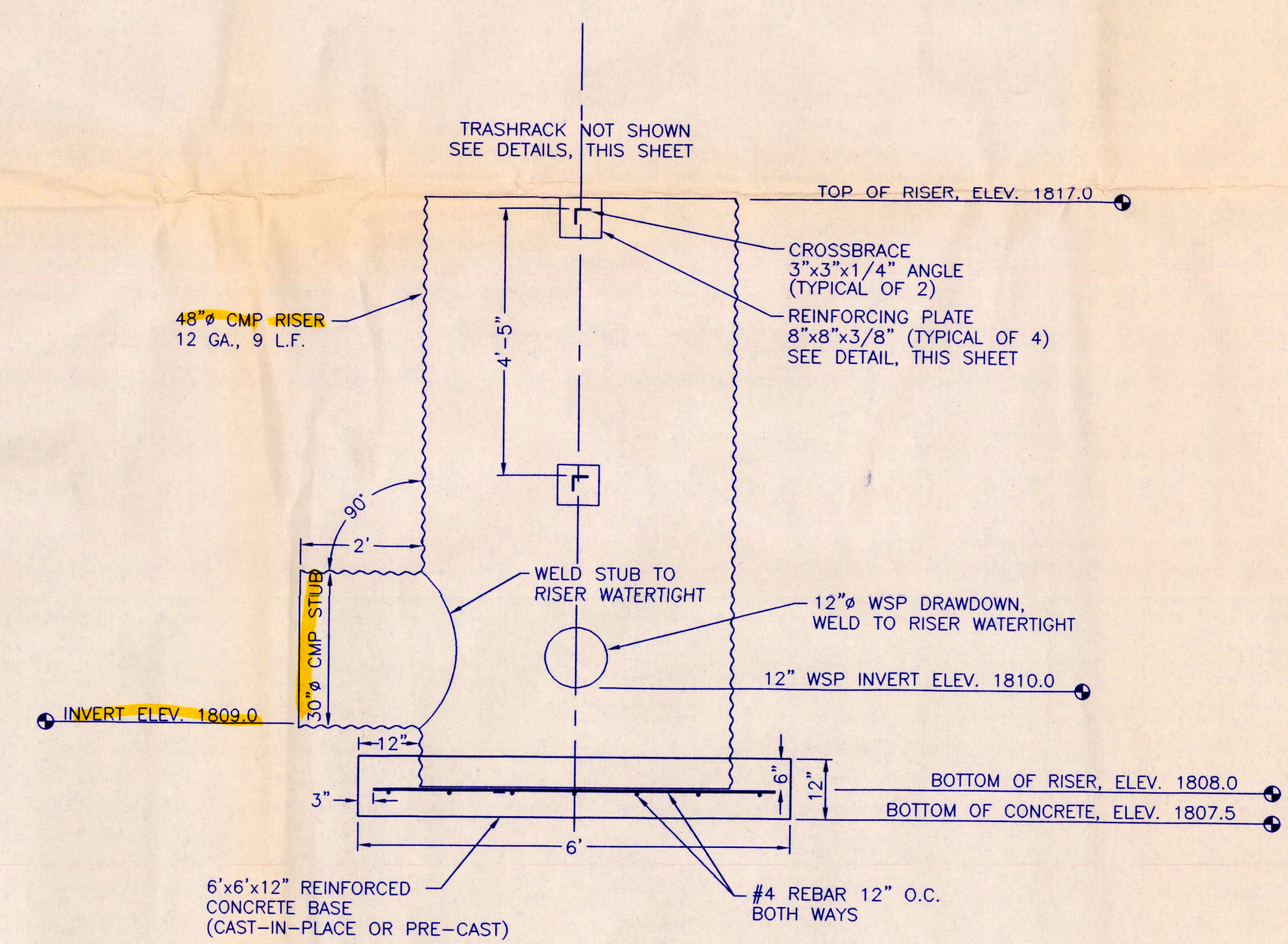


DRAWDOWN STRUCTURE-PLAN VIEW  
SCALE: 1" = 5'

