

WATER PERMIT NO. 5830-3

Phone: 605 773-3658

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

Post Office Address: 523 E Capitol, Pierre SD 57501

Amount of Water Claimed: 1604 AF Total Acres:

Source of Water Supply: runoff from Stray Horse Creek Drainage

Water to be used for: Fish and wildlife, recreational County: Hamlin

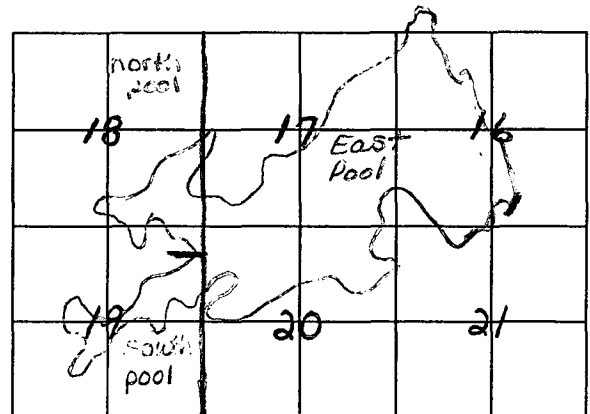
Location: 3 miles west, 1 mile north of Estelline

PRIORITY Date Received: 6-20-94 Fee: NA

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

Remarks: 3 pools - East Pool 1307 AF storage capacity, North Pool 154 AF storage capacity
South Pool 143 AF storage capacity

Water Impounded: East Pool - W 1/2, W 1/2 SE 1/4
Sec 16, SW 1/4 SW 1/4 Sec 9, NE 1/4 NW 1/4 Sec
21; E 1/2, SW 1/4 Sec 17, N 1/2 Sec 20; North
pool - SE 1/4, SE 1/4 SW 1/4 Sec 18, NW 1/4 SW
1/4 Sec 17, N 1/2 NE 1/4 Sec 19; south pool - NE
1/4, N 1/2 SE 1/4, SE 1/4 NW 1/4, NE 1/4 SW 1/4
Sec 19; all in T113N-R51W



Well Log: Driller: Licensed: YES NO

Depth of Well: REMARKS:

Type of Map: topo Prepared By: Tim Olson Reviewed and the Number

Assigned on: 6-20-94 By: Karen Schlaak

No. 5830-3 Hydrologic Unit 10170202
 Map No. _____ Basin Big Sioux River
 Newspaper Estelline Journal, Box 159, Estelline

523 E. Capitol
 Pierre, SD 57501
 (605) 773-3352

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

Check use of water: Industrial ☐ Commercial ☐ Municipal ☐ Other Common Distribution System ☐
 Rural Water System ☐ Suburban Housing ☐ Geothermal Heat ☐ Institutional ☐ Recreational ☒
 Domestic ☐ (above 18gpm) Other ☒ Flood Control

Type of Application: Check one or more of the following

New ☒ Vested Right ☐ Future Use ☐ Change Use ☐

☐ Amend Permit No. _____ with old priority date retained

Change diversion point(s) ☐ Add diversion point(s) ☐ Other ☐ _____

☐ Application to: Change diversion point(s) ☐ Add diversion point(s) ☐ on Permit No. _____

☐ Construction to use water reserved by Future Use Permit No. _____

1. Name of Applicant GAME FISH & PARKS Phone No. 773-3658
 Post Office Address 523 E. Capitol Pierre State SD Zip Code 57501
(Street, RR or Box) (City)

2. Amount of water claimed (c.f.s) 1000 ACRE FEET

3. Source of water supply Runoff from State House Creek Drainage

4. Location of point of diversion See map provided East Pool: 747 AC W¹/₂, W¹/₂ SE¹/₄ Sec 16, SW¹/₄ Sec 9, N¹/₂ NW¹/₄ Sec 21, E¹/₂, SW¹/₄ Sec 17, N¹/₂ Sec 20;
North Pool - 91 AC SE¹/₄, SE¹/₄ SW¹/₄ Sec 18, NW¹/₄ SW¹/₄ Sec 17, N¹/₂ NE¹/₄ Sec 19;
South Pool - 95 AC NE¹/₄, N¹/₂ SE¹/₄, SE¹/₄ NW¹/₄, NE¹/₄ SW¹/₄ Sec 19; all in T113N-R51W County Hamlin

5. Counties where water will be used Hamlin

6. Annual period during which water is to be used January 1 - December 31
late winter through Fall

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

Restore 1000 acre wetland which currently is being drained by a large drainage ditch.

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

STATE OF SOUTH DAKOTA
 County of Hughes ss

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

Signed Richard Beringsohn

Subscribed and sworn to before me this 20th day of June 19 94

My Commission expires on July 18, 2001.

Notary Public



Supplemental Information

(type or print in ink)

1. Well Information - Proposed construction

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

2. Dugout Information Estimates

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

3. Water Storage Dams

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

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

Ducks Unlimited 701-258-5599
3502 Franklin Avenue
Bismarck, ND 58501

- b) Freeboard See preliminary design

- c) Crest Width _____

Crest Length _____

- d) Height _____

- e) Primary Outlet Capacity _____

If Pipe, diameter _____

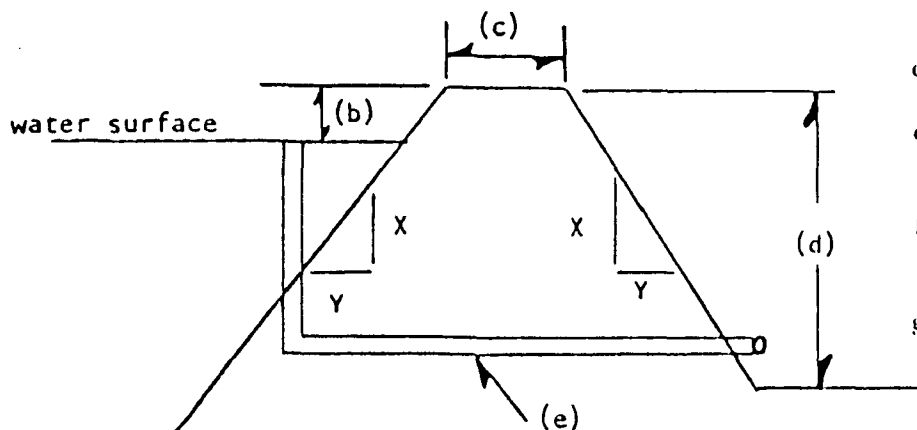
- f) Secondary Spillway Capacity _____

Spillway width _____

- g) X & Y Slope

Upstream _____

Downstream _____



Surface Area of Impoundment 933 acres

Storage 1700 acre feet

Drainage area above dam 5400 acres

Signature of Applicant

**SOUTH DAKOTA
WATER PERMIT NO. 5830-3**

Date of first receipt of application June 20, 1994.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 5830-3 to South Dakota Department of Game, Fish and Parks, 523 E Capitol, Pierre SD 57501 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 5830-3 authorizes impoundment of 1604 acre-feet of runoff by constructing three storage pools located in the Mickelson Memorial Marsh. The east pool will impound 1307 acre-feet of water located in the W 1/2, W 1/2 SE 1/4 Section 16; SW 1/4 SW 1/4 Section 9; N 1/2 NW 1/4 Section 21; E 1/2, SW 1/4 Section 17 and the N 1/2 Section 20; all in T113N-R51W. The north pool will impound 154 acre-feet of water located in the SE 1/4, SE 1/4 SW 1/4 Section 18; NW 1/4 SW 1/4 Section 17; N 1/2 NE 1/4 Section 19; all in T113N-R51W. The south pool will impound 143 acre-feet of water located in the NE 1/4, N 1/2 SE 1/4, SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 19; all in T113N-R51W. This permit authorizes impoundment of water sufficient to maintain the water level at the outlet elevation of 1647.5 feet mean sea level (FMSL) for the east pool and 1648.0 fmsl for the north and south pool.
2. The water appropriated shall be used for the purpose of supplying water for recreational, fish and wildlife production purposes and for flood control 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. 5830-3 is October 31, 1994.
5. The date from which applicant may claim right is June 20, 1994.
6. One-fifth of the construction is to be completed on or before April 30, 1997.
7. All construction is to be completed on or before October 31, 1999.
8. Water is to be put to beneficial use on or before October 31, 2003.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATION

Water Permit No. 5830-3 authorizes three water control structures with a total storage of 1604 acre-feet of water and sufficient water annually to maintain the water level to the outlet elevations. The structures will impound 1307 acre-feet of water to 1647.5 msl, 154 acre-feet of water to 1648.0 msl and 143 acre-feet of water to 1648.0 msl.

WATER MANAGEMENT BOARD

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

DEC 28 1994
date



DEPARTMENT OF GAME, FISH AND PARKS

Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

MEMO TO: SD DENR Divisions of WATER RIGHTS and WATER QUALITY
SD Division of Emergency and Disaster Services
US Fish and Wildlife Service
US Army Corps of Engineers
US Environmental Protection Agency
Federal Emergency Management Agency

FROM: Don McCrea, Senior Habitat Biologist

Date: March 23, 1994

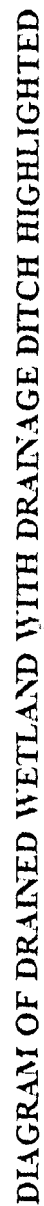
RE: Environmental Review-FEMA Hazard Mitigation Grant for Proposed
Mickelson Memorial Wetland Restoration Project

The State of South Dakota, Department of Game, Fish, & Parks, is completing a Hazard Mitigation Grant Application to assist financially with the purchase of approximately 1800 acres of flood-prone private property in Hamlin County adjacent to the Big Sioux River. Currently, the property is drained by a large drainage ditch, and we are hoping to purchase the land from willing-seller landowners and place 4 water control structures in the drainage ditch in an effort to restore a large wetland complex.

Prior to the drainage ditch being built, the wetland complex totaled over 1000 acres. The ditch has been so successful in draining the area, that only 57 acres remain. The completion of this project will help slow and store a large volume of water that otherwise would drain directly into the Big Sioux River. This project should provide a reduction in the frequency and duration of damaging flood waters in the project area.

Alternatives to this proposed project are: 1) relocate threatened structures 2) change codes or local ordinances 3) create small wetlands in the watershed and 4) do no project.

If your agency has any comments on the proposed project or any of the alternatives, please contact my office. A map of the project area is included for your review. Thank you for your consideration in this matter.



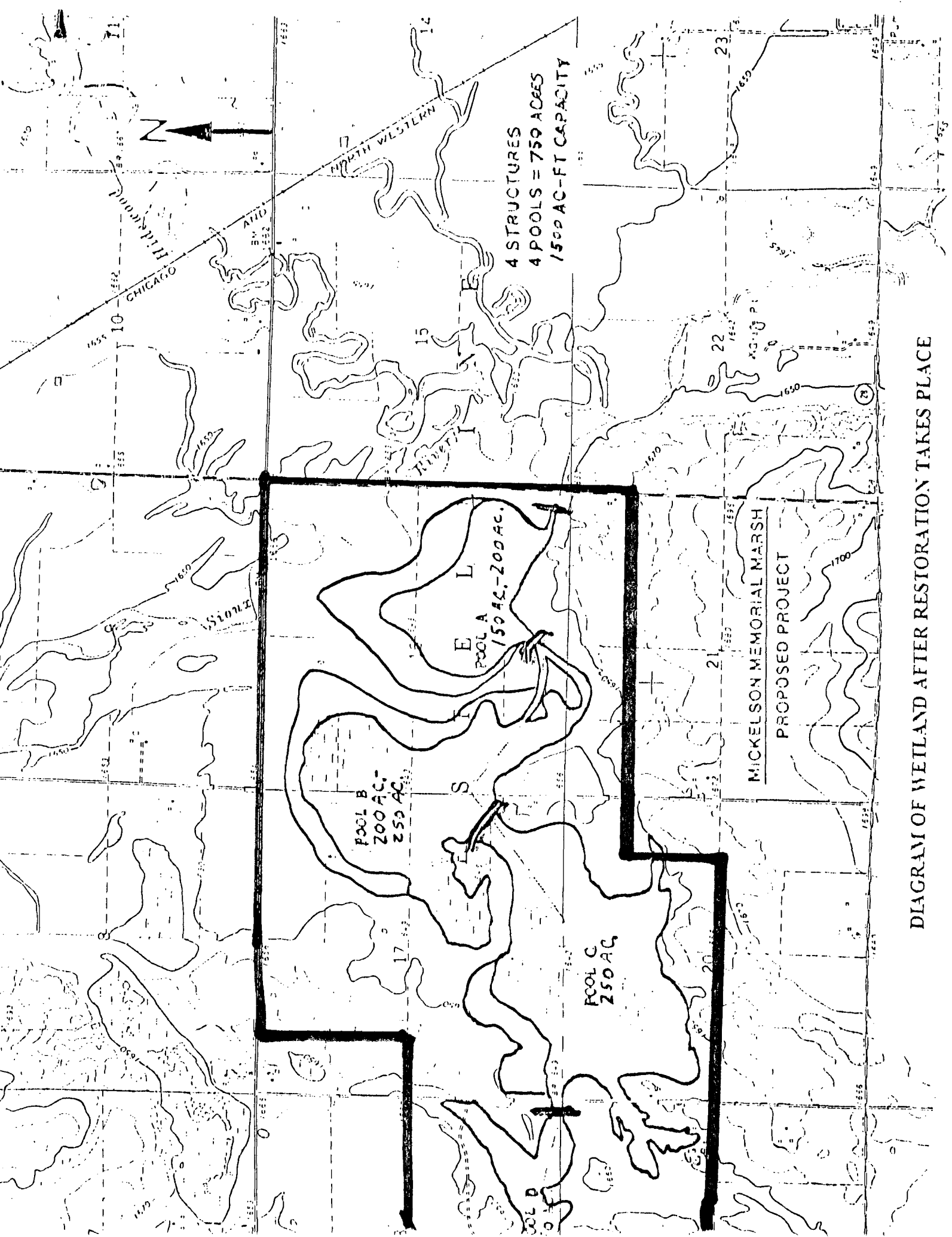
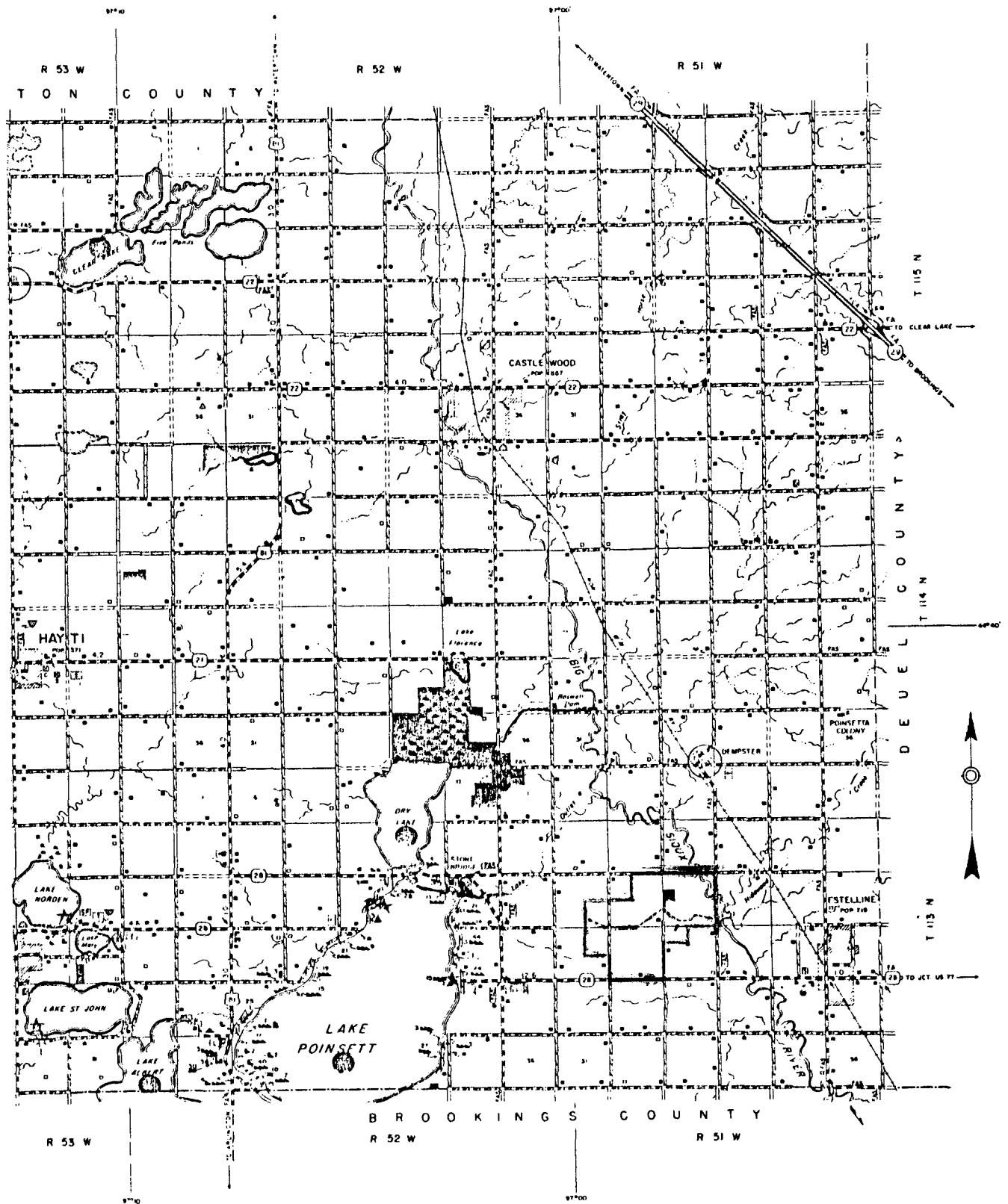


DIAGRAM OF WETLAND AFTER RESTORATION TAKES PLACE



PROJECT LOCATION IN HAMLIN COUNTY, SOUTH DAKOTA

Application No. 5830-3
S.D. Dept. of GF&P
Mickelson Memorial Marsh
Hamlin County

East Dam - Top of Dam Elev. 1650 > 4 ft.
Bottom Elev. 1646
FSL @ 1647.5 - 747 Ac.
- 1307 Ac.-Ft.
20 ft. sheetpile Weir @ 1647.5
300 ft. Earthcut Spillway @ 1648.5

North Dam - Top of Dam Elev. 1650.5 > 8 ft.
Bottom Elev. 1642.5
FSL @ 1648 - 91.3 Ac.
154 Ac.-Ft.
96" Dia. CMP Riser @ 1648 with
54" Dia. CMP Barrel

South Dam - Top of Dam Elev. 1650.5 > 8 ft.
Bottom Elev. 1642.5
FSL @ 1648 - 94.8 Ac.
143 Ac.-Ft.
96" Dia. CMP Riser @ 1648 with
54" Dia. CMP Barrel

According to the Safety of Dams Rules, Chapter 74:02:08, the North & South Dams would be classified as small size Cat. 3 dams with a 25 year frequency event as the Minimum Spillway Design. The East Dam would not be defined as a dam since it is less than 6 ft. high and would have no Minimum Spillway Design.

Ducks Unlimited considered the project as an Intermediate Size (1604 Ac.-Ft.) Cat. 3 Dam and designed all three dams to pass a 100 year frequency event.

Section 74:02:08:09

1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam X-sec. - OK
4. Area Capacity Curve - OK
5. Outlet Details - NA - OK
6. Spillway Rating - OK
7. Spillway Detail - OK
8. Specs. - standard - OK
9. EPP - NA - OK

SCS Annual Yield
Drainage Area = 5381 Ac.
8.41 mi²

Assume CN = 80
Isogram = 2 1/2

$$10\% = 3.0 \times 5381^{1/2} = 1345 \text{ Ac.-Ft.}$$

$$50\% = 0.8 \times 5381^{1/2} = 360 \text{ Ac.-Ft.}$$

$$80\% = 0.35 \times 5381^{1/2} = 160 \text{ Ac.-Ft.}$$



DUCKS UNLIMITED, INC.
GREAT PLAINS REGIONAL OFFICE

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

April 7, 1995



Tim Schaal
SD Dept. of Water & Natural Resources
Division of Water Rights
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501

RE: Mickelson Memorial Marsh
SD-0156-001

Dear Tim:

Enclosed is a revised final set of plans for the above-referenced project. Your office has already reviewed and approved this project, however, since we added some additional soils information and completed some miscellaneous, but minor corrections, I thought you may want to replace the original set I sent you with this one. Please note that **none** of the structure sizes or elevations changed, nor did any embankment heights or project features. Therefore, none of the items for which I believe you based your review have changed, merely corrections in details to assist the contractor and additional soil testing results.

If you have any questions or need any additional information, please give me a call.

Sincerely,

Doug Lipetzky, P.E.
Regional Engineer

"ESTIMATED CF IMPACT AREA (FOOTPRINT) FOR COE PERMIT

I. MAIN MARSH (EAST POOL) EMBANKMENT: 12' TOP WIDTH + 3:1 SS, NO BERMS

STATION	TOP OF EMBANKMENT ELEVATION	NAT. GROUND ELEVATION	TOTAL EMB. WIDTH (ft)	AVERAGE WIDTH (ft)	DISTANCE (ft)	AREA (SQ. FT.)	CUMULATIVE AREA (ACRES)
0 + 23	1650 [±]	1650 [±]	12.0				0
0 + 50	50 [±]	48 [±]	22.8	17.4	27	469.8	
2 + 00	50 [±]	48 [±]	19.8	21.3	150	3195.0	
4 + 00	50 [±]	49 [±]	15.6	17.7	200	3540.0	
7 + 20	50 [±]	49 [±]	18.0	16.8	320	5376.0	
8 + 85	50 [±]	50 [±]	12.0	15.0	165	2475.0	
						15055.8	= 0.35 ACRES
21 + 85	50 [±]	50 [±]	12.0	24.0	65	1560.0	0
22 + 50	50 [±]	46 [±]	36.0	33.0	120	3960.0	
23 + 70	50 [±]	47 [±]	30.0	28.5	230	6555.0	
26 + 00	50 [±]	47 [±]	27.0	28.5	340	9690.0	
29 + 40	50 [±]	47 [±]	30.0	33.0	140	4620.0	
30 + 80	50 [±]	46 [±]	36.0	33.0	80	2640.0	
31 + 60	50 [±]	47 [±]	30.0	31.2	340	10608.0	
35 + 00	50 [±]	46 [±]	32.4	34.2	200	6840.0	
37 + 00	50 [±]	46 [±]	36.0	34.5	250	8625.0	
39 + 50	50 [±]	46 [±]	33.0	34.5	190	6555.0	
41 + 40	50 [±]	46 [±]	36.0	37.8	200	7560.0	
43 + 40	50 [±]	45 [±]	39.6	40.8	250	10200.0	
45 + 90	50 [±]	45 [±]	42.0	39.0	49	1911.0	
46 + 39	50 [±]	46 [±]	36.0	18.0	15	270.0	
46 + 54	42 [±]	42 [±]	0.0	0.0	12	0.0	
46 + 66	42 [±]	42 [±]	0.0	20.4	15	306.0	
46 + 81	50 [±]	45 [±]	40.8	26.4	29	765.6	
47 + 10	50 [±]	50 [±]	12.0				

82,665.6 = 1.90 ACRES

TOTAL MAIN EMB. = 97,721.4 SQ. FT. = 2.25 ACRES

II. ISLANDS : FOUR 0.1 AC. NESTING ISLANDS

FOOTPRINT = 0.5 AC./ISLAND → TOTAL FOR ISLANDS = 2.0 ACRES



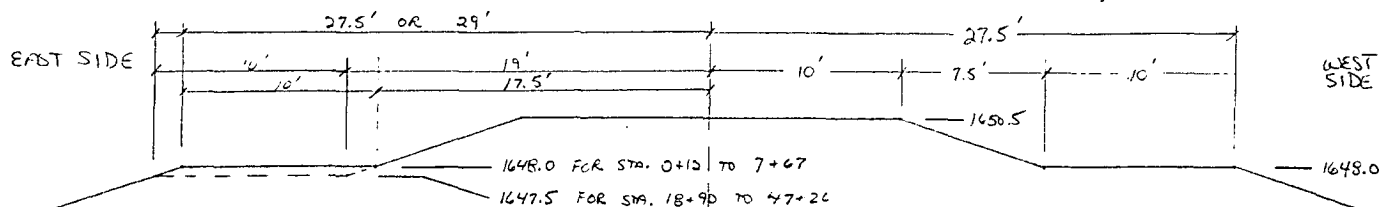
DESIGN NOTES

PROJECT: MICKELSON MEMORIAL MARSH
 SUBJECT: EST. OF FOOTPRINT AREA OF EMB. & ISLANDS
 FILE NO.: _____ DATE: 6-17-94
 BY: DJC CHECKED: _____ SHEET: 1 OF: 3

III.

ROAD EMBANKMENT

20' TOP w/ 3:1 SS & BERMS, TOP @ 1650.5



STATION	NAT. GROUND ELEV. @ TOE	NEW EMB. TOTAL WIDTH (FT)	EXISTING EMB. TOTAL WIDTH (FT)	DIFFERENCE (FT)	AVERAGE DIFFERENCE (FT)	DISTANCE (FT)	AREA (SQ. FT.)	CUMULATIVE AREA (ACRES)
0+12	1650.5	20.0	20	0				0
0+38	47.1	60.4	36	24.4	12.2	26	317.2	
2+34	45.6	69.4	36	33.4	28.9	196	5664.4	
3+54	45.0	73.0	39	34.0	33.7	120	4044.0	
4+94	45.3	71.2	36	35.2	34.6	140	4844.0	
6+82	45.7	68.8	35	33.8	34.5	188	6486.0	
7+67	50.5	20.0	20	0	16.9	85	1436.5	
							22,792.1 FT ² =	0.52 ACRES
18+90	1650.5	20.0	20	0				0
20+04	46.2	65.8	37	28.8	14.4	114	1641.6	
23+59	45.2	71.8	38	33.8	31.3	355	11,111.5	
26+14	45.1	72.4	43	29.4	31.65	255	8070.7	
26+60	45.0	73.0	39	34.0	31.7	46	1458.2	
27+44	44.5	76.0	32	44.0	38.5	84	3234.0	
32+19	44.3	77.2	42	35.2	39.6	475	18,810.0	
35+27	44.3	77.2	42	35.2	35.2	308	10,841.6	
38+94	45.6	69.4	37	32.4	33.8	367	12,404.6	
41+50	(48.0) (46.0)	61.0	33	28.0	30.2	256	7731.2	
45+00	(50.4) (48.5 E)	26.3	28	0	14.0	350	4900.0	
47+09	(48.4) (46.9 E)	45.6	32	13.6	6.8	209	1421.2	
47+26	50.5	20.0	20	0	6.8	17	115.6	
							81,740.2 FT ² =	1.88 ACRES

TOTAL ROAD EMBANKMENT = 104,532 FT² = 2.4 ACRES



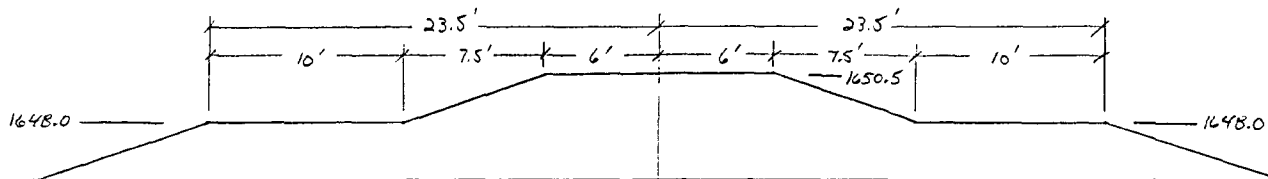
DUCKS
UNLIMITED
INC.

DESIGN NOTES

PROJECT: MICKEJON MEM MAREH
 SUBJECT: _____
 FILE NO.: _____ DATE: 6-17-24
 BY: DJL CHECKED: _____ SHEET: 2 OF: 3

IV.

WEST EMBANKMENT 12' TOP & 3:1 SS w/ 10' BERM ON EACH SIDE



STATION	TOP OF EMBANKMENT	NAT. GROUND ELEVATION	TOTAL EMB. WIDTH (FT)	AVERAGE WIDTH (FT)	DISTANCE (FT)	AREA (SQ. FT.)	Cumulative AREA (ACRES)
1+62	1650.5	1650.5	12.0				0
2+62	50.5	50.0	15.0	13.5	100	1350.0	
6+30	50.5	49.0	21.0	18.0	368	6624.0	
7+70	50.5	(RT 48.0)	37.0	29.0	140	4060.0	
8+00	50.5	(LT 47.8)(RT 48.0)	47.6	42.3	30	1269.0	
9+30	50.5	47.0	68.0	57.8	130	7514.0	
11+50	50.5	46.0	74.0	71.0	220	15620.0	
11+67	50.5	46.0	74.0	74.0	17	1258.0	

WEST EMBANKMENT = 37,695.0 FT² = 0.87 ACRES

TOTAL PROJECT :

(CONSERVATIVE ESTIMATE)

- COULD BE LESS THAN THIS -

MAIN EMBANKMENT : 2.25 AC.

FOUR ISLANDS : 2.00

WEST EMBANKMENT : 0.87

ROAD RECONSTRUCTION : 2.40

7.52 AC.



DUCKS
UNLIMITED
INC.

DESIGN NOTES

PROJECT: MICKELSON MEMORIAL MARSH

SUBJECT:

FILE NO.: DATE: 6-17-94

BY: DIL CHECKED: SHEET: 3 OF: 3



DUCKS UNLIMITED, INC.
GREAT PLAINS REGIONAL OFFICE

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



August 16, 1994

Tim Schaal
SD Dept. of Water & Natural Resources
Division of Water Rights
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501

RE: Mickelson Memorial Marsh

Dear Tim:

As promised, enclosed is a signed copy of the plans and Design Report for the Mickelson Memorial Marsh project in Hamlin County, South Dakota. If you have any questions or need any additional information, please give me a call.

Sincerely,

Doug Lipetzky, P.E.
Regional Engineer

DESIGN REPORT

for

MICKELSON MEMORIAL MARSH

Estelline, SD (SD-0156-001)

June 15, 1994



Prepared by:

Ducks Unlimited, Inc.
3502 Franklin Avenue
Bismarck, ND 58501



PROJECT: Mickelson Memorial Marsh
SD-0156-001

LOCATION: Sections 9, 16-21, T 113 N, R 51 W
3 miles west, 1 mile north of Estelline
Hamlin County, South Dakota

MARSH DATA:

East Pool	Full Service Level (FSL) @ 1647.5 747 Surface Acres @ FSL 1307 Acre-Feet Capacity @ FSL
North Pool	Full Service Level (FSL) @ 1648.0 91 Surface Acres @ FSL 154 Acre-Feet Capacity @ FSL
South Pool	Full Service Level (FSL) @ 1648.0 95 Surface Acres @ FSL 143 Acre-Feet Capacity @ FSL

TOTAL PROJECT 933 Surface Acres @ FSL
1604 Acre-Feet Capacity @ FSL

INTRODUCTION:

The area to be known as Mickelson Memorial Marsh is located in the southeast corner of Hamlin County near Estelline, South Dakota as shown in Figure 1. All land affected by the project will either be owned in fee title by the South Dakota Department of Game, Fish & Parks or under wetland easement. The project as proposed and preliminarily designed involves the restoration of a large marsh that lies immediately west of the Big Sioux River. The basin is currently drained by a man-made channel. A township road crosses the basin near the west end and will allow the marsh on the west side of the road to be managed at a slightly higher water elevation. Figure 2 shows the proposed pools as they will be referred to throughout this report.

