

WATER PERMIT NO. 1749-1

Name of Applicant: Waune Besler

Address: 14281 Bixby Road, Bison SD 57260

Phone: 244-5507

Amount of Water Claimed: 209 ac-ft Total Acres:

Source of Water Supply: construction of a dam

Water to be used for: fish, wildlife, recreation & livestock

County: Perkins

Type of Waste Disposal System:

Location: SE ¼ Section 33, SW ¼ Section 34, T17N, R13E

PRIORITY Date Received: 5/16/2001

Fee: \$275

Corrected Application Received: 6/4/2001

Period of Annual Use: Jan. 1 – Dec. 31

Remarks:

Diversion Point: E ½ SE ¼ Section 33

& W ½ SW ¼ Section 34, T17N, R13E

Land to be Irrigated:

Depth of Well:

Well Driller:

Remarks:

Type of Map: Quad

Prepared by: Roger Smith, Ducks Unlimited

Reviewed and the Number Assigned on: 6/4/2001

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

SOUTH DAKOTA
WATER PERMIT NO. 1749-1

Date of first receipt of application May 16, 2001.

Date of return to applicant for corrections, amendments or changes May 16, 2001.

Date of receipt of corrected application June 4, 2001.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 1749-1 to Wayne Besler, 14281 Bixby Road, Bison SD 57260 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. 1749-1 authorizes impoundment of 209 acre-feet of water from runoff by constructing a dam on an unnamed tributary to Rabbit Creek located between the E½ SE¼ Section 33 and W½ SW¼ Section 34; with water impounded in the E ½ SE ¼, NE¼ Section 33; SW ¼, W ½ NW ¼ Section 34; T17N-R13E. This permit requests impoundment of sufficient water to maintain water at a primary spillway elevation of 2,575.0 feet mean sea level.
2. The water appropriated shall be used for the purpose of fish & wildlife propagation, recreational use and livestock watering and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 1749-1 is August 20, 2001.
5. The date from which applicant may claim right is May 16, 2001.
6. One-fifth of the construction is to be completed on or before February 20, 2004.
7. All construction is to be completed on or before August 20, 2006.
8. Water is to be put to beneficial use on or before August 20, 2010.
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. 1749-1 authorizes a dam with a storage capacity of 209 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

By: Garland Erbele

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

SEP 18 2001

date



FORM 2: Application for uses other than irrigation
(type or print)

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>1749-1</u>	(office use only) Hydrologic Unit <u>10130305</u>
	Basin <u>Moreau River</u>	
	Newspaper <u>Bison Courier, Bison</u>	



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

Check use(s) of water:

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

Type of Application: ☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
(check one) ☐ 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.) _____

1. Name of Applicant Wayne Besler Phone 605-244-5507
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address 14281 Bixby Road, Bison State SD 57260
(Street, RR, or Box and City) (Zip Code)

2. Amount of water claimed _____ *CFS or _____ **GPM 209 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (**Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply Runoff

4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
SE1/4 of Section 33, SW1/4 of Section 34 - T. 17 N., R. 13 E. Water Impounded, E 1/2 SE 1/4 + NE 1/4 Sec 33
Lat 45°23'21.7" Long. 102°31'16.6" W 1/2 NW 1/4, SW 1/4 Sec 34, NW 1/4 County Perkins

5. Sec 3 County or counties where water will be used Perkins

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

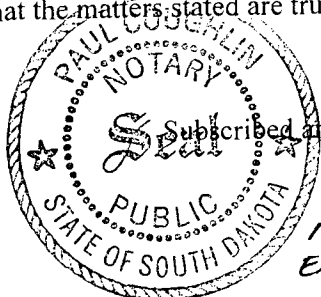
7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

This project involves constructing a small dam on Peggy Creek, a tributary of the Moreau River, in Perkins County. The dam will be situated in rangeland, and will be used for livestock, fish & wildlife habitat, and recreation. See attached design report and plans for additional information.

STATE OF SOUTH DAKOTA)
County of Perkins) SS

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

I, Wayne Besler, 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 Wayne Besler

Subscribed and sworn to before me this 9th day of May 20 01

[Signature]
Notary Public signature

Form 2A Supplemental Information

(Complete applicable portions only)

(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:

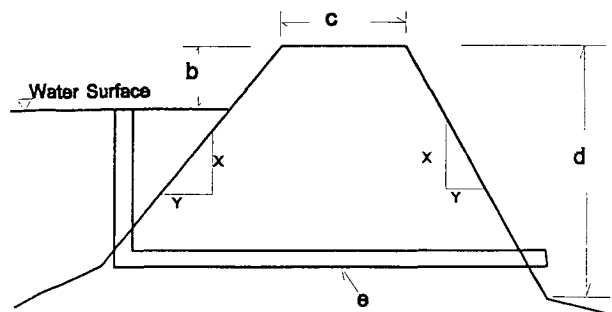
Roger Smith, P.E.

Ducks Unlimited, Inc.

2525 River Road

Bismarck, ND 58503

- b) Freeboard **3.5' at E.S.; 6.5' at P.S.**
- c) Crest Width **12'**
Crest Length **539'**
- d) Height **22'**
- e) Primary Outlet Capacity **Attached**
If pipe, diameter **48" riser; 30" barrel**
- f) Secondary Spillway Capacity **Attached**
Spillway Width **60'**
- g) X & Y Slope _____
Upstream **3:1**
Downstream **3:1**
- h) Surface Area of Impoundment **51.4 acres**
- i) Storage **209** Acre Feet
- j) Drainage Area Above Dam **3,821** Acres



Water Permit Application # 1749-1

Inlayue Besler

Cat. 3 - Low Hazard Dam

Top of Dam Elev. - 2581.5
 2nd Spway Elev. - 2578
 P. Spway Elev. - 2575
 D/S Toe Elev. - 2559.5

Ht. = 22 ft

Normal Storage Capacity - 209 A.-Ft
 Int. Storage Capacity - 402
 Max Storage Capacity - 670

Int. Capacity x Eff Ht. = 402 x 18 = 7236 73000 ∴ 50-yr
 Min. Spillway Design

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

DA = 5.97 mi.² = 3820 Ac

Slope = 50 ft/mi

SI = 2.50

$$Q_{50} = 106 A^{.63} S^{.45} S^{-.69}$$

$$= 106 (5.97)^{.63} (50)^{.45} (2.50)^{-.69}$$

$$= 106 (3.08) (5.81) (0.5314)$$

$$= \underline{1008 \text{ cfs}}$$

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

$$= 132 (5.97)^{.65} (50)^{.46} (2.50)^{-.67}$$

$$= 132 (3.15) (6.05) (0.5412)$$

$$= \underline{1380 \text{ cfs}}$$

Secondary Spillway Flow

$$Q = CLH^{3/2} \quad C = 2.6$$

$$= 2.6 (60) (3.5)^{1.5} \quad L = 60$$

$$= \underline{1025 \text{ cfs}} \quad H = 3.5$$

Ducks Unlimited uses the NRCS TR-20 model to route a
 Q₁₀₀ peak of 1303 cfs thru the dam with 1.0 ft of
 freeboard available.

Section 74:02:08:09

NRCS Annual Yield

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 - std. DU - OK
9. EPP - Cat 3 N/A - OK

$$DA = 3820 \quad ISO = 1.5 \quad CN = 74$$

$$80\% \text{ chance} = 0.08$$

$$.08 (3820) / 12 = \underline{25 \text{ A.-Ft}}$$

$$50\% \text{ chance} = 0.23$$

$$0.23 \times 3820 / 12 = \underline{73 \text{ A.-Ft}}$$

$$10\% \text{ chance} = 1.2$$

$$1.2 \times 3820 / 12 = \underline{382 \text{ A.-Ft}}$$

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

ME 416846

Pierre, June 4, 2001

RECEIVED OF Wayne Besler, 14281 Bixby Rd, Bison, SD 57620
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>1749-1</u> to Appropriate Water, to construct and to put water to beneficial use _____	225 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>1749-1</u>	50 00
Fee for Filing Transfer Form _____	
Fee for Filing Extension Request _____	
Fee for _____	

(Any Other Work Provided by Law)	
Total	275 00

By

Chief Engineer

Darland Erbele

gm

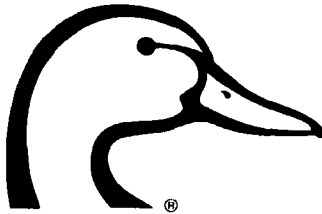
DESIGN REPORT

For

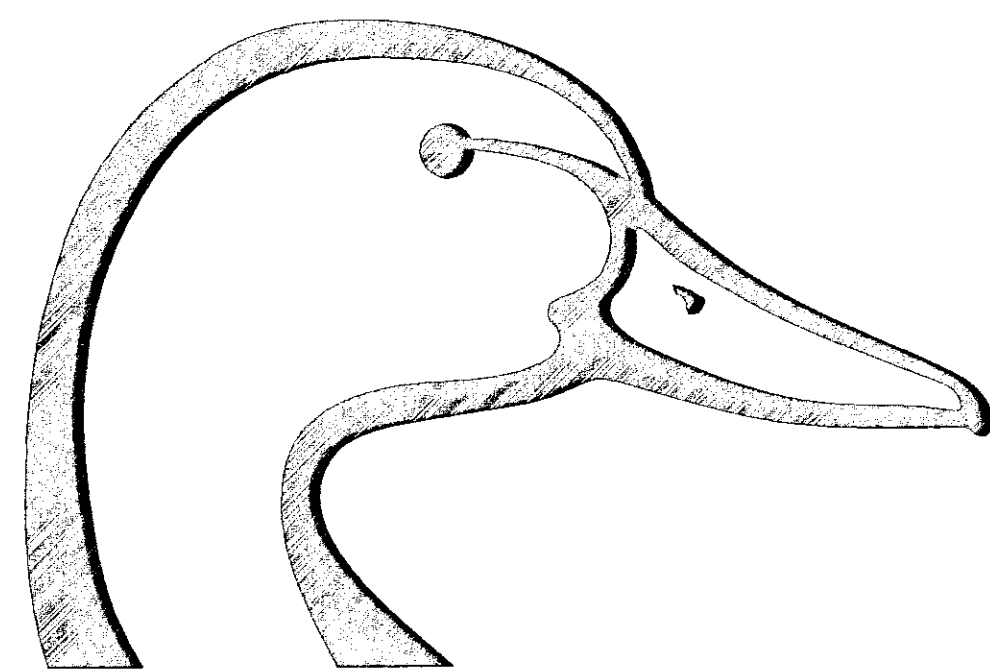
BESLER RANCH WETLANDS
~~PEGGY CREEK~~ "SITE B"

PERKINS COUNTY, SD (SD-0283-03)

April 20, 2001



Ducks Unlimited, Inc.
2525 River Road
Bismarck, ND 58501



DUCKS UNLIMITED

DUCKS UNLIMITED

PROJECT

BESLER RANCH WETLANDS

~~PEGGY CREEK~~ "SITE B"

SECTIONS 33 & 34, T-17-N, R-13-E

PERKINS COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

SOUTH DAKOTA GAME, FISH, AND PARKS DEPT.

AND

WAYNE BESLER

(PRIVATE LANDOWNER)

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 EMBANKMENT AND EMERGENCY SPILLWAY PLAN & PROFILE
- 4 WATER CONTROL STRUCTURE PLAN & PROFILE
- 5 WATER CONTROL STRUCTURE DETAILS
- 6 SOIL INFORMATION

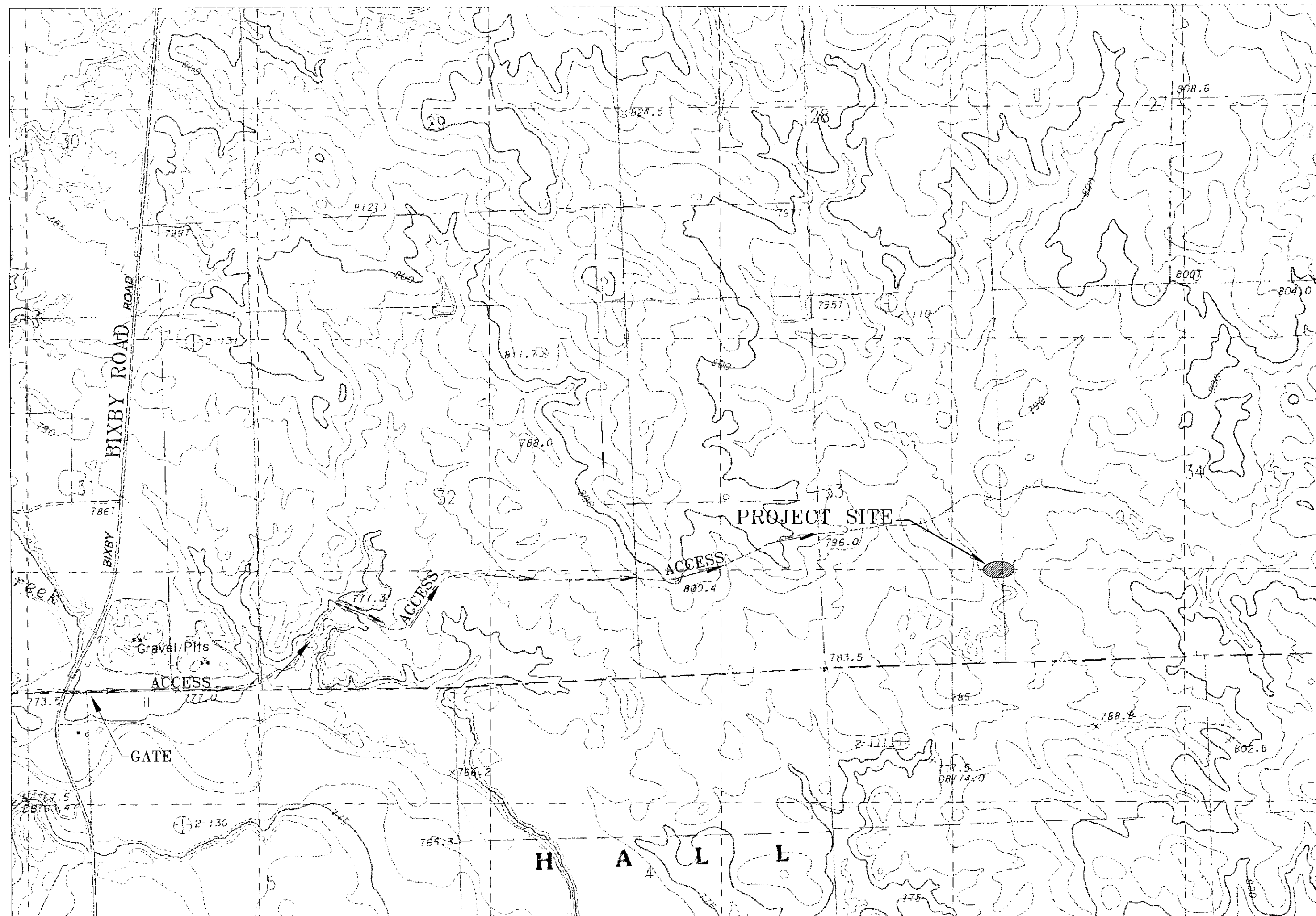
QUANTITIES

MOBILIZATION	1 L.S.
SITE PREPARATION (6")	1,051 CY-P
EXCAVATION	
EMERGENCY SPILLWAY	24004 CY (INC.)
OUTLET CHANNEL	1527 CY (INC.)
EMBANKMENT CONSTRUCTION	22,738 CY-S*
WATER (APPROX. 10 GAL./C.Y.)	227± M-GAL.**
WATER CONTROL STRUCTURE INSTALLATION	
48"Ø CMP RISER	1 EA.
AGRI-DRAIN INLINE DRAWDOWN STRUCTURE	1 EA.
CULVERT INSTALLATION	
30"Ø CMP	106 LF-P
12"Ø PVC	36 LF-P
RIPRAP PLACEMENT (CLASS I)	15 CY-P
RIPRAP PLACEMENT (CLASS II)	19 CY-P