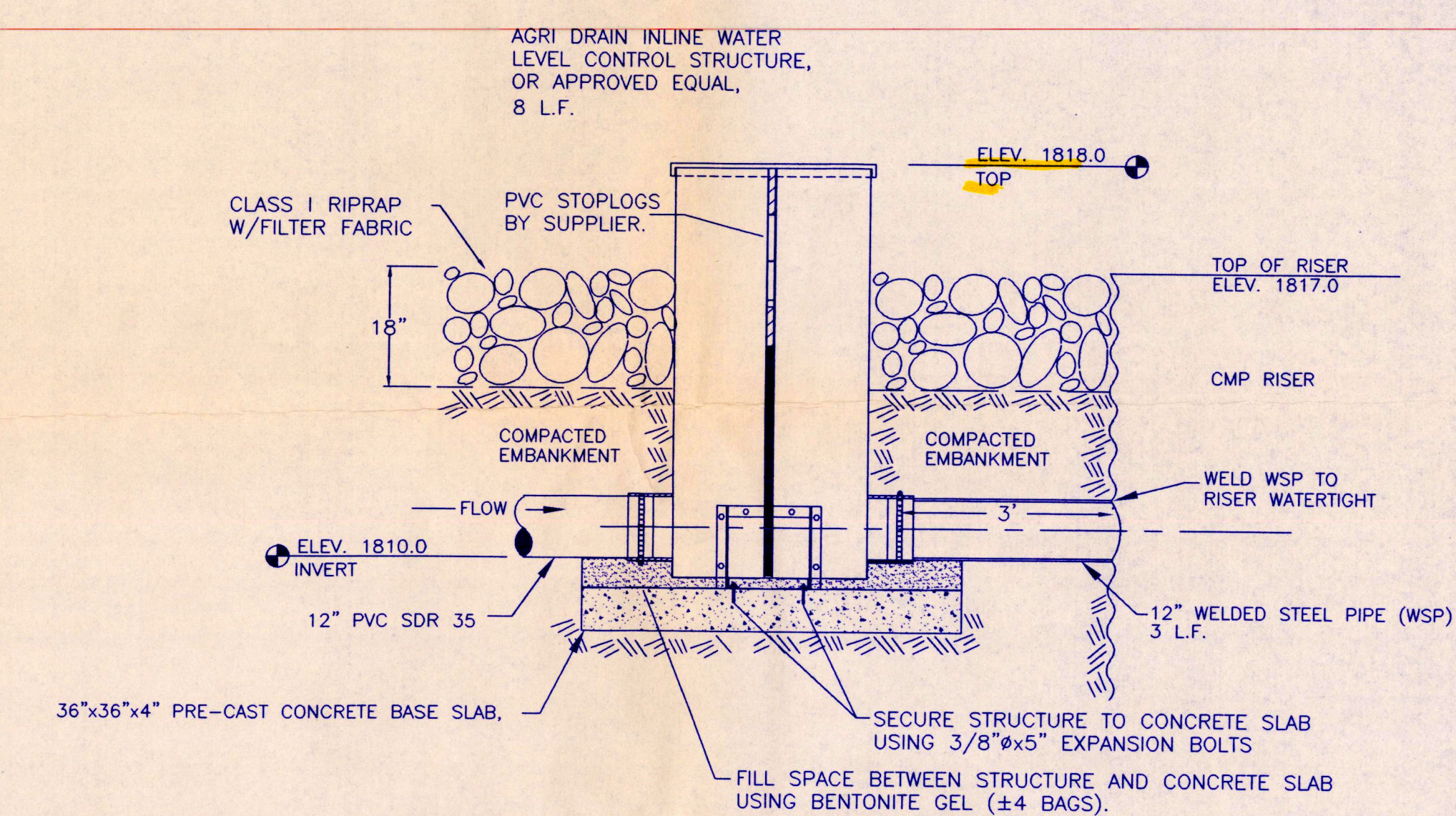
NOTE TO SUPPLIER:  
TRASHRACK TO BE PAINTED INSIDE AND OUT,  
CONSISTING OF ONE SHOP COAT OF ZINC BASE  
PRIMER WITH TWO COATS OF ALKYD ENAMEL  
FLAT BLACK PAINT.



