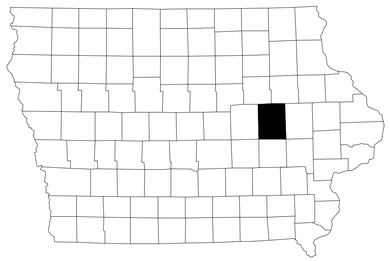
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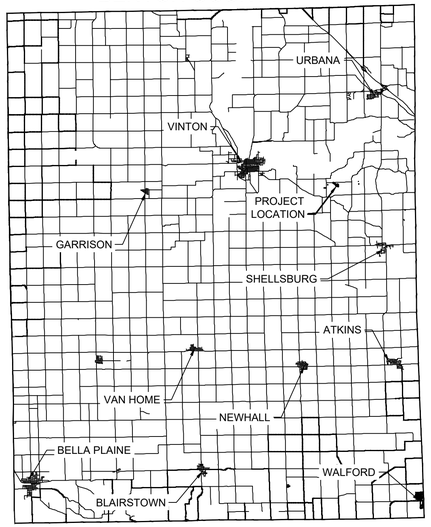
BEN850929B NUTRIENT REDUCTION WETLAND IDALS

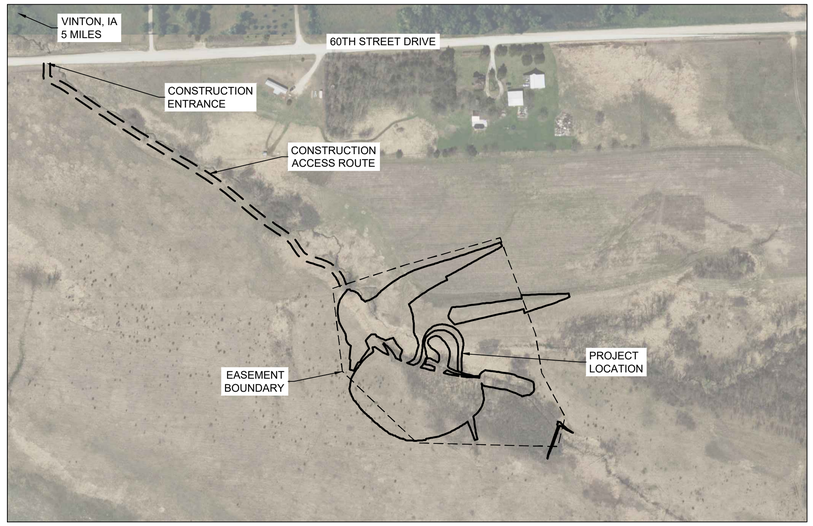
BENTON COUNTY, IOWA

STATE OF IOWA



BENTON COUNTY





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C501	CONSTRUCTION DETAILS
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CONTACT/SITE INFORMATION:

ENGINEER
SHIVE-HATTERY, INC
ATTN: DAN JENSEN, PE
4125 WESTOWN PARKWAY, SUITE 100
WEST DES MOINES, IOWA 50266
PH: (515) 223-8104

LANDOWNERS
MARK NEIGHBOR
PH: (319) 310-4925

SITE ADDRESS:
2928 60TH STREET DRIVE
VINTON, IA 52349

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP
SHANE WULF, PROJECT MANAGER
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1305 E. WALNUT ST.
DES MOINES, IA, 50319
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SHANE.WULF@IOWAAGRICULTURE.GOV
SARA.SMITH@IOWAAGRICULTURE.GOV

PROJECT DRAWING COORDINATE SYSTEM:
HORIZONTAL: NAD83 IOWA STATE PLANE NORTH ZONE (1401)
VERTICAL: NAVD88
UNITS: U.S. SURVEY FEET

STRUCTURAL ENGINEER

LICENSED PROFESSIONAL ENGINEER
CHRISTOPHER R. MARVIN
P27417
IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT DESCRIBED BELOW 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: _____ Date: 10/9/2026

Printed or typed name: CHRIS R. MARVIN
License Number: 27417
My License Renewal Date is: DECEMBER 31, 2027

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
SHEET C401

CIVIL ENGINEER

LICENSED PROFESSIONAL ENGINEER
DANIEL J. JENSEN
25063
IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT DESCRIBED BELOW 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: _____ Date: 10/9/2026

Printed or typed name: DANIEL J. JENSEN
License Number: 25063
My License Renewal Date is: DECEMBER 31, 2027

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
ALL SHEETS, EXCLUDING SHEET C401

