

WATER PERMIT NO. 6244-3

Name of Applicant: Harlan Krein

Address: PO Box 150, Busby MT 59016

Phone:

Amount of Water Claimed: 60 acre-feet

Total Acres: NA

Source of Water Supply: runoff

Water to be used for: fish & wildlife propagation

County: McPherson

Type of Waste Disposal System:

Location: 5 miles south of Leola

PRIORITY Date Received: 11-27-00

Fee: \$15

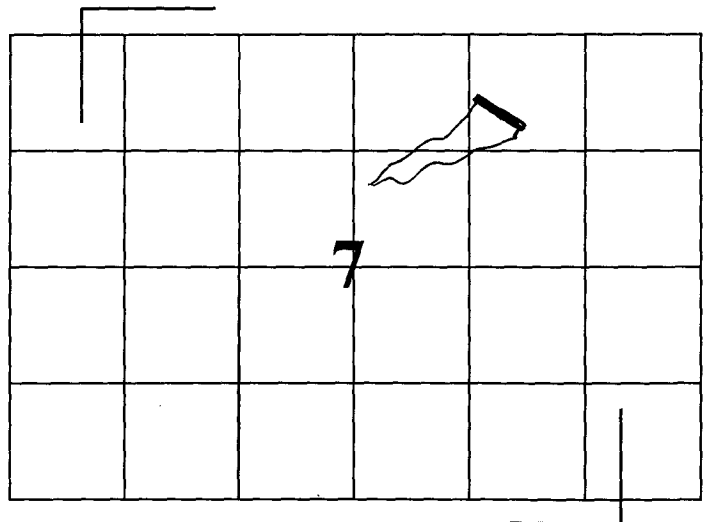
Corrected Application Received: 12-7-00

Period of Annual Use: January 1 – December 31

Remarks: Claimed priority date of 1952

Diversion Point: NE ¼ NE ¼ Sec 7-T125N-R67W

Water Impounded: NE ¼ Sec 7-T125N-R67W



Depth of Well: NA

Well Driller: :

Remarks:

Type of Map: aerial

Prepared by: Dave Konechne

Reviewed and the Number Assigned on: 12-7-00

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

SOUTH DAKOTA
VESTED WATER RIGHT NO. 6244-3

Date of Receipt of Claim November 27, 2000.

Date of Validation February 5, 2001.

The Chief Engineer, on behalf of the Water Management Board validated Vested Water Right Claim No. 6244-3 for Harlan Krein, PO Box 150, Busby MT 59016 with the following limitations, conditions and qualifications:

1. Vested Water Right No. 6244-3 authorizes impoundment of 60 acre-feet of water from runoff in an existing dam located in the NE ¼ NE ¼ Section 7 with water impounded in the NE ¼ Section 7; all in T125N-R67W.
2. The appropriated water is used for supplying water for fish and wildlife propagation and livestock watering purposes and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following annual period: January 1 – December 31.
4. The priority date of the Vested Water Right is January 1, 1952.
5. The water use system has been constructed and water has been applied to beneficial use.
6. Water Rights obtained in compliance with the laws of the State of South Dakota must not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Vested Water Right No. 6244-3 authorizes a dam with a storage capacity of 60 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

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

FEB 15 2001

date



(type or print)

No. 6244-3 Hydrologic Unit 10160008
Basin James River
Newspaper McPherson Co. Herald, Leola
(office use only)



☐ Municipal ☐ Suburban Housing ☐ Recreational ☐ Institutional
☐ Rural Water System ☐ Commercial ☒ Fish & Wildlife ☐ Geothermal Heat
☐ Domestic ☐ Industrial ☒ Other Cattle Watering Facility
 (over 18 gpm)

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

- COLETTE R GIESE
Subscribed and sworn to before me on _____
STATE NOTARY PUBLIC SEAL
SOUTH DAKOTA

Signed Harley Green
 before me this 22nd day of November 192000

Collette R. Kiese

Notary Public

My Commission expires 1-13-2003

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. Wastewater Disposal System Information

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

3. Dugout Information

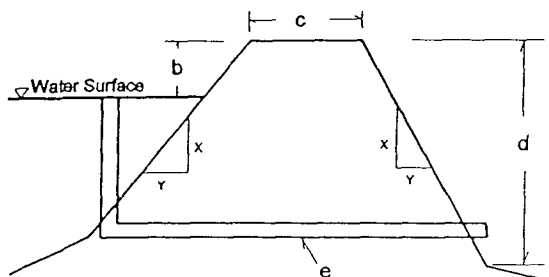
- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

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

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

Dave Konechne
Natural Resources Conservation Service
Pierre, SD 57501



- b) Freeboard 3 ft.
- c) Crest Width 12 ft.
Crest Length 1600 ft.
- d) Height 10 ft.
- e) Primary Outlet Capacity 190 CFS
If pipe, diameter 60 in. riser 48 in. pipe
- f) Secondary Spillway Capacity 785 CFS
Spillway Width 60 ft
- g) X & Y Slope
Upstream 3:1
Downstream 3:1
- h) Surface Area of Impoundment 15
- i) Storage 60 Acre Feet
- j) Drainage Area Above Dam 3435 Acres

Affidavit of Water Use

Form 2B
(Type or Print in Ink)

Note: This Form is supplemental to Form 2 and is to be used when an affidavit is needed to document historical water use, primarily with vested right claims.

Affidavit Of Construction Of Water Use System And Application Of Water To Beneficial Use

Name of Applicant (Same as Form 2) Harlan Krein

Mailing Address P.O. Box 150 Bushy MT 59016
(Street, RR or Box) (City) (State) (Zip Code)

A. Notice of Appropriation _____ Date of Posting _____
Date of Recording _____ Recording Date _____

B. Date of start of construction of water supply system 1952

C. Date that water was first applied to beneficial use 1952

D. Name of owner of original water supply system Krein

E. Amount of water originally applied to beneficial use 60 acre feet

F. Present use of water - amount of water now being used Water is used for wildlife and cattle

Date that this water was first used 1952

G. Chronological History of Water Use

Please see attached photo of the structure already in place in 1952.

Repair of this structure is planned to take place in the spring of 2001.

Attach to this Form 2B any copies of notices, postings, filings, publications, affidavits, or other records that apply. You may also attach any written statement by you, or by others, that you deem pertinent.

State of South Dakota)

SS

County of McPherson)

I, Harlan Krein the applicant, certify that I have read the foregoing and that
(print or type) the matters therein are true.

Signed

Subscribed and sworn to before me

COLETTE R GIESE

SEAL NOTARY PUBLIC SEAL

SOUTH DAKOTA

My Commission expires 1-13-2003

Notary Public

I, the undersigned do hereby certify that I know about the water use system described above, that I have read the foregoing, and that the matters therein are true.

HARLAN KREIN

(Print Name)

19 2000

Harlan Krein

(Print Name)

19 2000

PFS Review

Water Permit Application No. 6244-3
Harlen Krein

Top of Dam Elev. - 105.5
2nd Spillway Elev. - 102.5
P. Spillway Elev. - 100.0
D/S Toe Elev. - 95.0

$H = 10 \text{ ft}$

Cat. 3 Low Hazard Dam

Normal Storage Capacity = 60 Ac-Ft
Int. Storage Capacity = 180 Ac-Ft
Max. Storage Capacity = 560 Ac-Ft

Int. Capacity x Eff Ht. = $180 \times 7.5 = 1350 < 3000 \therefore 25 \text{ year}$
Minimum Spillway Design

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

DA = 3435 Ac = 5.37 mi.²
Slope = 40 ft/mi
SI = 2.99

$$Q_{50} = 83.4 A^{.6} S^{.44} S_i^{-.72}$$

$$= 83.4 (5.37)^{.6} (40)^{.44} (2.99)^{-.72}$$

$$= 83.4 (2.74) (5.07) (0.4595)$$

$$= \underline{525 \text{ cfs}}$$

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

$$= 106 (5.37)^{.63} (40)^{.45} (2.99)^{-.69}$$

$$= 106 (2.88) (5.26) (0.4697)$$

$$= \underline{755 \text{ cfs}}$$

Secondary Spillway Flow

$$Q = CLH^{3/2}$$

$C = 2.6$
 $L = 60$
 $H = 3 \text{ ft}$

$$= (2.6)(60)(3)^{1.5}$$

$$= \underline{810 \text{ cfs}}$$

$$Q_{50} = 132 A^{.65} S^{.46} S_i^{-.67}$$

$$= 132 (5.37)^{.65} (40)^{.46} (2.99)^{-.67}$$

$$= 132 (2.98) (5.46) (0.4801)$$

$$= \underline{1030 \text{ cfs}}$$

Section 74:02:08:09

1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam X-Sec. - OK
4. Area Capacity - OK
5. Outlet Details - OK
6. Spillway Rating - OK
7. Spillway Details - OK
8. Specs - stb. NRCS - OK
9. EPP - N/A Cat. 3 - OK

NRCS Annual Yield

DA = 3435 CN = 78 ISO = 2

80% chance = 0.2
 $0.2 \times 3435^{1/2} = \underline{58 \text{ Ac-Ft}}$

50% chance = 0.5
 $0.5 \times 3435^{1/2} = \underline{143 \text{ Ac-Ft}}$

10% chance = 2.2
 $2.2 \times 3435^{1/2} = \underline{630 \text{ Ac-Ft}}$

SKETCH PLAN OF DAM AND RESERVOIR AREA

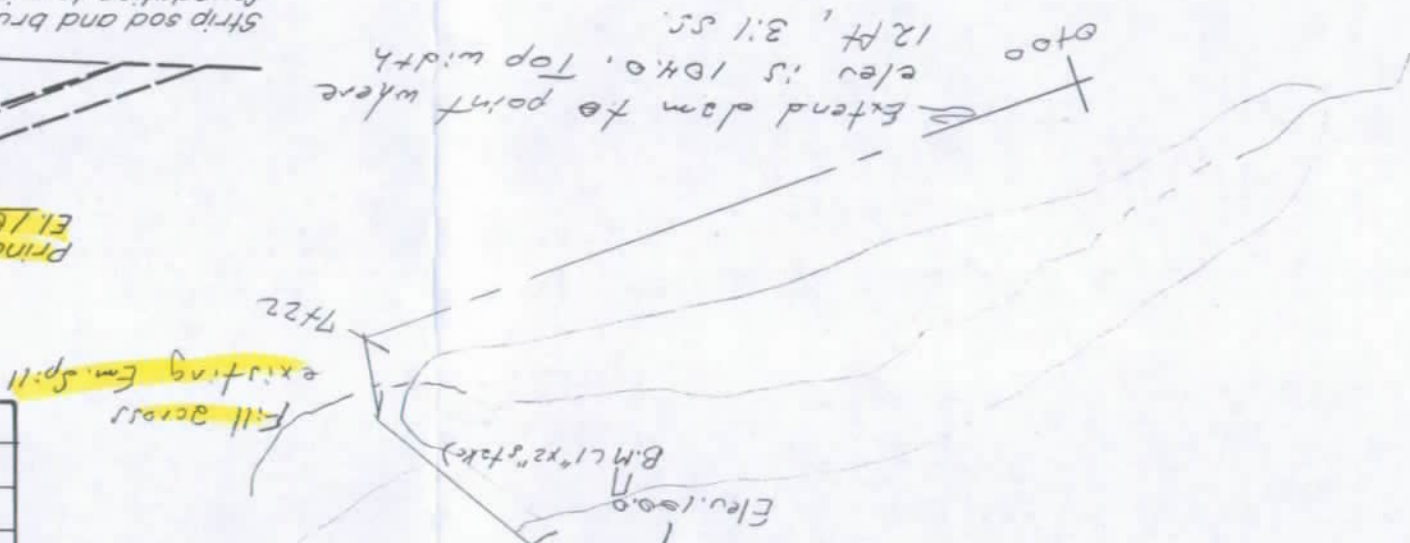
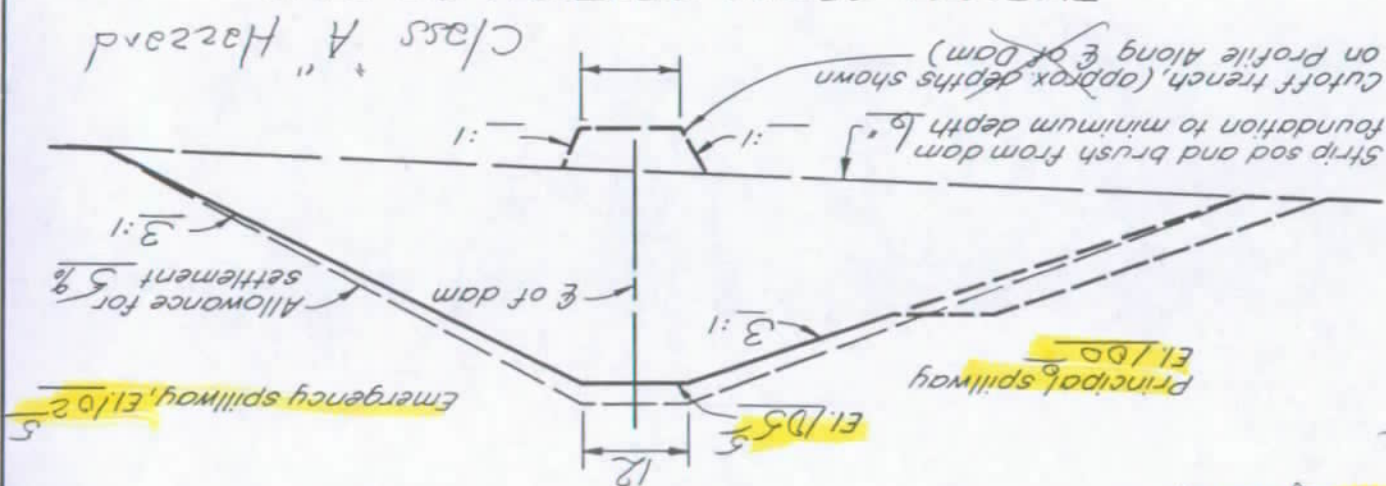
Approximate scale 1" =

- SD-4 Stripping
SD-5 Excavation
SD-7.5 Earth Fill
SD-9 Drain Fill
SD-12B Concrete
SD-13 Steel
SD-16 Timber Fabrication
SD-50 CMP

S.D. CONSTRUCTION AND MATERIAL SPECIFICATIONS:

EARTH DAM

TYPICAL CROSS SECTION OF DAM



LOCATION

Wf sec. 7 T. 125 R. 67
de McPherson County

3435	ACRES	86	320	540	8	15	60
DRAINAGE	ANNUAL	PEAK	EMERG.	WATER	SURFACE	SEDIMENT	TOTAL
AREA	YIELD	RUNOFF	SPLY.	DEPTH	AREA	STORAGE	STORAGE
AC.FT.	25-YR.	C.F.S.	FEET	ACRES	AC.FT.	AC.FT.	AC.FT.