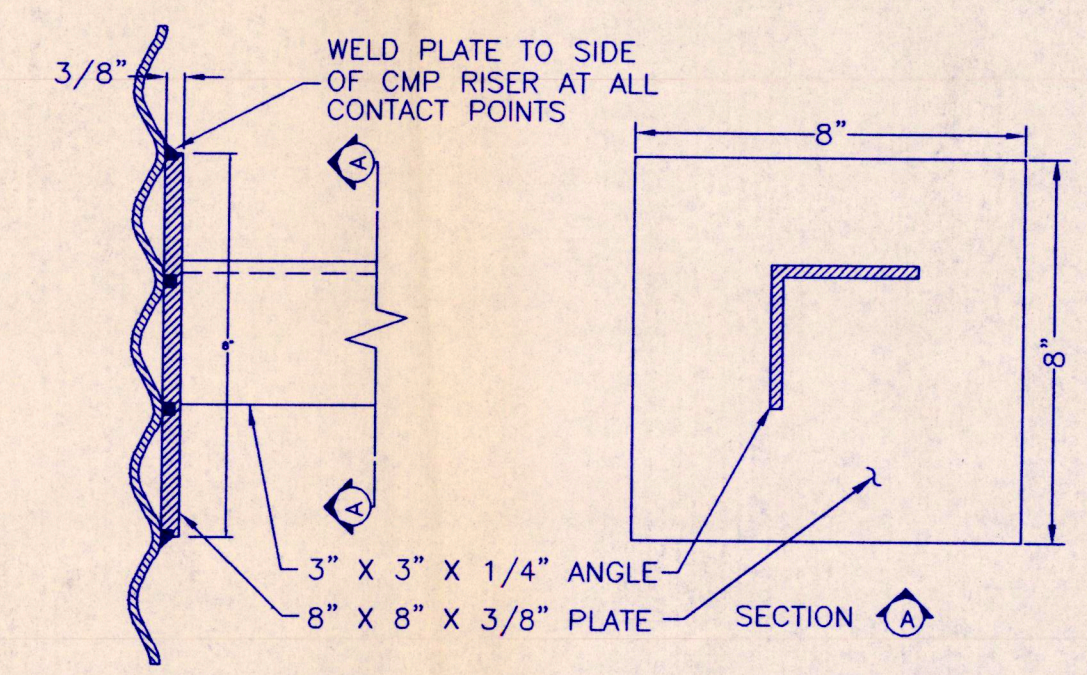
TRASHRACK- PROFILE  
NOT TO SCALE



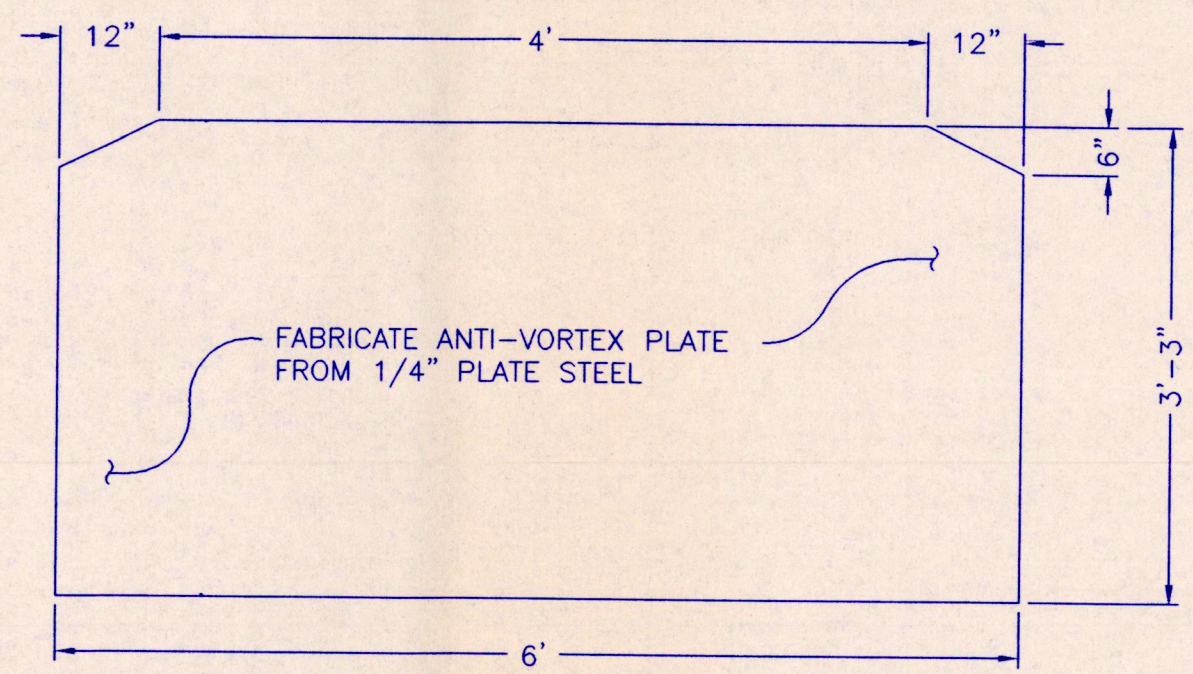
RISER PLAN AND PROFILE  
NOT TO SCALE



INLINE DRAWDOWN STRUCTURE PROFILE  
NOT TO SCALE



CROSS BRACE REINFORCING PLATE



ANTI-VORTEX PLATE DETAIL  
NOT TO SCALE

|                                                                                                                           |                                 |              |                  |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------|------------------|
| REVISED 10-18-2001 RISER PLAN DETAIL                                                                                      |                                 |              |                  |
|  <b>DUCKS<br/>UNLIMITED<br/>INC.</b> | PROJECT NO. SD-0315-003         |              | DESIGNED BY: RCS |
|                                                                                                                           | GOBEL                           |              | DRAWN BY: TSP    |
|                                                                                                                           | WATER CONTROL STRUCTURE DETAILS |              | SURVEYED BY:     |
| GREAT PLAINS REGIONAL OFFICE                                                                                              |                                 |              | CHECKED BY: BRK  |
| DATE: 8-04-2003                                                                                                           | SHEET NO. 6 OF 6                | APPROVED BY: | APPROVED BY:     |



