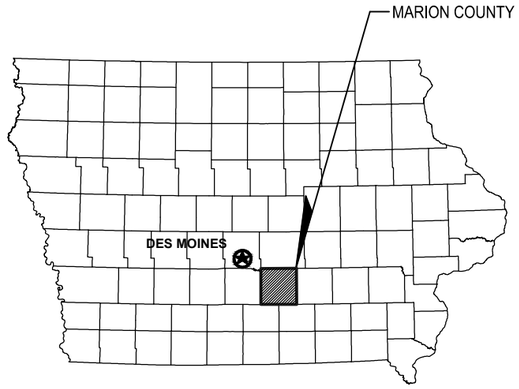
CROZIER FAMILY AML RECLAMATION PROJECT
BID NO. IA-365

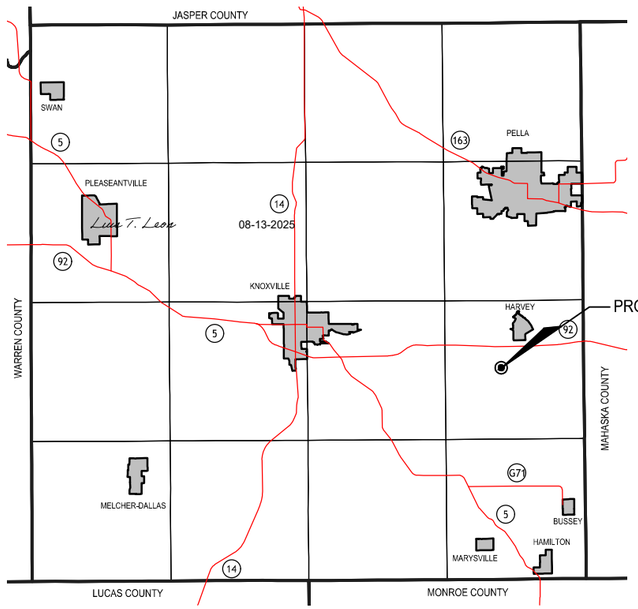
SE ¼ SECTION 16 & NE ¼ SECTION 21, TOWNSHIP 75N, RANGE 18W, MARION COUNTY, IOWA

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP
DIVISION OF SOIL CONSERVATION AND WATER QUALITY

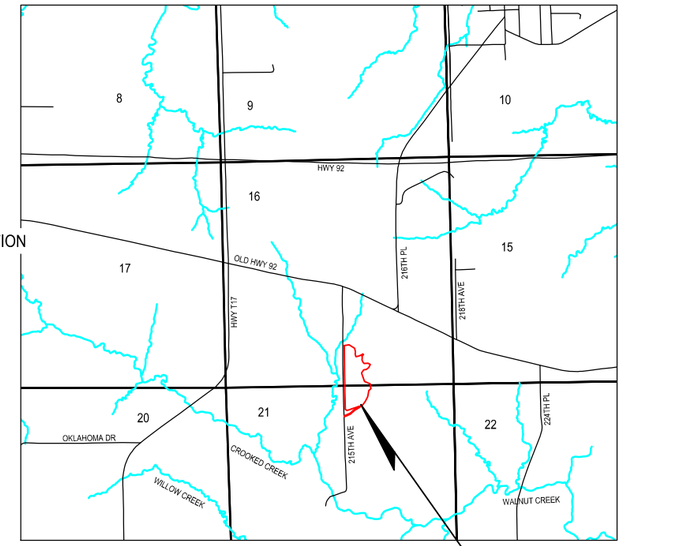
FUNDED BY:
U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT
GRANT NO: S23AF00088



STATE OF IOWA



MARION COUNTY



LOCAL VICINITY
SCALE: 1" = ⅔ MILE

PREPARED FOR:
IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP
DIVISION OF SOIL CONSERVATION AND WATER QUALITY
HOOVER STATE OFFICE BUILDING
1305 E. WALNUT STREET
DES MOINES, IOWA 50319
(515) 281-4246

ENGINEER:
LT LEON ASSOCIATES, INC.
1823 OHIO STREET, SUITE 101
DES MOINES, IOWA 50314
TEL: (515) 422-7016

INDEX OF SHEETS:

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Reference to particular products, tradenames, or manufacturers is intended for clarity only and does not represent endorsement by the State of Iowa. Equivalent products or materials may be suitable, subject to the approval of the Engineer or Division.

LICENSED PROFESSIONAL ENGINEER
LUIS T. LEON
18685
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa

Signature: *Luis T. Leon* Date: 08-13-2025

Name (printed or typed): LUIS T. LEON, P.E.
License Number: 18685
My license renewal date is: DECEMBER 31, 2025
Pages or sheets covered by this seal: ALL SHEETS

LT LEON ASSOCIATES-INC
1823 OHIO STREET SUITE 101
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FILE: 049.013
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CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

TITLE SHEET

GENERAL NOTES:

1. REFERENCES TO "DIVISION" SHALL MEAN "DIVISION OF SOIL CONSERVATION AND WATER QUALITY".

2. ALL IMPROVEMENTS SHOWN ON THESE PLANS SHALL COMPLY WITH THE GENERAL CONDITIONS, STANDARDS, AND SPECIFICATIONS SET FORTH IN PROJECT DOCUMENTS. THESE INCLUDE STANDARD CONSTRUCTION SPECIFICATIONS SET FORTH BY THE DIVISION OF SOIL CONSERVATION AND WATER QUALITY AS WELL AS THE SUPPLEMENTAL SPECIFICATIONS ESTABLISHED BY THE ENGINEER. SPECIFICATIONS OR STANDARDS INCORPORATED BY REFERENCE SHALL ALSO BE FOLLOWED.

3. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE DIVISION'S STANDARD SPECIFICATIONS AND THE ENGINEER'S SUPPLEMENTAL SPECIFICATIONS.

4. OWNERSHIP: THIS DOCUMENT, AND THE IDEAS AND DESIGN CONTAINED IN THIS DOCUMENT, ARE AN INSTRUMENT OF PROFESSIONAL SERVICE, AND MAY NOT BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN CONSENT OF THE DIVISION OF SOIL CONSERVATION AND WATER QUALITY.

5. REFERENCES TO PARTICULAR PRODUCTS, TRADENAMES, OR MANUFACTURERS IS INTENDED FOR CLARITY ONLY AND DO NOT REPRESENT EXCLUSION OR ENDORSEMENT BY THE STATE OF IOWA. EQUIVALENT PRODUCTS OR MATERIALS MAY BE SUITABLE, SUBJECT TO THE APPROVAL OF THE ENGINEER.

6. CONTRACTOR SHALL PROVIDE AT LEAST 48 HOURS NOTICE TO THE ENGINEER AND DIVISION PRIOR TO COMMENCING CONSTRUCTION.

7. THE MEANS OF THE WORK AND THE SAFETY OF THE CONTRACTOR'S EMPLOYEES ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

8. ANY WORK REQUIRED TO COMPLETE THE SCOPE OF THIS PROJECT BUT NOT SPECIFICALLY CALLED OUT, SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THE COMPLETION OF THIS WORK.

9. ALL DEBRIS AND TRASH ENCOUNTERED DURING CONSTRUCTION WITHIN THE PROJECT LIMITS, OR DIRECTED BY THE ENGINEER, SHALL BE PROPERLY DISPOSED OF ACCORDING TO THE PROJECT REQUIREMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBSERVE EXISTING SITE CONDITIONS AND IDENTIFY ALL DEBRIS TO BE REMOVED.

10. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION DE-WATERING THAT IS REQUIRED,

11. REPAIR OR REPLACE DAMAGE TO EXISTING FACILITIES (TILE, UTILITIES, FENCES, ETC.) DESIGNATED TO REMAIN AT NO ADDITIONAL EXPENSE TO THE DIVISION.

12. THE CONTRACTOR SHALL KEEP ALL ROADS OPEN TO THROUGH TRAFFIC AT ALL TIMES.

13. NO TREES SHALL BE CLEARED BETWEEN THE DATES OF APRIL 1 TO SEPTEMBER 30.

14. SUBMIT MANUFACTURER'S CERTIFICATION AND MATERIAL DATA FOR ALL MATERIALS DELIVERED TO THE PROJECT SITE AS REQUIRED BY THE OWNER'S REPRESENTATIVE.

UTILITY NOTES:

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES AND PUBLIC ROADWAYS, INCLUDING ANY NOT SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER IF ANY CONFLICTS WITH THE DRAWINGS OCCUR. ANY DAMAGE TO EXISTING UTILITIES AND/OR PAVED STREETS CAUSED BY TRENCHING AND GRADING OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. EXISTING UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE.

2. UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, PUBLIC RECORDS, AND FIELD INVESTIGATION. THEIR LOCATIONS SHALL BE CONSIDERED TO BE APPROXIMATE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT IOWA ONE-CALL AND/OR EACH UTILITY COMPANY FOR THE FIELD LOCATION(S) OF EXISTING UTILITY LINES IN OR NEARBY THE CONSTRUCTION AREA PRIOR TO BEGINNING ANY CONSTRUCTION.

3. THERE MAY BE ADDITIONAL PRIVATE OR OTHER UNDERGROUND UTILITIES NOT SHOWN OR KNOWN AT THE TIME OF THE PUBLICATION OF THIS DRAWING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXISTENCE AND LOCATION OF ANY ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN ON THIS DRAWING IN ORDER TO AVOID DAMAGE THERETO.

4. ALL OPEN UTILITY TRENCH EXCAVATION SHALL BE PROTECTED.

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	SPEC. SECTION	QUANTITY	UNIT
1	MOBILIZATION	02100	1	LS
2	SITE CLEARING AND PREPARATION	02100	15.7	ACRE
3	TEMPORARY EARTH DIVERSION BERM	02120	1,465	LF
4	FILTER SOCK, 12" DIA.	02120	36	LF
5	TIED CONCRETE BLOCK MAT	02120	2,100	SF
6	STABILIZED CONSTRUCTION ENTRANCE	02120	33	TON
7	MACADAM STONE	02120	47	TON
8	RIPRAP, CLASS 'E'	02120	196	TON
9	EXCAVATION	02200	124,965	CY
10	TERRACES	02300	2,950	LF
11	RISER - TERRACE, 6"	02300	1	EA
12	RISER - TERRACE, 24"	02300	2	EA
13	OPEN SIDED AREA INTAKE, 4'X4'	02300	1	EA
14	DUAL WALL HDPE PIPE, 6"	02300	191	LF
15	PPHP PIPE, 15"	02300	344	LF
16	PPHP PIPE, 18"	02300	73	LF
17	SUBGRADE PREPARATION	02400	15.4	ACRE
18	DEEP RIPPING, SUBGRADE	02400	1.7	ACRE
19	AGRICULTURAL LIME (40 TON ECCE/ACRE)	02400	616	TON ECCE
20	MULCH, SUBGRADE, (5 TONS/ACRE)	02400	15.4	ACRE
21	WETLAND UNDERCUT AND REPLACEMENT	02400	0.5	ACRE
22	WETLAND FERTILIZER, NITROGEN (N), (30 LB./ACRE)	02400	15	POUND
23	FIELD FENCE	02500	1,731	LF
24	DOUBLE 12' PANEL GATE	02500	1	EA
25	INSTALL SALVAGED 20' GATE	02500	1	EA
26	SEEDBED PREPARATION	02700	14.9	ACRE
27	NITROGEN (N), (50 LB./ACRE)	02700	745	POUND
28	PHOSPHOROUS (P), (100 LB./ACRE)	02700	1,490	POUND
29	POTASSIUM (K), (160 LB./ACRE)	02700	2,384	POUND
30	PASTURE SEEDING	02700	14.7	ACRE
31	WETLAND FRINGE SEEDING	02700	0.2	ACRE
32	MULCH, SEEDING (2 TONS/ACRE)	02700	14.9	ACRE

CONSTRUCTION SURVEY NOTES:

1. HORIZONTAL MEASUREMENTS ARE IN U.S. FEET. THIS DRAWING IS SET TO THE NAD 1983 IOWA STATE PLANE, SOUTH ZONE COORDINATE SYSTEM.

2. ELEVATION MEASUREMENTS ARE BASED UPON THE NAVD 1988 AND ARE IN U.S. FEET.

3. EXISTING TOPOGRAPHY SHOWN ON THIS DRAWING WAS DEVELOPED FROM LIDAR INFORMATION BY ENGINEER AND SUPPLEMENTAL TOPOGRAPHIC SURVEY DATA. LIDAR DATA WAS COLLECTED ON 2024-03-27. LOCAL CONTROL POINTS HAVE BEEN ESTABLISHED FOR THIS PROJECT. SEE SHEET 3. CONTRACTOR SHALL VERIFY SURVEY CONTROL AND EXISTING SURFACE PRIOR TO CONSTRUCTION. REFER TO SPECIFICATIONS.

4. SHOULD THERE EXIST SIGNIFICANT DIFFERENCES BETWEEN THE EXISTING ELEVATIONS SHOWN ON THE DRAWINGS AND THOSE REPORTED BY THE SURVEYING EQUIPMENT, THE CONTRACTOR SHALL DIRECT THEIR SURVEYOR TO CALIBRATE THE GPS INSTRUMENTS TO THE EXISTING ELEVATIONS SHOWN.

5. REPLACE ANY PROPERTY MONUMENTS REMOVED OR DESTROYED BY CONSTRUCTION. MONUMENTS SHALL BE SET BY A LAND SURVEYOR REGISTERED TO PRACTICE IN THE STATE OF IOWA.

PROJECT CONSTRUCTION NOTES:

1. QUANTITIES OF FERTILIZER AND LIME ARE ESTIMATED FOR BIDDING PURPOSES. ACTUAL QUANTITIES APPLIED WILL BE DETERMINED BY SOIL TESTS.

2. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY LAYOUT AND CONTROL REQUIRED TO COMPLETE ALL WORK.

3. A SHRINKAGE FACTOR OF 15% WAS ESTIMATED FOR THIS PROJECT. THE CONTRACTOR SHALL MAKE CHANGES IN EARTHWORK AS NEEDED TO ADJUST FOR INACCURACIES INHERENT WITH ESTIMATING THE SHRINKAGE FACTOR. THESE CHANGES SHALL ONLY BE MADE AFTER CONSULTATION AND APPROVAL BY THE ENGINEER AND DIVISION. NO ADDITIONAL COMPENSATION SHALL BE GIVEN FOR ANY GRADE ADJUSTMENTS DUE TO DEVIATIONS OF SHRINKAGE FACTOR.