ITEM	UNIT	QUANTITY
Earth F:11	cu yd	2500
Principal Spillway		
- 60 d.a. 12" riser 6 ft long w/	ea	1
4 ft 48" d.a. 12" stub		
- 48" d.a. wadertight bands	ea	3
- timber pier support	ea	1
- timber flash notch	ea	1

TABLE OF QUANTITIES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CONSERVATION DISTRICT: McPherson

OPERATOR: Harlen Klein

Designed
Drawn
Traced
Checked

No. 10

Drawing No.

JOB PLAN NO. 1.0

(Rev. 4-73) 5, N-29, 073.1a(1),

Σ-ΑΑΕΘ

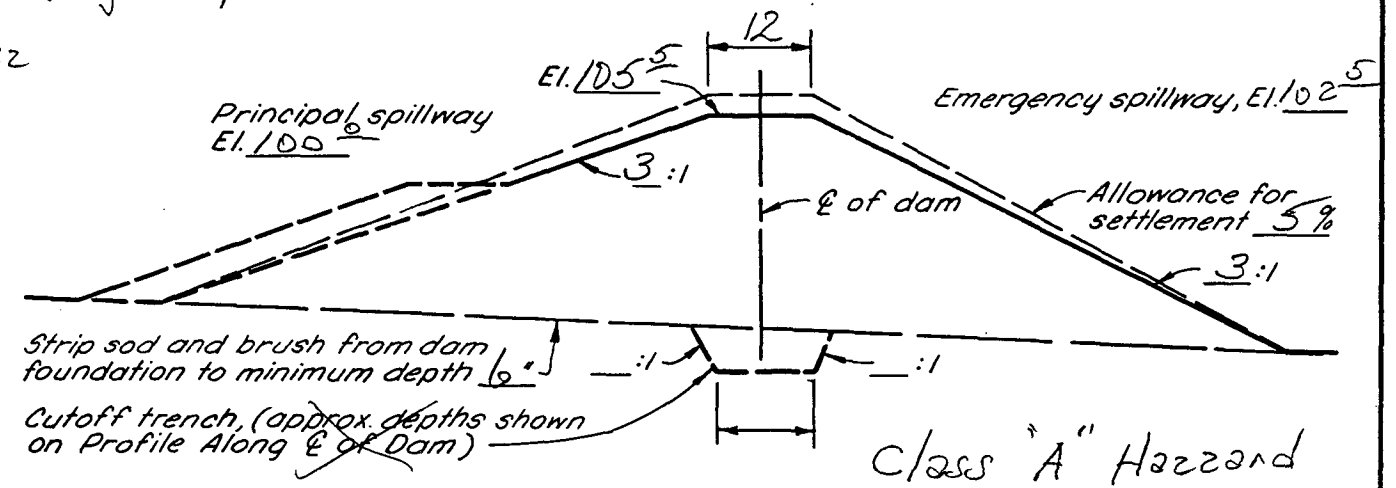
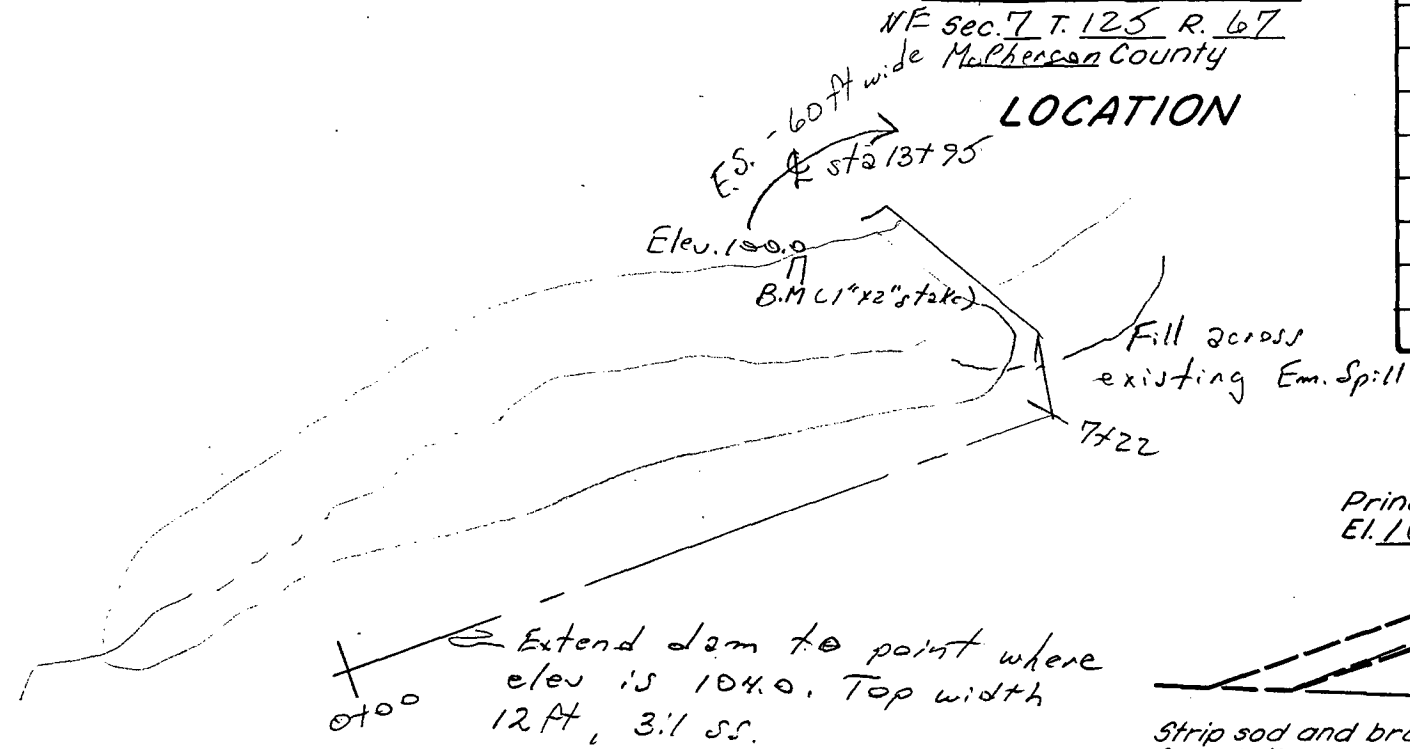
STRUCTURE DATA

DRAINAGE AREA	ANNUAL YIELD	PEAK RUNOFF	EMERG. SPLWY. CAPACITY	WATER DEPTH	SURFACE AREA	SEDIMENT STORAGE	TOTAL STORAGE
ACRES	AC. FT.	25-YR.	C. F. S.	FEET	ACRES	AC. FT.	AC. FT.
3435	86	320	540	8	13		60

TABLE OF QUANTITIES

[illegible]

LOCATION



TYPICAL CROSS SECTION OF DAM

S.D. CONSTRUCTION AND MATERIAL SPECIFICATIONS:

SD-4 Stripping
SD-5 Excavation
SD-7.5 Earth Fill
SD-9 Drain Fill
SD-12B Concrete
SD-13 steel
SD-16 Timber Fabrication
SD-50 CMP

EARTH DAM

OPERATOR: <u>Harten Klein</u>	
CONSERVATION DISTRICT: <u>McPherson</u>	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed <u>Konechne</u>	Date _____
Drawn <u>Konechne</u>	Approved by <u>[Signature]</u>
	Title <u>[Signature]</u>
	Title _____
Traced _____	Sheet _____
	Drawing No. _____
Checked _____	No. _____
	of _____

SKETCH PLAN OF DAM AND RESERVOIR AREA

Approximate scale 1" =

REFERENCE: GUIDE PLAN NO. 1.0

JOB PLAN NO. 1.0

Locate principal spillway pipe
at C of dam sta. $\frac{9}{2} + \frac{00}{100}$, at
an angle of 90° to the C of
the dam.

Emergency spillway El. 102

Principal spillway El. / 1000'

Berm, if required _____: 1
slope normal to $\mathbb{C}$ of
dam _____

Trash rack and baffle plate
not shown. See job plan
no. 604

$\frac{3}{4}$: 1 slope normal to $\odot$ of dam —

Top of dam after
settlement El. $105 \frac{5}{8}$

Note: Allowance for settlement 5 %

✓ 3:1 slope normal to ϕ of dam

60" dia. riser, see
job plan no. 5.3

Antiseep collars see job plan no 3.8p

El. 94 7

62' of 48" dia. pipe

CROSS SECTION OF DAM ALONG C OF PRINCIPAL SPILLWAY
(Not to scale)

SPECIFICATION NOTES

1. ELBOW, IF REQUIRED, MAY BE FABRICATED BY CONTINUOUS WELDING SEPERATE PIPE SECTIONS OR BY FABRICATING A CONTINUOUS WELDED JOINT ON THE UPSTREAM END OF LAST SECTION OF PIPE.
2. PIPE WALL THICKNESS SHALL BE 12 GAGE OR _____ INCHES.

All pipe to be spiral
or caulked seam and
double riveted

TABLE OF QUANTITIES

[illegible]

APPLICABLE STANDARD S.C.S. SPECIFICATIONS

Prefabricated elbow _____°

El. _____

El. _____

OUTLET DETAIL WITHOUT PIPE SUPPORT

Prefabricated elbow

Pipe support, see job plan no. 4.0

1 % gr.

El. 94

El. _____

OUTLET DETAIL WITH
PIPE SUPPORT

Sec. _____, T. _____, R. _____
_____ County

CORRUGATED METAL PIPE
DROP INLET PRINCIPAL SPILLWAY

OPERATOR Harlen Krein

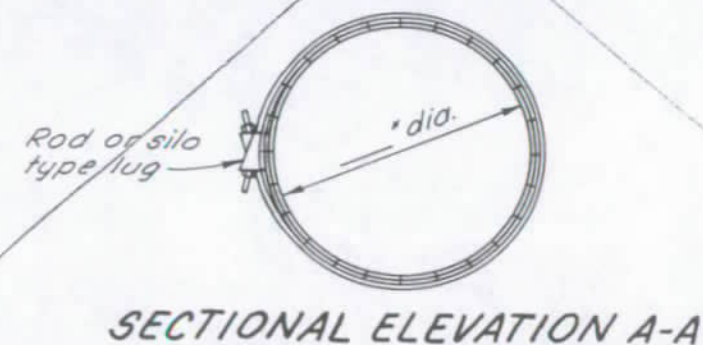
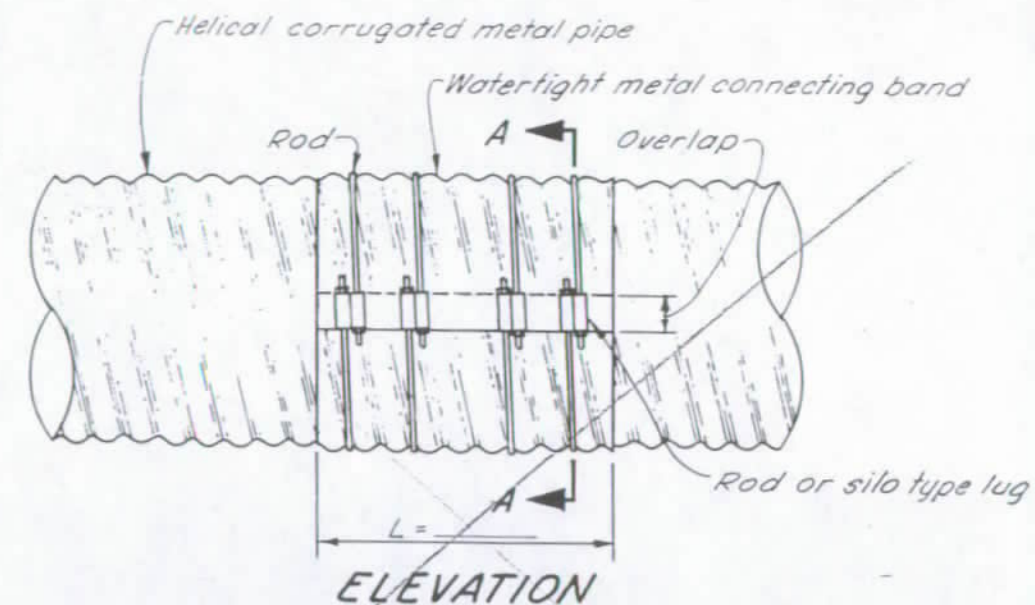
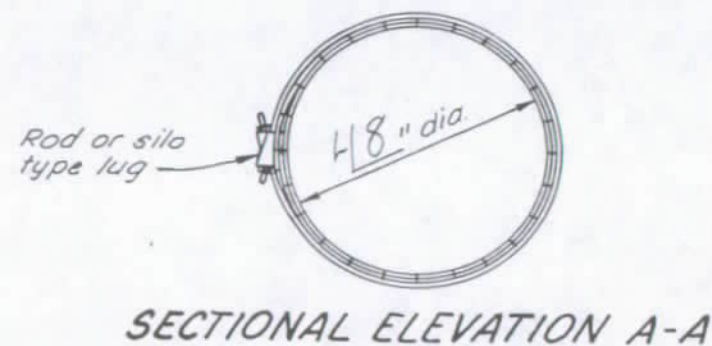
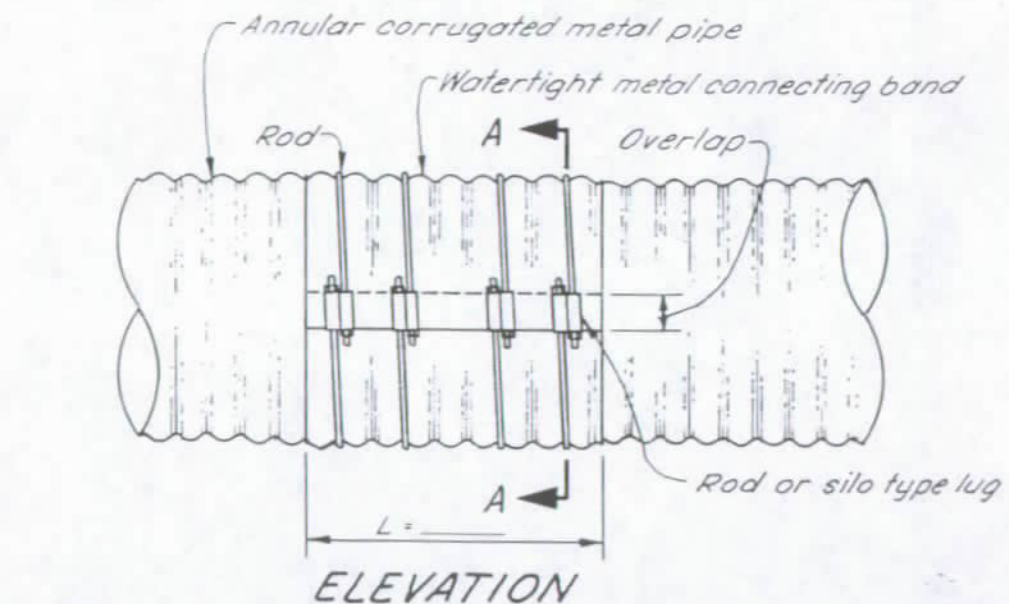
CONSERVATION DISTRICT McPherson