CLIENT ACCEPTANCE
PRINTED NAME: _____
SIGNATURE: _____

ONE-CALL TICKET NUMBER: _____

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

THE ENGINEERING JOB CLASS IS IV

NRCS NEM PART 505 CERTIFICATION
THE SIGNING PROFESSIONALS HEREBY CERTIFY THAT, TO THE BEST OF THEIR PROFESSIONAL KNOWLEDGE, JUDGEMENT, AND BELIEF, THESE PLANS MEET APPLICABLE NRCS STANDARDS.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska | Wisconsin

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BEN850929B WETLAND
IDALS
BENTON COUNTY, IOWA

10-08-2026
FINAL DESIGN
PROJECT NO: 2240012790
CLIENT NO: --

C000

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ESTIMATED QUANTITIES:

#	ITEM DESCRIPTION	QUANTITY	UNITS
1	SITE STRIPPING & PREPARATION	1	LS
2	CROP DAMAGE	0	AC
3	STRUCTURE & CHANNEL SEEDING	1.2	AC
4	BUFFER SEEDING	3.8	AC
5	MOBILIZATION AND DEMOBILIZATION	1	LS
6	DRAIN TILE INVESTIGATION AND REMOVAL	2,443	LF
7	STEEL SHEET PILING	1,150	SF
8	EXCAVATION (GENERAL)	1,183	CY
9	EARTHFILL (GENERAL (P))	1,848	CY
10	EARTHFILL (GENERAL DAM (P))	3,441	CY
11	EARTHFILL (DAM CORE (P))	2,933	CY
12	EARTHFILL (18" CLAY LINER, WETLAND BOTTOM, TWO 9" LIFTS (P))	5,300	CY
13	TOPSOIL PLACEMENT, 6 INCH	3,446	CY
14	6" CORRUGATED PROFILE WALL (DUAL WALL, NON-PERFORATED) POLYETHYLENE PIPE	1,158	LF
15	24" ALUMINIZED CMP DRAWDOWN RISER, 12 GA	1	EA
16	48" CMP WATER CONTROL STRUCTURE	1	EA
17	18" ALUMINIZED CMP WETLAND DRAWDOWN PIPE, 14GA	110	LF
18	18" ALUMINIZED CMP FLARED END SECTION	1	EA
19	8" CMP TILE OUTLETS (20 LF EACH)	3	EA
20	RIP RAP, CLASS "E"	668	TON
21	2" CLEAN STONE	35	TON
22	CONCRETE GROUT	72	CY
23	POLLUTION CONTROL, TURF REINFORCEMENT MAT - TYPE 5B	430	SY
24	POLLUTION CONTROL, SILT FENCE	515	LF

WETLAND DESIGN DATA:

CONSULTANT	SHIVE-HATTERY	-----
PROJECT ID	BEN850929B	-----
LANDOWNER(S)	MARK & STACEY NEIGHBOR	-----
PRELIMINARY OR FINAL DESIGN	FINAL	-----
DRAINAGE AREA	183.91	ACRES
WETLAND POOL AREA	2.19	ACRES
DEEP WATER AREA (>3 FT DEEP)	0.06 (2.7%)	ACRES
NORMAL POOL ELEVATION / PRIMARY SPILLWAY ELEVATION	821.00	FEET
AVERAGE POOL DEPTH	0.90	FEET
MAXIMUM POOL DEPTH	4.56	FEET
POOL STORAGE	1.96	ACRE-FEET
BERM ELEVATION	826.00	FEET
BERM STORAGE	21.11	ACRE-FEET
LENGTH OF BERM	617	FEET
AUXILIARY SPILLWAY ELEVATION	N/A	FEET
AUXILIARY SPILLWAY WIDTH	N/A	FEET
WEIR WIDTH	25	FEET
DROP HEIGHT (PRIMARY SPILLWAY ELEVATION – STILLING BASIN LOWEST ELEVATION)	4.0	FEET
HEIGHT OF DAM (BERM ELEVATION – STILLING BASIN LOWEST ELEVATION)	9.0	FEET
STILLING BASIN LENGTH	30	FEET
TIME OF CONCENTRATION	0.39	HOURS
WEIGHTED RUNOFF CURVE NUMBER	81	-----
10-YEAR STORM DESIGN FLOW	338.16	CFS
10-YEAR FLOOD SURF. ELEVATION	823.06	FEET
50-YEAR STORM DESIGN FLOW	565.61	CFS
50-YEAR FLOOD SURF. ELEVATION	823.88	FEET
100-YEAR STORM DESIGN FLOW	680.62	CFS
100-YEAR FLOOD SURF. ELEVATION	824.24	FEET
ESTIMATED SEDIMENT STORAGE	70	YEARS