4. THE CONTRACTOR IS REQUIRED TO CONSTRUCT THE RECLAMATION SURFACE AS DEPICTED ON THE PLANS. SITE GRADING SHALL BE COMPLETED TO ± 0.3 FEET OF DESIGN ELEVATIONS. THE CONTRACTOR SHALL PROVIDE A GRADE CHECKER FOR SLOPE STAKING AND OFFSETS. THE USE OF GPS MACHINE MOUNTED GRADE CONTROL EQUIPMENT FOR FINISH GRADING IS RECOMMENDED. CONTOURS AND SPOT ELEVATIONS SHOWN ARE FINISHED GRADE.

5. BEYOND THE PROJECT LIMITS, NO WORK SHALL BE PERFORMED WITHOUT PRIOR AUTHORIZATION FROM THE DIVISION.

6. ACCESS TO THE SITE SHOULD BE LIMITED TO ONE ACCESS OFF OF 215TH AVE AS SHOWN ON THE PLANS. BEFORE THE CLOSE OF THE PROJECT, THE CONTRACTOR SHALL REPAIR THE ACCESS ROAD TO ITS EXISTING CONDITION AND SEED THE AREA. QUANTITIES OF THE PERMANENT SEEDING ARE ESTIMATED FOR BIDDING PURPOSES AND INCLUDE THE SITE ACCESS AS SHOWN ON THE PLANS. IF THE CONTRACTOR REQUIRES ADDITIONAL SITE ACCESS, APPROVAL FROM THE ENGINEER AND DIVISION IS REQUIRED.

SURVEY LEGEND

- EXISTING CONTOUR
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC LINE
- STREAM CENTERLINE
- EXISTING STORM SEWER/EXISTING CULVERT
- EXISTING TELECOM LINE
- EXISTING WATER LINE
- PROPERTY LINE
- EDGE OF ROAD
- ROAD CENTERLINE
- 1/4 MILE BURN RADIUS LIMIT LINE
- EXISTING POWER POLE
- EXISTING FENCE POST
- SURVEY CONTROL POINT
- FOUND SURVEY MONUMENT

PROPOSED LEGEND

- PROPOSED CONTOUR
- DEMO ITEM
- TEMPORARY EARTH DIVERSION BERM
- PROJECT LIMITS
- PROPOSED TERRACE RIDGE
- PROPOSED STORM SEWER
- PROPOSED FIELD FENCE
- PROPOSED TERRACE RISER
- 12" DIA. FILTER SOCK
- RIPRAP OR MACADAM STONE
- TIED CONCRETE BLOCK MAT
- CONSTRUCTED WETLAND
- STAGING AREA
- WETLAND FRINGE MIX SEEDING
- PASTURE MIX SEEDING

UTILITY CONTACTS

ONE CALL
1-800-292-8989

INTERNET, CABLE, TELEPHONE:
WINDSTREAM COMMUNICATIONS
3540 SW 61ST STREET
DES MOINES, IA 50321
(800)289-1901

ELECTRIC:
MIDAMERICAN
2411 N MARKET STREET
OSKALOOSA, IA 52577
(515)281-2989

GAS:
KINDER MORGAN
1616 165TH AVE
KNOXVILLE, IA 50138
(641)842-5091

WATER:
MARION COUNTY RURAL WATER DISTRICT
1921 W BELL AVE
KNOXVILLE, IA 50138
(641)842-3304

LT LEON ASSOCIATES-INC
1823 OHIO STREET SUITE 101
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FILE: 049.0013

REVISED:

ISSUED: 08-05-2025

CHKD. BY: LTL

DRAWN BY: SMH

DESIGN BY: SMH

IOWA DEPARTMENT OF AGRICULTURE
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AND WATER QUALITY
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CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

PROJECT NOTES, QUANTITIES AND LEGEND

TABLE 1: CONTROL POINTS COORDINATES					
POINT I.D.	NORTH (FT.)	EAST (FT.)	ELEV. (FT.)	FOUND OR SET?	SIZE/TYPE
CP 100	472112.820	1794817.401	787.344	SET	1/2" IRON ROD WITH PINK FLAG
CP 101	470650.964	195200.315	824.147	FOUND	FOUND SURVEY MONUMENT W/ YELLOW CAP (#5594)
CP 102	470310.789	1794850.391	808.331	FOUND	FOUND SURVEY MONUMENT W/ YELLOW CAP (#5594)
CP 103	471387.155	1795381.642	822.670	SET	1/2" IRON ROD WITH PINK FLAG

TABLE 2: LANDOWNER INFORMATION	
KEY	OWNER
A	HARRINGTON, DOUGLAS W & KATHERINE S
B	CROZIER, STEVEN M & CINDY D

POND 1

PROTECT EXISTING WATER UTILITIES AND CATTLE EQUIPMENT

PROTECT FENCE

PROTECT EXISTING 2" PLASTIC WATER LINE

STAGING AREA

REMOVE AND SALVAGE EX. GATE

PROTECT EXISTING STORM SEWER OUTFALL

CP 103

SINGLE GATE

PROTECT EXISTING GRAVEL DRIVEWAY

PROTECT GATE

EXISTING DRAINED POND

PROJECT LIMITS =15.7 ACRES

REMOVE FENCE

CP 101 - PROTECT SURVEY MONUMENT

PROTECT 1000-GALLON PROPANE TANK

REMOVE FENCE

PROTECT FENCE

PROTECT CABLE PEDESTAL AND LINE

AML PROJECT SIGN. SEE SHEET 7.

STABILIZED CONSTRUCTION ENTRANCE

215TH AVE

CP 100

PROTECT POWER POLE

PROTECT FENCE

PROTECT EXISTING 30" RCP CULVERT

CP 102, FOUND EAST OF PROPANE TANK NEAR FENCE CORNER

PROTECT EXISTING 36" RCP CULVERT

PROTECT DOUBLE GATE

OVERHEAD ELECTRIC

OVERHEAD ELECTRIC

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GRAPHIC SCALE
0 120' 240' 360'

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CROZIER FAMILY (IA-365) AML RECLAMATION PROJECT

SITUATION PLAN - CLEARING AND SITE PREPARATION

SHEET 3 OF 18

PROTECT WATER LINE

DEEP RIP AREA PRIOR TO AG LIME APPLICATION FOR FUTURE TREE PLANTING, TYP.

CONSTRUCTED CHANNEL - SEE DETAIL 1 SHEET 8.

DEEP RIP AREA PRIOR TO AG LIME APPLICATION FOR FUTURE TREE PLANTING, TYP.

T-1
RIDGE=800.00

T-3
RIDGE=820.00

T-2
RIDGE=800.00

5-FOOT WIDE BENCH AT 2.00%

PROTECT CABLE PEDESTAL

ARMORED WETLAND
AUXILIARY SPILLWAY
SLOPE = 15.42%
SPILLCREST ELEV = 778.00,
SEE DETAIL 2 SHEET 10

CONSTRUCTED WETLAND
SIZE =0.50 ACRES
NORMAL POOL =776.00
BOTTOM=768.00
BERM=780.00

BASELINE. SEE CROSS SECTION SHEETS 13-16.

215TH AVE

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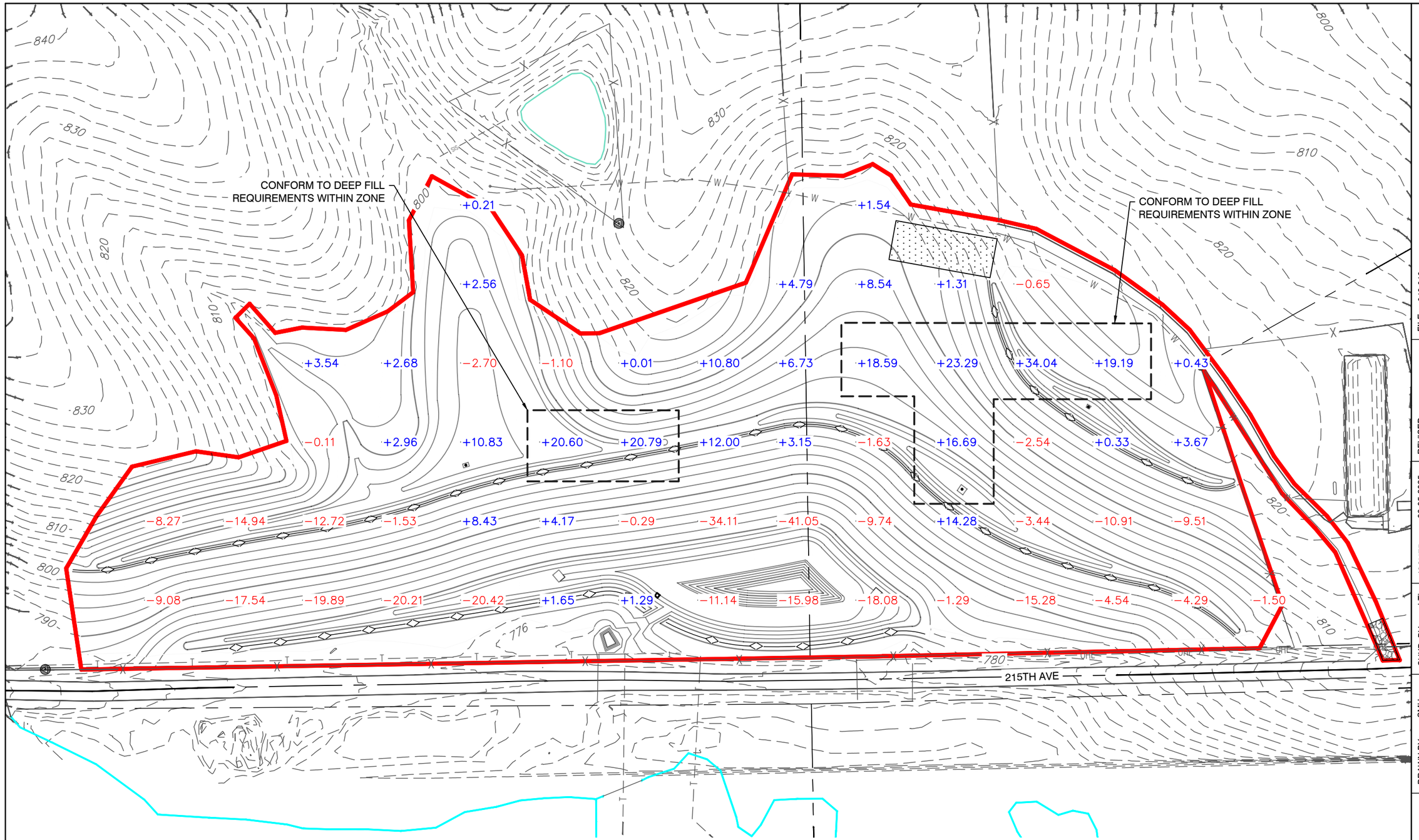
GRADING PLAN

SHEET
4 OF **18**



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GRAPHIC SCALE
0 120' 240' 360'

NOTES:
1. NEGATIVE (−) VALUES INDICATE AREAS OF CUT.
2. POSITIVE (+) VALUES INDICATE AREAS OF FILL.
3. ALL VALUES SHOWN ARE IN FEET.
4. ALL CONTOURS SHOWN ARE TO FINISHED GRADE.
5. PROPOSED CONTOURS ARE SHOWN AT 2' INTERVALS, UNLESS NOTED OTHERWISE. EXISTING CONTOURS ARE SHOWN AT 2' INTERVALS.

N

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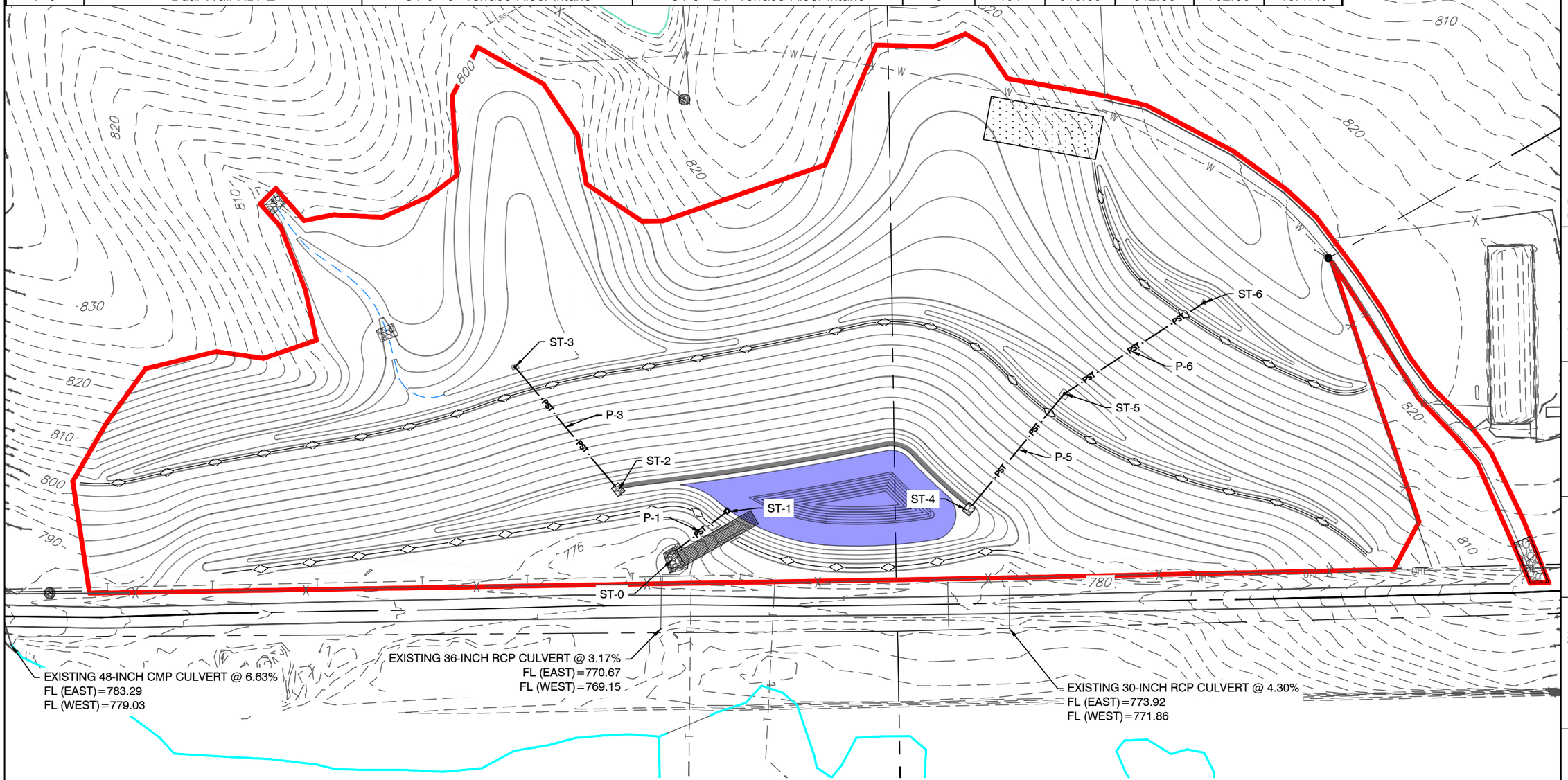
CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