Preliminary plans call for the installation of three water control structures. Two of the water control structures located along the west road will consist of 96 inch diameter corrugated metal pipe (CMP) full round risers with inlet and outlet CMP barrels. The riser at both locations will be equipped with removable stoplogs to facilitate drawdown of the pools. The road will be reconstructed to a higher elevation with compacted berms on each side to keep water away from the driving surface. An old timber bridge and two CMP

culverts will be replaced with new structures. A short east-west embankment will separate the north pool from the south pool under normal water levels. For a short time during various runoff events, the two pools may be connected as water levels bounce and flow over a natural spillway between the two pools.

The third water control structure will be installed across the outlet ditch near the east end of the main 747 acre marsh. This structure will consist of steel sheet pile creating a 20 foot long overflow weir. A 3-4 foot high, 4700 foot long embankment will be constructed to keep water from exiting the marsh into the Big Sioux River. In addition, a 300 foot wide emergency spillway will be excavated to assist the primary weir structure in allowing flood-flows into the basin at times when the Big Sioux River is high.

The location of each proposed structure is also shown in Figure 2.

CLASSIFICATION OF PROPOSED DAMS:

In reference to Chapter 74:02:08 "Safety of Dams" Water Management Board regulations as enforced by the Department of Environment and Natural Resources, the storage capacity of the entire project (all three pools) is 1604 acre-feet which dictates "Intermediate" size. However, no loss of life and minimal or no economic loss is expected should failure occur, which describes a Category 3 hazard potential. Based on the classification criteria outlined in Chapter 74:02:08, it is recommended that the proposed dam be classified as an Intermediate, Category 3 dam.

PRELIMINARY RISK ASSESSMENT:

The Mickelson Memorial Marsh is located in a rural, agricultural area of Hamlin County. The marsh discharges directly into the Big Sioux River approximately 2200 feet downstream from the main marsh structure. Just prior to entering the Big Sioux River, flows from the marsh pass beneath a County bituminous-surfaced highway via a 60 inch diameter concrete culvert. The west invert on the culvert is at elevation 1640.75. Since the Big Sioux River lies approximately 3000 feet north of the outlet channel, water would pass through the Big Sioux River highway bridge north of the 60 inch culvert before it would ever overtop the highway at the culvert location. No residences or other buildings are located downstream adjacent to the Mickelson Memorial Marsh outlet channel, nor does there appear to be any residences or building in the flood plain of the Big Sioux River directly downstream from the project area. The Big Sioux River intersects State Highway 28 approximately 7000 feet downstream from where the proposed marsh outlet channel enters the Big Sioux River. A large bridge exists at that location as well.

Based on information obtained in the field, data present on the U.S.G.S. quadrangular maps, and the size and capacity of the Big Sioux River structures downstream, the general public would appear to be in no danger in the unlikely event of a dam failure. No loss of life and minimal or no economic loss would be expected. Therefore, it appears reasonable to classify the dam as an Intermediate, Category 3 hazard dam.

DESIGN:

In accordance with South Dakota requirement 74:02:08:07, the minimum spillway design flood for the proposed dam is a 100-year frequency event. All three proposed pool structures are designed to ensure compliance with the South Dakota requirements. The primary spillways for the north, south and east pools will pass flows produced by a 100-year 24 hour rainfall without overtopping the embankment.

As previously mentioned, the primary spillway structures for the south pool consists of a 96 inch diameter CMP riser with a 54 inch diameter outlet barrel. The north pool structure is identical. The east pool (main marsh) structure consists of a steel, sheet pile weir with a crest length of 20 feet. All three structures will have removable stoplogs to provide variable control and drawdown capability.

The contributing watershed upstream of the Mickelson Memorial Marsh includes approximately 5381 acres or 8.41 square miles as shown in Figure 3. Regression equations provided in *Techniques for Estimating Flood Peaks, Volumes, and Hydrographs on Small Streams in South Dakota*¹ were used to develop flood peaks for design purposes. The Soil Conservation Service (SCS) TR-20 Hydrology program was then calibrated by adjusting the curve number to produce a peak inflow for the various design events similar to those determined using the regression equations. The curve numbers were reviewed to ensure they were realistic for the runoff event. The calibrated TR-20 model was then used to determine the discharge at various reservoir stages with respect to time. The program uses accepted procedures to develop inflow and outflow hydrographs. The primary spillway capacity was calculated by comparing discharges developed by the weir flow formula and formulas for calculating head loss through corrugated metal pipe. The emergency spillway capacity was calculated using Technical Release No. 39 *Hydraulics of Broad-Crested Spillways* developed by the SCS. Total discharge curves for the three proposed structures are attached.

Table 1 provides a summary of the relationship between peak inflows, corresponding outflows, and reservoir elevations using the previously-mentioned methods of analysis.

¹Becker, Lawrence D., U.S. Geological Survey, Water Resources Investigations 80-80, September 1980.

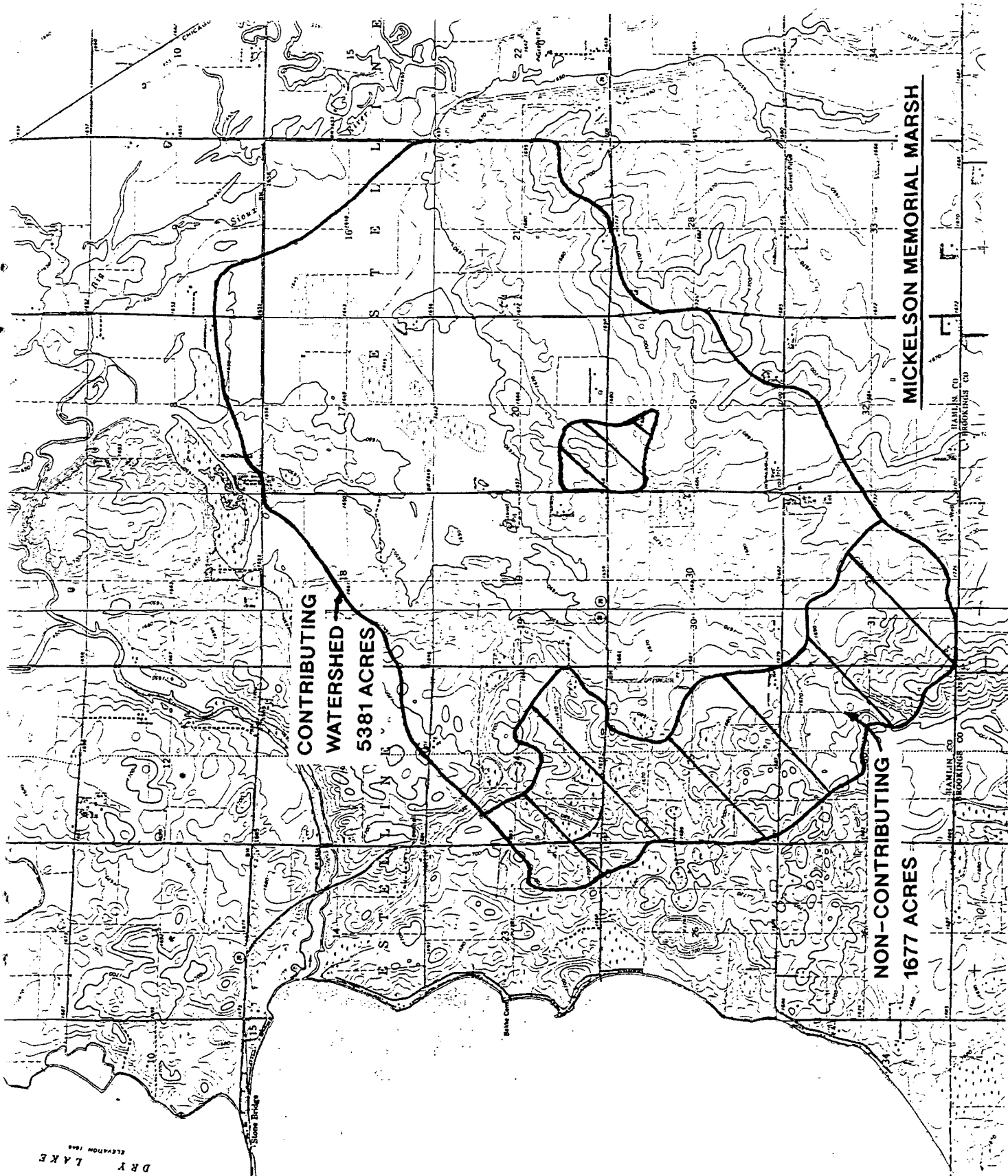


FIGURE 3

Table 1
Hydraulic Summary

BASIN	ITEM	5 YR	10 YR	25 YR	50 YR	100 YR
South Pool	Peak Q in	144	243	400	566	758
	Peak Elev.	1648.47	1648.67	1648.93	1649.21	1649.56
	Peak Q out	54	93	150	176	197
North Pool	Peak Q in	144	243	400	566	758
	Peak Elev.	1648.47	1648.67	1648.93	1649.21	1649.56
	Peak Q out	54	93	150	176	197
East Pool	Peak Q in	185	357	588	800	1043
	Peak Elev.	1647.77	1647.91	1648.08	1648.24	1648.41
	Peak Q out	10	15	26	38	52

South Pool (95 acres) 96" dia. CMP riser w/ trashrack and 54" dia. CMP outlet barrel, FSL @ 1648.0, top of road embankment @ 1650.5 plus surfacing.

North Pool (91 acres) 96" dia. CMP riser w/ trashrack and 54" dia. CMP outlet barrel, FSL @ 1648.0, top of road embankment @ 1650.5 plus surfacing.

East Pool (747 acres) 20' steel sheet pile weir w/ FSL crest @ 1647.5, 300' wide emergency spillway @ 1648.5, top of compacted embankment @ 1650.0 plus topsoil.

The analysis for the basins involved here assumes all wetlands are at full service level (FSL) at the commencement of any design precipitation event. Obviously, if any of the basins are at an elevation less than full pool due to natural weather conditions or intentional management practices, additional storage will be available, peak flows downstream will be reduced and additional flood storage benefits will result. Vegetation growth and overall marsh conditions will assist the manager in determining what depth of water is needed in each of the marshes to provide a productive environment for waterfowl and other wildlife.

CONCLUSIONS:

Based on the analysis conducted and the information provided, the restoration of the wetland will not cause any undesirable effects to roads or private landowners.

The project is designed to continue to allow flood flows from the Big Sioux River into the marsh. Flood control benefits will result, the magnitude of which depends on the management scheme of the pools. Also, there should be no effects to downstream

landowners, other than reducing peak flows downstream.

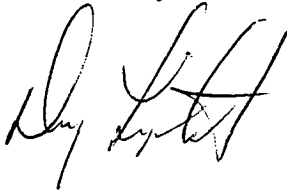
Four small 1/10 acre nesting islands in the East Pool are proposed for construction as part of this project. The islands will not affect the hydraulics of the system. The islands will be located to minimize potential wave action and will provide secure habitat for nesting waterfowl and other birds.

The project as proposed will provide quality habitat to numerous species of wildlife. In addition to flood control benefits, the project would provide water quality benefits by acting as a settling basins for flows discharging into the Big Sioux River.

A preliminary set of plans is submitted with the Design Report. A set of standard construction specifications has previously been submitted to the Division of Water Rights.

Dated: June 15, 1994

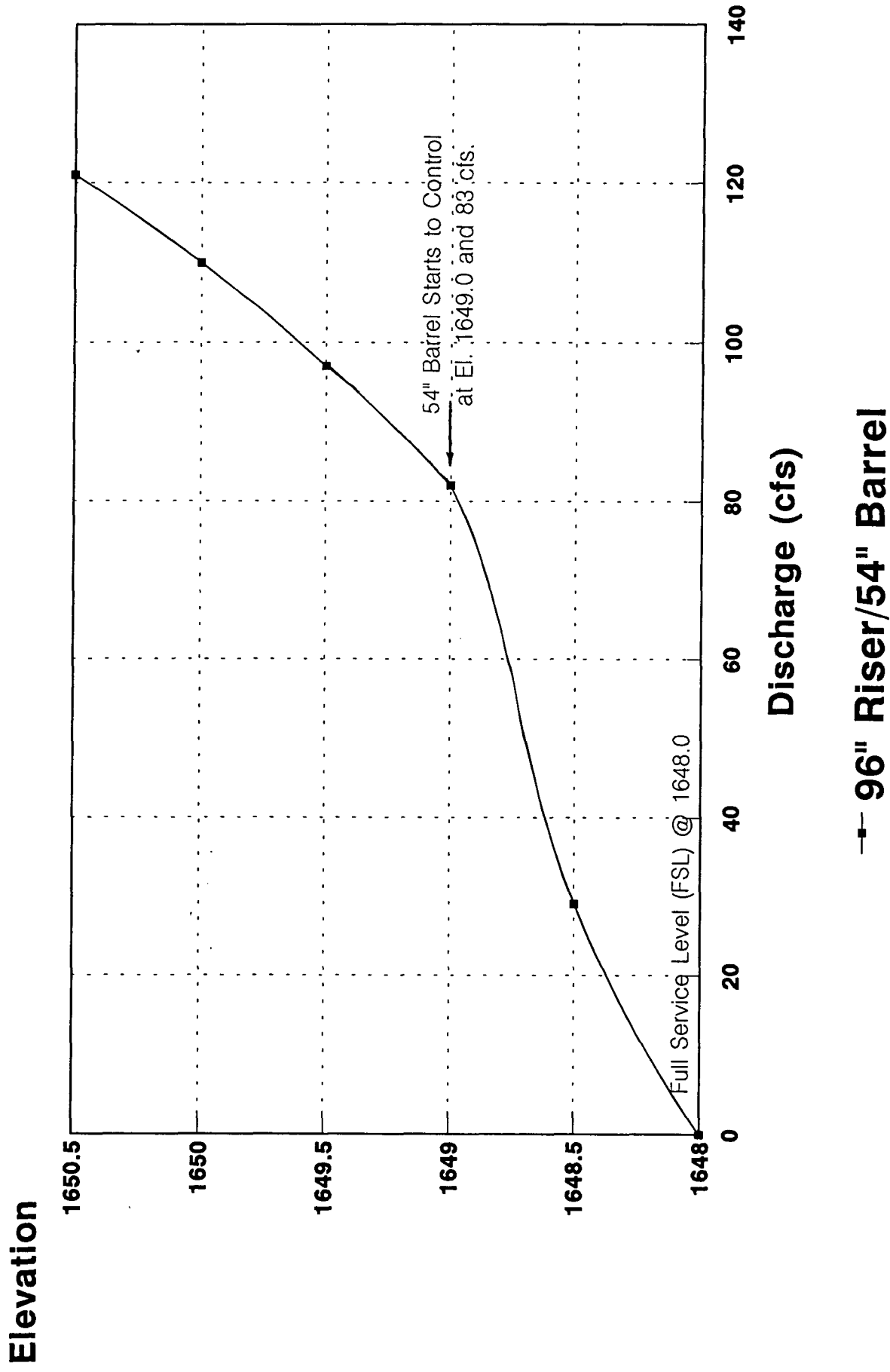
Submitted By:

A handwritten signature in black ink, appearing to read 'Doug Lipetzky', written over a horizontal line.

Doug Lipetzky, P.E
PE-4499

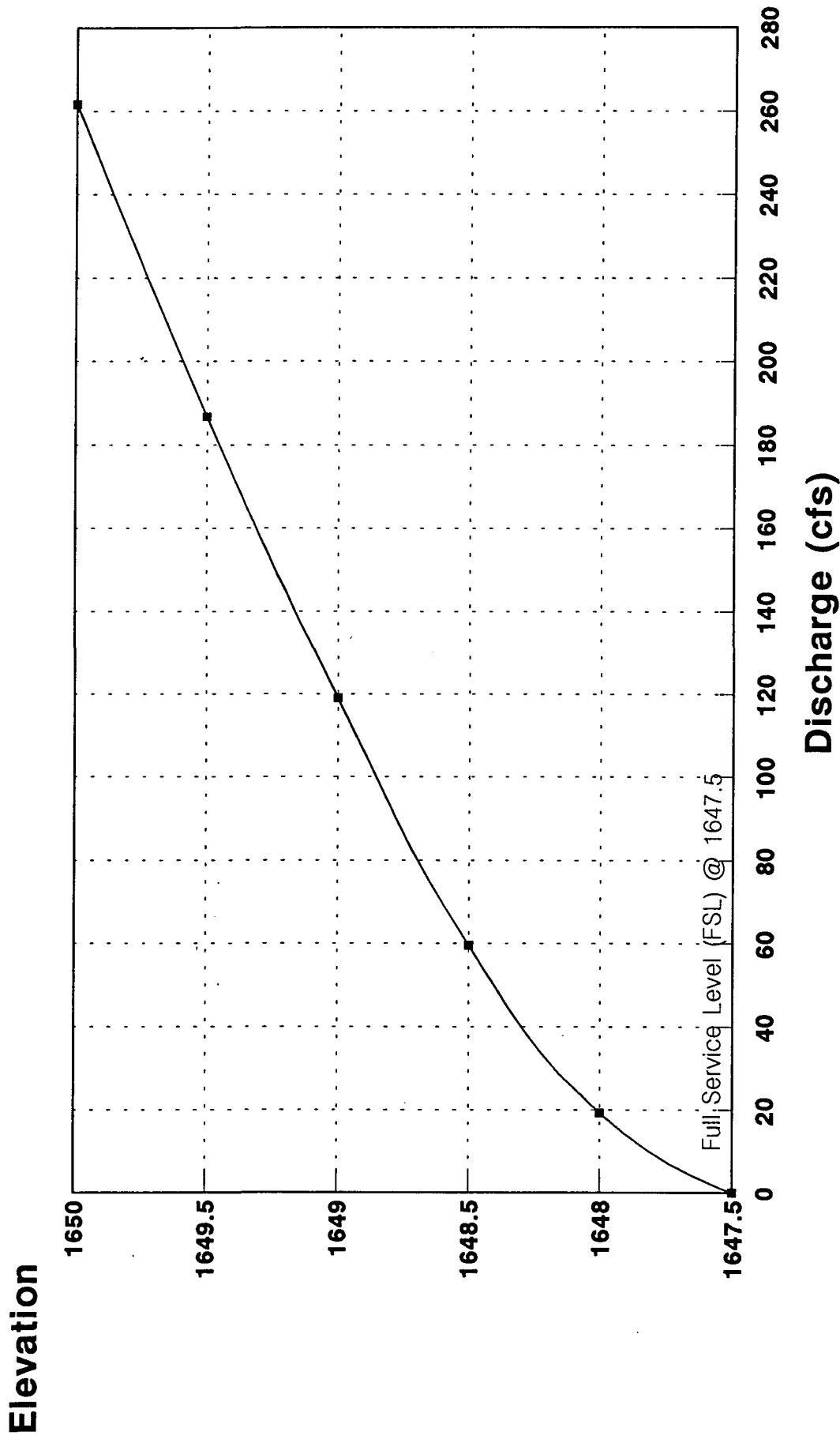
MICKELSON MEMORIAL MARSH

Discharge Curve For Riser/Barrel Structures



MICKELSON MEMORIAL MARSH

Discharge Curve For 20' Sheet Pile Weir



—■— 20' Sheet Pile Weir

REPORT ON
WATER PERMIT APPLICATION No. 5830-3
SOUTH DAKOTA DEPARTMENT OF GAME, FISH & PARKS
August 5, 1994

Water Permit Application No. 5830-3 has been filed by the South Dakota Department of Game, Fish & Parks to impound 1604 acre-feet of water by constructing three water control structures to create the Mickelson Memorial Marsh. The East structure will impound 1307 acre-feet of water in the W 1/2, W 1/2 SE 1/4 of Section 16; SW 1/4 SW 1/4 of Section 9; N 1/2 NW 1/4 of Section 21; E 1/2, SW 1/4 of Section 17; and the N 1/2 of Section 20; all in T113N-R51W. The North structure will impound 154 acre-feet of water in the SE 1/4, SE 1/4 SW 1/4 of Section 18; NW 1/4 SW 1/4 of Section 17; N 1/2 NE 1/4 of Section of Section 19; all in T113N-R51W. The South structure will impound 143 acre-feet of water in the NE 1/4, N 1/2 SE 1/4, SE 1/4 NW 1/4, NE 1/4 SW 1/4 of Section 19-T113N-R51W. The water will be used for recreation, fish and wildlife production and for flood control.

Discussion:

This project is a cooperative effort between Ducks Unlimited, Inc., the South Dakota Department of Game, Fish & Parks and several local landowners. The project involves the restoration of a 1000 acre wetland by constructing three water control structures to create the Mickelson Memorial Marsh.

The North structure will be an 8 foot high dam with a normal storage capacity of 154 acre-feet at the primary spillway elevation 1648 msl and a maximum storage capacity of 450 acre-feet at the top of dam elevation 1650.5 msl. The South structure will be an 8 foot high dam with a normal storage capacity of 143 acre-feet at the primary spillway elevation 1648 msl and a maximum storage capacity of 500 acre-feet at the top of dam elevation 1650.5. The East structure will be a 4 foot high earth embankment with a 20 foot wide steel sheet pile weir. This structure does not have to meet the Safety of Dams Rules, Chapter 74:02:08 definition of a dam since it is less than 6 feet high. However, it will impound 1307 acre-feet at the sheet pile weir elevation 1647.5 msl and 3500 acre-feet at the top of the embankment elevation 1650 msl.

The North and South dams for the Mickelson Memorial Marsh Dam will be classified as small size Category 3, Low Hazard dams. The Mickelson Memorial Marsh Project has been designed by Ducks Unlimited, Inc. and the plans and specifications have been approved; although, construction can not start until Water Permit Application No. 5830-3 is approved.

A small size Category 3 , Low Hazard dam is required to have a minimum spillway design capable of passing a 25 year frequency event. Ducks Unlimited, Inc. has designed all three water control structures to pass a 100 year frequency event without overtopping.

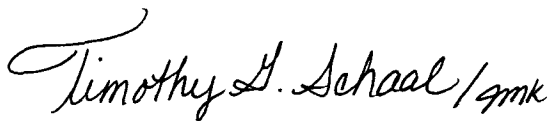
Both the North and South dams will have a 94 inch diameter CMP riser with a 54 inch diameter barrel. The East embankment will have a 20 foot wide steel sheet pile weir and a 300 foot wide earthcut spillway. The Mickelson Memorial Marsh Project has a drainage area of 5381 acres or 8.41 square miles. Ducks Unlimited uses the Soil Conservation Service TR-20 Hydrology program to route the runoff through the project. They route a 100 year-24 hour frequency event peak inflow of 758 cfs through the North and South dams with 1 foot of freeboard available. A peak inflow of 1043 cfs is routed through the east embankment with 1.5 feet of freeboard available.

The annual yield for this drainage area with a 50 percent chance of occurrence, or 1 out of 2 years, is estimated to approximately 360 acre-feet of water. The annual yield with a 10 percent chance of occurrence, or 1 out of 10 years, is estimated to be approximately 1345 acre-feet of water.

The Mickelson Memorial Marsh is located adjacent to the Big Sioux River and is designed to allow flood flows from the Big Sioux River into the marsh. This along with the direct runoff storage from the drained wetland will provide additional flood control benefits for the Big Sioux River. There should be little effect on other lakes or existing Water Permits/Rights in this area.

Conclusion:

1. Water Permit Application No. 5830-3 should be approved since there is unappropriated water available and approval will not have any adverse effects on existing Water Permits/Rights.

 Timothy G. Schaal /gmk

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

Approved by.

 Gale N. Selken

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

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 5830-3, South Dakota Department of
Game, Fish and Parks

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Environment and Natural Resources concerning Water Permit Application No. 5830-3, South Dakota Department of Game, Fish & Parks, c/o Secretary Richard Beringson, 523 East Capitol, Pierre, SD 57501.

The Chief Engineer is recommending APPROVAL of Application No. 5830-3 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) in the public interest with the following qualification:

Water Permit No. 5830-3 authorizes three water control structures with a total storage capacity of 1604 acre-feet of water and sufficient water annually to maintain the water level to the outlet elevations. The structures will impound 1307 acre-feet of water to 1647.5 msl, 154 acre-feet of water to 1648.0 msl, 143 acre-feet of water to 1648.0 msl.

See report on application for additional information.


for JOHN HATCH, Chief Engineer
August 18, 1994



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

September 14, 1994

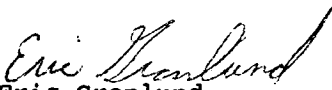
Richard Beringson, Secretary
SD Department of Game, Fish & Parks
523 East Capitol
Pierre, SD 57501

Dear Mr. Beringson:

Water Permit Application No. 5830-3 for recreational, fish and wildlife production 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 Estelline Journal printed at Estelline, SD (Ph # 605-873-2475). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 14, 1994

Estelline Journal
Box 159
Estelline, SD 57234-0159

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 5830-3 to be published twice. Please publish the first notice on September 22, 1994, with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is South Dakota Department of Game, Fish and Parks, c/o Richard Beringson, Secretary, 523 East Capitol, Pierre, SD 57501 (Ph # 605-773-3658).

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

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

FIRST TRANSMITTAL NOTICE

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

No. _____

Date _____

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

Name

Newspaper

Instruction to Newspaper - Publish first Notice on September 22, 1994, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 5830-3 to Appropriate Water

Notice is given that the South Dakota Department of Game, Fish and Parks, 523 East Capitol, Pierre, SD 57501 has filed an application for a water permit to impound 1604 acre-feet of runoff from Stray Horse Creek drainage by constructing three storage pools located in the Mickelson Memorial Marsh. The east pool will impound 1307 acre-feet of water located in the W 1/2, W 1/2 SE 1/4 Section 16; SW 1/4 SW 1/4 Section 9; N 1/2 NW 1/4 Section 21; E 1/2, SW 1/4 Section 17 and the N 1/2 Section 20; all in T113N-R51W. The north pool will impound 154 acre-feet of water located in the SE 1/4, SE 1/4 SW 1/4 Section 18; NW 1/4 SW 1/4 Section 17; N 1/2 NE 1/4 Section 19; all in T113N-R51W. The south pool will impound 143 acre-feet of water located in the NE 1/4, N 1/2 SE 1/4, SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 19; all in T113N-R51W. This application requests impoundment of water sufficient to maintain the water level at the outlet elevation of 1647.5 feet mean sea level (fmsl) for the east pool and 1648.0 fmsl for the north and south pool. The water is to be used for recreational, fish and wildlife production purposes and for flood control.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 5830-3 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 Division, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 11, 1994.

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

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of Hamlin) ss



I, Mark R. Hewson

certify that the attached printed Notice was

taken from the Estelline Journal

printed and published in Estelline

County of Hamlin and State of

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

9-22

9-29

Cost of Printing: \$48.06

[Signature]
(Signature)

[Signature]
(Title)

9-29-94
(Date Signed)

2x-Sept. 22, 29

NOTICE OF APPLICATION NO.

5830-3 to Appropriate Water

Notice is given that the South Dakota Department of Game, Fish and Parks, 523 East Capitol, Pierre, SD 57501 has filed an application for a water permit to impound 1605 acre-feet of runoff from Stray Horse Creek drainage by constructing three storage pools located in the Mickelson Memorial Marsh. The east pool will impound 1307 acre-feet of water located in the W 1/2, W 1/2 SE 1/4 Section 16; SW 1/4 SW 1/4 Section 9; N 1/2 NW 1/4 Section 21; E 1/2, SW 1/4 Section 17 and the N 1/2 Section 20; all in T113N-R51W. The north pool will impound 154 acre-feet of water located in the SE 1/4, SE 1/4 SW 1/4 Section 18; NW 1/4 SW 1/4 Section 17; N 1/2 NE 1/4 Section 19; all in T113N-R51W. The south pool will impound 143 acre-feet of water located in the NE 1/4, N 1/2 SE 1/4, SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 19; all in T113N-R51W. This application requests impoundment of water sufficient to maintain the water level at the outlet elevation of 1647.5 feet mean sea level (fmsl) for the east pool and 1648.0 fmsl for the north and south pool. The water is to be used for recreational, fish and wildlife production purposes and for flood control.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 5830-3 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.

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

ROBERT E. ROBERTS
Secretary,
Department of Environment
and Natural Resources



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

August 24, 1994

Doug Lipetzky, P.E.
Ducks Unlimited Inc.
3502 Franklin Ave.
Bismarck, ND 58501

Dear Mr. Lipetzky:

We have reviewed the plans and specifications for the Mickelson Memorial Marsh Project located in Estelline Township (T113N-R51W), in Hamlin County. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the project. No construction may begin until Water Permit Application No. 5830-3 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 the South Dakota Department of Game, Fish and Parks, as owner of the dams, from the responsibility for operating and maintaining the dams in good repair to ensure the safety of the dams.

Both the North and South dams for the Mickelson Memorial Marsh Project will be classified as small size Category 3 dams with dam heights of 8 feet; normal storage capacities of 154 acre-feet and 143 acre-feet respectively, and maximum storage capacities of 450 acre-feet and 500 acre-feet respectively. According to the Safety of Dams Rules, Chapter 74:02:08; the East dam does not meet the definition of a dam since it is less than 6 feet high.

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

Sincerely,

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

c: Tim Olson & Don McCrea, Dept. of GF&P

Water Rights Division - DENR
Conversation File Documentation

NAME OF PERSON OR FILE: Water Permit Appl. No 5830-3, G,F&P

ADDRESS: COUNTY: Hamlin

DATE: 9/29/94 TELEPHONE:

RE: Discussion with Tim Olson on readvertising application.

COMMENTS:

I contacted Tim Olson regarding the discrepancy that Mr. Spilde had pointed out on this application. The location of the proposed impoundments is not on Stray Horse Creek. Tim agreed and understood that the application would need to be readvertised. He asked me to change the source of water supply of the application to be from "runoff."

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

NAME:

Eric Hamlin



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 30, 1994

Lawrence Spilde
PO Box 46
Estelline, SD 57234

Dear Mr. Spilde:

I am writing in regard to the Notice of Application for Water Permit Application No. 5830-3 for the proposed Mickelson Memorial Marsh. The notice stated the water permit would impound runoff from Stray Horse Creek drainage. The drainage area listed was in error. The application will be readvertised in the Estelline Journal to remedy this error.

During our conversation, you requested the current pool elevations of the three impounded areas. I do not know the current elevation of water naturally impounded in these areas. I can provide you the information provided by the applicant on the top of the structure, bottom of the structure and full service level.

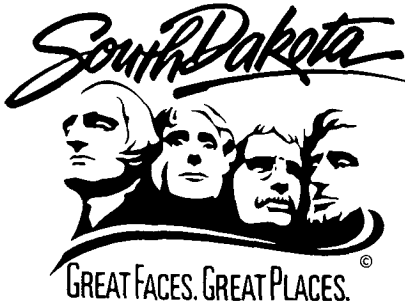
	Top	Bottom	Full Service
East Structure	1650 fmsl	1646 fmsl	1647.5 fmsl
North Structure	1650.5 fmsl	1642.5 fmsl	1648 fmsl
South Structure	1650.5 fmsl	1642.5 fmsl	1648 fmsl

** fmsl = feet mean sea level

If I may be of further assistance, please feel free to contact me.