ESTIMATE REFERENCE NOTES:

ITEM #	SPEC #	DESCRIPTION
1	IA CS-001	SITE STRIPPING & PREPARATION : THIS ITEM WILL CONSIST OF WORK TO REMOVE AND DISPOSE OF EXISTING MATERIAL TO REMOVE VEGETATION ON AREAS TO BE EXCAVATED OR FILLED. TOTAL DEPTH OF VEGETATIVE STRIPPING AND TOPSOIL STRIPPING SHALL EQUAL A COMBINED DEPTH OF 12", WITH THE ESTIMATED AMOUNT OF TOPSOIL REMOVAL BEING 6,891 CUBIC YARDS. THE TOPSOIL REPLACEMENT QUANTITY SHALL BE PAID SEPARATELY. THIS ITEM WILL ALSO INCLUDE ANY TREE AND BRUSH REMOVAL ALONG WITH ANY FENCES.
2	IA CS-001	CROP DAMAGE: THIS ITEM CONSISTS OF CROP DAMAGE THAT RESULTS FROM CONSTRUCTION ACTIVITIES. IT IS RECOMMENDED CONTRACTOR REMOVE CORN RESIDUE RATHER THAN KNOCK IT DOWN. PAYMENT FOR CROP DAMAGE WILL BE MADE TO THE NEAREST 0.1 ACRE AS MEASURED BY THE ENGINEER OR THEIR REPRESENTATIVE. THE UNIT RATE FOR CROP DAMAGE WILL BE DETERMINED BY THE DIVISION NEAR THE COMPLETION OF CONSTRUCTION AND ADDED TO THE CONTRACT WITH A CHANGE ORDER. PAYMENT WILL BE MADE TO CONTRACTOR WHO WILL PAY LANDOWNER.
3	IA CS-006	STRUCTURE & CHANNEL SEEDING: THIS ITEM INCLUDES SEEDING FOR ALL EMBANKMENT AND TILE COVER BERM AREAS AND INCLUDES SEEDBED PREP, SEEDING, MULCHING, AND FERTILIZER.
4	IA CS-006	BUFFER SEEDING: THIS ITEM INCLUDES SEEDING FOR ALL AREAS ABOVE NORMAL POOL AND WITHIN EASEMENT BOUNDARY EXCEPT FOR AREAS SPECIFIED, THIS EXCLUDES AREAS WHERE STRUCTURE SEEDING IS SPECIFIED. SEE SEEDING PLAN. NO MULCH OR FERTILIZER SHALL BE APPLIED.
5	CS-008	MOBILIZATION AND DEMOBILIZATION: THIS ITEM SHALL BE CONSIDERED FULL COMPENSATION TO MOBILIZE AND DEMOBILIZE THE CONTRACTOR'S FORCES AND EQUIPMENT FOR THE PROJECT. ALL OTHER WORK NECESSARY TO COMPLETE THE PROJECT AS REPRESENTED HEREIN BUT NOT INCLUDED IN THE ITEMS LISTED BELOW SHALL BE INCIDENTAL TO THIS ITEM. THIS ITEM SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND IOWA ONE CALL NOTIFICATIONS TO INSTALL SIGN PROVIDED BY IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP, AS SHOWN ON THE PLANS OR ON NEXT PAGE.
6	IA CS-009	DRAIN TILE INVESTIGATION AND REMOVAL: THIS ITEM INCLUDES THE EXPLORATORY EXCAVATIONS REQUIRED TO LOCATE AND REMOVE TILES SHOWN ON THE PLANS. THIS IS FULL COMPENSATION FOR EXCAVATION, BACKFILLING, AND REMOVAL OF THE TILE TRENCHES.
7	IA CS-013	STEEL SHEET PILING: THIS ITEM INCLUDES PROCUREMENT AND INSTALLATION OF THE SHEET PILING AS DETAILED ON SHEET C401 INCLUDING FIELD WELDING, CUTTING, TRIMMING, WALER, BOLTS, NUTS, AND OTHER APPURTENANCES.