6438-3

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 1 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                                                                                                                             | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                                                                                                                              | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 1                   | SILTY SAND-dark brown to brown, fine to medium grained, surface vegetation in upper 10", root (SM)<br>SANDY LEAN CLAY-grayish brown, soft to very soft to stiff, trace of gravel, moist, fine to 3" (CL)<br><br>*N value influenced by frost | 1                | SS          | 70"     |                  |         |       |                    |
|                     |                                                                                                                                                                                                                                              | 2                | SS          | 28      |                  |         |       |                    |
|                     |                                                                                                                                                                                                                                              | 3                | SS          | 29      |                  |         |       |                    |
|                     |                                                                                                                                                                                                                                              | 4                | SS          | 38      |                  |         |       |                    |
|                     |                                                                                                                                                                                                                                              | 5                | SS          | 23      |                  |         |       |                    |
| 11                  | END OF BORING                                                                                                                                                                                                                                |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                                                                                                                              | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                                                                                                                         | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 10:57                                                                                                                                                                                                                                        | HSA 479          | None        | 1-30-03 | 1-30-03 @ 10:55  |         |       |                    |
| 1-30-03             | 11:00                                                                                                                                                                                                                                        | 8"               | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                                                                                                                              | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                                                                                                                              | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 2 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                         | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|----------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                          | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | TOPSOIL<br>FILL-SANDY LEAN CLAY-dark brown, rather stiff, fine to 3"<br><br>*N value influenced by frost | 1                | SS          | 81"     |                  |         |       |                    |
|                     |                                                                                                          | 2                | SS          | 13      |                  |         |       |                    |
| 4                   | FILL-LEAN CLAY WITH SAND-grayish brown, rather stiff                                                     | 3                | SS          | 11      |                  |         |       |                    |
|                     |                                                                                                          | 4                | SS          | 17      |                  |         |       |                    |
| 6                   | SANDY LEAN CLAY-grayish brown, soft, trace of gravel, moist                                              | 5                | SS          | 18      |                  |         |       |                    |
|                     |                                                                                                          | 6                | SS          | 17      |                  |         |       |                    |
| 11                  | END OF BORING                                                                                            |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                          | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                     | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 11:07                                                                                                    | HSA 479          | None        | 1-30-03 | 1-30-03 @ 11:05  |         |       |                    |
| 1-30-03             | 11:35                                                                                                    | 8"               | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                          | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                          | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 3 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                            | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                             | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | TOPSOIL<br>FILL-LEAN CLAY WITH SAND-grayish brown, rather soft, trace of gravel, moist, fine to 4" (CL)<br><br>*N value influenced by frost | 1                | SS          | 70"     |                  |         |       |                    |
|                     |                                                                                                                                             | 2                | SS          | 8       |                  |         |       |                    |
| 4                   | SANDY LEAN CLAY-dark brown to grayish brown, rather soft to medium to rather stiff, waterbearing, sand, gravel, moist                       | 3                | SS          | 9       |                  |         |       |                    |
|                     |                                                                                                                                             | 4                | SS          | 8       |                  |         |       |                    |
| 10                  | CLAYEY SAND-brownish gray, fine to medium-grained, waterbearing                                                                             | 5                | SS          | 10      |                  |         |       |                    |
|                     |                                                                                                                                             | 6                | SS          | 24      |                  |         |       |                    |
| 12                  | SAND WITH SILT AND GRAVEL-brown, fine to coarse-grained, dense, waterbearing (SP-SM)                                                        | 7                | SS          | 24      |                  |         |       |                    |
|                     |                                                                                                                                             | 8                | SS          | 24      |                  |         |       |                    |
| 14                  | SILT SAND-brown, fine-grained, dense (SM)                                                                                                   |                  |             |         |                  |         |       |                    |