Sincerely,

Eric Gronlund
Water Rights Division
605 773-3352



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

October 6, 1994

Richard Beringson, Secretary
SD Department of Game, Fish & Parks
523 East Capitol
Pierre, SD 57501

Dear Secretary Beringson:

Water Permit Application No. 5830-3 for recreational, fish and wildlife production use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing readvertising No. 5830-3 has been sent to the Publisher of the Estelline Journal printed at Estelline, SD (Ph # 605-873-2475). This application needs to be readvertised to correct the statement that the runoff was from the Stray Horse Creek drainage. For your information, a copy of the readvertised notice on the application is enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosure

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 57501-3181

October 6, 1994

Estelline Journal
Box 159
Estelline, SD 57234-0159

ATTENTION: Legal Department

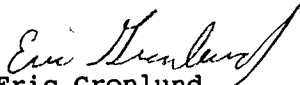
Enclosed is a Notice of readvertisement of Application No. 5830-3 to be published twice. Please publish the first notice on October 13, 1994, with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is South Dakota Department of Game, Fish and Parks, c/o Richard Beringson, Secretary, 523 East Capitol, Pierre, SD 57501 (Ph # 605-773-3658).

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

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

FIRST TRANSMITTAL NOTICE

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

No. _____

Date _____

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

Name

Newspaper

Instruction to Newspaper - Publish first Notice on October 13, 1994, with the second publication 7 days later. The applicant is responsible for payment.

Readvertisement of NOTICE OF APPLICATION NO. 5830-3 to Appropriate Water

Notice is given that the South Dakota Department of Game, Fish and Parks, 523 East Capitol, Pierre, SD 57501 has filed an application for a water permit to impound 1604 acre-feet of runoff by constructing three storage pools located in the Mickelson Memorial Marsh. The east pool will impound 1307 acre-feet of water located in the W 1/2, W 1/2 SE 1/4 Section 16; SW 1/4 SW 1/4 Section 9; N 1/2 NW 1/4 Section 21; E 1/2, SW 1/4 Section 17 and the N 1/2 Section 20; all in T113N-R51W. The north pool will impound 154 acre-feet of water located in the SE 1/4, SE 1/4 SW 1/4 Section 18; NW 1/4 SW 1/4 Section 17; N 1/2 NE 1/4 Section 19; all in T113N-R51W. The south pool will impound 143 acre-feet of water located in the NE 1/4, N 1/2 SE 1/4, SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 19; all in T113N-R51W. This application requests impoundment of water sufficient to maintain the water level at the outlet elevation of 1647.5 feet mean sea level (fmsl) for the east pool and 1648.0 fmsl for the north and south pool. The water is to be used for recreational, fish and wildlife production purposes and for flood control.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 5830-3 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 Division, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 31, 1994.

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

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
 County of Hamlin) ss

I, Mark Hausug
 certify that the attached printed Notice was
 taken from the Estellian Journal

printed and published in Estellian

County of Hamlin and State of
 South Dakota. The notice was published in
 the newspaper on the following two dates:

Oct 13, 1994
Oct 20, 1994

Cost of Printing: 42.52

[Signature]
 (Signature)

[Signature]
 (Title)

10/27/94
 (Date Signed)

Public Notices

2x-Oct. 13, 20
 Readvertisement of
 NOTICE OF APPLICATION
 NO. 5830-3
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ROBERT E. ROBERTS
 Secretary
 Department of Environment
 and Natural Resources



DEC 28 1994

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

Richard Beringson, Secretary
SD Department of Game, Fish and Parks
523 East Capitol
Pierre, SD 57501

Dear Mr. Beringson:

Enclosed is Water Permit No. 5830-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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

Very truly yours,

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

enclosures

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

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

Permit No. 5830-3
Big Sioux 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, August 26, 2004, made a thorough examination of the water use system constructed by SD Department of Game, Fish & Parks of 523 E. Capitol, Pierre, SD 57501 holder of Permit No. 5830-3, bearing the priority of June 20, 1994 authorizing the storage of 1604 acre-feet total (East Pool - 1307 ac-ft, North Pool - 154 ac-ft. & South Pool - 143 ac-ft.) of the waters of runoff for fish & wildlife production, recreational use and flood control purposes, in Hamlin County.

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

A. Works used to divert the water:

Three water control structures (East Pool, North Pool & South Pool) to create the Mickelson Memorial Marsh

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

N/A

C. Works used to apply water to beneficial use:

Three water control structures (East Pool, North Pool & South Pool) to create the Mickelson Memorial Marsh

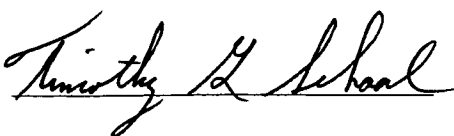
The system is in the following condition good. The point of diversion is located East Dam – 1900 ft. north & 2100 ft. west of the SE corner of Sec. 16-T113N-R51W (W ½ SE ¼) (Lat. 44.59250, Long. -96.95417); North Dam—5280 ft. south of the NE corner of Sec. 18-T113N-R51W (SE ¼ SE ¼) (Lat. 44.58707 Long. -96.98684); South Dam—900 ft. south of the NE corner of Sec. 19-T113N-R51W (NE ¼ NE ¼) (Lat. 44.58462, Long. -96.98684). The works are capable of storing 1604 acre-feet total (East Pool 1307 ac-ft, North Pool 154 ac-ft. & South Pool 143 ac-ft.) of water which is to be used for fish & wildlife production and recreational use. Water has been put to beneficial use to the maximum extent as follows:

Three water control structures (East Pool, North Pool & South Pool) to create the Mickelson Memorial Marsh

and the license should be issued for 1604 acre-feet of storage.

Applicable permit qualifications have been complied with: Yes X

Exceptions to compliance are: none Date Report Completed: January 31, 2005



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

REPORT ON INSPECTION OF PERMIT NO. 5830-3

DATE OF INSPECTION: August 26, 2004

NAME & ADDRESS OF PERMIT HOLDER: SD Department of Game, Fish & Parks, 523 E. Capitol, Pierre, SD 57501

DIVERSION POINT LEGAL LOCATION: East Dam – 1900 ft. north & 2100 ft. west of the SE corner of Sec. 16-T113N-R51W (W ½ SE ¼) (Lat. 44.59250, Long. -96.95417); North Dam—5280 ft. south of the NE corner of Sec. 18-T113N-R51W (SE ¼ SE ¼) (Lat. 44.58707 Long. -96.98684); South Dam—900 ft. south of the NE corner of Sec. 19-T113N-R51W (NE ¼ NE ¼) (Lat. 44.58462, Long. -96.98684).

DAM INFORMATION: East Dam

North Dam

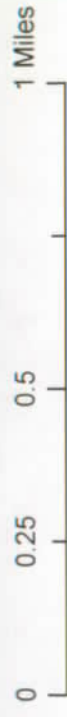
South Dam

- | | | |
|--|------------------------|------------------------|
| 1) Height to crest <u>4</u> feet | <u>8 ft.</u> | <u>8 ft.</u> |
| 2) Height to primary spillway <u>1.5</u> feet | <u>5.5 ft.</u> | <u>5.5 ft.</u> |
| 3) Height to secondary spillway <u>2.5</u> feet | | |
| 4) Crest width <u>12</u> feet | <u>20 ft.</u> | <u>20 ft.</u> |
| 5) Crest length <u>4700</u> feet | <u>2015 ft.</u> | <u>1576 ft.</u> |
| 6) Spillway length <u>XXX</u> feet | | |
| 7) Spillway width <u>24 ft. wide weir & 300 ft secondary</u> | <u>96 in. dia. CMP</u> | <u>96 in. dia. CMP</u> |
| 8) Approx. storage (Normal) <u>1307</u> acre-feet | <u>154 ac-ft.</u> | <u>143 ac-ft.</u> |
| 9) Approx. storage (Maximum) <u>3500</u> acre-feet | <u>450 ac-ft.</u> | <u>500 ac-ft.</u> |
| 10) Date constructed: <u>XXX</u> | | |

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. 5830-3



Timothy H. Schaaf
 Timothy G. Schaaf, P.E.
 Natural Resources Engineer Specialist
 DENR, Water Rights Program
 1/31/05

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 5830-3

(1) South Dakota Department of Game, Fish and Parks, 523 E Capitol, Pierre SD 57501 made Application No. 5830-3, June 20, 1994 for a water permit to impound 1,604 acre feet of water from runoff, Hamlin County, South Dakota for fish and wildlife propagation, recreation and flood control purposes. Permit No. 5830-3, with a priority date of June 20, 1994 was approved October 31, 1994 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before October 31, 1999 and for the application to beneficial use of water on or before October 31, 2003.

(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. 5830-3 is issued a license, bearing a priority date of June 20, 1994, to impound 1,604 acre feet of water for fish and wildlife propagation, recreation and flood control purposes.

The location of the water control structures for the Mickelson Memorial Marsh are as follows:

East Pool (1,307 acre-feet storage capacity) – 1,900 feet north and 2,100 feet west of the southeast corner of Section 16-T113N-R51W (W $\frac{1}{2}$ SE $\frac{1}{4}$)

North Pool (154 acre-feet storage capacity) – 5,280 feet south of the northeast corner of Section 18-T113N-R51W (SE $\frac{1}{4}$ SE $\frac{1}{4}$)

South Pool (143 acre-feet storage capacity) – 900 feet south of the northeast corner of Section 19-T113N-R51W (NE $\frac{1}{4}$ NE $\frac{1}{4}$)

(3) This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Permit No. 5830-3, including the following now applicable qualification:

- Water Permit No. 5830-3 authorizes three water control structures with a total storage of 1,604 acre-feet of water and sufficient water annually to maintain the water level to the outlet elevations. The structures will impound 1,307 acre-feet of water to 1647.5 msl, 154 acre-feet of water to 1648.0 msl and 143 acre-feet of water to 1648.0 msl.



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

APR 19 2005

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 19 2005

5830-3

SD Dept of Game Fish & Parks
% Tim Olson
523 E Capitol
Pierre SD 57501

Dear Mr. Olson:

Enclosed is Water License No. 5830-3. This is the final water right document completing your process of obtaining a Water Right.

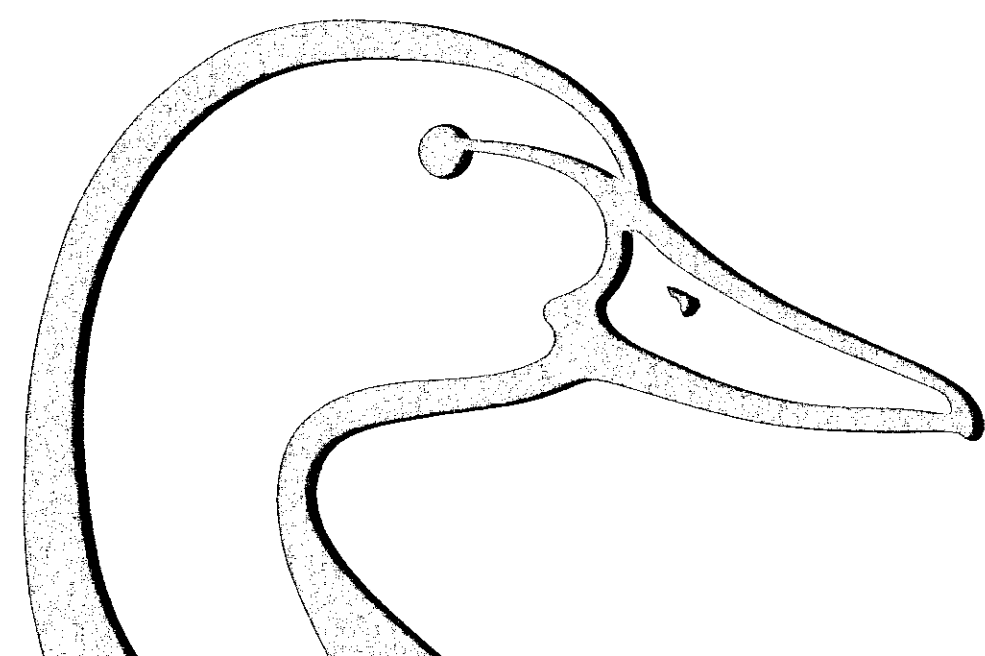
As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water.

Sincerely,

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

enclosures

Appl. 5830-3



DUCKS UNLIMITED SPECIFICATIONS

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EXCAVATION	203
EMBANKMENT CONSTRUCTION	204
WATER	205
WATER CONTROL	
STRUCTURE INSTALLATION	206
WATER CONTROL STRUCTURE	
& CULVERT APPURTENANCES	206A
CULVERT INSTALLATION	207
CAST-IN-PLACE	
REINFORCED CONCRETE	208
RIPRAP PLACEMENT	209
ISLAND EMBANKMENT CONSTRUCTION	211
SHEET PILE MATERIAL	214
SHEET PILE INSTALLATION	215
STRUCTURAL STEEL	216
STEEL H-PILES	217
MAINTENANCE &	
PROTECTION OF TRAFFIC	305
REMOVAL & SALVAGE OF	
EXISTING CULVERTS/STRUCTURES	307

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NESTING ISLAND DETAILS & SOILS INFORMATION	12
SOILS INFORMATION	13

ESTIMATED QUANTITIES

MOBILIZATION	1 L.S.
SITE PREPARATION	7,963 C.Y.-P
EMBANKMENT CONSTRUCTION	34,185 C.Y.-S*
WATER	171 M-GAL.**
WATER CONTROL STRUCTURES	
96"Ø CMP RISER, 7' L.F.	2 EA.
CULVERT INSTALLATION	
54"Ø CMP	120 L.F.
24"Ø CMP	16 L.F.
18"Ø CMP	62 L.F.
RIPRAP	
CLASS I	46 C.Y.-P
CLASS II	95 C.Y.-P
ISLAND CONSTRUCTION (0.1 ACRE)	4 EA.
SHEET PILE MATERIAL	1,046 S.F.-P
SHEET PILE INSTALLATION	1,046 S.F.-P
STRUCTURAL STEEL	1 L.S.
STEEL H-PILES	110 L.F.
MAINTENANCE &	
PROTECTION OF TRAFFIC	1 L.S.
ACCESS ROAD SURFACING	873 C.Y.-P***
REMOVAL OF EXISTING CULVERTS/STRUCTURES	1 L.S.

*INCLUDES 15% FOR SHRINKAGE
**BASED ON 5 GAL./C.Y. ASSUMPTION
SEE SPECIFICATION 205.

***BASED ON 4" TOTAL DEPTH @ 1164 C.Y. MINUS 1" ASSUMED SALVAGED
DEPTH @ 291 C.Y.=873 C.Y.-P NEW AGGREGATE SURFACING. COST OF
STRIPPING, SALVAGING & RESPREADING EXISTING GRAVEL SHALL BE
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DUCKS UNLIMITED

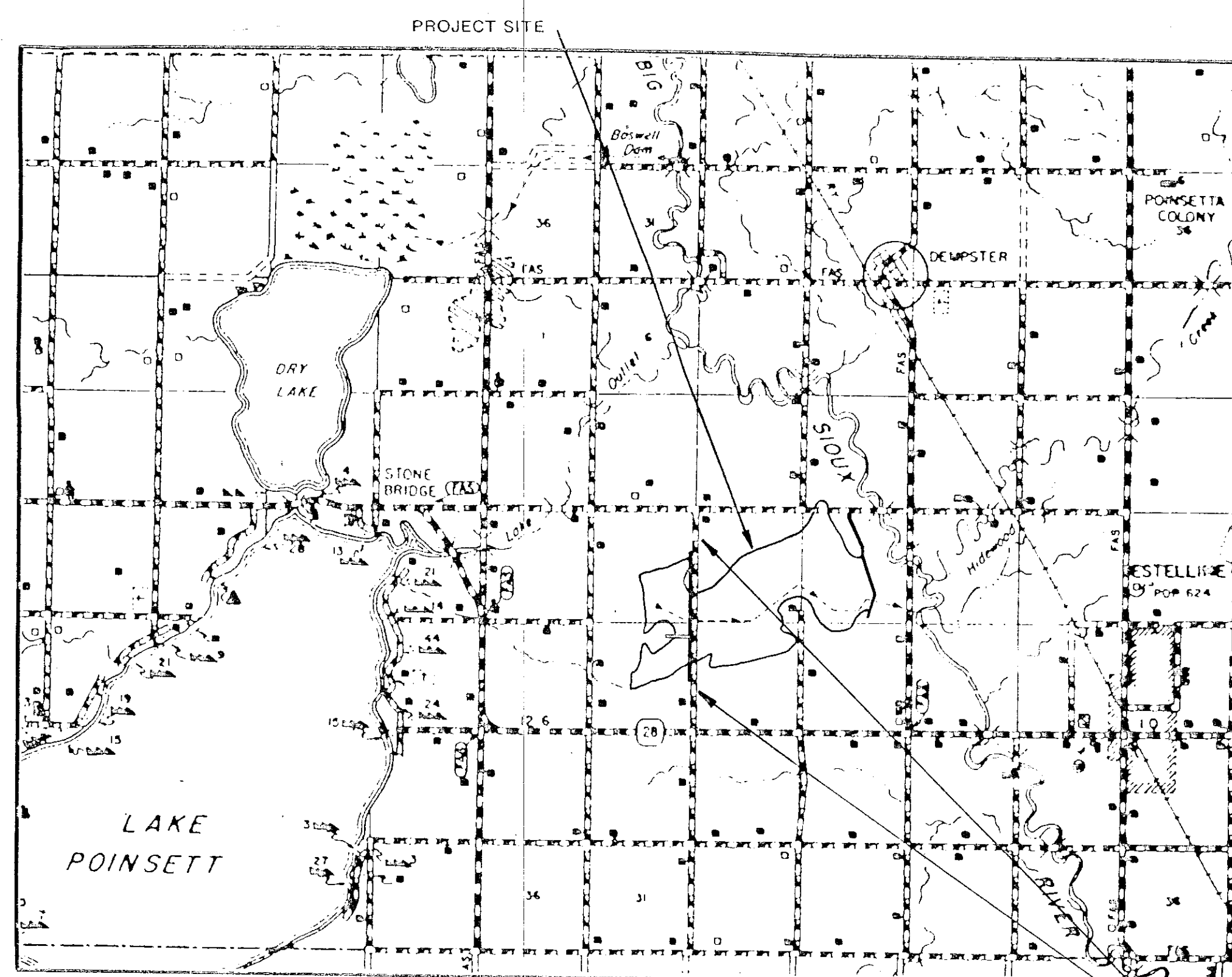
PROJECT

MICKELSON MEMORIAL MARSH

SECTIONS 16-21, T 114 N, R 52 W,
HAMLIN COUNTY, SOUTH DAKOTA

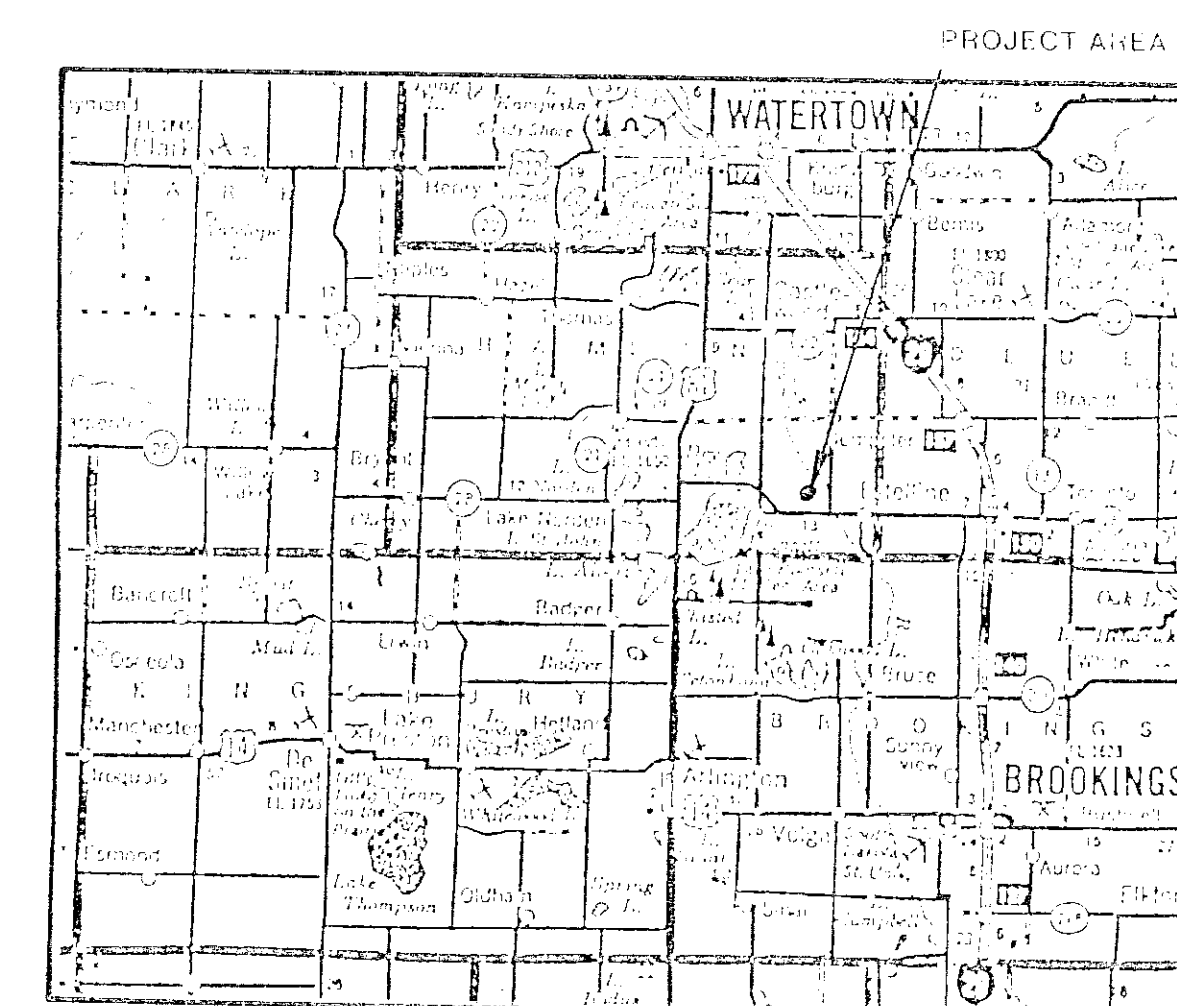
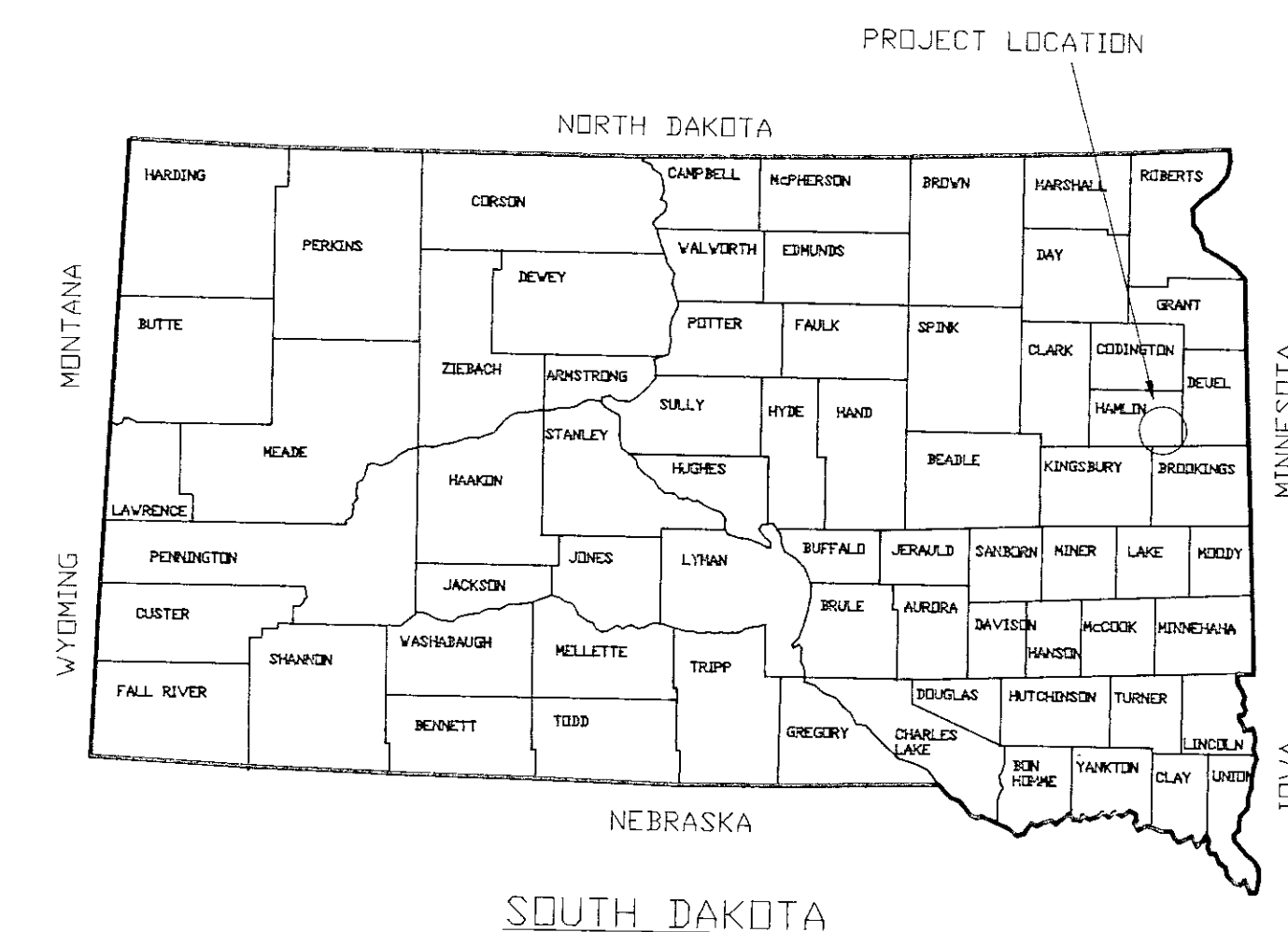
IN COOPERATION WITH

S.D. GAME, FISH & PARKS
&
SEVERAL PRIVATE LANDOWNERS



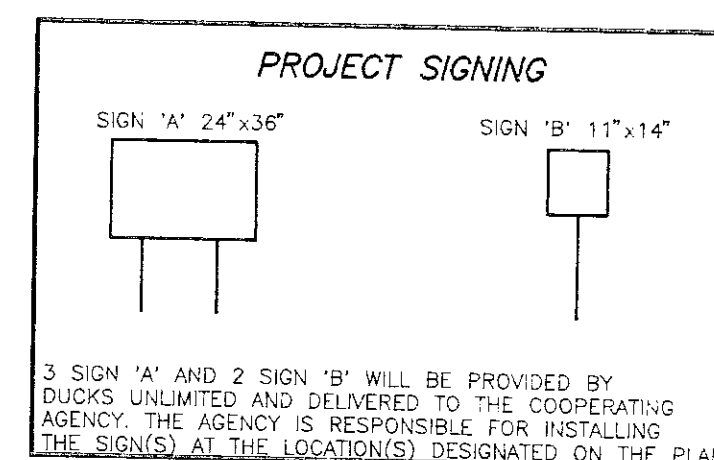
VICINITY MAP

BARRICADES* & "ROAD CLOSED TO
THRU TRAFFIC" SIGNS



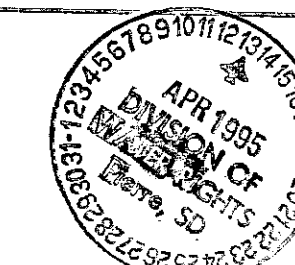
LOCATION MAP

AGENCY CONTACT:
STAN LUNDQUIST
S.D. DEPT. GAME, FISH & PARKS
605/873-2462

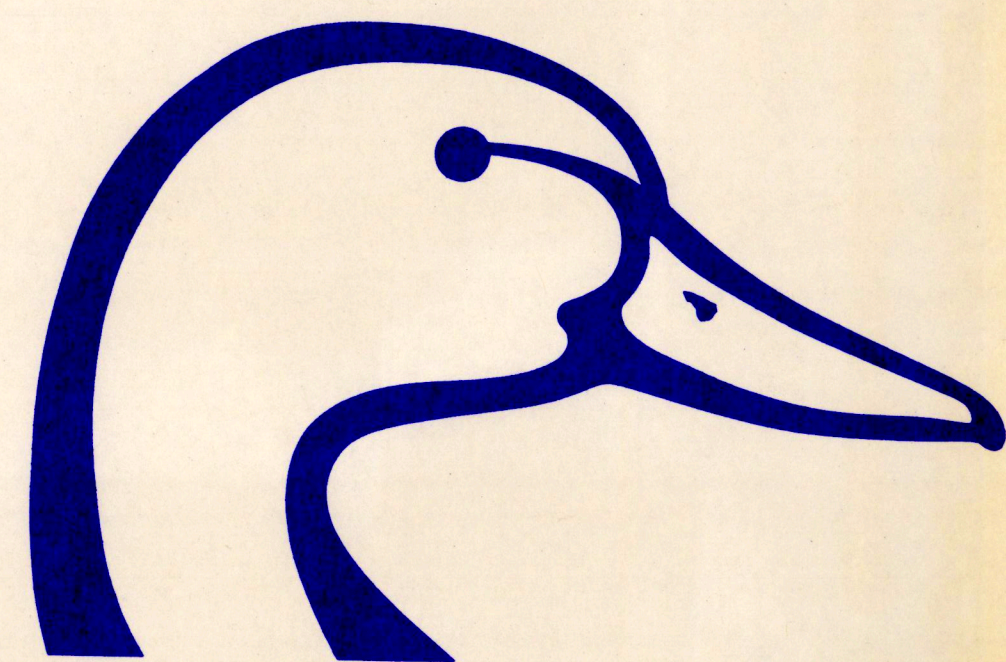


REV. 01 4-5-95 D.J.L. ADDED SOILS INFORMATION, BORROW AREAS,
& MISCELLANEOUS CORRECTIONS.