CUT AND FILL PLAN

SHEET 5 OF 18

TABLE: TERRACE PIPE DATA

Pipe Segment				Pipe Diameter (inches)	Pipe Length (feet)	Finish Grade U/S	Invert U/S	Invert D/S	Slope
ID	Material	U/S Structure	D/S Structure						
P-1	PPHP	ST-1 - 4' x 4' Open-Sided Intake	ST-0 - Outfall	18	73	777.00	772.50	771.00	2.05%
P-3	PPHP	ST-3 - 24" Terrace Riser Intake	ST-2 - Outfall	15	178	795.00	791.50	777.00	8.15%
P-5	PPHP	ST-5 - 24" Terrace Riser Intake	ST-4 - Outfall	15	166	796.00	792.50	777.00	9.34%
P-6	Dual Wall HDPE	ST-6 - 6" Terrace Riser Intake	ST-5 - 24" Terrace Riser Intake	6	191	816.00	812.50	792.50	10.47%



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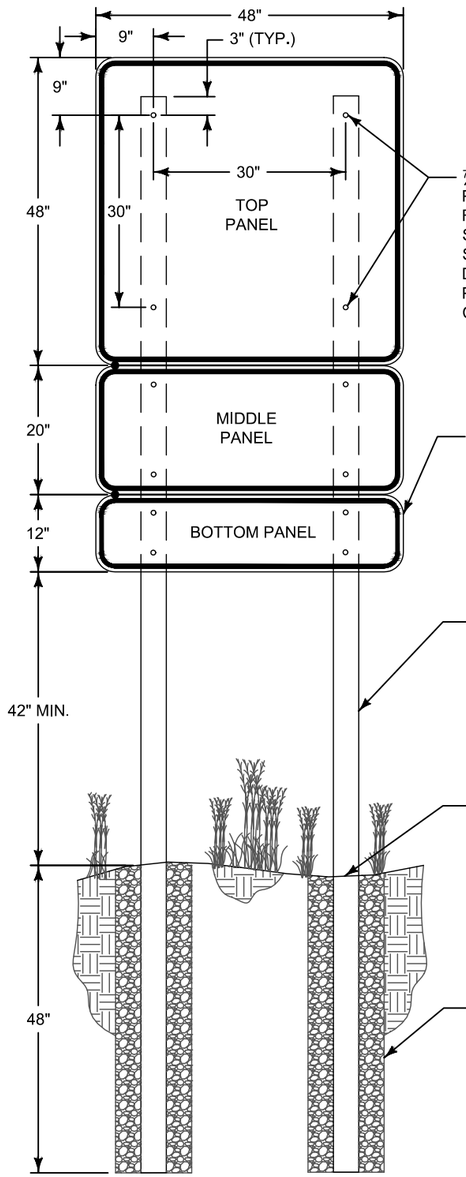
DRAINAGE PLAN

SHEET
6 OF **18**



7/16" HOLES LOCATED AS SHOWN, PRE-PUNCHED BY SIGN FABRICATOR. FASTEN SIGN TO POSTS WITH 3/8" DIA. STEEL THRU-BOLT & NUT SET. SEE BOLT, WASHER, & NUT FASTENER DETAIL THIS SHEET (12 SETS REQ'D. PROVIDED AND INSTALLED BY CONTRACTOR).

BOTTOM PANEL REMOVED BY CONTRACTOR AFTER PROJECT COMPLETION. CONTRACTOR SHALL RETURN BOTTOM PANEL UNDAMAGED TO DIVISION PRIOR TO RELEASE OF RETAINAGE.

4"x6"x14' PRESSURE-TREATED POST (TYP.) 2 REQ'D. POSTS SEALED WITH THOMPSON'S WATER SEAL OR EQUAL. POSTS, SEALANT, AND INSTALLATION PROVIDED BY CONTRACTOR. SEE THRU-BOLT DETAIL THIS SHEET.

EXISTING SOIL SURFACE

BACKFILL WITH CONCRETE (PREFERRED), CLEAN STONE (ACCEPTABLE), OR HAND-TAMPED EARTH IN SMALL LIFTS (SUBJECT TO ENGINEER'S APPROVAL)

TOP PANEL (4' x 4') 0.080" ALUMINUM SUBSTRATE

CROZIER FAMILY

ABANDONED COAL MINE RECLAMATION SITE

SPONSORED BY

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

DIVISION OF SOIL CONSERVATION AND WATER QUALITY

FUNDED BY

OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

GRANT NO. xxxxxxxx

GENERAL CONTRACTOR: XYZ EARTHWORKS CITY,STATE

ENGINEERING BY: SLIDE RULES RULE ANYTOWN, USA

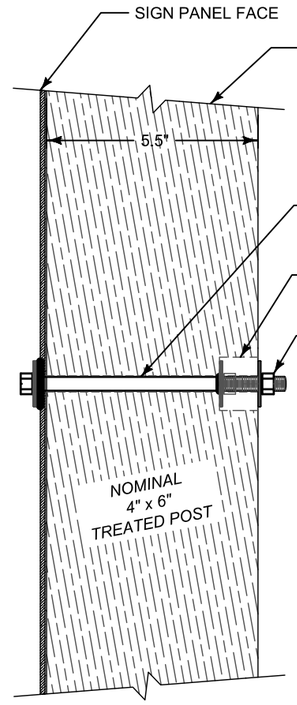
MIDDLE PANEL (1'-8" x 4') 0.080" ALUMINUM SUBSTRATE

PARTNERSHIP SIGN (BY OTHERS)

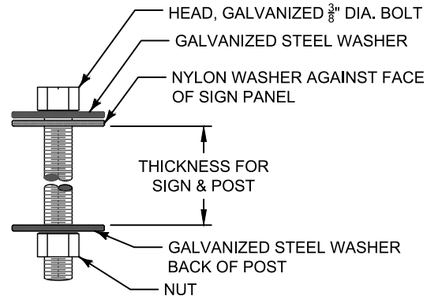
BOTTOM PANEL (1' x 4') 0.080" ALUMINUM SUBSTRATE

--- HARD HAT AREA ---
UNAUTHORIZED ENTRY PROHIBITED

*** LETTER WIDTH = 75% OF THE LETTER HEIGHT*



THRU-BOLT DETAIL
NOT TO SCALE



BOLT, WASHER, & NUT FASTENER DETAIL
NOT TO SCALE

SIGNAGE NOTES:

1. DIVISION WILL FURNISH TOP AND BOTTOM SIGN PANELS. MIDDLE PANEL PROVIDED BY OTHERS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING POSTS, HARDWARE, AND INSTALLATION FOR ALL PANELS.

2. ALL EXPOSED WOOD SHALL BE SEALED WITH THOMPSON'S WATER SEAL OR EQUAL MEETING ASTM D-4446-08.

3. ALL STEEL HARDWARE PIECES SHALL BE GALVANIZED.

4. NYLON AND STEEL WASHERS SHALL BE USED AS SHOWN ON THE BOLT, WASHER, NUT FASTENER DETAIL ABOVE.

5. CLEAR UTILITIES WITH IOWA ONE-CALL (800) 292-8989 BEFORE EXCAVATING FOR POSTS.

6. SECURE APPROVAL OF DIVISION AND ENGINEER FOR SIGN LOCATION BEFORE INSTALLATION.

7. COSTS FOR POSTS, HARDWARE, WOOD SEALANT AND SIGN INSTALLATION SHALL BE INCIDENTAL TO MOBILIZATION.

8. CONTRACTOR SHALL INSTALL SIGN POSTS USING A PLYWOOD OR OTHER SUITABLE TEMPLATE TO MAINTAIN ACCURATE POST SPACING AND ALIGNMENT DURING BACKFILLING OF THE POST HOLES. TO AVOID BENDING OF THE SIGN PANELS, POSTS SHALL NOT BE INSTALLED OR BACKFILLED WITH SIGN PANELS ATTACHED.

9. ONE (1) PROJECT SIGN IS REQUIRED, LOCATED AS SHOWN ON PLANS.

VERSION DATE: 03-27-2025

1 AML SIGN DETAIL
NOT TO SCALE

LT LEON ASSOCIATES-INC
1823 OHIO STREET SUITE 101
DES MOINES IOWA 50314
office 515-422-7006
www.ltleon.com

FILE: 049.013

REVISED:

ISSUED: 08-05-2025

CHKD. BY: LTL

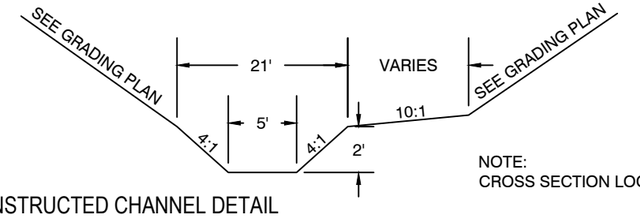
DRAWN BY: SMH

DESIGN BY: SMH

IOWA DEPARTMENT OF AGRICULTURE
AND LAND STEWARDSHIP
DIVISION OF SOIL CONSERVATION
AND WATER QUALITY
HOOVER STATE OFFICE BUILDING
1305 E. WALNUT STREET, DES MOINES, IOWA 50319
(515)281-4246

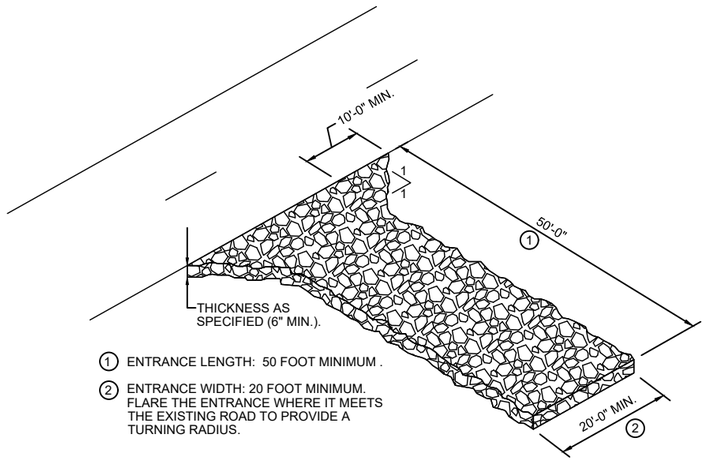
CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

TYPICAL DETAILS



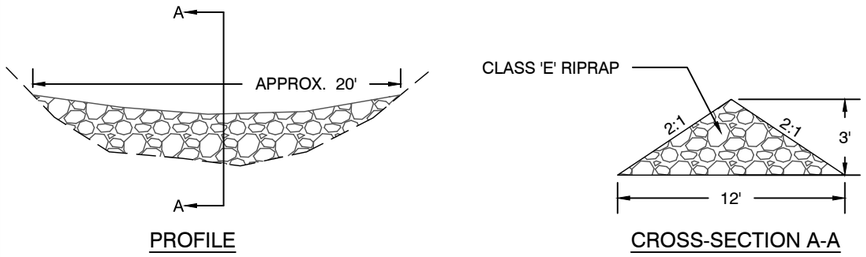
NOTE:
CROSS SECTION LOOKING DOWNSTREAM

1 CONSTRUCTED CHANNEL DETAIL
NOT TO SCALE

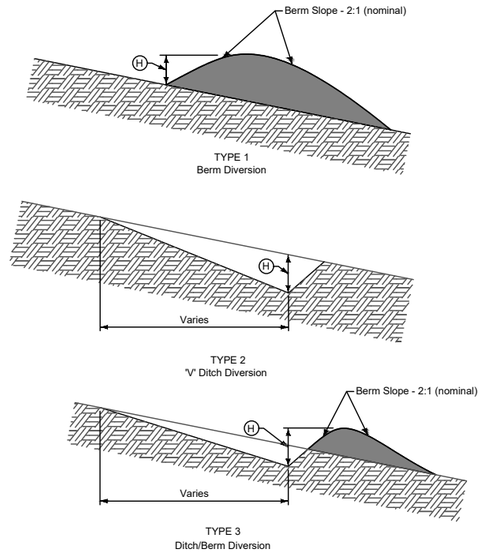


1. ENTRANCE LENGTH: 50 FOOT MINIMUM .
2. ENTRANCE WIDTH: 20 FOOT MINIMUM. FLARE THE ENTRANCE WHERE IT MEETS THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.

2 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



3 TEMPORARY ROCK CHECK DAM
NOT TO SCALE



Diversion Types 1, 2, and 3 may be used interchangably unless otherwise specified in the contract documents.

Alternate configurations may be used upon approval from the Engineer.

(H) Total height of diversion (swale and berm): 18 inch minimum or as specified.

