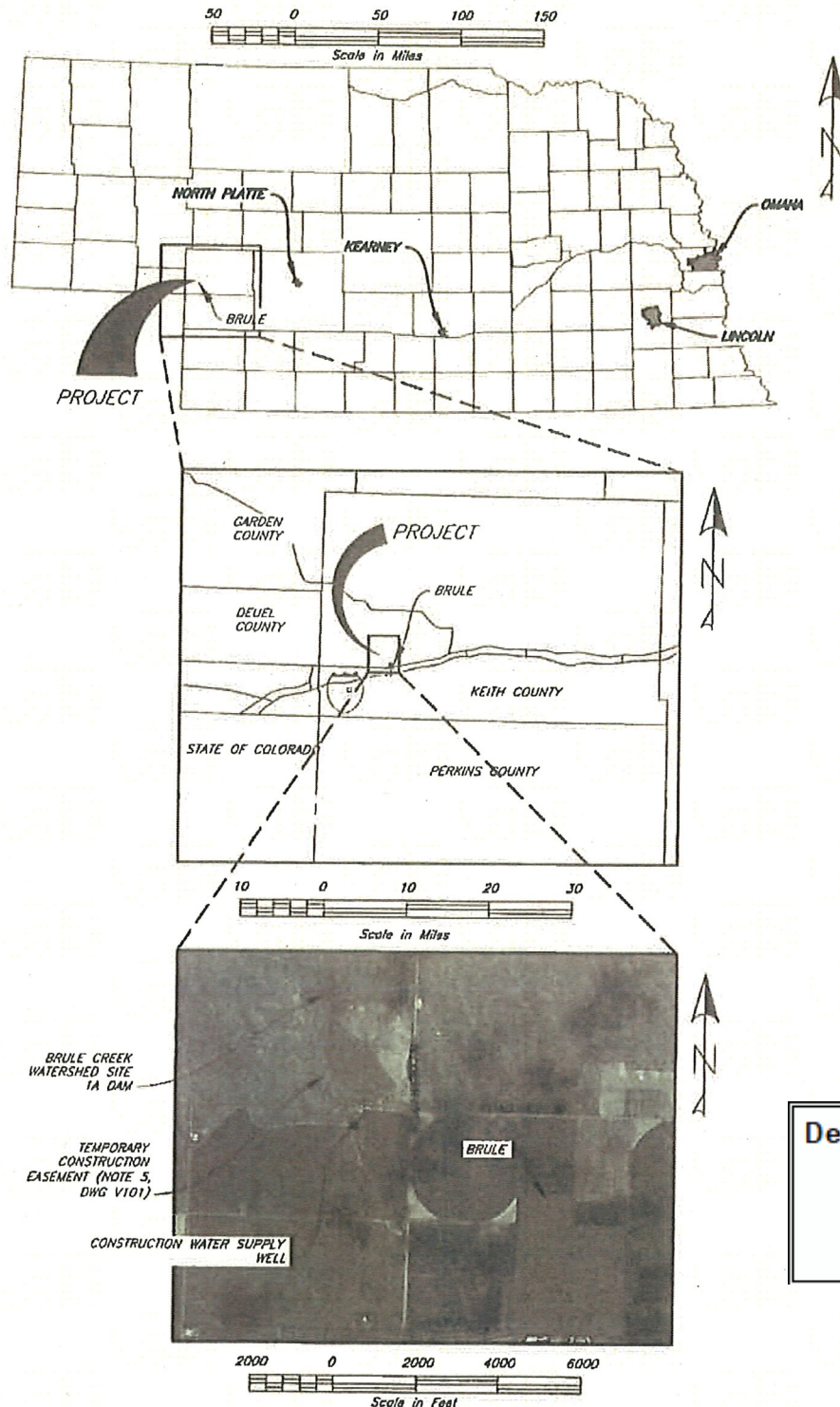


100 PERCENT COMPLETE CONSTRUCTION DRAWINGS FOR THE
BRULE CREEK WATERSHED SITE 1A DAM REMEDIAL REPAIR
TWIN PLATTE NATURAL RESOURCES DISTRICT

T13N R40W SECTION 9
KEITH COUNTY, NEBRASKA



PREPARED FOR



United States Department of Agriculture
Natural Resources Conservation Service

PREPARED BY



RJH CONSULTANTS, INC.
ENGLEWOOD • COLORADO
www.rjh-consultants.com

OWNER'S APPROVAL

AS OWNERS THEREOF WE HEREBY ACCEPT AND APPROVE THESE PLANS FOR REMEDIATION OF BRULE CREEK WATERSHED SITE 1A DAM.

[Signature]
OWNER

01.20.22
DATE

ENGINEER'S CERTIFICATION

I HEREBY CERTIFY THAT THESE PLANS FOR THE REMEDIAL REPAIR OF BRULE CREEK WATERSHED SITE 1A DAM WERE PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) FOR THE OWNERS THEREOF AND CONSISTS OF 37 SHEETS. I FURTHER CERTIFY THAT THESE DAM MODIFICATIONS WERE DESIGNED TO MEET THE REQUIREMENTS OF A HIGH HAZARD POTENTIAL DAM STRUCTURE.

ROBERT J. HUZIAK, P.E. NEBRASKA P.E. #E-14353
REGISTERED ENGINEER
RJH CONSULTANTS, INC.



Department of Natural Resources
Approved by Order Dated
January 31, 2022

Received
January 21, 2022
Department of
Natural Resources

Sheet List Table		
Sheet Number	Sheet Code	Sheet Title
1	G001	COVER PAGE
2	G002	PLAN NOTES
3	G003	STRUCTURAL NOTES
4	G601	HYDRAULIC INFORMATION
5	G602	WATERSHED PLAN
6	G603	RESERVOIR PLAN
7	V101	EXISTING CONDITIONS AND SURVEY CONTROL
8	V401	EXISTING CONDITIONS
9	B101	EXPLORATION LOCATIONS
10	C101	GENERAL PLAN OF MODIFICATIONS
11	C102	EXCAVATION AND DEMOLITION PLAN
12	C103	EMBANKMENT FILTER AND DRAIN PLAN
13	C104	EMBANKMENT REMEDIATION PLAN
14	C105	FENCING AND RECLAMATION PLAN
15	C106	INSTRUMENTATION PLAN
16	C201	PRINCIPAL SPILLWAY PROFILE
17	C202	TOE DRAIN PROFILES
18	C203	DAM PROFILE ALONG CENTERLINE
19	C204	ASBESTOS CEMENT DRAIN PIPE EXCAVATION AND BACKFILL PROFILES
20	C301	EXCAVATION AND DEMOLITION SECTIONS
21	C302	ASBESTOS CEMENT DRAIN PIPE EXCAVATION SECTIONS
22	C303	EMBANKMENT SECTIONS PAGE 1 OF 2
23	C304	EMBANKMENT SECTIONS PAGE 2 OF 2
24	C305	ASBESTOS CEMENT DRAIN PIPE BACKFILL SECTIONS
25	C306	PRINCIPAL SPILLWAY SECTIONS (1 OF 5)
26	C307	PRINCIPAL SPILLWAY SECTIONS (2 OF 5)
27	C308	PRINCIPAL SPILLWAY SECTIONS (3 OF 5)
28	C309	PRINCIPAL SPILLWAY SECTIONS (4 OF 5)
29	C310	PRINCIPAL SPILLWAY SECTIONS (5 OF 5)
30	C311	MISCELLANEOUS SECTIONS
31	C401	PRINCIPAL SPILLWAY MODIFICATION PLAN
32	C402	PRINCIPAL SPILLWAY EXCAVATION PLAN
33	C403	IMPACT BASIN GRADING PLAN
34	C501	INSTRUMENTATION DETAILS
35	C502	TOE DRAIN DETAILS (1 OF 2)
36	C503	TOE DRAIN DETAILS (2 OF 2)
37	C504	FENCE DETAILS

20855

United States
Department of
Agriculture
USDA
Natural Resources
Conservation Service

File No.

COVERBLOCK.dwg
Drawing No.
6001

Sheet 1 of 37

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
1 COVER PAGE

Sec 9, T 13 N, R 40 W

Keith County, Nebraska

Designed ABP
Drawn CND
Checked CLS
Reviewed RJH

Date
9/21/21
9/21/21
9/21/21
9/21/21

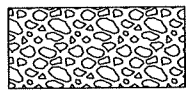
P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\Notes.dwg 1/13/2022 10:30 AM

GENERAL NOTES:

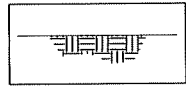
1. CONSTRUCTION IS SUBJECT TO THE RULES AND REGULATIONS OF THE NEBRASKA DNR.
2. THE HORIZONTAL COORDINATE SYSTEM FOR THE PROJECT IS NEBRASKA STATE PLANE NAD83. THE VERTICAL DATUM IS NAVD88.
3. RJH ADOPTED A VERTICAL ADJUSTMENT OF +1.5 FEET TO CONVERT ELEVATIONS PRESENTED ON THE ORIGINAL AS-BUILT DRAWINGS INTO NAVD88.
4. LOCATION AND NATURE OF EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT, PRIOR TO EXCAVATION. CONTRACTOR SHALL PROTECT ALL UTILITIES IN PLACE UNLESS DESIGNATED FOR REMOVAL OR REPLACEMENT.
5. TOPOGRAPHY WITHIN THE AREA OUTLINED ON DWG NO. V101 WAS OBTAINED FROM A FIELD TOPOGRAPHIC SURVEY. TOPOGRAPHY OUTSIDE OF THESE LIMITS WAS DEVELOPED FROM USGS 1-METER DEM DATA.
6. LIMIT OF EXISTING EASEMENT IS BASED ON INFORMATION FROM THE CONSTRUCTION AND CHANNEL EASEMENT DATED JANUARY 9, 1968. LIMIT OF EXISTING EASEMENT WAS NOT SURVEYED AND IS SHOWN IN ITS APPROXIMATE LOCATION.
7. SUBSURFACE DATA IS PRESENTED IN THE GEOTECHNICAL DATA REPORT (RJH, 2020) AND IN THE DESIGN SUMMARY REPORT (RJH, 2021).
8. COMPLY WITH THE NRCS SUPPLEMENT TO OSHA PARTS 1910 AND 1926 (APPENDIX F OF NATIONAL ENGINEERING HANDBOOK PART 645).
9. BRULE CREEK WATERSHED SITE 1A DAM IS A HIGH HAZARD POTENTIAL DAM, NATIONAL INVENTORY OF DAMS (NID) NUMBER NE00211.
10. CONTRACTOR IS RESPONSIBLE FOR PROVIDING EROSION CONTROL PLANS IN ACCORDANCE WITH CONSTRUCTION SPECIFICATION 5 (POLLUTION CONTROL). SEE ALSO BID ITEM 4 (POLLUTION CONTROL) IN SECTION 8 OF CONSTRUCTION SPECIFICATIONS 5 (POLLUTION CONTROL).

LEGEND OF SYMBOLS:

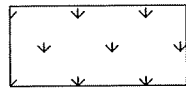
HATCHES



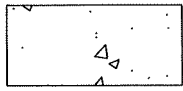
DRAIN MATERIAL



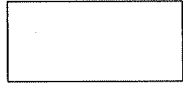
EARTH



GRASSING



STRUCTURAL CONCRETE



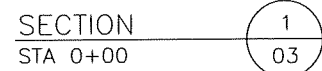
FILTER MATERIAL

- RJH TEST PITS AND TEST TRENCHES
- RJH BORINGS
- NRCS 2012 BORINGS (APPROX)
- NRCS 2021 INVESTIGATION LOCATIONS

NOTATIONS



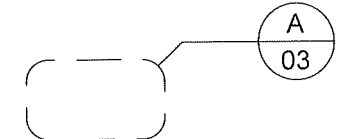
DETAIL TITLE. THE LETTER "A" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "03" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS CALLED OUT.



SECTION TITLE. THE NUMBER "1" REFERS TO THE SECTION DESIGNATION. THE NUMBER "03" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.



SECTION LOCATION. THE NUMBER "1" REFERS TO THE SECTION DESIGNATION. THE NUMBER "03" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS SHOWN.



DETAIL LOCATION. THE LETTER "A" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "03" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN.

LINE TYPES

- FINISHED GROUND
- OVERHEAD ELECTRIC
- ACCESS TRAIL
- MAJOR CONTOUR
- MINOR CONTOUR
- FLOW LINE
- PIPE
- EASEMENT
- WATERLINE
- ORIGINAL GROUND
- LIMIT OF EXCAVATION
- NEW FENCE
- FENCES TO BE REMOVED
- EXST FENCE
- SILT FENCE

ABBREVIATIONS:

- | | | | |
|-----------|-----------------------------|---------|---|
| AB | = ANCHOR BOLT | MW | = MONITORING WELL |
| ABT | = ABOUT | NAD | = NORTH AMERICAN DATUM |
| ADDL | = ADDITIONAL | NAVD | = NORTH AMERICAN VERTICAL DATUM |
| AL | = ALUMINUM | N | = NORTH OR NORTHING |
| ALT | = ALTERNATE | NF | = NEAR FACE |
| APPROX | = APPROXIMATE | NGS | = NATIONAL GEODETIC SURVEY |
| BF | = BOTTOM FACE | NGVD | = NATIONAL GEODETIC VERTICAL DATUM |
| BLDG | = BUILDING | NHWL | = NORMAL HIGH WATER LEVEL |
| BM | = BENCHMARK | NO. | = NUMBER |
| BOC | = BOTTOM OF CONCRETE | NR | = NEAR ROW |
| BOH | = BOTTOM OF HOLE | NRCS | = NATURAL RESOURCES CONSERVATION SERVICE |
| BOT | = BOTTOM | NTS | = NOT TO SCALE |
| BR | = BOTTOM ROW | NWS | = NORMAL WATER SURFACE |
| BRG | = BEARING | OC | = ON CENTER |
| BTWN | = BETWEEN | OD | = OUTSIDE DIAMETER |
| CFS | = CUBIC FEET PER SECOND | O.F. | = OUTSIDE FACE |
| CIPP | = CURED-IN-PLACE PIPE | OH | = OVERHEAD |
| CJ | = CONSTRUCTION JOINT | OPNG | = OPENING |
| CL | = CENTERLINE | OSHA | = OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION |
| CMP | = CORRUGATED METAL PIPE | O.G. | = OUTSIDE ROW |
| CMU | = CONCRETE MASONRY UNIT | PE | = POLYETHYLENE |
| CONC | = CONCRETE | PEN. | = PENETRATION |
| CONN | = CONNECTION | PI | = POINT OF INTERSECTION |
| CONT | = CONTINUOUS | PJF | = PREFORMED JOINT FILER |
| CP | = CONTROL POINT | PL | = PLATE |
| CTJ | = CONTRACTION JOINT | PMF | = PROBABLE MAXIMUM FLOOD |
| CTR | = CENTER | PSH | = PRINCIPAL SPILLWAY HYDROGRAPH |
| DEPT | = DEPARTMENT | PT | = POINT OF TANGENCY |
| DEM | = DIGITAL ELEVATION MODEL | PVC | = POLYVINYL CHLORIDE |
| DNR | = DEPT OF NATURAL RESOURCES | R | = RADIUS |
| DIA | = DIAMETER | RCP | = REINFORCED CONCRETE PIPE |
| DIA | = DIAGONAL | REINF | = REINFORCEMENT |
| DWG, DWGS | = DRAWING OR DRAWINGS | REQ'D | = REQUIRED |
| E | = EAST OR EASTING | ROW | = RIGHT OF WAY |
| EA | = EACH | S | = SLOPE |
| EC | = EACH CORNER | SC | = SOIL-CEMENT |
| ECF | = EMBANKMENT CONTROL POINT | SCH | = SCHEDULE |
| EF | = EACH FACE | SCS | = SOIL CONSERVATION SERVICE |
| EJ | = EXPANSION JOINT | SDH | = STABILITY DESIGN HYDROGRAPH |
| EL | = ELEVATION | SHT | = SHEET |
| EQ | = EQUAL | SIM | = SIMILAR |
| EXST | = EXISTING | SPC | = SPACE OR SPACES |
| EXT | = EXTENSION | SPY | = SPILLWAY |
| EXP | = EXPANSION | SS | = STAINLESS STEEL |
| F | = FAHRENHEIT | STA | = STATION |
| FB | = FLAT BAR | STL | = STEEL |
| FBH | = FREEBOARD HYDROGRAPH | SO | = SQUARE |
| FD | = FLOOR DRAIN | SYM | = SYMMETRICAL |
| FDN | = FOUNDATION | T&B | = TOP & BOTTOM |
| FF | = FAR FACE, FINISHED FLOOR | TCJ | = TOOLED CONSTRUCTION JOINT |
| FLG | = FLANGE | TF | = TOP FACE |
| FO | = FIBER OPTIC | THK | = THICK |
| FT | = FEET OR FOOT | TL | = TOP LAYER |
| FTG | = FOOTING | T.O. | = TOP OF |
| GALV | = GALVANIZED | TOC | = TOP OF CONCRETE |
| HDPE | = HIGH DENSITY POLYETHYLENE | TOW | = TOP OF WALL |
| HORZ | = HORIZONTAL | TR | = TOP ROW |
| HR | = HANDRAIL | TW | = TAILWATER |
| HS | = HIGH STRENGTH | TYP | = TYPICAL |
| HSS | = HOLLOW STRUCTURAL SECTION | UCP | = UTILITY CARRIER PIPE |
| HWY | = HIGHWAY | UDP | = UNDERDRAIN PIPE |
| HYD | = HYDRAULIC | UNC | = UNIFIED NATIONAL COARSE THREAD |
| ID | = INSIDE DIAMETER | UNO | = UNLESS NOTED OTHERWISE |
| IE | = INVERT ELEVATION | USGS | = UNITED STATES GEOLOGICAL SURVEY |
| I.F | = INSIDE FACE | V, VERT | = VERTICAL |
| INV | = INVERT | WS | = WATER SURFACE |
| JT | = JOINT | WSA | = WATERSTOP |
| LP | = LOW POINT | WWF | = WELDED WIRE FABRIC |
| MAX | = MAXIMUM | | |
| MI | = MILE, MILES | | |
| MIN | = MINIMUM | | |
| MH | = MANHOLE | | |
| MFR | = MANUFACTURER | | |




20855

RJH CONSULTANTS, INC.	Date	9/21/21	TWIN PLATTE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM PLAN NOTES Keith County, Nebraska	United States Department of Agriculture Natural Resources Conservation Service
	Designed	ABP		
	Drawn	CND		
	Checked	CLS		
	Approved	RJH		
				Sec 9, T 13 N, R 40 W
				File No.
				Notes.dwg
				Drawing No. 6002
				Sheet 2 of 37

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\Notes.dwg 1/13/2022 10:30 AM


STRUCTURAL NOTES:

1) REINFORCEMENT SYMBOLS

BARS SHOWN THUS  8SP @ 12

INDICATES A PATTERN OF BARS WITH 8 SPACES BETWEEN EACH BAR AND 12 INCHES WITHIN EACH SPACE.

123 REFERS TO INDIVIDUAL BAR MARK LISTED IN THE STEEL SCHEDULE ON SHEET C310.

SPLICES SHOWN THUS  INDICATES A LAPPED SPLICE, NOT A BEND IN THE BAR.

2) DIMENSIONS

DIMENSIONS ARE TO THE CENTERLINES OF THE BARS UNLESS OTHERWISE SHOWN. CLEAR COVER DIMENSIONS ARE MARKED "CLR." ALL DIMENSIONS TO A JOINT ARE TO THE CENTERLINE OF THE JOINT. BEAMS, COLUMNS, AND WALLS ARE CENTERED ON REFERENCED LINES.

THICKNESS SHOWN FOR WALLS AND SLABS ADJACENT TO UNDISTURBED SOIL OR ROCK ARE MINIMUM DIMENSIONS.

3) STANDARD HOOKS AND BENDS

HOOKS SHALL CONFORM TO ACI 318, SECTION 25.3.

BENDS MUST CONFORM TO ACI 315 REQUIREMENTS AS SPECIFIED IN CONSTRUCTION SPECIFICATION 34.

4) PLACING REINFORCEMENT

PLACE REINFORCEMENT IN ACCORDANCE WITH THESE DRAWINGS, APPROVED REINFORCEMENT SHOP DRAWINGS AND CONSTRUCTION SPECIFICATION 34. IN THE EVENT OF A CONFLICT BETWEEN THESE DRAWINGS AND THE APPROVED SHOP DRAWINGS, THE APPROVED SHOP DRAWINGS SHALL GOVERN.

SEE ACI 318, SECTION 25.2 AND ACI 301, SECTION 5.3 FOR PLACING TOLERANCES.

REINFORCEMENT MAY BE ADJUSTED IN THE FIELD TO CLEAR FORM TIES AND ANCHOR BARS. IN SUCH CASES, RELOCATION OF THE EMBEDDED MATERIALS MUST BE CONSIDERED. IN NO CASE SHALL BARS BE BENT IN THE FIELD.

REINFORCEMENT PARALLEL TO ANCHOR BOLTS OR OTHER EMBEDDED METALWORK SHALL BE PLACED TO MAINTAIN A CLEAR SPACING AT LEAST THE GREATEST OF 1 INCH, DIAMETER OF THE BAR, AND 1-1/3 TIMES THE MAXIMUM SIZE AGGREGATE.

5) SPACING

THE FIRST AND LAST BARS IN SLABS AND WALLS, STIRRUPS IN BEAMS, AND TIES IN COLUMNS ARE TO START AND END AT A MAXIMUM OF ONE HALF OF THE ADJACENT BAR SPACING. ALL REINFORCING TO BE EQUALLY SPACED UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

6) ACCESSORIES

BAR SUPPORTS, SPACERS, AND OTHER ACCESSORIES ARE NOT SHOWN ON THE DRAWINGS. THE RECOMMENDATIONS OF ACI 315 (DETAILING MANUAL) SHALL BE USED IN SELECTING ACCESSORIES.

7) DETAILING

UNLESS OTHERWISE SHOWN, FOLLOW THE RECOMMENDATIONS OF ACI 315. NO CHANGES SHALL BE MADE WITHOUT PRIOR APPROVAL.

8) CONCRETE PLACEMENT

BEFORE PLACING CONCRETE, CHECK ALL APPLICABLE DRAWINGS RELEASED AS SUITABLE FOR CONSTRUCTION INCLUDING MANUFACTURER'S DRAWINGS TO VERIFY THE PRESENCE OF ALL EMBEDDED MATERIAL REQUIRED IN THE PLACEMENT.

9) EMBEDMENT AND LAP SPLICE LENGTH REQUIREMENTS

EMBEDMENT LENGTHS AND LAP SPLICE LENGTHS SHALL CONFORM TO CONSTRUCTION SPECIFICATION 34 AND THE CONSTRUCTION DRAWINGS

SPLICES ARE TO BE MADE SO THAT THE GIVEN CLEAR DISTANCES TO THE FACE OF CONCRETE WILL BE MAINTAINED.

10) EMBEDDED ITEMS AND OPENINGS

BEFORE PLACING CONCRETE, CARE SHALL BE TAKEN THAT ALL EMBEDDED ITEMS ARE IN POSITION AND SECURELY FASTENED IN PLACE. ADD ADDITIONAL REINFORCING AROUND OPENINGS AS SHOWN ON DRAWINGS.

11) FINISHING SYMBOLS AND CONCRETE TOLERANCES

THE FOLLOWING FINISHING SYMBOLS MAY BE USED ON THESE DRAWINGS. REFER TO THE CONSTRUCTION SPECIFICATIONS FOR DETAILED REQUIREMENTS AND CONSTRUCTION TOLERANCES FOR HYDRAULIC STRUCTURES.

15) CHAMFER

UNLESS OTHERWISE INDICATED, CHAMFER EDGES OF ALL PERMANENTLY EXPOSED CONCRETE SURFACES WITH A 45 DEGREE BEVEL, 3/4 INCH X 3/4 INCH. CHAMFER STRIP MAY NOT BE SHOWN ON THE DESIGN DRAWINGS.

16) JOINTS

ALL CONSTRUCTION JOINTS, CONTRACTION JOINTS AND EXPANSION JOINTS SHALL BE PROVIDED WHERE SHOWN ON THE APPROVED SHOP DRAWINGS. NO OTHER JOINTS SHALL BE INTRODUCED UNLESS APPROVED BY THE ENGINEER.

17) STRUCTURAL STEEL

17a) GENERAL

FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO CURRENT AISC STEEL CONSTRUCTION MANUAL.

17b) BOLTED CONNECTIONS

ANCHOR AND NON-STRUCTURAL BOLTS AND NUTS SHALL BE ASTM A 307, STRUCTURAL BOLTS AND NUTS SHALL BE ASTM A 325. ALL BOLTED STRUCTURAL CONNECTIONS SHALL CONFORM TO THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A 325 OR A 490 BOLTS. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED. ALL STRUCTURAL BOLTED CONNECTIONS SHALL BE BEARING-TYPE CONNECTIONS.