8	IA CS-021	EXCAVATION (GENERAL): THIS ITEM INCLUDES THE EXCAVATION OF MATERIAL REQUIRED TO CONSTRUCT THE CORE TRENCH BELOW THE EXISTING GROUND LEVEL, AS DETAILED, ALONG THE CENTERLINE OF PROPOSED DAM EMBANKMENT. TERMINATE CORE TRENCH IN SUITBALE IMPERVIOUS SOILS. CORE TRENCHES SHALL BE LEFT OPEN FOR INSPECTION BY THE ENGINEER. THIS ITEM ALSO INCLUDES REMOVAL OF ANY TILE LOCATE WITHIN THE CORE TRENCH EXTENDING 10 FEET BEYOND THE EMBANKMENT FOOTPRINT. TILE SHALL BE TRACED UPSTREAM AND DAYLIGHTED TO PROPOSED POOLS WHERE POSSIBLE. COORDINATE WITH THE ENGINEER IF ADDITIONAL TILE WORK IS REQUIRED. THIS ITEM ALSO INCLUES THE OVER-EXCAVATION OF THE STREAM CHANNEL WITHIN THE EMBANKMENT FOOTPRINT.
9	IA CS-023	EARTHFILL (GENERAL (P)): THIS ITEM INCLUDES THE AMOUNT OF MATERIAL REQUIRED TO CONSTRUCT THE SUBMERGED BERMS AND ADDITIONAL FILL TO BE PLACED OVER TILE COVER BERMS. COHESIVE MATERIAL FOUND DURING GENERAL GRADING AND COMPACTED LINER REMOVAL CAN BE USED FOR THESE AREAS. SAND AND GRAVEL FOUND ON SITE SHALL NOT BE USED FOR THIS EARTHFILL. SEE SHEET C201 AND C202 FOR LIMITS OF EXCAVATION AND ASSOCIATED FILL. THE REQUIRED FILL INCLUDES A 20% SHRINKAGE FACTOR. MEASUREMENT AND PAYMENT FOR PLACEMENT AND COMPACTION OF ALL FILL MATERIAL IS INCLUDED IN THIS ITEM AND WILL BE PAID BASED ON PLAN QUANTITY.
10	IA CS-023	EARTHFILL (GENERAL DAM (P)): THIS ITEM INCLUDES THE EARTHFILL PLACEMENT AND COMPACTION NECESSARY TO CONSTRUCTION THE PORTION OF THE EMBANKMENT THAT IS NOT THE EMBANKMENT CORE. COHESIVE MATERIAL FOUND DURING GENERAL GRADING AND COMPACTED LINER CAN BE USED FOR THIS AREA. SAND AND GRAVEL FOUND ON SITE SHALL NOT BE USED FOR FILL IN THESE AREAS. SEE SHEET C201 AND C202 FOR LIMITS OF EXCAVATION AND ASSOCIATED FILL. THE REQUIRED FILL INCLUDES A 20% SHRINKAGE FACTOR. MEASUREMENT AND PAYMENT FOR PLACEMENT AND COMPACTION OF ALL FILL MATERIAL IS INCLUDED IN THIS ITEM AND WILL BE PAID BASED ON PLAN QUANTITY.
11	IA CS-023	EARTHFILL (DAM CORE (P)): THIS ITEM INCLUDES THE EARTHFILL PLACEMENT AND COMPACTION NECESSARY TO CONSTRUCT THE EMBANKMENT CORE WITHIN THE EMBANKMENT. COHESIVE MATERIAL TAKEN FROM DESIGNATED BORROW AREA SHOULD BE USED FOR THIS AREA. SAND AND GRAVEL SHALL NOT BE USED FOR THIS AREA. SEE SHEET C201 AND C202 FOR LIMITS OF EXCAVATION AND ASSOCIATED FILL. THE REQUIRED FILL INCLUDES A 20% SHRINKAGE FACTOR. MEASUREMENT AND PAYMENT FOR PLACEMENT AND COMPACTION OF ALL FILL MATERIAL IS INCLUDED IN THIS ITEM AND WILL BE PAID BASED ON PLAN QUANTITY.
12	IA CS-023	EARTHFILL (18" CLAY LINER, WETLAND BOTTOM, TWO 9" LIFTS (P)): THIS ITEM INCLUDES SCARIFICATION AND LOOSENING OF AN 18" LINER IN TWO LIFTS IN THE ENTIRE WETLAND POOL FOOTPRINT. REMOVE 9" OF SOIL, SCARIFY AND RE-COMPACT 9" BELOW, REPLACE 9" AND RECOMPACT, MOISTURE CONDITIONING, AND COMPACTION OF THE WETLAND BOTTOM TO FORM A SEAL. CONTRACTOR SHALL REMOVE ROCKS LARGER THAN 6 INCHES. NOTIFY ENGINEER IMMEDIATELY IF SANDY SOILS ARE ENCOUNTERED. ITEM WILL BE PAID BASED ON PLAN QUANTITY.