4 TEMPORARY EARTH DIVERSION STRUCTURE DETAIL
NOT TO SCALE

LT LEON ASSOCIATES-INC
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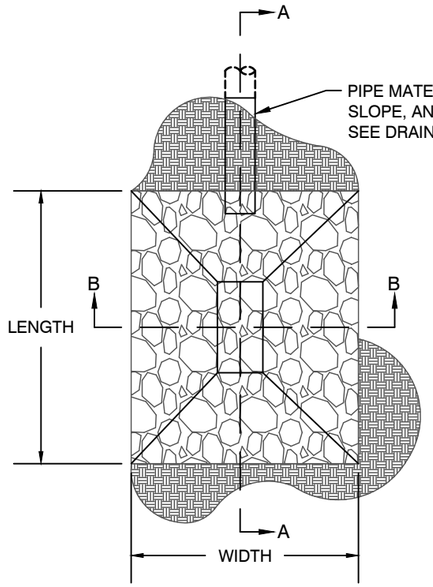
(515)281-4246

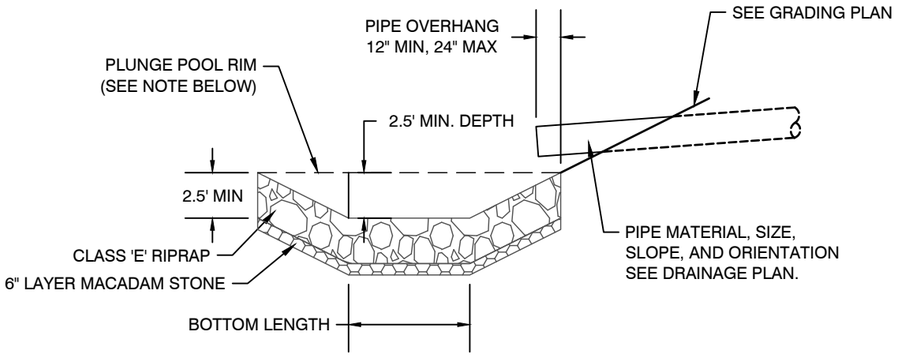
CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

TYPICAL DETAILS

RR ID	WIDTH (FT)	LENGTH (FT)	BOTTOM WIDTH (FT)	BOTTOM LENGTH (FT)	DEPTH (FT)	RIM ELEV. (FT)	RIPRAP (TON)	MACADAM STONE (TON)
PPL-1	10	12	2	8	2.5	777.00	21	5
PPL-2	24	20	16	12	2.5	771.00	82	20
PPL-3	10	12	2	8	2.5	777.00	21	5

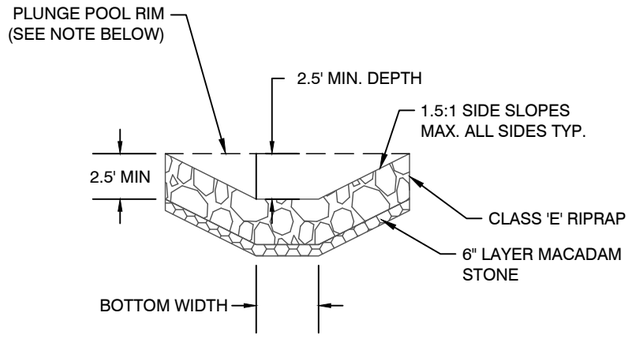


PLAN VIEW



SECTION A-A

NOTE:
PIPE OUTLETS INTO WETLANDS MUST OUTLET 1' ABOVE NORMAL POOL

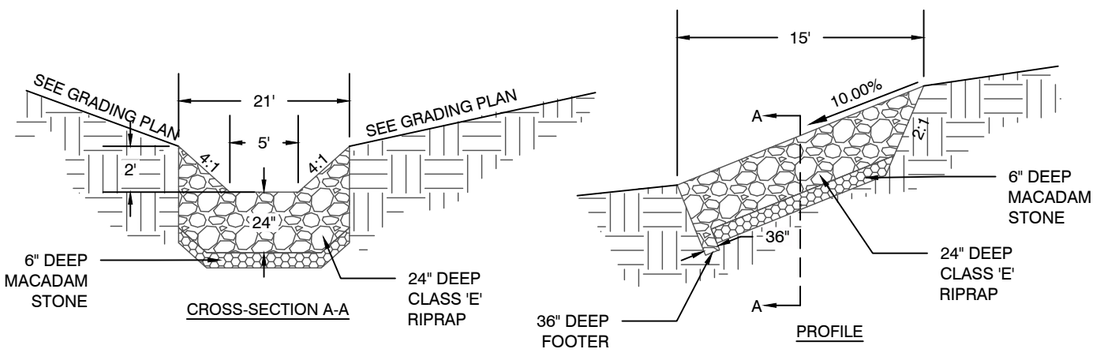


SECTION B-B

1 PLUNGE POOL DETAIL

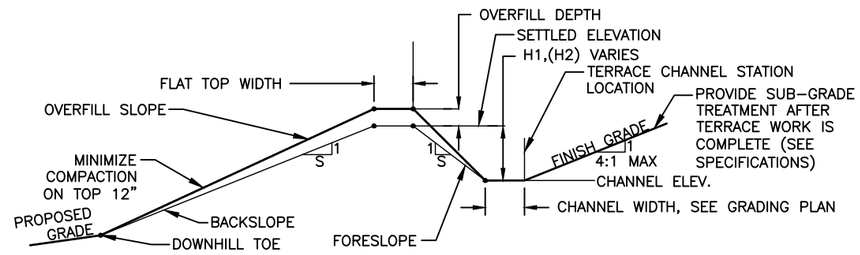
NOT TO SCALE

RR ID	RIPRAP (TON)	MACADAM STONE (TON)
RR-1	36	8
RR-2	36	8



2 ROCK RIFFLE GRADE CONTROL DETAIL

NOT TO SCALE



NOTES:
1. CHANNEL AND RIDGE ELEVATIONS ARE SHOWN RELATIVE TO THE LOW POINT ELEVATION OF THE TERRACE CHANNEL AT THE INTAKE RISER.
2. H1=HEIGHT FROM LOW POINT IN THE TERRACE CHANNEL AT THE INTAKE TO TOP OF THE SETTLED RIDGE.
3. H2=HEIGHT FROM HIGH POINT IN THE TERRACE CHANNEL AT THE ENDS TO TOP OF THE SETTLED RIDGE.
4. TERRACE RIDGES ARE UNIFORM (LEVEL) THROUGHOUT THE ENTIRE LENGTH.
5. RIDGE LENGTHS ARE MEASURED ALONG THE CENTERLINE OF THE RIDGE.
6. OVERFILL DEPTH IS 6 INCHES.
7. CHANNEL LENGTHS ARE MEASURED FROM THE HIGH POINT TO THE LOW POINT LOCATION ALONG THE CENTERLINE OF THE CHANNEL BOTTOM.
8. ** VOLUME FOR TERRACE CONSTRUCTION IS INCLUDED IN THE OVERALL EARTHWORK QUANTITY. THE OVERALL EARTHWORK QUANTITY DOES NOT INCLUDE OVERFILL DEPTH.

3 FILL TERRACE DETAIL

NOT TO SCALE

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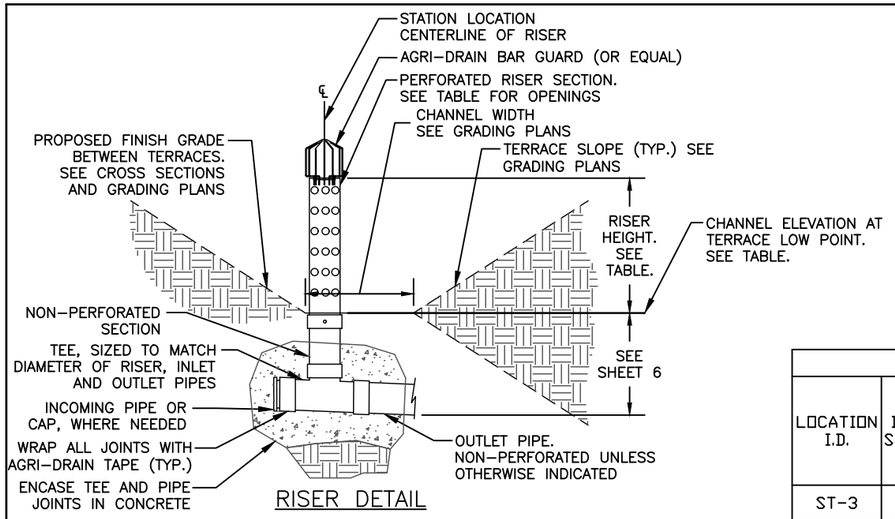
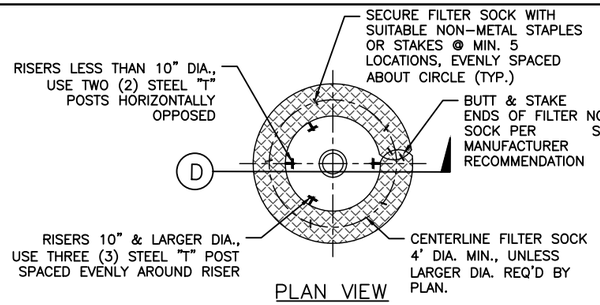
CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

TYPICAL DETAILS

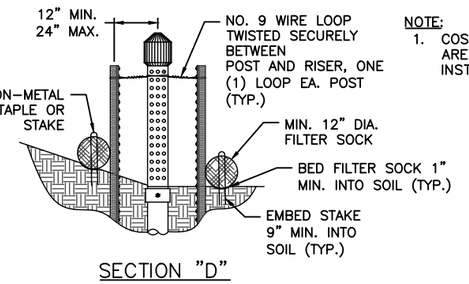
SHEET 9 OF 18



RISER DETAIL



PLAN VIEW



SECTION "D"

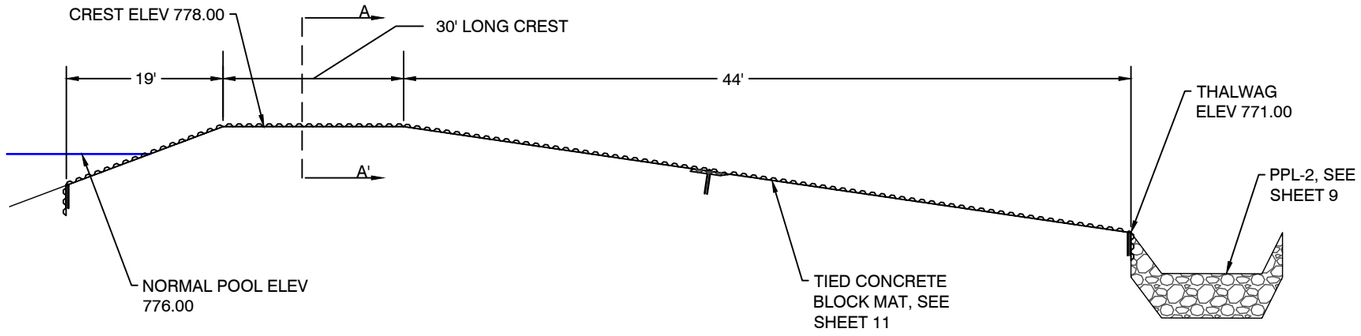
NOTE:
1. COST OF STEEL "T" POSTS & NO. 9 WIRE ARE INCIDENTAL TO THE COST OF RISER INSTALLATION.

NOTES:
1. UNLESS OTHERWISE NOTES, TWO (2) STEEL FENCE POSTS SHALL BE INSTALLED ADJACENT TO AND ON OPPOSITE SIDES OF EACH TERRACE INTAKE RISER TO REINFORCE AGAINST OVERTURNING. FENCE POSTS SHALL BE WIRED TO THE INTAKE RISER.
2. COST OF FENCE POSTS SHALL BE CONSIDERED INCIDENTAL TO COST OF INSTALLING INTAKE RISER.
3. INSTALL PRESCRIBED LENGTH OF 12" DIA. FILTER SOCK AROUND EACH INTAKE IN THE FORM OF A 4' DIA. CIRCLE. 4' DIA. CIRCLE WILL CONTAIN APPROXIMATELY 12 LF OF FILTER SOCK. FILTER SOCK SHALL BE STAKED IN PLACE.
4. LAST 20 LF OF ALL PLASTIC PIPE OR TILING TO DAYLIGHT SHALL BE SCH. 40 PVC, SDR 26, OR PPHP. PROPER ADAPTORS FROM PLASTIC TO PVC SHALL BE USED.
5. ALL STORM SEWER SHALL MEET SUDAS STANDARD SPECIFICATIONS. HDPE, PPHP, OR PVC MAY BE USED.