	PROJECT NO. SD-3156-001	DESIGNED BY: D.J.L.
	MICKELSON MEMORIAL MARSH	DRAWN BY: S
GREAT PLAINS REGIONAL OFFICE	VICINITY MAP	SURVEYED BY:
DATE: 4-5-95	SHEET NO. 1 OF 13	CHECKED BY: B.R.K.
APPROVED BY: [Signature]		APPROVED BY:



Appl. 5830-3



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DUCKS UNLIMITED

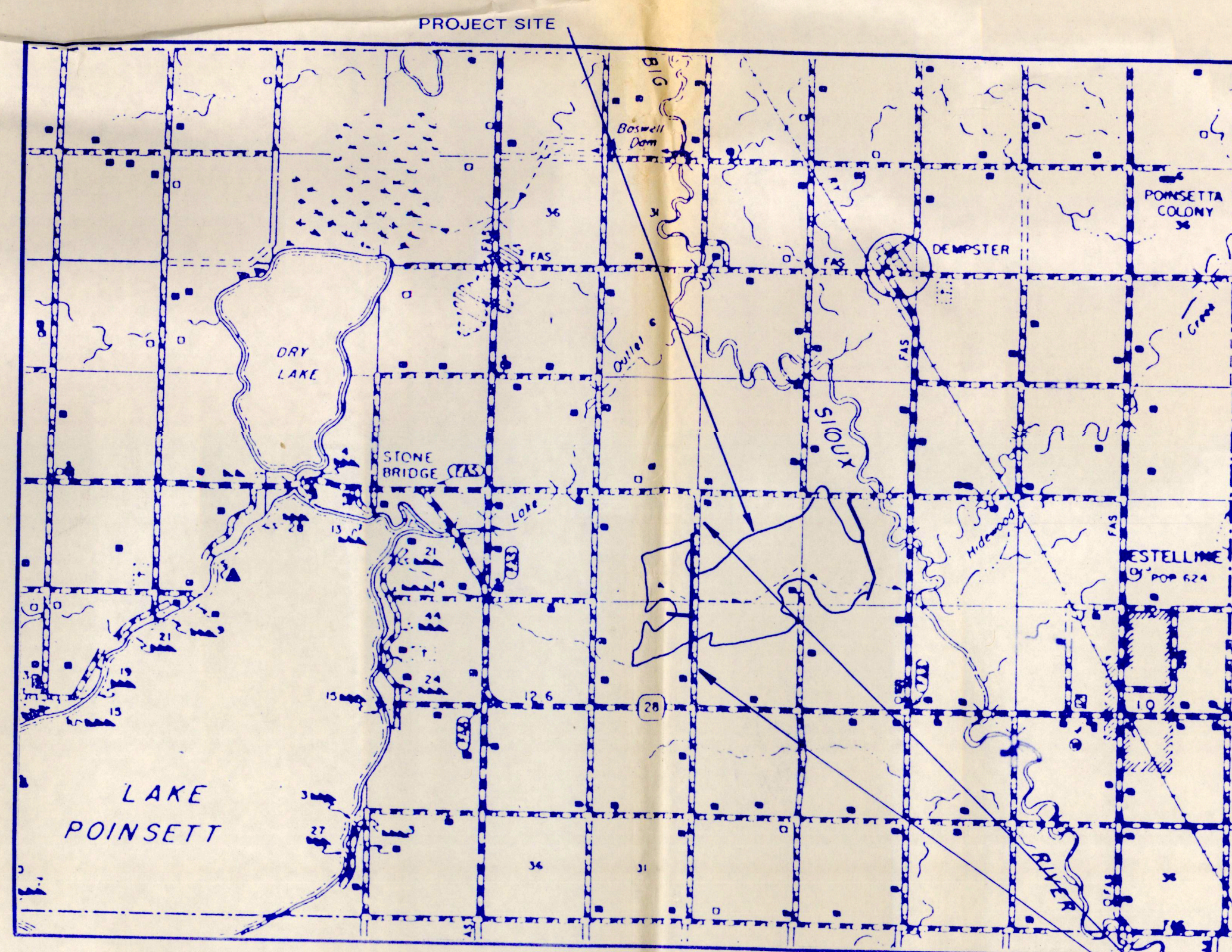
PROJECT

MICKELSON MEMORIAL MARSH

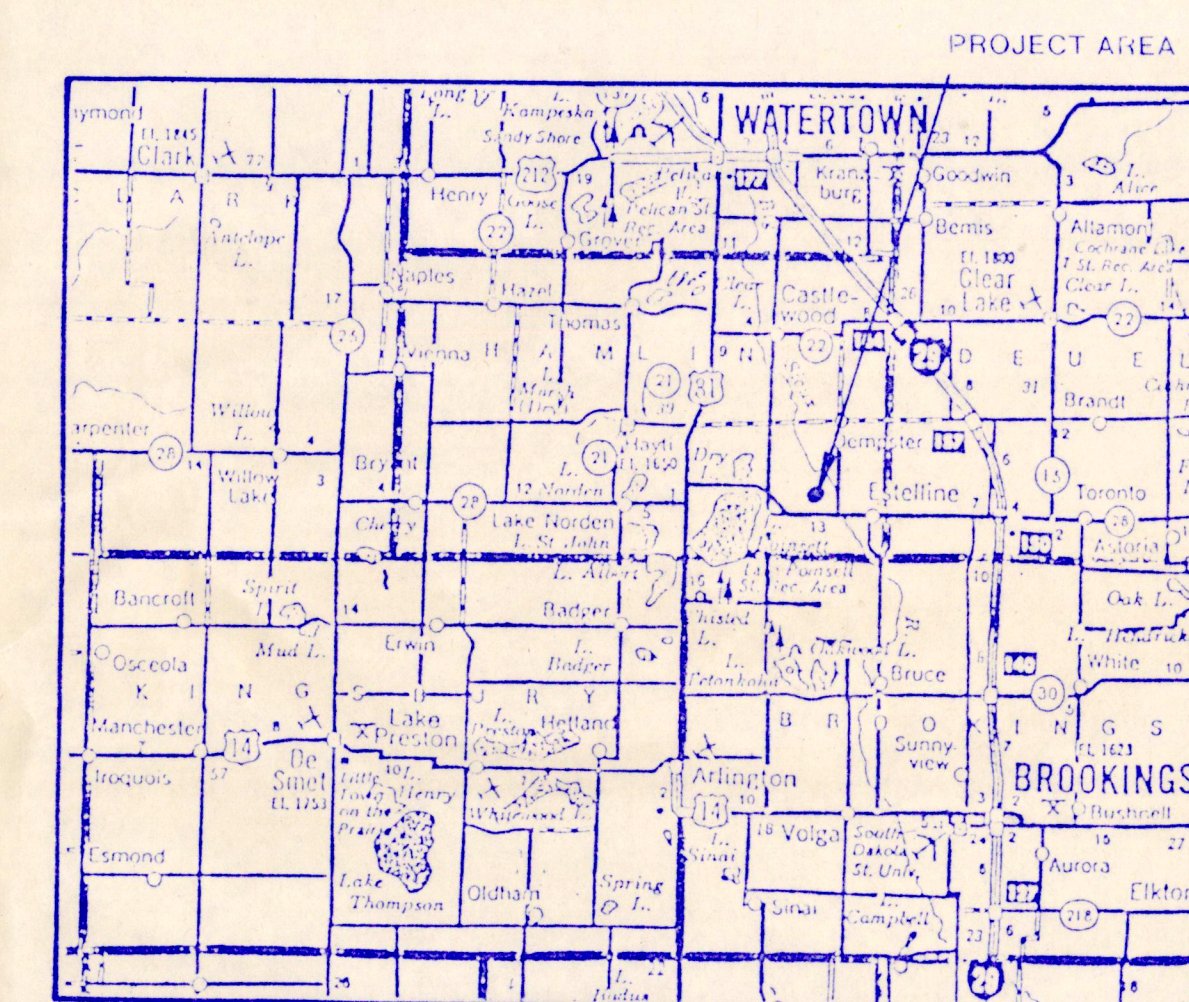
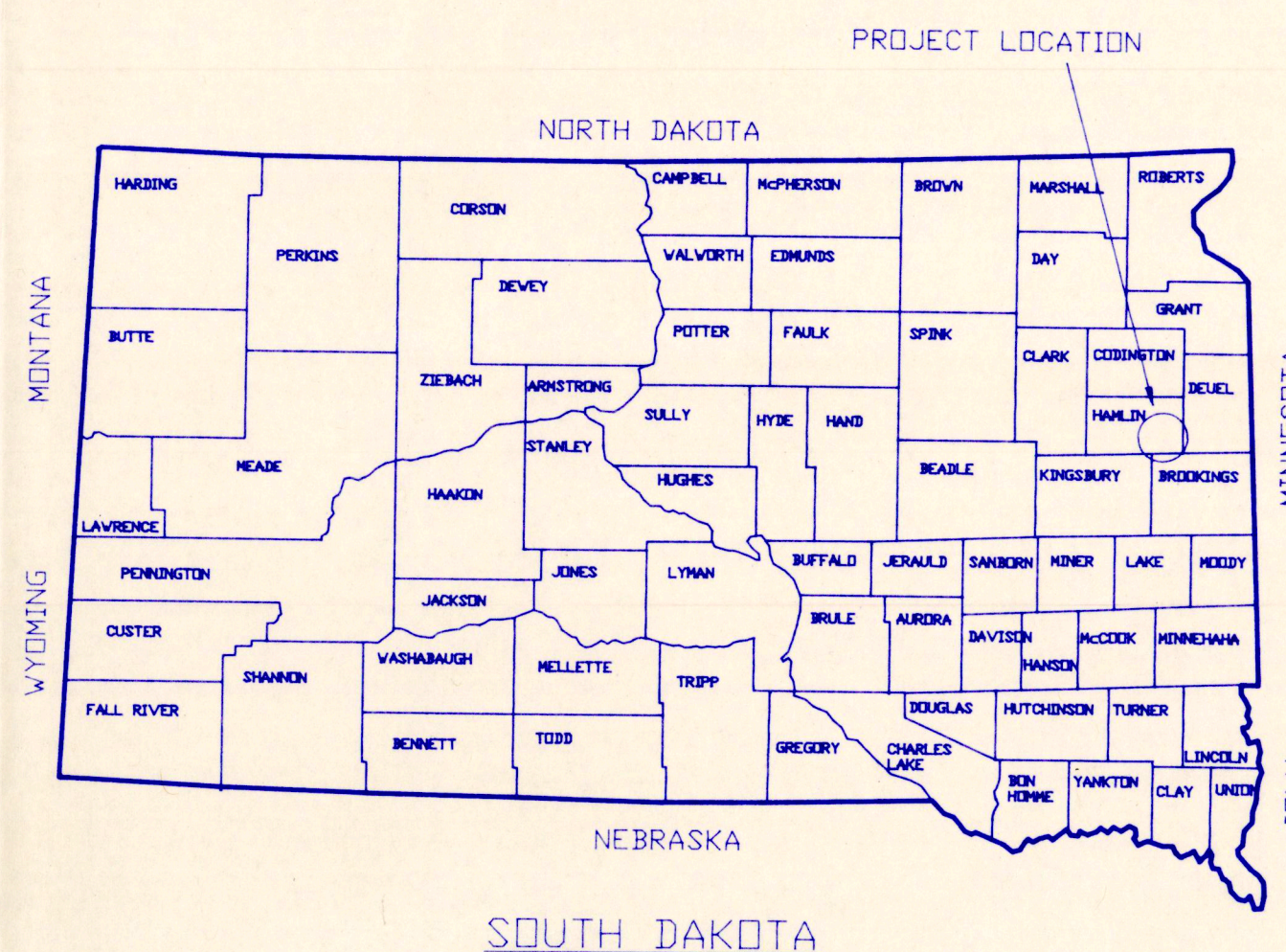
SECTIONS 16-21, T 114 N, R 52 W,
HAMLIN COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

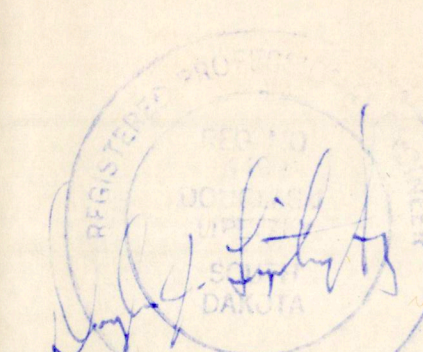
S.D. GAME, FISH & PARKS
&
SEVERAL PRIVATE LANDOWNERS



VICINITY MAP



LOCATION MAP

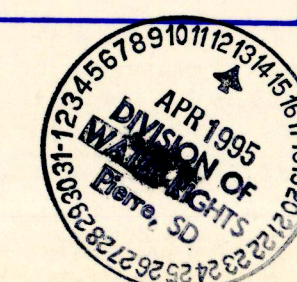


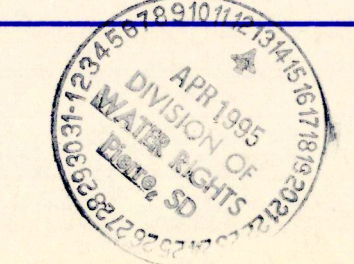
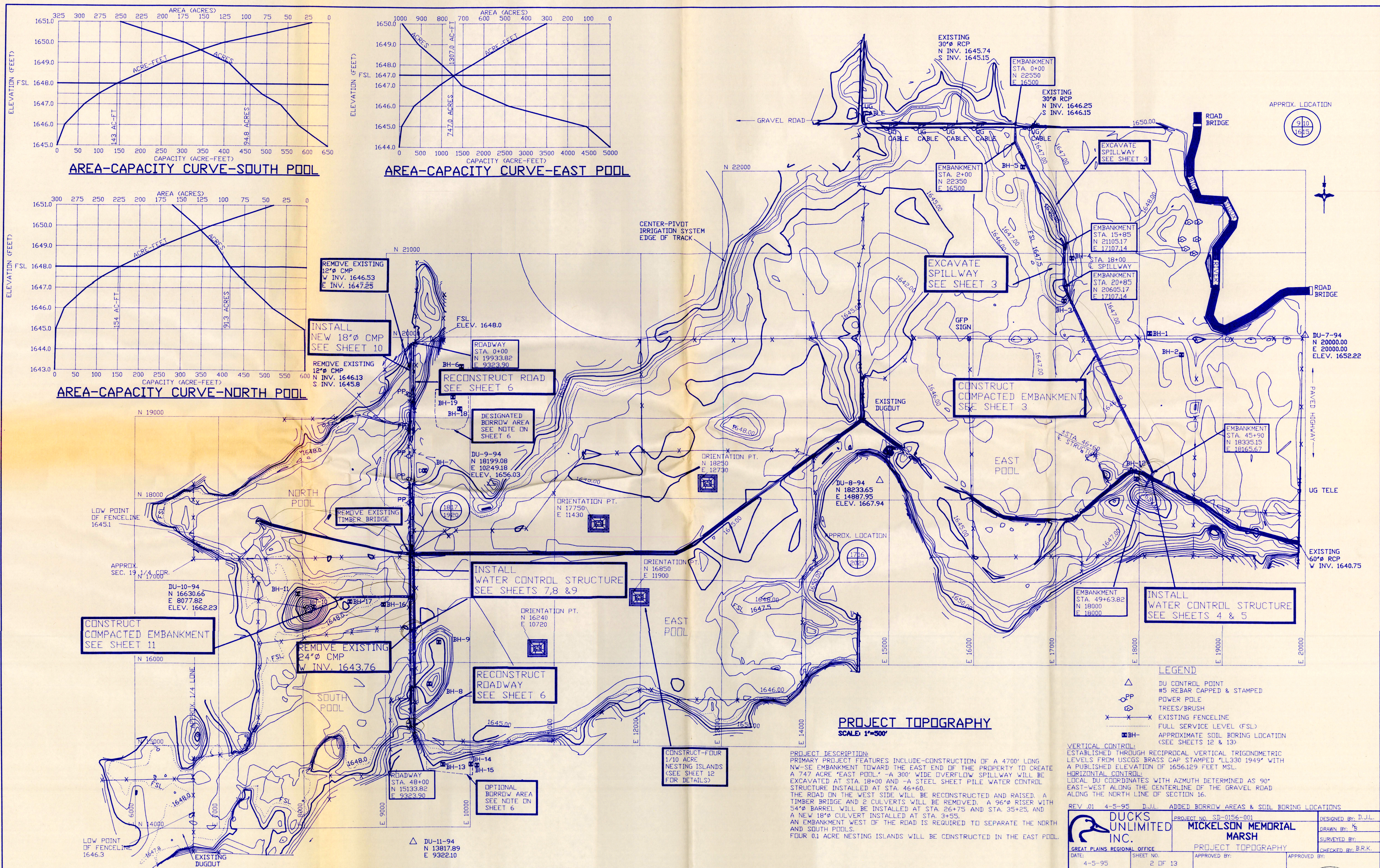
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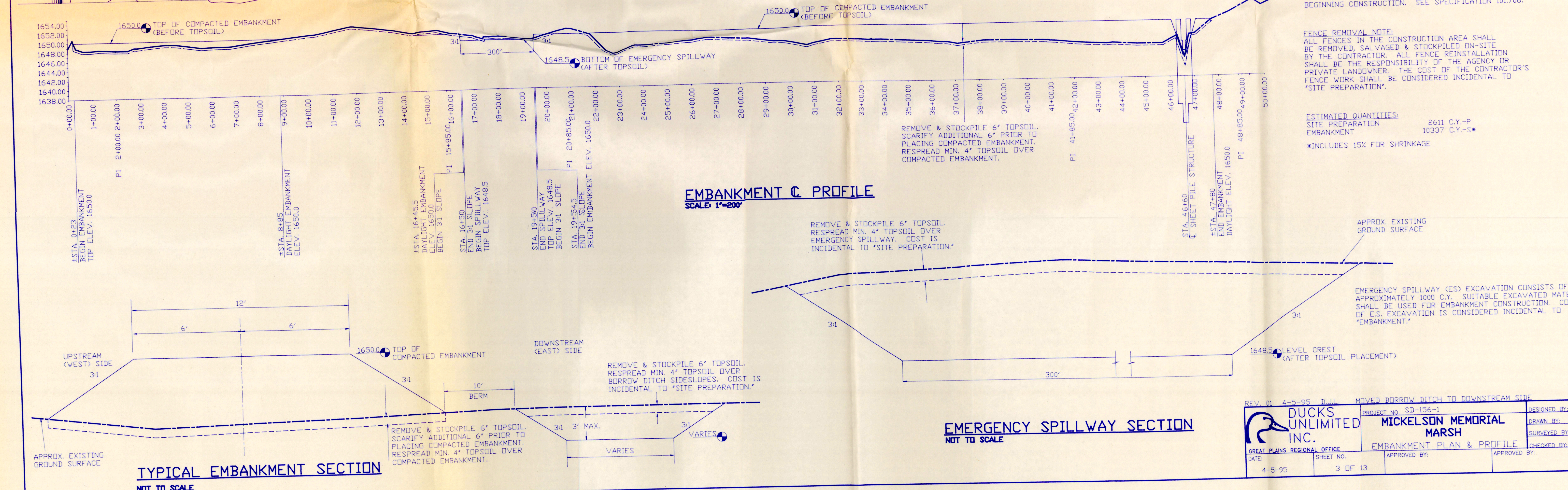
PROJECT SIGNING	
SIGN 'A' 24"x36"	SIGN 'B' 11"x14"
3 SIGN 'A' AND 2 SIGN 'B' WILL BE PROVIDED BY DUCKS UNLIMITED AND DELIVERED TO THE COOPERATING AGENCY. THE AGENCY IS RESPONSIBLE FOR INSTALLING THE SIGN(S) AT THE LOCATION(S) DESIGNATED ON THE PLANS.	

REV. 01 4-5-95 D.J.L. ADDED SOILS INFORMATION, BORROW AREAS,
& MISCELLANEOUS CORRECTIONS.

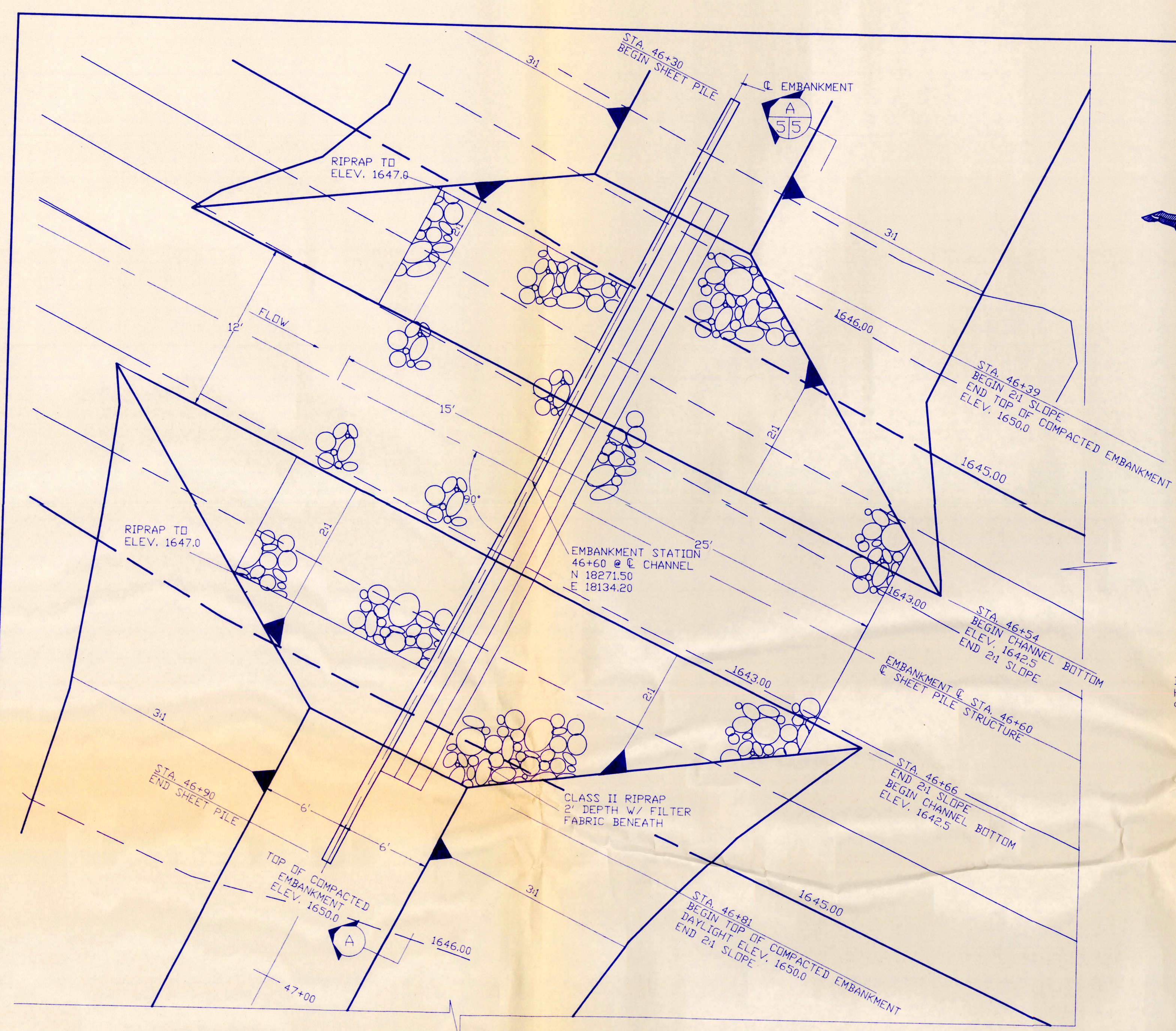
	PROJECT NO. SD-0156-001	DESIGNED BY: D.J.L.
	MICKELSON MEMORIAL MARSH	DRAWN BY: S
GREAT PLAINS REGIONAL OFFICE	VICINITY MAP	SURVEYED BY:
DATE: 4-5-95	SHEET NO. 1 OF 13	CHECKED BY: B.R.K.
APPROVED BY: [Signature]		APPROVED BY:





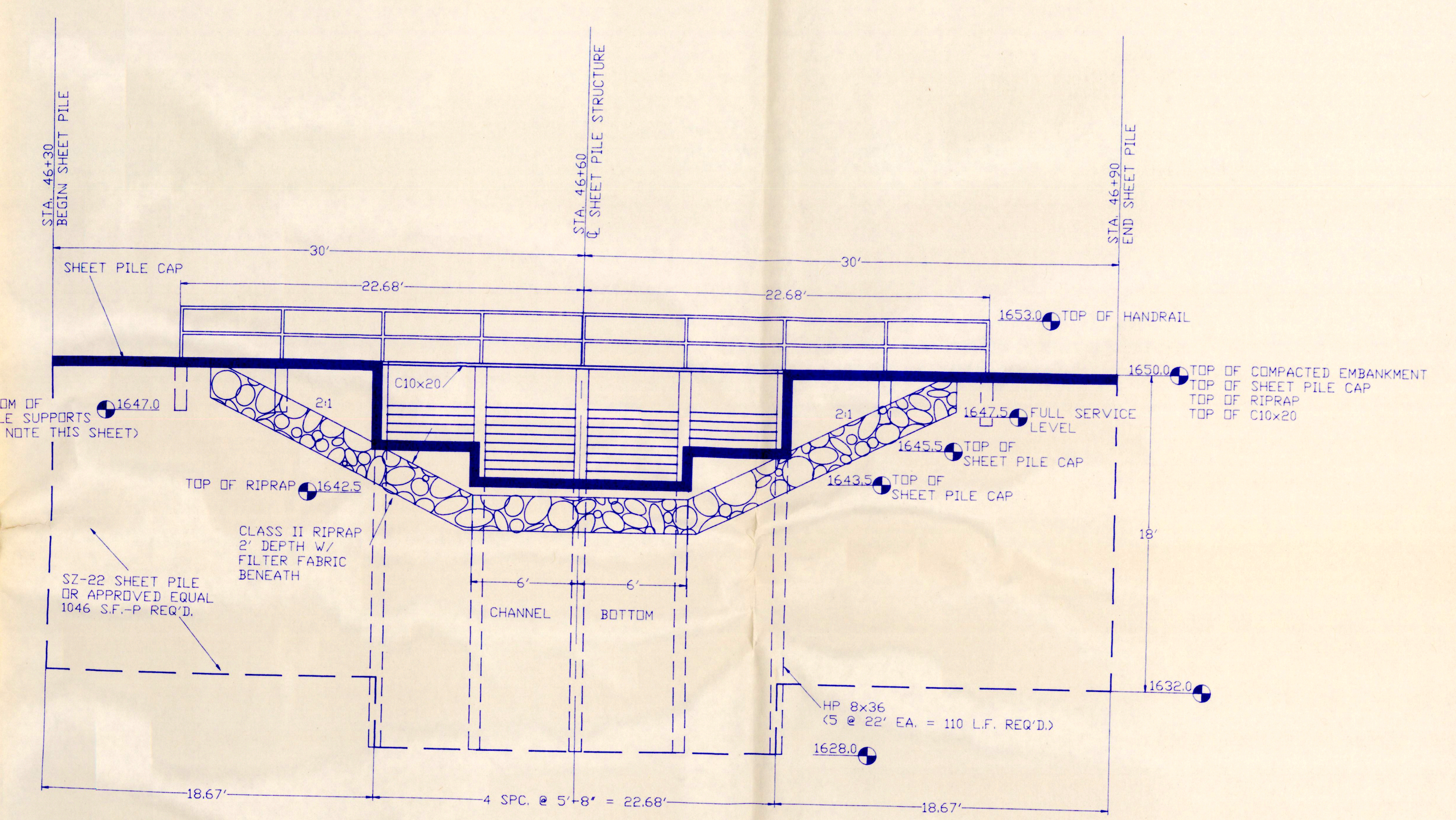
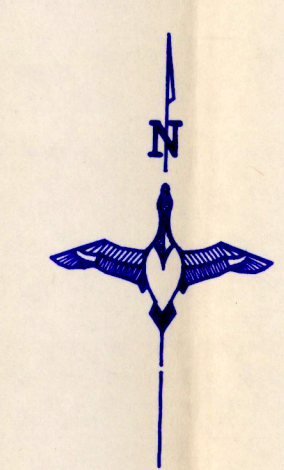


5830-3



SHEET PILE STRUCTURE PLAN
SCALE: 1"=5'

NOTE TO SURVEYORS:
ADJUST STRUCTURE LOCATION & STATIONING
TO FIT CHANNEL & WHEN STAKING.

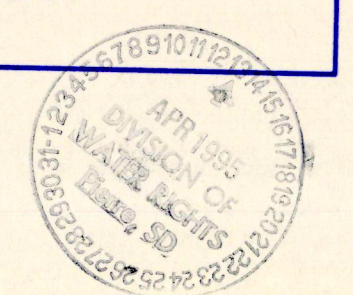


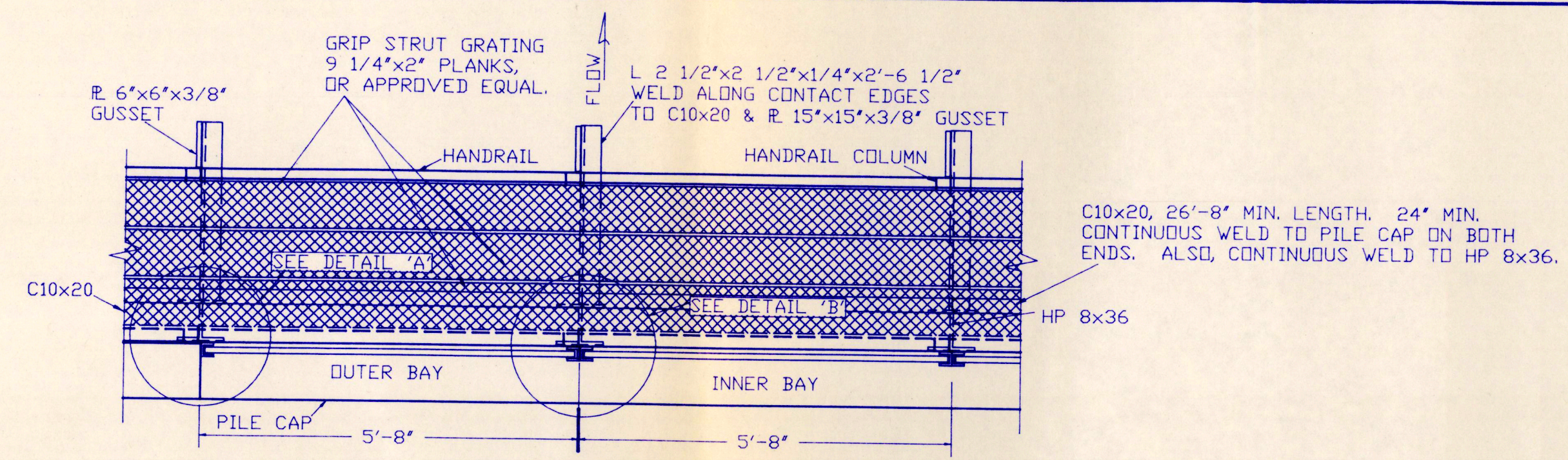
**SECTION 'A'
UPSTREAM SHEET PILE ELEVATION**

SHEET PILE SPECIFICATIONS:
MINIMUM SECTION MODULUS 18.1 IN.³/L.F. OF WALL
MINIMUM THICKNESS 0.375 INCHES

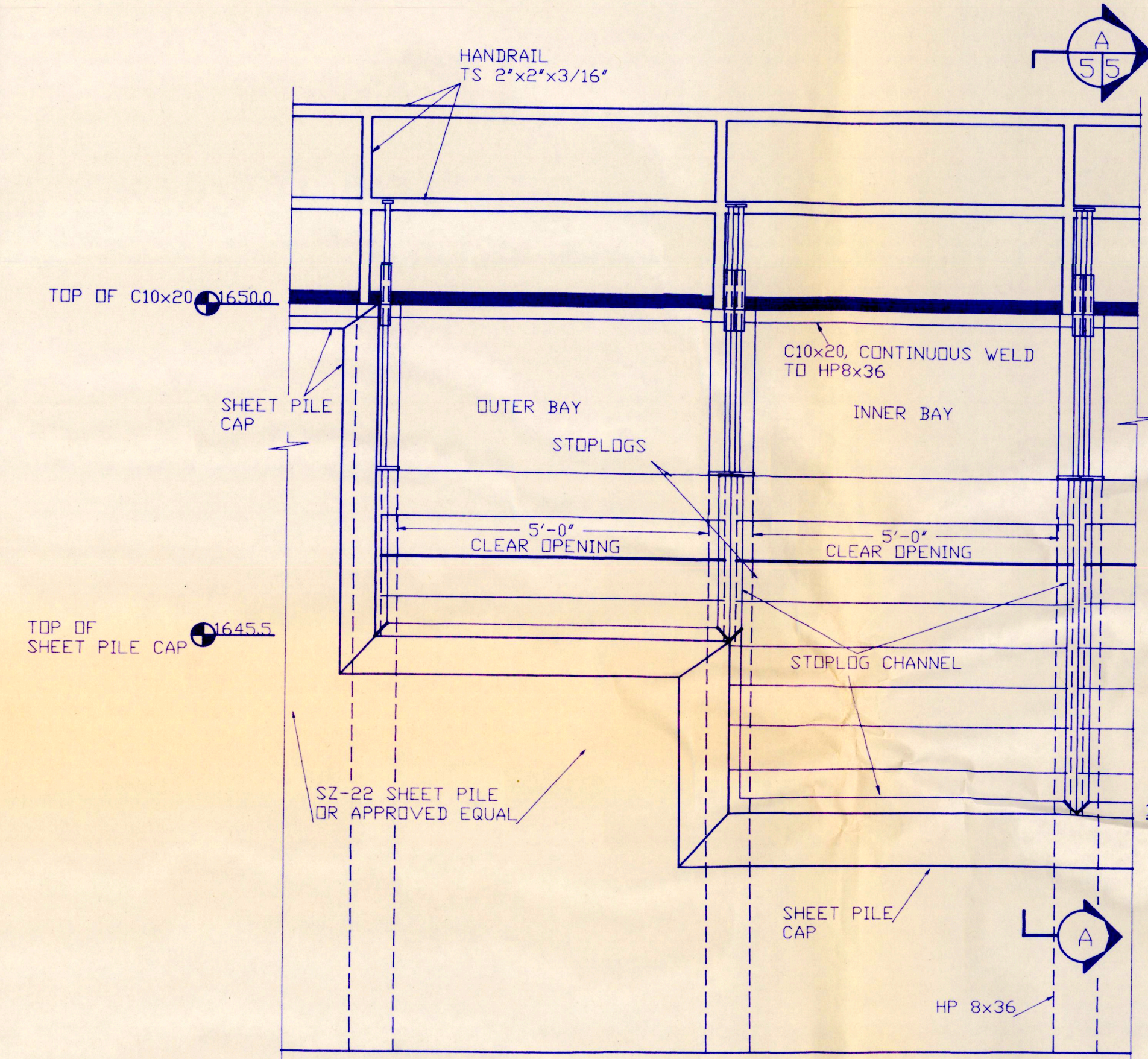
NOTE:
COST OF THE FOUR 3'-0" LONG HP 8x36 NON-DRIVEN SUPPORTS
FOR THE CATWALK SHALL BE INCLUDED IN 'STRUCTURAL STEEL'
BID ITEM.