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date	Approved by
Designed		Title
Drawn		Title
Traced		Sheet
Checked		No
		Drawing No

REFERENCE: GUIDE PLAN NO. 2.0

Rev. 8/80
JOB PLAN NO. 2.0



DIMENSIONS AND QUANTITIES

PIPE DIA. INCHES	MINIMUM "L" INCHES	APPROX. OVERLAP INCHES	NUMBER OF RODS & LUGS	MINIMUM ROD DIA. IN.	NEOPRENE GASKET WIDTH INCHES	ASPHALT MASTIC GAL.
6-18	12	2	2	1/2	12	1/2
21-30	24	3	4	1/2	12	1 1/2
36-48	24	6	4	1/2	12	2

NOTES:

1. WATERTIGHTNESS WILL BE OBTAINED BY USE OF (1) 3/8" THICK NEOPRENE GASKET (WIDTH AS SHOWN) OR (2) ASPHALT MASTIC SEALING MATERIAL TO COVER FULL WIDTH OF BAND.
2. CROSS OUT BAND AND QUANTITIES NOT APPLICABLE.

WATERTIGHT CONNECTING BAND FOR ANNULAR AND HELICAL CORRUGATED METAL PIPE

OPERATOR: Harlen Krein

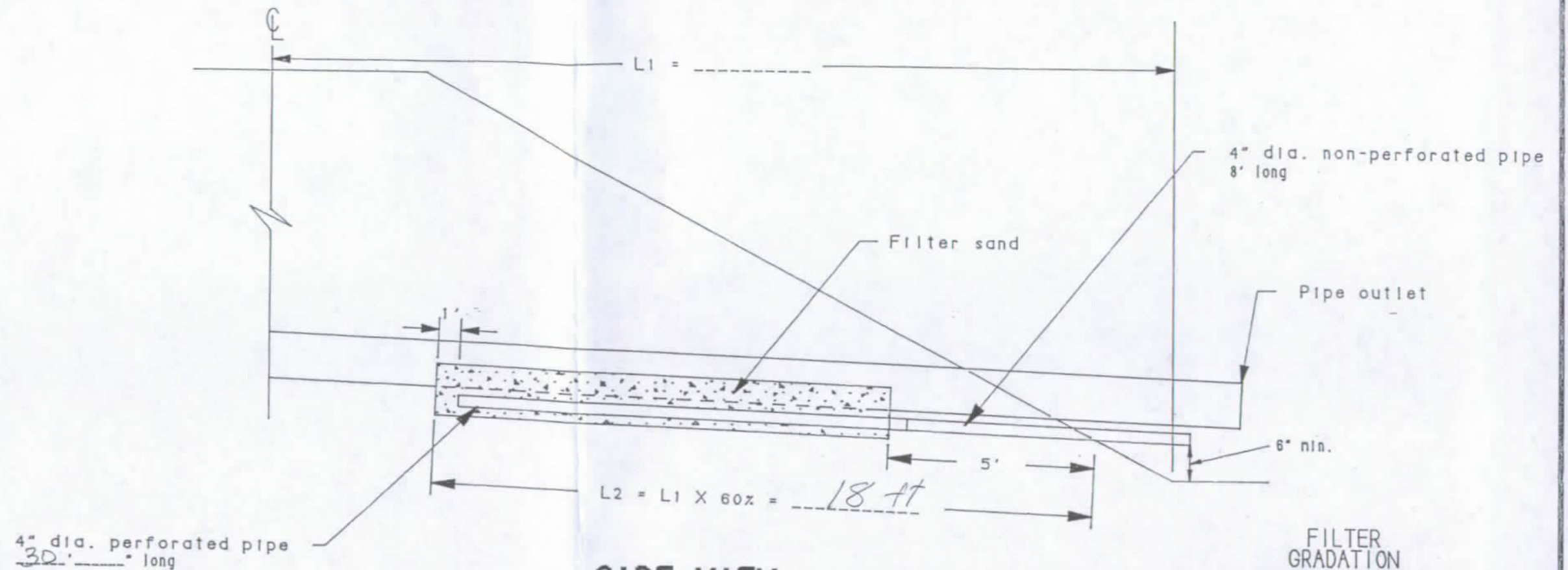
CONSERVATION DISTRICT: McPherson

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
Drawn		Title
Traced		File
Checked		Drawing No.

JOB PLAN NO. 3.0

5, N-29, 073.30

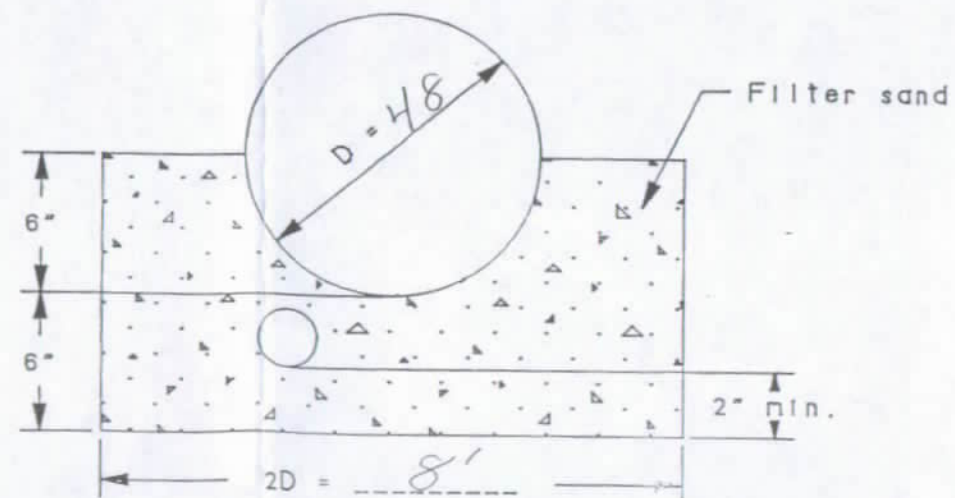


SIDE VIEW

**FILTER
GRADATION**

SIEVE SIZE	PERCENT PASSING
3/8"	100
4	85-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10

5.3 cu yd.



UPSTREAM VIEW

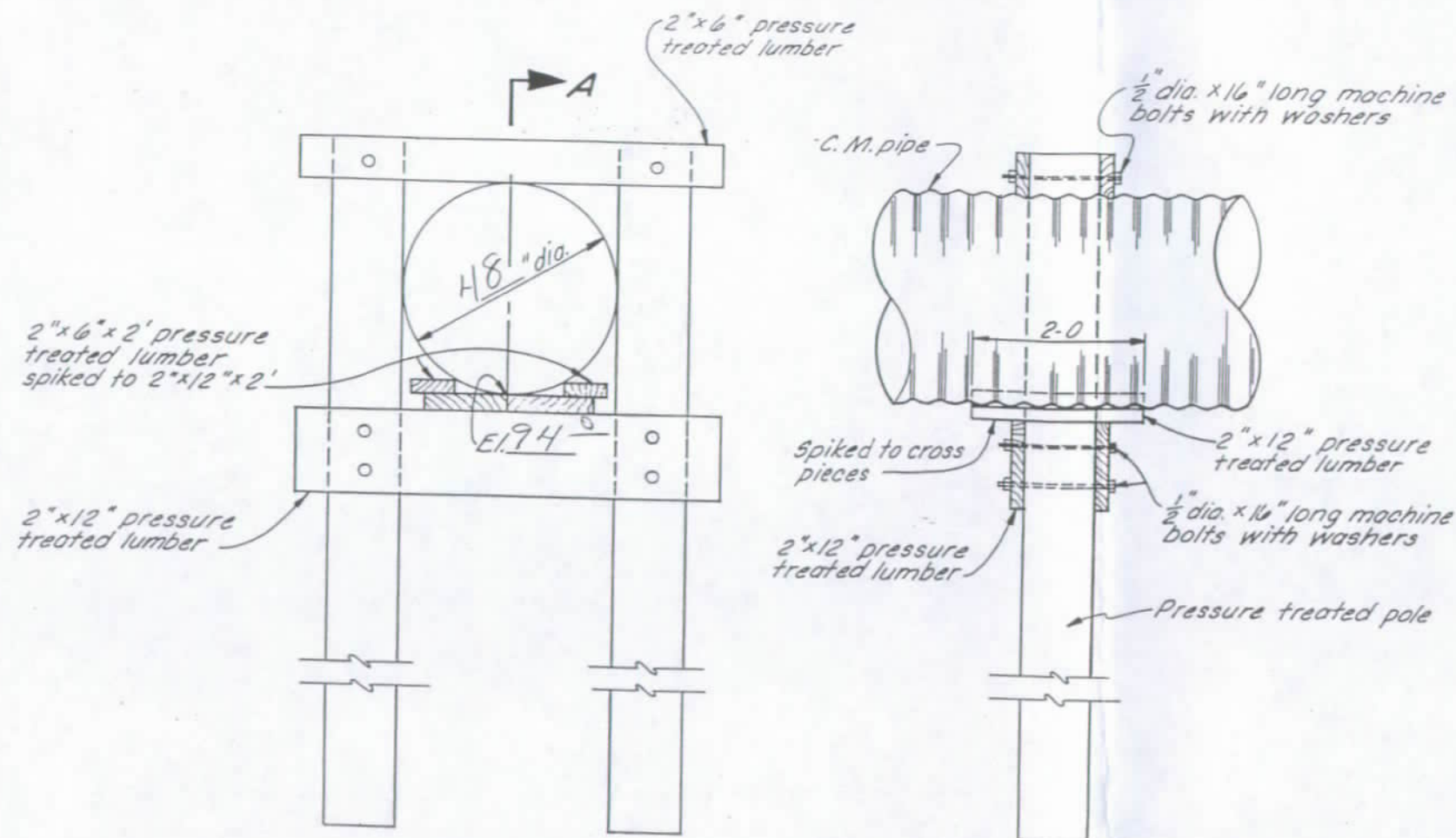
- NOTE:
1. THE 4" DIA. PIPE SHALL BE SDR 35 PVC, OR STRONGER
 2. PROVIDE AN ANIMAL GUARD ON DRAIN OUTLET PIPE. DRILL 2, 1/2" DIA. HOLES, ON 6" FROM END OF PIPE AND PLACE A 3/8" DIA., 5 1/2" LONG GALVANIZED STEEL BOLT THRU THEM AND SECURE WITH A NUT (PLACE BOLT HORIZONTAL).
 3. FILTER SAND WILL BE CLEAN PEA AGGREGATE OR CONCRETE SAND.

SAND ANTISEEP DRAIN

OPERATOR <u>Harlan Krein</u>	
CONSERVATION DISTRICT <u>McPherson</u>	
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	
Date	Approved by
Designed	Title
Drawn	Title
Traced	Title
Checked	Sheet No.
	Dwg. No.