*INCLUDES 15% FOR SHRINKAGE

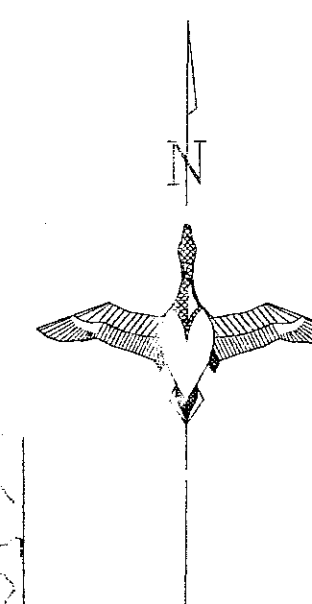
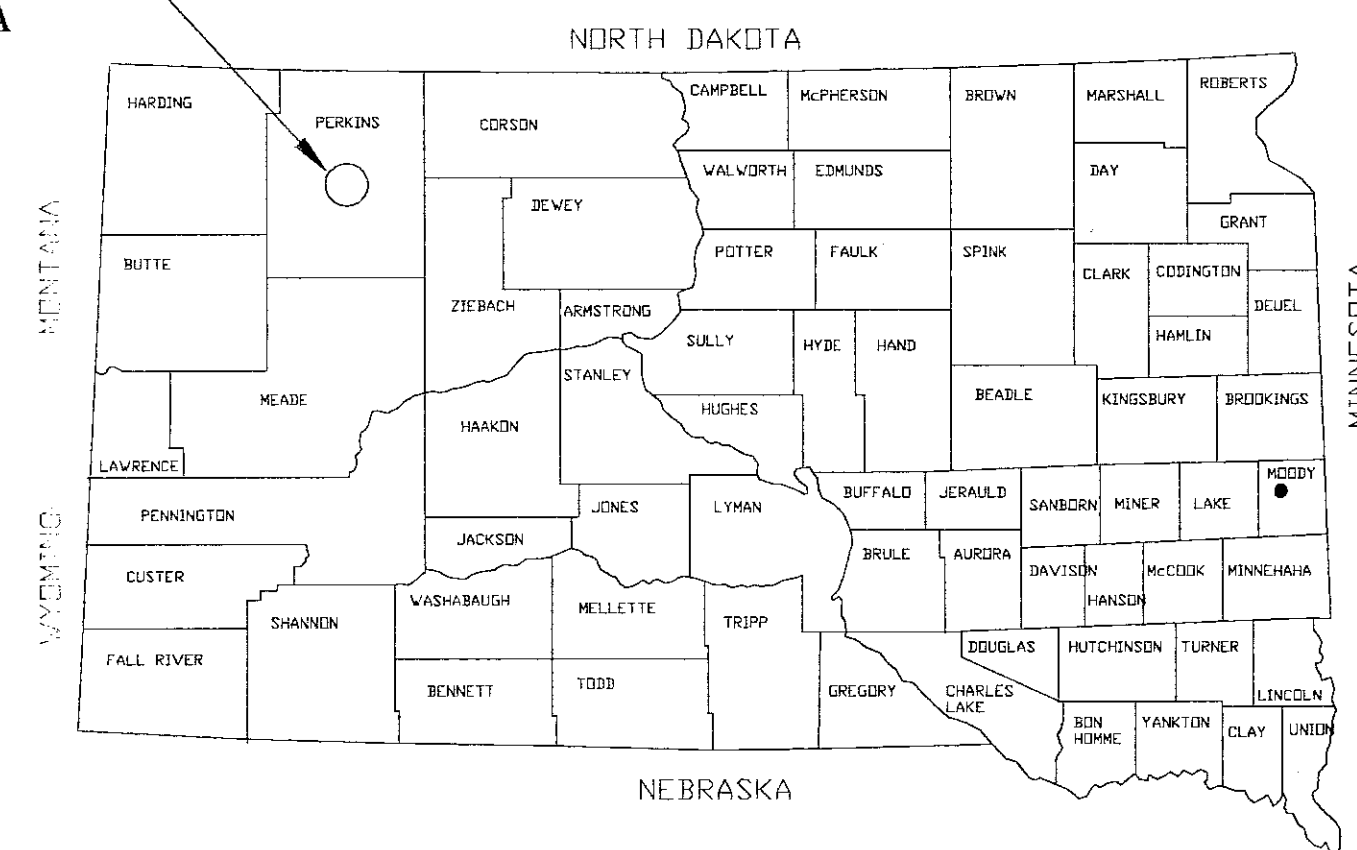
**ONLY ACTUAL QUANTITY OF WATER USED WILL BE PAID FOR.

NOTES TO CONTRACTOR:
Staked quantities listed above are estimated quantities for design & bidding purposes. Final as-staked quantities derived from the construction staking data will establish quantities for final payment. Project construction staking & final as-staked quantity calculations have not been completed prior to the bid solicitation.

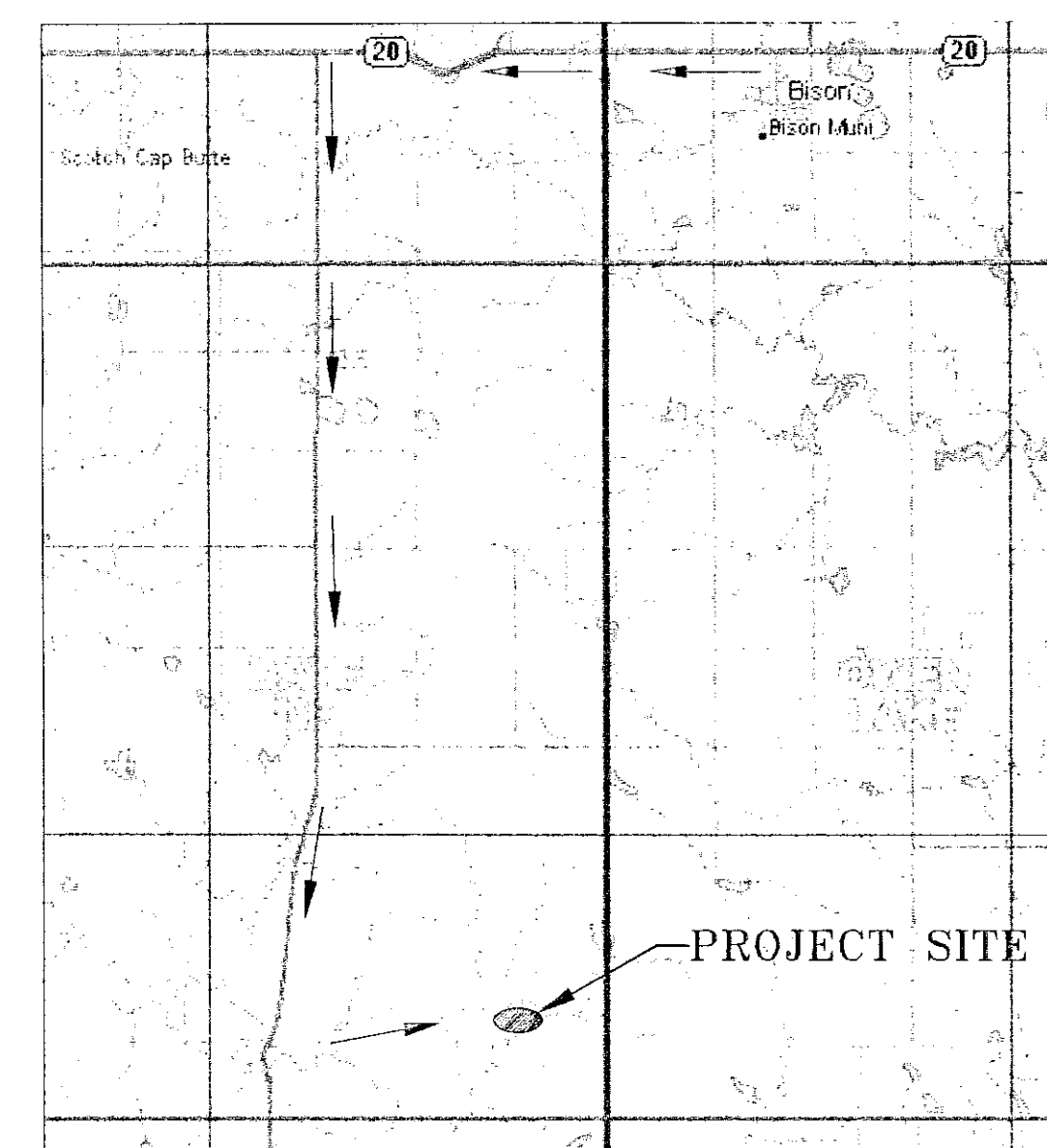


PROJECT LOCATION MAP
NOT TO SCALE

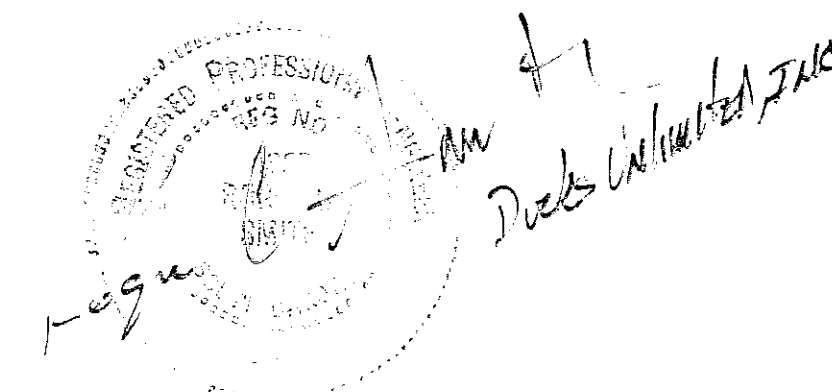
PROJECT
AREA



SOUTH DAKOTA



PROJECT LOCATION MAP
NOT TO SCALE



AGENCY CONTACT:
PAUL COUGHLIN
SD GF&P
605/854-9105

LANDOWNER:
WAYNE BESLER
605-244-5507

DUCKS UNLIMITED INC.	PROJECT NO. SD-0283-003	DESIGNED BY: RCS
	BESLER RANCH WETLANDS PEGGY CREEK LOCATION MAPS	DRAWN BY: TSP SURVEYED BY: GLJ CHECKED BY: BRK
GREAT PLAINS REGIONAL OFFICE	DATE: 4-19-2001	APPROVED BY: [Signature]
SHEET NO. 1 OF 6		APPROVED BY: [Signature]

DESIGN REPORT

PROJECT: Besler Ranch Wetlands - Peggy Creek Site
SD -0283-03

LOCATIONS: SE¼ SECTION 33, SW¼ SECTION 34 TWP. 17 N RGE. 13 E
Latitude 45° 23' 21.7" Longitude 102° 31' 16.6" Perkins County, South Dakota

MARSH DATA: Full Service Level (FSL) @ 2575.0 (mean sea level)
51.4 Surface Acres @ FSL
209 Acre-Feet Capacity @ FSL
Maximum Depth – 24.5' top of dam to pipe invert,
22' from top of dam to existing creek bottom.

PROJECT DATA: Top of Dam - elevation 2581.5
Primary Spillway - elevation 2575.0
Emergency Spillway - elevation 2578.0
Upstream Berm – 10' wide @ elevation 2575.0
Side Slopes - 3 (horizontal): 1 (vertical)

CLASSIFICATION: Based on the classification criteria outlined in Chapter 74:02:08 "Safety of Dams," it is recommended that the proposed dam be classified as a small, Category 3 dam. No loss of life and minimal economic loss is expected should failure occur. The product of the "maximum storage capacity" times the "effective height" is 12,400. (670 acre-feet x 18.5')

PRELIMINARY RISK ASSESSMENT: The proposed dam is on Peggy creek. Peggy Creek runs through pasture and range land for 3.4 miles prior to entering Rabbit Creek. A review of the USGS topography map shows no other structures prior the creeks discharge into Rabbit Creek. Rabbit Creek is a tributary to the Moreau River.

PROPOSED PROJECT: The dam will be constructed having a 10' wide upstream berm at elevation 2575.0, a 12' wide top at elevation 2581.5, and all slopes at 3:1. The dam will be constructed from local material obtained from the excavated emergency spillway and approach channel. The intent is to contain the borrow area to required excavations as much as possible.

PRIMARY SPILLWAY: The structure will have fixed level water control capabilities at elevation 2275.0. Variable level water control will be provided by a separate structure having the capability of retaining water at 6" increments between elevations 2575.0 and 2566.0. The riser, acting, as a circular weir will be a 48" 12 gage corrugated metal pipe. The outlet barrel will be a 30", 12 gage corrugated metal pipe at a 0% slope at elevation 2557.0. 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. An outlet channel was required to realign to the natural channel.

EMERGENCY SPILLWAY: The emergency spillway will be excavated having a 60' bottom width and 3:1 slopes. The top of the finished spillway grade, after replacing 4" of topsoil, will be 2578.0. The length of the level crest at the spillway centerline is 483'. Flows will outlet into an undisturbed well vegetated natural swale that will deliver flows back to the original creek.

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 – 5.97 SQ MI

TIME OF CONCENTRATION – 1.6 HOURS

CURVE #'s – 74 (5 yr) 76 (10 yr) 78 (25yr) 80 (100 yr)

Event	Rainfall (in)	Runoff (ac-ft)	Peak Inflow (cfs)	Peak Discharge (cfs)	Max WSP (elevation)	Freeboard*	Flow in E.S. (cfs)
5 yr	2.6	189	226	66	2577.03	4.47	0
10 yr	3.0	296	404	74	2578.23	3.27	<10
25yr	3.6	469	708	708	2579.40	2.10	107
100 yr	4.6	799	1303	548	2580.50	1.0	352

*Calculated from top of compacted fill, excluding topsoil. 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: It is difficult to determine the frequency in which there will be adequate runoff to sustain the marsh through the brood-rearing period, criteria important to project sponsors. Using NRCS methods, the 80% and 50% annual runoff will generate 60 and 140 acre-feet respectively. The annual requirement assuming an evaporative loss of approximately 3.5 feet is 131 acre-feet. There is evidence that inflows will be supplemented, at least periodically, from subsurface contributions.

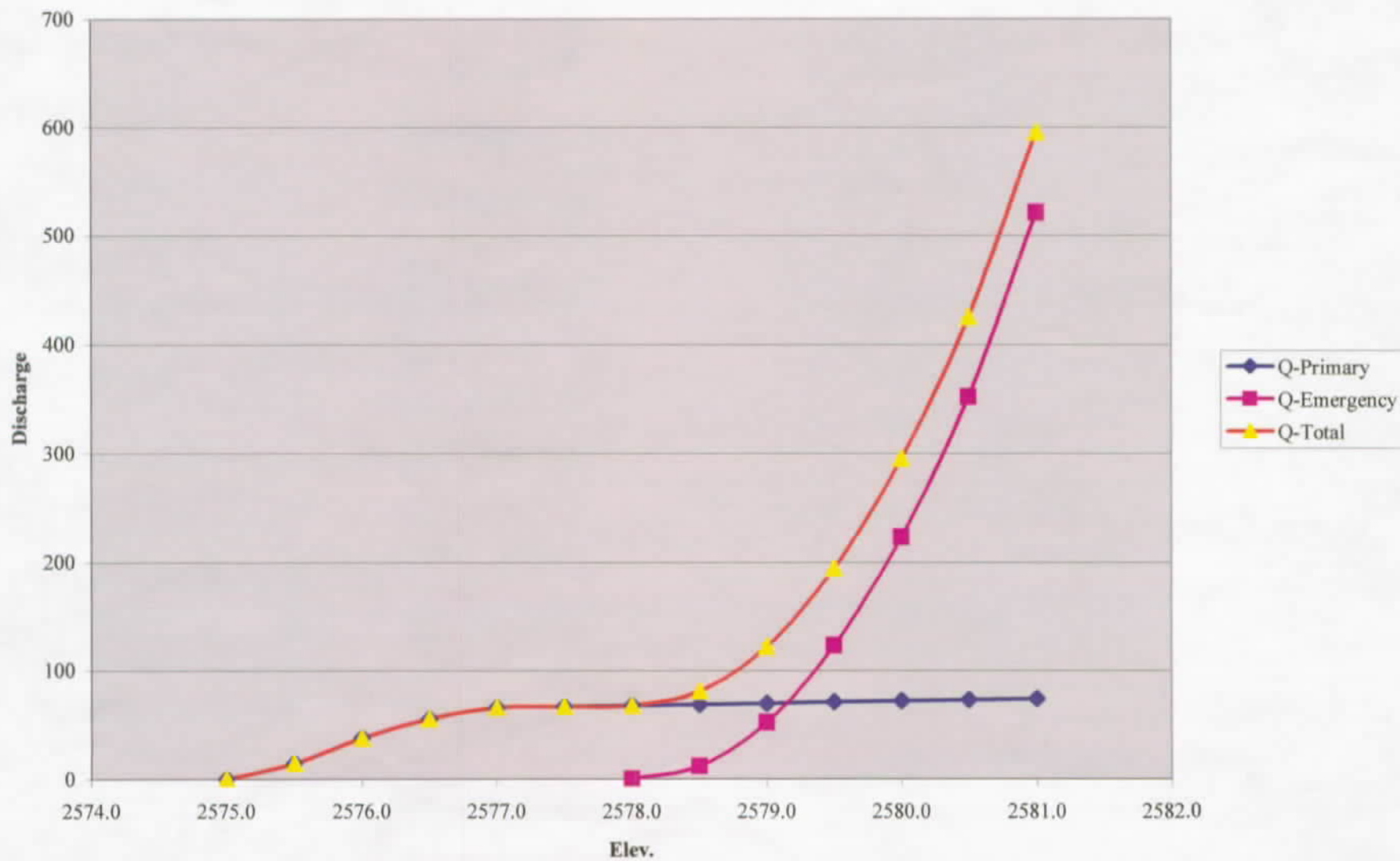
SOIL INVESTIGATION: As of this writing a soil investigation has not been completed. A preliminary investigation determined that suitable quantities of acceptable material are likely. A soil investigation report, to be completed in the near future, will be available upon request. The plans will be modified to show the approved borrow areas as well as any other modifications recommended by the geotechnical consultant.