17c) WELDING

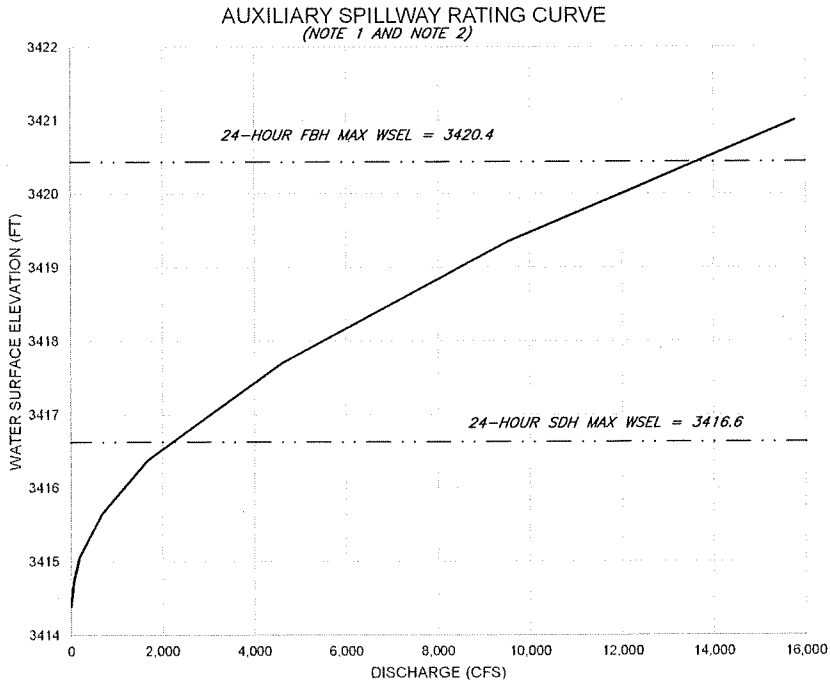
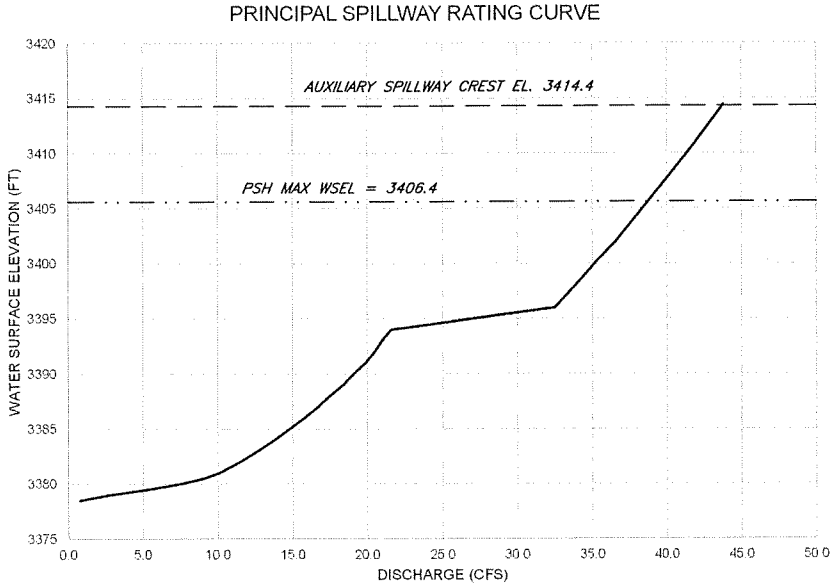
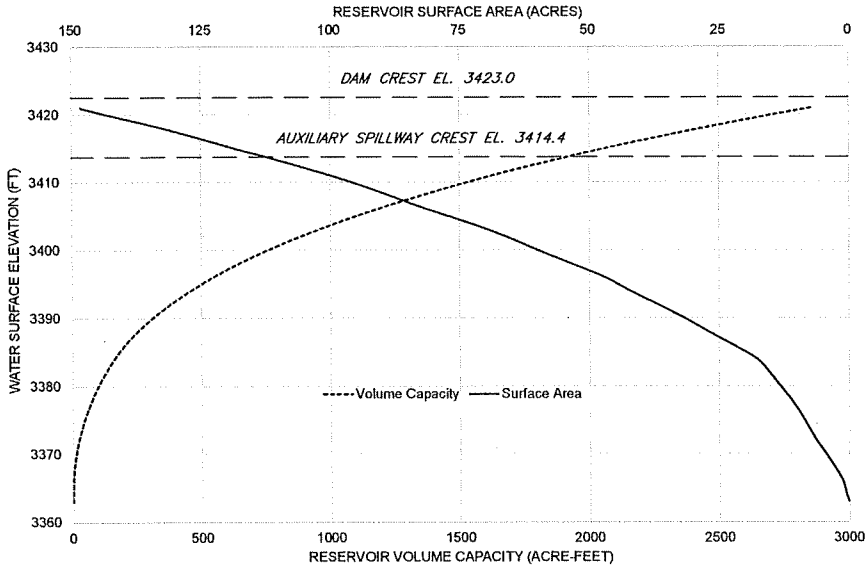
CONFORM TO AWS D1.1. WELDING ELECTRODES SHALL CONFORM TO THE REQUIREMENTS OF MATERIAL SPECIFICATION 581.



20855

Date 9/21/21 9/21/21 9/21/21 9/21/21		Designed ABP Drawn CND Checked CLS Approved RJH	
TWIN PLATTE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM STRUCTURAL NOTES		Keith County, Nebraska Sec 9, T 13 N, R 40 W	
United States Department of Agriculture		Natural Resources Conservation Service	
File No.		Notes.dwg	
Drawing No. 6003		Sheet 3 of 37	

Water Surface Elevation	Reservoir Surface Area	Incremental Reservoir Volume Capacity	Cumulative Reservoir Volume Capacity
(feet)	(acres)	(ac-ft)	(ac-ft)
3363	0	0	0
3364.0	0.5	0.2	0.2
3366.0	1.2	1.6	1.8
3368.0	2.7	3.8	5.6
3370.0	4.4	7.1	12.7
3372.0	6.3	10.7	23.4
3374.0	7.8	14.2	37.6
3376.0	9.3	17.1	54.7
3378.0	11.1	20.4	75.1
3380.0	13.2	24.2	99.3
3382.0	15.3	28.7	128.0
3384.0	17.7	32.8	160.8
3386.0	22.2	39.7	200.5
3388.0	27.0	49.3	249.8
3390.0	31.6	58.8	308.6
3392.0	36.7	68.4	377.0
3394.0	42.0	78.6	455.6
3396.0	47.0	88.9	544.5
3398.0	53.4	100.2	644.7
3400.0	59.9	113.6	758.3
3402.0	66.0	125.9	884.2
3404.0	73.0	138.9	1,023.1
3406.0	81.0	154.0	1,177.1
3408.0	88.2	169.3	1,346.4
3410.0	95.6	183.7	1,530.1
3412.0	104.1	199.4	1,729.5
3414.0	113.4	217.4	1,946.9
3414.4	115.4	46.3	1,993.2
3415.0	118.4	69.5	2,062.7
3416.0	122.8	120.6	2,183.3
3418.0	132.2	254.8	2,438.1
3420.0	142.9	275.2	2,713.3
3421.0	148.1	145.5	2,858.8



NOTES:
1. THE MAXIMUM FLOW VELOCITY IN THE AUXILIARY SPILLWAY IS 12.0 FT/S FOR THE SDH AND 25.2 FT/S FOR THE FBH.
2. THE AUXILIARY SPILLWAY IS PREDICTED TO EXPERIENCE UP TO 28 FEET OF EROSION DURING PASSAGE OF THE SDH AND THEREFORE DOES NOT SATISFY STABILITY CRITERIA. HOWEVER, NRCS ELECTED TO NOT INCLUDE AUXILIARY SPILLWAY MODIFICATIONS AS A PART OF THIS REMEDIAL REPAIR.



20855

File No.

Notes.dwg
Drawing No.
G601

Sheet 4 of 37



TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
HYDRAULIC INFORMATION

Designed ABP
Drawn CND
Checked CLS
Approved RJH

Date
9/21/21
9/21/21
9/21/21
9/21/21

Sec 9, T 13 N, R 40 W

Keith County, Nebraska

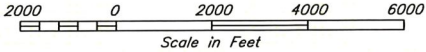


HYDROLOGIC DATA

WATERSHED = 7.98 SQ MI
TIME OF CONCENTRATION = 3.5 HOURS
CURVE NUMBER = 71

HYDROLOGIC DATA				
HYDROGRAPH	INFLOW PEAK DISCHARGE (CFS)	INFLOW VOLUME (AC-FT)	RAIN DEPTH (IN)	RUNOFF (IN)
PSH	3,116	783	NOTE 4	
SDH 6-HOUR	5,732	2,083	8.24	4.79
SDH 24-HOUR	4,939	2,380	9.15	5.59
FBH 6-HOUR	17,780	6,179	18.66	14.52
FBH-24-HOUR	13,868	7,165	21.05	16.83

- NOTES:
- PSH CORRESPONDS TO 100-YEAR PRECIPITATION.
 - SDH IS INTERMEDIATE BETWEEN THE PSH AND FBH IN ACCORDANCE WITH NRCS TR-210-60 EARTH DAMS AND RESERVOIRS.
 - FBH CORRESPONDS TO THE PROBABLE MAXIMUM PRECIPITATION.
 - PSH RAINFALL IS 4.97" FOR 1-DAY, OR 7.26" FOR 10-DAY.



 United States Department of Agriculture Natural Resources Conservation Service	TWIN PLATTE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM WATERSHED PLAN	Designed <i>ABP</i>	Date <i>9/21/21</i>
		Drawn <i>CND</i>	<i>9/21/21</i>
File No.	Notes.dwg	Checked <i>CLS</i>	<i>9/21/21</i>
		Approved <i>RJH</i>	<i>9/21/21</i>
Sheet 5 of 37		Keith County, Nebraska	



NOTES:
1. THE RESERVOIR AT THE BRULE 1A SITE IS NORMALLY EMPTY.
2. ALL SECTIONS SHOWN ARE IN TOWNSHIP 13N, RANGE 40W OF THE SIXTH PRINCIPAL MERIDIAN IN KEITH COUNTY, NEBRASKA.



20855



Date	Designed	Drawn	Checked	Approved
9/21/21	ABP	CND	CLS	RJH
9/21/21				
9/21/21				
9/21/21				

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
RESERVOIR PLAN
Keith County, Nebraska
Sec 9, T 13 N, R 40 W



United States
Department of
Agriculture

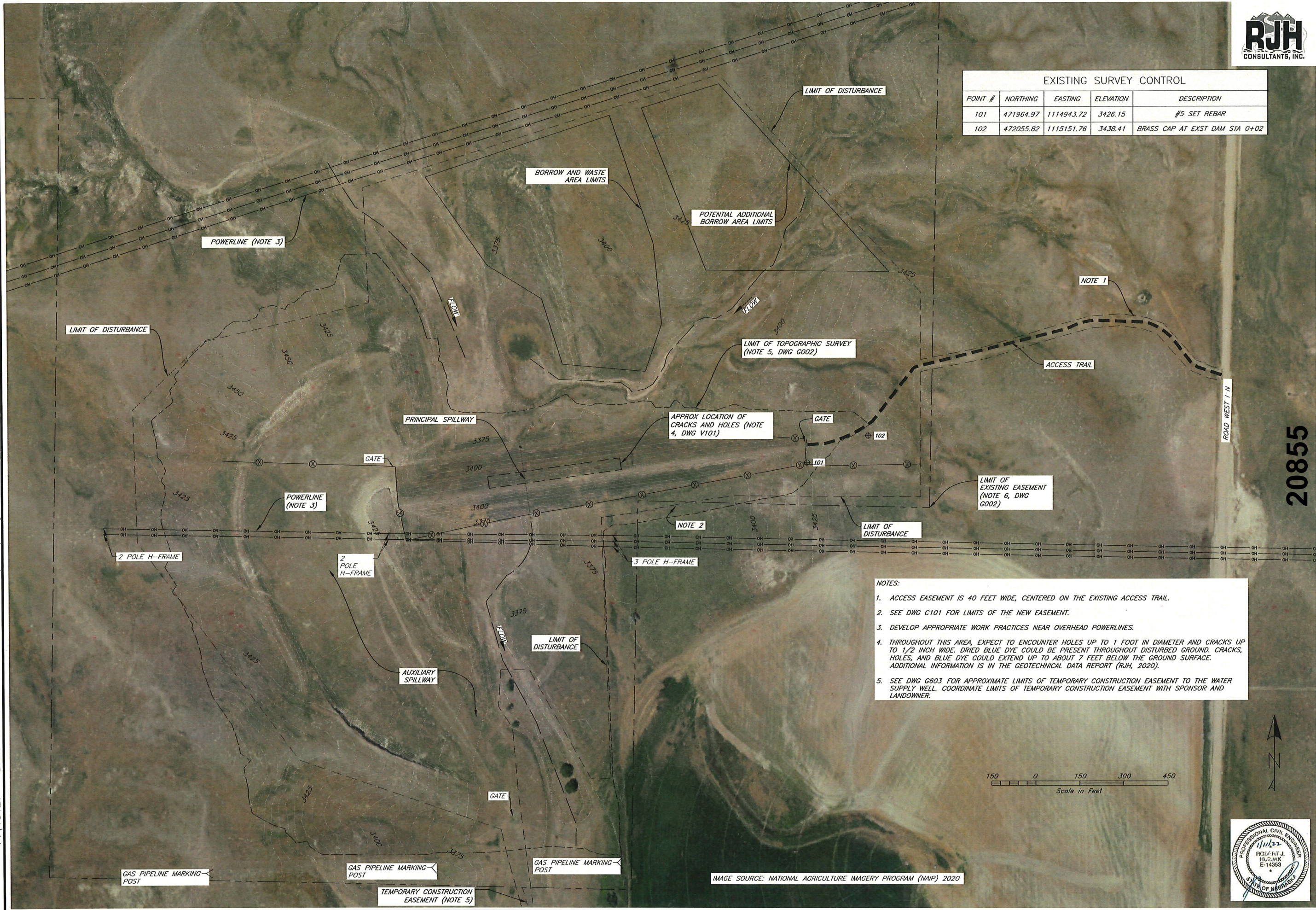


Natural Resources
Conservation Service

File No.
Easements.dwg

Drawing No.
6603

Sheet 6 of 37



EXISTING SURVEY CONTROL				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	471964.97	1114943.72	3426.15	#5 SET REBAR
102	472055.82	1115151.76	3438.41	BRASS CAP AT EXST DAM STA 0+02

- NOTES:
1. ACCESS EASEMENT IS 40 FEET WIDE, CENTERED ON THE EXISTING ACCESS TRAIL.
 2. SEE DWG C101 FOR LIMITS OF THE NEW EASEMENT.
 3. DEVELOP APPROPRIATE WORK PRACTICES NEAR OVERHEAD POWERLINES.
 4. THROUGHOUT THIS AREA, EXPECT TO ENCOUNTER HOLES UP TO 1 FOOT IN DIAMETER AND CRACKS UP TO 1/2 INCH WIDE. DRIED BLUE DYE COULD BE PRESENT THROUGHOUT DISTURBED GROUND. CRACKS, HOLES, AND BLUE DYE COULD EXTEND UP TO ABOUT 7 FEET BELOW THE GROUND SURFACE. ADDITIONAL INFORMATION IS IN THE GEOTECHNICAL DATA REPORT (RJH, 2020).
 5. SEE DWG G603 FOR APPROXIMATE LIMITS OF TEMPORARY CONSTRUCTION EASEMENT TO THE WATER SUPPLY WELL. COORDINATE LIMITS OF TEMPORARY CONSTRUCTION EASEMENT WITH SPONSOR AND LANDOWNER.



United States
Department of
Agriculture

USDA

Natural Resources
Conservation Service

TWIN PLATTE NATURAL RESOURCES DISTRICT

BRULE CREEK WATERSHED SITE 1A DAM

EXISTING CONDITIONS AND SURVEY CONTROL

Sec 9, T 13 N, R 40 W

Keith County, Nebraska

File No.

Existing Conditions
LG.dwg

Drawing No.
V101

Sheet 7 of 37

Date

9/21/21

9/21/21

9/21/21

9/21/21

Designed

ABP

Drawn

CND

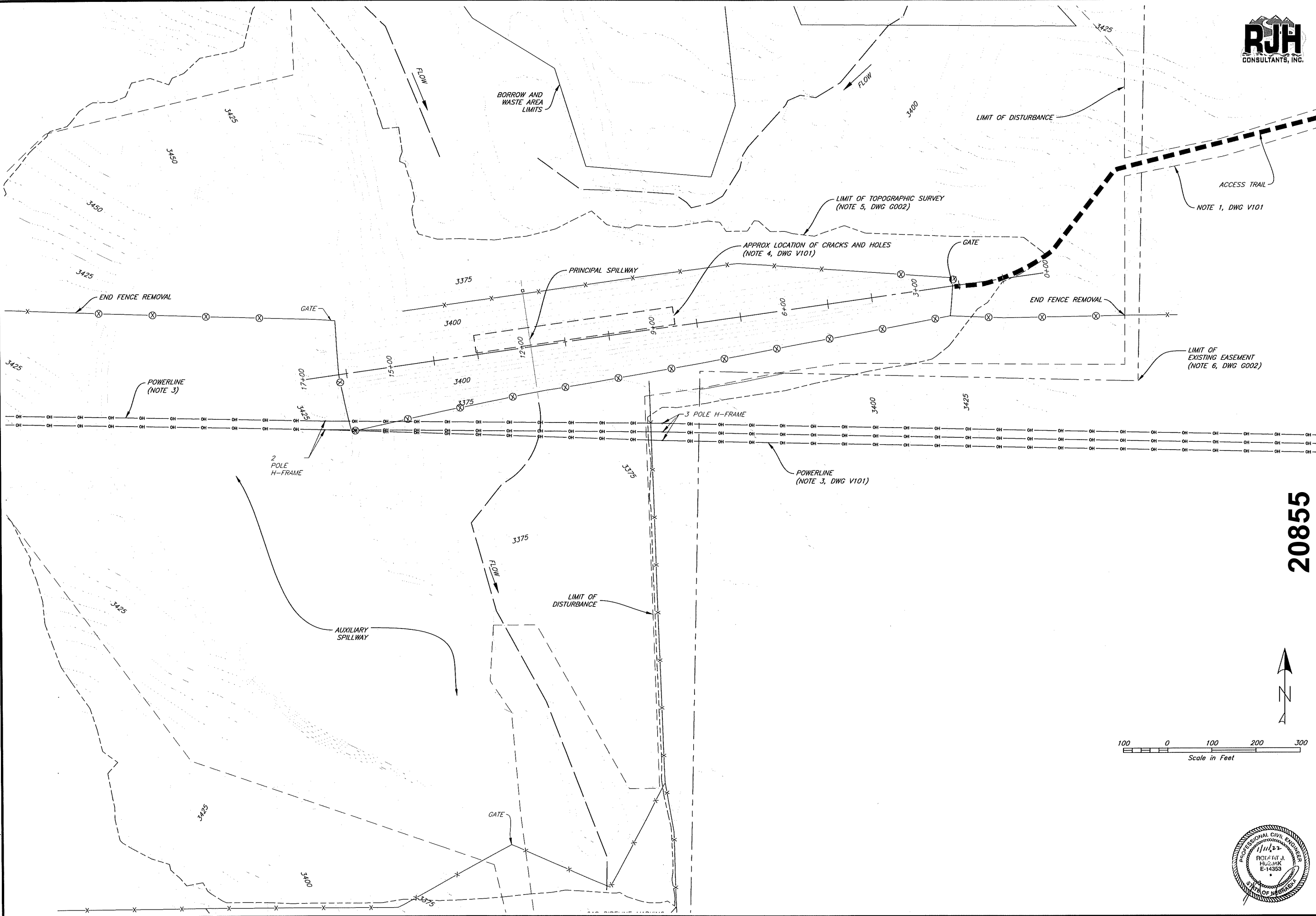
Checked

CLS

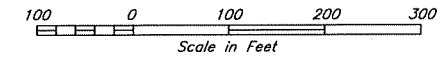
Approved

RJH

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\Existing Conditions LG.dwg 1/13/2022 10:31 AM



20855



 United States Department of Agriculture Natural Resources Conservation Service	File No.	Existing Conditions LG.dwg	Sheet 8 of 37
	Drawing No.	V401	
	TWIN PLATE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM EXISTING CONDITIONS		
	Sec 9, T 13 N, R 40 W Keith County, Nebraska		

Designed	ABP	Date	9/21/21
Drawn	CND		9/21/21
Checked	CLS		9/21/21
Approved	RJH		9/21/21



Date	Designed	Drawn	Checked	Approved
9/21/21	ABP	CND	CLS	RJH
9/21/21				
9/21/21				
9/21/21				

Keith County, Nebraska

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
EXPLORATION LOCATIONS

Sec 9, T 13 N, R 40 W

United States
Department of
Agriculture
USDA
Natural Resources
Conservation Service

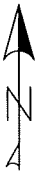
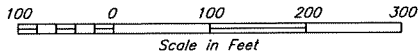
File No.

GeoExConds.dwg

Drawing No.
B101

Sheet 9 of 37

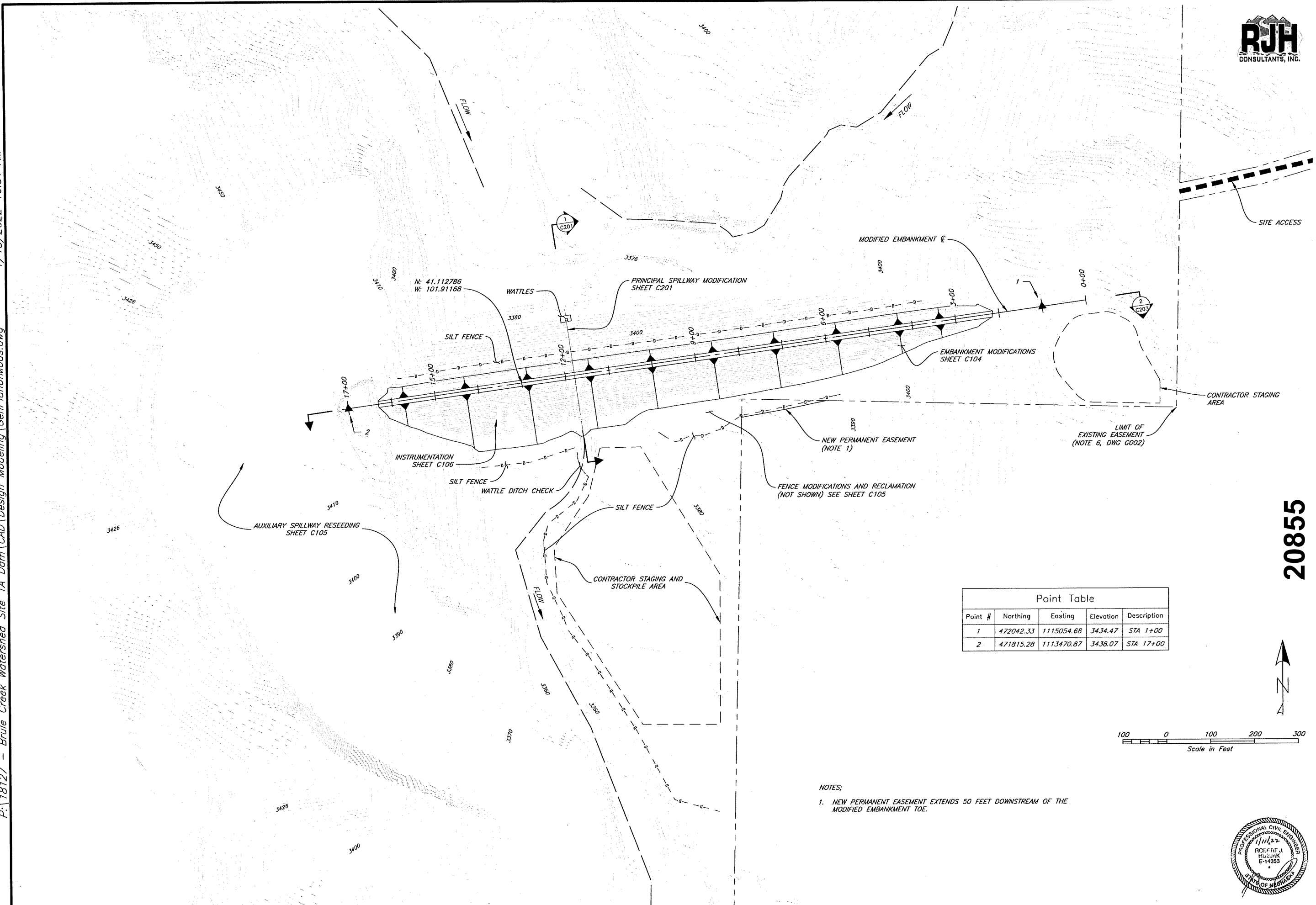
20855



NOTES:

1. SUBSURFACE DATA IS PRESENTED IN THE GEOTECHNICAL DATA REPORT (RJH, 2020).
2. NRCS BORINGS B-1 THROUGH B-5 WERE NOT SURVEYED AND ARE SHOWN IN THEIR APPROXIMATE LOCATIONS.
3. INFORMATION FROM SUBSURFACE INVESTIGATIONS PERFORMED BY NRCS IN POTENTIAL BORROW AREAS IS IN THE DESIGN SUMMARY REPORT (RJH, 2021).





Point Table				
Point #	Northing	Easting	Elevation	Description
1	472042.33	1115054.68	3434.47	STA 1+00
2	471815.28	1113470.87	3438.07	STA 17+00

NOTES:
1. NEW PERMANENT EASEMENT EXTENDS 50 FEET DOWNSTREAM OF THE MODIFIED EMBANKMENT TOE.