Rev. 3/96

JOB PLAN NO. 3.8-P



ELEVATION

SECTIONAL ELEVATION A-A

NOTES:

1. HAND OR MACHINE TAMP BACKFILL THOROUGHLY AROUND FOOTINGS AND COLUMNS.

TABLE OF QUANTITIES

ITEM	LENGTH FOR 48" DIA. C.M. PIPE	UNIT	QUANTITY
PRESSURE TREATED POLE 12" DIA.	12	EACH	2
2" X 12" PRESSURE TREATED LUMBER	6-0	EACH	6
2" X 6" PRESSURE TREATED LUMBER	6-0	EACH	2
2" X 12" PRESSURE TREATED LUMBER	2-0	EACH	3
2" X 6" PRESSURE TREATED LUMBER	2-0	EACH	2
1/2" DIA. MACHINE BOLTS WITH NUTS	1-4	EACH	10
1/2" DIA. WASHERS		EACH	20

REFERENCE: GUIDE PLAN NO. 4.0

JOB PLAN NO. 4.0

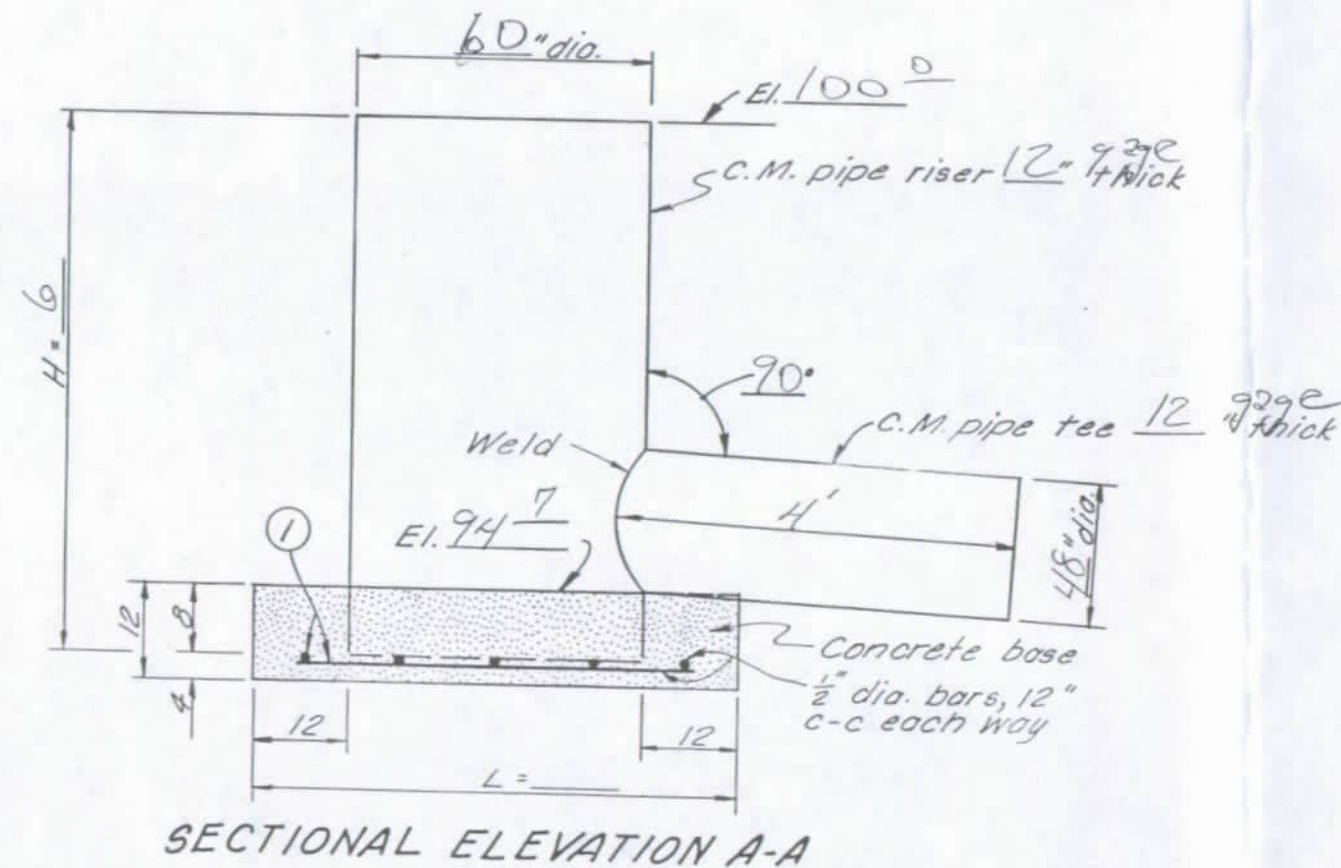
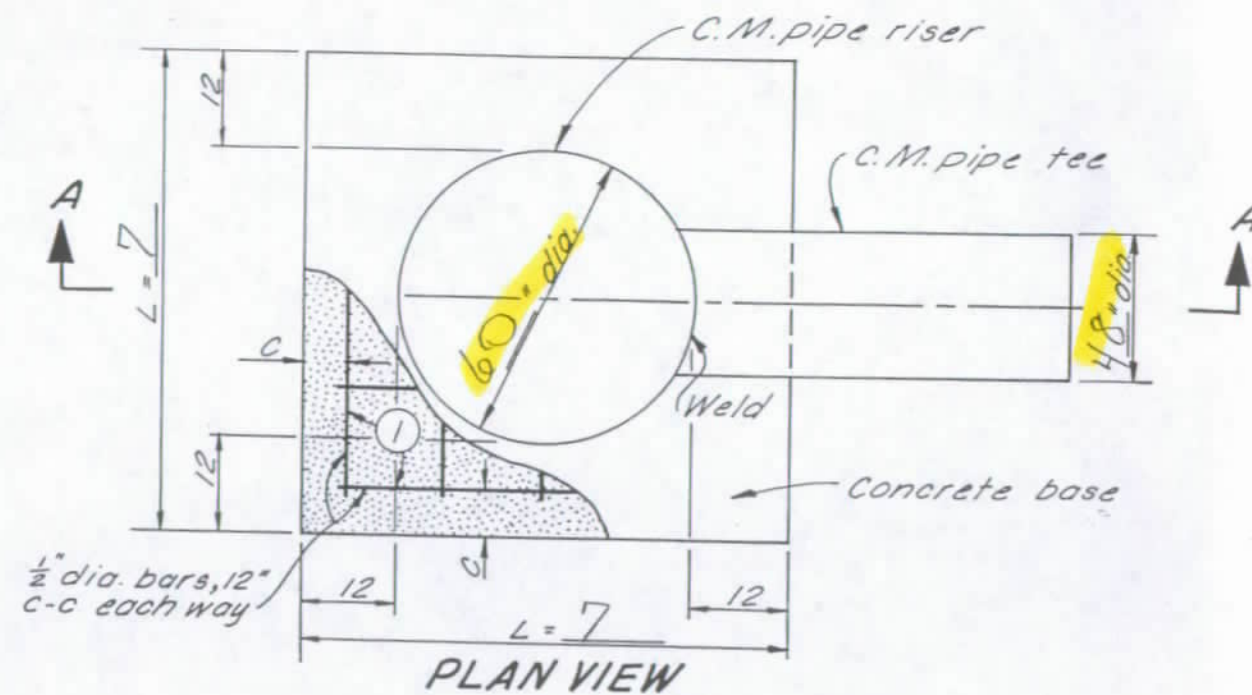
TIMBER PIPE SUPPORT

OPERATOR: Harlen Krein
 CONSERVATION DISTRICT: McPherson

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Designed	Date	Approved by
Drawn		Title
Traced		Title
Checked	Sheet	Drawing No.
	No.	
	of	

5, N-29,073.4a



STEEL SCHEDULE

RISER DIA. IN.	BAR SIZE	MARK	TYPE	NO. REQ'D.	LENGTH FT.-IN.	TOTAL LENGTH FT.-IN.	TOTAL WT. LB.	C IN.	L FT.-IN.
60	4	1	STR.	14	6-6	91-0	61	6	7-0

TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE	CU. YD.	1.9
REINFORCING STEEL	LB.	61

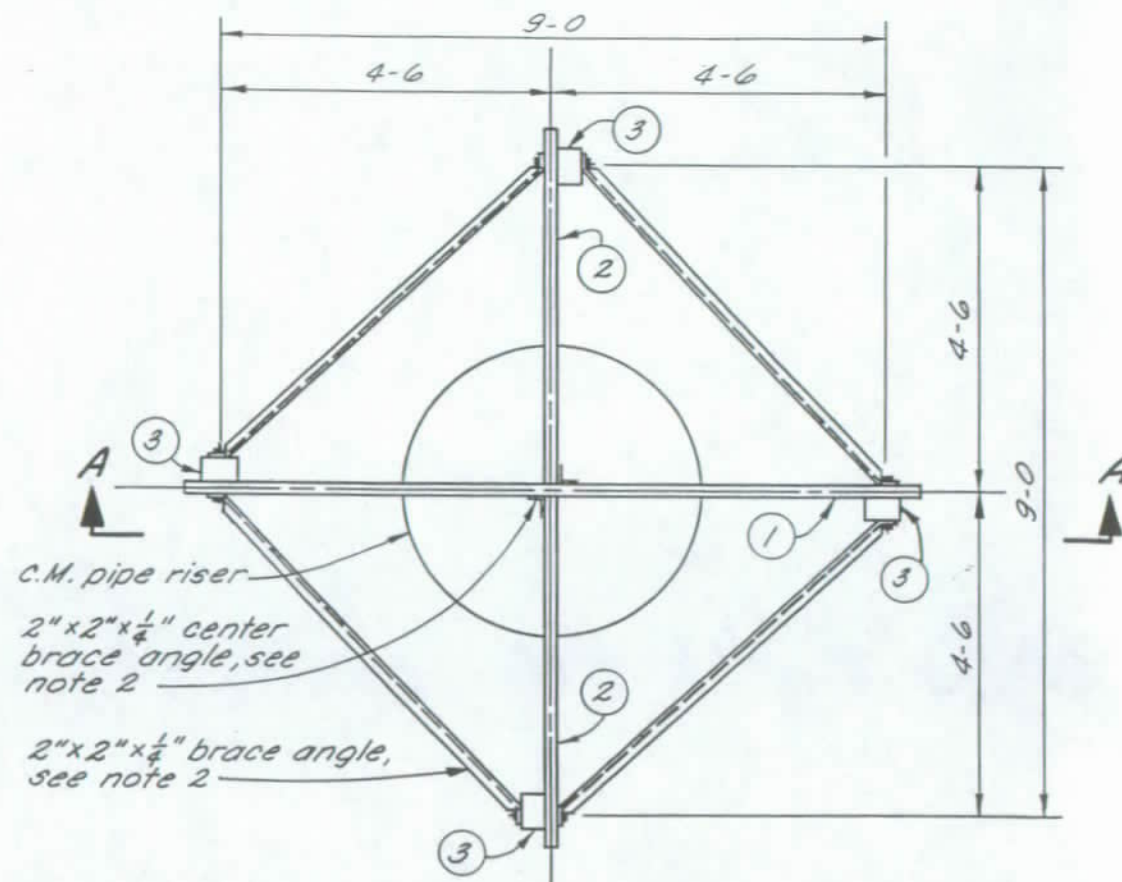
NOTE: All pipe to be spiral or double riveted and caulked seam

C.M. PIPE RISER WITH FABRICATED TEE

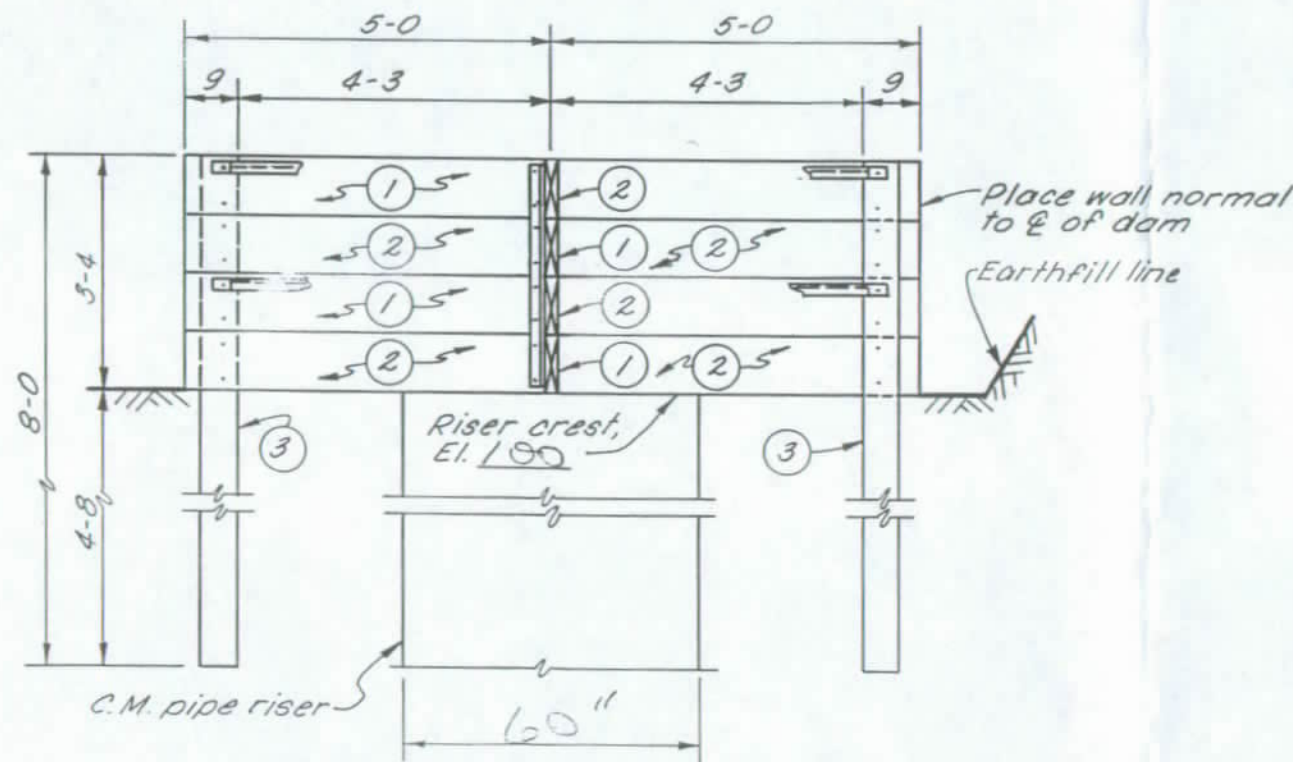
OPERATOR: Harlen Krein
 CONSERVATION DISTRICT: McPherson

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

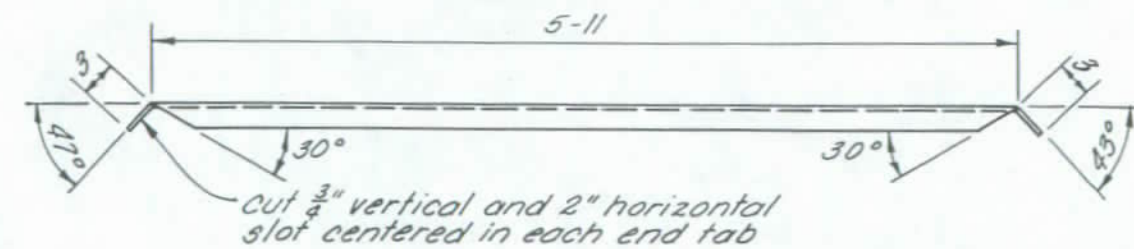
Designed	Date	Approved by
Drawn		Title
Traced		Title
Checked		Sheet No.
		Drawing No.