IMPACTS TO SURROUNDING PROPERTY: The planned construction and subsequent reservoir will be contained within land owned by Wayne Besler and managed by the SD Game, Fish & Parks through a Cooperative Wildlife Agreement.

Dated: April 20, 2001
Submitted By:

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

Stage vs. Discharge





DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

May 16, 2001

Wayne Besler
14281 Bixby Road
Bison SD 57260

Dear Mr. Besler:

Paul Coughlin with the Department of Game, Fish and Parks hand delivered to the Water Right Program your water right permit application for a dam. This dam is proposed to impound 209 acre feet of water on Peggy Creek in Perkins County. The only remaining issue to complete the application is the submittal of the filing fee.

Please submit an application filing fee of \$275 (\$225 application fee and \$50 licensing fee). The check can be made payable to the "Water Rights Program". I have enclosed a self addressed stamped envelope for your use.

I also want to make you aware it is the applicant's responsibility to pay the cost of the public notice in the local newspaper. This expense is between the applicant and the newspaper at the time the notice is published.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Eric Gronlund
Water Rights Program
605 773-3352





DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

July 26, 2001

Wayne Besler
14281 Bixby Road
Bison, SD 57620

Dear Mr. Besler:

We have reviewed the plans and specifications for your Ducks Unlimited Besler Ranch Wetlands "Site B" Project, in Perkins County. Water Permit Application No. 1749-1 has been filed for a dam located in the E 1/2 SE 1/4 of Section 33 and the W 1/2 SW 1/4 of Section 34-T17N-R13E. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the dam. The construction may not begin until Water Permit Application Nos. 1749-1 is approved.

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

The Besler Dam No. 3 will be classified as a small size Category 3, Low Hazard dam with a dam height of 22 feet and a normal storage capacity of 209 acre-feet and a maximum storage capacity of 670 acre-feet.

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

Sincerely,

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

c: Roger Smith, Ducks Unlimited
Paul Coughlin, GF&P



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1749-1, Wayne Besler**

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. 1749-1, Wayne Besler, 14281 Bixby Road, Bison SD 57260.

The Chief Engineer is recommending APPROVAL of Application No. 1749-1 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Water Permit No. 1749-1 authorizes a dam with a storage capacity of 209 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer
July 26, 2001

REPORT ON
WATER PERMIT APPLICATION NO. 1749-1
Wayne Besler
June 28, 2001

Water Permit Application No. 1749-1-1 has been filed by Wayne Besler to impound 209 acre-feet of water from runoff by constructing a dam located in the E 1/2 SE 1/4 Section 33 and the W 1/2 SW 1/4 of Section 34-T17N-R13E, in Perkins County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation of 2575 feet mean sea level. The water will be used for recreation, fish and wildlife production and livestock watering.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. The dam has been designed by Ducks Unlimited, Inc. (DU). The plans and specifications have been reviewed and will be approved; however, construction of the dam can not begin until Water Permit Application No. 1749-1 is approved.

The Besler Dam "Site B" will be 22 feet high with a normal storage capacity of 209 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 670 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 50-year frequency event.

The dam has a drainage area of 5.97 square miles. The dam is designed to have a CMP drop inlet structure with a 48 inch riser and a 30 inch barrel and 6.5 feet of freeboard as the primary spillway, and a 60 foot wide earthcut spillway with 3.5 feet of available freeboard as the secondary spillway. Ducks Unlimited uses the NRCS TR-20 model to route the inflow through the dam. They route a 100-year event peak of 1300 cfs through the structure with 1.0 feet of freeboard remaining.

The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 25 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 73 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 382 acre-feet.

The Besler Dam "Site B" is located in the E 1/2 SE 1/4 of Section 33 and the W 1/2 SW 1/4 of Section 34-T17N-R13E on an unnamed tributary of Rabbit Creek about 2.5 miles upstream of its confluence with Rabbit Creek. There are no existing Water Permits/Rights on the unnamed tributary between the proposed dam and Rabbit Creek. The nearest permit below Water Permit Application No. 1749-1 is located at the confluence of the unnamed tributary and Rabbit Creek, Water Right No. 782-1 held by Burdine & Sons, Inc. This permit appropriates 2.25 cfs from

Page 2

Application No. 1749-1

Wayne Besler

Rabbit Creek to irrigate 445 acres of lands. Approval of Water Permit Application No. 1749- should not have any adverse effect on Water Right No. 782-1.

Conclusions:

1. Water Permit Application No. 1749-1 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 1749-1.

Eric Hundert

for

Timothy G. Schaal, P.E.

Natural Resources Engineer Specialist

Approved by:

Gale N. Selken

Gale N. Selken, P.E.

Natural Resources Engineer Director



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

July 26, 2001

Wayne Besler
14281 Bixby Rd.
Bison, SD 57260

Dear Mr. Besler:

Water Permit Application No. 1749-1 for recreational 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 Bison Courier printed at Bison, SD (Ph # 605-244-7199). 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

enclosures

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



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

July 26, 2001

Bison Courier
Box 429
Bison, SD 57620-0429

ATTENTION: Legal Public Notice

Enclosed is a Notice of Hearing on Application No. 1749-1 to Appropriate Water to be published twice. Please publish the first notice on August 2, 2001 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 Wayne Besler, 14281 Bixby Road, Bison, SD 57260 (Ph # 605-244-5507).

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. 1749-1

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

Date _____

We are in receipt of your letter of July 26, 2001 enclosing Notice of Hearing to Appropriate Water by Application No. 1749-1 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on August 2, 2001 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 1749-1 to Appropriate Water

Notice is given that Wayne Besler, 14281 Bixby Road, Bison SD 57260 has filed an application for a water permit to impound 209 acre-feet of water from runoff by constructing a dam on an unnamed tributary to Rabbit Creek located between the E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 33 and W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 34; with water impounded in the E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 33; SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 34; T17N-R13E. This application requests impoundment of sufficient water to maintain water at a primary spillway elevation of 2,575.0 feet mean sea level and is to be used for fish & wildlife propagation, recreational use and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1749-1 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

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 August 20, 2001.

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.

PUBLISHER'S AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

ISS

COUNTY OF PERKINS

Elizabeth Hulm, of said County and State, being duly sworn, on oath says: THE BISON COURIER is a weekly newspaper of general circulation, printed and published in Bison, in said County and State and has been such newspaper during the times hereinafter mentioned; that the said BISON COURIER is a legal newspaper and has been in existence for more than one year immediately preceding the first publication herein mentioned; and has more than 200 bonafide subscribers; that I, the undersigned, am Legal Advertising Manager, of said newspaper, and in charge of the advertising department thereof, and have personal knowledge of all facts stated in this affidavit; and that the advertisement headed

NOTICE OF APPLICATION NO. 1749-1

a printed copy of which is hereto attached, was printed and published in said newspaper for 2 successive issues, the first publication being on the 2 day of August, 20 01 and the last publication on the 9 day of August, 20 01 that \$ 45.22 being the full amount of the fee for publication of the annexed notice insures solely to the benefit of the publishers of the said newspaper; that no arrangement or understanding for a division thereof has been made with any person and that no part thereof has been agreed to be paid to any other person whomsoever.

Elizabeth Hulm

Subscribed and sworn to before me this 23 day of Aug., 20 01.

Marsha Neal

Notary Public, Perkins County

My commission expires:

6-27-06



NOTICE OF APPLICATION NO. 1749-1 to Appropriate Water

Notice is given that Wayne Besler, 14281 Bixby Road, Bison SD 57620 has filed an application for a water permit to impound 209 acre-feet of water from runoff by constructing a dam on an unnamed tributary to Rabbit Creek located between the

E1/2SE1/4 Section 33 and
W1/2SW1/4 Section 34;
with water impounded in the
E1/2SE1/4, NE1/4 Section 33;
SW1/4, W1/2NW1/4 Section 34;
T17N-R13E.

This application requests impoundment of sufficient water to maintain water at a primary spillway elevation of 2,575.0 feet mean sea level and is to be used for fish & wildlife propagation, recreational use and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1749-1 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

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 August 20, 2001.

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.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

SEP 18 2001

Wayne Besler
14281 Bixby Road
Bison, SD 57260

Dear Mr. Besler:

Enclosed is Water Permit No. 1749-1 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

Permit No. 1749-1
Moreau River - Water District

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

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

I have this day, **November 19, 2003**, made a thorough examination of the water use system constructed by **Wayne Besler** of **14281 Bixby Road, Bison, SD 57260** holder of Permit No. **1749-1**, bearing the priority of **May 16, 2001** authorizing the storage of **209** acre-feet of the waters of **runoff** for **recreation, fish & wildlife propagation, and livestock water** purposes, in **Perkins** County.

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

A. Works used to divert the water:

A 22 foot high earthen dam with a normal storage capacity of 209 acre-feet

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

N/A

C. Works used to apply water to beneficial use:

A 22 foot high earthen dam with a normal storage capacity of 209.5 acre-feet

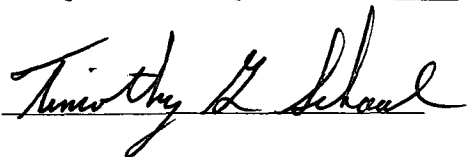
The system is in the following condition **good**. The point of diversion is located **1300 feet north of the SE corner of Sec. 33-T17N-R13E (SE ¼ SE ¼) (45.389167, -102.519438)**. The works are capable of storing **209** acre-feet of water which is to be used for **recreation, fish & wildlife propagation and livestock water**. Water has been put to beneficial use to the maximum extent as follows:

A 22 foot high earthen dam with a normal storage capacity of 209 acre-feet

and the license should be issued for **209** acre-feet of storage.

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

Exceptions to compliance are: **none** Date Report Completed: **February 19, 2004**



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

REPORT ON INSPECTION OF PERMIT NO. 1721-1

DATE OF INSPECTION: **November 19, 2003**

NAME & ADDRESS OF INSPECTION CONTACT/ **Brad Besler**

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

NAME & ADDRESS OF PERMIT HOLDER: **Wayne Besler, 14281 Bixby Road, Bison, SD 57260**

DIVERSION POINT LEGAL LOCATION: **1300 feet north of the SE corner of Sec. 33-T17N-R13E**
(SE ¼ SE ¼) (45.389167, -102.519428).

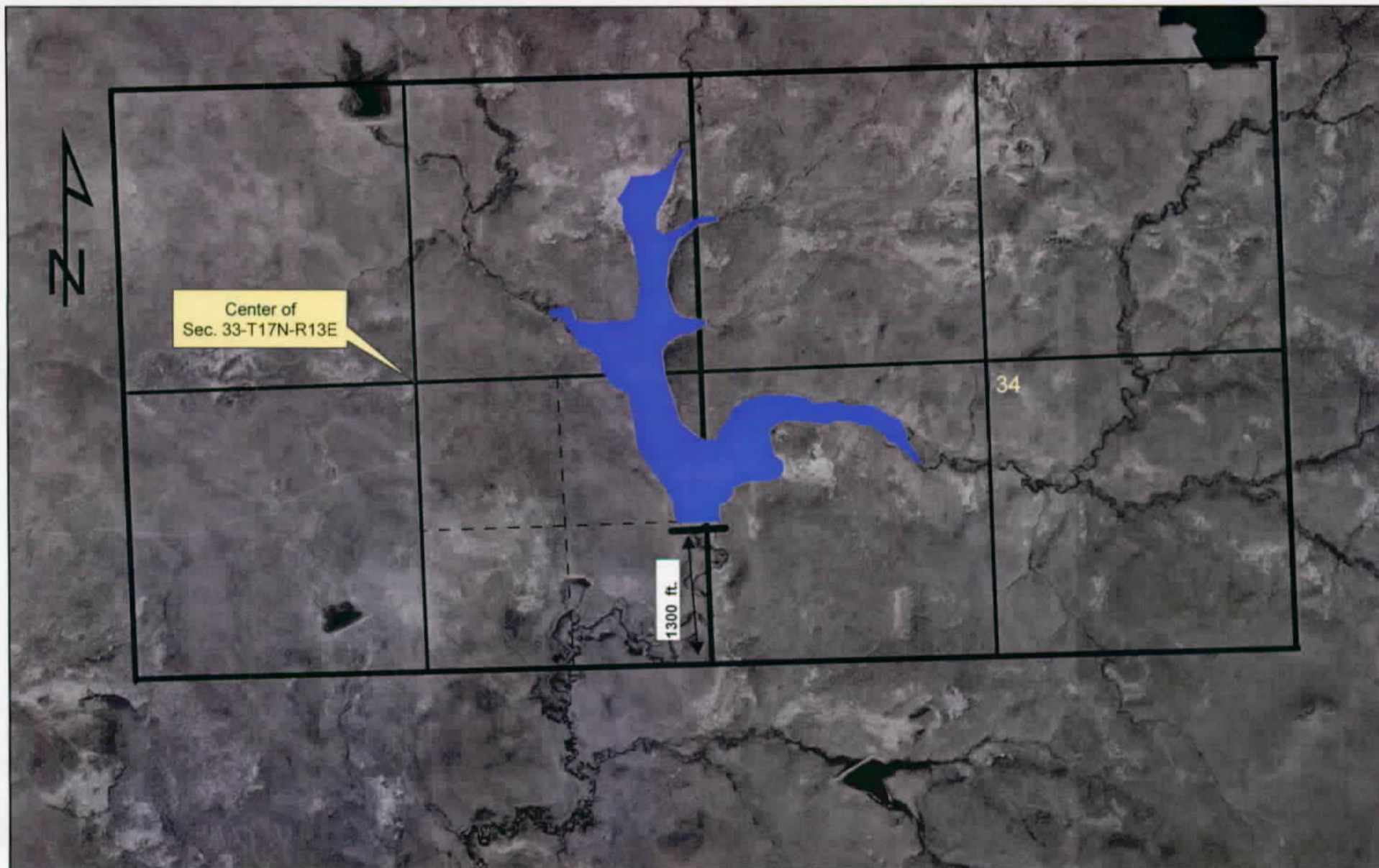
DAM INFORMATION:

- 1) Height to crest **22** feet
- 2) Height to primary spillway **15.5** feet
- 3) Height to secondary spillway **18.5** feet
- 4) Crest width **12** feet
- 5) Crest length **539** feet
- 6) Spillway length **XXX** feet
- 7) Spillway width **60** feet
- 8) Approx. storage (Normal) **209** acre-feet
- 9) Approx. storage (Maximum) **670** acre-feet
- 10) Date constructed: **Fall 2001**

PERMIT QUALIFICATIONS AND REGULATIONS:

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

Water Permit Application No. 1749-1



STATE OF SOUTH DAKOTA

WATER LICENSE NO. 1749-1

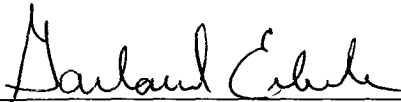
(1) Wayne Besler, 14281 Bixby Road, Bison SD 57260 made Application No. 1749-1, May 16, 2001 for a water permit to impound 209 acre feet of water from runoff (unnamed tributary to Rabbit Creek), Perkins County, South Dakota for recreation, fish and wildlife propagation and livestock watering purposes. Permit No. 1749-1, with a priority date of May 16, 2001 was approved August 20, 2001 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before August 20, 2006 and for the application to beneficial use of water on or before August 20, 2010.