Date	Designed	Drawn	Checked	Approved
9/21/21	ABP	CND	CLS	RJH

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
GENERAL PLAN OF MODIFICATIONS
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

United States Department of Agriculture
Natural Resources Conservation Service

File No.
GenPlanofMods.dwg
Drawing No.
C101
Sheet 10 of 37



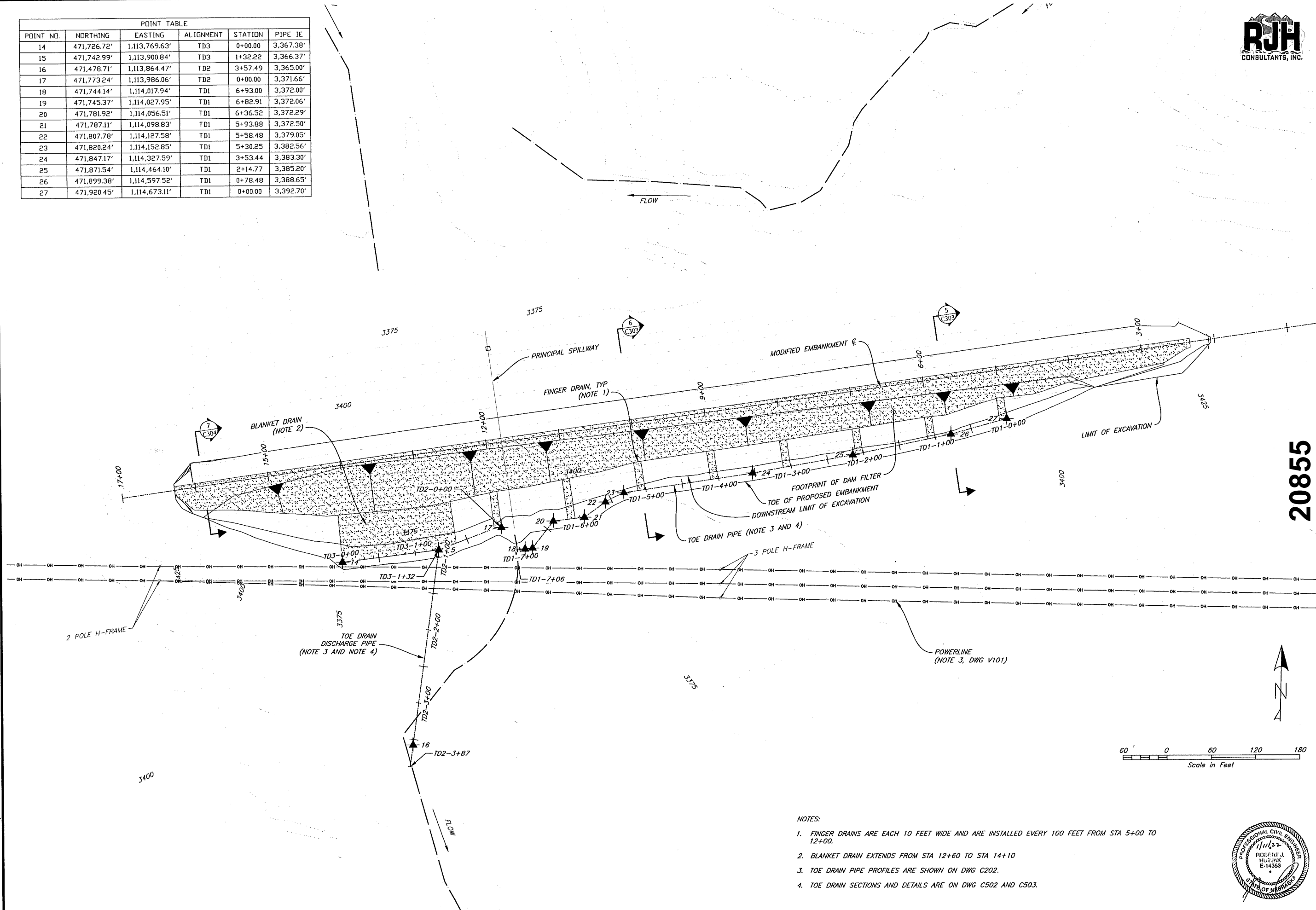
Sec 9, T 13 N, R 40 W
Keith County, Nebraska

File No.
<i>ExcavationandDemo.dwg</i>
Drawing No. <i>C102</i>
Sheet <i>11</i> of <i>37</i>



P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\EmbFilterAndDrain.dwg 1/13/2022 10:32 AM

POINT TABLE					
POINT NO.	NORTHING	EASTING	ALIGNMENT	STATION	PIPE IE
14	471,726.72'	1,113,769.63'	TD3	0+00.00	3,367.38'
15	471,742.99'	1,113,900.84'	TD3	1+32.22	3,366.37'
16	471,478.71'	1,113,864.47'	TD2	3+57.49	3,365.00'
17	471,773.24'	1,113,986.06'	TD2	0+00.00	3,371.66'
18	471,744.14'	1,114,017.94'	TD1	6+93.00	3,372.00'
19	471,745.37'	1,114,027.95'	TD1	6+82.91	3,372.06'
20	471,781.92'	1,114,056.51'	TD1	6+36.52	3,372.29'
21	471,787.11'	1,114,098.83'	TD1	5+93.88	3,372.50'
22	471,807.78'	1,114,127.58'	TD1	5+58.48	3,379.05'
23	471,820.24'	1,114,152.85'	TD1	5+30.25	3,382.56'
24	471,847.17'	1,114,327.59'	TD1	3+53.44	3,383.30'
25	471,871.54'	1,114,464.10'	TD1	2+14.77	3,385.20'
26	471,899.38'	1,114,597.52'	TD1	0+78.48	3,388.65'
27	471,920.45'	1,114,673.11'	TD1	0+00.00	3,392.70'



NOTES:

1. FINGER DRAINS ARE EACH 10 FEET WIDE AND ARE INSTALLED EVERY 100 FEET FROM STA 5+00 TO 12+00.
2. BLANKET DRAIN EXTENDS FROM STA 12+60 TO STA 14+10
3. TOE DRAIN PIPE PROFILES ARE SHOWN ON DWG C202.
4. TOE DRAIN SECTIONS AND DETAILS ARE ON DWG C502 AND C503.



Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
EMBANKMENT FILTER AND DRAIN PLAN
Keith County, Nebraska
Sec 9, T 13 N, R 40 W



File No.	EmbFilterAndDrain.dwg
Drawing No.	C103
Sheet	12 of 37



Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
EMBANKMENT REMEDIATION PLAN
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

United States
Department of
Agriculture

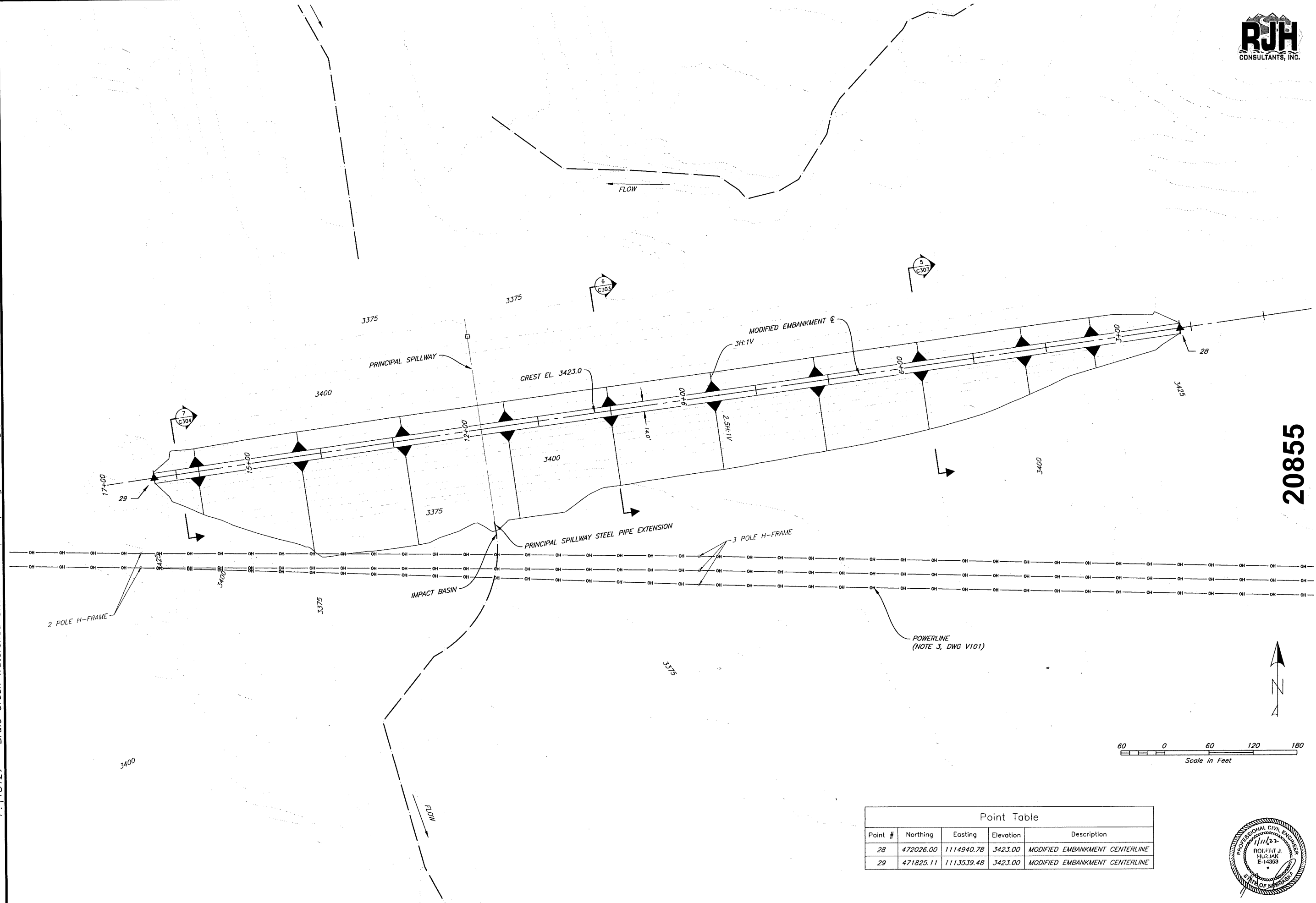
Natural Resources
Conservation Service

File No.

CivRehabPlan.dwg

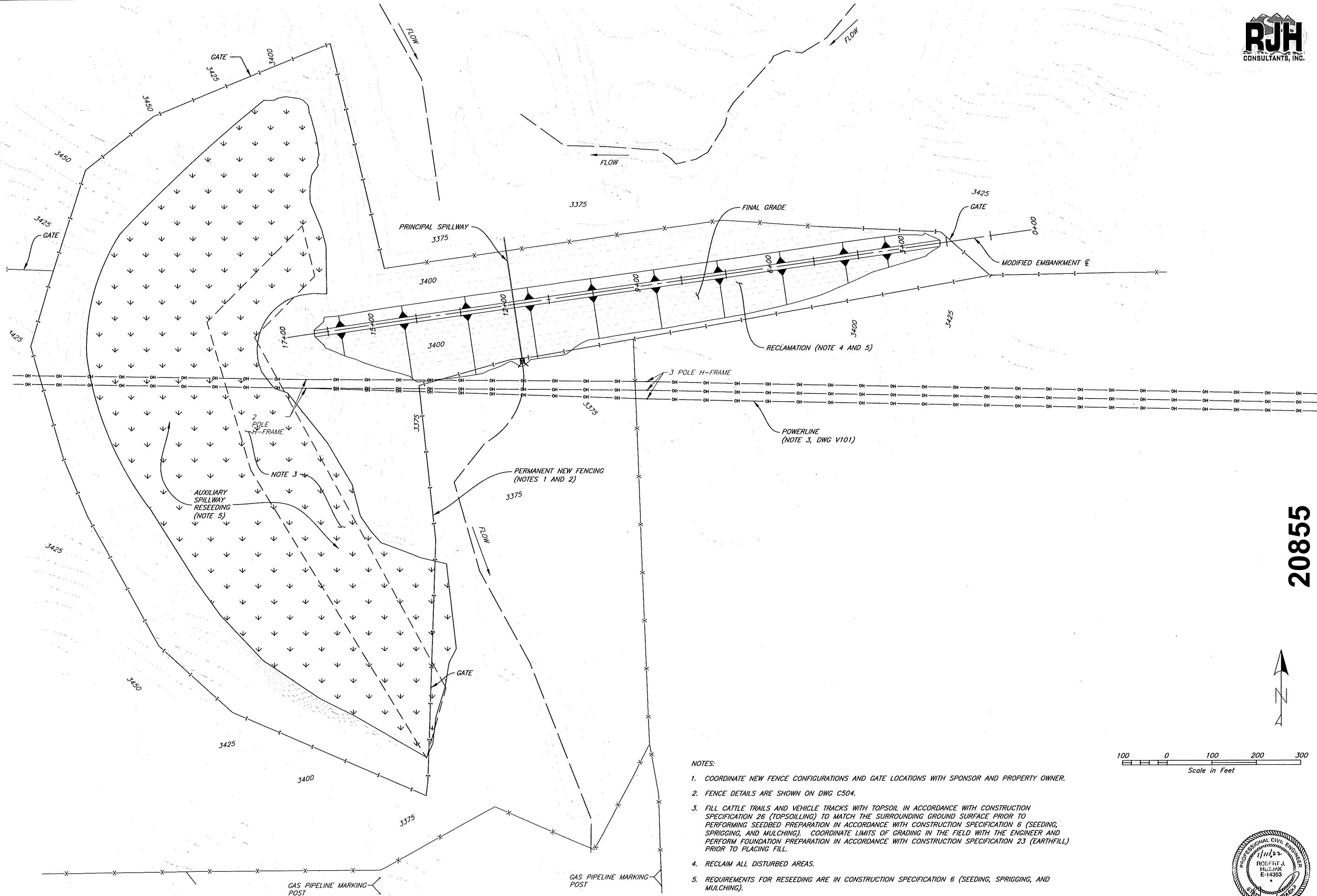
Drawing No.
C104

Sheet 13 of 37



Point Table				
Point #	Northing	Easting	Elevation	Description
28	472026.00	1114940.78	3423.00	MODIFIED EMBANKMENT CENTERLINE
29	471825.11	1113539.48	3423.00	MODIFIED EMBANKMENT CENTERLINE





Designed	ABP	Date	9/21/21
Drawn	CND		9/21/21
Checked	CLS		9/21/21
Approved	RJH		9/21/21

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
FENCING AND RECLAMATION PLAN

Sec 9, T 13 N, R 40 W

Keith County, Nebraska

United States
Department of
Agriculture

USDA

Natural Resources
Conservation Service

File No.

CivRecondFencePlan.dwg

Drawing No.
C105

Sheet 14 of 37



1/13/2022 10:32 AM

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivInstrumentationPlan.dwg



Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
INSTRUMENTATION PLAN
Sec 9, T 13 N, R 40 W
Keith County, Nebraska

United States
Department of
Agriculture

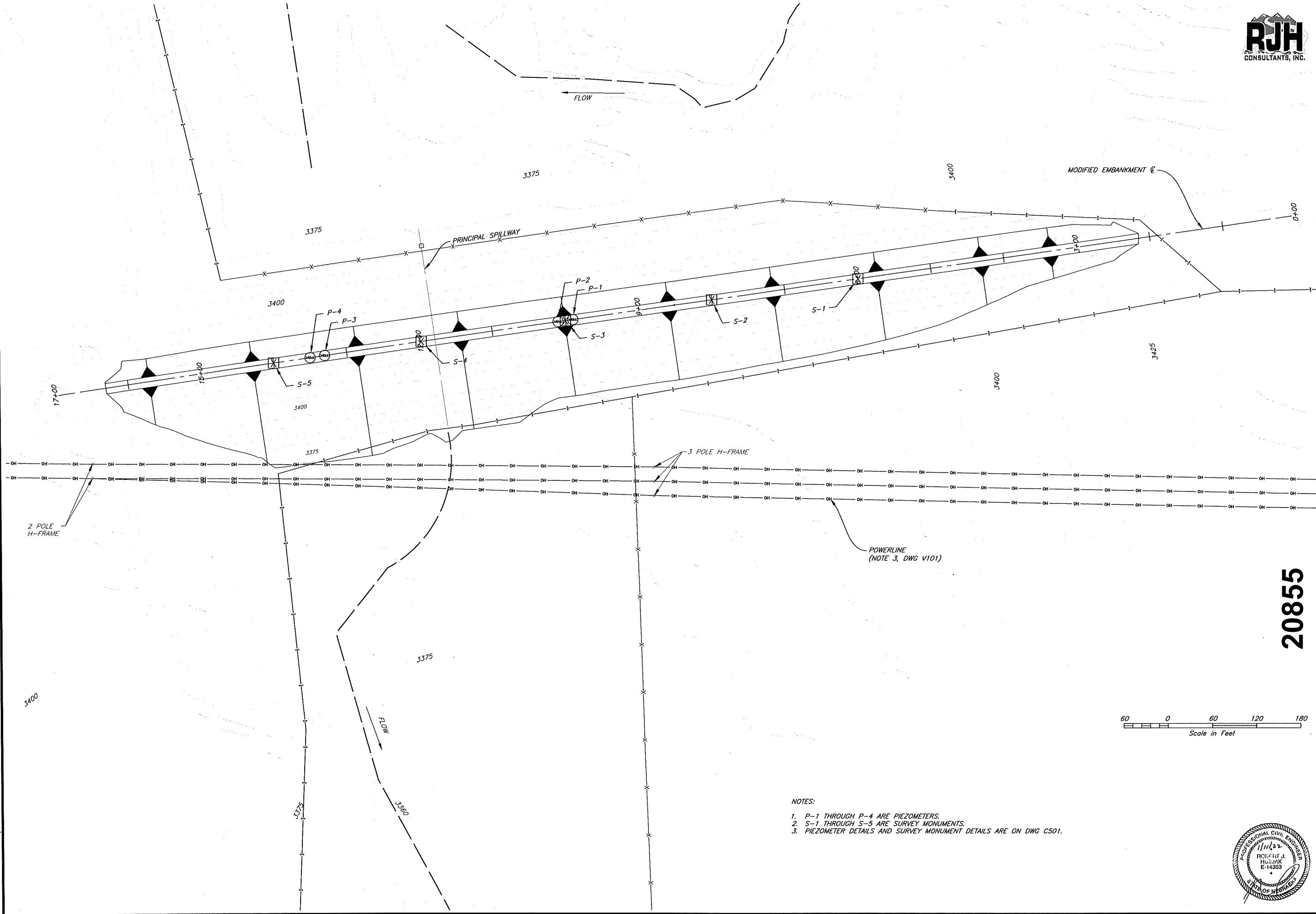
Natural Resources
Conservation Service

File No.

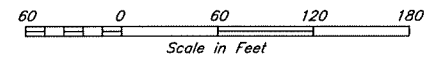
CivInstrumentationPlan.dwg

Drawing No.
C106

Sheet15 of 37



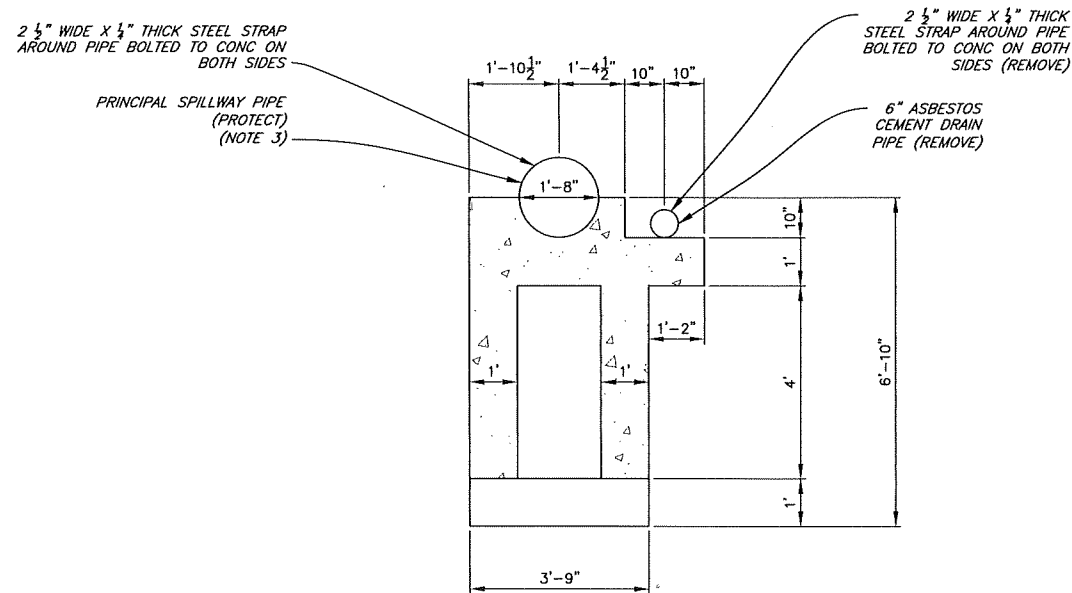
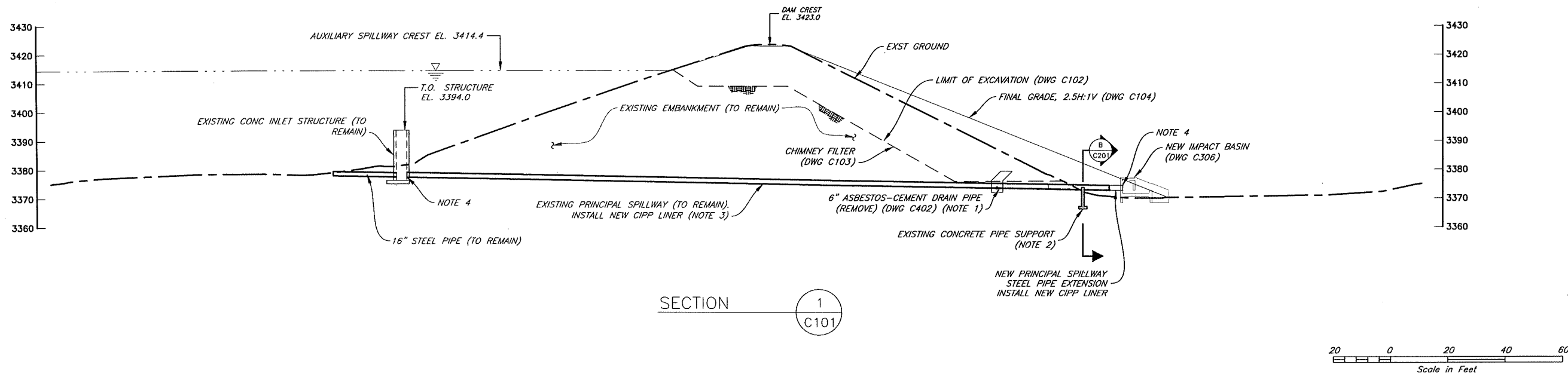
20855



- NOTES:
1. P-1 THROUGH P-4 ARE PIEZOMETERS.
 2. S-1 THROUGH S-5 ARE SURVEY MONUMENTS.
 3. PIEZOMETER DETAILS AND SURVEY MONUMENT DETAILS ARE ON DWG C501.



P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivPrincSpillwayProf.dwg 1/13/2022 10:33 AM



- NOTES:
1. REQUIREMENTS FOR REMOVAL OF ASBESTOS-CEMENT PIPE ARE IN CONSTRUCTION SPECIFICATION 3.
 2. REMOVE EXISTING PIPE SUPPORT MIN 0.5 FT AND MAX 2.0 FT BELOW THE INVERT OF THE PRINCIPAL SPILLWAY PIPE. BACKFILL WITH FILTER MATERIAL.
 3. PROTECT THE EXISTING PRINCIPAL SPILLWAY FROM DAMAGE. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED AT THE CONTRACTOR'S TIME AND EXPENSE BY A METHOD APPROVED BY THE ENGINEER.
 4. INSTALL LMK INSIGNIA END SEAL OR ENGINEER-ACCEPTED COMPARABLE PRODUCT AT EACH END OF THE NEW CIPP LINER.