PLAN VIEW



SECTIONAL ELEVATION A-A



PLAN VIEW OF BRACE ANGLE

TABLE OF QUANTITIES

ITEM	MARK	NO. REQ'D.	QUANTITY
2" X 10" X 10' PRESSURE TREATED LUMBER	1	4	67 BD. FT.
2" X 10" X 4'-11" PRESSURE TREATED LUMBER	2	8	66 BD. FT.
4" X 6" X 8' PRESSURE TREATED POST	3	4	64 BD. FT.
2" X 2" X 1/4" X 6'-5" STEEL ANGLE		8	164 LB.
2" X 2" X 1/4" X 3'-2" STEEL ANGLE		2	20 LB.
5/8" X 8" STEEL BOLTS, NUTS, 2 WASHERS		32	32 SETS
1/2" X 3" STEEL BOLTS, NUTS, 2 WASHERS		32	32 SETS

NOTES:

1. TO 4" X 6" POSTS (4 REQUIRED) BOLT 2" X 10" BOARDS USING TWO 5/8" X 8" BOLTS PER 2" X 10" BOARD. DO NOT PLACE BOLTS CLOSER THAN 1 1/2" FROM EDGE OF BOARD.
2. FOR CENTER BRACE ANGLES DRILL 8 - 9/16" HOLES 5/8" FROM OUTER EDGE OF EACH LEG OF EACH ANGLE AND CENTERED 5 1/4" APART ALONG THE LEG.
3. ATTACH BRACE ANGLES TO TOP BOLT ON TOP 2" X 10" BOARD AND TO TOP BOLT ON NEXT TO BOTTOM BOARD.

TRASH RACK AND BAFFLE
FOR RISER DIA. 36" THRU 60"

OPERATOR: Harlen Krein

CONSERVATION DISTRICT: _____

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed: _____ Date: _____ Approved by: _____
Drawn: _____ Title: _____
Traced: _____ Sheet: _____ Drawing No. _____
Checked: _____ No. _____ of _____

JOB PLAN NO. 6.4

5, N-29, 073.6-40

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

N~~2~~ 416706

Pierre, December 7, 2000 ,

RECEIVED OF US Fish & Wildlife Service, 39650 Sand Lake Drive, Columbia SD 57433
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use _____	15	00
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	15 00

By Harland Ebele
Chief Engineer



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

January 5, 2000

Harlan Krein
PO Box 150
Busby, MT 59016

Dear Mr. Krein:

We have reviewed the plans and specifications for your dam repair project located in the NE 1/4 of Section 7-T125N-R67W, in McPherson County. The plans and specifications as submitted are approved.

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

The Krein Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 10 feet and a normal storage capacity of 60 acre-feet and a maximum storage capacity of 560 acre-feet.

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

Sincerely,

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

c: Dave Konechne, NRCS, Pierre
Neil Schaar, NRCS, Leola



United States Department of the Interior

FISH AND WILDLIFE SERVICE
SAND LAKE NATIONAL WILDLIFE REFUGE
RR1, BOX 25
COLUMBIA, SOUTH DAKOTA 57433-9761
605/885-6320

IN REPLY REFER TO:

December 5, 2000

Water Rights Division
Foss Building
523 E. Captiol
Pierre, SD 57501



Dear Sirs:

This should be the remaining information needed to complete the Vested Water Rights Permit Application for Harlan Krein from Leola, SD. If more information is needed please give me a call because there is a chance I have overlooked something.

Sorry about the mix up of not having this information sent to you at the same time. Again if you have any questions feel free to call me at (605) 885-6320. Thank you.

Sincerely;

Brian Wehausen
Private Lands Technician

Enclosures



CONSTRUCTION SPECIFICATIONS

for

Harlen Krein

Stock water Pond

NE Sec 7, T125, R67

Prepared by:

USDA-NATURAL RESOURCES CONSERVATION SERVICE

Leola, So. Dak

Assisting:

McPherson

Conservation District

CONSTRUCTION SPECIFICATION

SD-4 STRIPPING

4.1 SCOPE

The work shall consist of removing topsoil and other undesirable materials from borrow areas and foundations of structures and earth fills.

4.2 GENERAL

The stripping excavation shall extend to a depth sufficient to expose subsoil reasonably free of roots and other perishable material. Excavated earth material deemed satisfactory by the technician shall be used for earth fill. All waste material shall be disposed of in areas shown on the drawings or as directed by the technician. Stripped material suitable for topsoil shall be stockpiled and respread over disturbed areas as directed by the technician.

4.3 STRIPPING FOUNDATIONS

Stripping excavation shall extend to consolidated subsoil and shall be to reasonably smooth surfaces free of unconsolidated or loose soil. Unless otherwise shown on the drawings, foundation slopes shall be excavated to one to one, or flatter slopes.

4.4 STRIPPING BORROW AREAS

The areas from which borrow is to be taken shall be stripped to sufficient depth to expose material suitable for the earth fill.

additional materials shall be obtained from the designated borrow area as directed by the technician.

Borrow pits shall be excavated and finely dressed in a manner to eliminate steep or unstable side slopes or other hazardous or unsightly conditions.

5.8 BLASTING

The transportation, handling, storage, and use of dynamite and other explosives shall be directed by a person of proven experience and ability in blasting operations.

Blasting shall be done in such a way as to prevent damage to the work or unnecessary fracturing of the foundation.

CONSTRUCTION SPECIFICATION

SD-7S EARTH FILL-CLASS S

7S.1 SCOPE

The work shall consist of the construction of compacted earth fills where the amount of compaction is to be controlled by a method type of specification.

7S.2 MATERIALS

All fill materials shall be obtained from required excavations and designated borrow areas. The selection, blending, routing and disposition of materials shall be subject to approval by the technician.

Fill materials shall not contain frozen material, sod, brush, roots, or other perishable materials, or rocks larger than 8 inches in diameter. Fill shall not be placed on a frozen surface.

7S.3 FOUNDATION PREPARATION

After stripping (see stripping specification), the foundation shall be scarified or plowed to a minimum depth of 4 inches. The entire foundation area shall then be compacted by the process used on the fill.

7S.4 PLACEMENT

All foundation excavations and/or preparation shall be completed before placing fill. The fill shall be placed such that the distribution of materials is essentially uniform throughout the entire fill and is free from lenses, pockets, streaks, or layers of materials differing substantially from surrounding material.

Fill, adjacent to structures, shall be placed in a manner that will prevent damage to the structures and allow the structures to assume the backfill loads gradually and uniformly. Equipment weighing more than 400 pounds shall not be operated within 2 feet of any structure.

Fill shall be placed in approximately equal horizontal layers. Fill layer thicknesses shall not exceed 9 inches for machine compaction or 4 inches for hand compaction (including hand directed power tampers adjacent to structures).

7S.5 MOISTURE CONTENT

The fill material shall have a moisture content that when kneaded in the hand will form a ball which does not easily crumble when struck sharply with a pencil or which does not crumble when pressed between the hands.

If the soil is too wet, it will yield free water when kneaded in the hand. The fill may have to be wetted or dried to achieve proper moisture control.

7S.6 COMPACTION (CLASS S)

The fill shall be compacted by one of the following methods.

- a. By routing the hauling and spreading equipment such that all points of the fill is traversed by at least one tread track of the loaded equipment, parallel to the centerline of the fill.
- b. By at least two passes of a tamping (sheepfoot) roller weighing at least 100 pounds per square inch of bearing area.

Fill adjacent to structures shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators. Heavy equipment shall not be operated within 2 feet of any structure.

Compaction of fill adjacent to concrete structures shall not be started until the following time limits have elapsed after placement of the concrete.

<u>Structure</u>	<u>Time Interval</u>
Walls and counterforts	14 days
Conduits and Spillway Risers (cast in place)	14 days
Conduits, precast, cradled	2 days
Conduits, precast, bedded	1 day
Anti-seep Collars and Cantilever pipe props	3 days

CONSTRUCTION SPECIFICATION

SD-9 DRAIN FILL AND FILTER

9.1 SCOPE

The work shall consist of furnishing and placing drain fill and filter sands or gravels.

9.2 MATERIALS

a. Quality

Aggregates shall be sand, gravel, or crushed stone, composed of clean, hard, durable mineral particles free from organic matter, clay balls, soft particles or other substances that would interfere with their free draining properties.

Not more than 5 percent of the material may be crushed limestone, not more than 15 percent may be flat, elongated particles, and not more than 5 percent may be finer than a No. 200 sieve.

b. Gradation

The aggregates shall meet the following gradation requirements unless otherwise specified in the plans.

<u>Size</u>	<u>% Finer</u>
3"	100%
1"	90-100%
#4	50- 85%
#50	10- 40%
#200	0- 5%

9.3 BASE PREPARATION

Surfaces on which drain fill will be placed shall be as undisturbed as possible (do not scarify), and will be free of standing water during placement of the fill. Care shall be taken to prevent trench walls from sliding.

9.4 PLACEMENT

Material shall be placed in uniform, approximately 6-inch thick layers. Extreme care shall be taken to assure uniformity of the drain fill, and to prevent segregation or contamination of the drain fill with foreign matter. When collector pipes are included in drains, the fill materials shall be placed in a manner to avoid displacing the pipe.

CONSTRUCTION SPECIFICATION

SD-5 EXCAVATION

5.1 SCOPE

The work shall consist of all excavations to the lines and grades as shown on the drawings and the use and disposal of the excavated materials.

5.2 CLASSIFICATION

Common excavation shall be defined as the excavation of all materials that can be removed and transported by heavy duty construction equipment having a power rating of at least 200 net peak flywheel horsepower 1/, and includes boulders and loose rock less than 1 cu. yd. in volume.

Rock excavation shall be defined as the excavation of all hard compacted or cemented materials requiring blasting or larger equipment than defined under common excavation, including boulders and loose rock 1 cu. yd. or greater in volume.

5.3 USE OF EXCAVATED MATERIALS

Excavated materials deemed satisfactory by the technician shall be used for earth or rock fill to the extent needed.

5.4 DISPOSAL OF WASTE MATERIAL

All surplus or waste material shall be disposed of in areas shown on the drawings or as directed by the technician, and left in a neat, sightly condition and sloped to provide drainage.

5.5 BRACING AND SHORING

Excavated surfaces too steep to be stable shall be supported to prevent soil movement. The contractor shall furnish, place, and subsequently remove the supports.

5.6 STRUCTURE AND TRENCH EXCAVATION

Structure or trench excavation shall be approved by the technician before any structure, pipe, or earth fill is placed in the excavation.

5.7 BORROW EXCAVATION

When quantities of suitable materials obtained from specified excavations are insufficient to construct specified fills.

1/ D8 Caterpillar or equivalent

CONSTRUCTION SPECIFICATION

SD-12B CONCRETE FOR MINOR STRUCTURES
(FOR STRUCTURES UP TO 10 C.Y.)

12B.1 SCOPE

The work shall consist of proportioning, forming, placing, finishing, and curing portland cement concrete.

Acceptance:

The acceptance or rejection of concrete made under this specification will depend upon adherence to the procedures set forth herein, and the appearance of the finished structure.

12B.2 MATERIALS

Portland Cement shall be Type II or Type IIA Portland Cement. Cement that is partially hydrated or otherwise damaged shall not be used.

Fine Aggregate is defined as all material which will pass a $\frac{1}{4}$ -inch screen. Fine aggregate shall compose between 35 and 45 percent of the total aggregate and shall not contain more than 1 percent clay lumps or more than 4 percent finer than a No. 200 sieve. Coal in fine aggregate shall not exceed $\frac{1}{2}$ of 1 percent.

Coarse Aggregate is defined as all material larger than $\frac{1}{4}$ inch. Maximum size aggregate shall not exceed:

- 1 inch - Concrete thickness of 4 inches or less
- $1\frac{1}{2}$ inch - Concrete thickness of 4 inches or more

Coarse aggregate shall compose between 55 and 65 percent of total aggregate and shall not contain more than $\frac{1}{4}$ of 1 percent of clay lumps or more than 1 percent of material finer than No. 200 sieve. Coal shall not exceed one percent.

Mixed fine and coarse aggregate or pit-run aggregate may be used provided the requirements stated above are met.

Water shall be clean and free of harmful chemicals (suitable for drinking).

12B.3 DESIGN OF CONCRETE MIX

The contractor or person in charge of construction shall be responsible for designing a high quality concrete mix conforming to this specification.

The mix shall contain less than 6 gallons of water per bag of cement, and at least 6 bags of cement per cubic yard of concrete. The air-entrainment shall be between 4 and 7 percent by volume, and the slump after mixture shall be between 2 and 4 inches.

The following table is recommended as a guide for developing a satisfactory mix to give 3000 psi compressive strength for air-entrained concrete.

Max. Size Aggregate	Gal. Water per sack of cement	% of Fine Aggregate	Sacks Cement per cu. yd.	Pounds Fine Aggregate per sack cement	Pounds Coarse Aggregate per sack cement
1"	6.0	40	6.0	190-200	300-310
1½"	6.0	35	6.0	180-190	330-340

Ready Mixed concrete may be used provided it meets the requirements of these specifications. Upon request the vendor shall provide the owner with a signed delivery ticket giving the quantities of concrete, cement, fine aggregate, coarse aggregate and water contained in the batch.

Measurements of materials shall be by weight where suitable scales are available. Where suitable scales are not available, volume measurement may be used provided volume-weight relationships are carefully determined. Calcium chloride or other accelerators or anti-freeze compounds shall not be used.

Measurements (by weight) of materials in the mix shall be made available to the technician.

12B.4 FORMS FOR CONCRETE

Forms shall be made of wood, plywood, steel or other approved material. The type, size, shape, quality and strength of forms will be subject to approval by the technician.

All forms shall be true to line and grade, mortar tight, and rigid enough to prevent bulging or displacement. Tolerances will be close enough to assure that the structure appears and performs well.

All forms shall be removed from the concrete. Forming shall not be embedded in the concrete.

12B.5 PLACING CONCRETE

Concrete shall be placed in final position within one and one-half hours after mixing with cement.

Concrete shall be consolidated by hand spading and tamping or by mechanical vibration.

All concrete placed on earth shall be placed on clean damp surface, free of frost, ice, or running water. Concrete shall not be dropped more than 5 feet vertically unless suitable equipment is used to prevent segregation.

Uniformed surfaces (excluding slip form concrete) exposed in the completed work shall have a wood float finish. Exposed concrete edges shall be chamfered or finished with molding tools.