REV. 01 4-5-95 D.J.L. MISCELLANEOUS UPDATES	PROJECT NO. SD-0156-001	DESIGNED BY: D.J.L.
DUCKS UNLIMITED INC.	MICKELSON MEMORIAL MARSH	DRAWN BY: JS
GREAT PLAINS REGIONAL OFFICE	STRUCTURE SITE PLAN	SURVEYED BY:
DATE: 4-5-95	SHEET NO. 4 OF 13	CHECKED BY: B.R.K.
APPROVED BY:		APPROVED BY:

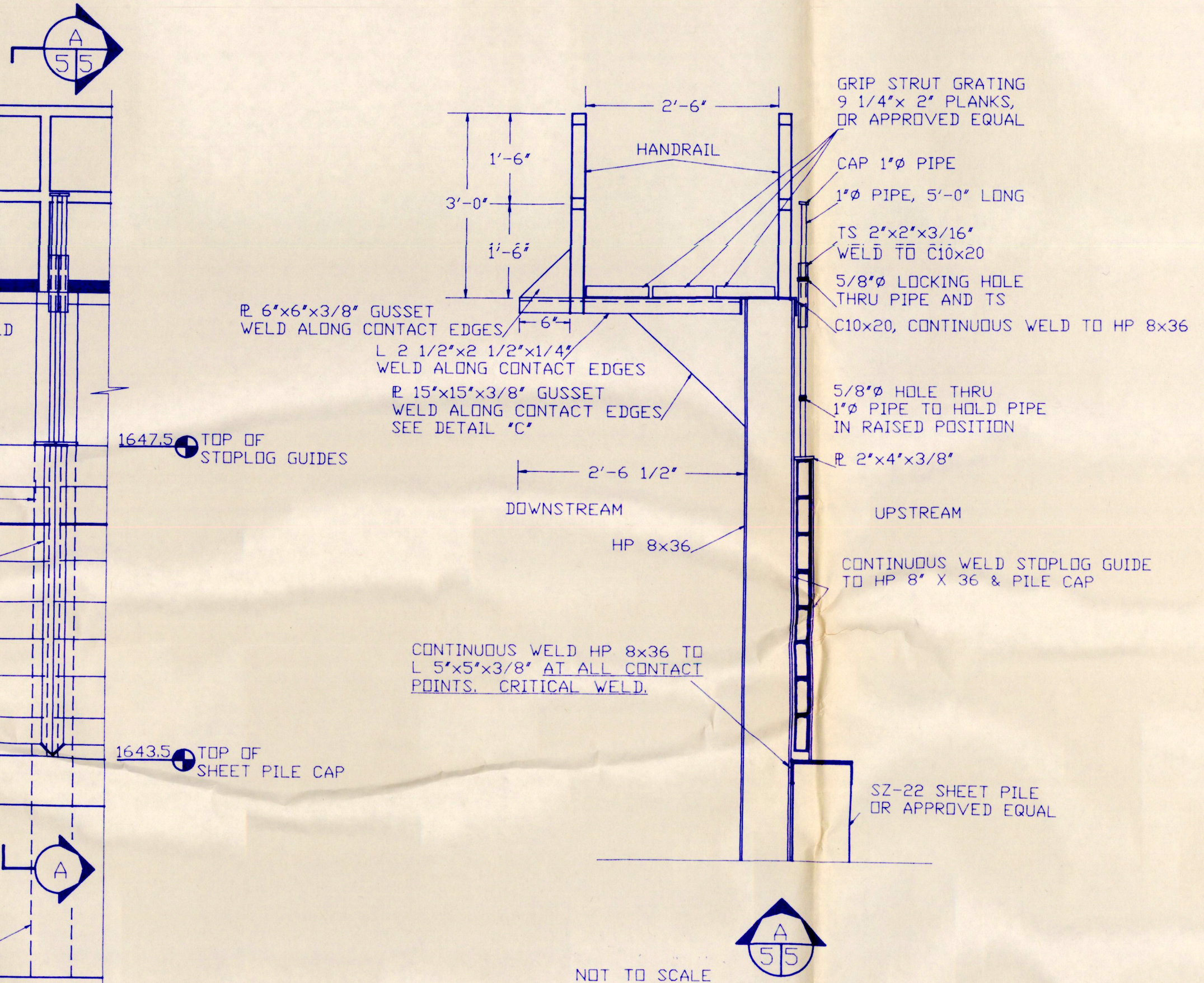




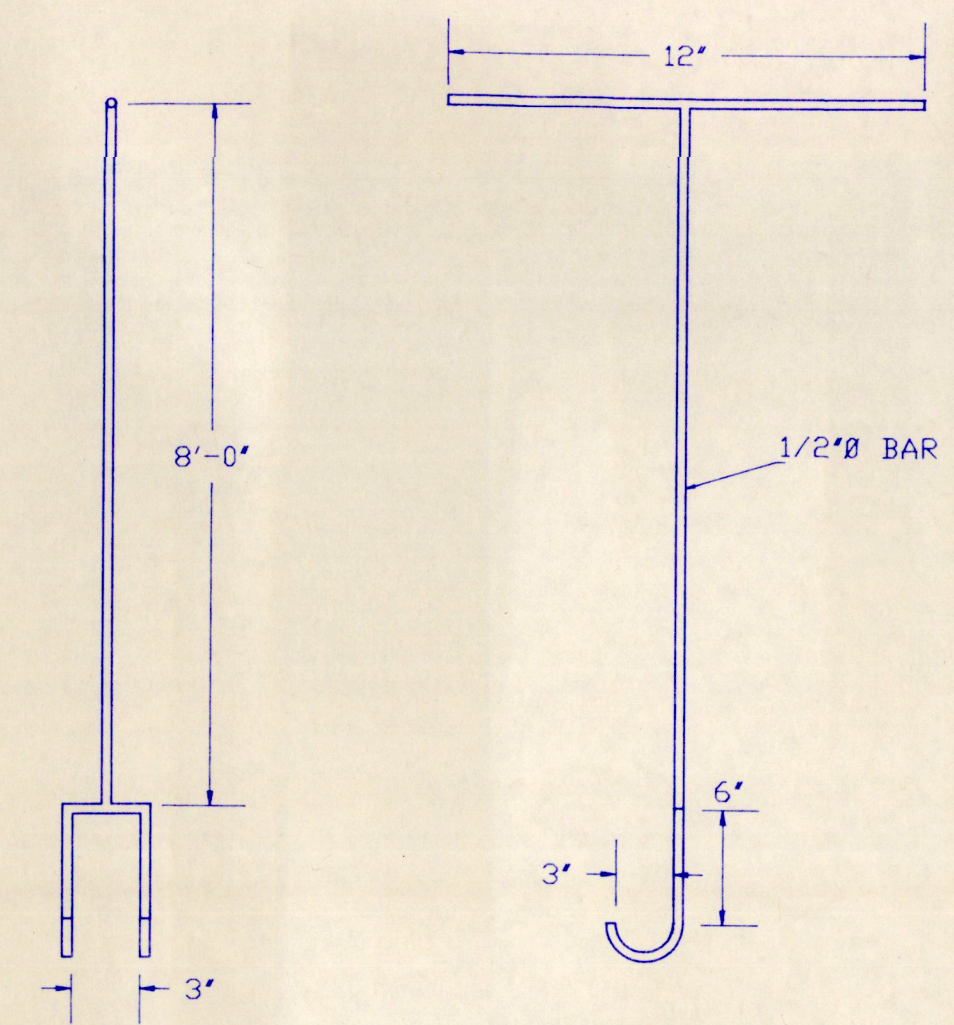
PLAN VIEW
NOT TO SCALE



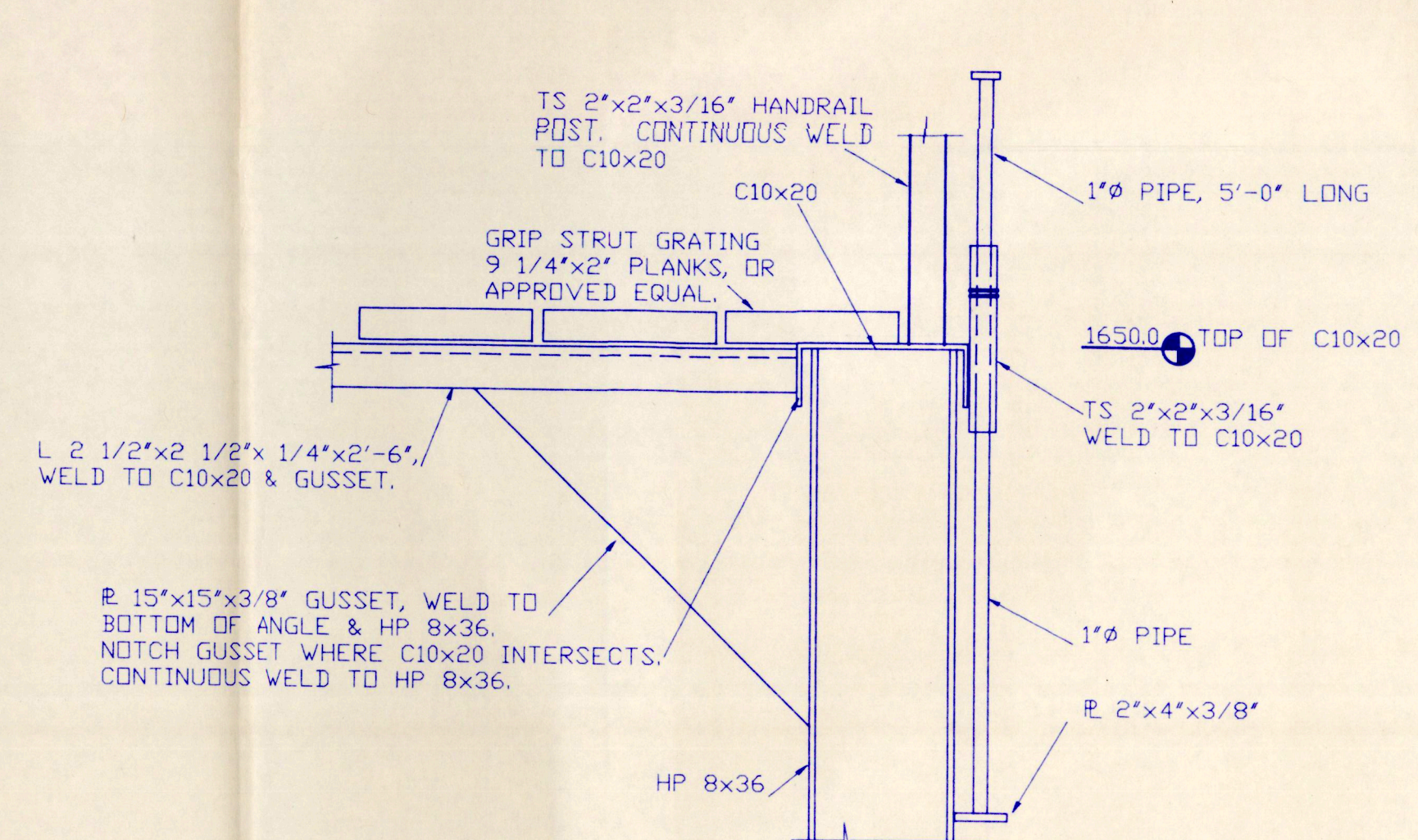
PARTIAL UPSTREAM ELEVATION
NOT TO SCALE



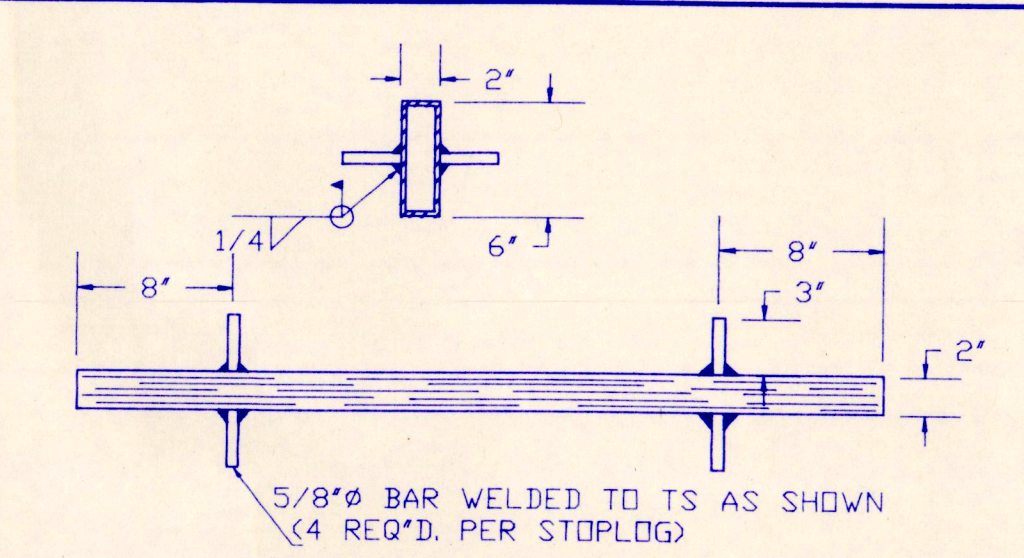
NOT TO SCALE



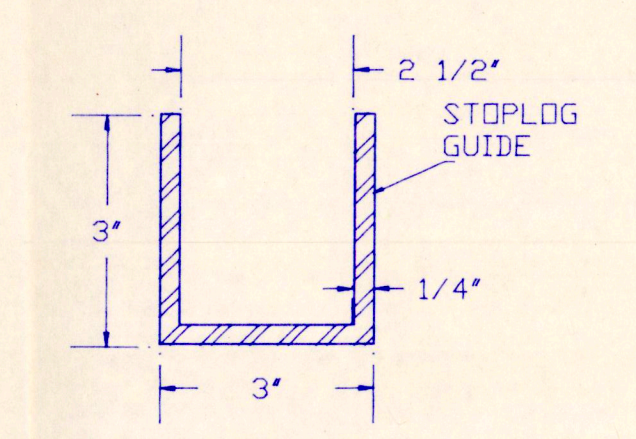
STOPLOG LIFTING HOOK
NOT TO SCALE
(2 REQ'D.)



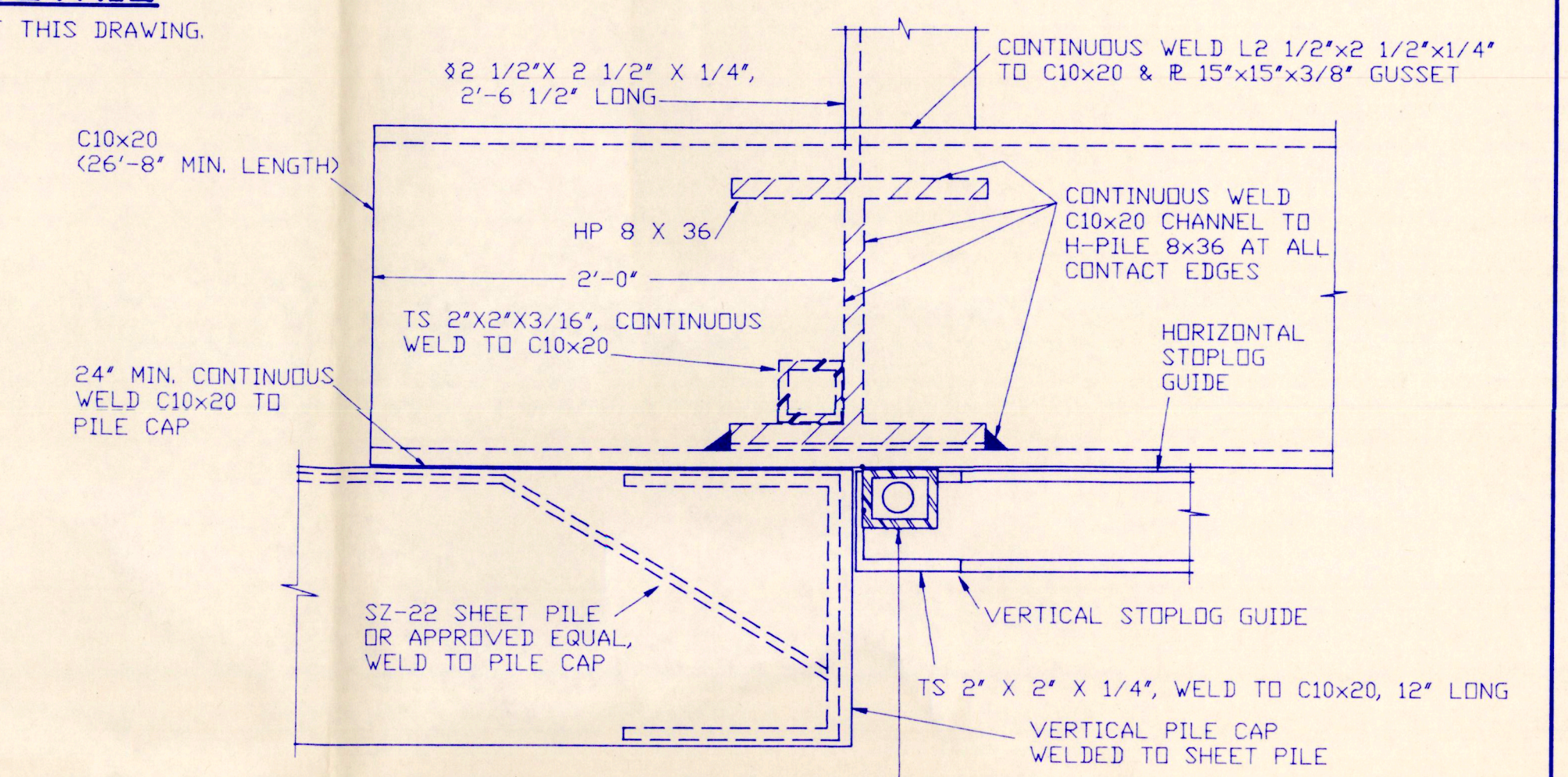
DETAIL 'C'
NOT TO SCALE



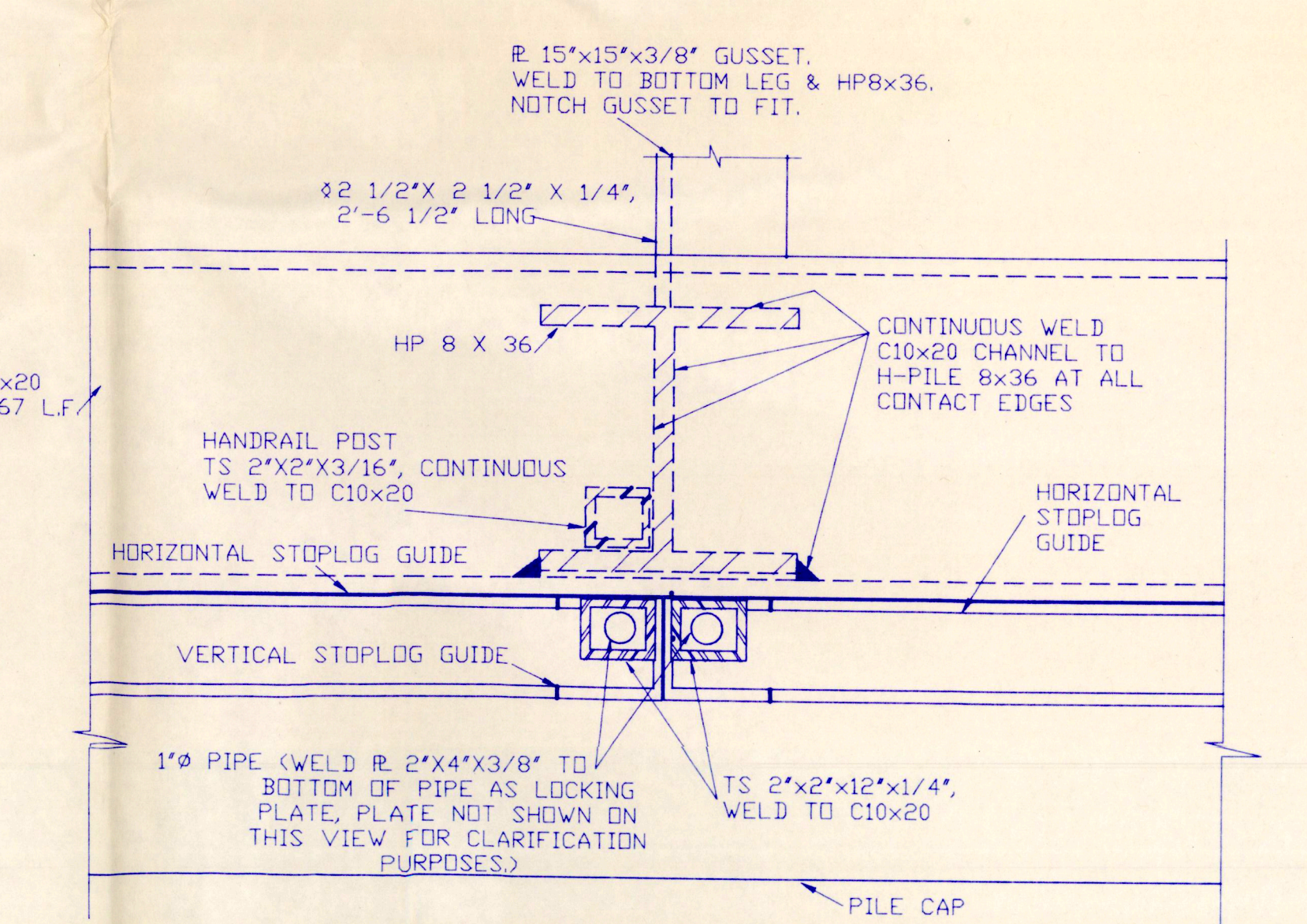
STEEL STOPLOG DETAIL
NOT TO SCALE. DO NOT SCALE OFF THIS DRAWING.



STOPLOG GUIDE DETAIL
NOT TO SCALE
APPROX. 47 L.F. REQUIRED.

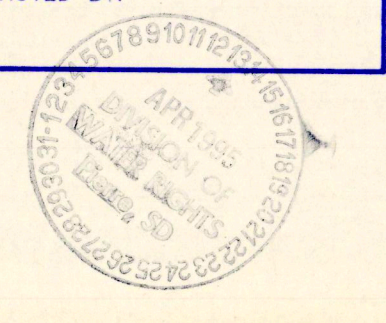


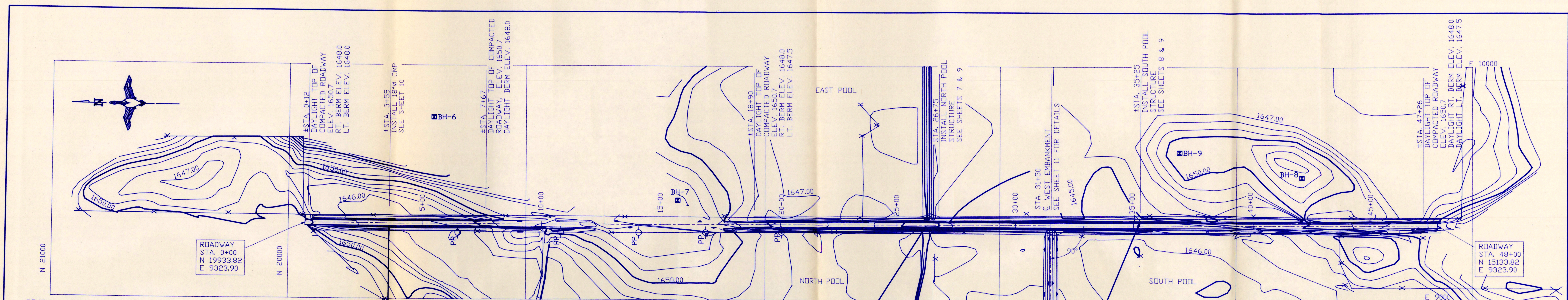
DETAIL 'A'
NOT TO SCALE



DETAIL 'B'
NOT TO SCALE

REV. 01	4-5-95	D.J.L.	MISCELLANEOUS UPDATES
DUCKS UNLIMITED INC.		PROJECT NO. SD-0156-001	DESIGNED BY: D.J.L.
GREAT PLAINS REGIONAL OFFICE		MICKELSON MEMORIAL MARSH	DRAWN BY: B
DATE: 4-5-95		SHEET NO. 5 OF 13	SURVEYED BY:
		APPROVED BY:	CHECKED BY: B.R.K.





REMOVAL NOTE:
ALL EXISTING CMP THAT REQUIRES REMOVAL SHALL BECOME PROPERTY OF THE CONTRACTOR. COST OF REMOVAL & DISPOSAL OF THE TWO CMP'S & THE TIMBER BRIDGE SHALL BE INCLUDED IN "REMOVAL OF EXISTING CULVERTS/STRUCTURES."

FENCE REMOVAL NOTE:
ALL FENCES IN THE CONSTRUCTION AREA SHALL BE REMOVED, SALVAGED & STOCKPILED ON-SITE BY THE CONTRACTOR. ALL FENCE REINSTALLATION SHALL BE THE RESPONSIBILITY OF THE AGENCY OR PRIVATE LANDOWNER. THE COST OF THE CONTRACTOR'S FENCE WORK SHALL BE CONSIDERED INCIDENTAL TO "SITE PREPARATION".

UTILITIES NOTE:
IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE & VERIFY THE LOCATION OF EXISTING UTILITIES BEFORE COMMENCING ANY WORK IN THE VICINITY. REPAIR COSTS FOR ANY DAMAGE TO EXISTING UTILITIES SHALL BE AT THE CONTRACTOR'S EXPENSE. SEE SPECIFICATION 101.706.