(2) The water supply system has been completed and water applied to beneficial use in accordance with South Dakota State Law. Pursuant to South Dakota Codified Law 46-5-30.1, the holder and/or owner of Water Right No. 1749-1 is issued a license, bearing a priority date of May 16, 2001, to impound 209 acre feet of water.

The location of the storage dam (spillway) is 1,300 feet north of the southeast corner of Section 33-T17N-R13E (SE ¼ SE ¼).

(3) This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Permit No. 1749-1, including the following now applicable qualifications:

- Water Permit No. 1749-1 authorizes a dam with a storage capacity of 209 acre-feet of water and sufficient water annually to maintain the water level to the outlet elevation.
- Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.



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

APR 23 2004

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

APR 23 2004

1708-1
1749-1
1720-1
1721-1

Wayne Besler
14281 Bixby Rd
Bison SD 57620

Dear Mr. Besler:

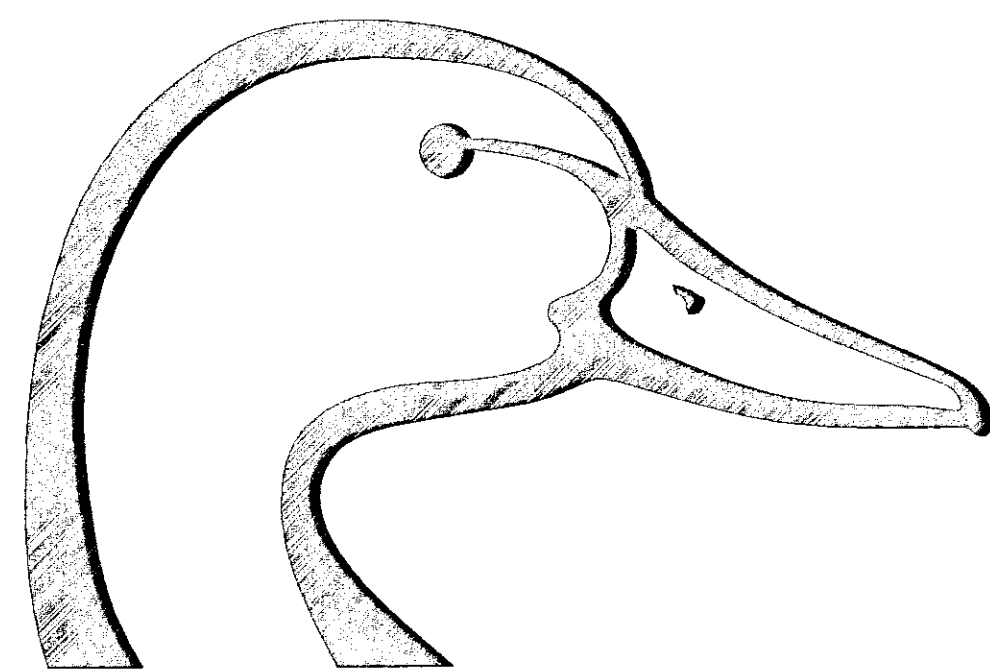
Enclosed are Water License Nos. 1708-1, 1749-1, 1720-1 & 1721-1. This is the final water right document completing your process of obtaining a Water Right.

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

Sincerely,

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

enclosures



DUCKS UNLIMITED

DUCKS UNLIMITED

PROJECT

BESLER RANCH WETLANDS

~~PEGGY CREEK~~ "SITE B"

SECTIONS 33 & 34, T-17-N, R-13-E

PERKINS COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

SOUTH DAKOTA GAME, FISH, AND PARKS DEPT.

AND

WAYNE BESLER

(PRIVATE LANDOWNER)

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

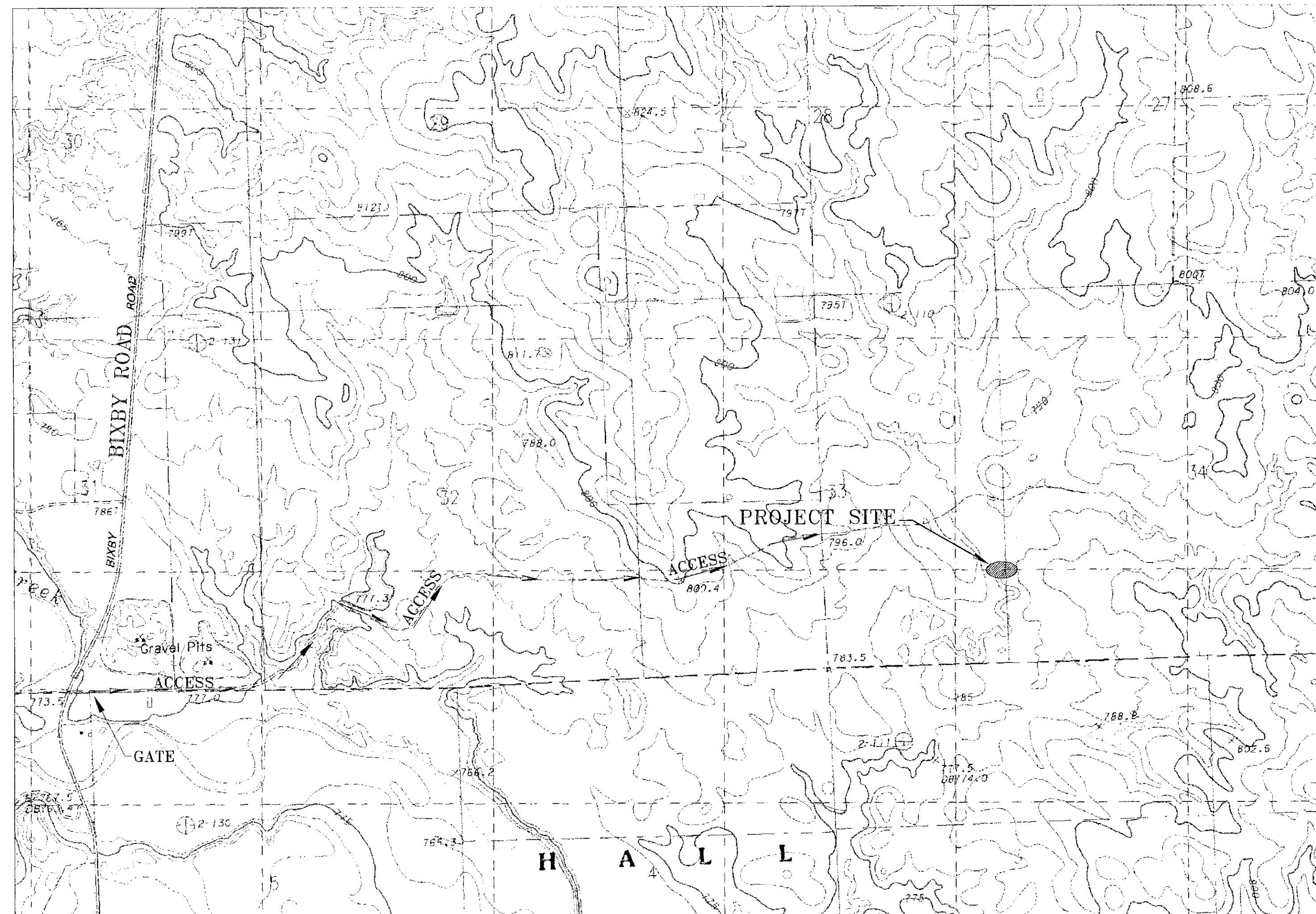
- 1 LOCATION MAPS
- 2 PROJECT TOPOGRAPHY
- 3 EMBANKMENT AND EMERGENCY SPILLWAY PLAN & PROFILE
- 4 WATER CONTROL STRUCTURE PLAN & PROFILE
- 5 WATER CONTROL STRUCTURE DETAILS
- 6 SOIL INFORMATION

QUANTITIES

MOBILIZATION	1 L.S.
SITE PREPARATION (6")	1,051 CY-P
EXCAVATION	
EMERGENCY SPILLWAY	24004 CY (INC.)
OUTLET CHANNEL	1527 CY (INC.)
EMBANKMENT CONSTRUCTION	22,738 CY-S*
WATER (APPROX. 10 GAL./C.Y.)	227± M-GAL.**
WATER CONTROL STRUCTURE INSTALLATION	
48"Ø CMP RISER	1 EA.
AGRI-DRAIN INLINE DRAWDOWN STRUCTURE	1 EA.
CULVERT INSTALLATION	
30"Ø CMP	106 LF-P
12"Ø PVC	36 LF-P
RIPRAP PLACEMENT (CLASS I)	15 CY-P
RIPRAP PLACEMENT (CLASS II)	19 CY-P

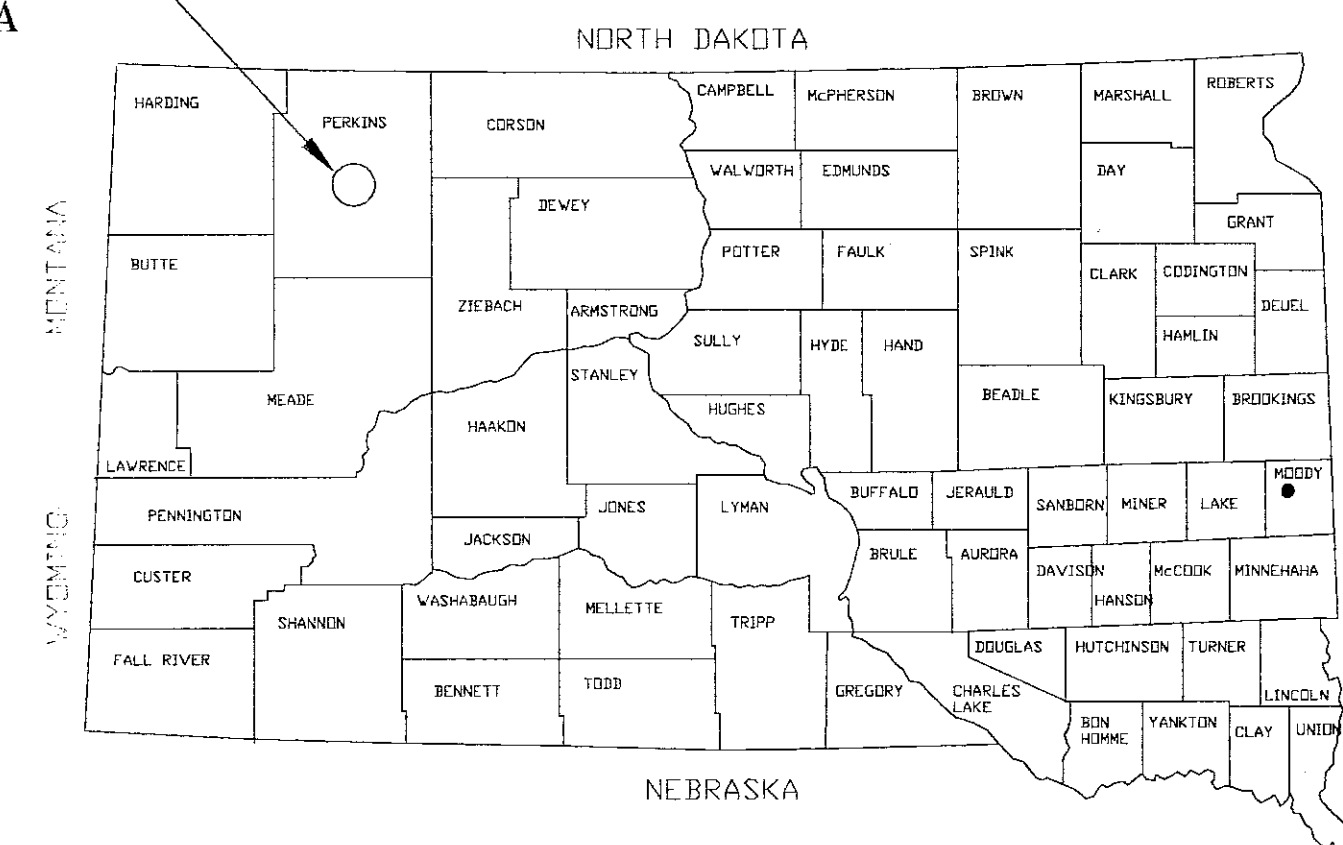
*INCLUDES 15% FOR SHRINKAGE
**ONLY ACTUAL QUANTITY OF WATER USED WILL BE PAID FOR.

NOTES TO CONTRACTOR:
Staked quantities listed above are estimated quantities for design & bidding purposes. Final as-staked quantities derived from the construction staking data will establish quantities for final payment. Project construction staking & final as-staked quantity calculations have not been completed prior to the bid solicitation.

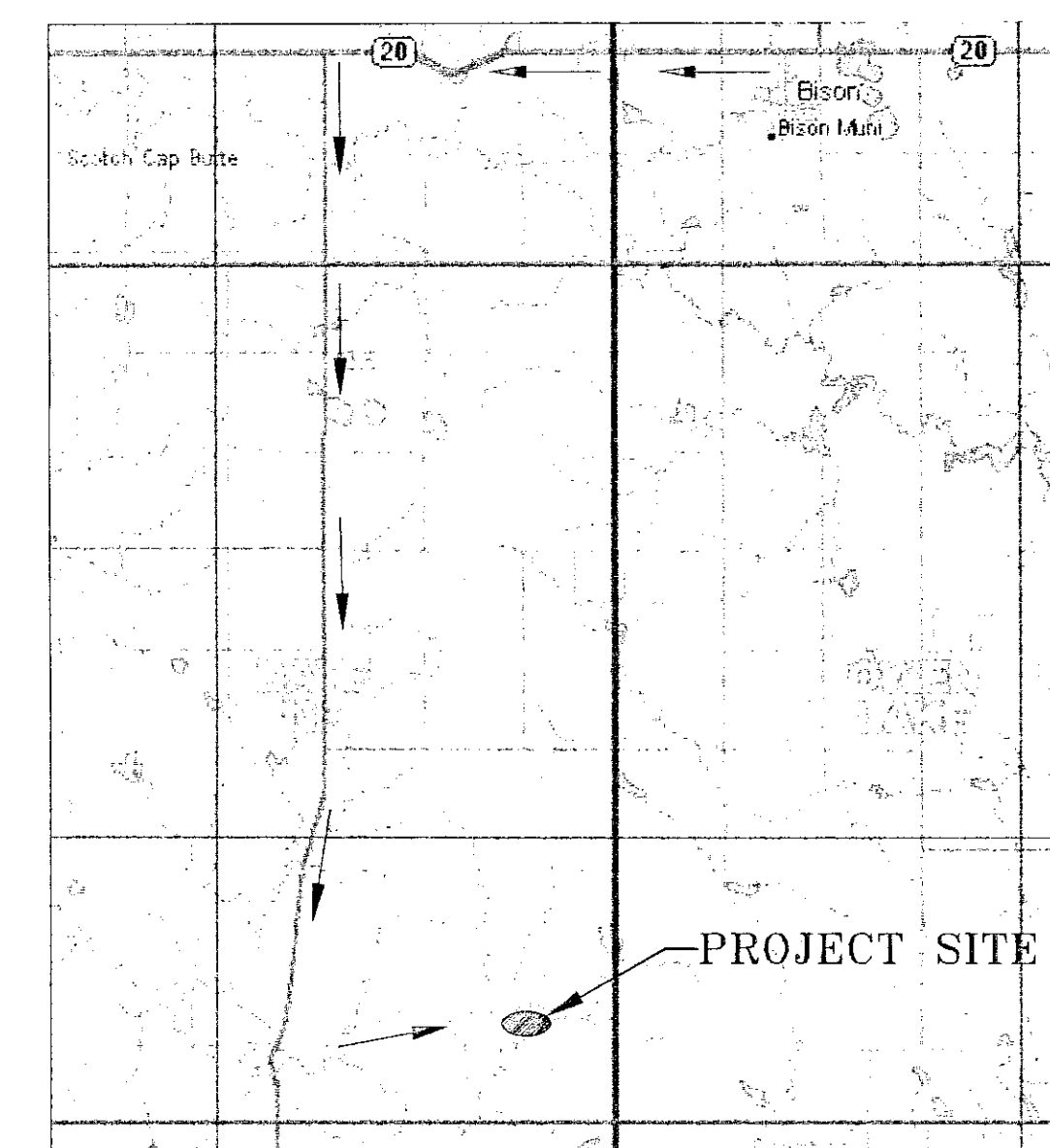
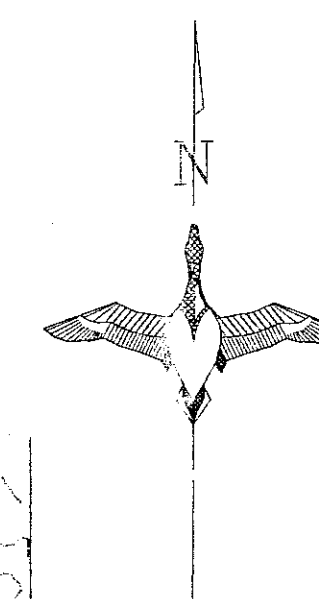