Concrete shall be placed at air temperatures between 40°F. and 80°F. unless special measures are taken to protect the concrete. Concrete shall be protected from freezing for 7 days after placement.

12B.6 CURING CONCRETE

All concrete shall be cured by keeping all exposed surfaces wet for 7 days or by applying a spray type curing compound to exposed concrete surfaces immediately after the free water has disappeared after pouring.

12B.7 DEFECTIVE CONCRETE

Honey combed areas and other voids in concrete will be promptly repaired with mortar patching immediately upon discovery.

Concrete subjected to damage and/or other violations of this specification will be rejected.

CONSTRUCTION SPECIFICATION

SD-15 CORRUGATED METAL PIPE CONDUITS

15.1 SCOPE

The work shall consist of furnishing and placing circular, arched, or elliptical corrugated metal pipe and the necessary fittings as shown on the plans.

15.2 MATERIALS

Pipe and fittings shall conform to the requirements of Material Specification SD-50 or Material Specification SD-51, whichever is specified. When specified, caulked seam corrugated metal pipe shall conform to the following additional requirements:

- (1) Caulked seam corrugated metal pipe shall have all circumferential and horizontal seams caulked with an asphalt compound before riveting. This shall be accomplished by applying a uniform bead ($\frac{1}{4}$ inch minimum diameter) of the asphalt compound to the inner lap surface before riveting such that when the rivets are in place all voids are filled and a coating of asphalt is between the lap surfaces.
- (2) The asphalt compound shall consist of an asphalt base combined with asbestos fiber and other inert filler material to form a heavy-bodied compound that will not sag or run out of the seam. The compound should contain 63 to 68 percent solids by weight. It shall be similar in type and equal in quality to Trumbull 5X Asphalt Mastic, knife grade, as manufactured by the Trumbull Asphalt Company of Delaware.

15.3 HANDLING THE PIPE

The Contractor shall furnish such equipment as is necessary to place the pipe without damaging the pipe or coatings. The pipe shall be transported and handled in such a manner as to prevent bruising, scaling, or breaking of the zinc, bituminous or plastic coating.

Whenever the coating of zinc coated pipe is damaged in any individual area larger than 12 square inches, or if more than 0.2 percent of the total surface area of the pipe is damaged, the section will be rejected.

Whenever the coating on bituminous or plastic coated pipe is damaged in any individual area that exceeds 36 square inches or when the total area of breaks exceeds 0.5 percent of the total surface area of the pipe, the section will be rejected.

15.4 REPAIR OF DAMAGED COATINGS

Breaks, scuffs, or other damage to the various coatings shall be repaired as follows:

- (1) Zinc Coating - by thoroughly wire brushing and cleaning the damaged area with solvent, and then painting two coats of one of the following paints:
 - a. Zinc Dust - Zinc Oxide Primer conforming to Federal Specification TT-P-641, Type III.
 - b. Zinc Dust Chlorinated Rubber conforming to Federal Specification TT-P-1046a.
 - c. Zinc Dust Paint conforming to Military Specification MIL-P-21035.
 - d. Epoxy-Polyamide Paint conforming to Defense Specification DOD-P-15145B.
- (2) Bituminous Coating - by the application of two coats of hot asphaltic paint or a coating of cold-applied bituminous mastic. The repair coating shall be at least 0.05 inches thick after hardening and shall bond securely and permanently to the pipe. The material shall meet the physical requirements of the original coating.
- (3) Plastic or Vinyl Coating - by using a plastic coating similar and equal to Scotch-Clad Protective Coating 1706, manufactured by 3M Co., 3M Center, St. Paul, Minnesota. Surfaces to be coated must be clean and dry. A 10 mil coating thickness is required. If the repair coating thickness is not measured, four coats shall be applied allowing 30 minutes drying time between coats.

15.5 LAYING AND BEDDING THE PIPE

Unless otherwise specified, the pipe shall be installed in accordance with the manufacturer's recommendations. The pipe shall be laid with the outside laps of circumferential joints pointing upstream and with longitudinal laps at the sides at about the vertical midheight of the pipe. Field welding on corrugated galvanized iron or steel pipe will not be permitted. Unless otherwise specified, the pipe sections shall be joined with water-tight coupling bands, with a minimum width of 12 inches, or flanges for a flange-type connection. The area between pipe and coupling band shall be coated with either an asphalt cement to insure a water-tight joint or a rubber neoprene gasket 3/8 inch thick and as wide as the connecting band $\pm$ 1 inch.

The trench or foundation width in or on which the pipe will be laid should be at least: (a) 2 times the pipe diameter, or (b) the pipe diameter plus 2 feet, whichever is the greater.

Pipe should be laid on a moist, compacted foundation (not wet nor hard and dry). Just before the pipe is laid, spread a 2-to 3-inch layer of moist loose soil for the pipe to be placed on. The pipe should make uniform contact with the soil along its entire length.

Perforated pipe shall be laid with perforation down and oriented symmetrically about a vertical centerline. Perforations shall be clear of any obstructions at the time the pipe is laid.

15.6 BACKFILLING

The pipe shall be loaded sufficiently during backfilling around the side to prevent its being lifted from the bedding.

Backfill around the pipe shall be placed in layers not more than 4 inches thick before compaction. Each layer of backfill shall be compacted with power tampers or hand tamping to the same density requirements as specified for the adjacent embankment. Backfill over and around the pipe shall be brought up uniformly on all sides and shall extend a minimum of 2 feet over the pipe before earth embankment with earth moving equipment over the pipe is started. Special care shall be taken not to disturb the grade and alignment during backfill operations.

CONSTRUCTION SPECIFICATION

SD-16 TIMBER FABRICATION AND INSTALLATION

16.1 SCOPE

This specification covers the quality and installation of plywood and pressure treated structural timber poles, posts, and lumber structure and timber and lumber portions of composite structure.

16.2 MATERIAL

a. Plywood

Plywood shall be new, exterior grades, and shall meet Product Standard PS 1-66.

Plywood for use underground shall be pressure treated in accordance with the American Wood Preservers Bureau AWPB-FDN Standard (stamped on plywood).

b. Structural Timber and Lumber

Structural timber and lumber shall be structural grade or better. Structural timber, poles, posts, and lumber shall be new, sound, decay free, straight, not warped or cracked. Unless otherwise specified on the drawings, all lumber and timber except red wood and red cedar shall be treated by any of the following preservatives:

- Commercial Coal Tar Creosote
- Hot and Cold Bath Creosote
- Pentachlorophenol - Commercial Treatment
- Pentachlorophenol - Cold Soaking Method
- AWPB-FDN Standard Preserving Salts

c. Hardware

Bolts, rods, nuts, washers, and other hardware shall be an appropriate grade of steel, and if to be placed underground, shall be galvanized or otherwise corrosion protected.

16.3 INSTALLATION

The material shall be of the dimensions, and installed at the location, as shown on the drawings. All lumber to be treated shall be cut to size, insofar as practical, prior to treatment. Raw ends of lumber which has been cut after treatment shall be immersed in the preservative solution, or painted with four (4) heavy coats of the solution. Each application should be allowed to dry. For home treatment, the preservative manufacturer's directions shall be carefully followed.

MATERIAL SPECIFICATION

SD-50 ZINC-COATED IRON OR STEEL CORRUGATED PIPE

50.1 SCOPE

This specification covers the quality of zinc-coated iron or steel corrugated pipe and fittings.

50.2 PIPE

Zinc-coated iron or steel corrugated pipe and fittings shall conform to the requirements of Federal Specification WW-P-405 for the specified classes and shapes of pipe, and to the following additional requirements:

- a. Unless otherwise specified, circumferential shop riveted seams shall have a maximum rivet spacing of 6 inches, except that 6 rivets will be sufficient for 12-inch diameter pipe.
- b. When close riveted pipe is specified: (1) the pipe shall be fabricated so that the rivet spacing in the circumferential seams shall not exceed 3 inches, except that 12 rivets will be sufficient to secure the circumferential seams in 12-inch pipe, and (2) in those portions of the longitudinal seams that will be covered by the coupling bands the rivets shall have finished flat heads or the rivets and holes shall be omitted and the seams shall be connected by welding to provide a minimum of obstruction to the seating of the coupling bands.
- c. Double riveting or double spot welding of pipe less than 42 inches in diameter may be required. If specified, the riveting or welding shall be done in the manner specified for pipe 42 inches or greater in diameter.

50.3 COATING

Coating shall conform to the requirements of Federal Specification WW-P-405 for the specified types of coatings.

DAMS2 XEQ 06/22/** STRUCTURE SITE ANALYSIS COMPUTER PROGRAM
REV 01/01/90 SCS TECHNICAL RELEASE 48, (USER MANUAL) DATED JAN. 1990
TIME 11:39:10

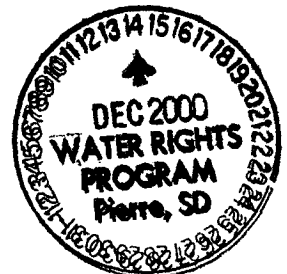
***** THIS PROGRAM IS IN TEST STATUS *****

***** 80-80 LIST OF INPUT DATA *****

DAMS2 01/01/90 Krein Dam McPherson Co. SD
STRUCTURE Krein Dam 06-22-00 D. Konechne378 Design

		92				0.0
		98				30
		100				60
		102				130
		105	102.5			180
		105				500
		105.5				560
ENDTABLE						
WSDATA	1A101	AC	78	3435	19.4	
PDIRECT	1.0		3.5	5.8	4.0	4.0
POOLDATA	ELEV			100		
PSDATA	1		54	48	0.025	94
PSINLET	ELEV		1.0	15.7	100	
ESCREST	ELEV					
ESDATA	28		60	0.03	3	0.035
BTMWIDTH	FEET		100	60		5
ENDTABLE						
COMMENT						
COMMENT						
COMMENT						
COMMENT						
COMMENT						
COMMENT						
GO, DESIGN L, E				6	TYPE2 378 24	
ENDJOB						

***** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.



DAMS2 XEQ 06/22/**
REV 01/01/90

McPherson Co. SD

WSID = Krein D

This is routing a 10-yr storm thru the principal spillway
and a 25 yr storm thru the emergency spillway

DAMS2 -----
 XEQ 06/22/** McPherson Co. SD WSID= Krein D
 REV 01/01/90 06-22-00 D. Konechne378 Design SUBW= 01
 TIME 11:39:10 SITE = Krein PASS= 1 PAGE= 1

***** BASIC DATA *****
 ARID- SEMIARID CLIMATE AREA DESIGN CLASS A1 =LT 3000

STORM DISTRIBUTION-PSH 24 HOUR TYPE II RAINFALL DISTRIBUTION

STORM DISTRIBUTION USED FOR EMERGENCY SPILLWAY IS;
 SCS DESIGN STORM RAINFALL DISTRIBUTION. (CHAPTER 21 NEH4 AND SCS TR-60)

PRECIP.-	P-PS1 DAY 3.50	P-PS10 DAY 5.80	P-ES 4.00	P-FB 4.00
WSDATA-	CN 78.00	DA-SM 5.37	TC/L 19.40	-/H .00
SITEDATA-	PERM POOL .00	CREST PS 100.00	FP SED .00	QRF .00
	BASEFLOW .00	INITIAL EL .00	EXTRA VOL. .00	
PSDATA-	NO. COND. 1.00	COND L 54.00	D/W 48.00	-/H .00
	PS N .025	KE 1.00	WEIR L 15.70	TW EL 94.00
	2ND STG 100.00	ORF H .00	ORF L .00	START ES .00
CRESTS-	ES1 .00	ES2 .00	ES3 .00	ES4 .00
				ES5 .00
EMG DATA-	SIDE SLOPE 3.00	EXIT N .035	EXIT SLOPE .050	
EMG DATA-	ES TYPE 28	ES LENGTH 60	ES ENTRANCE N .030	
BTM WIDTH-	BW1 100.00	BW2 60.00	BW3 .00	BW4 .00
				BW5 .00

***** NOTE - THIS IS ONLY A PRELIMINARY EMG RATING CURVE OF DISCHARGE/FT
 OF WIDTH AND DOES NOT INCLUDE SIDESLOPE CORRECTION OR
 REVISED RATING USING ACTUAL EMG. CONFIGURATION.

EMG ID CODE	28	ELEVATION INCREMENT (FT)= 1.000	
DISCHARGES-Q1	Q2	Q3	Q4
2.106	7.061	13.846	22.147
Q5	Q6	Q7	Q8
31.651	42.245	53.786	66.265
Q9	Q10	Q11	Q12
79.609	93.682	108.524	124.103

DAMS2 -----
 XEQ 06/22/** McPherson Co. SD WSID= Krein D
 REV 01/01/90 06-22-00 D. Konechne378 Design SUBW= 01
 TIME 11:39:10 SITE = Krein PASS= 1 PAGE= 2

CREST PS	100.00 FT	60.0 ACFT	.00 AC	.0 CFS
SED ACCUM	100.00 FT	60.0 ACFT	.00 AC	.0 CFS
2ND STAGE	100.00 FT	60.0 ACFT	.00 AC	.0 CFS
STARTING E	100.00 FT	60.0 ACFT	.00 AC	.0 CFS
SCS-PSH	D= 24.00 HR TC= 19.40 HR	P= 3.50 IN CN= 78.00	Q= 1.50 IN VOL= 428.6 ACFT	DA = 5.37 SM

Q₁₀ PEAK = 288.9 CFS, AT 25.5 HRS.