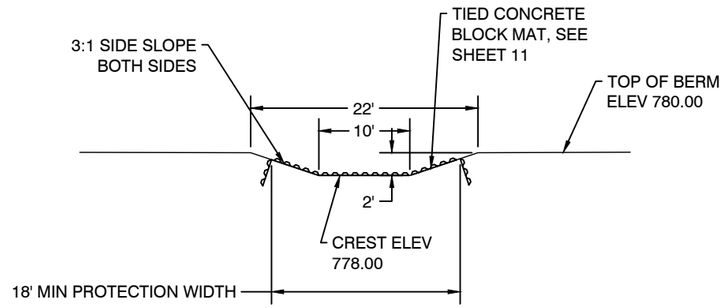
TABLE: TERRACE INTAKES, PIPES & OUTLETS

LOCATION I.D.	DWG. SHEET	INTAKE RISER								TERRACE PIPE/TILE			OUTLET/END TREATMENT		
		DIA. (IN.)	INTAKE MATERIAL	HOLES	HOLE SIZE (IN.)	CHANNEL LOW PT. ELEV(FT)	RISER HEIGHT (FT)	BAR GUARD (Y/N)	12" FILTER SOCK, L.F.	PIPE DIA. (IN.)	MIN. SLOPE (%)	PIPE MATERIAL	RODENT GUARD (Y/N)	OUTLET TEE (Y/N)	DISCHARGE INTO
ST-3	6	24	PLASTIC	60/FT	1.25	795.00	3.0	Y	12	15	8.15	PPHP	Y	N	ST-2 - OUTFALL
ST-5	6	24	PLASTIC	60/FT	1.25	796.00	3.0	Y	12	15	9.34	PPHP	Y	N	ST-4 - OUTFALL
ST-6	6	6	PLASTIC	40/FT	1.00	816.00	3.0	Y	12	6	10.47	DUAL WALL HDPE	N	Y	ST-5 - RISER INTAKE

1 TERRACE INTAKE DETAILS
NOT TO SCALE



SPILLWAY PROFILE



CROSS SECTION A-A' AT SPILLWAY CREST

2 AUXILIARY SPILLWAY DETAIL
NOT TO SCALE

LT LEON ASSOCIATES-INC
1823 OHIO STREET SUITE 101
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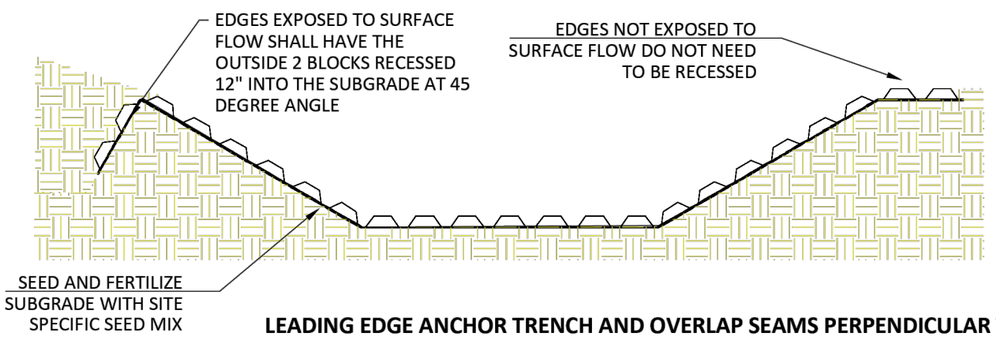
CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

TYPICAL DETAILS

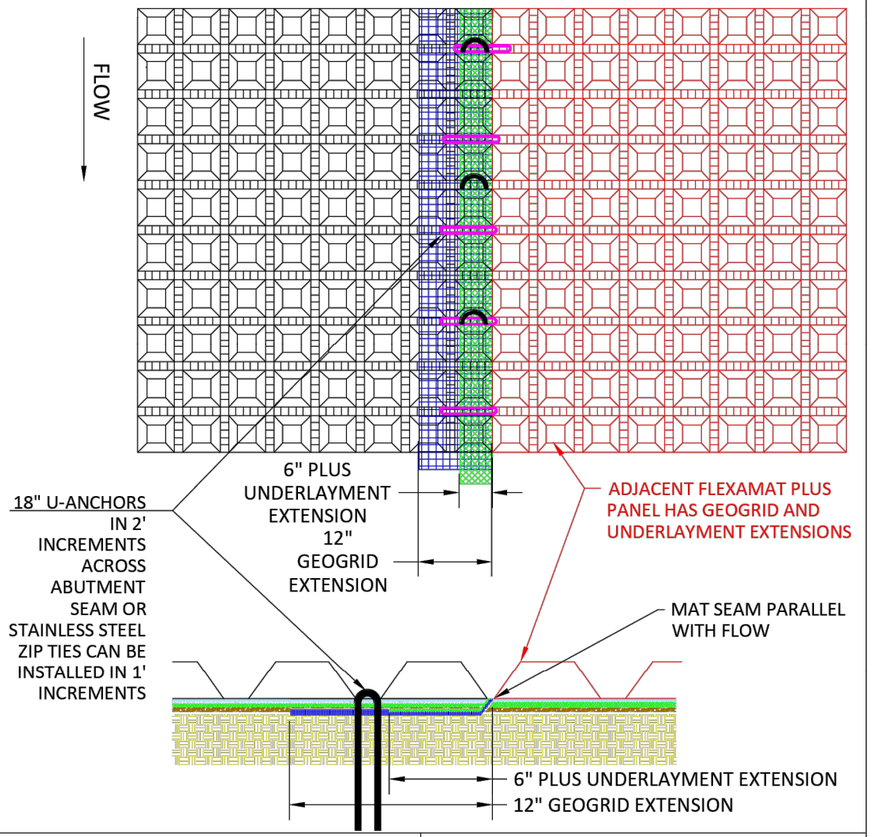
SHEET 10 OF 18

NOTES:
1. INFORMATION SHOWN IS THE BASIS OF DESIGN BASED ON FLEXAMAT PLUS TIED CONCRETE BLOCK MATS. APPROVED EQUAL PRODUCTS MAY BE ACCEPTABLE. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO BE APPROVED BY THE ENGINEER WITH THE SPECIFIED PRODUCT OR APPROVED EQUAL.

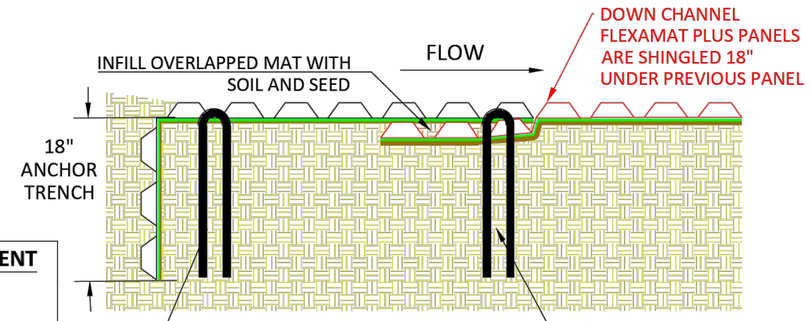
METHOD FOR TREATING EDGES EXPOSED TO SURFACE SHEET FLOW



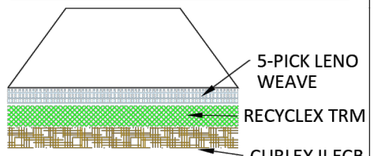
ABUTMENT METHOD FOR WIDER THAN 16'



LEADING EDGE ANCHOR TRENCH AND OVERLAP SEAMS PERPENDICULAR TO FLOW



FLEXAMAT PLUS UNDERLAYMENT



FLEXAMAT PLUS CHANNEL - LAYOUT PARALLEL TO FLOW

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURES REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT PLUS INSTALLATION SEED AND FERTILIZE THE PREPARED SUBGRADE WITH SITE SPECIFIC SEED MIX AND IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT PLUS ROLLS, USING THE WIDEST ROLLS POSSIBLE TO AVOID SEAMS.
   - 4.1. FOR CHANNELS THAT ARE WIDER THAN 16', INSTALL 15.5' WIDE FLEXAMAT PLUS ROLLS THAT INCLUDE 12" GEOGRID EXTENSIONS WITH A 6" PLUS UNDERLAYMENT EXTENSIONS. THESE SEAMS ARE PARALLEL WITH FLOW, THE ADJACENT MAT INSTALLED OVER THE EXTENSIONS. ENSURE GEOGRID AND TRM EXTENSIONS ARE LAYING FLAT ON SUBGRADE PRIOR TO INSTALLING ADJACENT MAT.
   - 4.2. SECURE THE ABUTMENT PARALLEL WITH FLOW BY INSTALLING 18" U-ANCHORS IN 2' INCREMENTS OR 20" STAINLESS STEEL ZIP TIES IN 1' INCREMENTS THROUGH THE EXTENSION OVERLAP. U ANCHORS OR ZIP TIES TO BE INSTALLED PERPENDICULAR TO FLOW. ZIP TIES SHALL ENCOMPASS 3 CORDS OF GEOGRID FROM EACH MAT.
5. FOR ADDITIONAL SECTIONS OF MAT, SECURE SEAM PERPENDICULAR WITH FLOW BY OVERLAPPING THE DOWNSTREAM SECTION 18" WITH UPSTREAM SECTION OF MAT. PRIOR TO INSTALLING OVERLAP, FLIP UPSTREAM MAT BACK 24". EXCAVATE 2.25'" OF SOIL 18" FROM END OF UPSTREAM MAT. DOWNSTREAM SECTION IS LAID IN THE SHALLOW TRENCH. RETURN AND TAMP SOIL OVER INITIAL EDGE AND SEED. FLIP END OF UPSTREAM MAT OVER THE SOIL COVERED AND SEEDED INITIAL LEADING EDGE OF DOWNSTREAM MAT.
   - 5.1. SECURE OVERLAPS PERPENDICULAR TO FLOW BY INSTALLING 18" U-ANCHORS IN 2' INCREMENTS OR 20" STAINLESS STEEL ZIP TIES IN 1' INCREMENTS THROUGH THE OVERLAP. ZIP TIES SHALL ENCOMPASS 3 CORDS OF GEOGRID FROM EACH MAT.
6. AT THE INITIAL LEADING EDGE OF THE FLEXAMAT PLUS ARMORED CHANNEL, EMBED THE MAT 18" IN A VERTICAL ANCHOR TRENCH. FILL AND COMPACT ANCHOR TRENCH WITH SUITABLE FILL. AT ENDING

REV - 2

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Flexamat® PERMANENT EROSION CONTROL

1 TIED CONCRETE BLOCK MAT DETAIL
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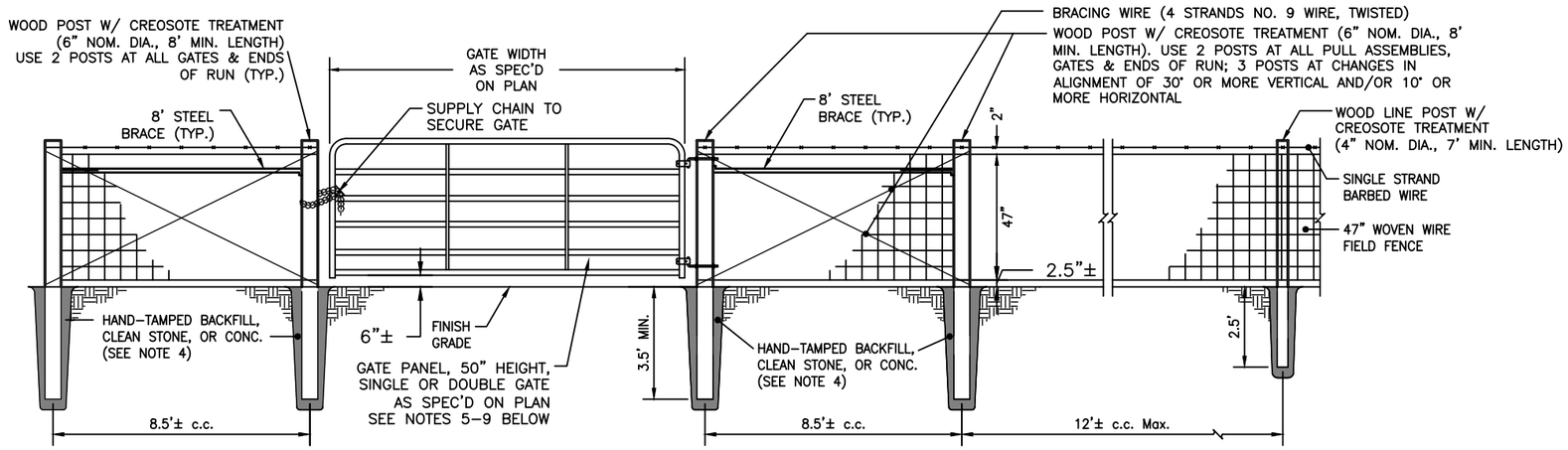
CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

TYPICAL DETAILS

SHEET 11 OF 18



FENCE AND GATE DETAIL NOTES:

1. ALL FENCING TO BE WOVEN WIRE UNLESS OTHERWISE NOTED.

2. FENCING DETAIL IS SIMILAR TO IOWA DOT STANDARD ROAD PLAN MI-103 EXCEPT ALL POSTS MUST BE WOOD AND NO BARBED WIRE REQUIRED AS THE BOTTOM STRAND BELOW THE WOVEN FENCING.

3. BRACE END POST TO FIRST INTERIOR POST WITH STEEL BRACE AND BRACING WIRE. SIMILAR DETAIL AT ALL REQUIRED CORNER POSTS AND GATE POST ASSEMBLIES.

4. IN LIEU OF EXCAVATING, POSTS MAY BE SET BY DRIVING. IN EITHER EVENT, CLEAR UTILITIES PRIOR TO INSTALLING FENCE POSTS.

5. UNLESS OTHERWISE NOTED, MIN. GATE PANEL LENGTH FOR SINGLE GATES IS 12 FEET. TWO (2) 12-FOOT PANELS SHALL BE INSTALLED FOR DOUBLE GATES.

6. WHERE SPECIFIED CLEAR WIDTH FOR DOUBLE GATES IS LESS THAN 24', ALLOW GATE PANELS TO OVERLAP.

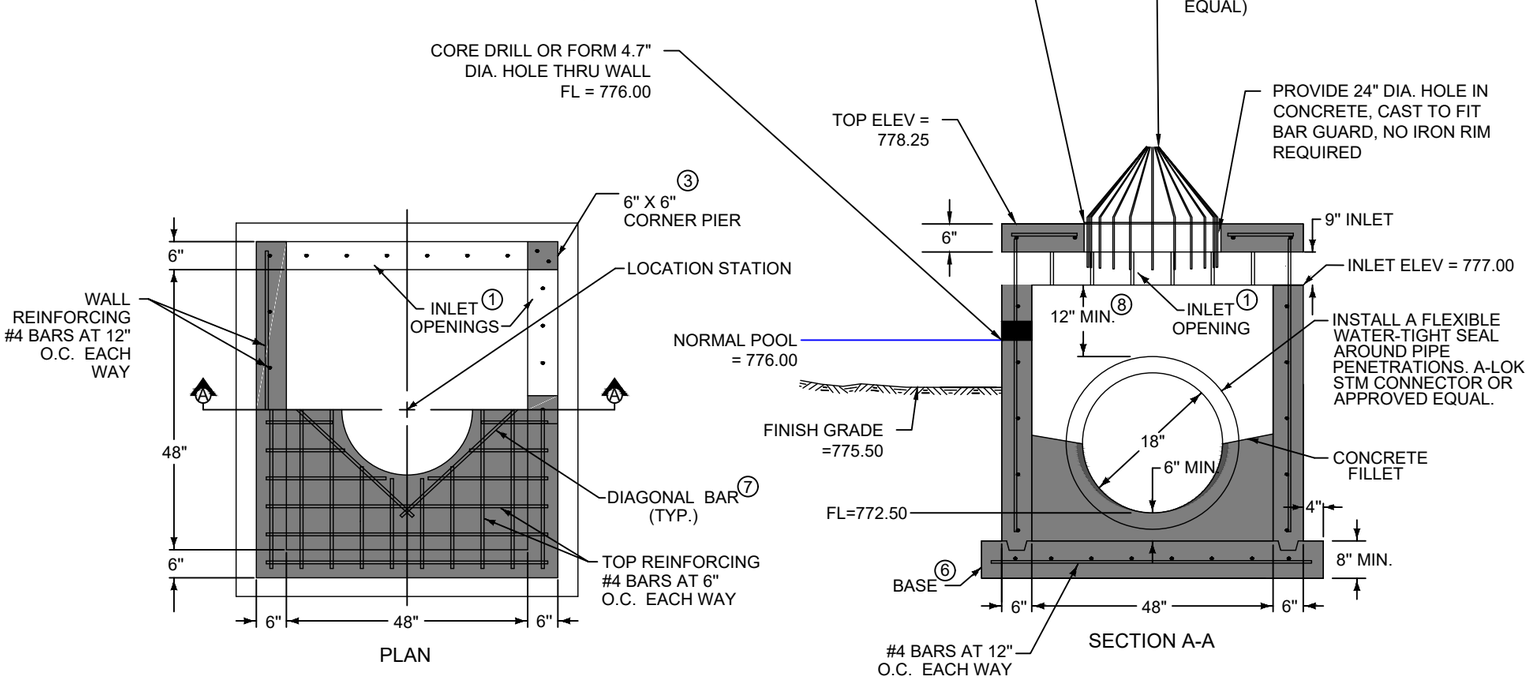
7. SECURE DOUBLE GATES TOGETHER AT ENDS OPPOSITE HINGES.