PROJECT LOCATION MAP
NOT TO SCALE

PROJECT
AREA



SOUTH DAKOTA



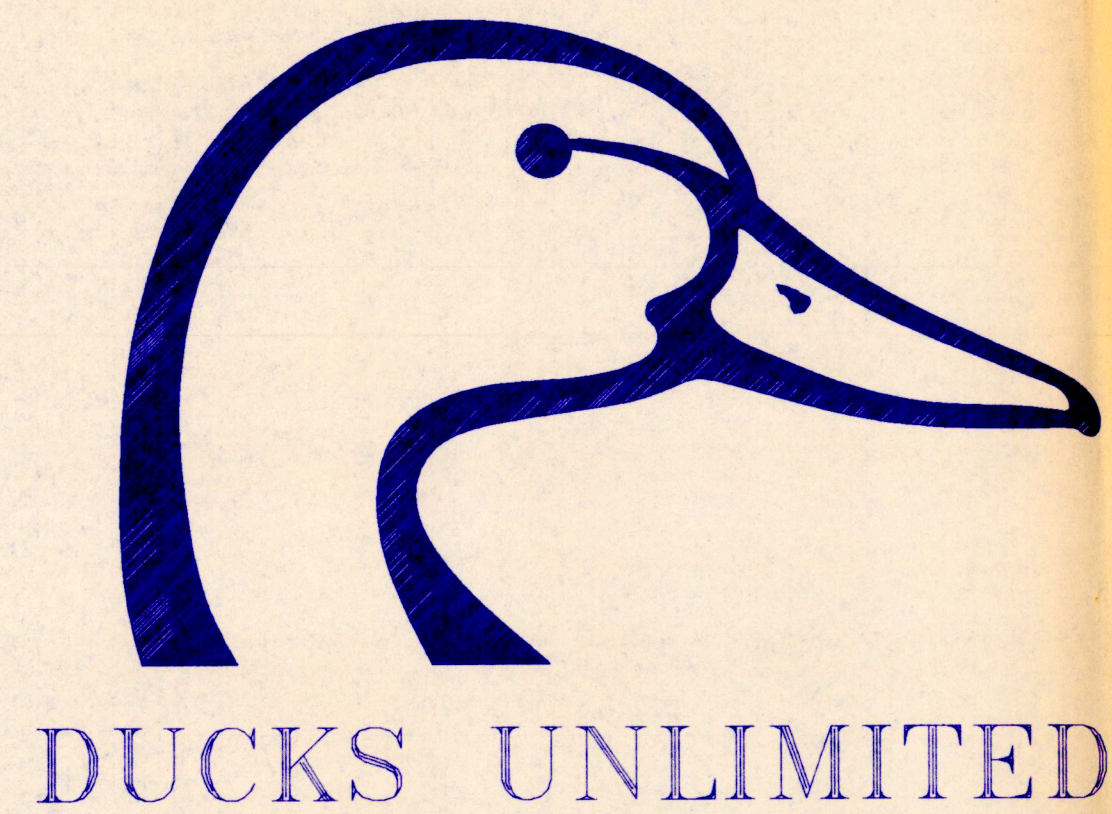
PROJECT LOCATION MAP
NOT TO SCALE

Professional Engineer
Paul Coughlin
4-19-2001
Ducks Unlimited Inc.

AGENCY CONTACT:
PAUL COUGHLIN
SD GF&P
605/854-9105

LANDOWNER:
WAYNE BESLER
605-244-5507

	DUCKS UNLIMITED INC.	PROJECT NO. SD-0283-003	BESLER RANCH WETLANDS	DESIGNED BY: RCS
	GREAT PLAINS REGIONAL OFFICE	DATE: 4-19-2001	SHEET NO. 1 OF 6	DRAWN BY: TSP
			LOCATION MAPS	SURVEYED BY: GLJ
			APPROVED BY: [Signature]	CHECKED BY: BRK



DUCKS UNLIMITED

PROJECT

BESLER RANCH WETLANDS

~~PEGGY CREEK~~ "SITE B"

SECTIONS 33 & 34, T-17-N, R-13-E

PERKINS COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

SOUTH DAKOTA GAME, FISH, AND PARKS DEPT.

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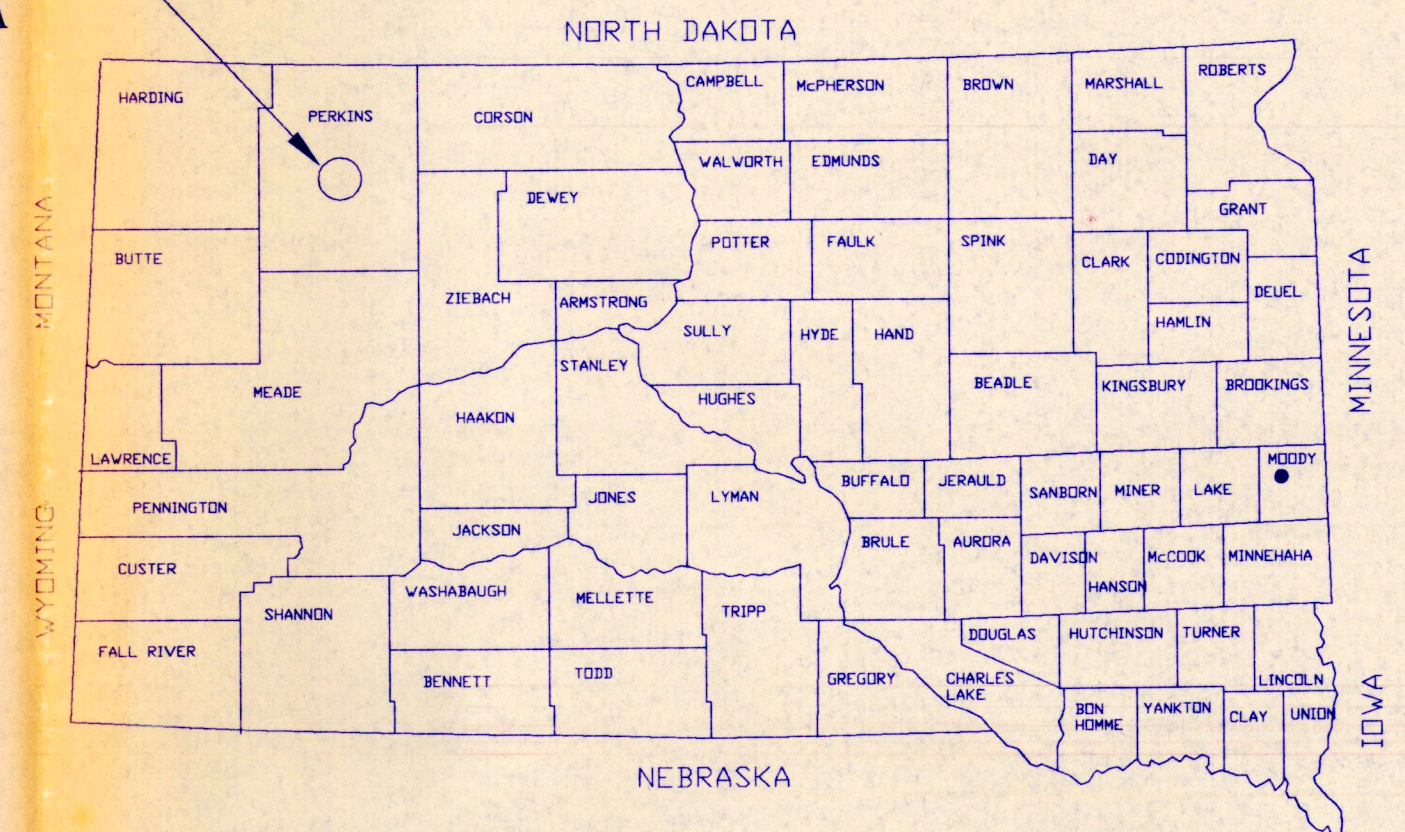
*INCLUDES 15% FOR SHRINKAGE
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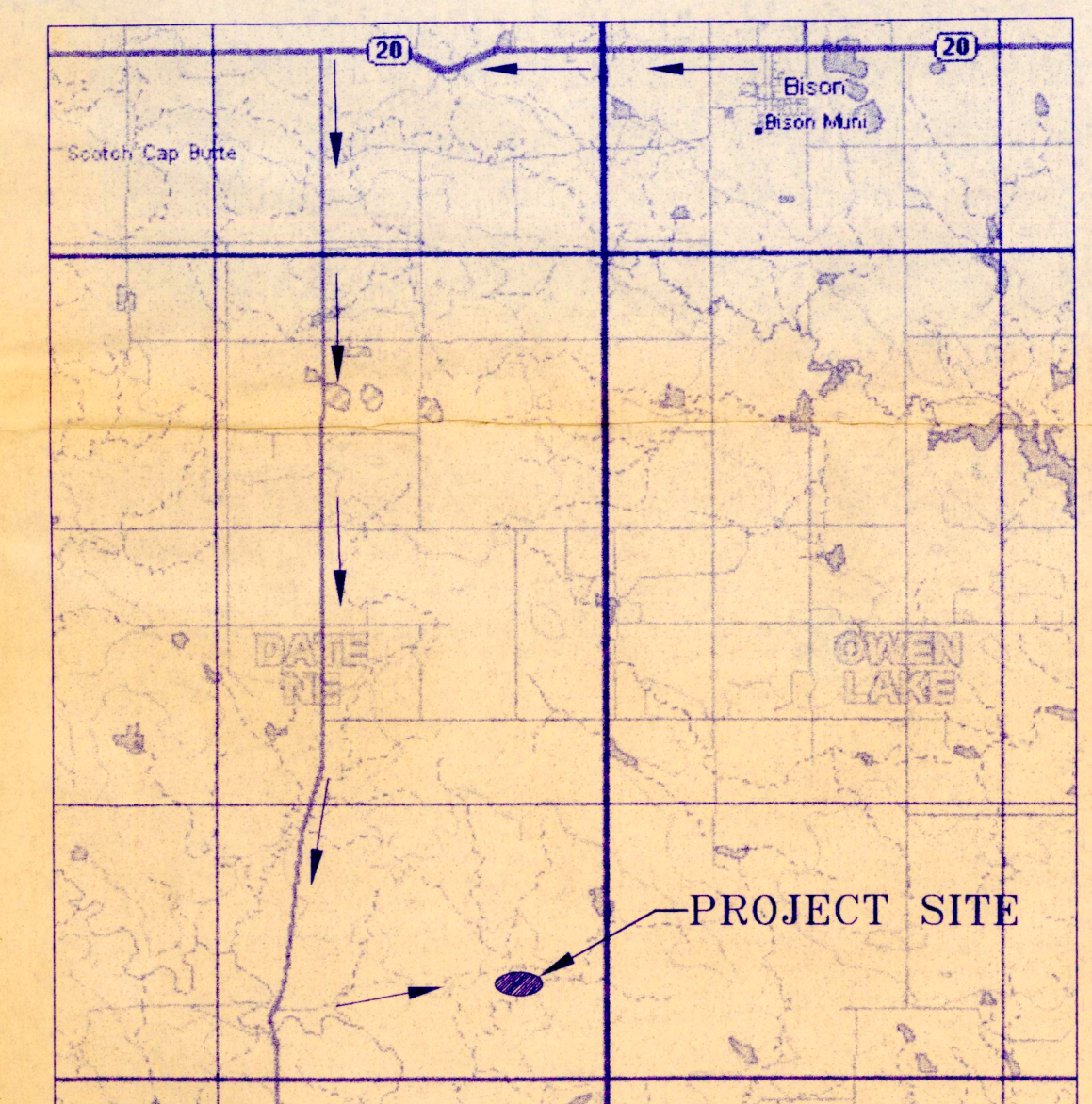
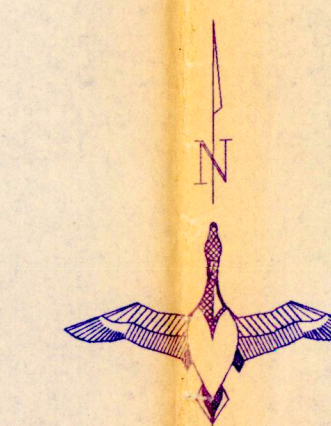


PROJECT LOCATION MAP
NOT TO SCALE

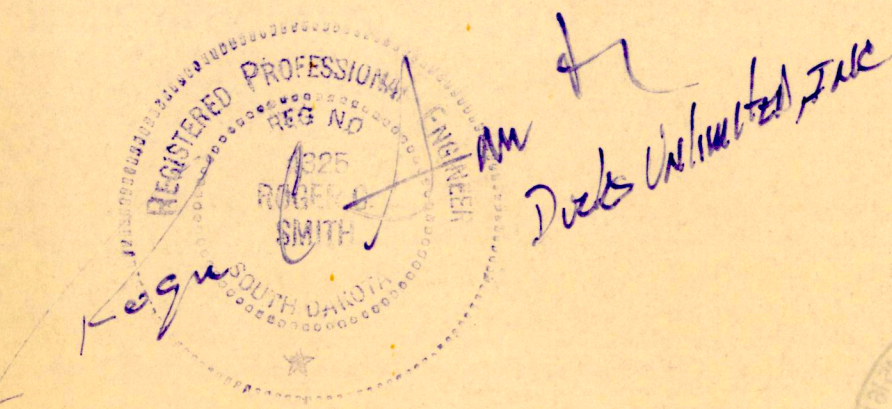
PROJECT AREA



SOUTH DAKOTA



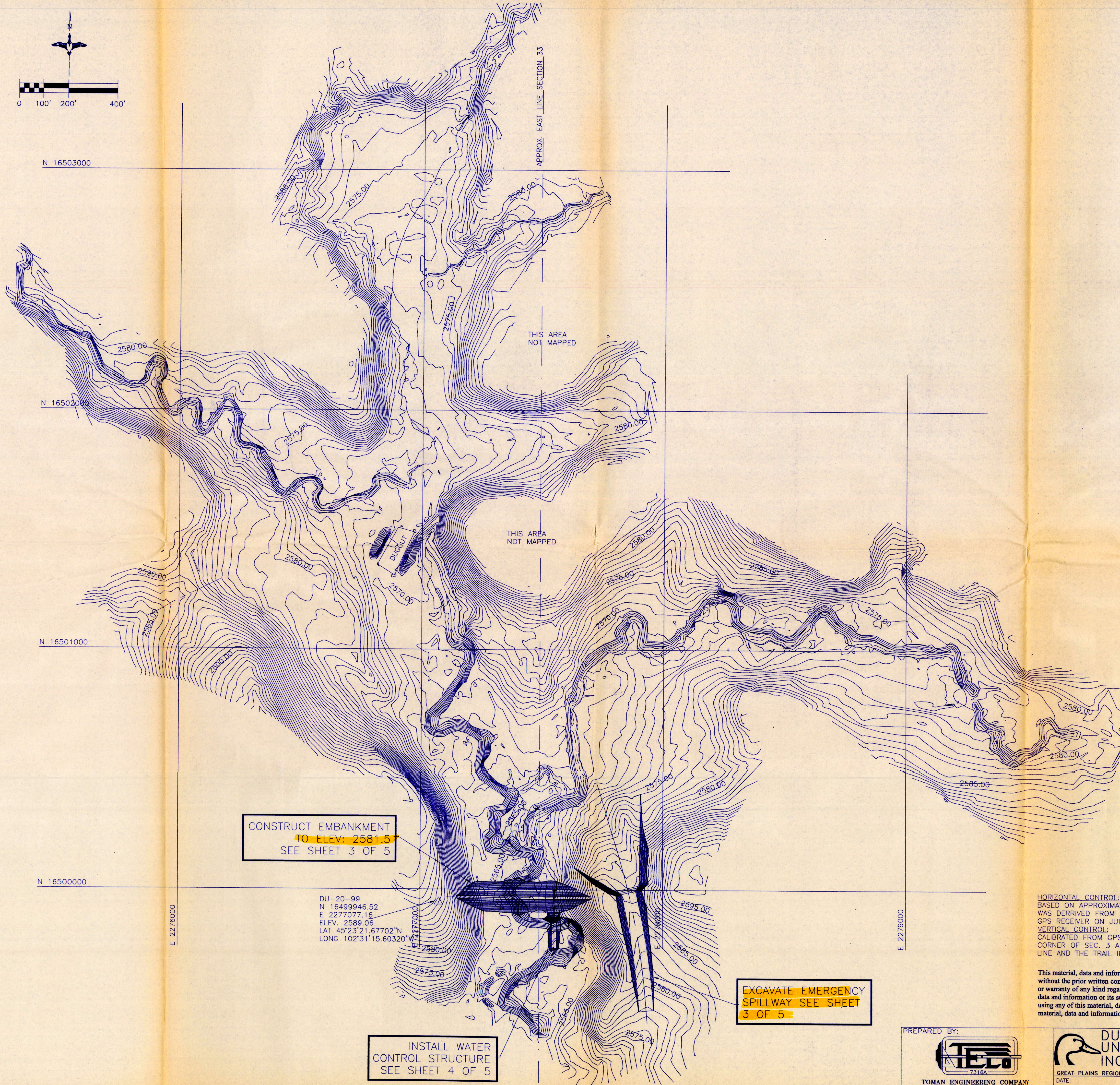
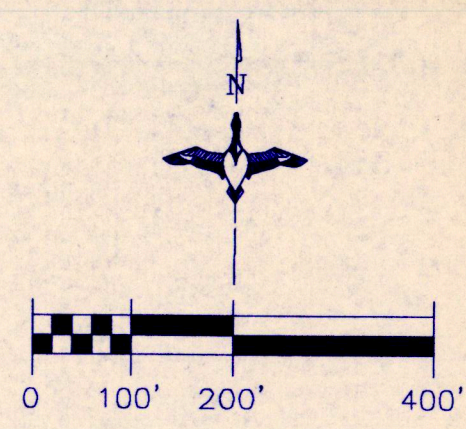
PROJECT LOCATION MAP
NOT TO SCALE