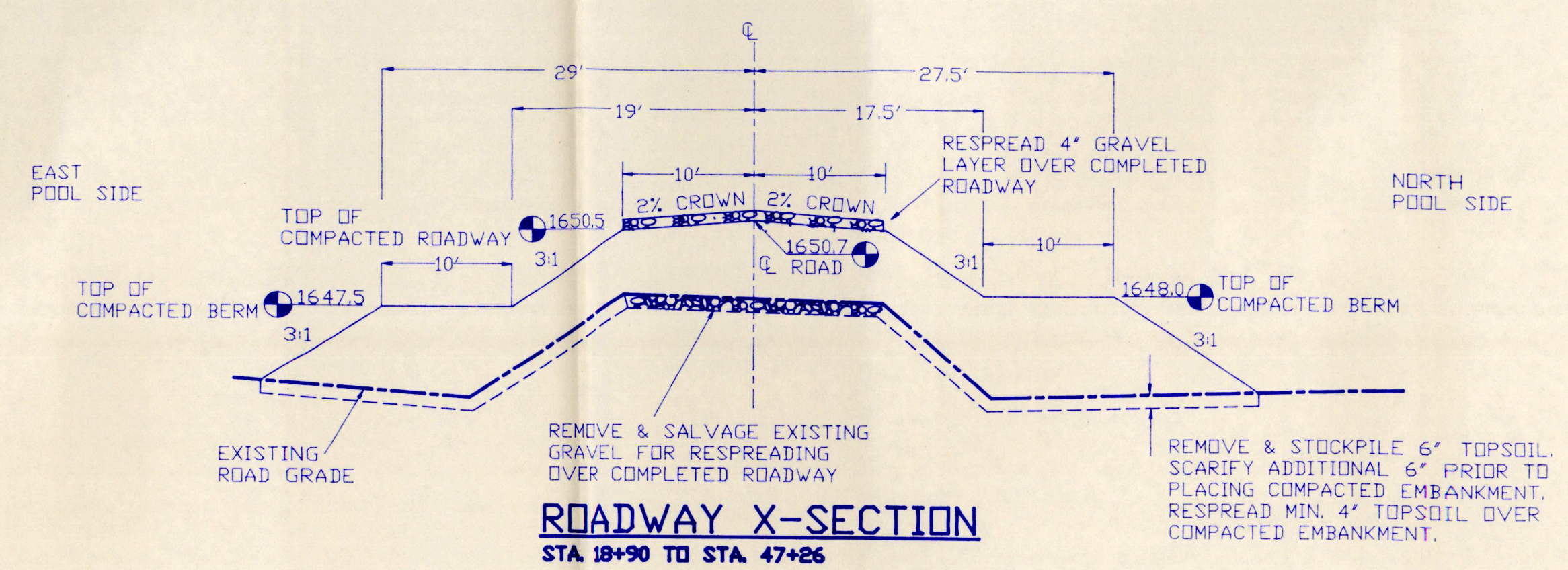
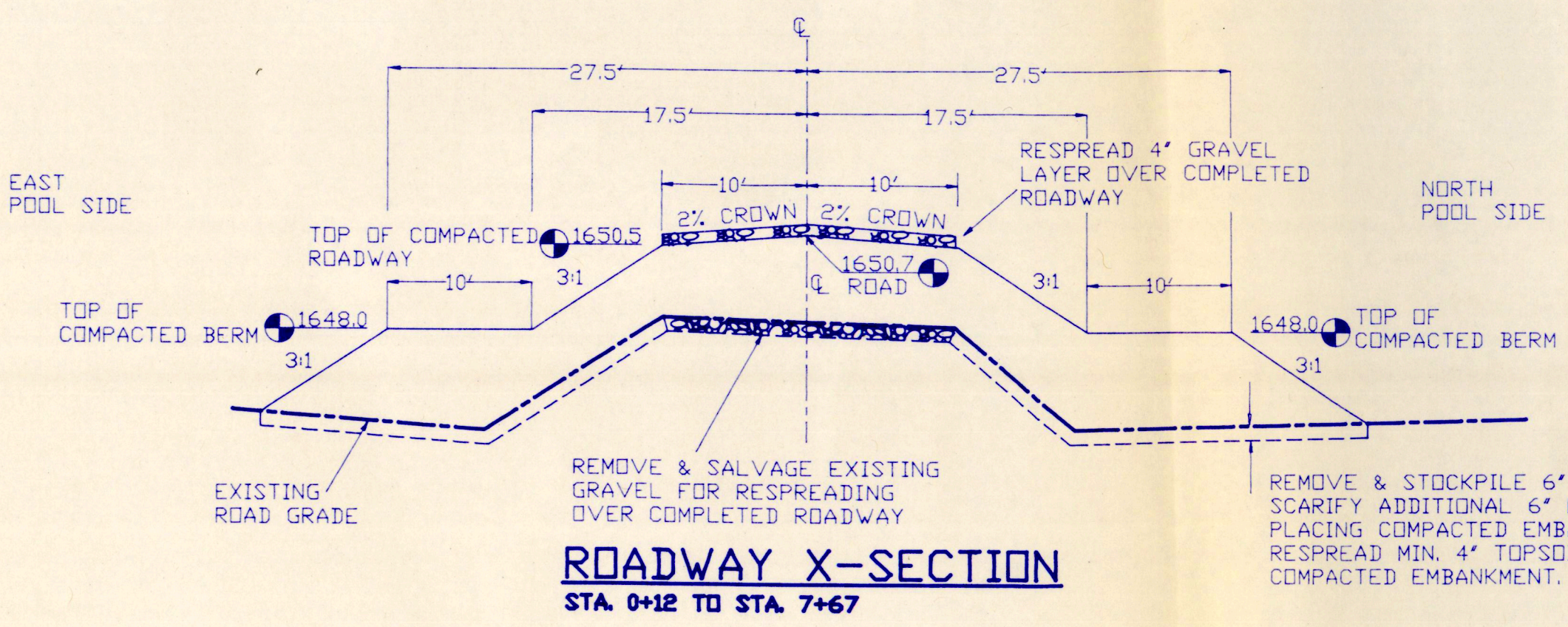
ROADWAY GRADING NOTE:
PRIOR TO PLACING AGGREGATE SURFACING, CONTRACTOR SHALL FINAL GRADE ROADWAY TO CREATE 2% CROWN @ CENTERLINE TO ALLOW FOR DRAINAGE.

IN AREA WHERE EXISTING ROADWAY EMBANKMENT IS HIGHER THAN PROPOSED CROSS-SECTION, NO EXCAVATION IS NECESSARY. HOWEVER, GRAVEL SHALL BE RESPAID OVER ENTIRE LENGTH FROM STA. 0+12 TO STA. 47+26. ALSO, BLEND EMBANKMENT INTO EXISTING CROSS-SECTION AT DAYLIGHT LOCATIONS FOR TOP OF COMPACTED ROADWAY & BERMS.

ESTIMATED ROADWAY QUANTITIES:
SITE PREPARATION 4,352 C.Y.-P
EMBANKMENT 20,243 C.Y.-S*
AGGREGATE SURFACING 873 C.Y.-S**

*INCLUDES 15% FOR SHRINKAGE
**TOTAL @ 4" DEPTH IS (4714'x20'x4")=1164 C.Y.
MINUS 1" SALVAGED @ 291 C.Y.=873 C.Y.-P

BORROW FOR ROADWAY EMBANKMENT:
SUITABLE MATERIAL FOR CONSTRUCTION OF THE EMBANKMENT SHALL BE OBTAINED FROM THE "DESIGNATED BORROW AREA" AS SHOWN ON SHEET 2. TOPSOIL SHALL BE STRIPPED FROM THE BORROW AREAS AND STOCKPILED. UPON COMPLETION, THE TOPSOIL SHALL BE RESPAID OVER THE BORROW AREA SIDESLOPES AND BOTTOM. COST OF TOPSOIL WORK ON THE BORROW AREA SHALL BE CONSIDERED INCIDENTAL TO "SITE PREPARATION".



LEGEND

- △ DU CONTROL POINT
- #5 REBAR CAPPED & STAMPED
- PP POWER POLE
- ⊗ TREES/BRUSH
- X---X--- EXISTING FENCELINE
- X---X--- FULL SERVICE LEVEL (FSL)
- BH- APPROX. SOIL BORING LOCATIONS (SEE SHEETS 12 & 13)

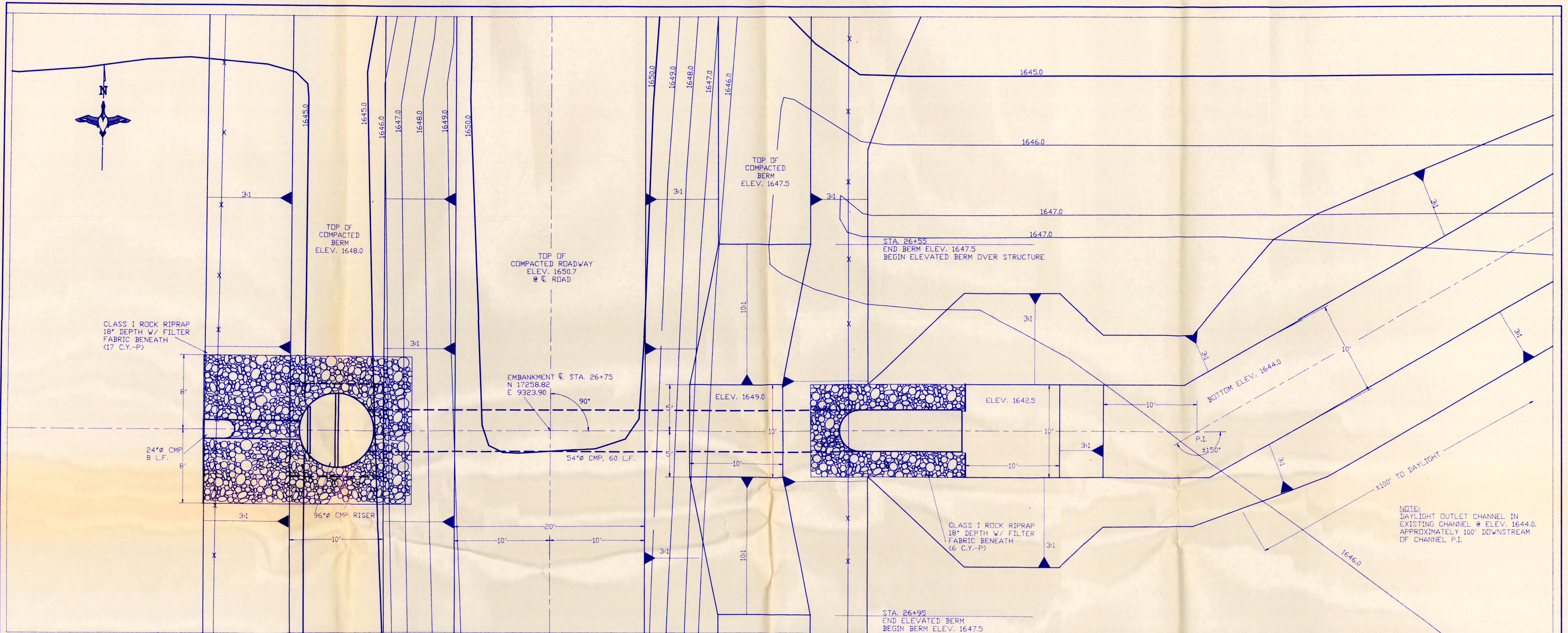
REV. 01 4-5-95 D.J.L. MISCELLANEOUS UPDATES

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

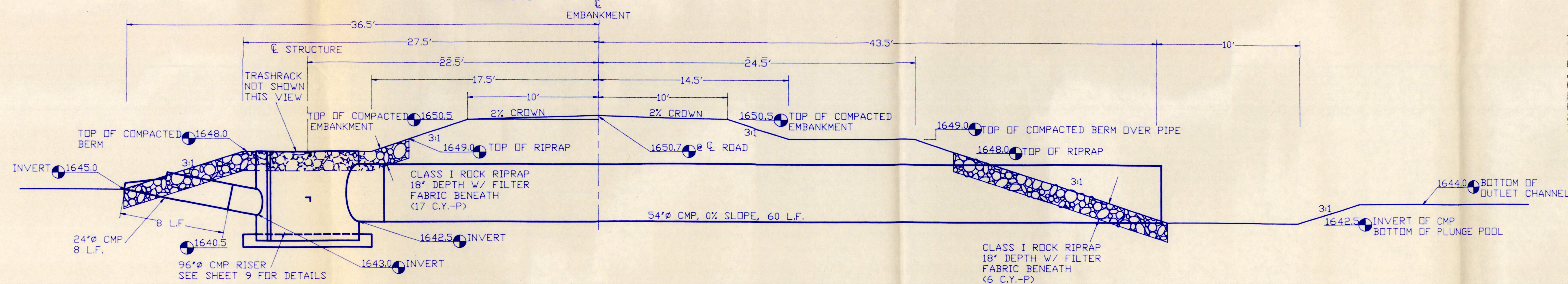
PROJECT NO. SD-0156-001
MICKELSON MEMORIAL MARSH
ROADWAY RECONSTRUCTION

DESIGNED BY: D.J.L.
DRAWN BY: KB
SURVEYED BY:
CHECKED BY: B.R.K.

DATE: 4-5-95 SHEET NO. 6 OF 13 APPROVED BY: APPROVED BY:



NORTH STRUCTURE PLAN
SCALE 1"=5'

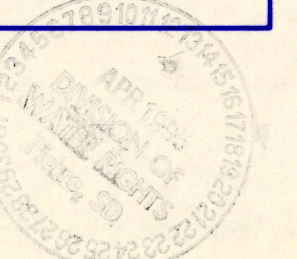


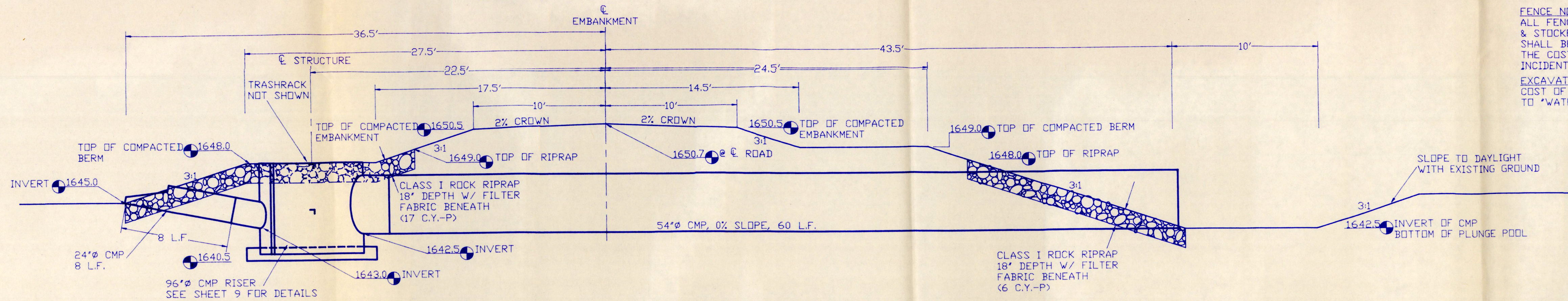
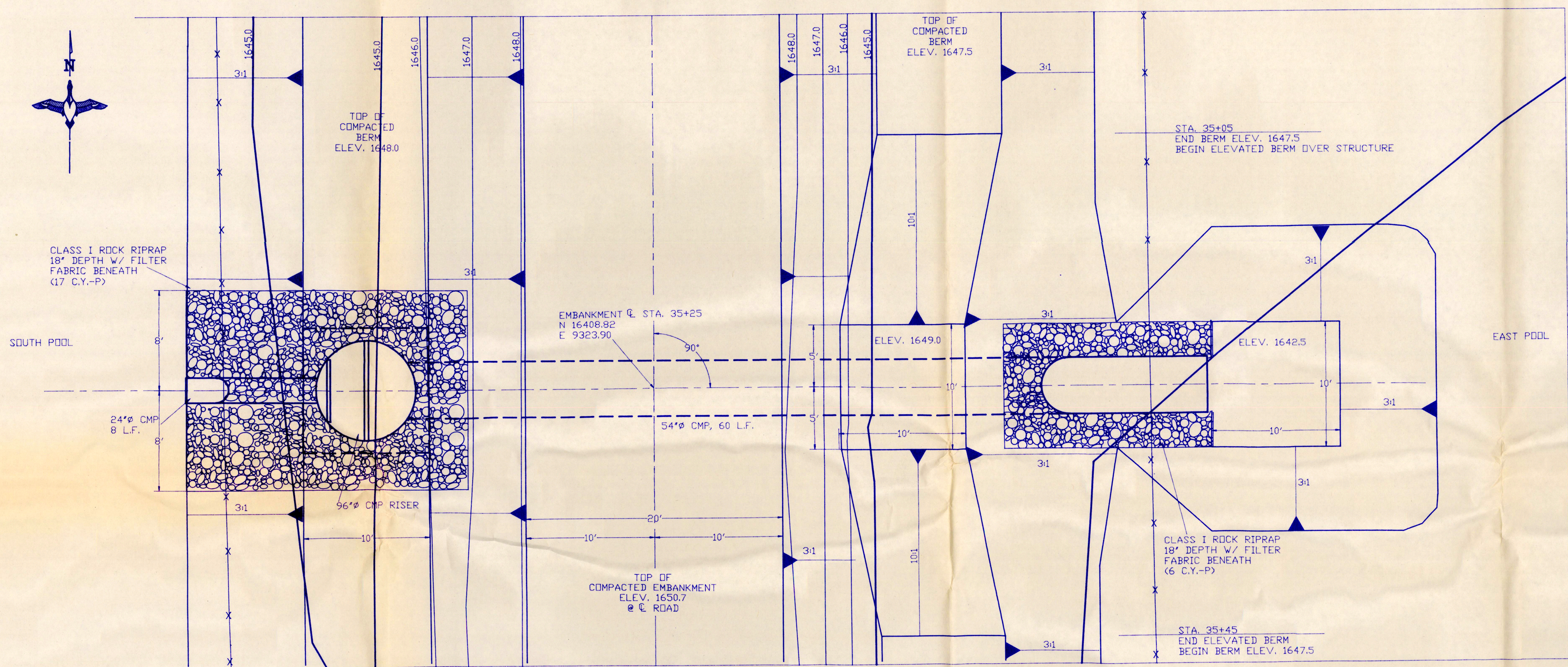
NORTH STRUCTURE @ PROFILE
SCALE 1"=5' HORIZ. & VERT.

FENCE NOTE:
ALL FENCES IN THE CONSTRUCTION AREA SHALL BE REMOVED, SALVAGED & STOCKPILED ON-SITE BY THE CONTRACTOR. ALL FENCE REINSTALLATION SHALL BE THE RESPONSIBILITY OF THE AGENCY OR PRIVATE LANDOWNER. THE COST OF THE CONTRACTOR'S FENCE WORK SHALL BE CONSIDERED INCIDENTAL TO 'SITE PREPARATION' EXCAVATION NOTE:
PLUNGE POOL & OUTLET CHANNEL EXCAVATION INVOLVES APPROXIMATELY 220 C.Y. COST OF SUCH EXCAVATION SHALL BE CONSIDERED INCIDENTAL TO 'WATER CONTROL STRUCTURE INSTALLATION'.

DIAMETER	CORRUGATION	MINIMUM GAUGE
96" CMP	3 x 1 CORR.	12 GA.
	2 2/3 x 1/2 CORR.	8 GA.
54" CMP	3 x 1 CORR.	16 GA.
	2 2/3 x 1/2 CORR.	12 GA.
24" CMP	2 2/3 x 1/2 CORR.	16 GA.

REV. 01 4-5-95 D.J.L. MISCELLANEOUS UPDATES		PROJECT NO. SD-0156-001	
DUCKS UNLIMITED INC.		MICKELSON MEMORIAL MARSH	
GREAT PLAINS REGIONAL OFFICE		NORTH POOL STRUCTURE PLAN & PROFILE	
DATE: 4-5-95	SHEET NO. 7 OF 13	APPROVED BY:	APPROVED BY:
		CHECKED BY: B.R.K.	