| 16                  | END OF BORING                                                                                                                               |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                             | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                        | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 11:35                                                                                                                                       | HSA 479          | None        | 1-30-03 | 1-30-03 @ 11:35  |         |       |                    |
| 1-30-03             | 12:25                                                                                                                                       | HSA 479          | None        |         |                  |         |       |                    |
| 1-30-03             | 12:30                                                                                                                                       | 10"              | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                             | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                             | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 4 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                            | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                             | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | TOPSOIL<br>FILL-LEAN CLAY WITH SAND-grayish brown, rather soft, trace of gravel, moist, fine to 4" (CL)<br><br>*N value influenced by frost | 1                | SS          | 52"     |                  |         |       |                    |
|                     |                                                                                                                                             | 2                | SS          | 11      |                  |         |       |                    |
| 4                   | CLAYEY SAND-dark brown, fine to medium-grained, silty loess, moist                                                                          | 3                | SS          | 4       |                  |         |       |                    |
|                     |                                                                                                                                             | 4                | SS          | 10      |                  |         |       |                    |
| 7                   | FAT CLAY-dark brown to grayish brown, rather soft, moist                                                                                    | 5                | SS          | 10      |                  |         |       |                    |
|                     |                                                                                                                                             | 6                | SS          | 19      |                  |         |       |                    |
| 11                  | SILT SAND-brown, fine to coarse-grained, dense to medium dense, waterbearing (SM)                                                           | 7                | SS          | 14      |                  |         |       |                    |
|                     |                                                                                                                                             | 8                | SS          | 27      |                  |         |       |                    |
| 20                  | SILT SAND-sandy, fine-grained, silty, "N" value influenced by frost                                                                         |                  |             |         |                  |         |       |                    |
| 21                  | END OF BORING                                                                                                                               |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                             | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                        | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 13:30                                                                                                                                       | HSA 479          | None        | 1-30-03 | 1-30-03 @ 13:30  |         |       |                    |
| 1-30-03             | 13:55                                                                                                                                       | 15"              | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                             | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                             | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 5 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                                                          | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                                                           | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | SANDY LEAN CLAY-dark brown to grayish brown, medium to stiff, trace of gravel, moist, surface vegetation in upper 6", root to 3" (CL)<br><br>*N value influenced by frost | 1                | SS          | 64"     |                  |         |       |                    |
|                     |                                                                                                                                                                           | 2                | SS          | 8       |                  |         |       |                    |
| 4                   | CLAYEY SAND-dark brown, fine to medium-grained, silty loess, moist                                                                                                        | 3                | SS          | 11      |                  |         |       |                    |
|                     |                                                                                                                                                                           | 4                | SS          | 15      |                  |         |       |                    |
| 5                   | SILT SAND-brown, fine to coarse-grained, dense to medium dense, waterbearing (SM)                                                                                         | 5                | SS          | 22      |                  |         |       |                    |
|                     |                                                                                                                                                                           | 6                | SS          | 22      |                  |         |       |                    |
| 11                  | END OF BORING                                                                                                                                                             |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                                                           | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                                                      | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 14:30                                                                                                                                                                     | HSA 479          | None        | 1-30-03 | 1-30-03 @ 14:30  |         |       |                    |
| 1-30-03             | 14:35                                                                                                                                                                     | 8"               | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                                                           | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                                                           | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 6 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                   | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                    | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | CLAYEY SAND-dark brown to brown, fine to medium-grained, surface vegetation in upper 10", root<br><br>*N value influenced by frost | 1                | SS          | 50"     |                  |         |       |                    |
|                     |                                                                                                                                    | 2                | SS          | 13      |                  |         |       |                    |
| 3                   | SILT SAND-light brown to brown, fine to coarse-grained, medium dense to dense (SM)                                                 | 3                | SS          | 18      |                  |         |       |                    |