AGENCY CONTACT:
PAUL COUGHLIN
SD GF&P
605/854-9105

LANDOWNER:
WAYNE BESLER
605-244-5507

DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE	PROJECT NO. SD-0283-003	DESIGNED BY: RCS
	BESLER RANCH WETLANDS PEGGY CREEK LOCATION MAPS	DRAWN BY: TSP
DATE: 4-19-2001	SHEET NO. 1 OF 6	SURVEYED BY: GLJ
APPROVED BY: [Signature]		CHECKED BY: BRK
		APPROVED BY:



AREA/CAPACITY CHART

ELEVATION	ACRES	ACRE-FEET
2558	0.002	0.0
2559	0.01	0.0
2560	0.05	0.0
2561	0.14	0.1
2562	0.27	0.3
2563	0.60	0.8
2564	1.10	1.6
2565	2.00	3.2
2566	3.73	6.0
2567	5.80	10.8
2568	9.00	18.2
2569	13.35	29.4
2570	17.60	44.9
2571	23.25	65.3
2572	29.20	91.5
2573	34.80	123.5
2574	42.70	162.3
2575 (FSL)	51.38	209.3
2576	59.64	264.8
2577	68.80	329.0
2578	76.72	401.8
2579	84.92	482.6
2580	92.85	571.5
2581	105.00	670.4

△
DU-19-99
N 16500131.41
E 2274453.99
ELEV. 2620.96
LAT 45°23'24.29758"N
LONG 102°31'52.25959"W

DU-20-99
N 16499946.52
E 2277077.16
ELEV. 2589.06
LAT 45°23'21.67702"N
LONG 102°31'15.60320"W

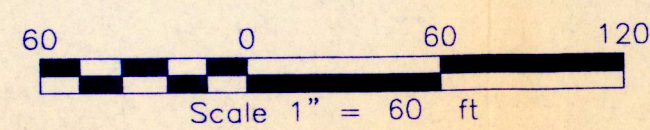
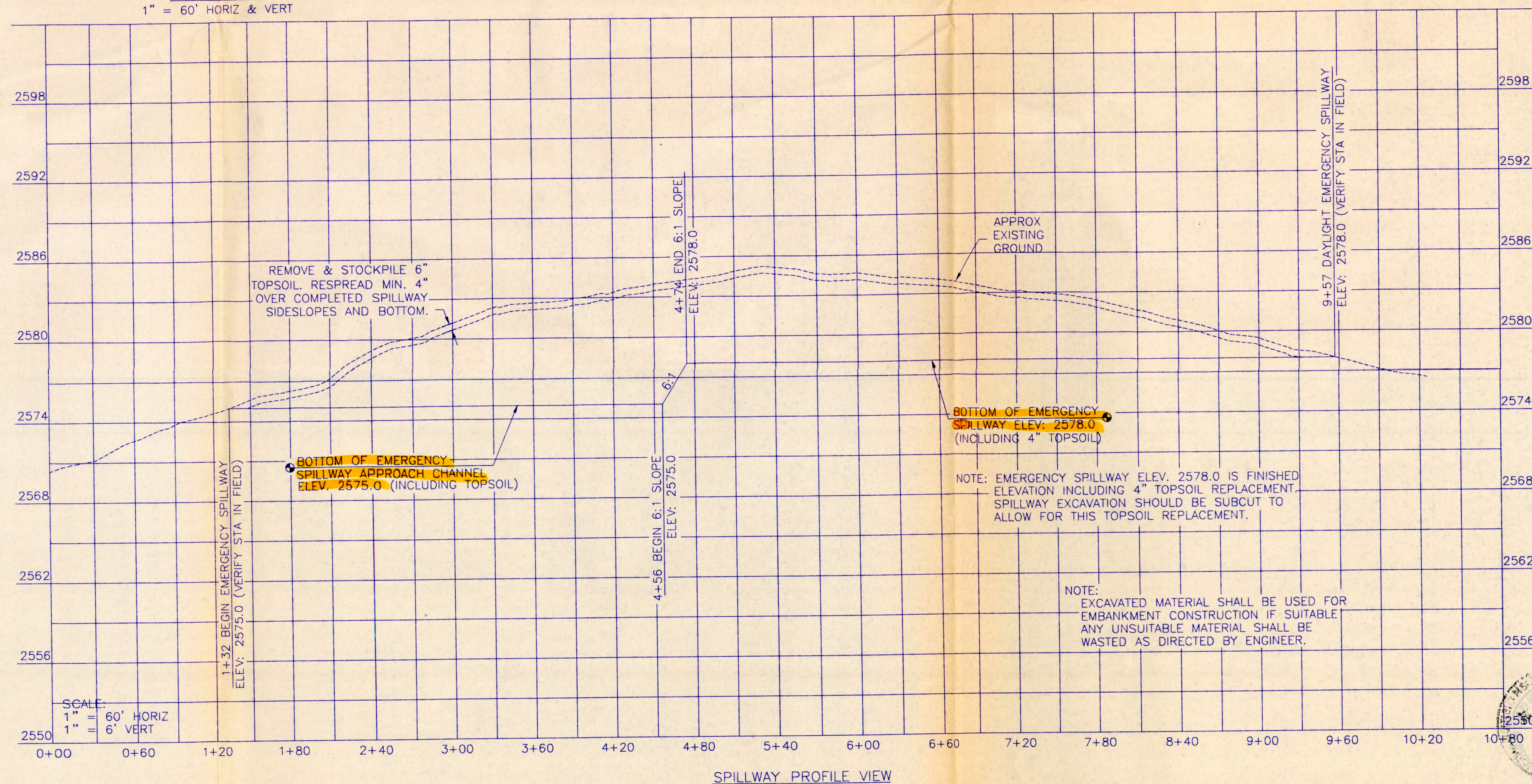
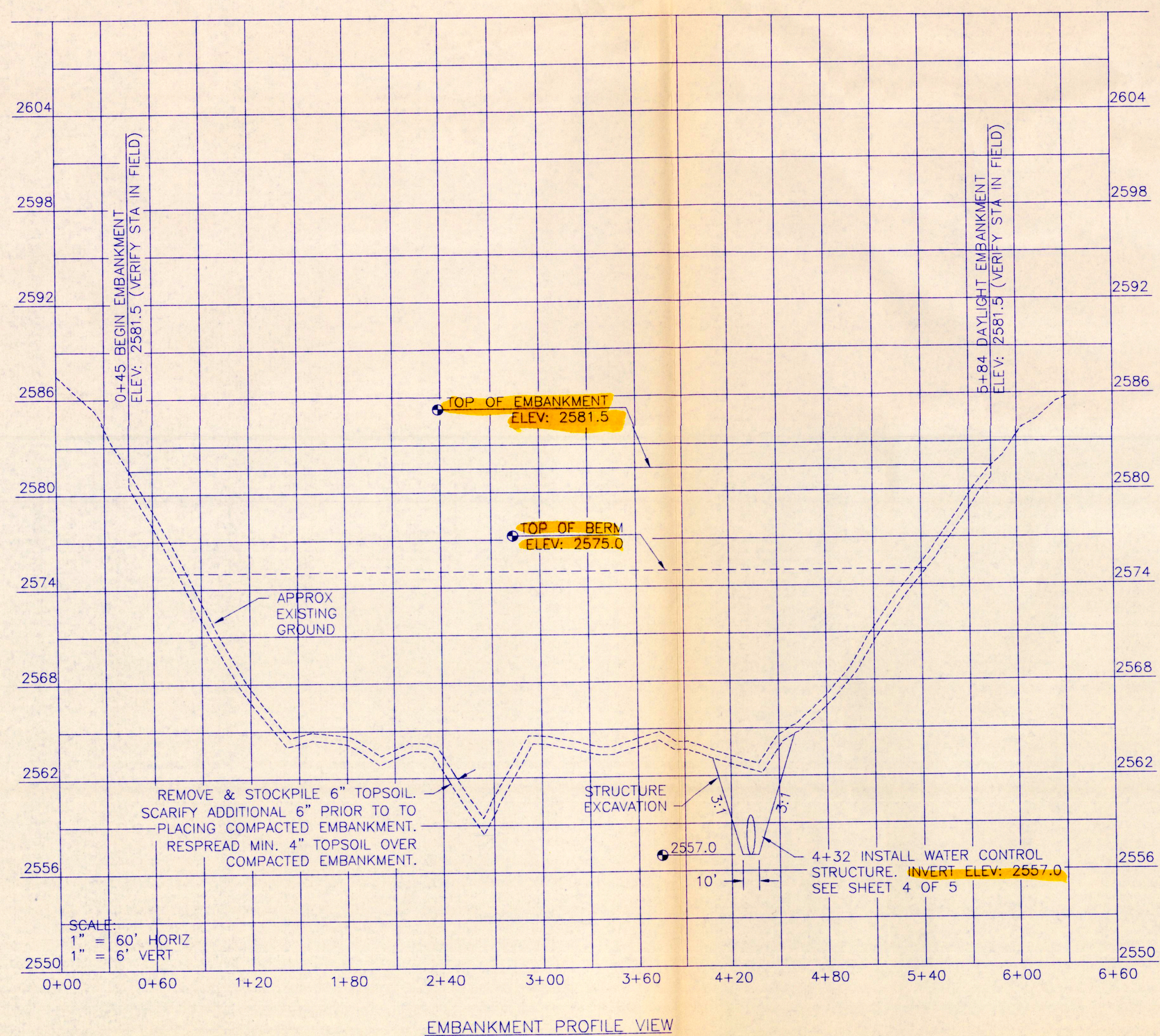
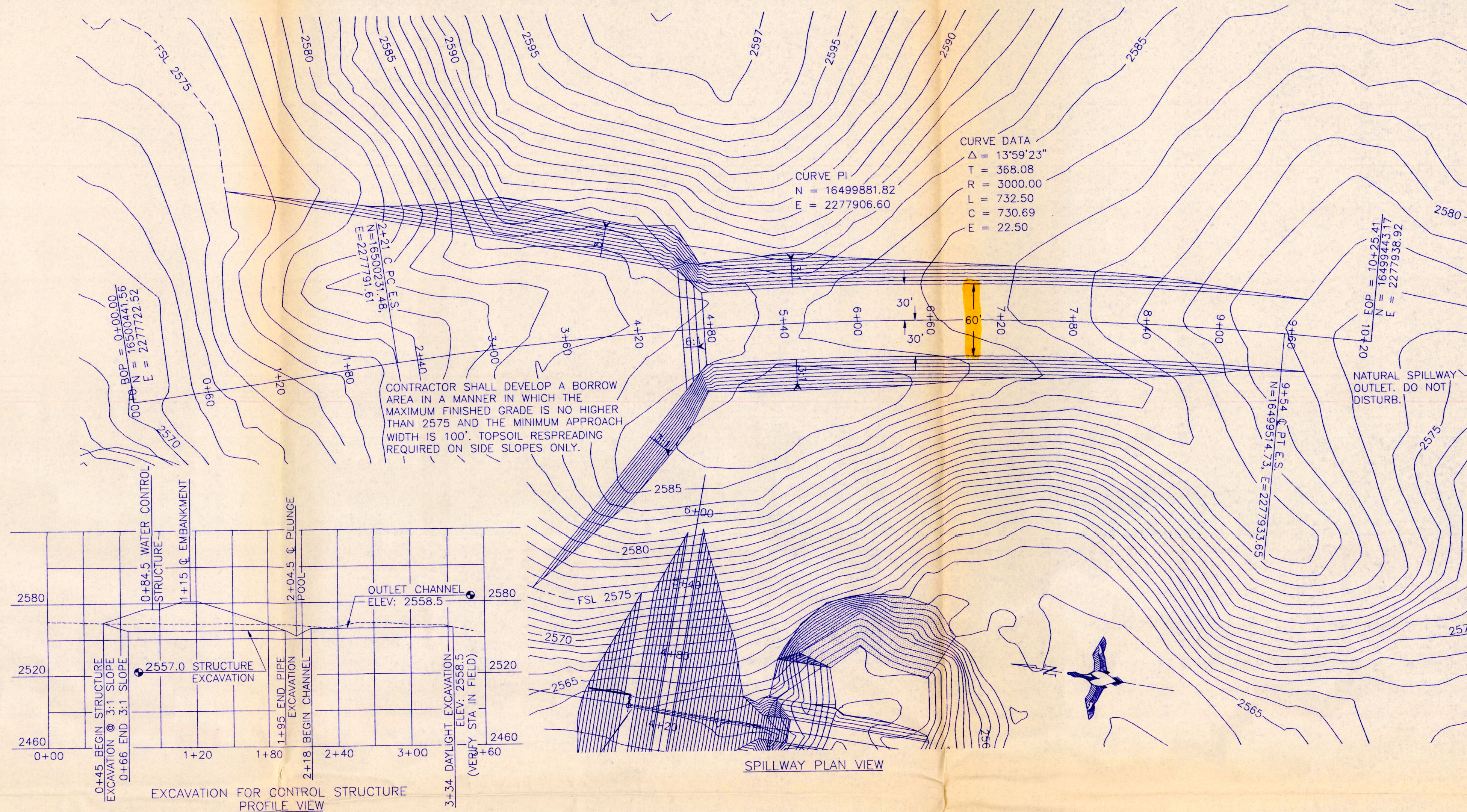
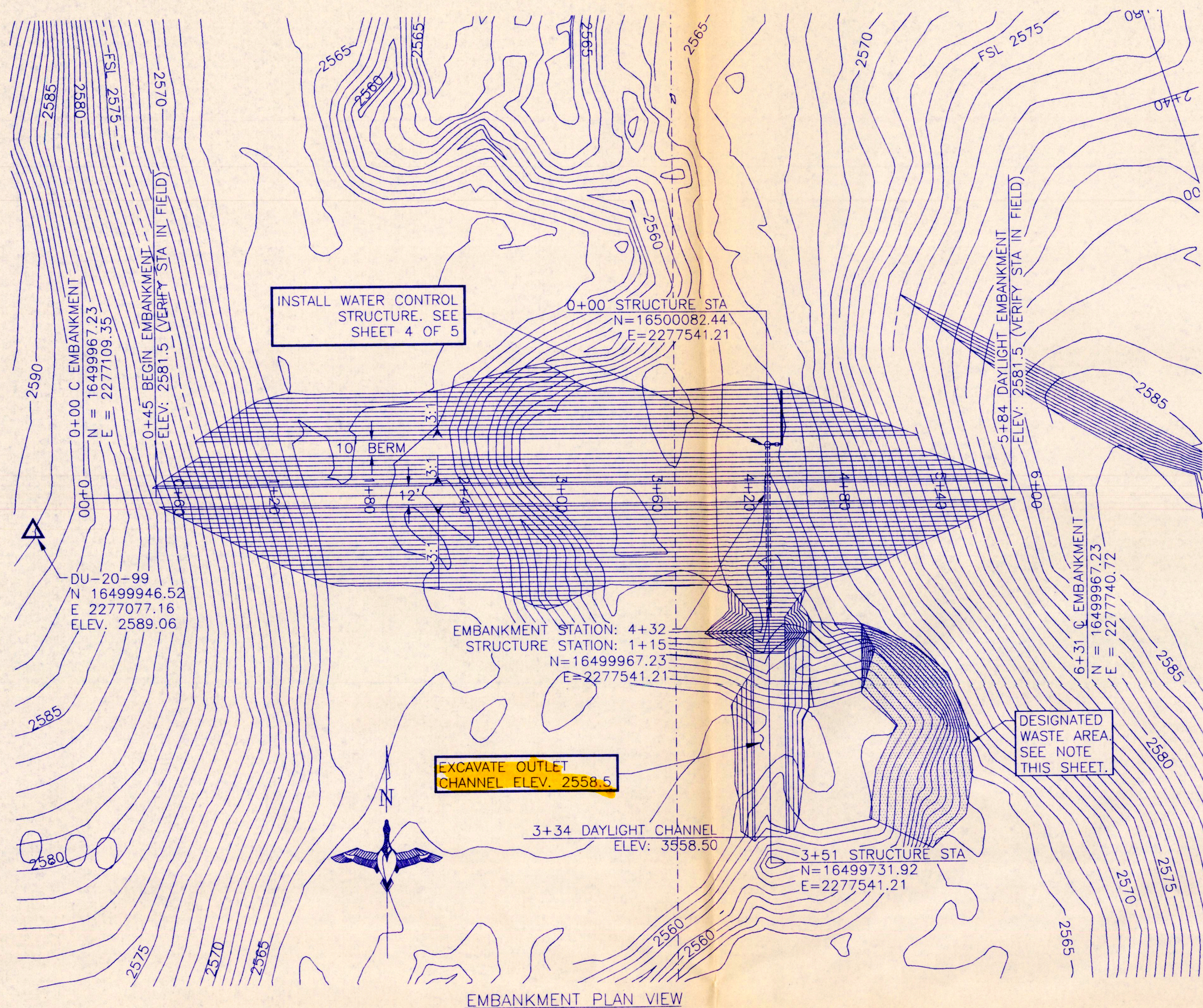
HORIZONTAL CONTROL:
BASED ON APPROXIMATE UTM COORDINATES FROM THE SOUTH DAKOTA NORTH ZONE 13. IT WAS DERIVED FROM AN AUTONOMOUS WGS84 ELLIPSOID POSITION FROM A TRIMBLE 4400 GPS RECEIVER ON JULY 20, 1999.
VERTICAL CONTROL:
CALIBRATED FROM GPS INFORMATION TO THE USGS TOPO MAP SPOT ELEVATIONS AT THE NW CORNER OF SEC. 3 AS 783.5 METERS AND THE SPOT ELEVATION 796.0 METERS AT THE N-S LINE AND THE TRAIL INTERSECT IN SEC. 33. THIS IS APPROXIMATE NGVD 29.