20855

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
PRINCIPAL SPILLWAY PROFILE

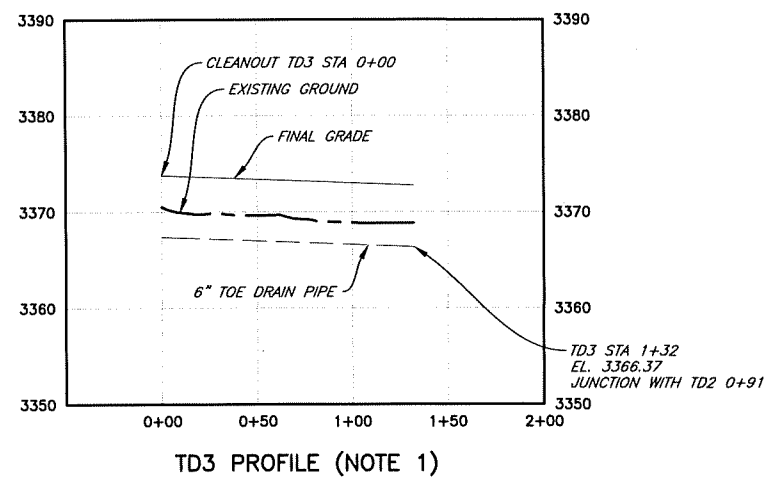
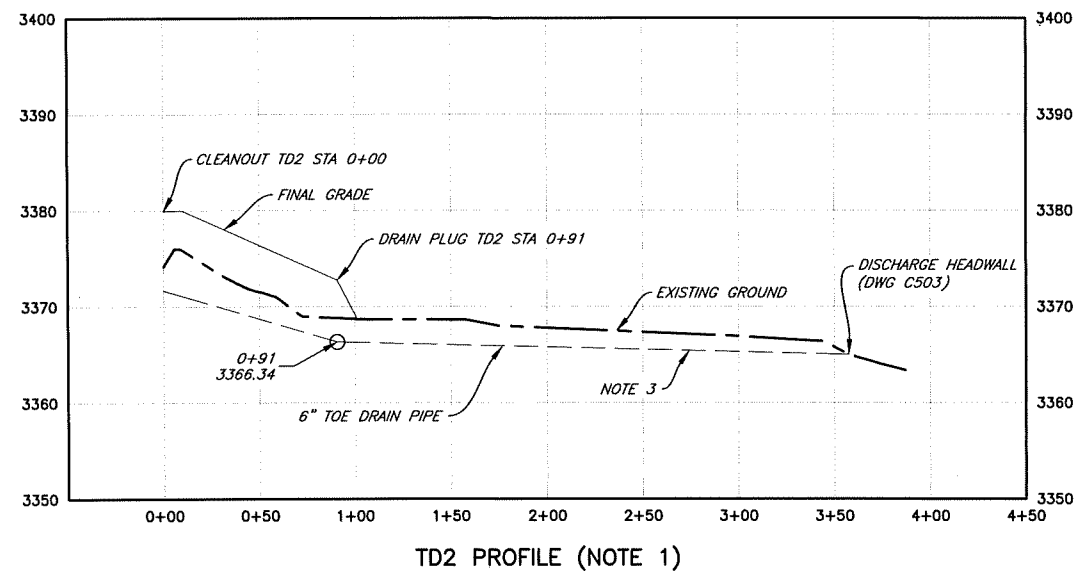
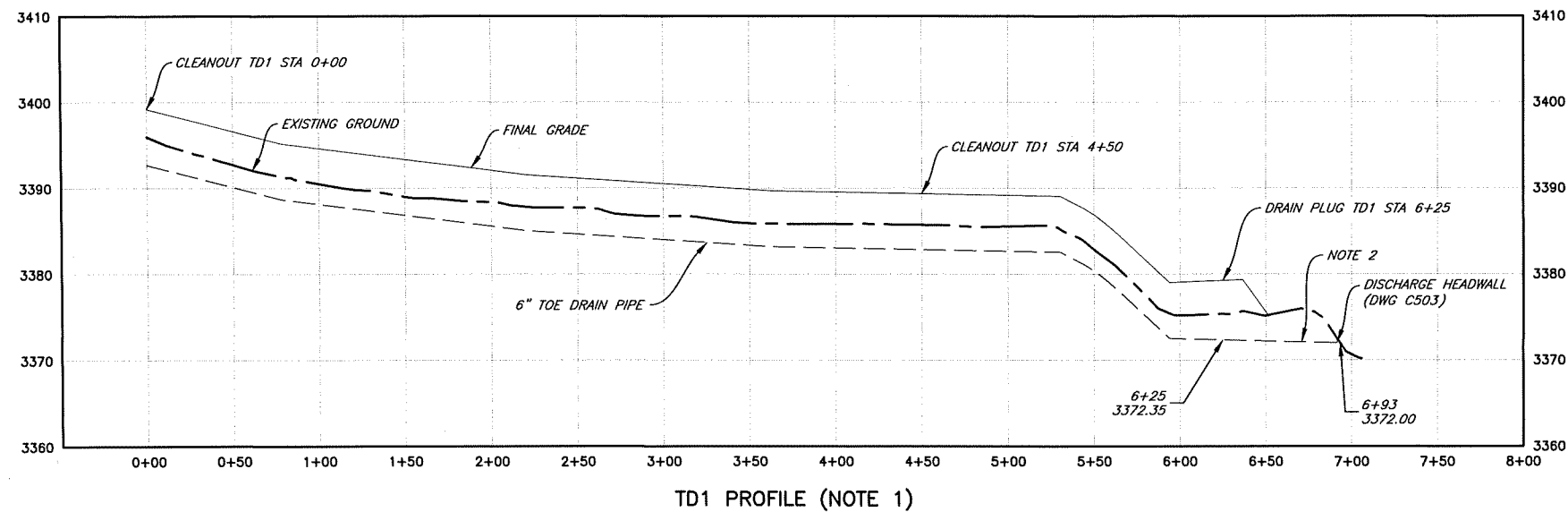


File No.
CivPrincSpillwayProf.dwg
Drawing No.
C201
Sheet 16 of 37

Date	Designed	Drawn	Checked	Approved
9/21/21	ABP	CND	CLS	RJH

Keith County, Nebraska
Sec 9, T 13 N, R 40 W

p:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\EmbFilterAndDrain.dwg 1/13/2022 10:33 AM



- NOTES:
1. TOE DRAIN PROFILE LOCATIONS ARE SHOWN ON DWG C103.
 2. INSTALL TOE DRAIN PIPE AT 0.5 PERCENT SLOPE BEYOND TD1 STA 6+25 TO DAYLIGHT.
 3. INSTALL TOE DRAIN PIPE AT 0.5 PERCENT SLOPE BEYOND TD2 STA 0+91 TO DAYLIGHT.

Horizontal Scale in Feet

Vertical Scale in Feet



20855

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivPrincSpillwayProf.dwg 1/13/2022 10:33 AM

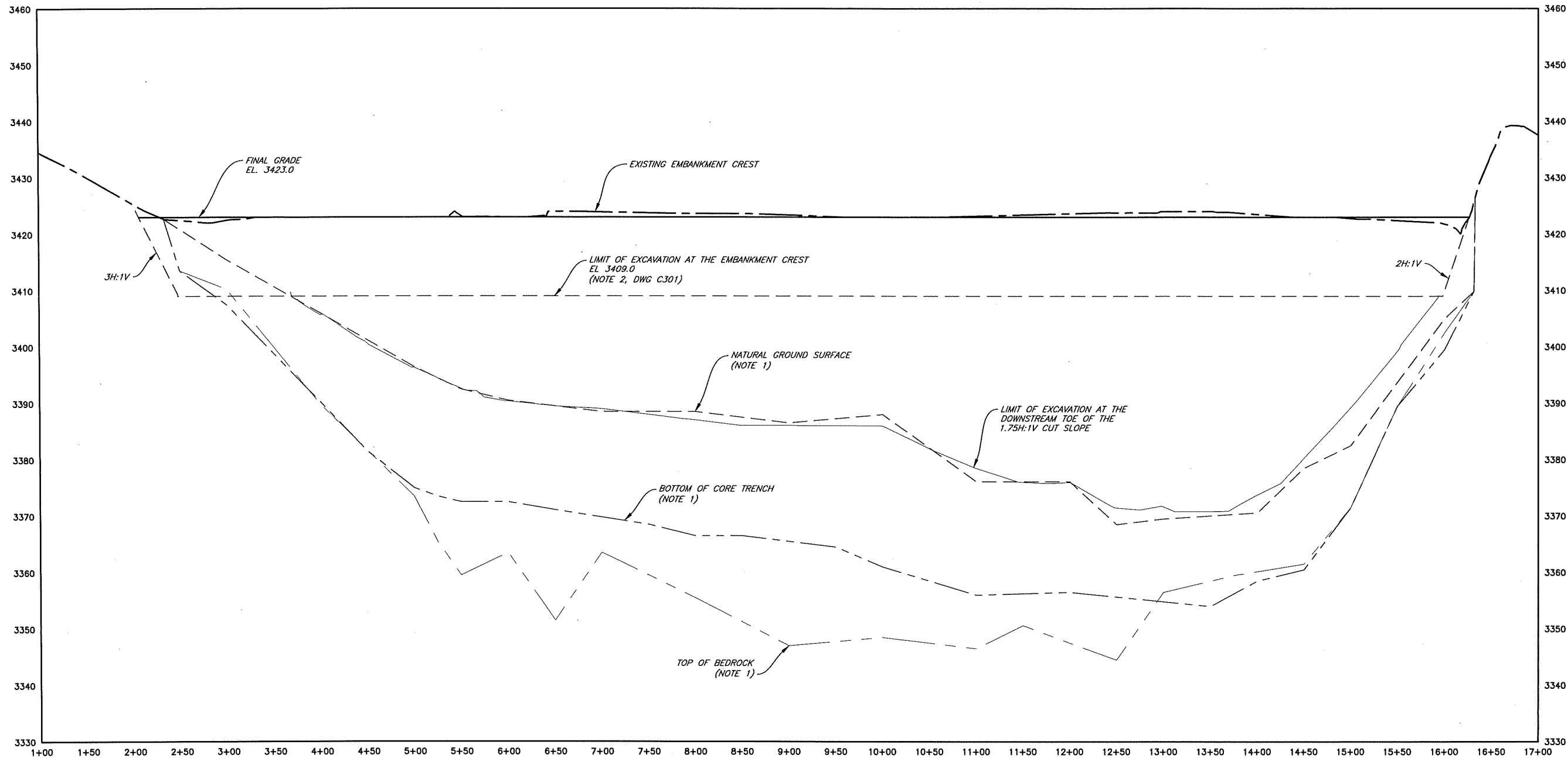


Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
DAM PROFILE ALONG CENTERLINE
Sec 9, T 13 N, R 40 W
Keith County, Nebraska

United States
Department of
Agriculture
USDA
Natural Resources
Conservation Service

File No.
CivPrincSpillwayProf.dwg
Drawing No.
C203
Sheet 18 of 37



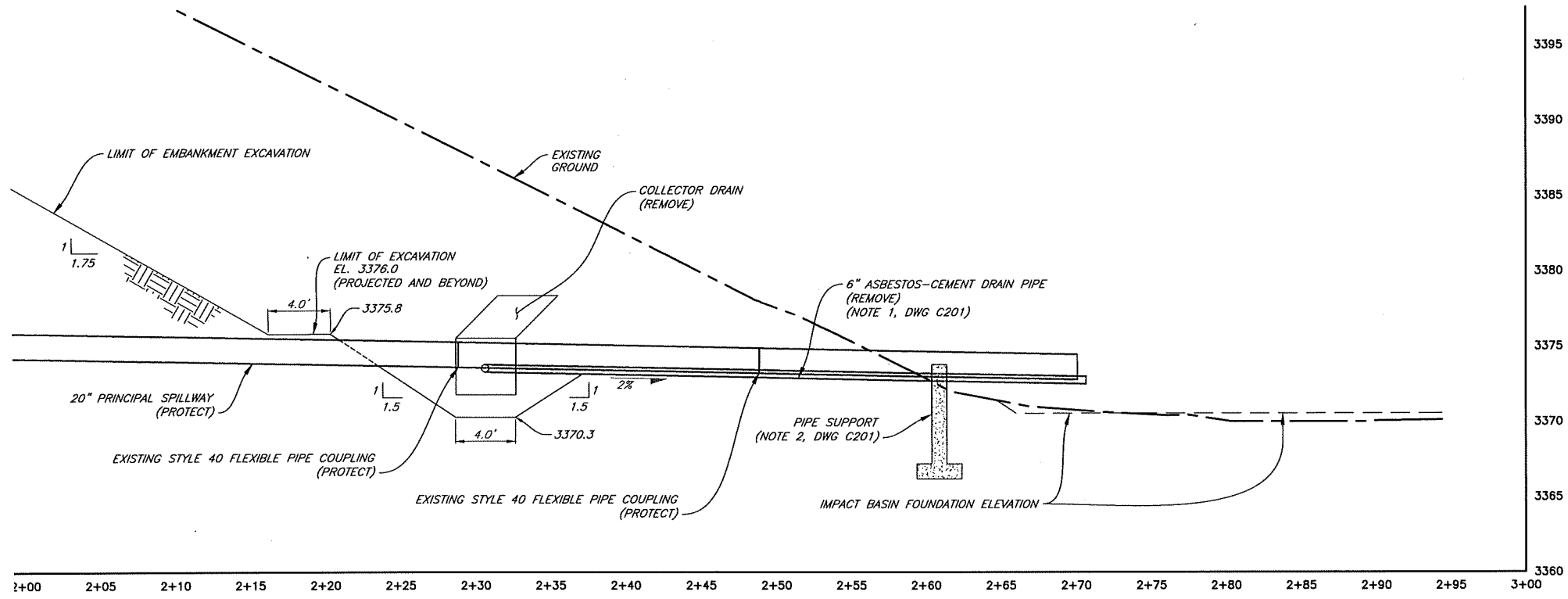
SECTION
DAM PROFILE

2
C101

NOTE:
1. SUBSURFACE PROFILE IS BASED ON DATA FROM THE 1968 AS-BUILT
DRAWINGS. ALL GEOLOGIC CONTACTS ARE APPROXIMATE.

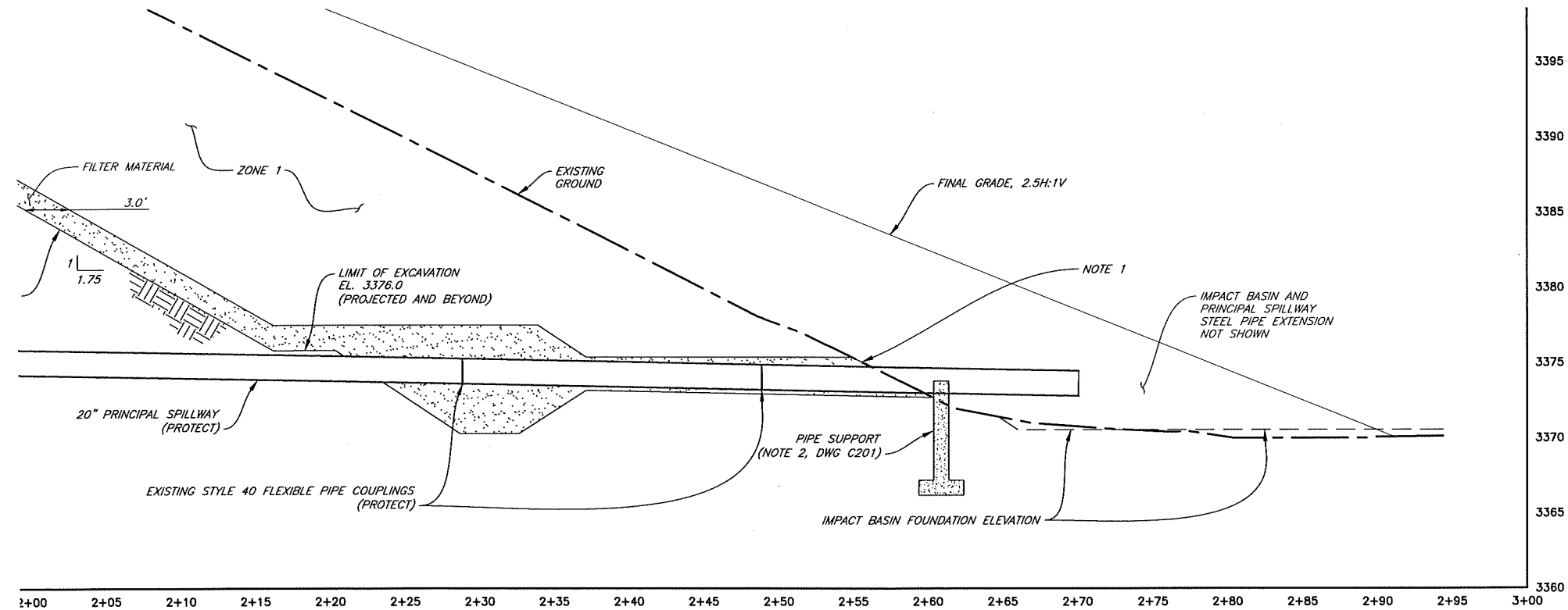


20855



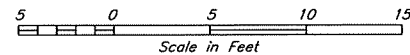
SECTION 9
COLLECTOR DRAIN EXCAVATION PROFILE

9
C402



SECTION 10
COLLECTOR DRAIN BACKFILL PROFILE

10
C402



NOTE:
1. EXTEND FILTER MATERIAL DOWNSTREAM AND CONNECT IMPACT BASIN FILTER AND DRAIN BACKFILL (DWG C306)



Date	Designed	Drawn	Checked	Approved
9/21/21	ABP	CND	CLS	RJH
9/21/21				
9/21/21				
9/21/21				

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
ASBESTOS CEMENT DRAIN PIPE EXCAVATION AND BACKFILL PROFILES
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

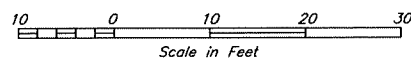
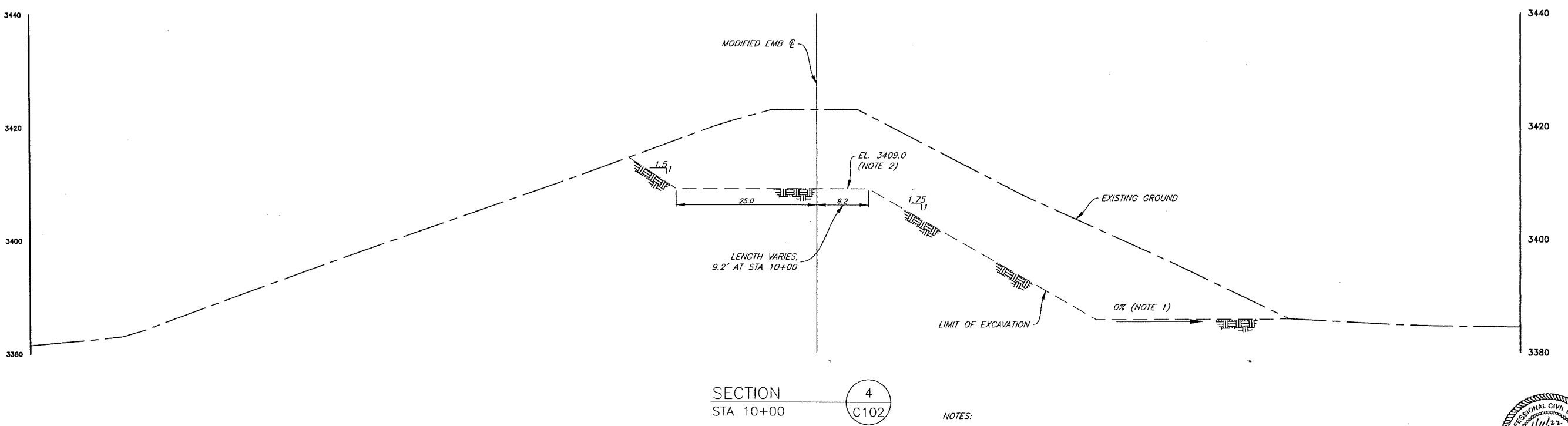
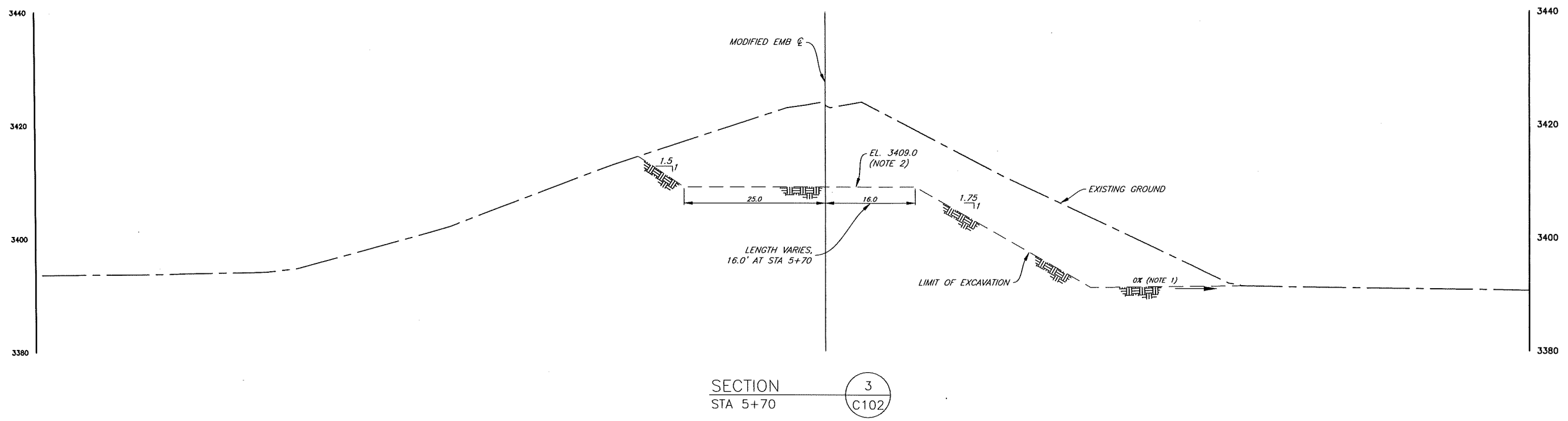
United States
Department of
Agriculture
Natural Resources
Conservation Service

File No.
CivImpactBasinExc.dwg
Drawing No.
C204
Sheet 19 of 37



20855

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivExcandDemoSecs.dwg 1/13/2022 10:34 AM

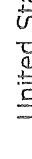


NOTES:

1. EXTEND THE 1.75H:1V CUTSLOPE DOWN TO THE ELEVATION OF THE EXISTING EMBANKMENT TOE.
2. CONFIRM LIMIT OF EXCAVATION IN THE FIELD WITH ENGINEER. EXCAVATION MIGHT EXTEND LOWER THAN EL. 3409.0 TO OVEREXCAVATE HOLES, CRACKS, OR DYED ZONES. SEE NOTE 4 ON DWG V101. OVEREXCAVATION REQUIREMENTS ARE IN SECTION 8 OF CONSTRUCTION SPECIFICATION 21 (EXCAVATION).



20855

 United States Department of Agriculture	TWIN PLATTE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM EXCAVATION AND DEMOLITION SECTIONS Keith County, Nebraska Sec 9, T 13 N, R 40 W	Designed <i>ABP</i>	Date 9/21/21
		Drawn <i>CND</i>	9/21/21
		Checked <i>CLS</i>	9/21/21
		Approved <i>RJH</i>	9/21/21
File No.			
CivExcandDemoSecs.dwg			
Drawing No. C301			
Sheet 20 of 37			

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivImpactBasinExc.dwg 1/13/2022 10:34 AM



Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
ASBESTOS CEMENT DRAIN PIPE EXCAVATION SECTIONS
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

United States
Department of
Agriculture

USDA

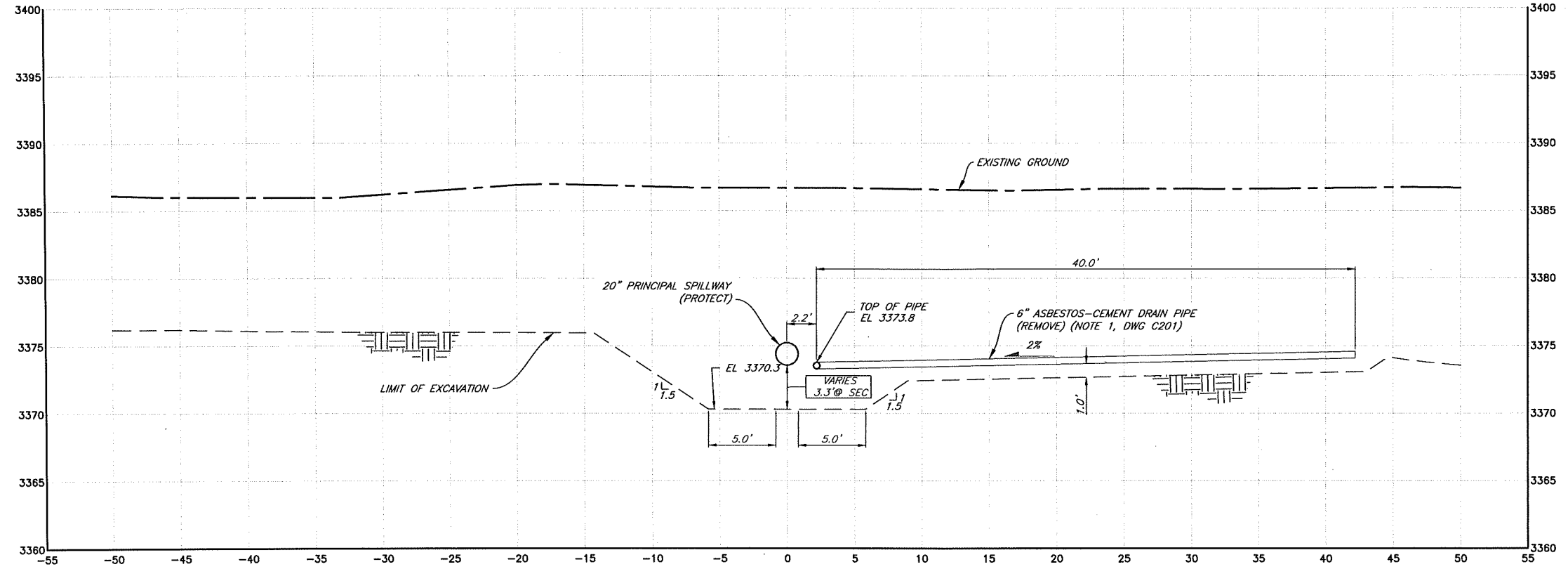
Natural Resources
Conservation Service

File No.