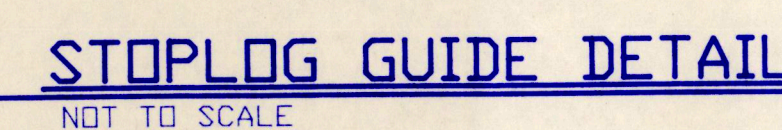
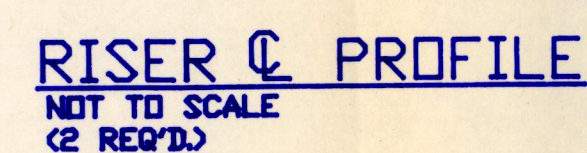
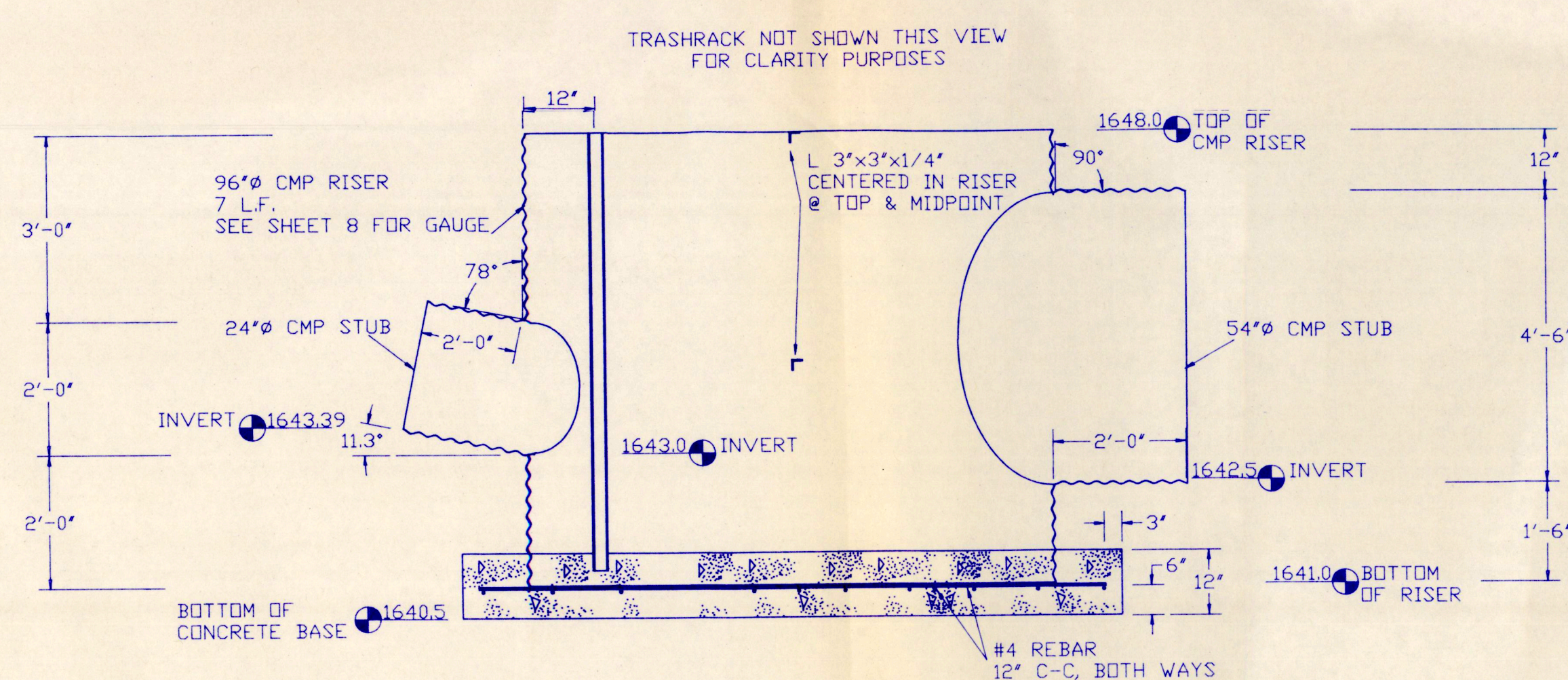
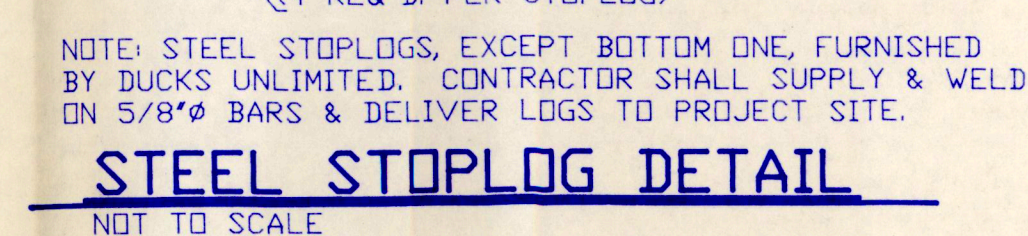
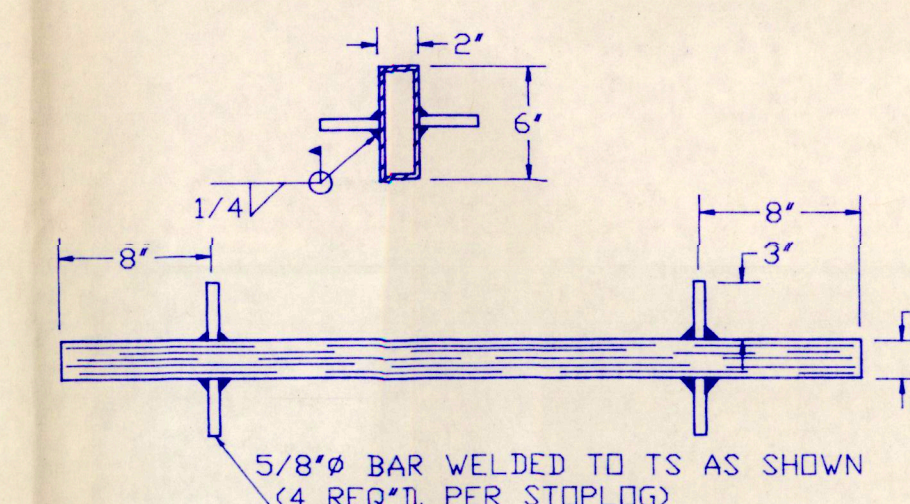
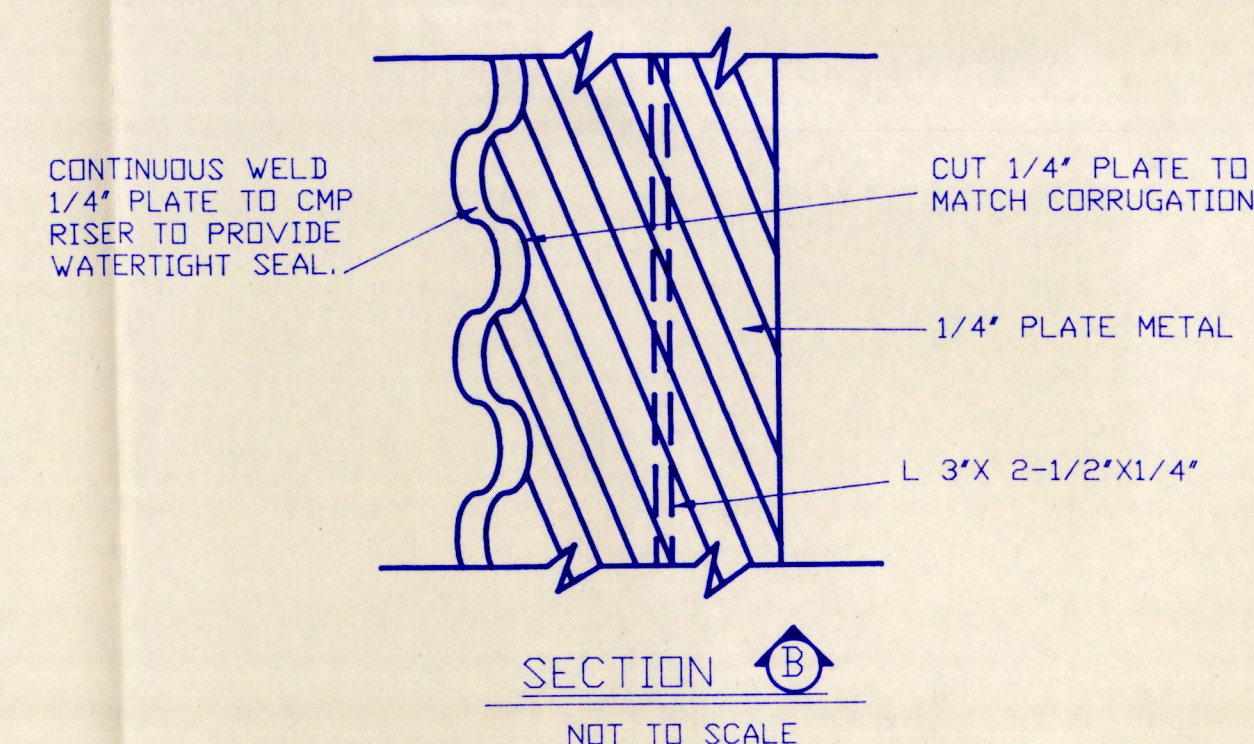
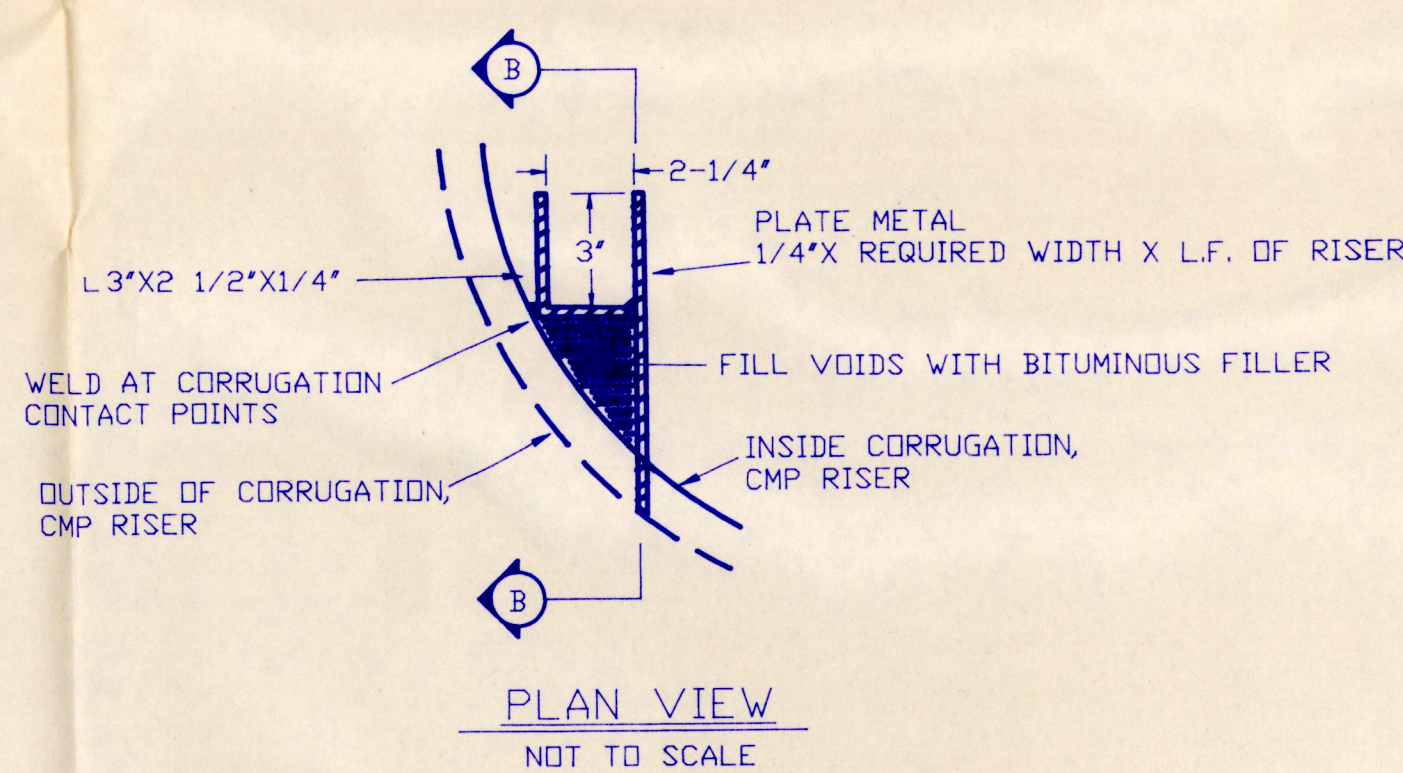
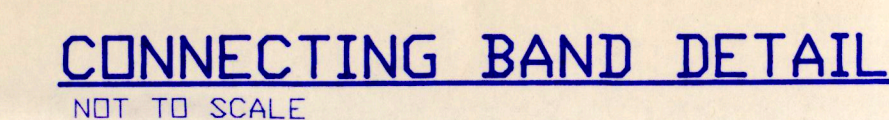
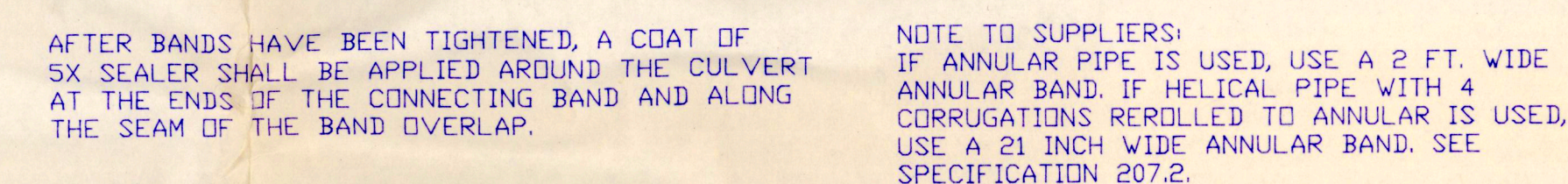
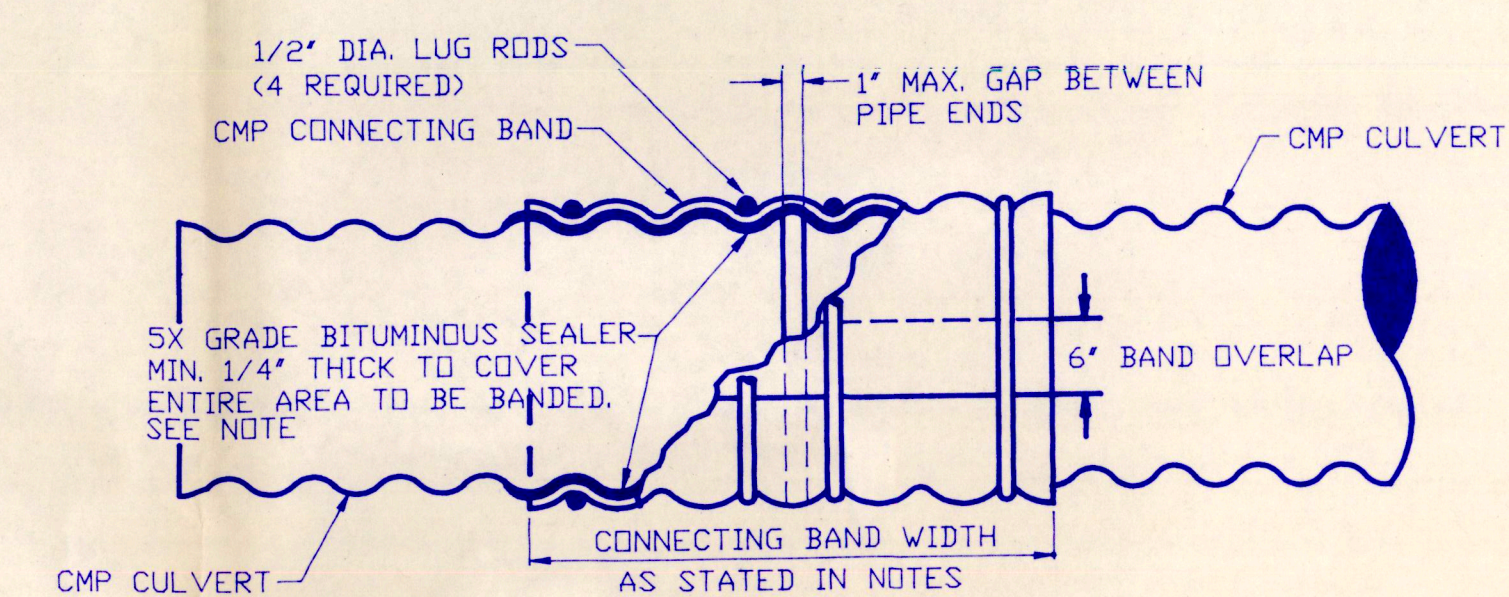
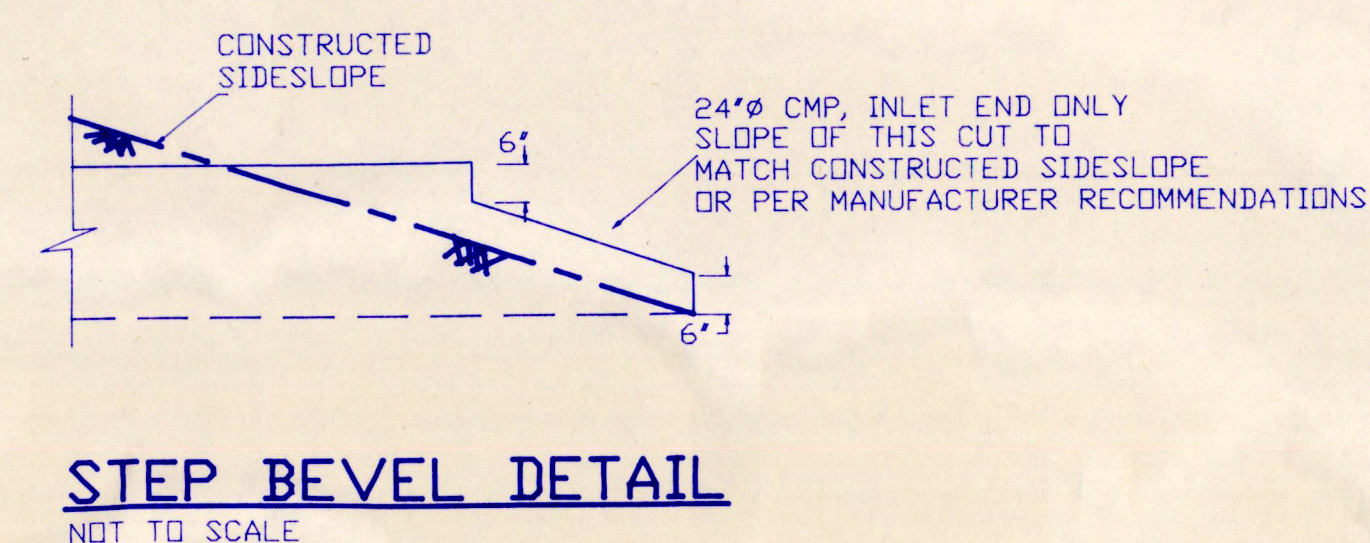
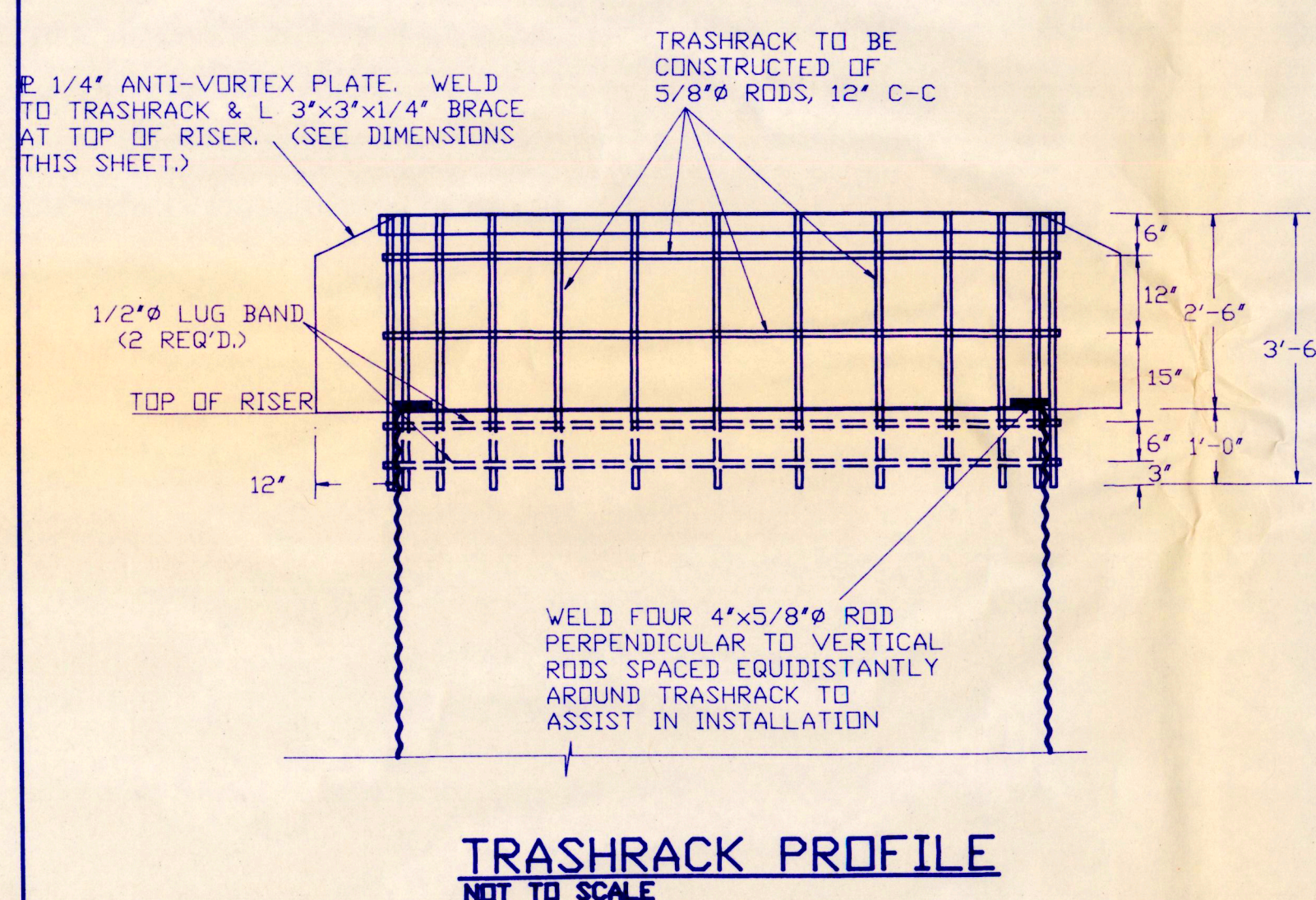
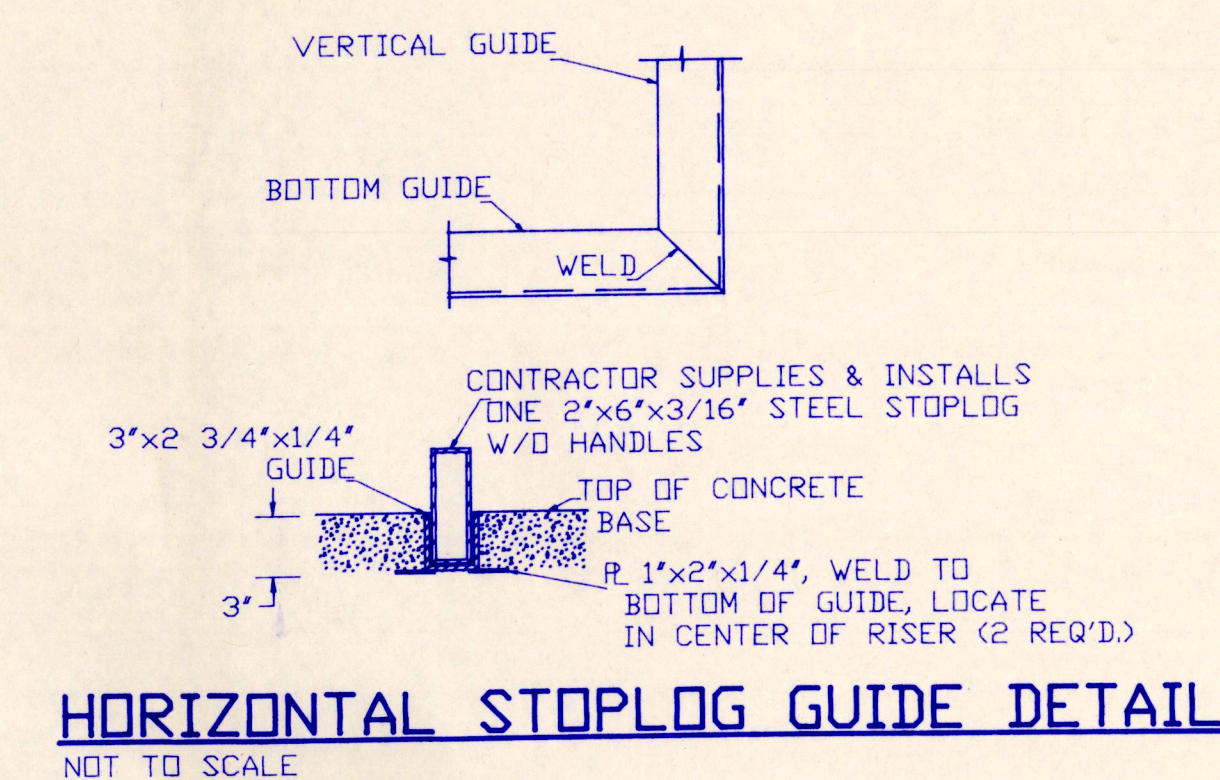
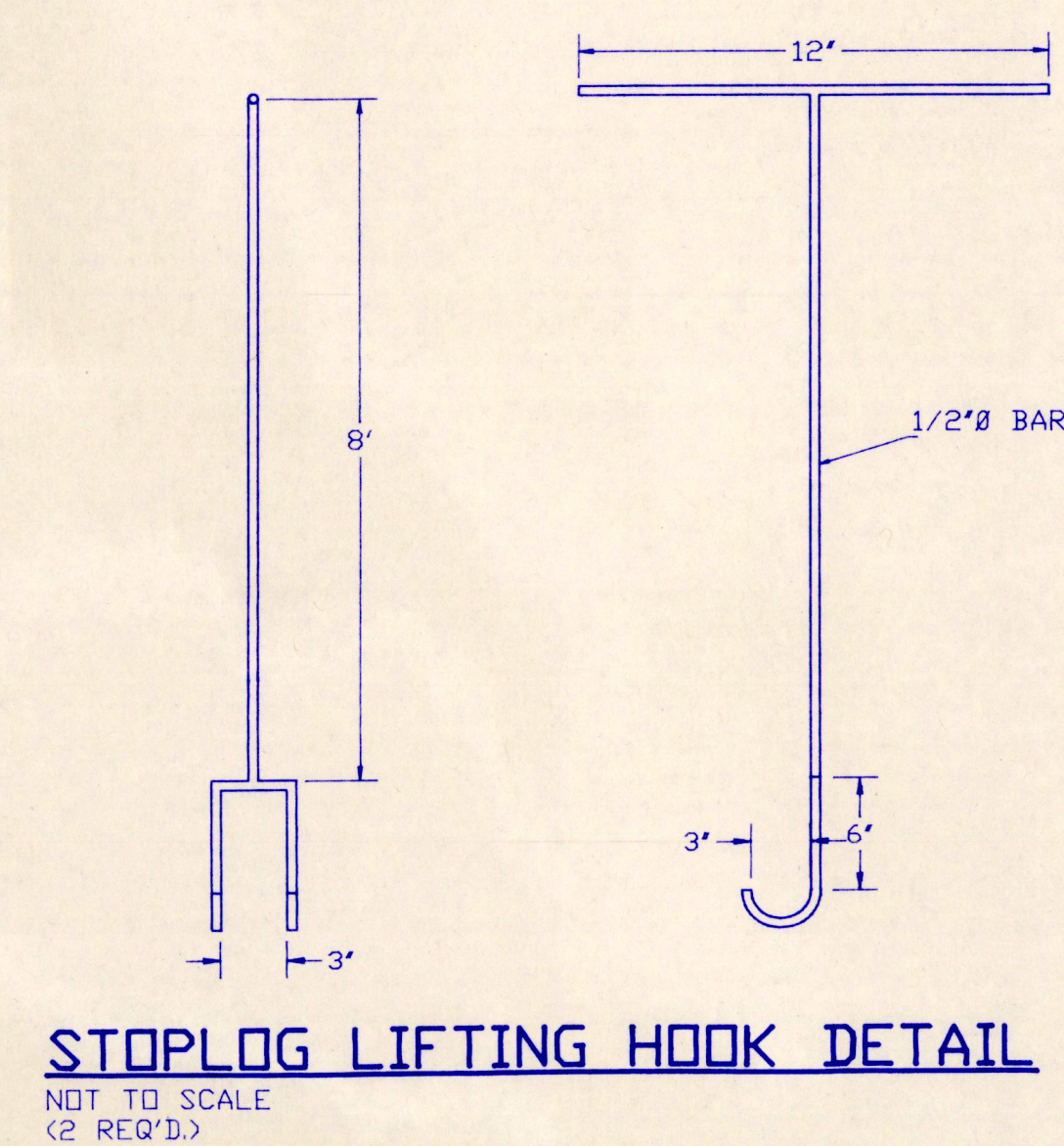
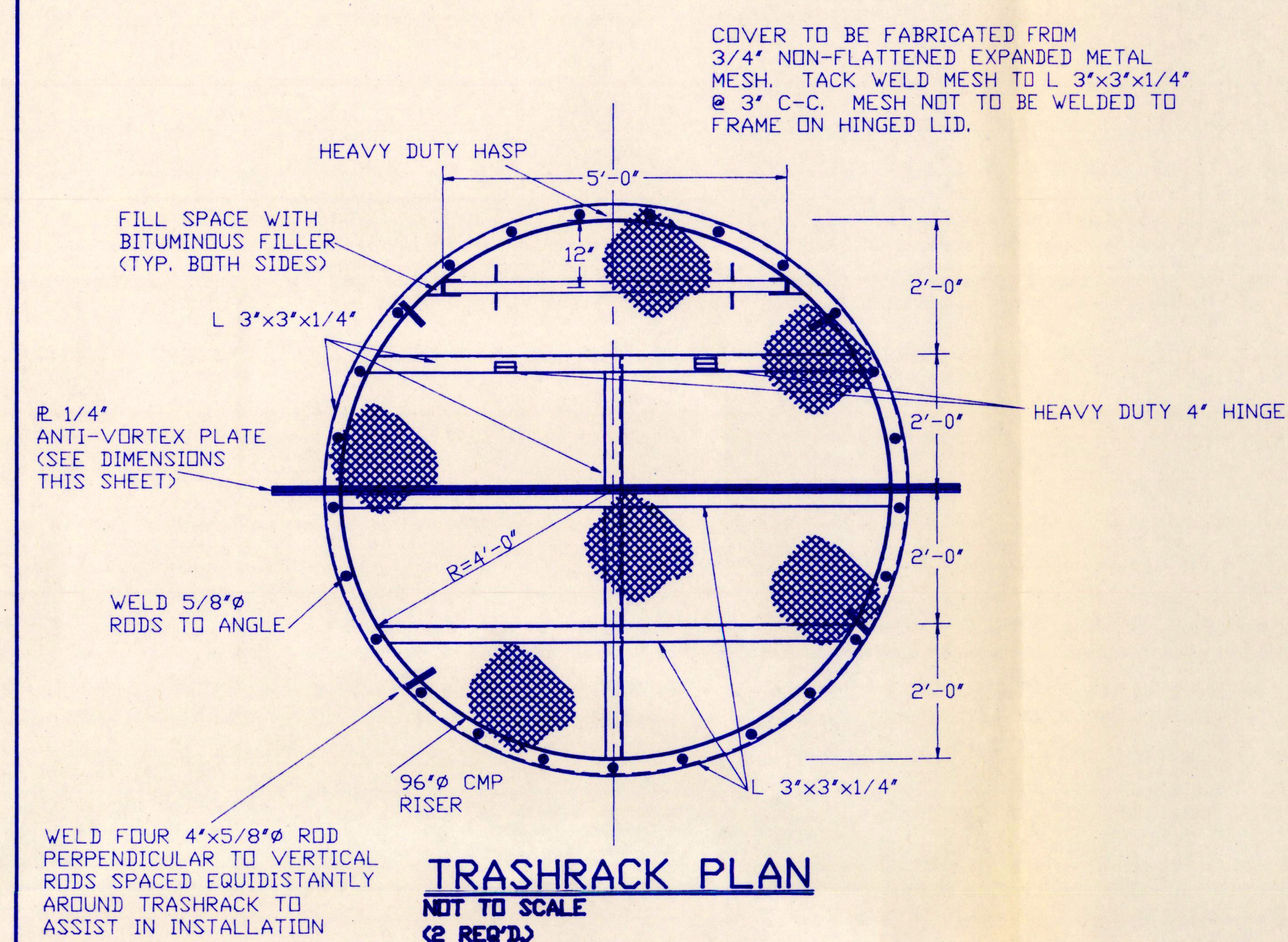


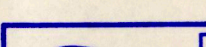
DIAMETER	CORRUGATION	MINIMUM GAUGE
96" CMP	3 x 1 CORR.	12 GA.
	2 2/3 x 1/2 CORR.	8 GA.
54" CMP	3 x 1 CORR.	16 GA.
	2 2/3 x 1/2 CORR.	12 GA.
24" CMP	2 2/3 x 1/2 CORR.	16 GA.

FENCE NOTE:
 ALL FENCES IN THE CONSTRUCTION AREA SHALL BE REMOVED, SALVAGED & STOCKPILED ON-SITE BY THE CONTRACTOR. ALL FENCE REINSTALLATION SHALL BE THE RESPONSIBILITY OF THE AGENCY OR PRIVATE LANDOWNER. THE COST OF THE CONTRACTOR'S FENCE WORK SHALL BE CONSIDERED INCIDENTAL TO 'SITE PREPARATION.'

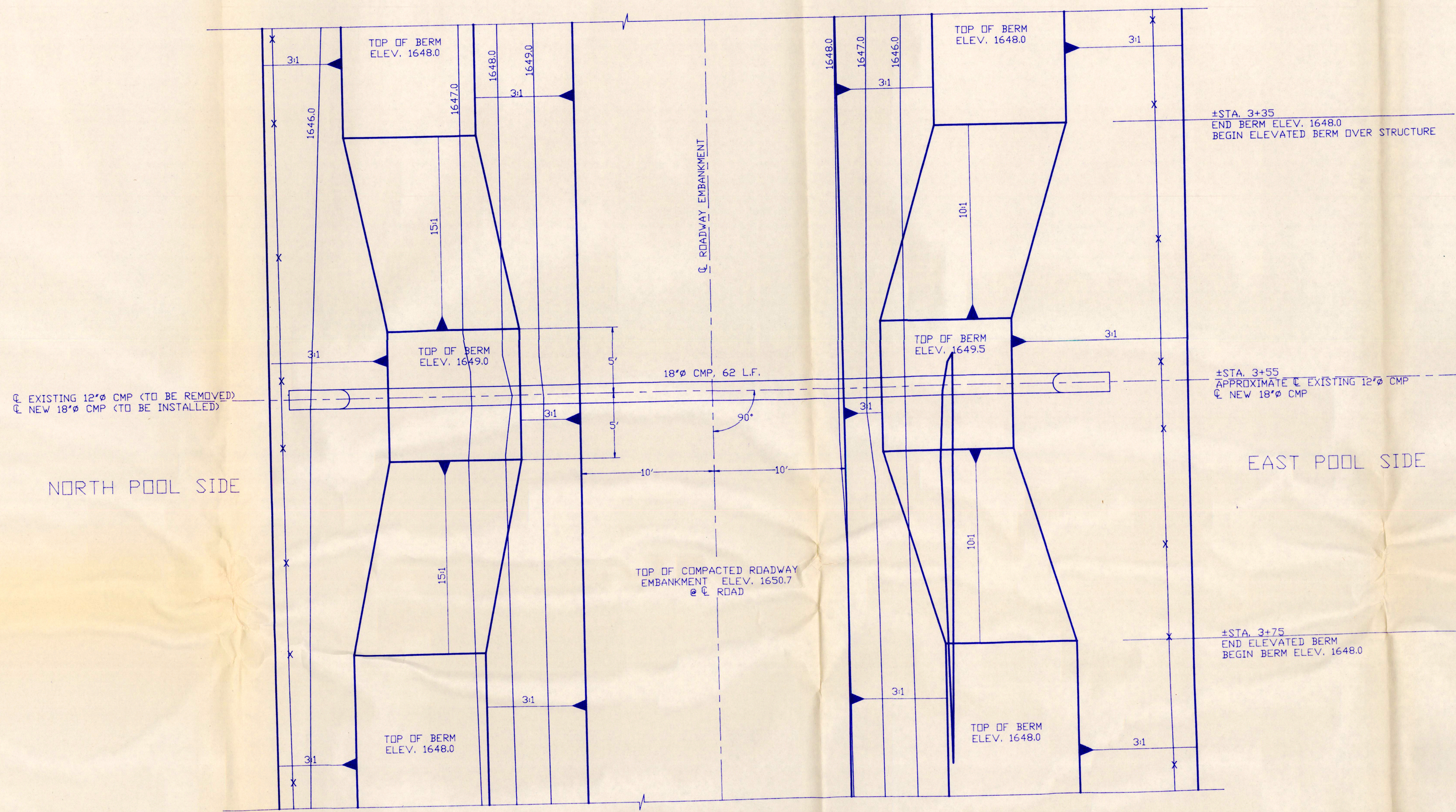
EXCAVATION NOTE:
 COST OF PLUNGE POOL EXCAVATION SHALL BE CONSIDERED INCIDENTAL TO 'WATER CONTROL STRUCTURE INSTALLATION.'

REV. 01 4-5-95 D.J.L. MISCELLANEOUS UPDATES		PROJECT NO. SD-0156-001		DESIGNED BY: D.J.L.
DUCKS UNLIMITED INC.		MICKELSON MEMORIAL MARSH		DRAWN BY: B
GREAT PLAINS REGIONAL OFFICE		SOUTH POOL STRUCTURE PLAN & PROFILE		SURVEYED BY:
DATE: 4-5-95	SHEET NO. 8 OF 13	APPROVED BY:	CHECKED BY: B.R.K.	APPROVED BY:



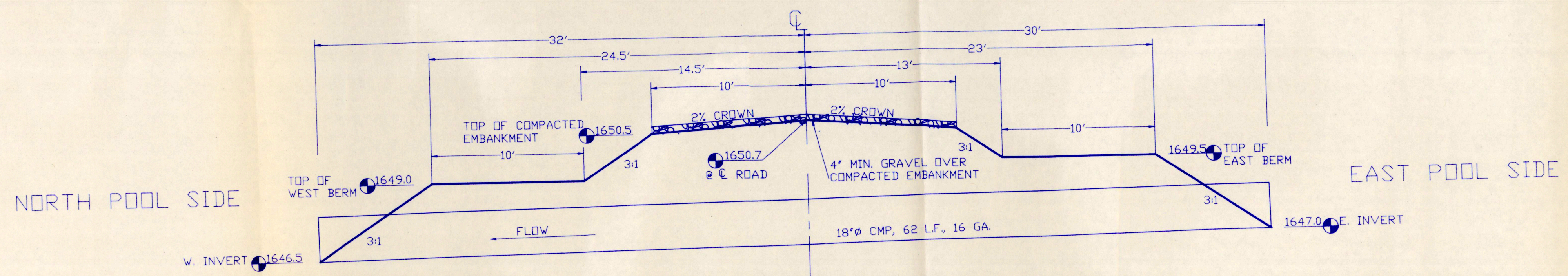
 DUCKS UNLIMITED INC.	PROJECT NO. <u>SD-0156-001</u>		DESIGNED BY: <u>D.J.L.</u>
	MICKELSON MEMORIAL MARSH		DRAWN BY: <u>KS</u>
<u>GREAT PLAINS REGIONAL OFFICE</u>	<u>RISER DETAILS</u>		SURVEYED BY: CHECKED BY: <u>BRK</u>
DATE: <u>4-5-95</u>	SHEET NO. <u>9</u> OF <u>13</u>	APPROVED BY:	APPROVED BY:

5830-3



**CULVERT INSTALLATION
SITE PLAN**
SCALE: 1"=5'

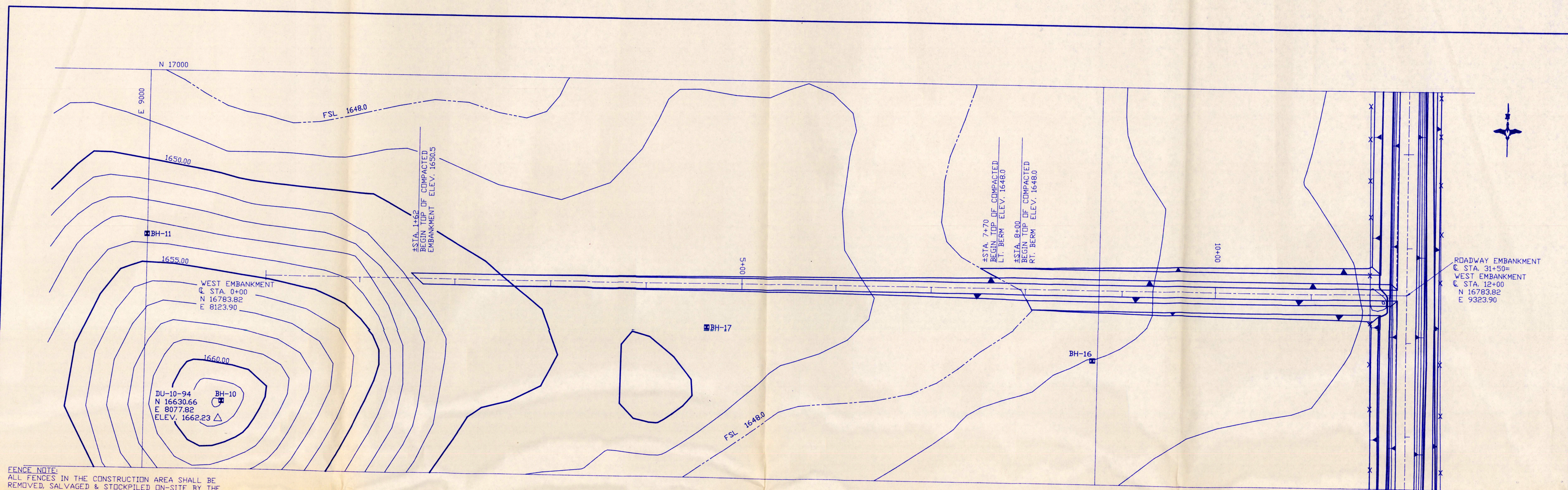
FENCE REMOVAL NOTE:
ALL FENCES IN THE CONSTRUCTION AREA SHALL BE REMOVED. SALVAGED & STOCKPILED ON-SITE BY THE CONTRACTOR. ALL FENCE REINSTALLATION SHALL BE THE RESPONSIBILITY OF THE AGENCY OR PRIVATE LANDOWNER. THE COST OF THE CONTRACTOR'S FENCE WORK SHALL BE CONSIDERED INCIDENTAL TO "SITE PREPARATION."



CULVERT & PROFILE

NOTE:
INVERTS OF EXISTING 12' CMP
WEST INV. ELEV. 1646.53
EAST INV. ELEV. 1647.25

REV. 01 4-5-95 D.J.L. MISCELLANEOUS UPDATES		PROJECT NO. SD-0156-001		DESIGNED BY: D.J.L.
DUCKS UNLIMITED INC.		MICKELSON MEMORIAL MARSH		DRAWN BY: K.S.
GREAT PLAINS REGIONAL OFFICE		CULVERT INSTALLATION		SURVEYED BY:
DATE: 4-5-95	SHEET NO. 10 OF 13	APPROVED BY:	CHECKED BY: B.R.K.	