|                     |                                                                                                                                    | 4                | SS          | 18      |                  |         |       |                    |
| 6                   | END OF BORING                                                                                                                      |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                    | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                               | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 14:35                                                                                                                              | HSA 479          | None        | 1-30-03 | 1-30-03 @ 14:35  |         |       |                    |
| 1-30-03             | 14:55                                                                                                                              | 3"               | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                    | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                    | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 7 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                                                                | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                                                                 | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | SANDY LEAN CLAY-dark brown to grayish brown, soft to rather stiff, trace of gravel, moist, surface vegetation in upper 10", root to 3" (CL)<br><br>*N value influenced by frost | 1                | SS          | 67"     |                  |         |       |                    |
|                     |                                                                                                                                                                                 | 2                | SS          | 17      |                  |         |       |                    |
| 3                   | SILT SAND-light brown to brown, fine to coarse-grained, medium dense to dense (SM)                                                                                              | 3                | SS          | 13      |                  |         |       |                    |
|                     |                                                                                                                                                                                 | 4                | SS          | 13      |                  |         |       |                    |
| 6                   | END OF BORING                                                                                                                                                                   |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                                                                 | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                                                            | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 15:00                                                                                                                                                                           | HSA 479          | None        | 1-30-03 | 1-30-03 @ 15:00  |         |       |                    |
| 1-30-03             | 15:10                                                                                                                                                                           | 31"              | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                                                                 | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                                                                 | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 8 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                                       | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                                        | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | SANDY LEAN CLAY-dark brown to grayish brown, soft to rather stiff, surface vegetation in upper 6", root to 3" (CL)<br><br>*N value influenced by frost | 1                | SS          | 66"     |                  |         |       |                    |
|                     |                                                                                                                                                        | 2                | SS          | 19      |                  |         |       |                    |
| 3                   | SILT SAND-light brown to brown, fine to coarse-grained, medium dense to dense (SM)                                                                     | 3                | SS          | 14      |                  |         |       |                    |
|                     |                                                                                                                                                        | 4                | SS          | 14      |                  |         |       |                    |
| 6                   | END OF BORING                                                                                                                                          |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                                        | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                                   | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 15:20                                                                                                                                                  | HSA 479          | None        | 1-30-03 | 1-30-03 @ 15:20  |         |       |                    |
| 1-30-03             | 15:30                                                                                                                                                  | 31"              | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                                        | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                                        | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 9 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                                                  | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                                                   | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | LEAN CLAY WITH SAND-dark brown to grayish brown, rather soft to stiff, surface vegetation in upper 6", moist, root to 3" (CL)<br><br>*N value influenced by frost | 1                | SS          | 34"     |                  |         |       |                    |
|                     |                                                                                                                                                                   | 2                | SS          | 15      |                  |         |       |                    |
| 3                   | SILT SAND-light brown to brown, fine to coarse-grained, medium dense to dense (SM)                                                                                | 3                | SS          | 21      |                  |         |       |                    |
|                     |                                                                                                                                                                   | 4                | SS          | 21      |                  |         |       |                    |
| 6                   | END OF BORING                                                                                                                                                     |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                                                   | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                                              | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 15:40                                                                                                                                                             | HSA 479          | None        | 1-30-03 | 1-30-03 @ 15:40  |         |       |                    |
| 1-30-03             | 15:50                                                                                                                                                             | 31"              | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                                                   | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                                                   | M. Roberts       |             |         |                  |         |       |                    |