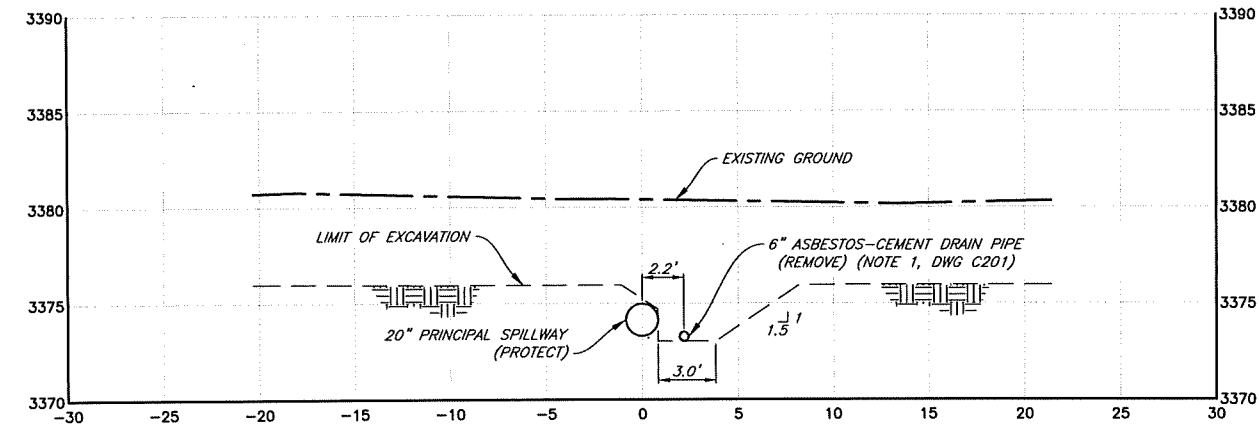
CivImpactBasinExc.dwg

Drawing No.
C302

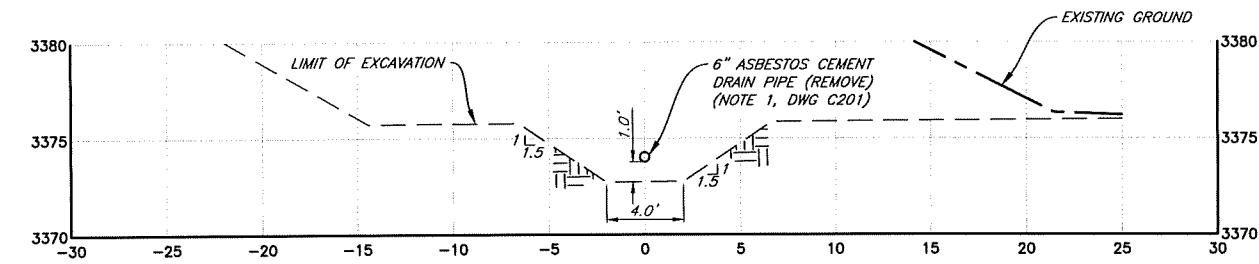
Sheet 21 of 37



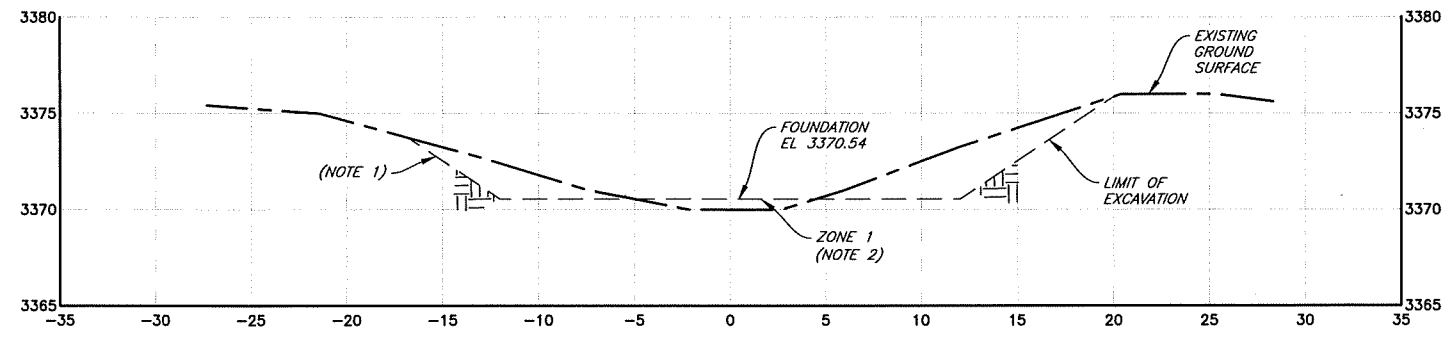
SECTION 11
COLLECTOR DRAIN EXCAVATION PROFILE C402



SECTION 12
COLLECTOR DRAIN EXCAVATION SECTION C402

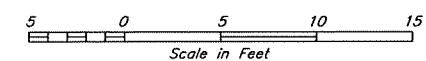


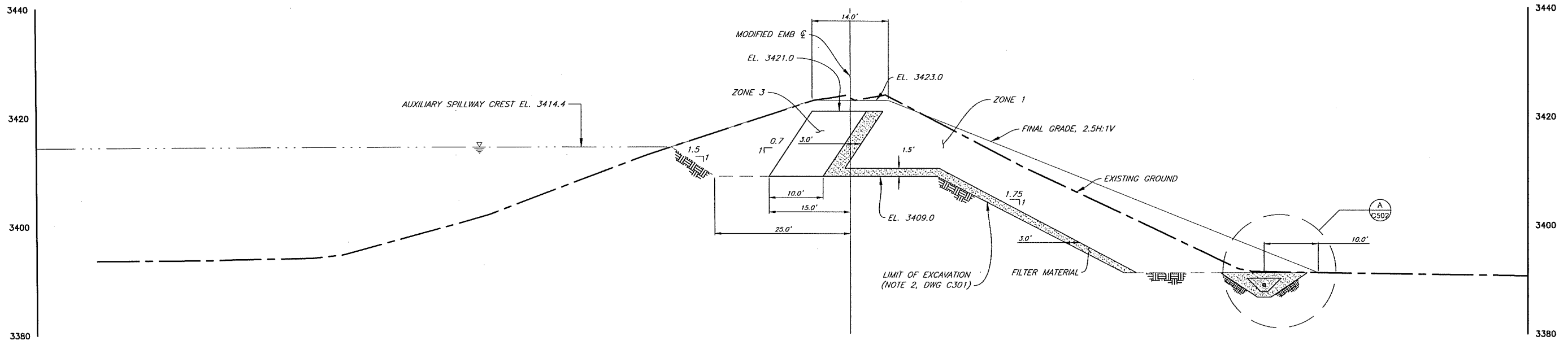
SECTION 13
6" ASBESTOS CEMENT DRAIN PIPE PROFILE C402



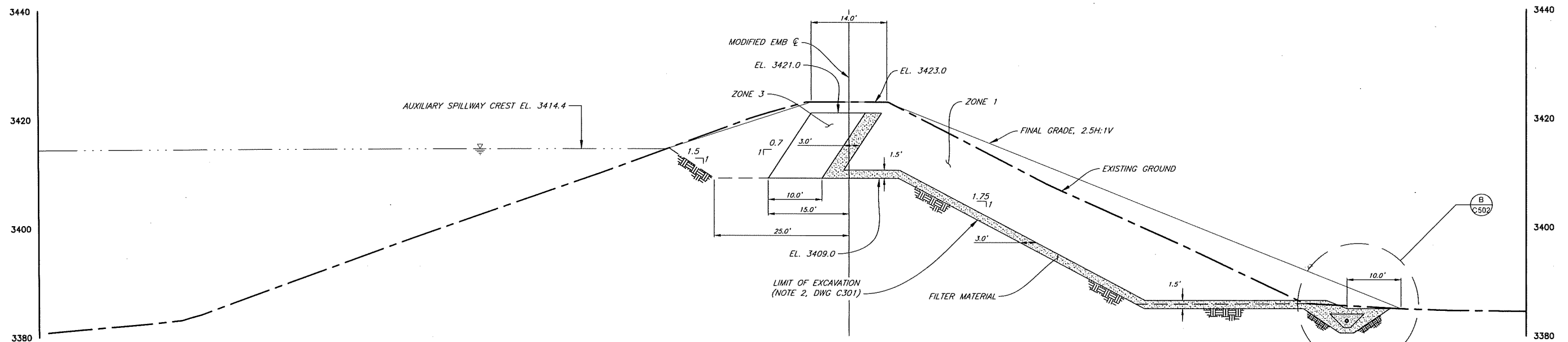
SECTION 14
IMPACT BASIN FOUNDATION PROFILE C402

- NOTES:
1. LIMIT OF EXCAVATION TO BE DESIGNED BY CONTRACTOR, BUT SHALL BE NO STEEPER THAN 1.5H:1V.
 2. UP TO APPROX 0.5' OF FILL REQUIRED TO ACHIEVE THE IMPACT BASIN FOUNDATION ELEVATION. PREPARE THE SUBGRADE FOUNDATION IN ACCORDANCE WITH SECTION 23 OF CONSTRUCTION SPECIFICATION 23 PRIOR TO FILL PLACEMENT.

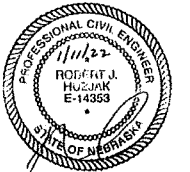
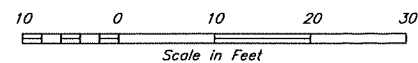




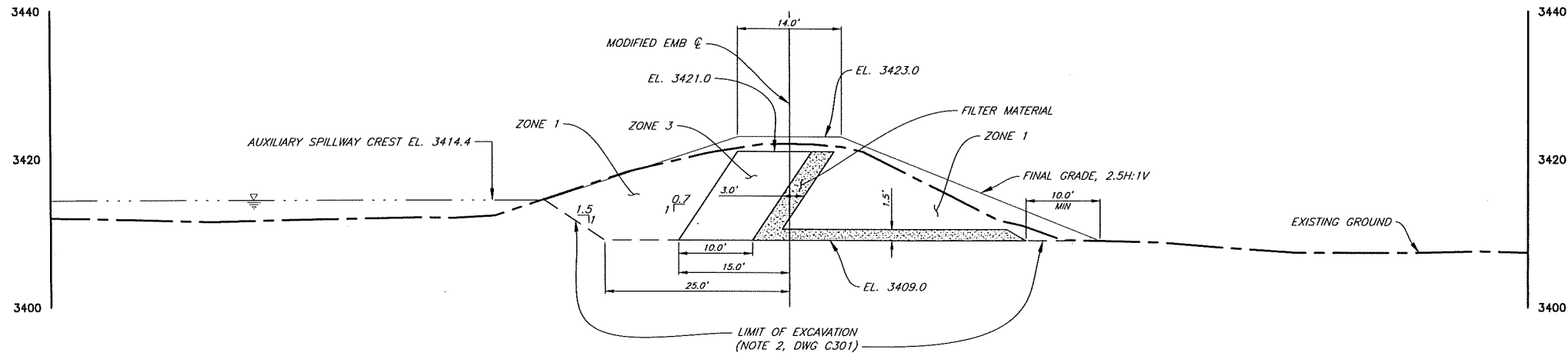
SECTION
STA 5+70



SECTION
STA 10+00

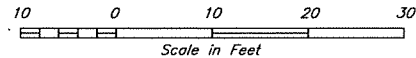


P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivEmbSecs.dwg 1/13/2022 10:34 AM



SECTION
STA 16+00

7	7
C104	C103



20855

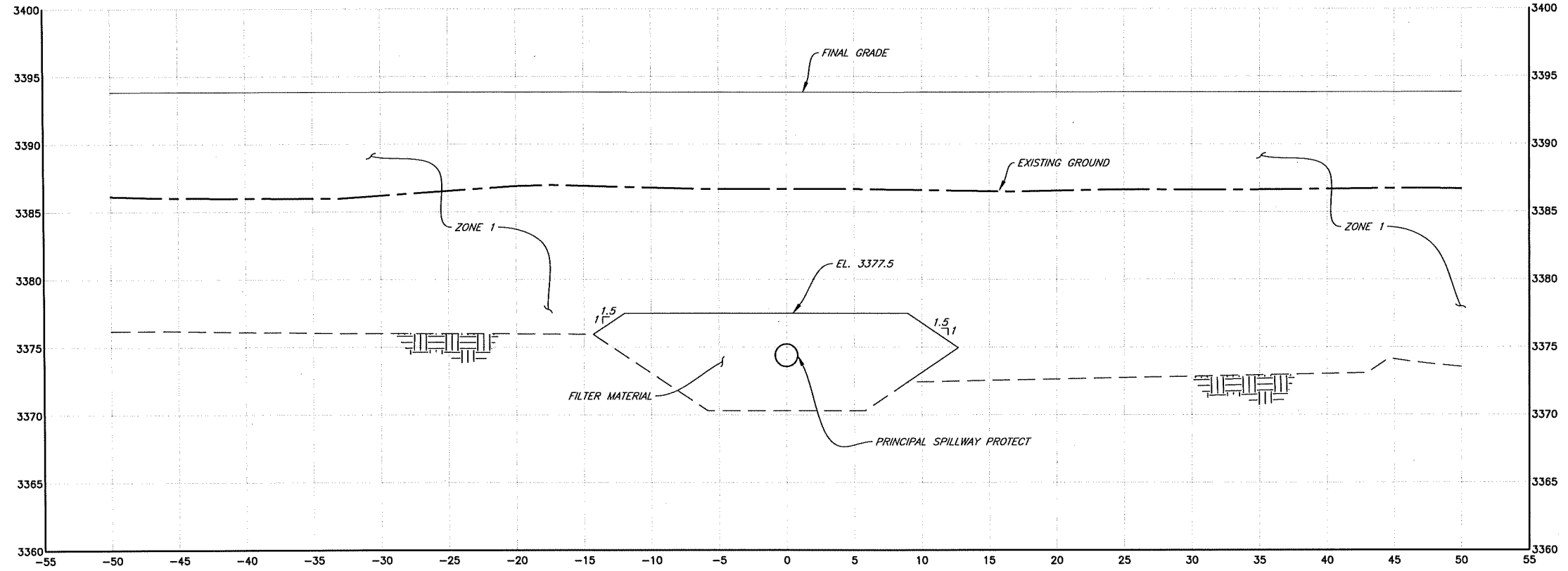
 United States Department of Agriculture	Natural Resources Conservation Service
	File No.
CivEmbSecs.dwg	
Drawing No. C304	
Sheet 23 of 37	

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
EMBANKMENT SECTIONS PAGE 2 OF 2
Sec 9, T 13 N, R 40 W
Keith County, Nebraska

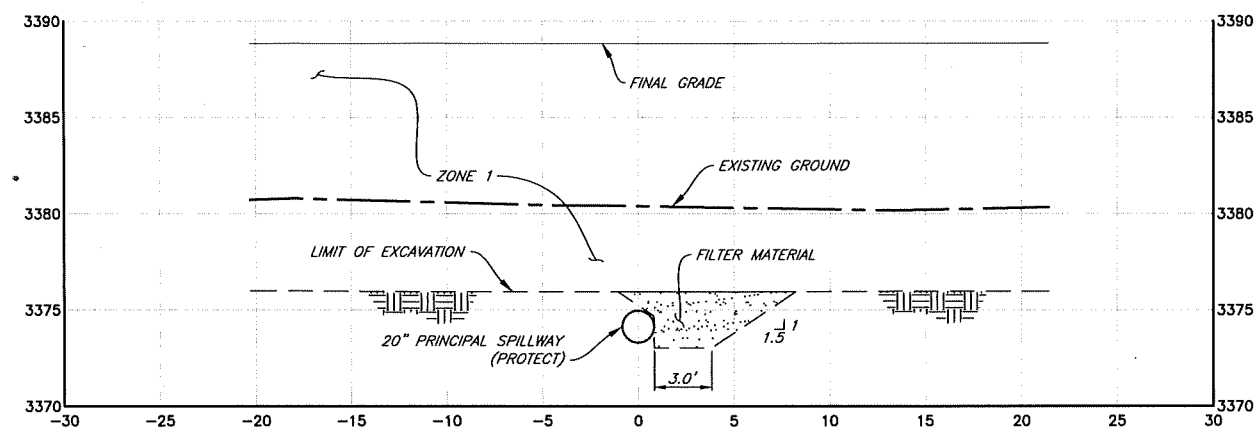
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

Date	9/21/21
9/21/21	
9/21/21	
9/21/21	

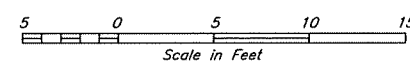
P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivImpactBasinExc.dwg 1/13/2022 10:35 AM



SECTION 15
COLLECTOR DRAIN BACKFILL PROFILE C402

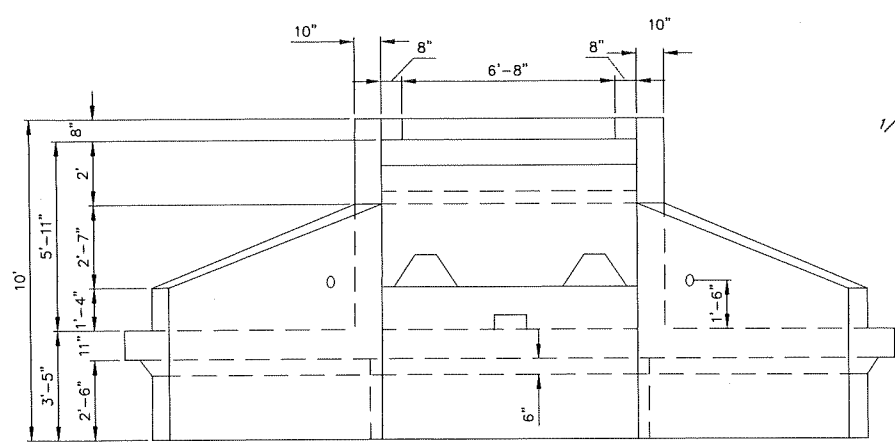


SECTION 16
COLLECTOR DRAIN BACKFILL SECTION C402

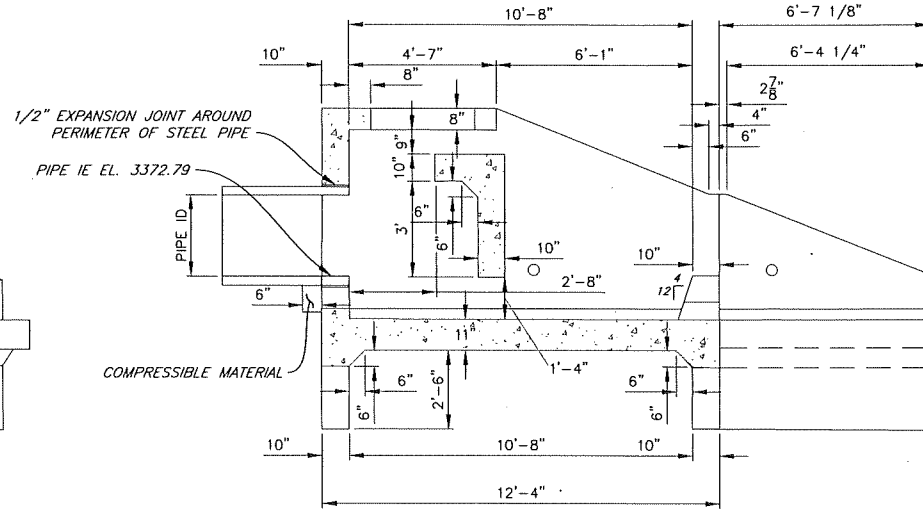
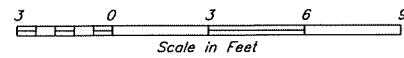


20855

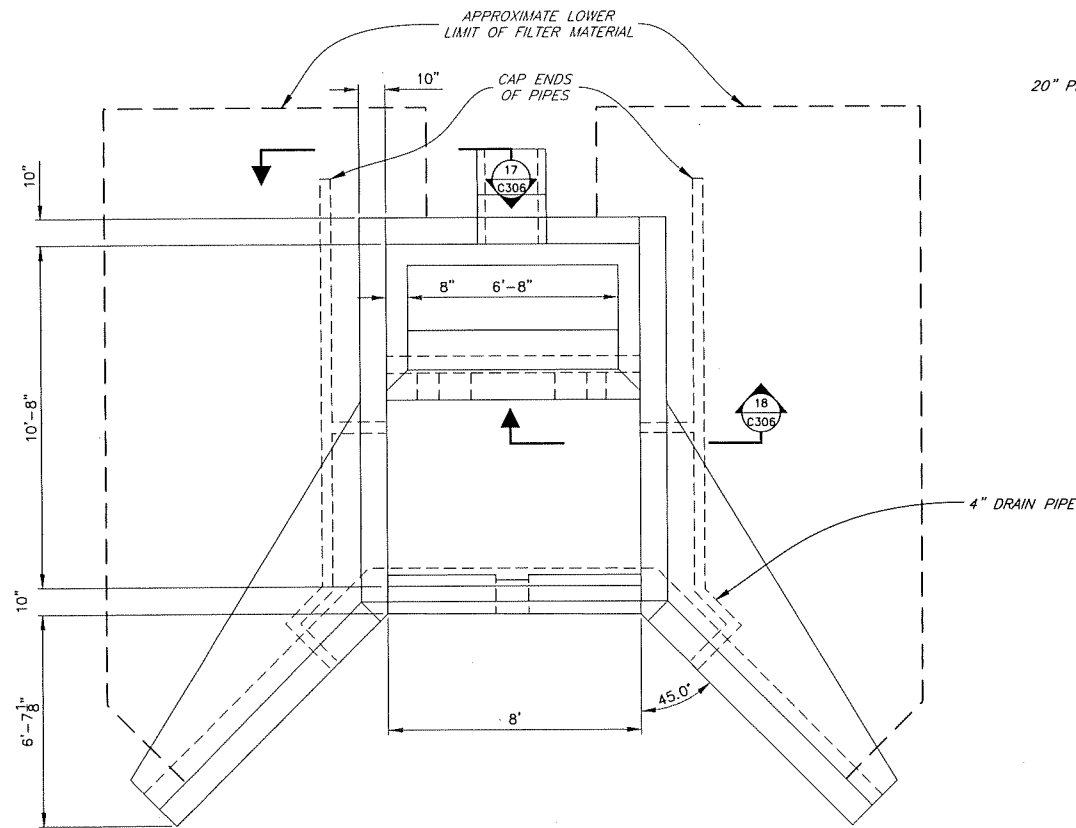
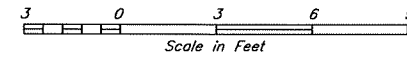
	File No.	CivImpactBasinExc.dwg
	Drawing No.	C305
	Sheet 24 of 37	
	TWIN PLATTE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM ASBESTOS CEMENT PIPE BACKFILL SECTIONS Sec 9, T 13 N, R 40 W Keith County, Nebraska	
United States Department of Agriculture	Designed ABP	Date 9/21/21
Natural Resources Conservation Service	Drawn CND	9/21/21
	Checked CLS	9/21/21
	Approved RJH	9/21/21



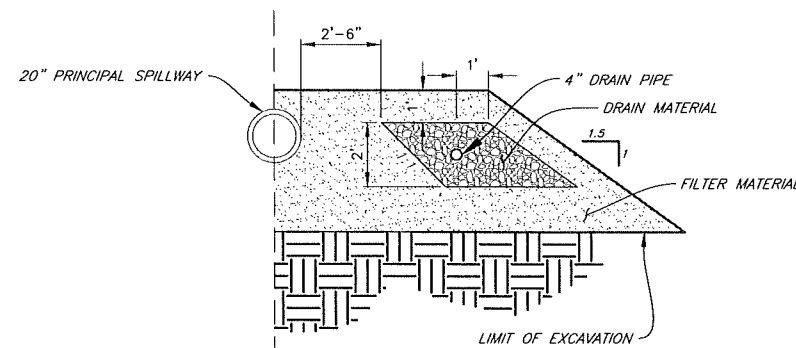
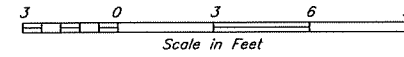
DOWNSTREAM ELEVATION



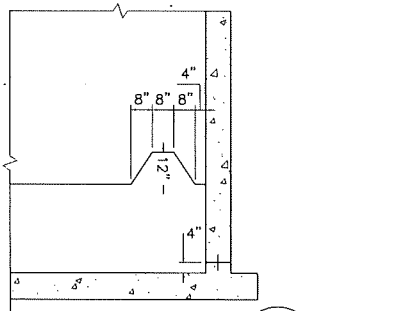
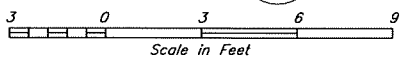
SECTION ON CENTERLINE



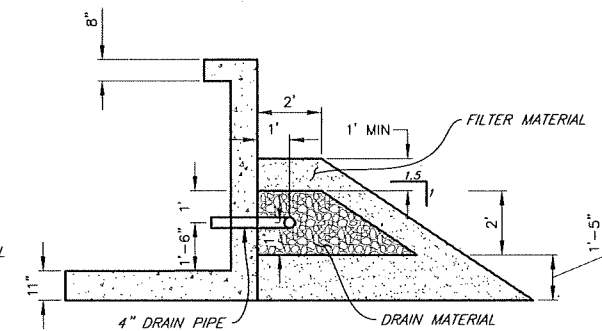
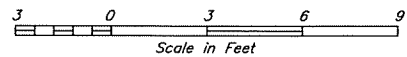
PLAN



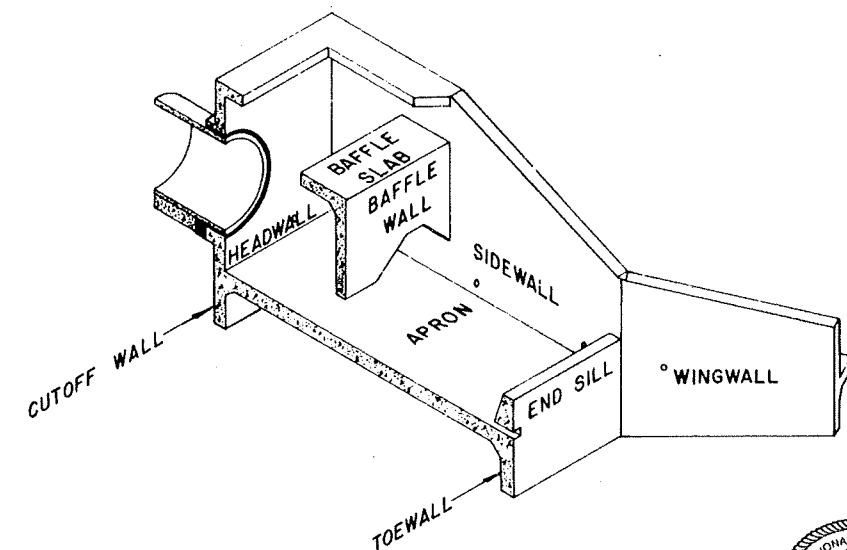
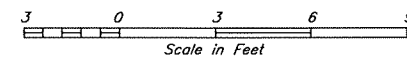
SECTION



SECTION

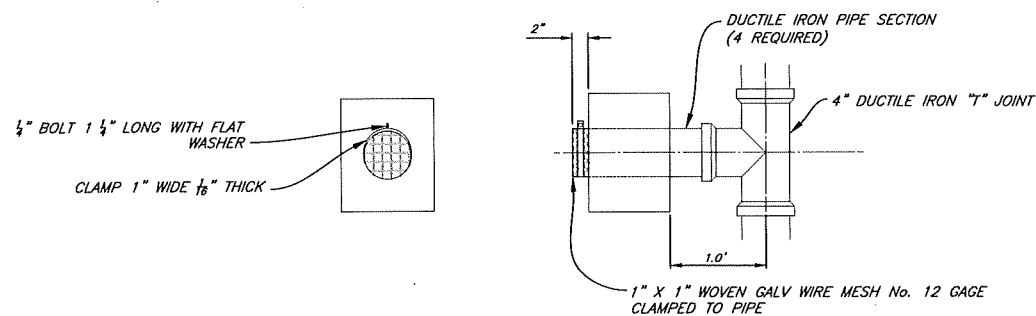


SECTION THROUGH DRAIN & FILTER



ISOMETRIC VIEW

(NOT TO SCALE)



DETAIL OF SMALL ANIMAL GUARD
SCREEN AND OUTLET OF DRAIN PIPE

(NOT TO SCALE)

NOTES:

1. INFORMATION SHOWN ON THIS SHEET IS FROM USDA STANDARD DRAWING ES-4080 & SCS STANDARD IMPACT BASIN DESIGN MODIFICATIONS, 1974.