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PREPARED BY:

TOMAN ENGINEERING COMPANY
CONSULTING CIVIL ENGINEERS
906 2ND ST. N.W. • MINNETONKA, NORTH DAKOTA 58554 • 701-853-6463

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE
DATE: 4-19-2001
SHEET NO. SHEET 2 OF 6
DESIGNED BY: R.C.S.
DRAWN BY: KB
SURVEYED BY: G.L.U.
PRELIMINARY TOPOGRAPHY
APPROVED BY: [Signature]
CHECKED BY: BRK



NOTE:
CONTRACTOR SHALL WASTE ALL UNSUITABLE MATERIAL FROM REQUIRED EXCAVATION AREAS. SHOULD A SHORTAGE OF WASTE MATERIAL BE AVAILABLE, THE CONTRACTOR SHALL FILL THE EXISTING CHANNEL WITH AVAILABLE MATERIAL IN A MANNER WHICH WILL CAUSE FLOW TO USE OUTLET CHANNEL RATHER THAN THE EXISTING CREEK BED.

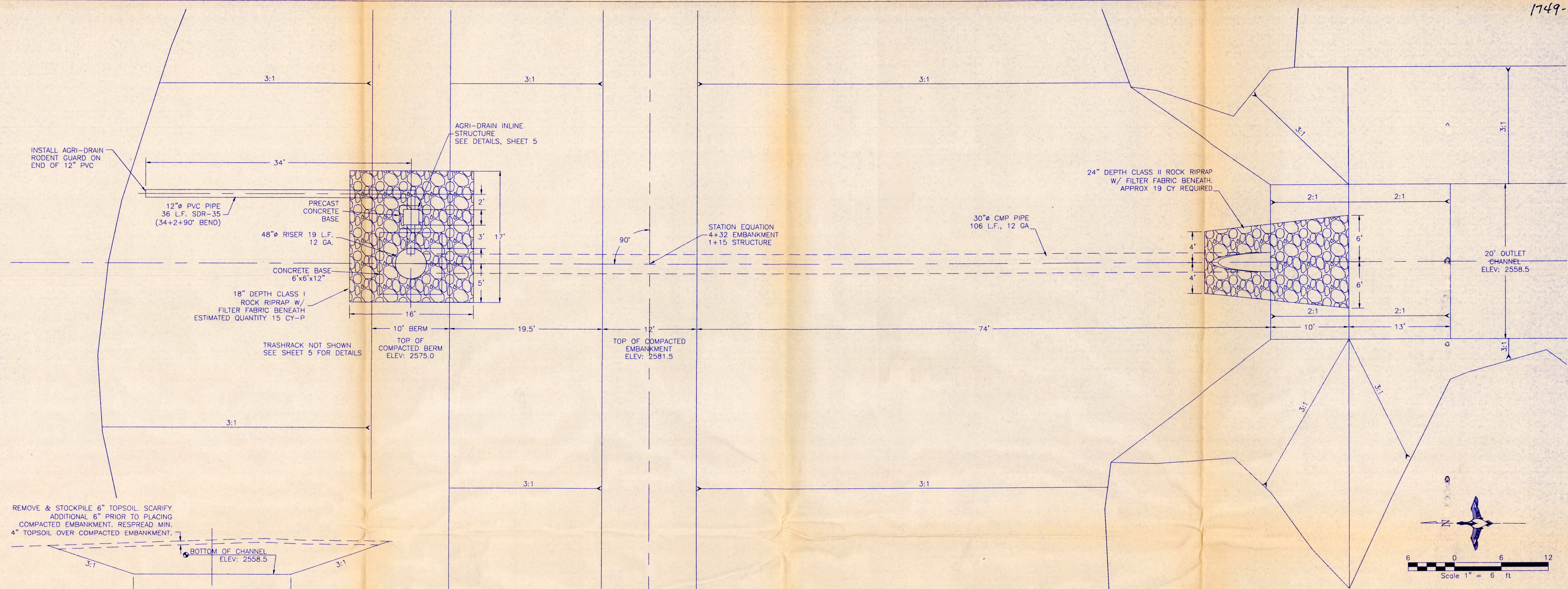
PREPARED BY:
TOMAN ENGINEERING COMPANY
CONSULTING CIVIL ENGINEERS
906 2ND ST. N.W. • MINNAPOLIS, MINN. 55412-1100 • 761-461-6483

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE
DATE: 03-23-01 SHEET NO. 3 OF 6

PROJECT NO. SD-0283-003
BESLER RANCH-PEGGY CREEK
EMBANKMENT & SPILLWAY
PLAN & PROFILE

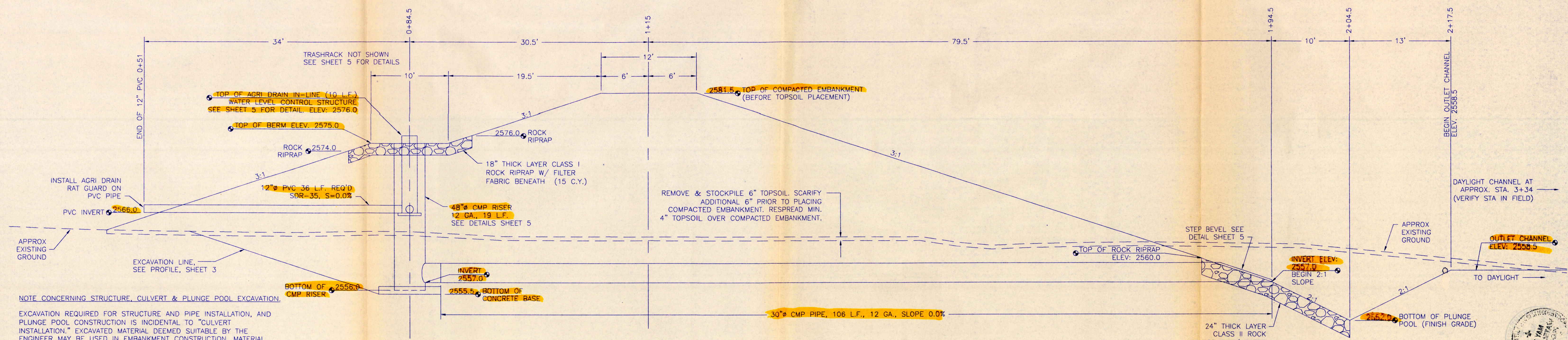
DESIGNED BY: RCS
DRAWN BY: AM TP
SURVEYED BY: GLJ
CHECKED BY: BRK

1749-1



OUTLET CHANNEL CROSS SECTION

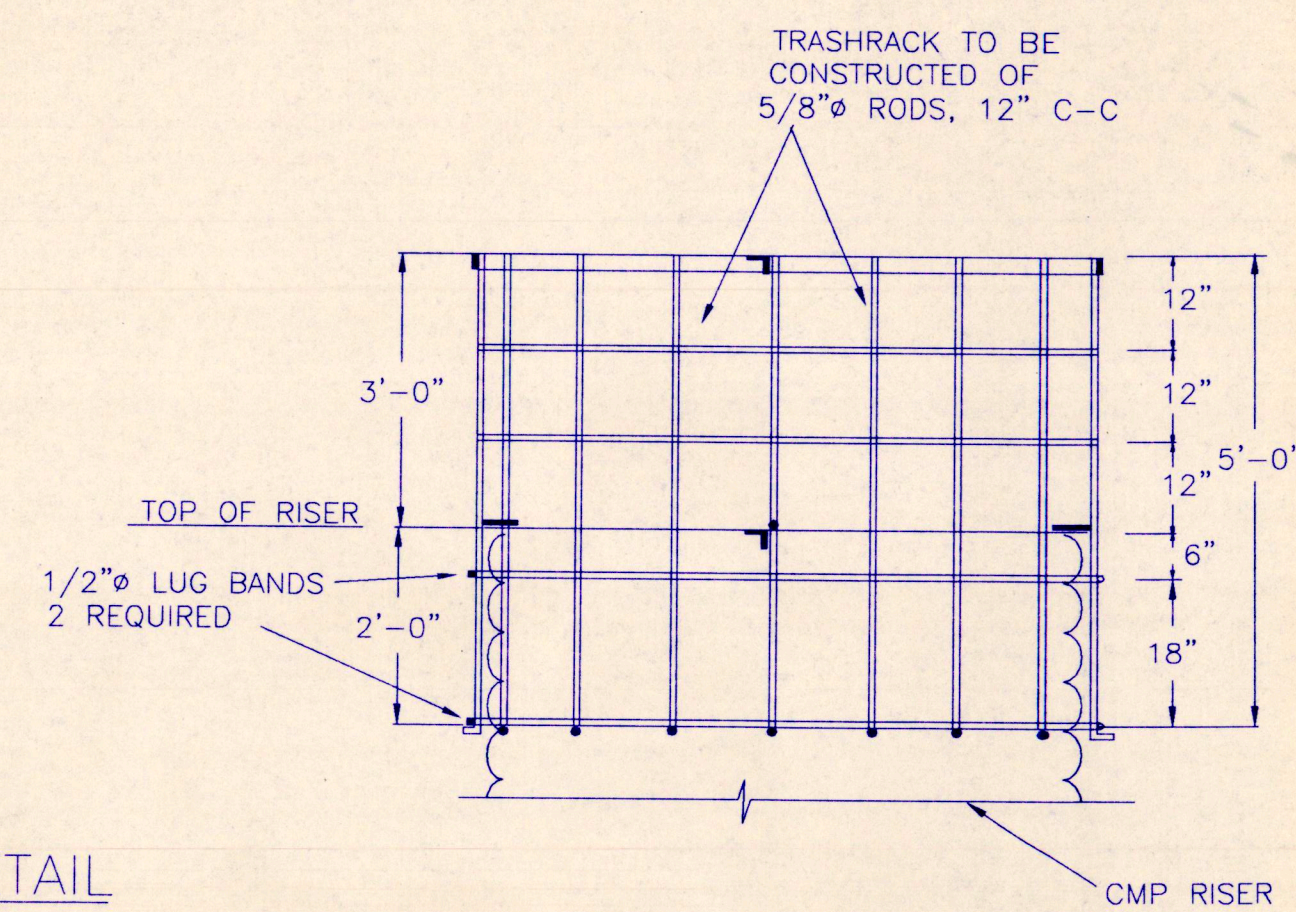
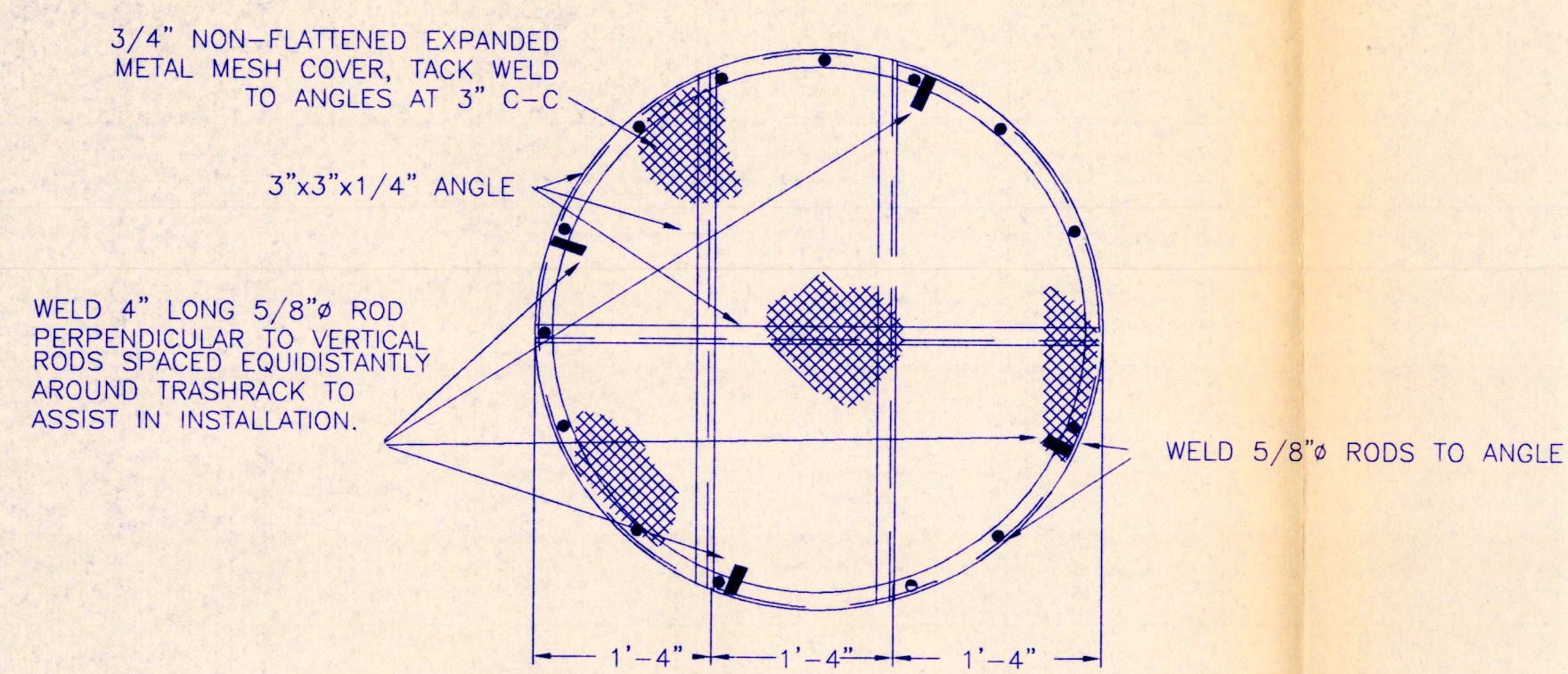
STRUCTURE PLAN VIEW
SCALE: 1" = 6'