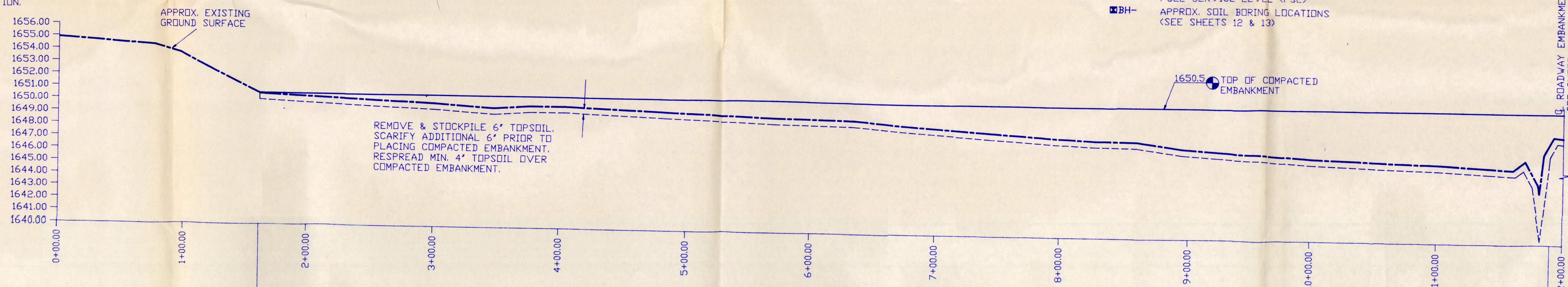
WEST EMBANKMENT PLAN
SCALE: 1"=50'

FENCE NOTE:
ALL FENCES IN THE CONSTRUCTION AREA SHALL BE REMOVED, SALVAGED & STOCKPILED ON-SITE BY THE CONTRACTOR. ALL FENCE REINSTALLATION SHALL BE THE RESPONSIBILITY OF THE AGENCY OR PRIVATE LANDOWNER. THE COST OF THE CONTRACTOR'S FENCE WORK SHALL BE CONSIDERED INCIDENTAL TO "SITE PREPARATION."

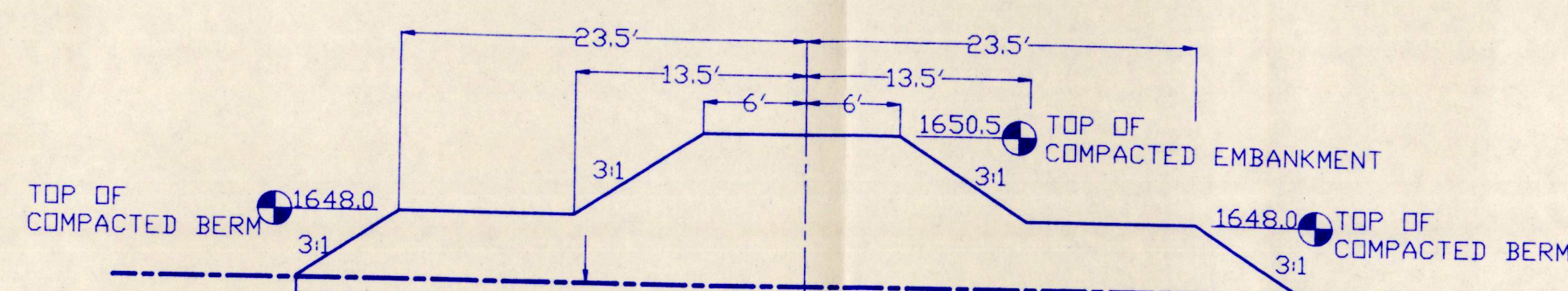
UTILITIES NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING & VERIFYING THE LOCATION OF EXISTING UTILITIES BEFORE BEGINNING CONSTRUCTION. SEE GENERAL CONDITIONS SPECIFICATION 101.706.

ESTIMATED WEST EMBANKMENT QUANTITIES:
SITE PREPARATION 1,000 C.Y.-P
EMBANKMENT 3,605 C.Y.-S*
*INCLUDES 15% FOR SHRINKAGE

BORROW FOR WEST EMBANKMENT:
SUITABLE MATERIAL FOR CONSTRUCTION OF THE WEST EMBANKMENT SHALL BE OBTAINED FROM THE "DESIGNATED BORROW AREA" OR "OPTIONAL BORROW AREA" AS SHOWN ON SHEET 2.



WEST EMBANKMENT C PROFILE
SCALE: 1"=5' VERT.
1"=10' HORIZ.

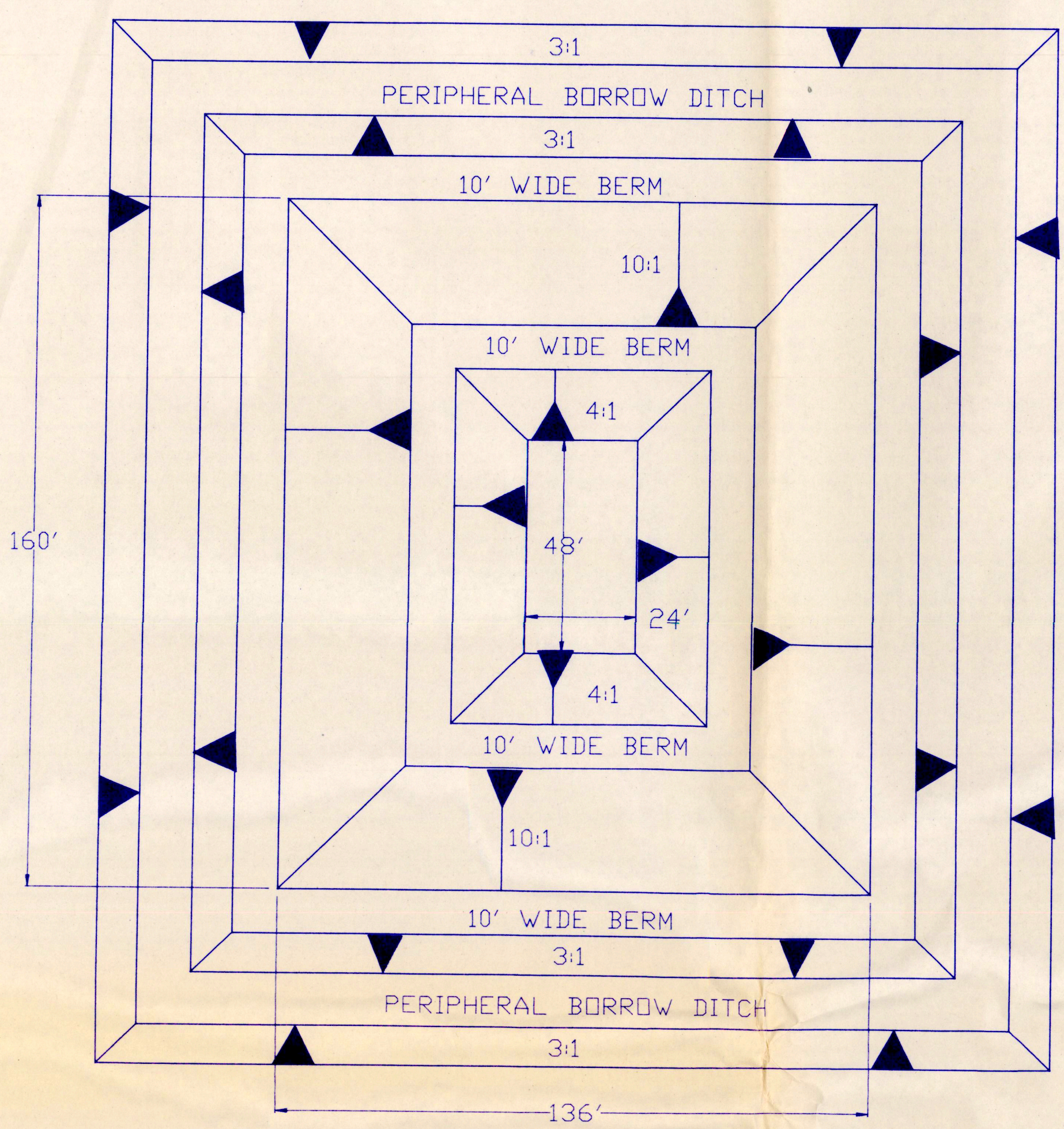


REMOVE & STOCKPILE 6" TOPSOIL.
SCARIFY ADDITIONAL 6" PRIOR TO
PLACING COMPACTED EMBANKMENT.
RESPREAD MIN. 4" TOPSOIL OVER
COMPACTED EMBANKMENT.

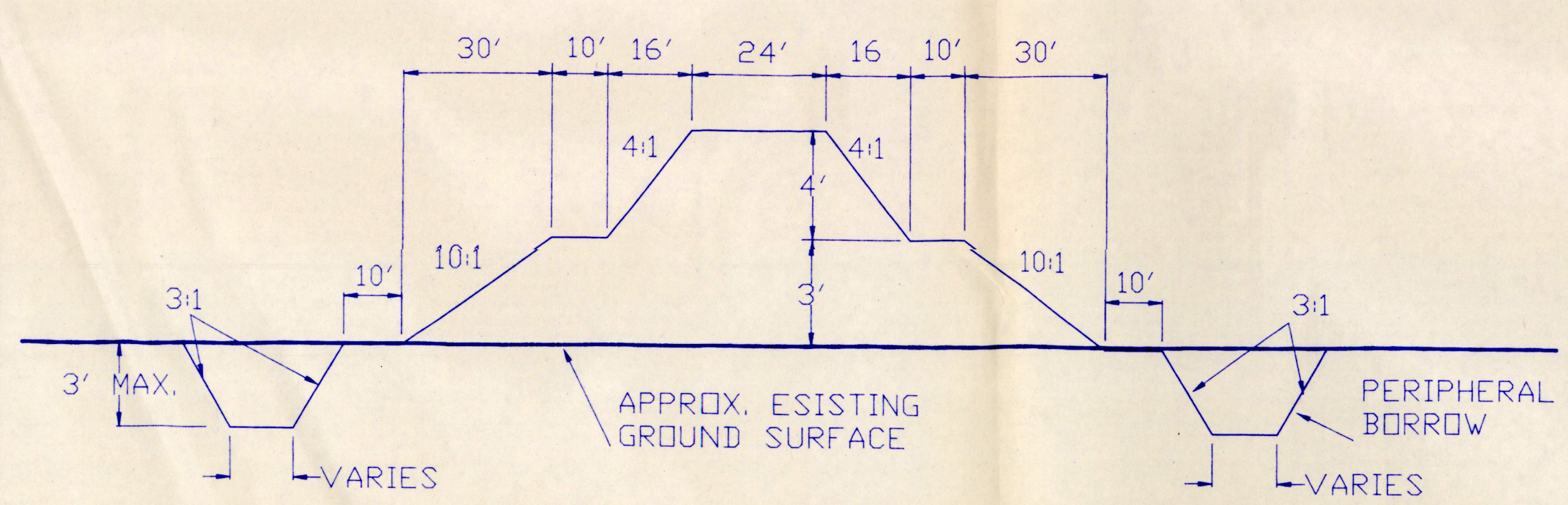
TYPICAL X-SECTION-WEST EMBANKMENT

LEGEND
△ DU CONTROL POINT
#5 REBAR CAPPED & STAMPED
○ PP POWER POLE
X TREES/BRUSH
X EXISTING FENCELINE
- - - FULL SERVICE LEVEL (FSL)
BH- APPROX. SOIL BORING LOCATIONS
(SEE SHEETS 12 & 13)

REV. 01	4-5-95	D.J.L.	MISCELLANEOUS UPDATES
		MICKELSON MEMORIAL MARSH	
GREAT PLAINS REGIONAL OFFICE DATE: 4-5-95		PROJECT NO. SD-0156-001 WEST EMBANKMENT PLAN & PROFILE APPROVED BY:	
SHEET NO. 11 OF 13		DESIGNED BY: D.J.L. DRAWN BY: K. SURVEYED BY: CHECKED BY: B.R.K.	



ISLAND PLAN



ISLAND SECTION

- ISLAND CONSTRUCTION NOTES:**
- ISLANDS SHALL BE CONSTRUCTED OF MATERIAL OBTAINED FROM A PERIPHERAL BORROW DITCH AROUND ISLANDS AS NECESSARY.
 - STRIPPING BELOW THE ISLAND WILL NOT BE NECESSARY.
 - THE ESTIMATED QUANTITY CONTAINED IN EACH ISLAND IS APPROX. 2356 C.Y. WHICH INCLUDES 15% FOR SHRINKAGE.
 - THE VOLUME BASED ON THE IN-PLACE DIMENSIONS OF THE ISLAND. IT IS PROVIDED FOR INFORMATION ONLY. EACH ISLAND WILL BE PAID FOR BASED ON A LUMP SUM BID FOR "ISLAND EMBANKMENT CONSTRUCTION".
 - THE ISLAND LOCATION WILL BE STAKED BY THE ENGINEER IN THE FIELD. DIMENSIONS SHOWN ARE APPROXIMATE. THE SHAPE OF THE ISLANDS SHALL BE CONSTRUCTED WITH IRREGULAR LINES & ROUNDED CORNERS TO MAKE A MORE NATURAL APPEARANCE.
 - A MINIMUM OF 4" TOPSOIL SHALL BE PLACED ON THE BERM & THAT PORTION OF THE ISLAND ABOVE THE BERM APPROX. 94 C.Y. THE TOPSOIL SHALL BE OBTAINED FROM THE PERIPHERAL BORROW AREA. COST OF TOPSOIL PLACEMENT SHALL BE CONSIDERED INCIDENTAL TO "ISLAND CONSTRUCTION".
 - NESTING AREA ABOVE THE BERM = 0.10 ACRES FOOT PRINT AREA = 0.50 ACRES

MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

DEPTH	SOIL DESCRIPTION	WATER CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	SHRINKAGE (%)	UNIFORMITY COEFFICIENT	CURVE NO.
1	SANDY LEAN CLAY - dark brown, surface vegetation, frost, moist	44	48	18	10	1.0	1
2	FAT CLAY - greenish brown, medium moist	48	52	22	12	1.0	2
3	FAT CLAY WITH SAND - light grayish brown, stiff, moist	48	52	22	12	1.0	3
4	END OF BORING						

WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"

MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

DEPTH	SOIL DESCRIPTION	WATER CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	SHRINKAGE (%)	UNIFORMITY COEFFICIENT	CURVE NO.
1	SANDY LEAN CLAY - dark brown, surface vegetation, frost, moist	44	48	18	10	1.0	1
2	FAT CLAY - greenish brown, medium moist	48	52	22	12	1.0	2
3	FAT CLAY WITH SAND - light grayish brown, stiff, moist	48	52	22	12	1.0	3
4	END OF BORING						

WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"

MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

DEPTH	SOIL DESCRIPTION	WATER CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	SHRINKAGE (%)	UNIFORMITY COEFFICIENT	CURVE NO.
1	SANDY LEAN CLAY - dark brown, surface vegetation, frost, moist	44	48	18	10	1.0	1
2	FAT CLAY - greenish brown, medium moist	48	52	22	12	1.0	2
3	FAT CLAY WITH SAND - light grayish brown, stiff, moist	48	52	22	12	1.0	3
4	END OF BORING						

WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"

MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

DEPTH	SOIL DESCRIPTION	WATER CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	SHRINKAGE (%)	UNIFORMITY COEFFICIENT	CURVE NO.
1	SANDY LEAN CLAY - dark brown, surface vegetation, frost, moist	44	48	18	10	1.0	1
2	FAT CLAY - greenish brown, medium moist	48	52	22	12	1.0	2
3	FAT CLAY WITH SAND - light grayish brown, stiff, moist	48	52	22	12	1.0	3
4	END OF BORING						

WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"

MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

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MIDWEST TESTING LABORATORY

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WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"

MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

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4	END OF BORING						

WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"

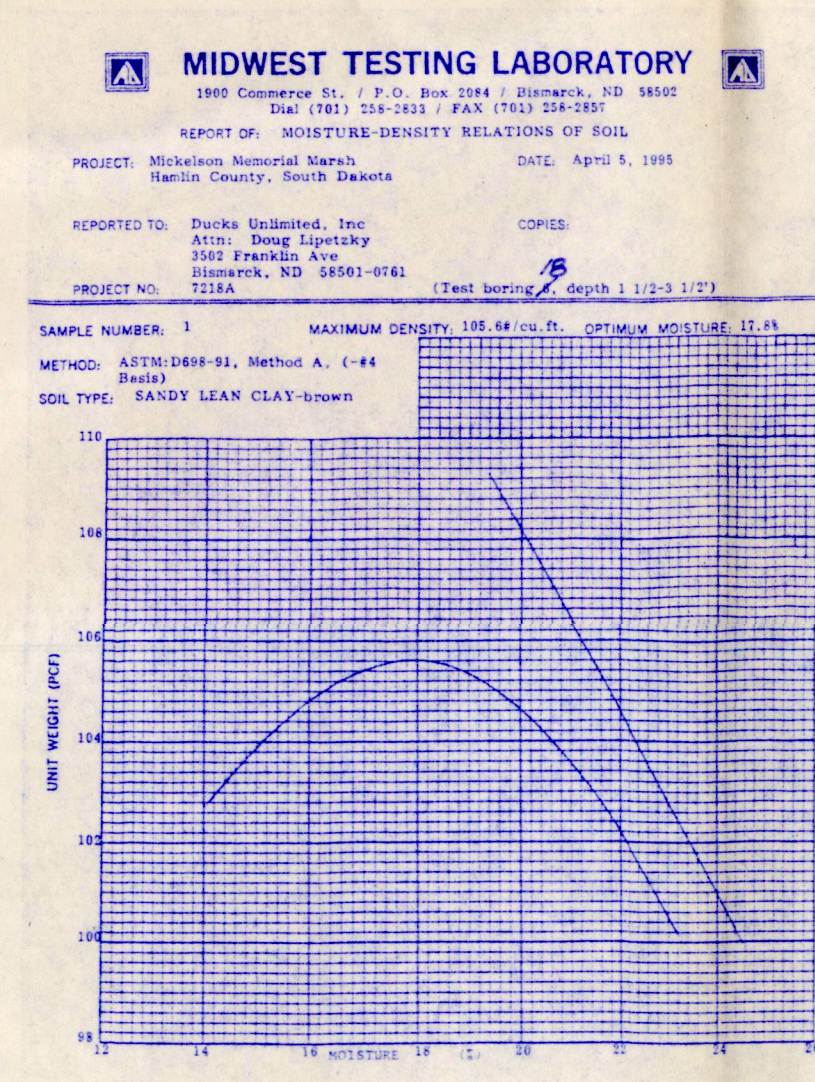
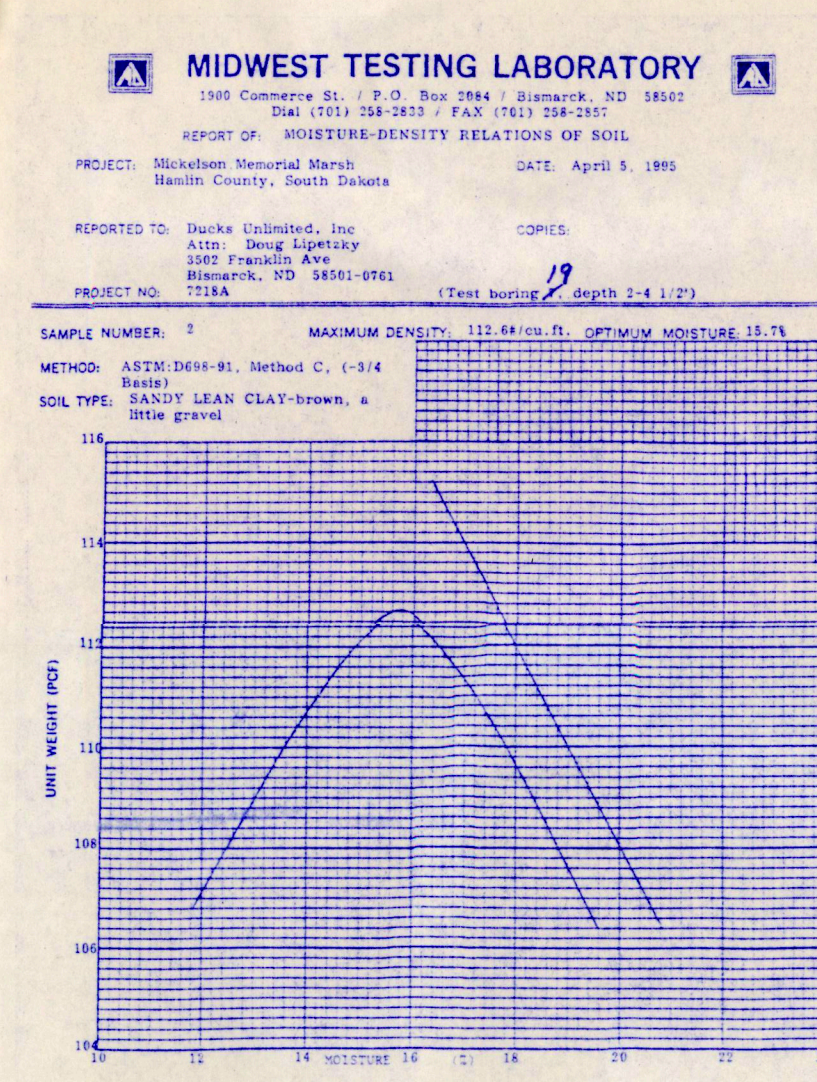
MIDWEST TESTING LABORATORY

JOB NO. 7218A LOG ON TEST BORING NO. 14-1/2 VERTICAL SCALE 10'

PROJECT: Mickelson Memorial Marsh, Hand County, South Dakota

DEPTH	SOIL DESCRIPTION	WATER CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	SHRINKAGE (%)	UNIFORMITY COEFFICIENT	CURVE NO.
1	SANDY LEAN CLAY - dark brown, surface vegetation, frost, moist	44	48	18	10	1.0	1
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4	END OF BORING						

WATER LEVEL DATA: DATE 4-5-95, TIME 10:00, LOCATION 14-1/2, METHOD USED 3.1/4" RSA 4-1/2"



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

REV. 01 4-5-95 D.J.L. ADDITIONAL SOILS INFORMATION

PROJECT NO. SD-0156-001

DESIGNED BY: D.J.L.

DRAWN BY: S

SURVEYED BY:

CHECKED BY: B.R.K.

DATE: 4-5-95 SHEET NO. 12 OF 13 APPROVED BY: APPROVED BY:

5830-3

MIDWEST TESTING LABORATORY JOB NO. 7218 LOG OF TEST BORING NO. 1 VERTICAL SCALE 1'-1" PROJECT: Mickelson Memorial Marsh, Near Estabrook, South Dakota SOIL DESCRIPTION: TOPSOIL, ORGANIC CLAY WITH SILT (CL) 1. 1 SS 6 2. 2 SS 4 10 11 3. 3 BAC 4 4. 4 SS 4 5. 5 SS 4 6. 6 SS 4 7. 7 SS 4 8. 8 SS 4 9. 9 SS 4 10. 10 SS 4 11. 11 SS 4 12. 12 SS 4 13. 13 SS 4 14. 14 SS 4 15. 15 SS 4 16. 16 SS 4 17. 17 SS 4 18. 18 SS 4 19. 19 SS 4 20. 20 SS 4 21. 21 SS 4 22. 22 SS 4 23. 23 SS 4 24. 24 SS 4 25. 25 SS 4 26. 26 SS 4 27. 27 SS 4 28. 28 SS 4 29. 29 SS 4 30. 30 SS 4 31. 31 SS 4 32. 32 SS 4 33. 33 SS 4 34. 34 SS 4 35. 35 SS 4 36. 36 SS 4 37. 37 SS 4 38. 38 SS 4 39. 39 SS 4 40. 40 SS 4 41. 41 SS 4 42. 42 SS 4 43. 43 SS 4 44. 44 SS 4 45. 45 SS 4 46. 46 SS 4 47. 47 SS 4 48. 48 SS 4 49. 49 SS 4 50. 50 SS 4 51. 51 SS 4 52. 52 SS 4 53. 53 SS 4 54. 54 SS 4 55. 55 SS 4 56. 56 SS 4 57. 57 SS 4 58. 58 SS 4 59. 59 SS 4 60. 60 SS 4 61. 61 SS 4 62. 62 SS 4 63. 63 SS 4 64. 64 SS 4 65. 65 SS 4 66. 66 SS 4 67. 67 SS 4 68. 68 SS 4 69. 69 SS 4 70. 70 SS 4 71. 71 SS 4 72. 72 SS 4 73. 73 SS 4 74. 74 SS 4 75. 75 SS 4 76. 76 SS 4 77. 77 SS 4 78. 78 SS 4 79. 79 SS 4 80. 80 SS 4 81. 81 SS 4 82. 82 SS 4 83. 83 SS 4 84. 84 SS 4 85. 85 SS 4 86. 86 SS 4 87. 87 SS 4 88. 88 SS 4 89. 89 SS 4 90. 90 SS 4 91. 91 SS 4 92. 92 SS 4 93. 93 SS 4 94. 94 SS 4 95. 95 SS 4 96. 96 SS 4 97. 97 SS 4 98. 98 SS 4 99. 99 SS 4 100. 100 SS 4 101. 101 SS 4 102. 102 SS 4 103. 103 SS 4 104. 104 SS 4 105. 105 SS 4 106. 106 SS 4 107. 107 SS 4 108. 108 SS 4 109. 109 SS 4 110. 110 SS 4 111. 111 SS 4 112. 112 SS 4 113. 113 SS 4 114. 114 SS 4 115. 115 SS 4 116. 116 SS 4 117. 117 SS 4 118. 118 SS 4 119. 119 SS 4 120. 120 SS 4 121. 121 SS 4 122. 122 SS 4 123. 123 SS 4 124. 124 SS 4 125. 125 SS 4 126. 126 SS 4 127. 127 SS 4 128. 128 SS 4 129. 129 SS 4 130. 130 SS 4 131. 131 SS 4 132. 132 SS 4 133. 133 SS 4 134. 134 SS 4 135. 135 SS 4 136. 136 SS 4 137. 137 SS 4 138. 138 SS 4 139. 139 SS 4 140. 140 SS 4 141. 141 SS 4 142. 142 SS 4 143. 143 SS 4 144. 144 SS 4 145. 145 SS 4 146. 146 SS 4 147. 147 SS 4 148. 148 SS 4 149. 149 SS 4 150. 150 SS 4 151. 151 SS 4 152. 152 SS 4 153. 153 SS 4 154. 154 SS 4 155. 155 SS 4 156. 156 SS 4 157. 157 SS 4 158. 158 SS 4 159. 159 SS 4 160. 160 SS 4 161. 161 SS 4 162. 162 SS 4 163. 163 SS 4 164. 164 SS 4 165. 165 SS 4 166. 166 SS 4 167. 167 SS 4 168. 168 SS 4 169. 169 SS 4 170. 170 SS 4 171. 171 SS 4 172. 172 SS 4 173. 173 SS 4 174. 174 SS 4 175. 175 SS 4 176. 176 SS 4 177. 177 SS 4 178. 178 SS 4 179. 179 SS 4 180. 180 SS 4 181. 181 SS 4 182. 182 SS 4 183. 183 SS 4 184. 184 SS 4 185. 185 SS 4 186. 186 SS 4 187. 187 SS 4 188. 188 SS 4 189. 189 SS 4 190. 190 SS 4 191. 191 SS 4 192. 192 SS 4 193. 193 SS 4 194. 194 SS 4 195. 195 SS 4 196. 196 SS 4 197. 197 SS 4 198. 198 SS 4 199. 199 SS 4 200. 200 SS 4 201. 201 SS 4 202. 202 SS 4 203. 203 SS 4 204. 204 SS 4 205. 205 SS 4 206. 206 SS 4 207. 207 SS 4 208. 208 SS 4 209. 209 SS 4 210. 210 SS 4 211. 211 SS 4 212. 212 SS 4 213. 213 SS 4 214. 214 SS 4 215. 215 SS 4 216. 216 SS 4 217. 217 SS 4 218. 218 SS 4 219. 219 SS 4 220. 220 SS 4 221. 221 SS 4 222. 222 SS 4 223. 223 SS 4 224. 224 SS 4 225. 225 SS 4 226. 226 SS 4 227. 227 SS 4 228. 228 SS 4 229. 229 SS 4 230. 230 SS 4 231. 231 SS 4 232. 232 SS 4 233. 233 SS 4 234. 234 SS 4 235. 235 SS 4 236. 236 SS 4 237. 237 SS 4 238. 238 SS 4 239. 239 SS 4 240. 240 SS 4 241. 241 SS 4 242. 242 SS 4 243. 243 SS 4 244. 244 SS 4 245. 245 SS 4 246. 246 SS 4 247. 247 SS 4 248. 248 SS 4 249. 249 SS 4 250. 250 SS 4 251. 251 SS 4 252. 252 SS 4 253. 253 SS 4 254. 254 SS 4 255. 255 SS 4 256. 256 SS 4 257. 257 SS 4 258. 258 SS 4 259. 259 SS 4 260. 260 SS 4 261. 261 SS 4 262. 262 SS 4 263. 263 SS 4 264. 264 SS 4 265. 265 SS 4 266. 266 SS 4 267. 267 SS 4 268. 268 SS 4 269. 269 SS 4 270. 270 SS 4 271. 271 SS 4 272. 272 SS 4 273. 273 SS 4 274. 274 SS 4 275. 275 SS 4 276. 276 SS 4 277. 277 SS 4 278. 278 SS 4 279. 279 SS 4 280. 280 SS 4 281. 281 SS 4 282. 282 SS 4 283. 283 SS 4 284. 284 SS 4 285. 285 SS 4 286. 286 SS 4 287. 287 SS 4 288. 288 SS 4 289. 289 SS 4 290. 290 SS 4 291. 291 SS 4 292. 292 SS 4 293. 293 SS 4 294. 294 SS 4 295. 295 SS 4 296. 296 SS 4 297. 297 SS 4 298. 298 SS 4 299. 299 SS 4 300. 300 SS 4 301. 301 SS 4 302. 302 SS 4 303. 303 SS 4 304. 304 SS 4 305. 305 SS 4 306. 306 SS 4 307. 307 SS 4 308. 308 SS 4 309. 309 SS 4 310. 310 SS 4 311. 311 SS 4 312. 312 SS 4 313. 313 SS 4 314. 314 SS 4 315. 315 SS 4 316. 316 SS 4 317. 317 SS 4 318. 318 SS 4 319. 319 SS 4 320. 320 SS 4 321. 321 SS 4 322. 322 SS 4 323. 323 SS 4 324. 324 SS 4 325. 325 SS 4 326. 326 SS 4 327. 327 SS 4 328. 328 SS 4 329. 329 SS 4 330. 330 SS 4 331. 331 SS 4 332. 332 SS 4 333. 333 SS 4 334. 334 SS 4 335. 335 SS 4 336. 336 SS 4 337. 337 SS 4 338. 338 SS 4 339. 339 SS 4 340. 340 SS 4 341. 341 SS 4 342. 342 SS 4 343. 343 SS 4 344. 344 SS 4 345. 345 SS 4 346. 346 SS 4 347. 347 SS 4 348. 348 SS 4 349. 349 SS 4 350. 350 SS 4 351. 351 SS 4 352. 352 SS 4 353. 353 SS 4 354. 354 SS 4 355. 355 SS 4 356. 356 SS 4 357. 357 SS 4 358. 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