ROUTED RESULTS - HYD TYPE EMAX VOL-MAX AMAX QMAX
 SCS-PSH 102.64 FT 208.4 ACFT .00 AC 171.5 CFS

PS STORAGE 148.4 ACFT BETWEEN ES CREST AND SED ACCUM ELEVATIONS

DRAWDOWN (DDT) TEST 100.00 FT 60.0 ACFT .00 CFS
 CONTROL IS .000 DETENTION STORAGE

TIME = 4.18 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

 RATING TABLE DEVELOPED, SITE = Krein
 BY PROGRAM FOR PS AND EMG SPILLWAYS

RATING TABLE NUMBER 1

	ELEV FEET	Q-TOTAL CFS	Q-PS CFS	VOLUME AC-FT	AREA ACRE
1	100.00	.00	.00	60.00	.00
2	100.57	20.99	20.99	79.98	.00
3	101.14	59.36	59.36	99.95	.00
4	101.71	109.05	109.05	119.93	.00
5	102.28	167.89	167.89	164.91	.00
FULL CONDUIT FLOW, ELEV = 102.28 FT					
6	102.62	171.34	171.34	206.79	.00
7	102.96	174.68	174.68	248.68	.00
8	103.30	177.96	177.96	290.57	.00
9	103.64	181.18	181.18	332.45	.00
10	103.98	184.35	184.35	374.34	.00
11	104.32	187.46	187.46	416.23	.00
12	104.66	190.52	190.52	458.11	.00
13	105.00	193.53	193.53	500.00	.00

DAMS2 -----
 XEQ 06/22/** McPherson Co. SD WSID= Krein D
 REV 01/01/90 06-22-00 D. Konechne378 Design SUBW= 01
 TIME 11:39:10 SITE = Krein PASS= 1 PAGE= 3

ES CREST 102.64 FT 208.4 ACFT .00 AC 171.5 CFS
 PS STORAGE 148.4 ACFT BETWEEN ES CREST AND SED ACCUM ELEVATIONS
 STARTING E 100.00 FT 60.0 ACFT .00 AC .0 CFS

ELEVATION OF LOW POINT IS ZERO. NO CRITERIA CHECK MADE FOR
 STRUCTURE CLASSIFICATION

SCS-ESH D= 6.00 HR P= 4.00 IN Q= 1.89 IN DA = 5.37 SM
 TC= 19.40 HR CN= 78.00 VOL= 540.1 ACFT

PEAK = 411.6 CFS, AT 14.8 HRS.

***** WARNING - TR-60 REQUIRES AN INCREASE IN RAINFALL AMOUNT COMPATIBLE
 WITH INCREASE IN EMERGENCY STORM DURATION WHEN TC EXCEEDS 6-HRS.

SCS-FBH D= 6.00 HR P= 4.00 IN Q= 1.89 IN DA = 5.37 SM
 TC= 19.40 HR CN= 78.00 VOL= 540.1 ACFT

PEAK = 411.6 CFS, AT 14.8 HRS.

 RATING TABLE DEVELOPED, SITE = Krein
 BY PROGRAM FOR PS AND EMG SPILLWAYS

RATING TABLE NUMBER 2					
	ELEV	Q-TOTAL	Q-PS	VOLUME	AREA
	FEET	CFS	CFS	AC-FT	ACRE
1	100.00	.00	.00	60.00	.00
2	100.57	20.99	20.99	79.98	.00
3	101.14	59.36	59.36	99.95	.00
4	101.71	109.05	109.05	119.93	.00
5	102.28	167.89	167.89	164.91	.00
FULL CONDUIT FLOW, ELEV = 102.28 FT					
6	102.33	168.38	168.38	170.34	.00
7	102.37	168.83	168.83	175.78	.00
8	102.42	169.27	169.27	181.22	.00
9	102.46	169.71	169.71	186.65	.00
10	102.50	170.15	170.15	192.09	.00
11	102.55	170.59	170.59	197.53	.00
12	102.59	171.03	171.03	202.96	.00
13	102.64	171.47	171.47	208.40	.00
14	102.75	197.64	172.64	222.98	.00
15	102.87	223.90	173.80	237.56	.00
16	103.08	271.36	175.88	263.80	.00
17	103.34	329.62	178.38	295.88	.00
18	103.82	489.64	182.83	354.20	.00
19	104.41	800.36	188.26	427.10	.00
20	105.00	1187.27	193.53	500.00	.00

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	EMG. HP	VOL-ES
RESULTS	FT	FT	ACFT	AC	FT	ACFT
SCS-ESH	100.0	103.07	261.8	.0	.43	53.4

PEAK - CFS	Q-PS	Q-ES	Q-TOT
DISCHARGE =	175.7	92.0	267.7

	CRITICAL	CRITICAL	CRITICAL	25% OF
	DEPTH	VELOCITY	SLOPE-S/C	S/C
EMERGENCY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY----	.30	3.08	.027	.037

	DURATION	ATTACK	SUMMATION
	FLOW	OE/B	VEL**2 DELTA T
EMERGENCY	HRS	ACFT/FT	(FT/SEC)**2 HRS
SPILLWAY----	14.8	.7	130.1

***** MESSAGE - ES378 CRITERIA USED BUT EMERGENCY SPILLWAY NOT BASED ON RETARDANCE.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 3.71 FT/SEC
EXIT SLOPE = .050 FT/FT
FLOW DEPTH = .246

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 102.64 FT.

DRAWDOWN (DDT) TEST 100.00 FT 60.0 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = 4.50 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	EMG. HP	VOL-ES
RESULTS	FT	FT	ACFT	AC	FT	ACFT
SCS-FBH	100.0	103.07	261.8	.0	.43	53.4

PEAK - CFS	Q-PS	Q-ES	Q-TOT
DISCHARGE =	175.7	92.0	267.7

	CRITICAL	CRITICAL	CRITICAL	25% OF
	DEPTH	VELOCITY	SLOPE-S/C	S/C
EMERGENCY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY----	.30	3.08	.027	.037

	DURATION	ATTACK	SUMMATION
	FLOW	OE/B	VEL**2 DELTA T
EMERGENCY	HRS	ACFT/FT	(FT/SEC)**2 HRS
SPILLWAY----	14.8	.7	130.1

***** MESSAGE - ES378 CRITERIA USED BUT EMERGENCY SPILLWAY NOT BASED ON RETARDANCE.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 3.71 FT/SEC
EXIT SLOPE = .050 FT/FT
FLOW DEPTH = .246

***** ES378 RUN - MINIMUM FLOW IN EMG. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT. *****

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	EMG. HP	VOL-ES
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM ES	100.0	104.27	410.5	.0	1.64	202.1

PEAK - CFS	Q-PS	Q-ES	Q-TOT
DISCHARGE =	187.0	542.6	729.7

	CRITICAL	CRITICAL	CRITICAL	25% OF
	DEPTH	VELOCITY	SLOPE-S/C	S/C
EMERGENCY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY----	.96	5.49	.018	.025

***** ES378 RUN - MINIMUM DEPTH, CREST EMG TO TOP OF DAM IS 2.00 FT

NEW TOP OF DAM ELEVATION = 104.64

ROUTED RESULTS MINIMUM ES	BTM WIDTH FT 100.0	MAX ELEV FT 104.64	VOL-MAX ACFT 455.1	AREA-MAX AC .0	EMG. HP FT 2.00	VOL-ES ACFT 246.7
---------------------------------	--------------------------	--------------------------	--------------------------	----------------------	-----------------------	-------------------------

PEAK - CFS DISCHARGES =	Q-PS 190.3	Q-ES 758.5	Q-TOT 948.8
----------------------------	---------------	---------------	----------------

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-S/C FT/FT	25% OF S/C FT/FT
EMERGENCY SPILLWAY----	1.20	6.11	.017	.023

***** WARNING - TOP ELEVATION (104.64) IS LESS THAN L OWEST
ELEVATION (*****) ON CLPROFILE.

RATING TABLE DEVELOPED, SITE = Krein
BY PROGRAM FOR PS AND EMG SPILLWAYS

RATING TABLE NUMBER 3

	ELEV FEET	Q-TOTAL CFS	Q-PS CFS	VOLUME AC-FT	AREA ACRE
1	100.00	.00	.00	60.00	.00
2	100.57	20.99	20.99	79.98	.00
3	101.14	59.36	59.36	99.95	.00
4	101.71	109.05	109.05	119.93	.00
5	102.28	167.89	167.89	164.91	.00
6	102.33	168.38	168.38	170.34	.00
7	102.37	168.83	168.83	175.78	.00
8	102.42	169.27	169.27	181.22	.00
9	102.46	169.71	169.71	186.65	.00
10	102.50	170.15	170.15	192.09	.00
11	102.55	170.59	170.59	197.53	.00
12	102.59	171.03	171.03	202.96	.00
13	102.64	171.47	171.47	208.40	.00
14	102.75	187.68	172.64	222.98	.00
15	102.87	203.98	173.80	237.56	.00
16	103.08	233.51	175.88	263.80	.00
17	103.34	269.86	178.38	295.88	.00
18	103.82	369.28	182.83	354.20	.00
19	104.41	562.87	188.26	427.10	.00
20	105.00	805.95	193.53	500.00	.00

FULL CONDUIT FLOW, ELEV = 102.28 FT

ROUTED RESULTS SCS-ESH	BTM WIDTH FT 60.0	MAX ELEV FT 103.15	VOL-MAX ACFT 271.8	AREA-MAX AC .0	EMG. HP FT .51	VOL-ES ACFT 63.4
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PEAK - CFS DISCHARGE =	Q-PS 176.5	Q-ES 66.1	Q-TOT 242.6
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	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-S/C FT/FT	25% OF S/C FT/FT
EMERGENCY SPILLWAY----	.33	3.25	.026	.036

	DURATION FLOW HRS	ATTACK OE/B ACFT/FT	SUMMATION VEL**2 DELTA T (FT/SEC)**2 HRS
EMERGENCY SPILLWAY----	16.1	.9	165.7

***** MESSAGE - ES378 CRITERIA USED BUT EMERGENCY SPILLWAY NOT BASED
ON RETARDANCE.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 3.96 FT/SEC
EXIT SLOPE = .050 FT/FT
FLOW DEPTH = .274

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 102.64 FT.

DRAWDOWN (DDT) TEST 100.00 FT 60.0 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = 4.31 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX AC	EMG. HP FT	VOL-ES ACFT
SCS-FBH	60.0	103.15	271.8	.0	.51	63.4

PEAK - CFS	Q-PS	Q-ES	Q-TOT
DISCHARGE =	176.5	66.1	242.6

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-S/C FT/FT	25% OF S/C FT/FT
EMERGENCY SPILLWAY----	.33	3.25	.026	.036

	DURATION FLOW HRS	ATTACK OE/B ACFT/FT	SUMMATION VEL**2 DELTA T (FT/SEC)**2 HRS
EMERGENCY SPILLWAY----	16.1	.9	165.7

***** MESSAGE - ES378 CRITERIA USED BUT EMERGENCY SPILLWAY NOT BASED
ON RETARDANCE.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 3.96 FT/SEC
EXIT SLOPE = .050 FT/FT
FLOW DEPTH = .274

***** ES378 RUN - MINIMUM FLOW IN EMG. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT. *****

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX AC	EMG. HP FT	VOL-ES ACFT
MINIMUM ES	60.0	104.83	478.6	.0	2.19	270.2

PEAK - CFS	Q-PS	Q-ES	Q-TOT
DISCHARGE =	192.0	542.6	734.6

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-S/C FT/FT	25% OF S/C FT/FT
EMERGENCY SPILLWAY----	1.33	6.36	.017	.022

***** WARNING - TOP ELEVATION (104.83) IS LESS THAN LOWEST
ELEVATION (*****) ON CLPROFILE.

DAMS2.....JOB NO. 1 COMPLETE

Krein D

McPherson Co. SD

0 SUBWATERSHED(S) ANALYZED

1 STRUCTURE(S) ANALYZED

5 HYDROGRAPHS ROUTED AT LOWEST SITE

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED VELOCITY(S)

DAMS2.....COMPUTATIONS COMPLETE

SUMMARY TABLE 1

DAMS2 VERSION 01/01/90

WATERSHED ID		RUN DATE		RUN TIME	
Krein D		06/22/**		11:39:10	

>>>	SITE ID	SUBWS ID	SUBWS DA (SQ MI)	CURVE NO.	TC (HRS)	TOTAL DA (SQ MI)	TYPE DESIGN	STRUC CLASS	<<<
	Krein	01	5.37	78.	19.40	5.37	378CR	A1	

PASS NO.	DIA/ WIDTH (IN/FT)	ES CREST ELEV (FT)	BTM WIDTH (FT)	MAX HP (FT)	MAX ELEV (FT)	YARDAGE EMB (CY)	OE/B* (AF/FT)	EXIT* VELOCITY (FT/SEC)	TYPE HYD
1	48.0	102.64	100.00	2.00	104.64	0.	.7	3.71	MINIMUM ES
1	48.0	102.64	60.00	2.19	104.83	0.	.9	3.96	MINIMUM ES

* OE/B AND EXIT VELOCITY ARE BASED ON THE ROUTED HYDROGRAPH AND WILL NOT RELATE TO THE MAX. ELEV. (TOP OF DAM), WHICH IS SET BY MINIMUM DESIGN CRITERIA.

DAMS2.....SUMMARY TABLE 1 COMPLETED

SCS DAMS2 VERSION 01/01/90

Krein D FILES

INPUT = c:\eng\dams2\data\crow.dat

OUTPUT = c:\eng\dams2\data\crow.dat

DATED 06/22/** 11:39:10

REPORT ON
VESTED WATER RIGHT APPLICATION NO. 6244-3
Harlan Krein
December 15, 2000

Vested Water Right Claim No. 6244-3 has been filed by Harlan Krein to impound 60 acre-feet of water from runoff in an existing dam located in the NE 1/4 NE 1/4 of Section 7-T125N-R67W, in McPherson County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation. The water will be used for fish and wildlife production and livestock watering purposes and has a priority date of January 1, 1952.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. The Natural Resources Conservation Service (NRCS) has designed new spillways and a top of dam elevation raise for the project. The plans and specifications for these repairs have been reviewed and will be approved; however, repair of the dam can not begin until Vested Water Right Claim No. 6224-3 is approved.

The Krein Dam will be 10 feet high with a normal storage capacity of 60 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 560 acre-feet with a reservoir level at the top of dam elevation. Since the structure is a Category 3 dam and was constructed prior to the enactment of our Safety of Dams Rules, Chapter 74:02:08 in 1986, it is exempt from spillway requirements. However, a dam of this size and hazard classification would be required to have a minimum spillway design capable of passing a 25-year frequency event.

The dam has a drainage area of 5.37 square miles. A 25-year frequency event for this drainage area produces a peak runoff of approximately 525 cfs. A 50-year frequency event produces a peak of approximately 755 cfs and a 100-year frequency event produces a peak of approximately 1030 cfs. The dam is designed to have a 60 inch diameter corrugated metal pipe (CMP) riser with a 48 inch diameter CMP barrel with 5.5 feet of available freeboard as the primary spillway, and a 60 foot wide earth spillway with 3.0 feet of available freeboard as the secondary spillway. The 60 foot wide spillway will have a capacity of approximately 810 cfs.