8. ALL GATES SHALL BE BUILT FROM TWO (2) INCH DIAMETER STEEL TUBE AND SHOP PAINTED. USE MOUNTING HARDWARE AND HINGES RECOMMENDED BY GATE MANUFACTURER.

9. PAYMENT IS BY LUMP SUM FOR EACH GATE ASSEMBLY INSTALLED. DOUBLE GATES, WHERE SPECIFIED, ARE PAID FOR AS ONE (1) UNIT. BRACE PANELS AS SHOWN ON EACH END OF GATE ARE PAID PER LINEAL FOOT AS FENCING.

(1) FENCE AND GATE DETAIL

NOT TO SCALE



① CONSTRUCT INLET OPENINGS WITH 15-INCH #4 EPOXY-COATED BARS AT 8 INCHES ON CENTER. EMBED BARS A MINIMUM OF 3 INCHES INTO WALLS AND TOP AT ALL OPENINGS.

② STRUCTURE TO BE OPEN ON ALL 4 SIDES (N, S, E, AND W)

③ CORNER PIER REQUIRED BETWEEN OPENINGS OF TWO ADJACENT WALLS. EXTEND WALL REINFORCING VERTICALLY THROUGH PIER. INSTALL ONE ADDITIONAL 15-INCH #4 BAR IN PIER.

④ CENTER PIER REQUIRED AT CENTER OF ANY INLET OPENING WITH LENGTH OF 5 FEET OR GREATER. EXTEND WALL REINFORCING VERTICALLY THROUGH PIER. INSTALL ONE ADDITIONAL 15-INCH #4 BAR IN PIER.

⑥ CAST-IN-PLACE BASE SHOWN. IF BASE IS PRECAST INTEGRAL WITH WALLS, THE FOOTPRINT OF BASE IS NOT REQUIRED TO EXTEND BEYOND THE OUTER EDGE OF THE WALLS.

⑦ INSTALL FOUR #4 DIAGONAL BARS AT ALL PIPE OPENINGS.

⑧ 12" MINIMUM WALL HEIGHT ABOVE ALL PIPES.

(2) SW-513 OPEN-SIDED AREA INTAKE DETAIL, 4'x4' (ST-1)

NOT TO SCALE

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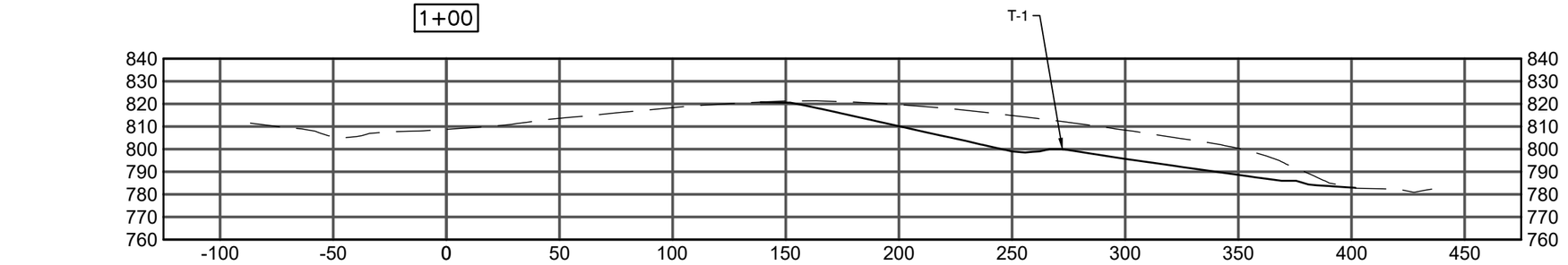
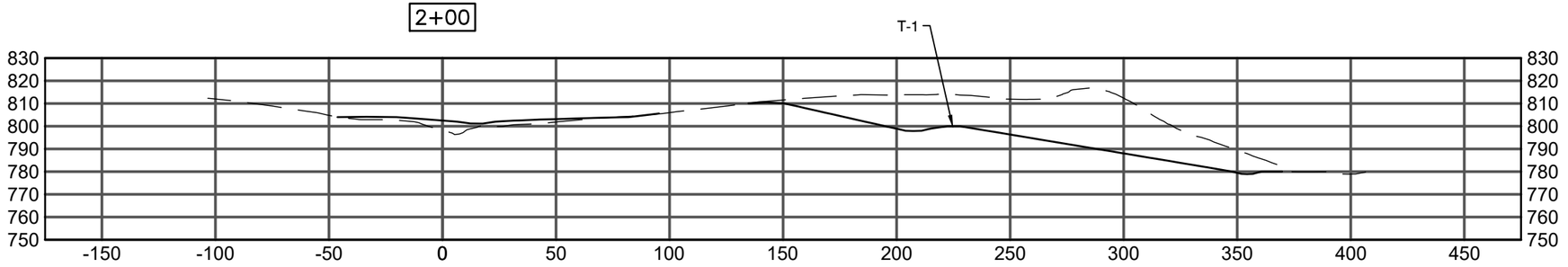
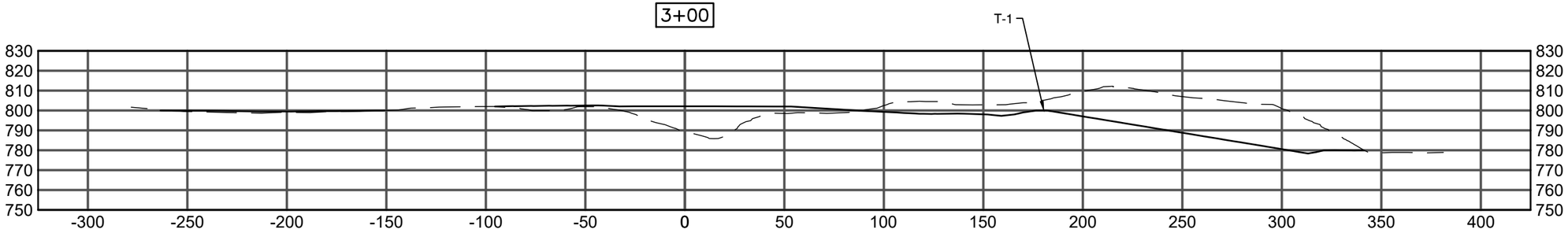
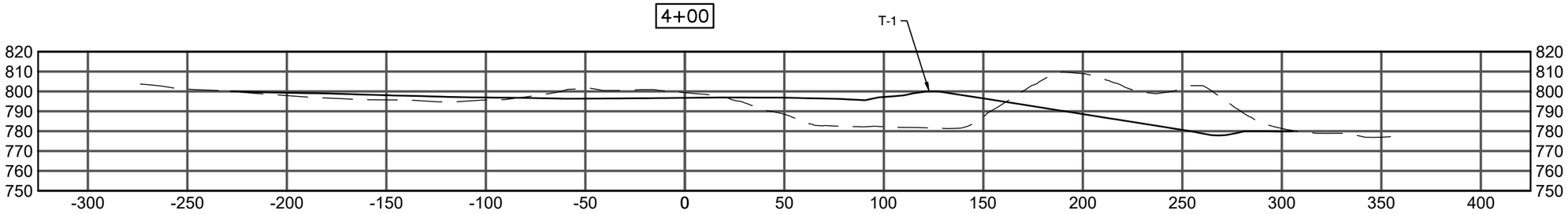
TYPICAL DETAILS









GRAPHIC SCALE

0 60' 120' 180'

NOTE:
CROSS SECTIONS FACING
SOUTH ALONG BASELINE

LT LEON ASSOCIATES-INC
1823 OHIO STREET SUITE 101
DES MOINES IOWA 50314
office 515-422-7016
www.ltleon.com

FILE: 049.013

REVISED:

ISSUED: 08-05-2025

CHKD. BY: LTL

DRAWN BY: SMH

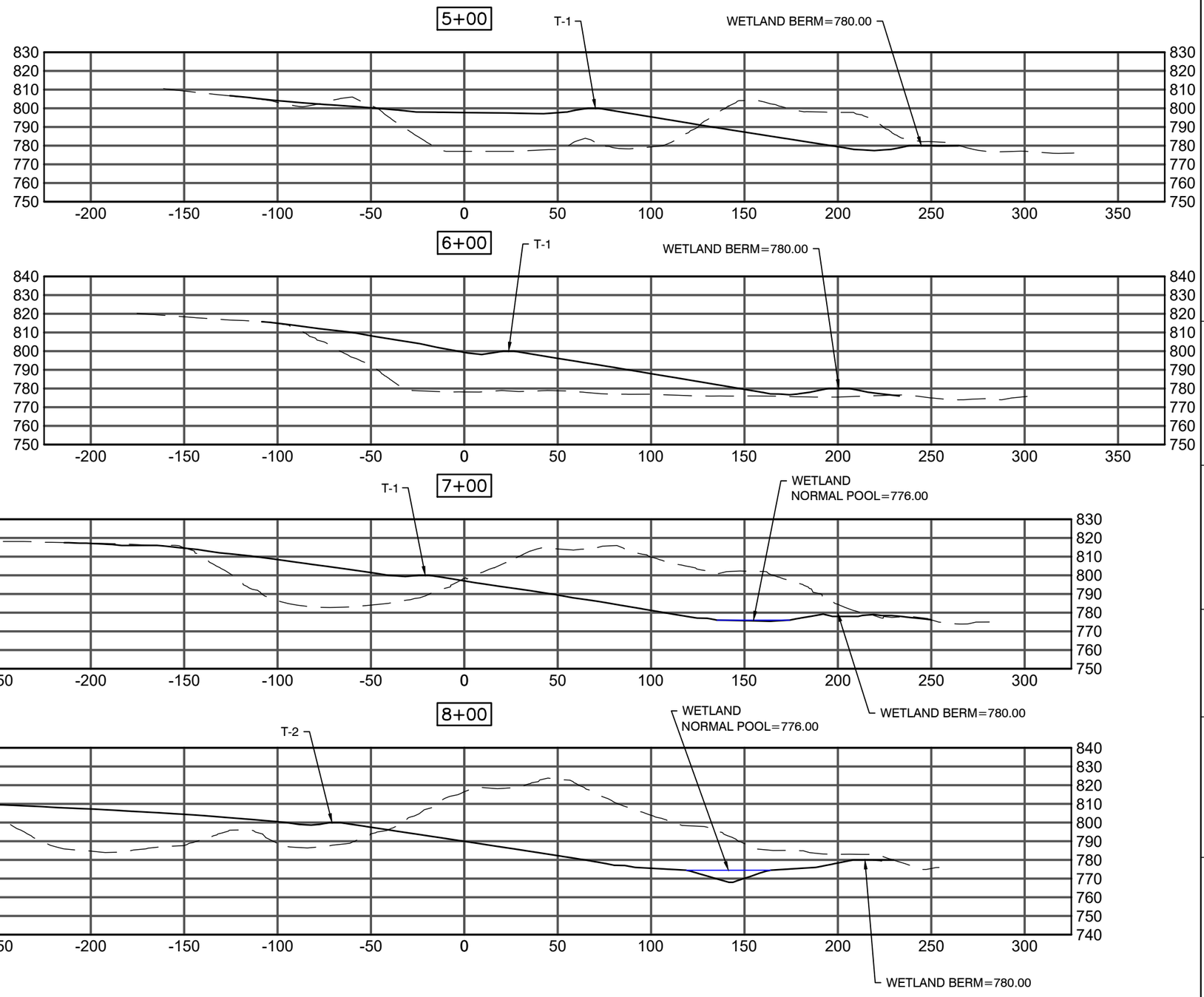
DESIGN BY: SMH

IOWA DEPARTMENT OF AGRICULTURE
AND LAND STEWARDSHIP
DIVISION OF SOIL CONSERVATION
AND WATER QUALITY
HOOVER STATE OFFICE BUILDING
1305 E. WALNUT STREET, DES MOINES, IOWA 50319
(515)281-4246

CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

CROSS SECTIONS

SHEET
13 OF 18



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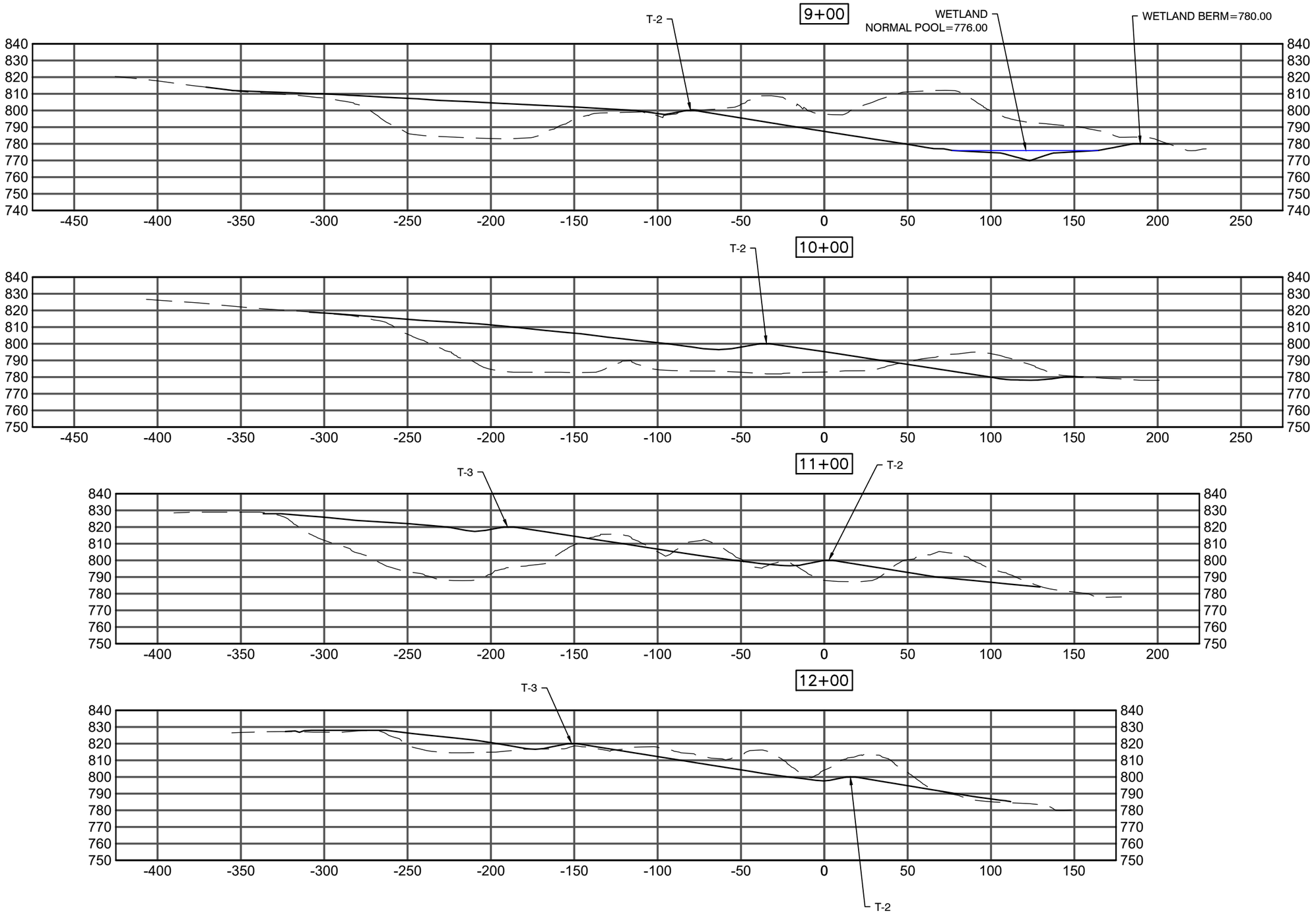
CROSS SECTIONS

SHEET
14 OF 18



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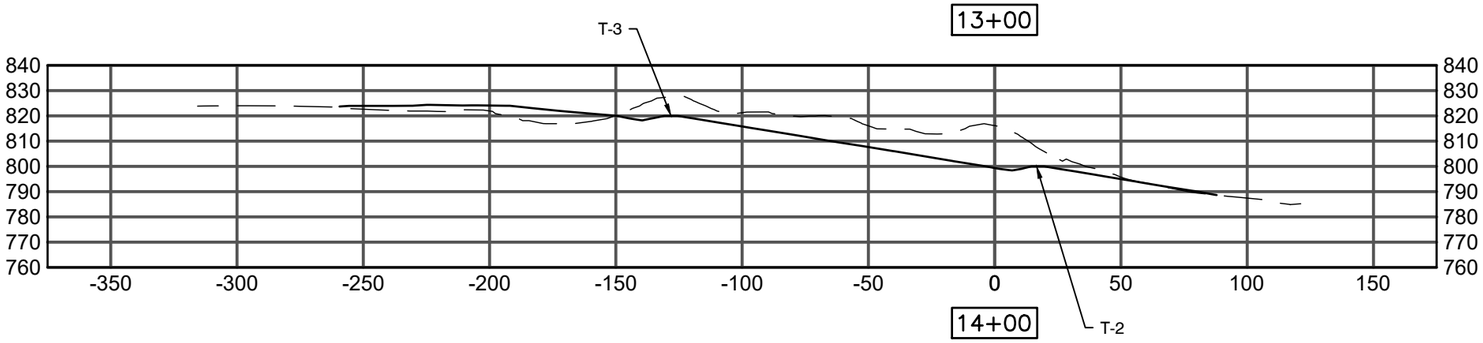
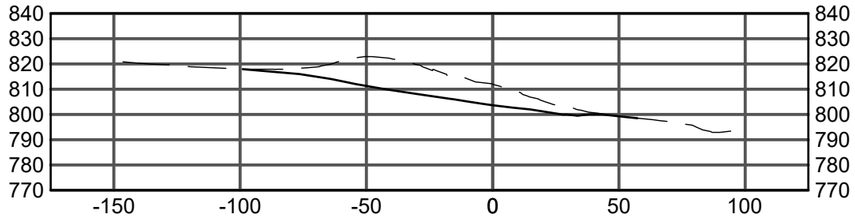
CROSS SECTIONS

SHEET
15 OF 18

13+00



14+00



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SMH	SMH	LTL	08-05-2025	

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CROZIER FAMILY (IA-365)
AML RECLAMATION PROJECT

CROSS SECTIONS

SHEET
16 OF 18

VERSION: 01-23-2025

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

REFER TO: *CONTENTS OF THE POLLUTION PREVENTION PLAN* IN PART IV. D. OF IOWA NPDES GENERAL PERMIT NO. 2 – EFFECTIVE MARCH 1, 2023 THROUGH FEBRUARY 29, 2028.

1. SITE DESCRIPTION

A. DESCRIBE NATURE OF CONSTRUCTION ACTIVITY:

- *THE PROJECT CONSISTS OF RECLAIMING THE AML SITES DISTURBED BY PAST COAL MINING ACTIVITIES. THE MAIN OBJECTIVE OF THE AML RECLAMATION IS TO MITIGATE PRIORITY FEATURES THAT PRESENT A DANGER TO THE HEALTH AND SAFETY OF THE GENERAL PUBLIC.*
- *THE MAJOR PHASES OF THE PROJECT ARE TEMPORARY EROSION CONTROL; ROUGH GRADING; LIME TREATMENT OF SURFACE SOILS, FERTILIZING, MULCHING, PERMANENT SEEDING INCLUDING INSTALLATION OF PERMANENT EROSION CONTROL PRACTICES LIKE TERRACING, RIPRAP, CONCRETE BLOCK MAT, AND WETLANDS.*
- *END USE OF SITE IS: LIVESTOCK PASTURE, WILDLIFE HABITAT AND/OR RECREATIONAL USE*
- *THE ESTIMATED PROJECT TIMELINE IS: OCTOBER 1, 2025 TO DECEMBER 31, 2026*

B. ESTIMATE THE TOTAL AREA OF THE SITE AND THE AREA EXPECTED TO BE DISTURBED BY EXCAVATION, GRADING OR OTHER ACTIVITIES:

- *15.7 ACRES DISTURBED BY MASS GRADING.*

C. ESTIMATE THE SOIL RUNOFF COEFFICIENT OF THE SITE AFTER CONSTRUCTION IS COMPLETED, AND DESCRIBE THE WATER QUALITY OF ANY EXISTING DISCHARGE FROM THE SITE.

- *THE RATIONAL RUNOFF COEFFICIENT FOLLOWING THE ESTABLISHMENT OF FINAL VEGETATION IS ESTIMATED TO BE ABOUT 0.45. THIS IS ROUGHLY EQUIVALENT TO AN SCS CURVE NUMBER OF 79 WHICH IS TYPICAL FOR PASTURE-GRASS VEGETATION.*
- *THE WATER QUALITY BEING DISCHARGED FROM THE SITE, AT PRESENT, IS IMPAIRED WITH ACIDIC PH AND HIGH DISSOLVED IRON CONCENTRATIONS WHICH ARE DERIVED FROM THE WATER'S CONTACT WITH BARE MINE SPOIL MATERIAL ON THE SITE. THIS POOR WATER QUALITY IS OFTEN INDICATED BY RUST-COLORED PRECIPITANT IN THE RECEIVING WATERS.*

D. PROVIDE A SITE MAP SATISFYING REQUIREMENTS DESCRIBED IN PART IV. D.1.A.D.:

- *SEE BMP PLAN SHEET 18 FOR CONTROLS THAT WILL BE IMPLEMENTED.*

E. PROVIDE NAME OF THE RECEIVING WATER(S) AND THE ULTIMATE RECEIVING WATERS(S).

- *THE RECEIVING WATER IS AN UNNAMED TRIBUTARY TO CROOKED CREEK EVENTUALLY TO THE DES MOINES RIVER*

2. CONTROLS -- A.(1) STABILIZATION PRACTICES:

DESCRIBE TEMPORARY & PERMANENT STABILIZATION PRACTICES WITH SEQUENCE FOR IMPLEMENTATION.

1. *UNLESS PRECLUDED BY SNOW COVER OR FROZEN SITE CONDITIONS, AREAS TO BE GRADED AND LEFT UNDISTURBED FOR 14 OR MORE CALENDAR DAYS WILL BE ROUGH DISKED ON THE CONTOUR TO INCREASE SURFACE ROUGHNESS. ROUGH DISKING WILL BE USED EXCLUSIVELY PRIOR TO SEEDING THE FINAL VEGETATION. ROUGH DISKING IS USUALLY CONCURRENT WITH INCORPORATION OF AG LIME AND MULCH FOR THE WORK OF SUBGRADE PREPARATION.*
2. *ONCE ALL GRADING IS COMPLETE, AND THE SOIL PH ADJUSTMENT IS ACCOMPLISHED, A PERMANENT SEEDING MIX CONSISTING OF WARM AND COOL SEASON GRASSES WILL BE PLANTED WITH AN APPROPRIATE COVER CROP OF OATS, WINTER WHEAT.*
3. *APPROXIMATELY 2 TONS OF STRAW MULCH PER ACRE WILL BE SPREAD ACROSS THE SEEDED SOIL AND TUCKED IN WITH A TUCKING MACHINE TO PROVIDE PROTECTION FROM RAIN DROPLET IMPACT WHILE THE SEEDING BECOMES ESTABLISHED.*
4. *THE SEEDING TYPICALLY GERMINATES WITHIN 14 DAYS & LATER PROVIDES AT LEAST 70% VEGETATIVE COVER.*

A.(2) STRUCTURAL PRACTICES DESCRIBE EROSION AND SEDIMENT CONTROL PRACTICES THAT WILL USED ON THE SITE:

EROSION CONTROL PRACTICES

1. *ROUGH DISKING AS DESCRIBED IN "STABILIZING PRACTICES" ABOVE WILL BE USED AS NECESSARY TO REDUCE SURFACE RUNOFF VELOCITIES AND INCREASE INFILTRATION.*
2. *TERRACES WILL BE USED TO REDUCE SLOPE LENGTHS AND DETAIN/RETAIN STORM WATER RUNOFF. TERRACES WILL BE DRAINED WITH PERFORATED PLASTIC RISERS.*
3. *RIP RAP PLUNGE POOLS (STILLING BASINS) WILL BE USED AT DRAINAGE OUTLETS TO ABSORB ENERGY OF FLOWING STORM DRAINAGE.*

A.(2) STRUCTURAL PRACTICES CONT'D:

DESCRIBE EROSION AND SEDIMENT CONTROL PRACTICES THAT WILL USED ON THE SITE:

SEDIMENT CONTROL PRACTICES:

1. *STRAW WATTLES OR FILTER SOCK OR SHALLOW DITCHES ACTING AS SEDIMENT TRAPS WILL BE USED ALONG THE PERIMETERS OF THE SITE AS NECESSARY TO PREVENT MIGRATION OF SEDIMENT INTO THOSE WATERS OUTSIDE THE PROJECT BOUNDARY. PROPOSED WATERBODIES WITHIN THE PROJECT BOUNDARY MAY INCLUDE STORAGE VOLUME BELOW THE NORMAL POOL ELEVATION FOR SOME ACCUMULATED SEDIMENT.*
2. *FILTER SOCKS OR SHALLOW TRENCHES WILL BE INSTALLED IN DRAINAGE WAYS AS NECESSARY TO TRAP SEDIMENT TRANSPORTED FROM SLOPES DURING CONSTRUCTION. IN CONCENTRATED DRAINAGES, RIPRAP WILL BE INCLUDED TO SLOW FLOW VELOCITIES AND TRAP TRANSPORTED SEDIMENTS.*
3. *A WETLAND BASIN WILL BE CONSTRUCTED AS SHOWN ON THE PLANS. AS THE PROPOSED WATER BODY IS CONSTRUCTED IT WILL BEGIN TO RETAIN SEDIMENT ERODED FROM THE UPLAND SLOPES. THE WETLAND BASIN WILL BE CLEANED OUT JUST PRIOR TO PROJECT COMP0LETION AND WILL BE CONVERTED INTO A PERMANENT WETLAND. SEDIMENT CLEANED OUT WILL BE RE-SPREAD ONTO THE LANDSCAPE. PRIOR TO CONSTRUCTION OF THE WETLAND, TEMPORARY PRACTICES INDICATED ABOVE WILL BE INSTALLED.*
4. *ALL PROPOSED PERMANENT WETLANDS HAVE OUTLETS PROTECTED FROM EROSION WITH TIED CONCRETE BLOCK MAT FOR SURFACE FLOWS AND/OR PRECAST CONCRETE RISERS CONNECTED TO PIPES THAT OUTLET INTO A RIPRAP PLUNGE POOL OR OTHER STABLE LOCATION.*

A.(2)(a). DESCRIBE PRACTICES WHICH PROVIDE AT LEAST 3600 CUBIC FEET OF STORAGE PER [DISTURBED] ACRE FOR COMMON DRAINAGE LOCATIONS SERVING MORE THAN TEN (10) ACRES OF DISTURBED AREA:

THE GRADING LIMITS FOR THE SITE CONTAINS 15.7 ACRES OF DISTURBED AREA IN WHOLE. OF THAT AREA, 13.5 ACRES ARE SITUATED UPGRADIENT OF THE PROPOSED WETLAND BASIN. PER THE DESIGN DRAWINGS, THE PLANNED WETLAND BASIN PROVIDES 103,800 CUBIC FEET OF SEDIMENT STORAGE IN TOTAL, WHICH IS EQUIVALENT TO APPROXIMATELY 7,689 CUBIC FEET OF SEDIMENT STORAGE PER DISTURBED ACRE. THE BALANCE OF THE REQUIRED AMOUNT OF STORAGE WILL BE PROVIDED WITH TEMPORARY ROCK CHECK DAMS AS NEEDED.