**MIDWEST TESTING LABORATORY**

JOB NO. B6329 LOG OR TEST BORING NO. 10 VERTICAL SCALE 1"=2'

PROJECT: Goebel Ranch, McPherson County, South Dakota

| DEPTH<br>IN<br>FEET | SOIL DESCRIPTION                                                                                                                                          | SAMPLE           |             | N       | LABORATORY TESTS |         |       |                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------------|---------|-------|--------------------|
|                     |                                                                                                                                                           | NO.              | TYPE        |         | MOISTURE         | DENSITY | LL/PL | PI/PI <sub>u</sub> |
| 0                   | LEAN CLAY WITH SAND-dark brown to grayish brown, soft, surface vegetation in upper 10", dry to moist, root to 3" (CL)<br><br>*N value influenced by frost | 1                | SS          | 61"     |                  |         |       |                    |
|                     |                                                                                                                                                           | 2                | SS          | 28      |                  |         |       |                    |
| 3                   | SILT SAND-light brown to brown, fine to coarse-grained, medium dense to dense (SM)                                                                        | 3                | SS          | 23      |                  |         |       |                    |
|                     |                                                                                                                                                           | 4                | SS          | 23      |                  |         |       |                    |
| 6                   | END OF BORING                                                                                                                                             |                  |             |         |                  |         |       |                    |
| WATER LEVEL DATA    |                                                                                                                                                           | BORING DATA      |             |         |                  |         |       |                    |
| DATE                | TIME                                                                                                                                                      | CAVE IN DEPTH    | WATER LEVEL | STARTED | COMPLETED        |         |       |                    |
| 1-30-03             | 16:10                                                                                                                                                     | HSA 479          | None        | 1-30-03 | 1-30-03 @ 16:10  |         |       |                    |
| 1-30-03             | 16:30                                                                                                                                                     | 31"              | None        |         |                  |         |       |                    |
| METHOD USED:        |                                                                                                                                                           | 31" ID HSA 0-41V |             |         |                  |         |       |                    |
| CREW CHIEF:         |                                                                                                                                                           | M. Roberts       |             |         |                  |         |       |                    |

SEE BORING LOCATIONS, SHEET 2

THE BORINGS COMPLETED FOR 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. 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 COMMENCING CONSTRUCTION OF THIS PROJECT. NO ADJUSTMENTS TO THE CONTRACT WILL BE MADE DUE TO CHANGED SITE CONDITIONS.

|                                                                                                                                                           |                         |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------|
|  <b>DUCKS<br/>UNLIMITED<br/>INC.</b><br>GREAT PLAINS REGIONAL OFFICE | PROJECT NO. SD-0315-003 | DESIGNED BY: RCS |
|                                                                                                                                                           | GOEBEL RANCH            |                  |
|                                                                                                                                                           | SOIL BORING INFORMATION |                  |
|                                                                                                                                                           | DATE: 8-06-2003         | SHEET NO. 7 OF 7 |