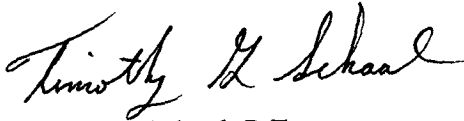
The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 58 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 143 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 630 acre-feet.

The Krein Dam will be located in the NE 1/4 NE 1/4 of Section 7-T125N-R67W on an unnamed tributary of Snake Creek about six miles upstream of Crompton Dam (SD ID No. 2203). There

are no existing Water Permits/Rights located on the unnamed tributary or Snake Creek between the proposed dam and Crompton Dam.

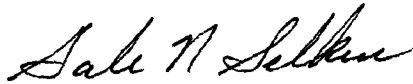
Conclusions:

1. Water Permit Application No. 6244-3 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 6244-3.



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

Approved by:



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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

**RECOMMENDATION OF CHIEF ENGINEER FOR VALIDATION OF VESTED WATER
RIGHT APPLICATION NO. 6244-3, Harlan Krein**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Validation of Vested Water Right Application No. 6244-3, Harlan Krein, PO Box 150, Busby MT 59016.

The Chief Engineer is recommending VALIDATION of Application No. 6244-3 for impoundment of 60 acre feet of water because 1) water has been appropriated as described for fish and wildlife propagation and livestock watering uses with a priority date of January 1, 1952, 2) the use has been developed without unlawful impairment of existing rights, 3) the use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Vested Water Right No. 6244-3 authorizes a dam with a storage capacity of 60 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer
January 5, 2001



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

January 5, 2001

Harlan Krein
PO Box 150
Busby, MT 59016

Dear Mr. Krein:

Vested Water Right Application No. 6244-3 for fish and wildlife 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 McPherson County Herald printed at Leola, SD (Ph # 605-439-3131). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

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

c: Brian Wehausen, U.S. Fish & Wildlife Service



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

January 5, 2001

Mc Pherson Co Herald
Box 170
Leola SD 57456

ATTENTION: Legal Public Notice

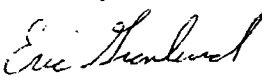
Enclosed is a Notice of Hearing on Application No. 6244-3 to Appropriate Water to be published twice. Please publish the first notice on January 17, 2001 with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Harlan Krein, PO Box 150, Busby MT 59016 (Ph # 406-592-3763).

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

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 6244-3

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

Date _____

We are in receipt of your letter of January 5, 2001 enclosing Notice of Hearing to Appropriate Water by Application No. 6244-3 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 January 17, 2001 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING To Validate
Vested Water Right Application No. 6244-3 to Appropriate Water

Notice is given that Harlan Krein, PO Box 150, Busby MT 59016 has filed an application to validate a vested water right claim to impound 60 acre-feet of water from runoff in an existing dam located in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 7 with water impounded in the NE $\frac{1}{4}$ Section 7; all in T125N-R67W. This application requests impoundment of sufficient water to maintain water at the outlet elevation. The water is to be used for fish and wildlife propagation and livestock watering purposes and has a priority date of January 1, 1952.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends VALIDATION of Vested Water Right Application No. 6244-3 because 1) water has been appropriated as described for fish and wildlife propagation, livestock watering purposes with a claimed priority date of January 1, 1952, 2) the use has been developed without unlawful impairment of existing rights, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by February 5, 2001.

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

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of McPherson) SS

I, Nancy Zantow

certify that the attached printed Notice was taken

from the McPherson

County Herald

printed and published in Leola

County of McPherson and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

Jan. 17, 2001

Jan. 24, 2001

Cost of Printing \$52.47

Nancy S. Zantow
(Signature)

Publisher/Editor
(Title)

1-17-01

(Date Signed)

NOTICE

NOTICE OF HEARING

To Validate

Vested Water Right Application No. 6244-3 to Appropriate Water

Notice is given that Harlan Krein, PO Box 150, Busby, MT 59016 has filed an application to validate a vested water right to claim to impound 60 acre-feet of water from runoff in an existing dam located in the NE 1/4NE1/4 Section 7 with water impounded in the NE 1/4 Section 7; all in T125N-R67W. This application requests impoundment of sufficient water to maintain water at the outlet elevation. The water is to be used for fish and wildlife propagation and livestock watering purposes and has a priority date of Jan. 1, 1952.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends VALIDATION of Vested Water Right Application No. 6244-3 because 1) water has been appropriated as described for fish and wildlife propagation, livestock watering purposes with a claimed priority date of Jan. 1, 1952, 2) the use has been developed without unlawful impairment of existing rights, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a

petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E. Capitol, Pierre, SD 57501 (605-773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by Feb. 5, 2001.

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

1*17,24





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

FEB 15 2001

Harlan Krein
PO Box 150
Busby, MT 59016

Dear Sir:

Enclosed is Vested Water Right No. 6244-3 authorizing your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

We will schedule an inspection so that the Water License may be issued to you, thus completing your acquisition of a Water Right.

Sincerely,

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

enclosures

Permit No. 6244-3
James 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 14, 2002**, made a thorough examination of the water use system constructed by **Harlan Krein** of **PO Box 150, Busby, MT 59016** holder of Permit No. **6244-3**, bearing the priority of **January 1, 1952** authorizing the storage of **60** acre-feet of the waters of **runoff** for **fish & wildlife propagation** purposes, in **McPherson** County.

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

A. Works used to divert the water:

A 10 foot high dam with a CMP drop inlet structure, with a 60 inch diameter riser and a 48 inch barrel, as the primary spillway and a 60 foot wide earthcut secondary spillway that stores 60 acre-feet of water.

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

N/A

C. Works used to apply water to beneficial use:

A 10 foot high dam with a CMP drop inlet structure, with a 60 inch diameter riser and a 48 inch barrel, as the primary spillway and a 60 foot wide earthcut secondary spillway that stores 60 acre-feet of water.

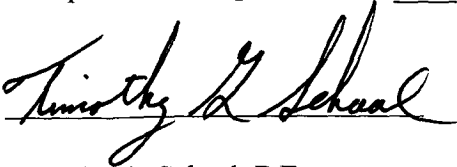
The system is in the following condition **good**. The point of diversion is located **1000 feet south & 1000 feet west of the NE corner of Sec. 7-T125N-R67W (NE 1/4 NE 1/4)**. The works are capable of storing **60** acre-feet of water which is to be used for **fish & wildlife propagation**. Water has been put to beneficial use to the maximum extent as follows:

A 10 foot high dam with a CMP drop inlet structure, with a 60 inch diameter riser and a 48 inch barrel, as the primary spillway and a 60 foot wide earthcut secondary spillway that stores 60 acre-feet of water.

and the license should be issued for **60** acre-feet of storage.

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

Exceptions to compliance are: **none** Date Report Completed: **August 19, 2002**



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

REPORT ON INSPECTION OF PERMIT NO. 6244-3

DATE OF INSPECTION: August 14, 2002

NAME & ADDRESS OF INSPECTION CONTACT/ Al Olson

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: USF&WS 39650 Sand Lake Drive, Columbia, SD 57433

NAME & ADDRESS OF PERMIT HOLDER: Harlan Krein, PO Box 150, Busby, MT 59016

DIVERSION POINT LEGAL LOCATION: 1000 feet south & 1000 feet west of the NE corner of Sec. 7-T125N-R67W (NE 1/4 NE 1/4).

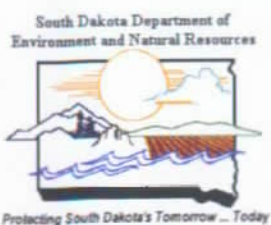
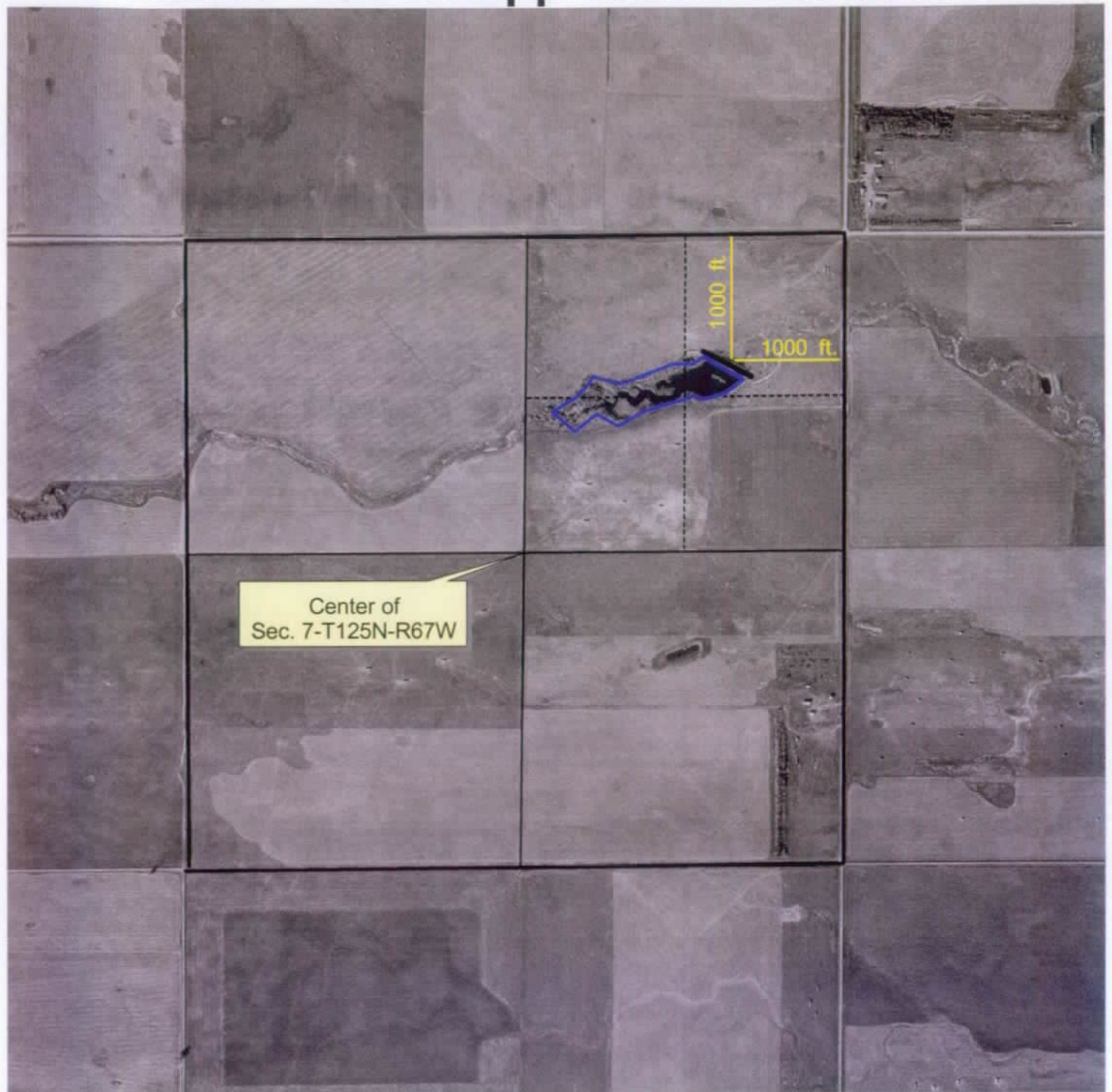
DAM INFORMATION:

- 1) Height to crest 10 feet
- 2) Height to primary spillway 5.0 feet
- 3) Height to secondary spillway 7.0 feet
- 4) Crest width 12 feet
- 5) Crest length 1600 feet
- 6) Spillway length XXX feet
- 7) Spillway width 60 feet
- 8) Approx. storage (Normal) 60 acre-feet
- 9) Approx. storage (Maximum) 560 acre-feet
- 10) Date constructed: 1952 (repaired in 2001)

PERMIT QUALIFICATIONS AND REGULATIONS:

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

Water Permit Application No. 6244-3



Timothy G. Schaal
Timothy G. Schaal, P.E. 8/19/02
Natural Resources Engineer Specialist
Water Rights Program

STATE OF SOUTH DAKOTA

VESTED RIGHT WATER LICENSE NO. 6244-3

(1) Harlan Krein, PO Box 150, Bushby, MT 59016 made Application No. 6244-3, for validation of a vested right claim to impound 60 acre feet of water from runoff, in McPherson County, South Dakota, for irrigation purposes. Vested Water Right No. 6244-3 was validated February 5, 2001 with a priority date of January 1, 1952. Construction of the described water supply system and application of water to beneficial use has been completed and complies with applicable provisions of South Dakota State Law.

(2) The vested right owner is entitled to impound 60 acre feet of water for beneficial use with sufficient water annually to maintain the water level to the outlet elevation. The location of the storage dam (spillway) is: 1,000'S and 1,000'W of the NE corner of Section 7, T125N, R67W (NE ¼ NE ¼).

(3) Pursuant to Section 46-5-30.1 Harlan Krein, PO Box 150, Bushby, MT 59016 the holder and/or owner of Vested Water Right No. 6244-3 is issued a license to impound 60 acre feet of water from runoff, with sufficient water annually to maintain the water level to the outlet elevation. Vested Water Right No. 6244-3, with a priority date of January 1, 1952, authorizes storage of water at the location specified in (2) of this license, for the purpose of fish and wildlife propagation and domestic livestock watering use.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Vested Water Right No. 6244-3 including the following qualifications:

- Vested Water Right No. 6244-3 authorizes a dam with a storage capacity of 60 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
- Low flows as needed for downstream domestic use, including livestock water and prior water rights must be bypassed.



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

AUG 29 2002

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

AUG 29 2002

6244-3

Harlan Krein
PO Box 150
Bushby MT 59016-0150

Dear Mr. Krein:

Enclosed is your Vested Right Water License No. 6244-3. The license is the final document which completes the process of obtaining a water right.

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

Sincerely,

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

c: US Fish & Wildlife Service, Sand Lake Refuge

enclosures