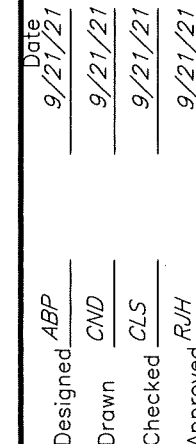


	Date
Designed <i>ABP</i>	<u>9/21/21</u>
Drawn <i>CND</i>	<u>9/21/21</u>
Checked <i>CLS</i>	<u>9/21/21</u>
Approved <i>RUH</i>	<u>9/21/21</u>

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
PRINCIPAL SPILLWAY SECTIONS (1 OF 5)
Sec 9, T 13 N, R 40 W
Keith County, Nebraska

 United States Department of Agriculture Natural Resources Conservation Service	File No.
	<i>CivPrincSpillwaySecs.dwg</i>
	Drawing No. <i>C306</i>
	Sheet <i>25</i> of <i>37</i>

20855

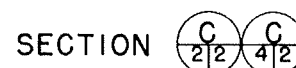
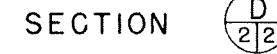
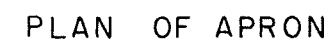


TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
PRINCIPAL SPILLWAY SECTIONS (2 OF 5)
Sec 9, T 13 N, R 40 W
Keith County, Nebraska

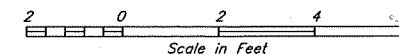
 <p>United States Department of Agriculture</p>	<p>Natural Resources Conservation Service</p>
File No.	

CivPrincSpillwaySecs.dwg
Drawing No.
C307

Sheet 26 of 37

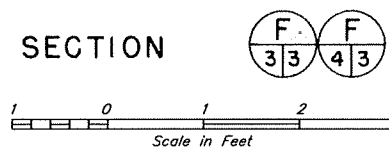
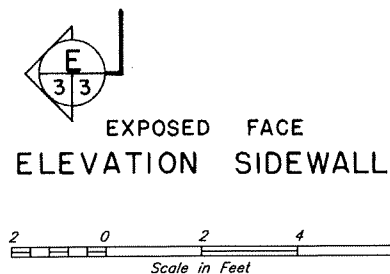
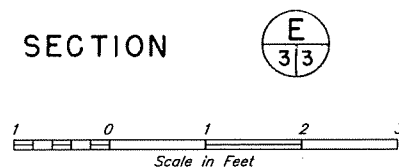
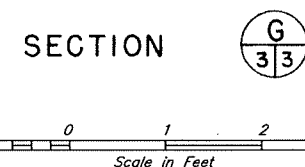
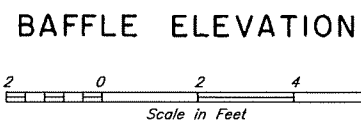
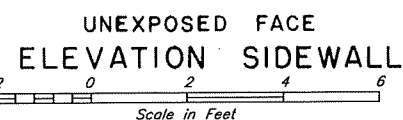


1. INFORMATION ON THIS SHEET IS FROM USDA STANDARD DRAWING ES-4080 & SCS STANDARD IMPACT BASIN DESIGN MODIFICATIONS, 1974.



20855






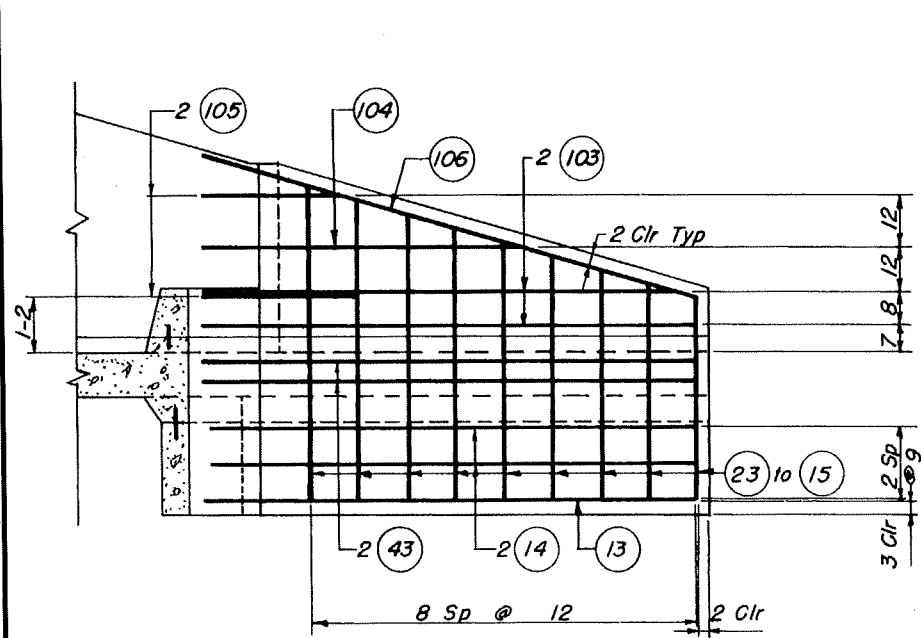
NOTES:

1. INFORMATION ON THIS SHEET IS FROM STANDARD DRAWING ES-4080 & SCS STANDARD IMPACT BASIN DESIGN MODIFICATIONS, 1974.

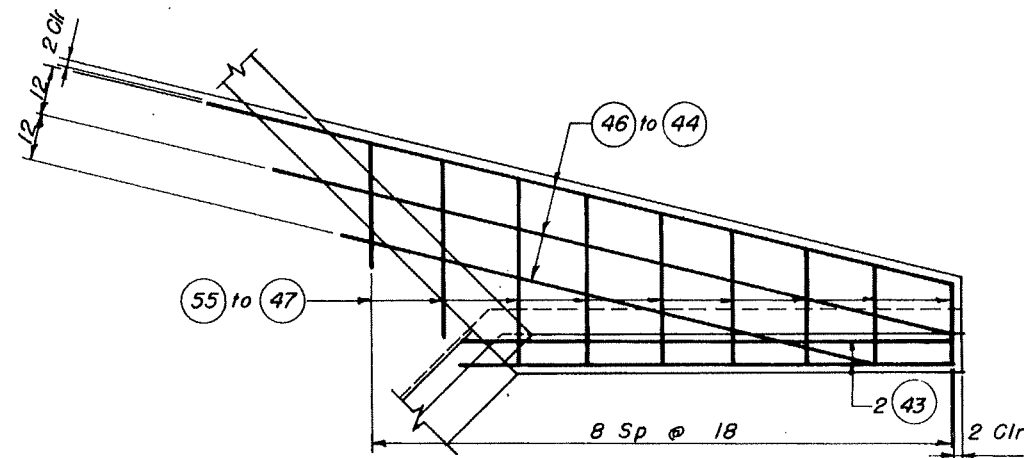


20855

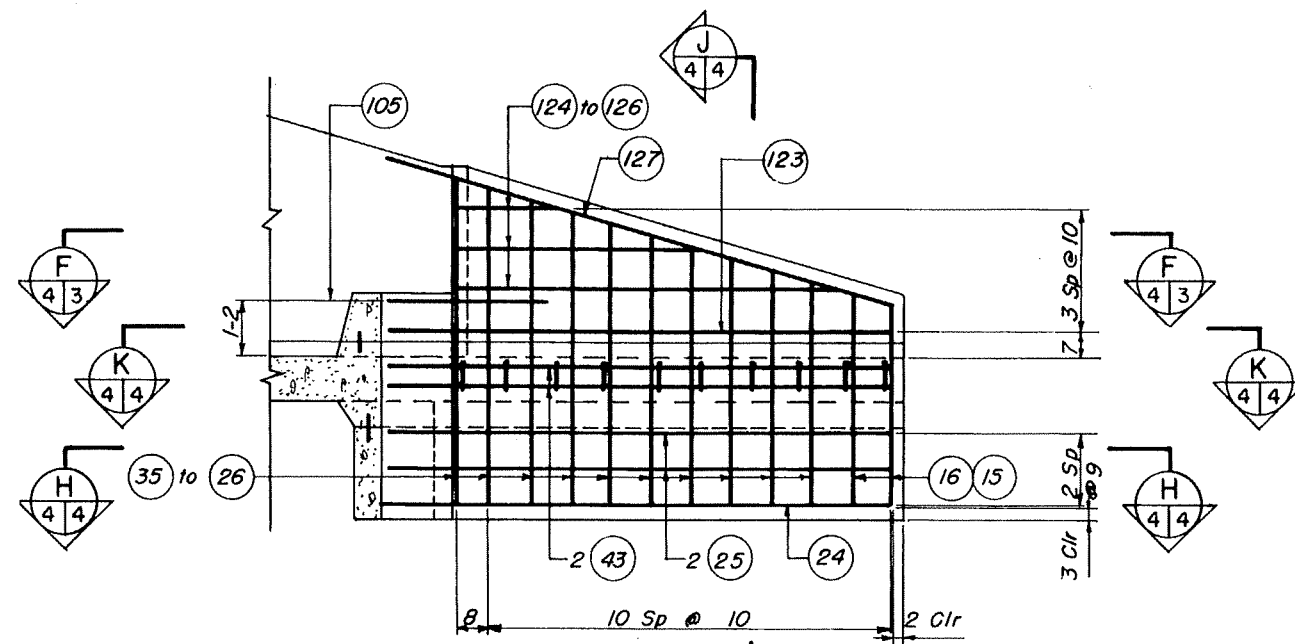
 <p>United States Department of Agriculture</p> <p>Natural Resources Conservation Service</p>	<p>TWIN PLATTE NATURAL RESOURCES DISTRICT</p> <p>BRULE CREEK WATERSHED SITE 1A DAM</p> <p>PRINCIPAL SPILLWAY SECTIONS (3 OF 5)</p>		<p>Designed <i>ABP</i></p> <p>Drawn <i>CND</i></p> <p>Checked <i>CLS</i></p> <p>Approved <i>RJH</i></p>	<p>Date</p> <p>9/21/21</p>
	<p>Sec 9, T 13 N, R 40 W</p> <p>Keith County, Nebraska</p>			
	<p>File No.</p> <p>CivPrincSpillwaySecs.dwg</p>			
	<p>Drawing No.</p> <p>C308</p>			
<p>Sheet 27 of 37</p>				



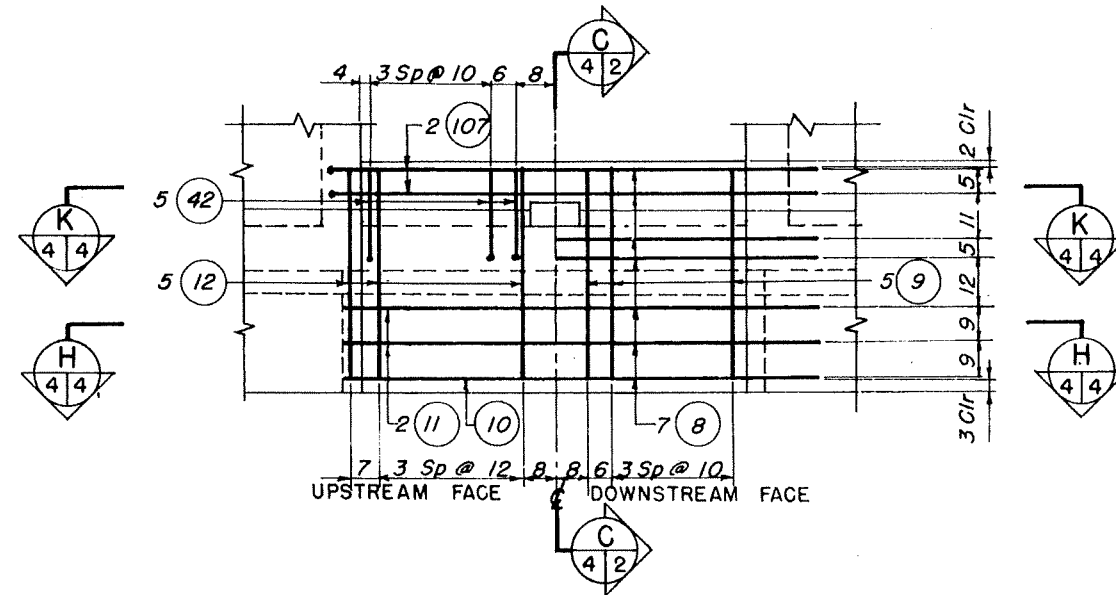
UNEXPOSED FACE
WINGWALL ELEVATION



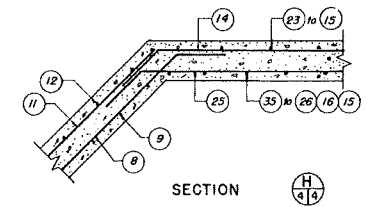
PLAN BOTTOM FACE
WINGWALL FOOTING



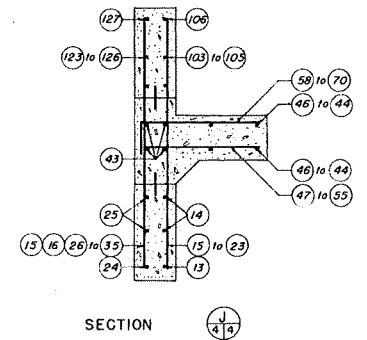
EXPOSED FACE
WINGWALL ELEVATION



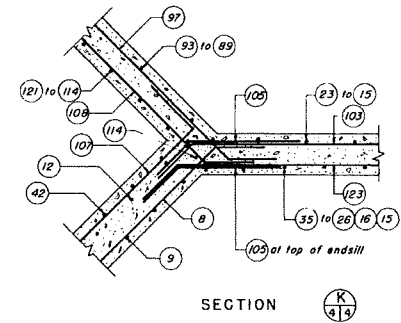
ELEVATION OF END SILL & TOEWALL



SECTION



SECTION



SECTION



	Date
Designed	9/21/21
Drawn	9/21/21
Checked	9/21/21
Approved	9/21/21

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
PRINCIPAL SPILLWAY SECTIONS (4 OF 5)
Sec 9, T 13 N, R 40 W
Keith County, Nebraska



United States
Department of
Agriculture

Natural Resources
Conservation Service

File No. _____
Drawing No. *C309*

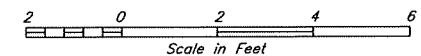
Sheet 28 of 37

20855



NOTES:

1. INFORMATION ON THIS SHEET IS FROM STANDARD DRAWING ES-4080 & SCS STANDARD IMPACT BASIN DESIGN MODIFICATIONS, 1974.



P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivPrncSpillwaySecs.dwg 1/13/2022 10:36 AM

Steel Schedule																										
Location	Mark	Size	Quantity	Length	Type	B	C	Total Length	Location	Mark	Size	Quantity	Length	Type	B	C	Total Length	Location	Mark	Size	Quantity	Length	Type	B	C	Total Length
Headwall	1	5	2	9-4	St			18-8	Wingwall	47	4	2	1-8	St			3-4	Sidewall	93	4	2	5-5	St			10-10
	2	4	4	9-4	St			37-4		48	4	2	2-0	St			4-0		94	4	8	7-3	21	6-1	1-2	58-0
	3	4	2	4-0	St			8-0		49	4	2	2-4	St			4-8		95	4	8	3-9	21	0-4	1-2	30-0
	4									50	4	2	2-9	St			5-6		96	4	10	9-0	21	2-3	6-9	90-0
	5									51	4	2	3-1	St			6-2		97	4	6	9-10	19	1-0	8-10	59-0
	6									52	4	2	3-5	St			6-10		98	4	2	8-5	St			16-10
	7									53	4	2	3-10	St			7-8		99	4	2	12-0	21	2-3	9-9	24-0
Endsill	8	5	7	11-8	7	9-2	1-3	81-8	54	4	2	3-8	St				7-4	100	4	2	9-11	21	2-3	7-8	19-10	
	9	5	10	4-4	St			43-4	Apron	55	4	2	2-8	St			5-4	101	5	4	6-6	21	1-3	5-3	26-0	
	10	5	1	8-7	St			8-7		56	4	13	12-0	St			156-0	Wingwall	102	5	4	8-5	23	1-3	7-2	33-8
	11	4	2	8-7	St			17-2		57	4	14	9-4	St			130-8		103	4	4	10-2	19	1-0	9-2	40-8
Wingwall	12	4	10	4-4	St			43-4	Wingwall	58	4	2	2-4	21	0-8	1-8	4-8	Endsill	104	4	2	6-9	19	1-0	5-9	13-6
	13	5	2	10-7	19	1-3	9-4	21-2		59	4	2	2-6	21	0-8	1-10	5-0		105	4	6	3-3	19	1-0	2-3	19-6
	14	4	4	10-4	19	1-0	9-4	41-1	60	4	2	2-9	21	0-8	2-1	5-6	Sidewall	106	5	2	11-0	19	1-3	9-9	22-0	
	15	5	4	4-4	St			17-4	61	4	2	3-0	21	0-8	2-4	6-0		107	5	2	11-8	17	1-3	9-2	23-4	
	16	4	4	4-7	St			18-4	62	4	2	3-3	21	0-8	2-7	6-6	Baffle	108	4	8	13-0	19	1-0	12-0	104-0	
	17	4	2	4-10	St			9-8	63	4	2	3-6	21	0-8	2-10	7-0		109	4	2	12-0	St			24-0	
	18	4	2	5-2	St			10-4	64	4	2	3-9	21	0-8	3-1	7-6		110	4	2	9-11	St			19-10	
	19	4	2	5-5	St			10-10	65	4	2	4-0	21	0-8	3-4	8-0		111	4	2	7-10	St			15-8	
	20	4	2	5-9	St			11-6	66	4	2	4-3	21	0-8	3-7	8-6		112	4	2	6-5	St			12-6	
	21	4	2	6-0	St			12-0	67	4	2	4-6	21	0-8	3-10	9-0		113	5	4	5-11	19	1-7	4-4	23-8	
	22	4	2	6-4	St			12-8	68	4	2	4-0	St			8-0		114	4	2	3-5	St			6-10	
	23	4	2	6-7	St			13-2	69	4	2	3-4	St			6-8		115	4	2	3-9	St			7-6	
	24	5	2	11-1	19	1-3	9-10	22-2	70	4	2	2-6	St			5-0		116	4	2	4-1	St			8-2	
25	4	4	10-10	19	1-0	9-10	43-4	Headwall	71									117	4	2	4-5	St			8-10	
26	4	2	4-9	St			9-6		72										118	4	2	4-9	St			9-6
27	4	2	5-0	St			10-0		73	5	2	7-3	21	6-1	1-2	14-6		119	4	2	5-1	St			10-2	
28	4	2	5-3	St			10-6		74	4	6	7-3	21	6-1	1-2	43-6	120	4	2	5-5	St			10-10		
29	4	2	5-6	St			11-0		75	4	9	3-9	21	0-4	1-2	33-9	121	4	2	5-9	St			11-6		
30	4	2	5-9	St			11-6		76									122	4	12	6-1	St			73-0	
31	4	2	6-0	St			12-0		77	5	8	9-4	St				74-8	Wingwall	123	4	2	10-10	19	1-0	9-10	21-8
32	4	2	6-2	St			12-4		78	4	6	2-11	St				17-6		124	4	2	8-4	St			16-8
33	4	2	6-5	St			12-10		79	5	8	4-0	St				32-0		125	4	2	5-5	St			10-10
34	4	2	6-8	St			13-4		80										126	4	2	2-6	St			5-0
Apron	35	4	2	6-11	St			13-10	81									127	5	2	10-7	19	1-3	9-4	21-2	
	36	4	4	9-4	St			37-4	82									Baffle	128	5	14	11-10	17	1-4	9-2	165-8
	37	4	22	7-5	21	2-3	5-2	163-2	83								129		5	2	3-6	St			7-0	
	38	4	26	2-8	21	2-0	0-8	69-4	84								130		4	11	5-3	21	0-6	1-9	57-9	
	39								85	5	2	6-1	St			12-2	131		5	4	5-1	24	3-5	0-5	20-4	
40	4	6	14-0	21	2-0	12-0	84-0	86										132	5	4	4-9	24	3-1	0-5	19-0	
41	4	2	12-0	St			24-0	87										133	5	4	4-1	24	2-5	0-5	16-4	
42	5	10	2-9	22	1-0	1-9	27-6	88										134	5	4	5-3	21	1-3	4-0	21-0	
Wingwall	43	4	8	10-4	St			82-8	Sidewall	89	4	2	3-5	St			6-10	135	5	2	9-2	7	2-6	3-4	18-4	
	44	5	4	16-4	St			65-4		90	4	2	3-7	St			7-2	136	5	11	3-4	17	0-8	2-0	36-8	
	45	4	4	14-6	St			58-0		91	4	2	4-3	St			8-6	137	5	4	5-3	21	3-6	1-9	21-0	
	46	4	4	11-4	St			45-4		92	4	2	4-10	St			9-8	138	5	4	4-11	21	3-2	1-9	19-8	
																		139	5	4	4-3	21	2-6	1-9	17-0	
Schedule of Bars Varying with Conduit Diameter																										
18 ID Conduit									24 ID Conduit									30 ID Conduit								
Location	Mark	Size	Quantity	Length	Type	B	C	Total Length	Location	Mark	Size	Quantity	Length	Type	B	C	Total Length	Location	Mark	Size	Quantity	Length	Type	B	C	Total Length
Headwall	4	4	2	4-7	St			9-2	Headwall	4	4	2	4-5	St			8-10	Headwall	4	4	2	4-4	St			8-8
	5	4	16	4-6	St			72-0		5	4	16	4-6	St			72-0		5	4	14	4-6	St			63-0
	6	4	2	4-5	St			8-10		6	4	2	4-3	St			8-6		6	4	24	4-2	St			8-4
	7				None				7					None					7	4	2	5-2	St			10-4
Apron	39	4	2	13-7	21	1-7	12-0	27-2	Apron	39	4	2	13-6	21	1-6	12-0	27-0	Apron	39	4	2	13-6	21	1-6	12-0	27-0
	71	4	1	4-4	21	3-2	1-2	4-4		71	4	1	3-9	21	2-7	1-2	3-9		71	4	1	3-3	21	2-1	1-2	3-3
Headwall	72	4	2	5-1	21	3-11	1-2	10-2	Headwall	72	4	2	4-2	21	3-0	1-2	8-4	Headwall	72	4	2	3-7	21	2-5	1-2	7-2
	76	4	3	7-2	St			21-6		76	4	2	7-2	St			14-4		76	4	2	7-2	St			14-4
	80	4	3	9-4	St			28-0		80	4	3	9-4	St			28-0		80	4	2	9-4	St			18-8
	81	4	2	3-6	St			7-0		81	4	2	3-2	St			6-4		81	4	2	2-11	St			5-10
	82	4	4	3-10	St			15-4		82	4	4	3-5	St			13-8		82	4	4	3-1	St			12-4
	83				None					83				None					83	4	4	4-2	St			16-8
	84	4	8	6-1	St			48-8		84	4	8	6-1	St			48-8		84	4	6	6-1	St			36-6
	86	4	1	3-2	St			3-2		86	4	1	2-7	St			2-7		86	4	1	2-1	St			2-1
	87	4	2	3-6	St			7-0		87	4	2	2-10	St			5-8		87	4	2	2-3	St			4-6
	88				None					88				None						88	4	2	3-3	St		