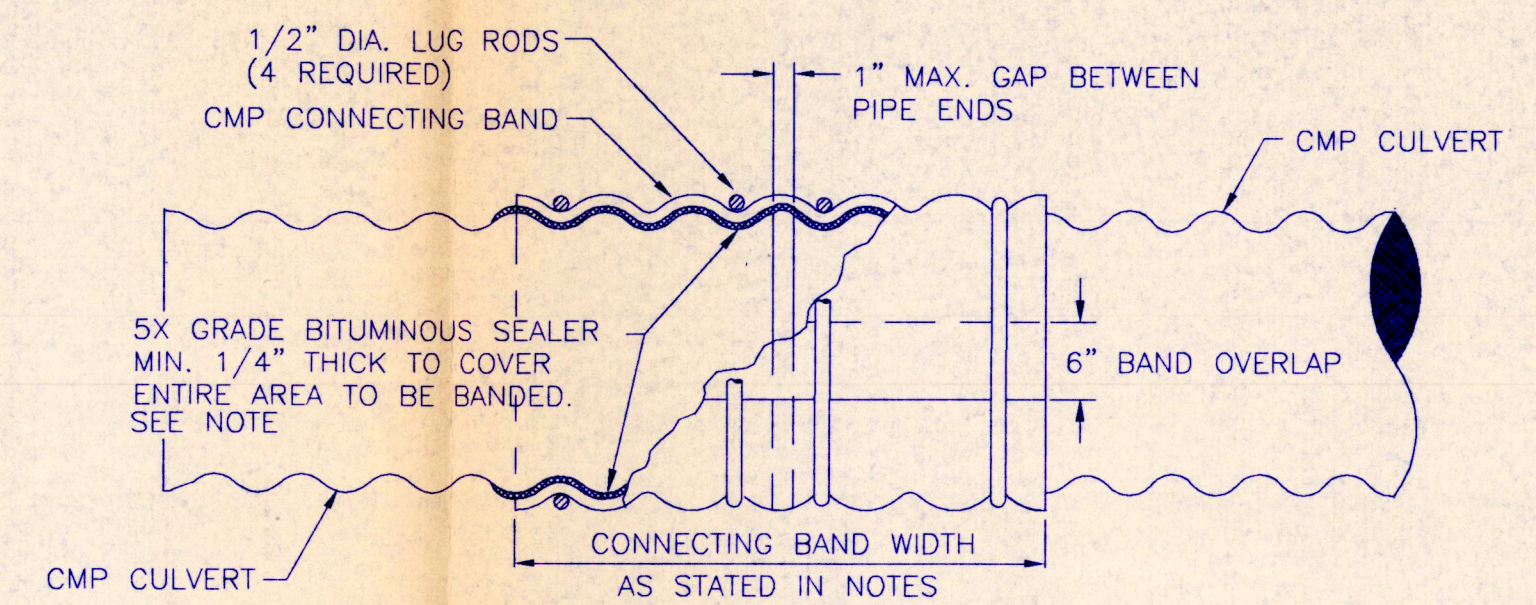
STRUCTURE PROFILE VIEW
SCALE: 1" = 6' HORIZ. & VERT.

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

PREPARED BY: TOMAN ENGINEERING COMPANY CONSULTING CIVIL ENGINEERS 908 2ND ST. N.W. • MINNAPOLIS, MINN. 55412-1001 • 763-565-5483	DESIGNED BY: R.C.S. DRAWN BY: AM SURVEYED BY: CHECKED BY: BRK	PROJECT NO. SD-283-003 BESLER RANCH PEGGY CREEK STRUCTURE PLAN & PROFILE	DATE: 4-19-2001 SHEET NO. 4 OF 6
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TRASHRACK DETAIL
NOT TO SCALE

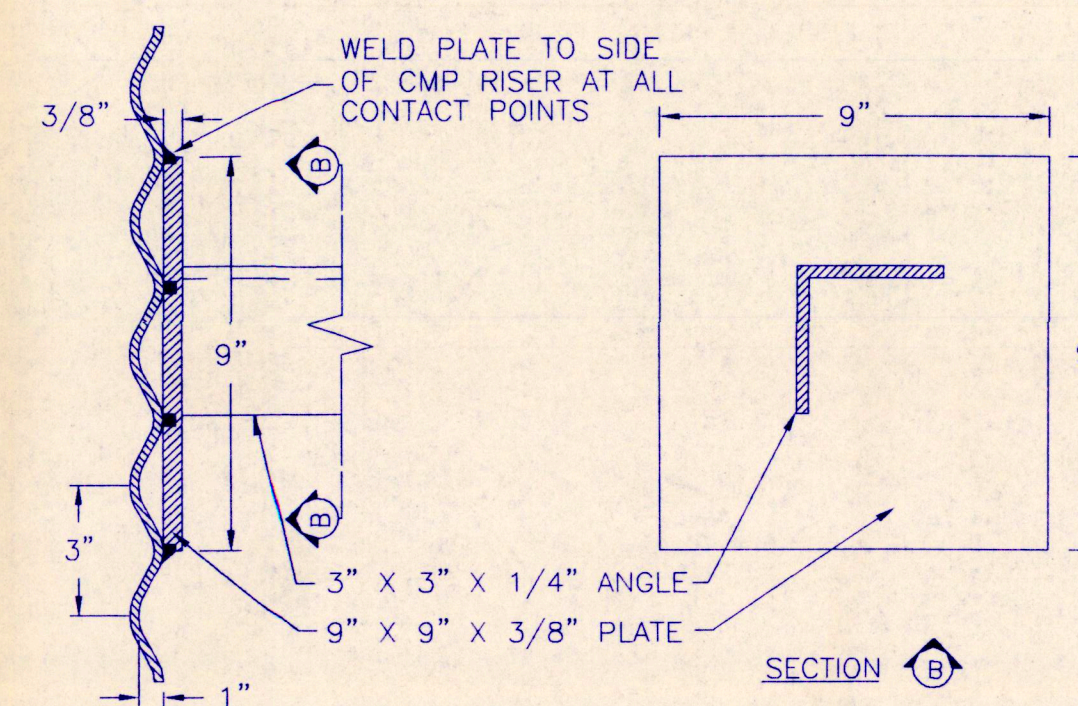


AFTER BANDS HAVE BEEN TIGHTENED, A COAT OF 5X SEALER SHALL BE APPLIED AROUND THE CULVERT AT THE ENDS OF THE CONNECTING BAND AND ALONG THE SEAM OF THE BAND OVERLAP.

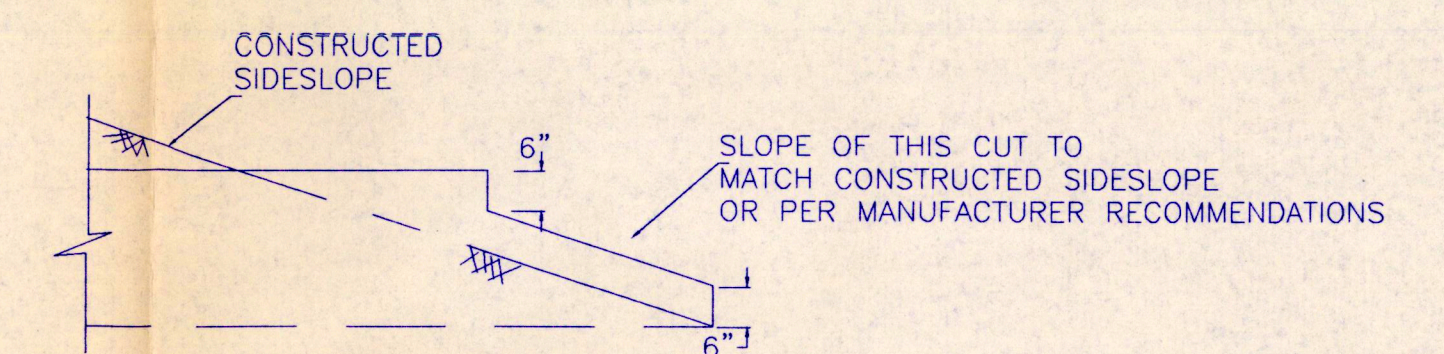
NOTE TO SUPPLIERS:
IF ANNULAR PIPE IS USED, USE A 2 FT. WIDE
ANNULAR BAND. IF HELICAL PIPE WITH 4
CORRUGATIONS REROLLED TO ANNULAR IS USED,
USE A 21 INCH WIDE ANNULAR BAND. SEE
SPECIFICATION 207.2.

CONNECTING BAND DETAIL

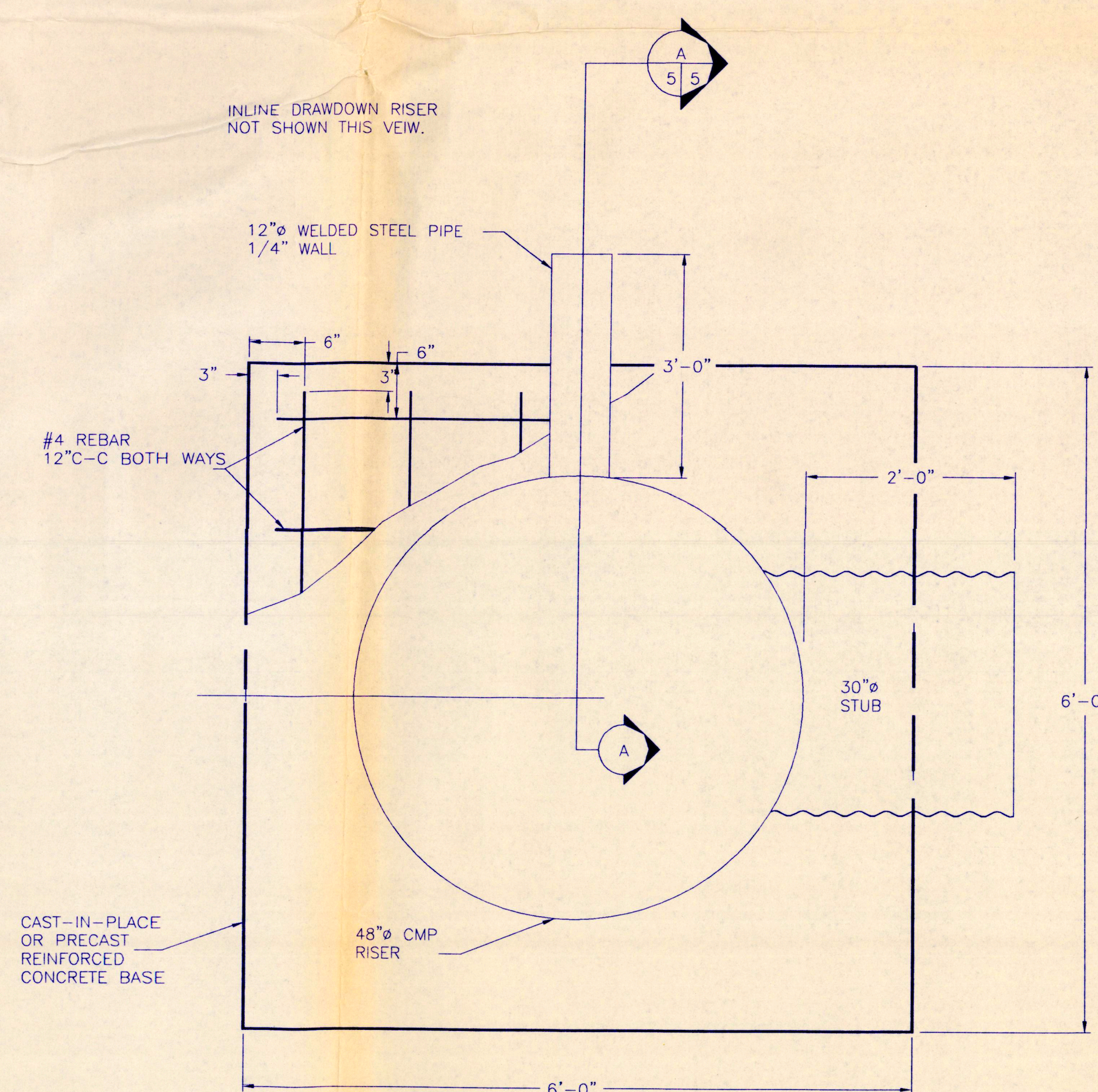
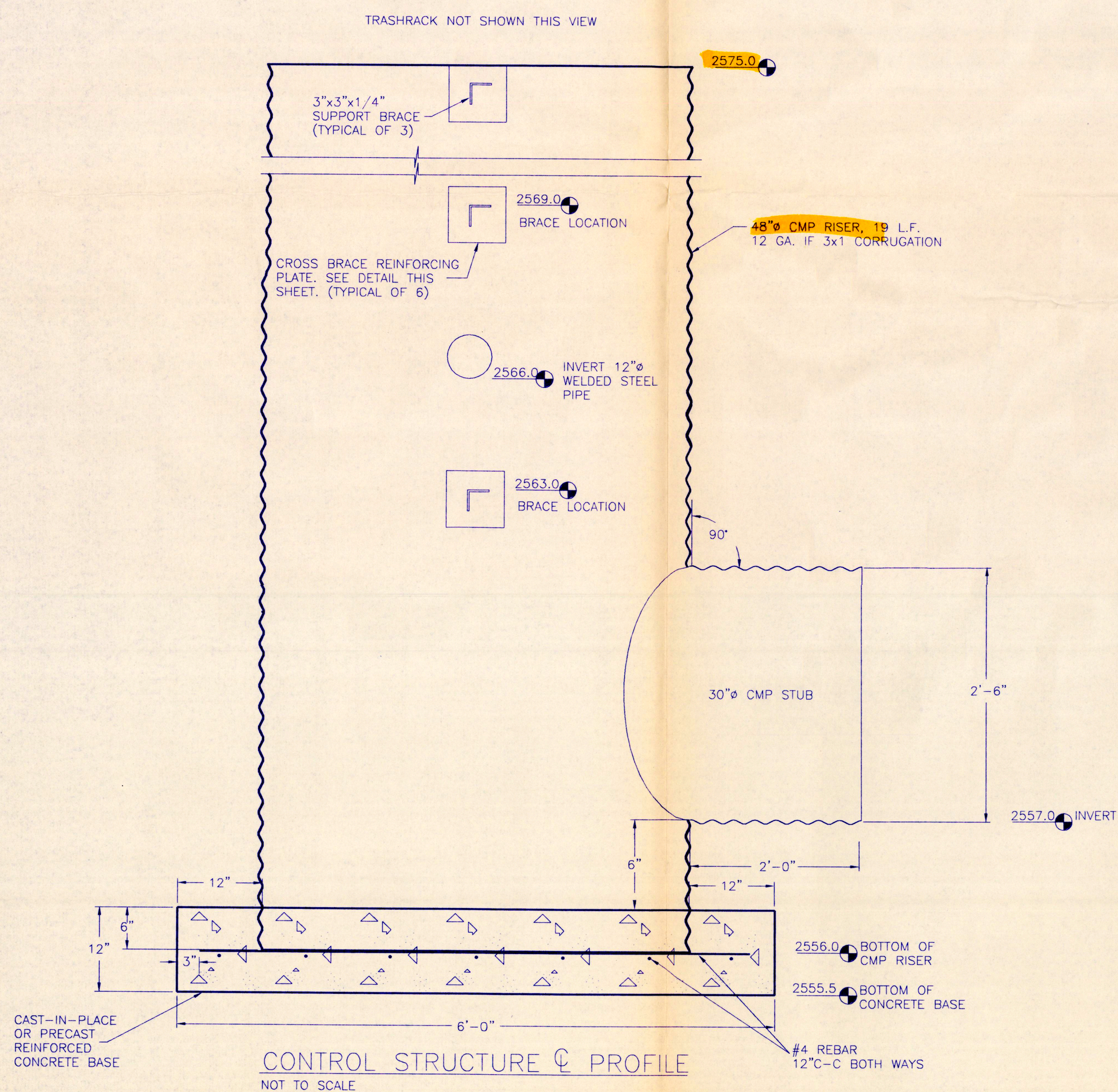
NOT TO SCALE



CROSS BRACE REINFORCING PLATE
NOT TO SCALE



STEP BEVEL DETAIL
NOT TO SCALE



CONTROL STRUCTURE PLAN