A.(2)(b). DESCRIBE PRACTICES WHICH ARE USED TO RETAIN SEDIMENT ON SITE FOR COMMON DRAINAGE LOCATIONS SERVING TEN (10) OR FEWER ACRES OF DISTURBED AREA:

DRAINAGE LOCATIONS SERVING 10 OR FEWER ACRES WILL BE PROTECTED FROM SEDIMENTATION BY FILTER SOCKS OR STRAW WATTLES, FABRIC CHECKS, RIPRAP CHECKS OR SMALL SEDIMENT CATCHMENTS TO ARREST SEDIMENT MOVEMENT BEFORE SEDIMENT LEAVES THE SITE.

A.(2)(c). SURFACE WATER WITHDRAWAL, SURFACE WATER BUFFERS, STORM WATER DISCHARGE INTO VEGETATED AREAS, & TOPSOIL PRESERVATION:

i. DESCRIBE OUTLETS THAT WITHDRAW WATER FROM SURFACE OF BASINS:

PERFORATED PLASTIC INTAKE RISERS ARE USED TO DRAIN DRY DETENTION BASINS AND TERRACES. CONCRETE BOX STRUCTURES WITH OPEN SIDED INLETS ARE USED TO WITHDRAW WATER FROM THE CONSTRUCTED WETLANDS.

ii. DESCRIBE NATURAL BUFFERS AROUND SURFACE WATERS:

TO THE EXTENT PRACTICABLE, A BUFFER OF VARYING WIDTH CONSISTING OF TREES AND UNDERSTORY VEGETATION WAS LEFT UNDISTURBED BETWEEN THE PROJECT BOUNDARY AND THE NEAREST STREAM CHANNEL.

iii. REDIRECTION OF STORM WATER DISCHARGES TO AND THROUGH VEGETATED AREAS FOR INCREASED SEDIMENT REMOVAL AND OPPORTUNITY FOR INFILTRATION TO THE SOIL.

WHERE PRACTICABLE, OFFSITE AND ONSITE RUNOFF FLOWS ARE DIRECTED INTO TERRACES, DETENTION BASINS, OR CONSTRUCTED WETLANDS.

iv. TOPSOIL PRESERVATION:

THE SITE IS AN ABANDONED COAL MINE RECLAMATION PROJECT; NO TOPSOIL EXISTS PRIOR TO RECLAMATION-RELATED CONSTRUCTION ACTIVITIES. THEREFORE, THE TOPSOIL PRESERVATION REQUIREMENT WILL NOT BE MET. THE SITE CONSISTS OF MINE SPOIL MATERIAL CLASSIFIED AS MINE PITS AND DUMPS - SOIL TYPE 502 ON USDA SOIL SURVEY MAPS. AFTER FINAL GRADE IS ACHIEVED, AGRICULTURAL LIME WILL BE APPLIED AT A RATE TO BE DETERMINED BY SOIL TESTS. THE AGRICULTURAL LIME, ALONG WITH 5 TONS OF MULCH WILL BE INCORPORATED INTO THE UPPER ONE (1) FOOT OF THE MINE SPOIL TO PRODUCE A GROWING MEDIUM AS OUTLINED IN PROJECT SPECIFICATION 02400. AFTER A PERIOD OF TIME TO ALLOW FOR NEUTRALIZATION AND MULCH DECOMPOSITION, THE SITE WILL BE PREPARED FOR SEEDING. AGRICULTURAL LIME, FERTILIZER, SEED AND CRIMPED MULCH WILL BE APPLIED AS OUTLINED IN PROJECT SPECIFICATION 02700.

B(1). DESCRIBE POST-CONSTRUCTION PRACTICES THAT WILL ATTENUATE PEAK RUNOFF FLOWS AND REDUCE SUSPENED SOLIDS IN WATER FLOWS:

PROPOSED WETLAND WATER BODIES ARE ANTICIPATED TO ATTENUATE PEAK RUNOFF FLOWS AND PROVIDE OPPORTUNITY FOR SETTLEMENT OF SUSPENDED SOLIDS PRIOR TO RUNOFF EXITING THE PROJECT BOUNDARIES.

B.(2). DESCRIBE TYPE AND LOCATION OF VELOCITY DISSIPATION DEVICES:

RIPRAP PLUNGE POOLS ARE DESIGNED TO BE PLACED AT THE OUTLETS OF TERRACE DRAIN PIPES TO ABSORB ENERGY AND REDUCE THE VELOCITY OF FLOW EXITING THE BURIED PIPE CONDUITS.

C.(1). WASTE DISPOSAL -- DESCRIBE HOW BUILDING MATERIALS WASTE WILL BE ADDRESSED ON THE SITE:

THIS PROJECT IS PRIMARILY A GRADING AND DRAINAGE PROJECT. BUILDING MATERIALS WASTES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, CARDBOARD PACKAGING, PIECES OF WOOD, PLASTIC SHRINK WRAP, STEEL BANDS USED FOR PACKAGING, PIECES OF UNUSED PLASTIC PIPE OR FITTINGS, AND PORTLAND CEMENT CONCRETE WASHOUT RESIDUE. ALL CONSTRUCTION WASTES WILL BE DISPOSED OFFSITE.

C.(2). TRACKING OF SEDIMENTS -- DESCRIBE HOW VEHICLE TRACKING OF SEDIMENTS TO OFFSITE AREAS WILL BE MINIMIZED:

a. *TRACKING OF SEDIMENTS OFFSITE WILL BE REDUCED BY AVOIDING VEHICLE TRAVEL ACROSS THE SITE SURFACE SOILS WHEN THEY ARE WET.*
b. *A GRAVELED ENTRANCE WILL BE INSTALLED USING 3" NOMINAL MACADAM STONE. THE INSTALLATION WILL FUNCTION TO AID IN CLEANING OFF THE TIRES OF VEHICLES LEAVING THE SITE.*
c. *IF "a" CANNOT BE ACCOMPLISHED, AND "b" PROVES INEFFECTIVE, THEN MUD FROM VEHICLE TIRES WILL BE MANUALLY CLEANED OFF, TO THE EXTENT PRACTICABLE, BEFORE THE VEHICLE LEAVES THE SITE.*

C.(3). COMPLIANCE WITH STATE OR LOCAL SANITARY WASTE DISPOSAL REGULATIONS:

POLLUTION FROM HUMAN SANITARY WASTE WILL BE PREVENTED WITH THE USE OF A PORTABLE TOILET INSTALLED ON THE SITE. THE PORTABLE TOILET WILL BE SUPPLIED AND MAINTAINED BY THE CONTRACTOR. ON TIMELY INTERVALS, HUMAN SANITARY WASTE FROM THE PORTABLE TOILET WILL BE COLLECTED AND DISPOSED OFFSITE BY A QUALIFIED PROFESSIONAL SERVICES COMPANY RETAINED BY THE CONTRACTOR. PORTABLE TOILET FACILITIES MUST BE ANCHORED TO THE SOIL SURFACE TO RESIST OVERTURNING BY WIND OR VANDALISM.

3. MAINTENANCE -- DESCRIBE MAINTENANCE AND PROTECTIVE MEASURES TO KEEP CONTROLS AND PRACTICES IN WORKING ORDER:

TO THE EXTENT PRACTICABLE, THE EFFORTS WILL BE MADE TO AVOID TRAFFIC OVER OR DAMAGE TO INSTALLED PRACTICES AND CONTROLS. IF DAMAGED, REPAIRS OR REPLACEMENTS TO BMP'S WILL BE MADE AS SOON AS POSSIBLE OR WITHIN SEVEN (7) DAYS FOLLOWING INSPECTION.

4. INSPECTIONS, REVISIONS & REPAIRS -- NOTE SPECIAL CONSIDERATIONS OR PROCEDURES, IF ANY, FOR ROUTINE WEEKLY INSPECTIONS:

PER CONTRACT DOCUMENTS, IDALS-DSCWQ IN PARTNERSHIP WITH PATHFINDERS RC&D WILL PERFORM AND DOCUMENT ALL WEEKLY INSPECTIONS FOR THIS SWPPP IN ACCORDANCE WITH PART IV.D.4.C. ELECTRONIC COPIES OF WEEKLY INSPECTIONS REPORTS WILL BE AVAILABLE UPON REQUEST. REQUIRED REVISIONS OR REPAIRS WILL BE MADE WITHIN SEVEN (7) DAYS FOLLOWING INSPECTION.

5. NON-STORMWATER DISCHARGES -- DESCRIBE PRACTICES TO PREVENT NON-STORMWATER POLLUTION:

LESS THAN 1000 GALLONS OF DIESEL FUEL AND/OR LUBRICATING OILS ARE EXPECTED TO BE ON SITE AT ANY ONE TIME. THEREFORE, RISK OF GROSS POLLUTION TO RECEIVING WATERS IS MINIMAL. IF FUEL OR OIL SPILLS OCCUR, LIQUID POLLUTANTS WILL BE CONTAINED USING SMALL BERMS MADE FROM SITE SOILS TO PREVENT TRAVEL OF POLLUTANTS TO RECEIVING WATERS. SUFFICIENT TIME WILL BE GIVEN FOR THE POLLUTANTS IN IT TO VOLATILIZE IN THE CONTAMINATED SOIL AND/OR CONTAMINATED SOIL WILL BE DISPOSED OFF-SITE.

6. ADDITIONAL REQUIREMENTS FOR STORM WATER DISCHARGE FROM INDUSTRIAL ACTIVITIES OTHER THAN CONSTRUCTION:

THERE ARE NO ADDITIONAL REQUIREMENTS BECAUSE THIS SWPPP IS FOR A "CONSTRUCTION ONLY" SITE WHERE THERE IS NO INDUSTRIAL SOURCE, OTHER THAN CONSTRUCTION, THAT IS GENERATING THE DISCHARGE.

7. IMPLEMENTATION OF CONTROLS:

THE GENERAL CONTRACTOR IDENTIFIED ON THE CONTRACT, WILL BE ULTIMATELY RESPONSIBLE FOR ALL ASPECTS OF THE PROJECT. THESE INCLUDE GRADING, PIPE INSTALLATION, AND INSTALLATION OF BMPS. AN EROSION CONTROL OR SEEDING SUBCONTRACTOR MAY BE RESPONSIBLE IN SOME SITUATIONS.

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CROZIER FAMILY (IA-365) AML RECLAMATION PROJECT

STORMWATER POLLUTION PREVENTION PLAN

SHEET 17 OF 18

556 LF FIELD FENCE, PROTECT WATER LINE

REINSTALL SALVAGED GATE

DEEP RIP AREA PRIOR TO AG LIME APPLICATION FOR FUTURE TREE PLANTING, TYP.

DOUBLE 12' PANEL GATE

1175 LF FIELD FENCE

PASTURE SEEDING MIX = 14.7 ACRES

RESTORE GRAVEL DRIVE ACCESS TO ORIGINAL CONDITION

RR-1 - SEE DETAIL 2 SHEET 9

SPAN FENCE ACROSS CHANNEL, ADJUST SPACING OF FENCE POSTS TO AVOID PLACEMENT IN BOTTOM OF CHANNEL

RR-2 - SEE DETAIL 2 SHEET 9

DEEP RIP AREA PRIOR TO AG LIME APPLICATION FOR FUTURE TREE PLANTING, TYP.

INSTALL 1 LAYER 12" DIA. FILTER SOCK IN 4' DIA. CIRCLE. 12 LF TOTAL @ EACH INLET (TYP. OF 3) TEMPORARY, BUT LEFT IN PLACE TO DETERIORATE. SEE DETAIL.

TEMPORARY SEDIMENT BASIN - ACCUMULATED SEDIMENT SHALL BE REMOVED TO MEET DESIGN GRADES

TIED CONCRETE BLOCK MAT AUXILIARY SPILLWAY. SEE DETAIL 1 SHEET 11.

WETLAND FRINGE SEEDING MIX = 0.2 ACRES

PPL-1 - SEE DETAIL 1 SHEET 9

PPL-3 - SEE DETAIL 1 SHEET 9

PPL-2 - SEE DETAIL 1 SHEET 9

650 LF TEMPORARY EARTH DIVERSION BERM

USE CLASS 'E' RIPRAP TO CONSTRUCT TEMPORARY ROCK CHECK DAM AT END OF THE TEMPORARY EARTH DIVERSION BERM. SEE DETAIL. RE-USE CLASS 'E' RIPRAP FOR PPL-2

380 LF TEMPORARY EARTH DIVERSION BERM

USE CLASS 'E' RIPRAP TO CONSTRUCT TEMPORARY ROCK CHECK DAM AT END OF THE TEMPORARY EARTH DIVERSION BERM. SEE DETAIL. RE-USE CLASS 'E' RIPRAP FOR PPL-3

435 LF TEMPORARY EARTH DIVERSION BERM

DEEP RIP AREA PRIOR TO AG LIME APPLICATION FOR FUTURE TREE PLANTING, TYP.

STABILIZED CONSTRUCTION ENTRANCE

IOWA ONE CALL
CALL 811 / 1-800-292-8989
2 *Working Days* BEFORE YOU DIG
DigSafeWait48.com

GRAPHIC SCALE
0 120' 240' 360'

N

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CROZIER FAMILY (IA-365) AML RECLAMATION PROJECT

RESTORATION AND SWPPP BMP PLAN

SHEET 18 OF 18