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivMiscSecs.dwg 1/13/2022 10:36 AM

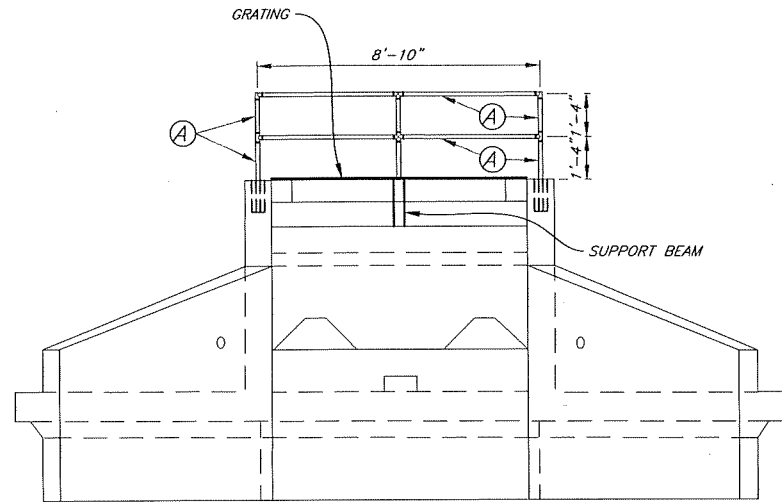


Date	9/21/21
Designed	ABP
Drawn	MRT
Checked	CLS
Approved	RJH

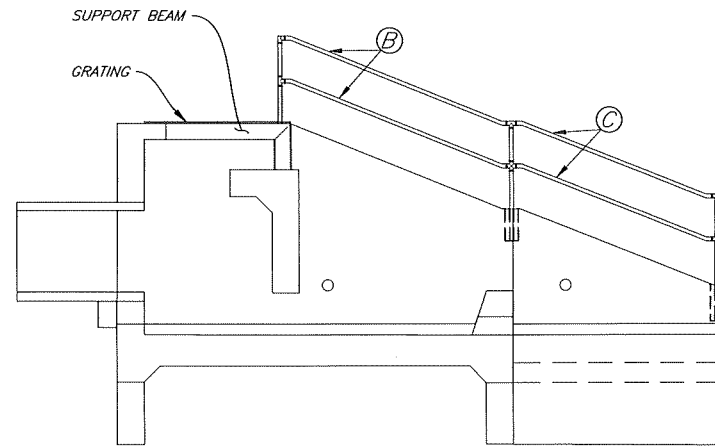
TWIN PLATE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
MISCELLANEOUS SECTIONS
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

United States
Department of
Agriculture
USDA
Natural Resources
Conservation Service

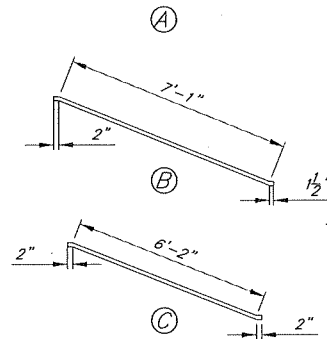
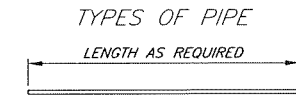
File No.
C311
Drawing No.
Sheet 30 of 37



DOWNSTREAM ELEVATION



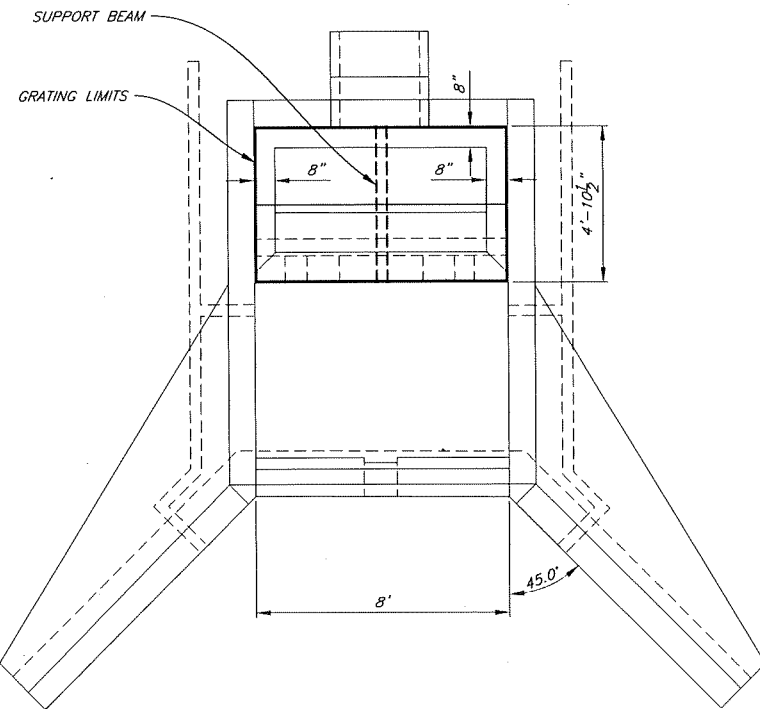
SECTION ON CENTERLINE



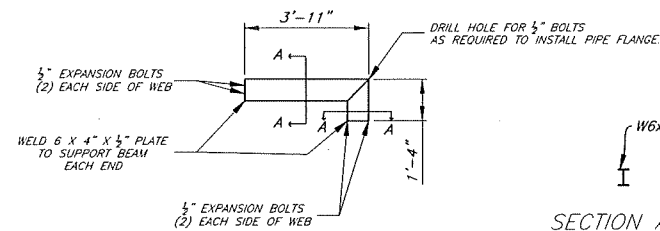
PIPE LENGTHS ARE APPROXIMATE
AND WILL DEPEND ON THE
FITTING USED



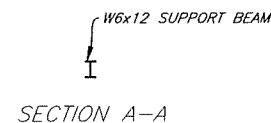
GRATING DETAIL



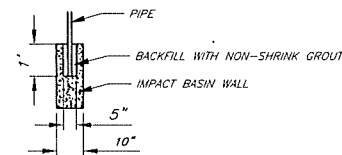
PLAN OF GRATING



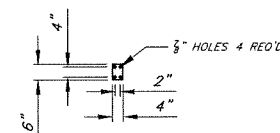
SUPPORT BEAM DETAILS



SECTION A-A

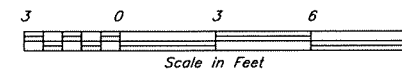


RAIL FENCE ANCHORING DETAIL

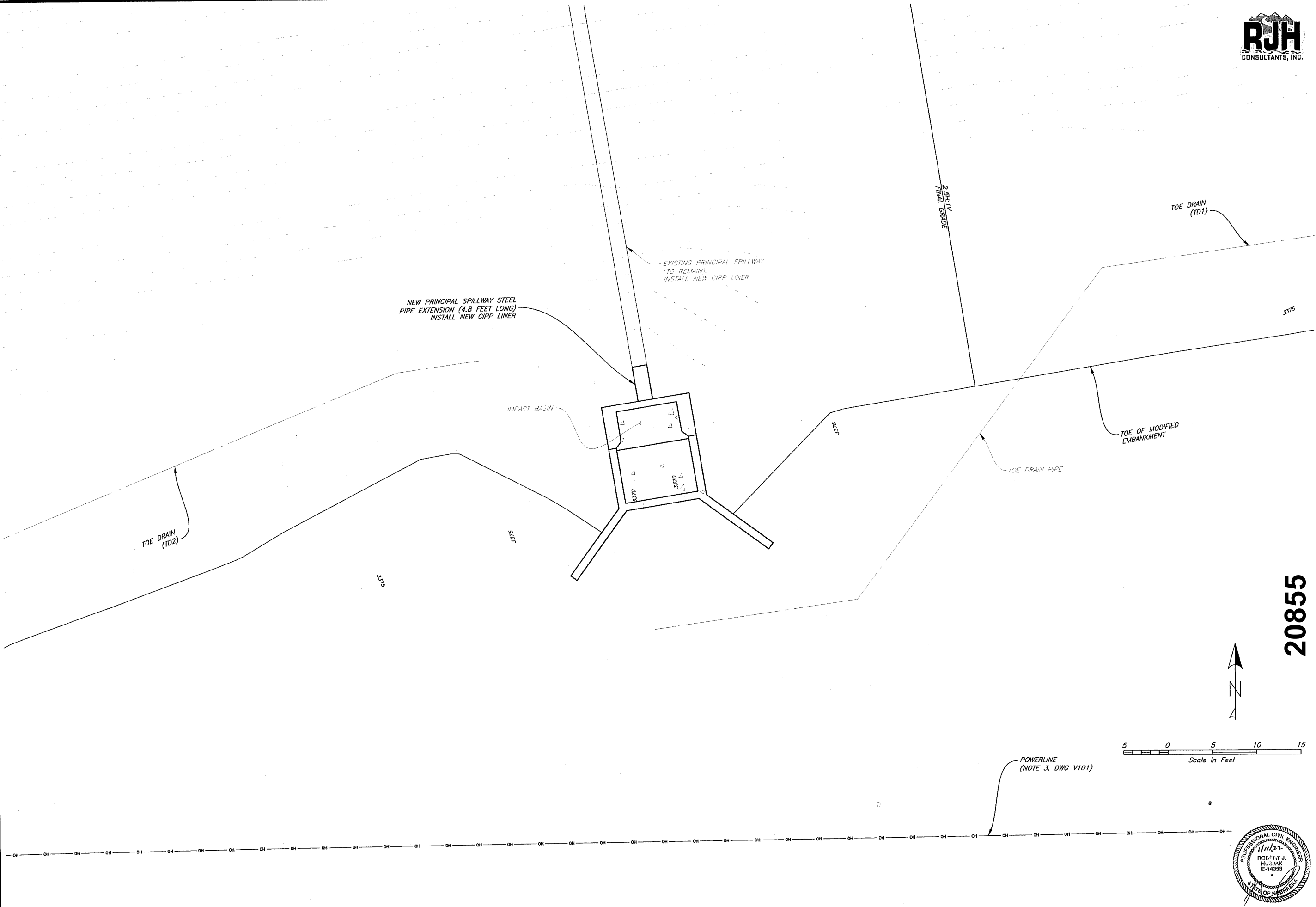


SUPPORT BEAM END PLATE
(2 REQUIRED)

- CONSTRUCTION NOTES:
1. GRATING SHALL BE BORDEN TYPE W/B, SIZE 3 OR APPROVED EQUAL.
 2. FASTEN GRATING WITH TYPE F-9 SADDLE CLIPS OR APPROVED EQUAL.
 3. GRATING SHALL BE GALVANIZED.
 4. CUT GRATING AS REQUIRED TO INSTALL RAIL FENCE FLANGE. TREAT CUT SURFACES IN ACCORDANCE WITH CONSTRUCTION SPECIFICATION 81 (METAL FABRICATION AND INSTALLATION).
 5. PIPE RAILING AND FITTING SHALL CONFORM TO THE REQUIREMENTS OF MATERIAL SPECIFICATION 554 AND HAVE 1 1/2" DIAMETER.
 6. ALL PIPE RAILING SHALL BE GALVANIZED.
 7. ANCHOR BOLTS MAY BE USED IN LIEU OF EXPANSION BOLTS AT THE CONTRACTORS OPTION FOR FASTENING SUPPORT BEAM END PLATE TO IMPACT BASIN, AS APPROVED BY ENGINEER.



20855

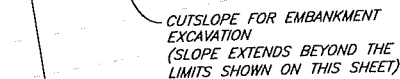


Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED DAM 1A
PRINCIPAL SPILLWAY MODIFICATION PLAN
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

United States
Department of
Agriculture
USDA
Natural Resources
Conservation Service

File No.
CivPrinSpillMod.dwg
Drawing No.
C401
Sheet 31 of 37



ASBESTOS-CEMENT
DRAIN PIPE
(NOTE 1, DWG C201)

- PRINCIPAL SPILLWAY

3395

5H:1V CUTSLOPE

3.390

3385

EXISTING COLLECTOR DRAIN

TOP OF PIPE
EL 3374.6

-TOP C

CUTSLOPE FOR
ASBESTOS-CEMENT
DRAIN PIPE REMOVAL
(1.5H:1V UNO)

0%
(NOTE 1, DWG C301)

— NOTE 3

LIMIT OF EXCAVATION FOR EMBANKMENT
OVEREXCAVATION

Point #	Northing	Easting	Elevation	Description
30	471749.37	1113996.29	3372.72	CORNER OF FLOOR SLAB
31	471752.37	1114017.16	3371.91	CORNER OF FLOOR SLAB
32	471768.80	1114008.20	3370.49	CORNER OF FLOOR SLAB
33	471767.67	1114000.28	3370.73	CORNER OF FLOOR SLAB

NEW PRINCIPAL SPILLWAY STEEL PIPE
EXTENSION

- FOUNDATION
EL 3370.54
(NOTE 2)

— NOTE 1

- IMPACT BASIN

3375

3374

3373

3372

3371

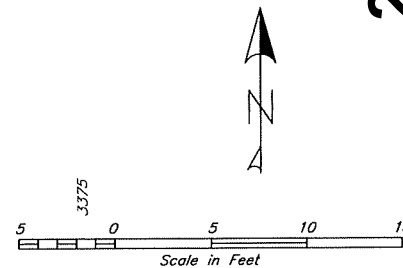
3371

3372

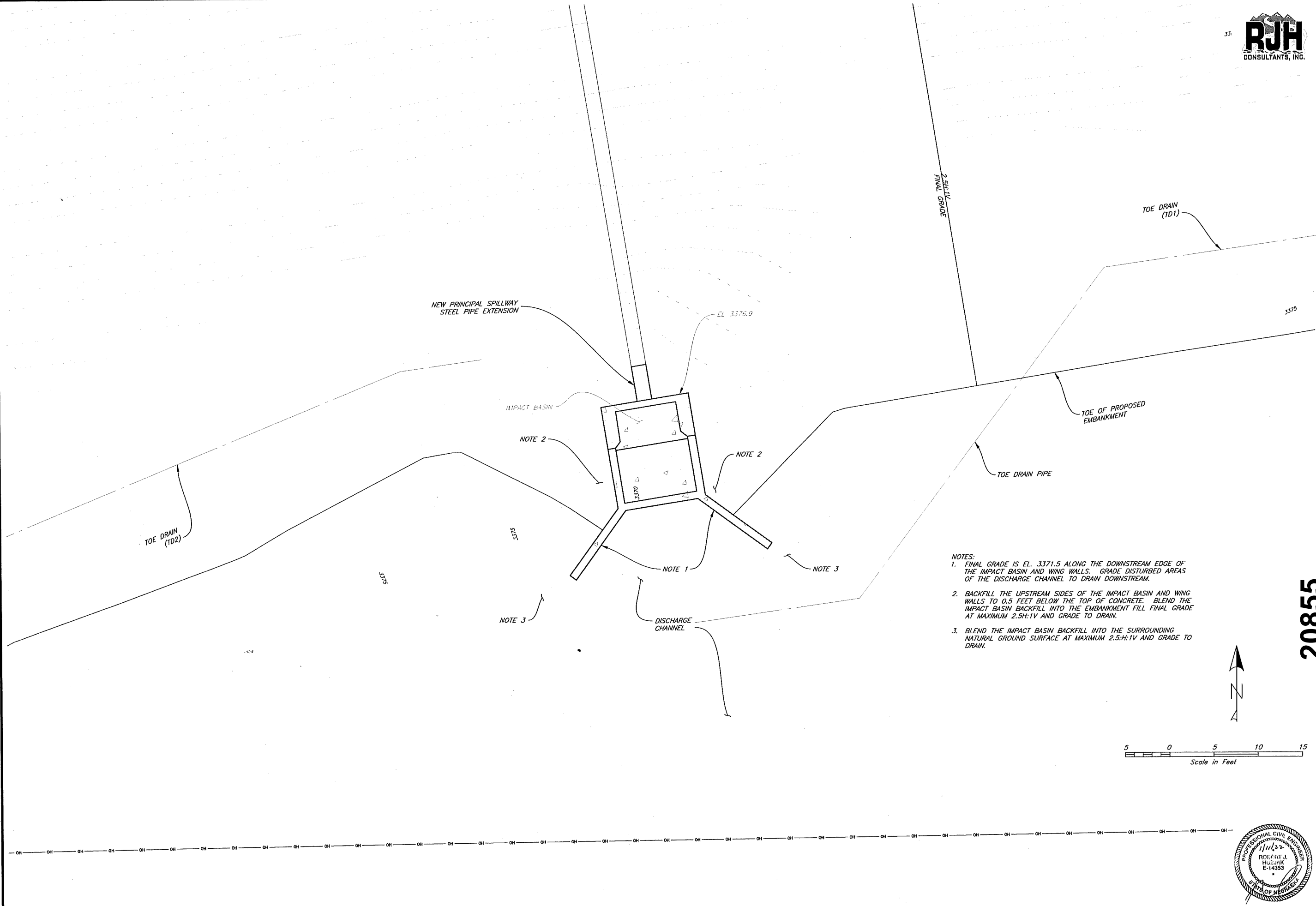
4477

NOTES:

1. LIMIT OF EXCAVATION TO BE DESIGNED BY CONTRACTOR, BUT SHALL BE NO STEEPER THAN 1.5H:1V.
2. UP TO APPROX. 0.5 FEET OF FILL OF FILL REQUIRED ACHIEVE THE IMPACT BASIN FOUNDATION ELEVATION.
3. DO NOT EXPOSE MORE THAN A 5-FOOT-LONG UNBACKFILLED SEGMENT OF THE PRINCIPAL SPILLWAY PIPE AT A TIME DURING EXCAVATIONS ADJACENT TO THE PIPE. THE 5-FOOT DIMENSION SHALL BE MEASURED ALONG THE BOTTOM OF THE EXCAVATION PARALLEL TO THE PRINCIPAL SPILLWAY PIPE ALIGNMENT.
4. CONTRACTOR SHALL PROVIDE 10-DAY NOTICE PRIOR TO EXCAVATIONS ADJACENT TO THE PRINCIPAL SPILLWAY PIPE. NO BACKFILLING SHALL OCCUR UNTIL APPROVED BY THE ENGINEER.
5. THE DOWNSTREAM SEGMENT OF 6" ASBESTOS-CEMENT DRAIN PIPE IS REMOVED AND IS LAYING LOOSE ONSITE. THE REMAINING DOWNSTREAM END OF THE PIPE IS BURIED AN UNKNOWN DISTANCE BENEATH THE EXISTING GROUND SURFACE.




20855



- NOTES:
1. FINAL GRADE IS EL. 3371.5 ALONG THE DOWNSTREAM EDGE OF THE IMPACT BASIN AND WING WALLS. GRADE DISTURBED AREAS OF THE DISCHARGE CHANNEL TO DRAIN DOWNSTREAM.
 2. BACKFILL THE UPSTREAM SIDES OF THE IMPACT BASIN AND WING WALLS TO 0.5 FEET BELOW THE TOP OF CONCRETE. BLEND THE IMPACT BASIN BACKFILL INTO THE EMBANKMENT FILL FINAL GRADE AT MAXIMUM 2.5H:1V AND GRADE TO DRAIN.
 3. BLEND THE IMPACT BASIN BACKFILL INTO THE SURROUNDING NATURAL GROUND SURFACE AT MAXIMUM 2.5H:1V AND GRADE TO DRAIN.



 United States Department of Agriculture Natural Resources Conservation Service	TWIN PLATTE NATURAL RESOURCES DISTRICT BRULE CREEK WATERSHED SITE 1A DAM <i>IMPACT BASIN GRADING PLAN</i>		Keith County, Nebraska					
	Sec 9, T 13 N, R 40 W							
	Designed	ABP	Drawn	CND	Checked	CLS	Approved	RJH
	Date	9/21/21	Date	9/21/21	Date	9/21/21	Date	9/21/21

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivInstrumentationDet.dwg 1/13/2022 10:37 AM



Date	9/21/21
Designed ABP	9/21/21
Drawn CND	9/21/21
Checked CLS	9/21/21
Approved RJH	9/21/21

TWIN PLATE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
INSTRUMENTATION DETAILS
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

20855

United States
Department of
Agriculture

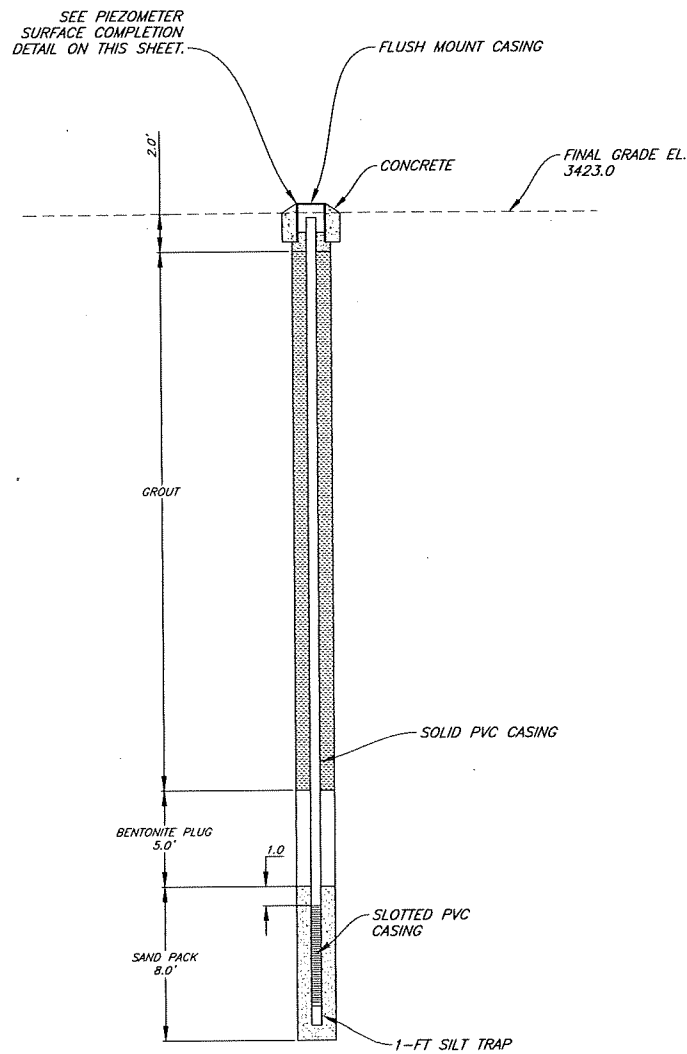
Natural Resources
Conservation Service

File No.

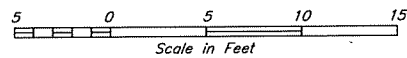
CivInstrumentationDet.dwg

Drawing No.
C501

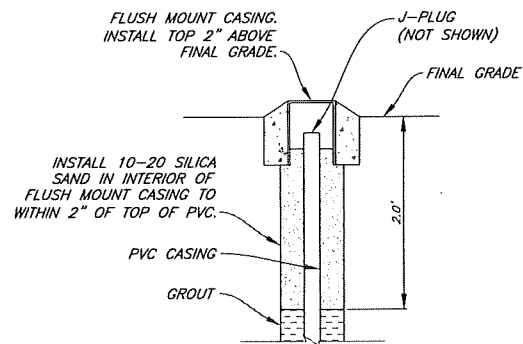
Sheet 34 of 37



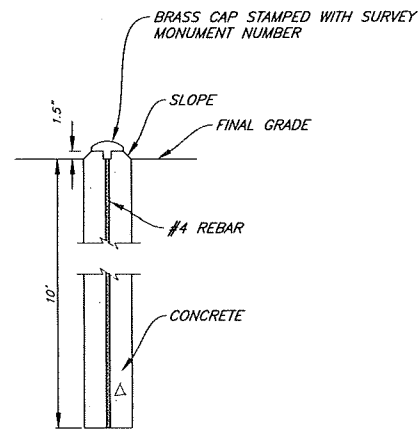
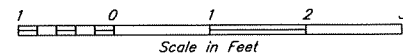
DETAIL
PIEZOMETER



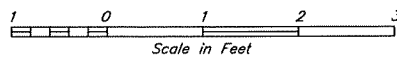
Piezometer Point Table				
Pt. Name	Dam STA	Northing	Easting	Elevation at Bottom of Piezometer
P-1	9+90	471916.03	1114173.69	3393.00
P-2	10+10	471913.19	1114153.89	3353.00
P-3	13+30	471867.78	1113837.13	3393.00
P-4	13+50	471864.94	1113817.33	3343.00



DETAIL
PIEZOMETER SURFACE COMPLETION

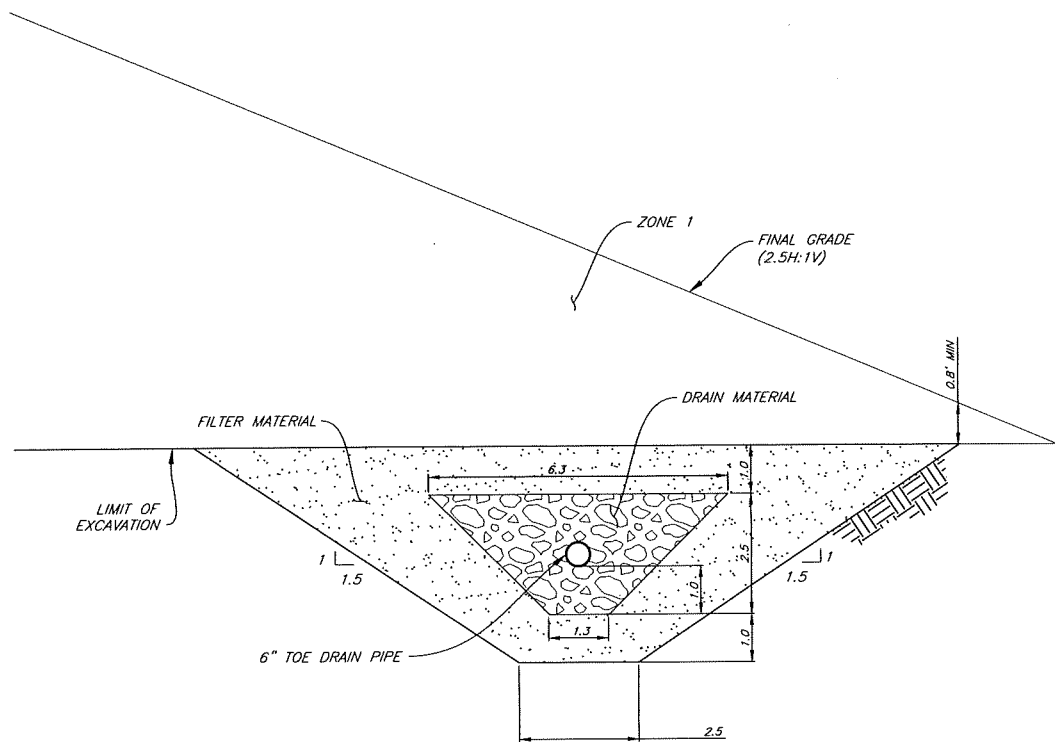


DETAIL
SURVEY MONUMENT INSTALLATION



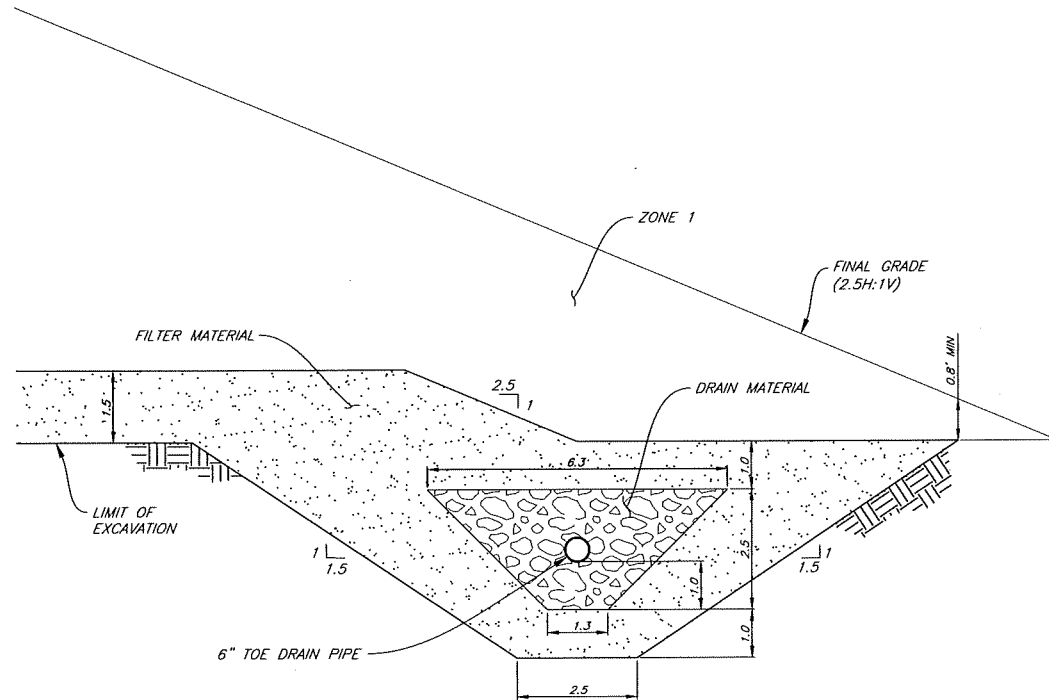
Survey Monument Point Table			
Pt. Name	Dam STA	Northing	Easting
S-1	6+00	471971.46	1114560.40
S-2	8+00	471942.99	1114361.76
S-3	10+00	471914.61	1114163.79
S-4	12+00	471886.54	1113967.94
S-5	14+00	471857.85	1113767.84

P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\CivMiscDet.dwg 1/13/2022 10:37 AM



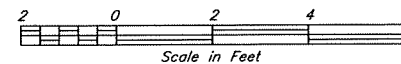
DETAIL
TOE DRAIN SECTION

A
C303



DETAIL
TOE DRAIN SECTION AT FINGER DRAINS AND BLANKET DRAIN

B
C303



20855

United States
Department of
Agriculture
USDA
Natural Resources
Conservation Service

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
TOE DRAIN DETAILS (1 OF 2)

Sec 9, T 13 N, R 40 W

Keith County, Nebraska

Designed ABP
Drawn CND
Checked CLS
Approved RJH

Date
9/21/21
9/21/21
9/21/21
9/21/21

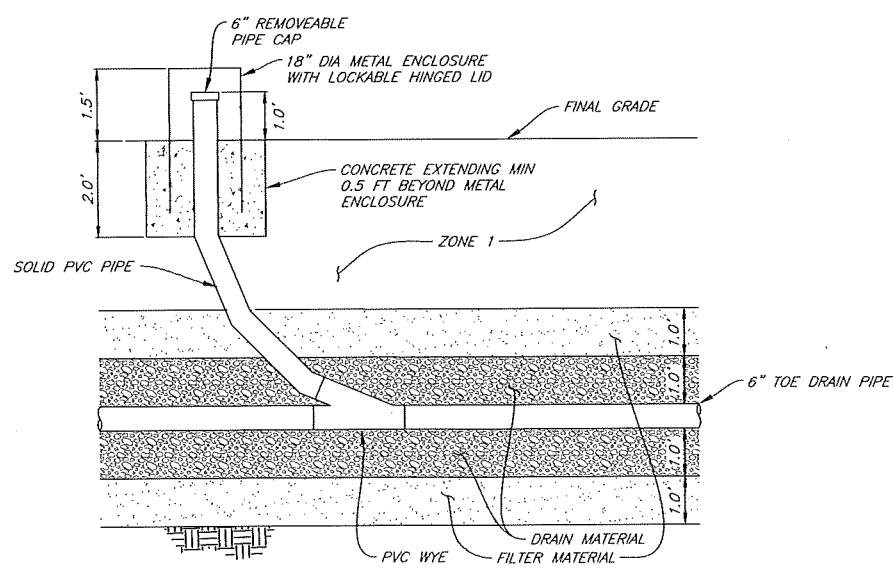
File No.

CivMiscDet.dwg

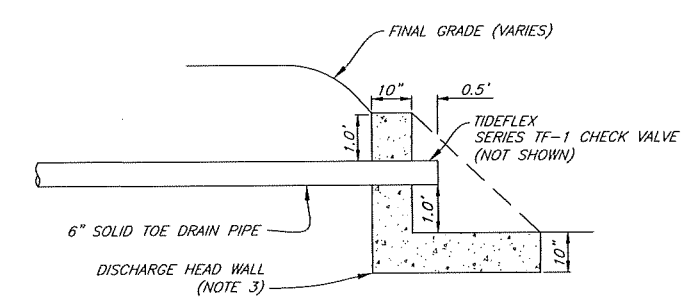
Drawing No.
C502

Sheet 35 of 37

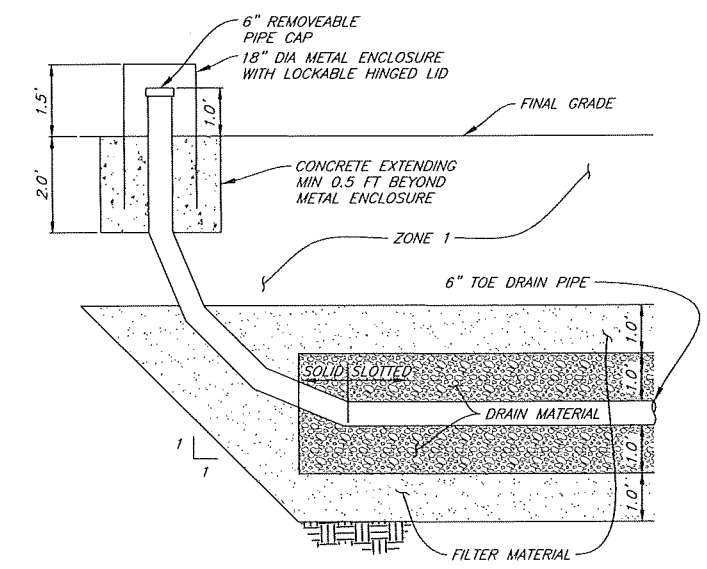
P:\18127 - Brule Creek Watershed Site 1A Dam\CAD\Design Modeling\EmbFilterAndDrain.dwg 1/13/2022 10:37 AM



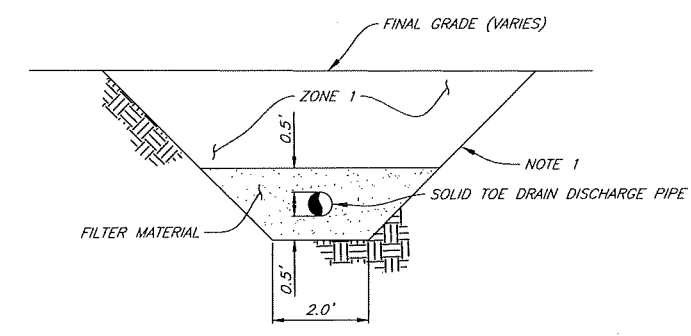
DETAIL
IN-LINE DRAIN CLEANOUT



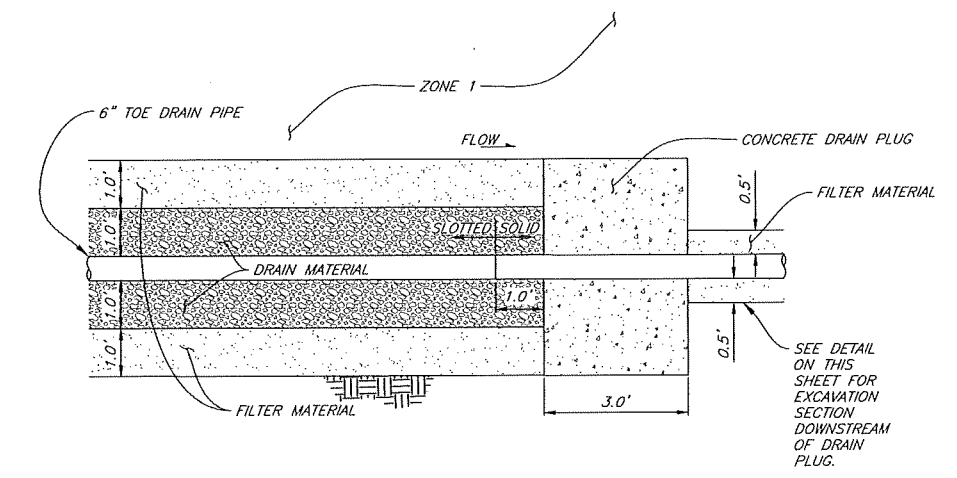
DETAIL
DISCHARGE HEADWALL SECTION



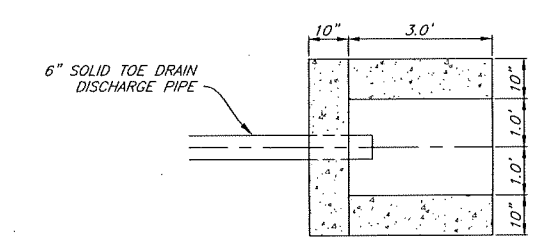
DETAIL
END OF DRAIN CLEANOUT



DETAIL
TOE DRAIN DISCHARGE PIPE
DOWN STREAM OF DRAIN PLUG



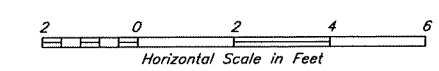
DETAIL
DRAIN PLUG



DETAIL
DISCHARGE HEADWALL PLAN (NOTE 3)

NOTES:

1. LIMIT OF EXCAVATION TO BE DESIGNED BY CONTRACTOR.
2. INSTALL A TEE POST AT EACH DRAIN PIPE DISCHARGE.
3. REINFORCE THE SLAB AND EACH WALL OF THE DISCHARGE HEADWALL WITH #5 REBAR SPACED AT 12 INCHES EACH WAY EACH FACE.
4. TOE DRAIN PIPE PROFILES ARE SHOWN ON DWG C202.
5. EMBANKMENT FILTER AND DRAIN PLAN IS SHOWN ON DWG C103.



Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATTE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
TOE DRAIN DETAILS (2 OF 2)
Keith County, Nebraska
Sec 9, T 13 N, R 40 W

20855

United States
Department of
Agriculture

USDA

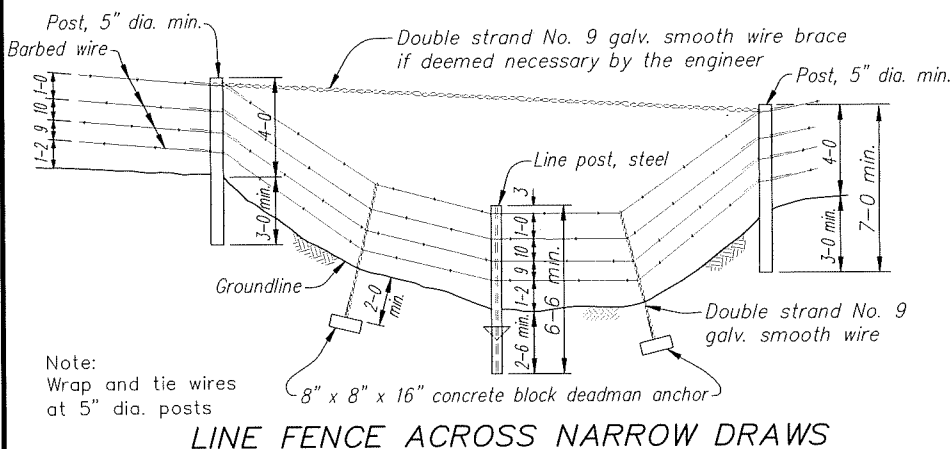
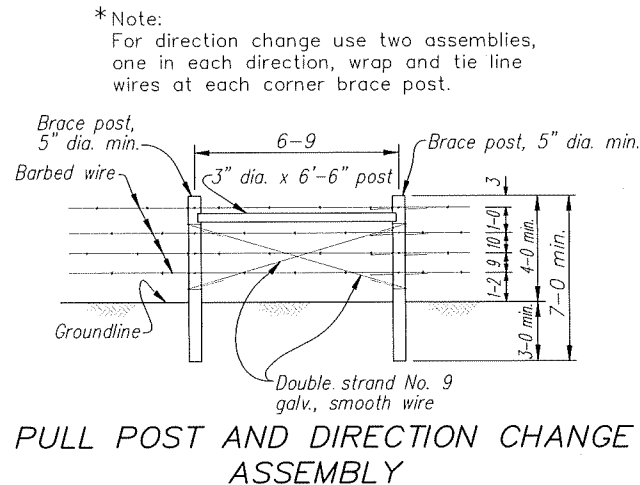
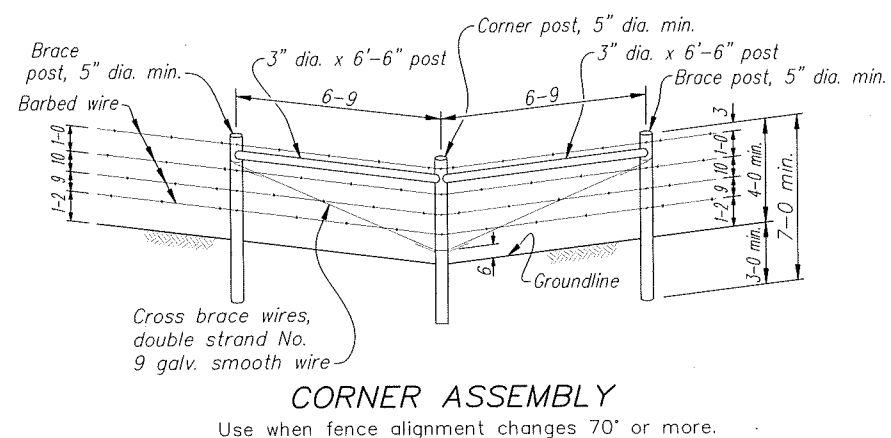
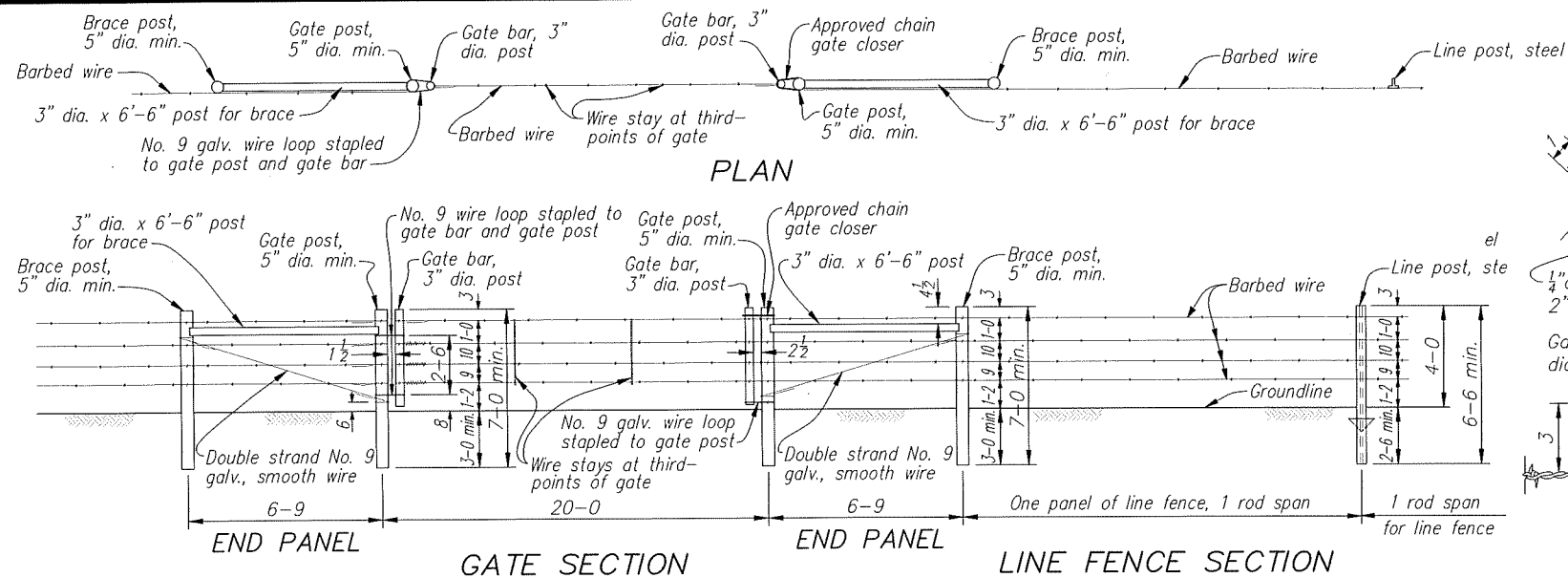
Natural Resources
Conservation Service

File No.

EmbFilterAndDrain.dwg
Drawing No.
C503

Sheet 36 of 37



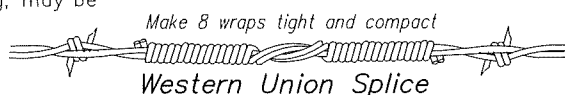
**Notes:**

1. Notch gate posts, brace posts, and corner posts 1" for the horizontal 3" dia. by 6'-6" wood post.
2. Fasten each horizontal brace with 3/8" x 4" steel dowel, 2" into each post.
3. Staple No. 9 cross-brace wires to gate, brace and corner posts at quarter points of posts.
4. Barbed wire to consist of two strands of 12 1/2 gauge galvanized wire with 2-point, 14 gauge barbs spaced on about 4" centers.
5. All line posts shall be steel tee type, with triangular shaped ground pressure plate. Posts shall be painted in accordance with construction specifications. Fasten barbed wire to line posts with standard clamps.
6. All corner, brace gate posts and gate bars shall be wood and treated in accordance with construction specifications.
7. Staples to be No. 9 gauge, 1 1/2" long (1" long for hardwoods). At corner and gate posts, staple each wire at quarter points of posts. At brace posts and gate bars, double-staple each wire. Drive staples diagonal to wood grain and at a slightly downward angle. Wire shall be wrapped around and tied at each gate post, corner post and one brace post in line fence bracing.
8. Posts shall be set vertically and in alignment per plans.
9. When wire splice is required, use "Western Union Splice" as shown in detail drawing.
10. Wire gate stays shall be galvanized.
11. Wood posts, minimum 3 1/2" dia. and 6'-6" long, may be used in lieu of steel posts in line fence.

REQUIREMENT TABLE

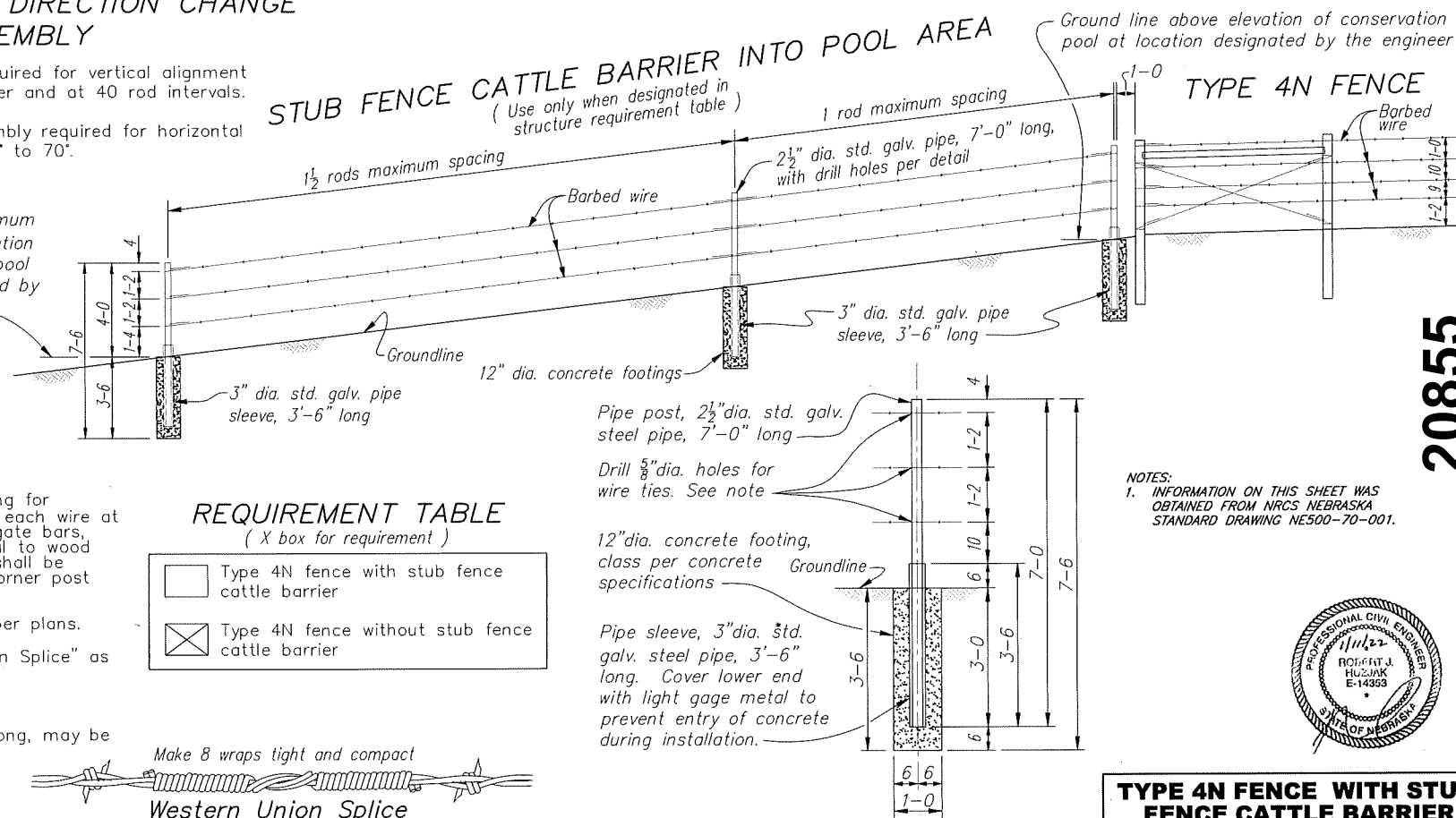
(X box for requirement)

<input type="checkbox"/>	Type 4N fence with stub fence cattle barrier
<input checked="" type="checkbox"/>	Type 4N fence without stub fence cattle barrier



STUB FENCE CATTLE BARRIER INTO POOL AREA

(Use only when designated in structure requirement table)

**NOTES:**

1. INFORMATION ON THIS SHEET WAS OBTAINED FROM NRCS NEBRASKA STANDARD DRAWING NE500-70-001.



TYPE 4N FENCE WITH STUB FENCE CATTLE BARRIER

Date	9/21/21
Designed	ABP
Drawn	CND
Checked	CLS
Approved	RJH

TWIN PLATE NATURAL RESOURCES DISTRICT
BRULE CREEK WATERSHED SITE 1A DAM
FENCE DETAILS

Keith County, Nebraska

Sec 9, T 13 N, R 40 W

20855

United States Department of Agriculture
Natural Resources Conservation Service
File No.
CivMiscDet.dwg
Drawing No. C504
Sheet 37 of 37