13	IA CS-026	TOPSOIL PLACEMENT. 6 INCH: THIS ITEM INCLUDES THE RESPREAD OF 6" TOPSOIL IN ALL DISTURBED AREAS. ITEM WILL BE PAID BASED ON PLAN QUANTITY.
14	IA CS-046	6" CORRUGATED POLYETHYLENE PIPE (DUAL WALL, NON-PERFORATED): THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND BACKFILL OF THE 6" DUAL-WALL NON-PERFORATED HDPE DRAIN TILE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS.
15	IA CS-051	24" ALUMINIZED CMP DRAWDOWN RISER, 12 GA: THIS ITEM INCLUDES COSTS FOR THE MATERIAL AND INSTALLATION OF 24 INCH ALUMINIZED CMP DRAWDOWN STRUCTURE RISER PIPE, TRASH RACK, AND BASE A DETAILED.
16	IA CS-051	48" CMP WATER CONTROL STRUCTURE : THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, AND MATERIALS FOR THE PLACEMENT OF THE 48" CMP RISER STRUCTURE, FOOTING, STEEL, FABRICATION, STOPLOGS, STOPLOG STORAGE STRUCTURE, PIPE CONNECTIONS, AND TRASH RACK.
17	IA CS-051	18" CMP DRAWDOWN WETLAND OUTLET PIPE: THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, MATERIALS REQUIRED FOR THE EXCAVATION, AND THE PLACEMENT OF THE CORRUGATE METAL PIPE.
18	IA CS-051	18" ALUMINIZED CMP FLARED END SECTION: THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, MATERIALS REQUIRED FOR THE EXCAVATION, AND THE PLACEMENT OF THE CMP FES.
19	IA CS-051	8" CMP TILE OUTLETS (20 LF EACH): THIS ITEM INCLUDES THE COSTS FOR MATERIAL, EXCAVATION, PLACEMENT, JOINTING, BEDDING, RODENT GUARDS, AND BACKFILLING OF THE 20 LF 8" CMP END SECTION FOR THE PROPOSED FIELD TILE OUTLET TO THE WETLAND. 8" CMP OUTLET SECTIONS ARE FOR 6 INCH TILES.
20	IA CS-061	RIP RAP, CLASS "E": THIS ITEM INCLUDES THE EXCAVATION AND PLACEMENT OF CLASS 'E' REVETMENT OVER GEOTEXTILE FABRIC AT THE LOCATIONS SHOWN ON THE PLANS. THIS ITEM INCLUES TILE OUTLETS, FOREBAY ROCK CHECKS, AND SHEET PILE OUTLET CHANNEL. GEOTEXTILE FABRIC IS INCIDENTAL TO THIS ITEM. QUANTITY DETERMINATION IS BASED ON A UNIT WEIGHT OF 110 POUNDS PER CUBIC FOOT. PROVIDE WEIGHT TICKETS TO OWNER'S REPRESENTATIVE.
21	IA CS-061	2" CLEAN STONE: THIS ITEMS INCLUDES PROCUREMENT, PLACEMENT AND SPREADING OF 2 INCH CLEAN STONE AT THE CONSTRUCTION ENTRANCE. QUANTITY DETERMINATION IS BASED ON A UNIT WEIGHT OF 130 POUNDS PER CUBIC FOOT.
22	IA CS-062	CONCRETE GROUT: GROUT MIX SHALL BE AS SPECIFIED AND SHALL BE PLACED USING A CONCRETE PUMPER AND CONSOLIDATED USING A MECHANICAL VIBRATOR. GROUT SHALL FULLY ENCASE THE BOTTOM OF THE RIP RAP BUT NOT FULL TO THE TOP OF THE RIP RAP SO AS TO REDUCE THE ENERGY DISSIPATION CAPABILITIES. GROUT UPSTREAM OF THE WEIR SHALL BE SMOOTH FINISHED 1" BELOW THE CREST. GROUT SHALL ONLY BE PLACED IN THE PRESENCE OF THE ENGINEER.
23	IA CS-005	POLLUTION CONTROL, TURF REINFORCEMENT MAT - TYPE 5B: THIS ITEM INCLUDES PROCUREMENT AND INSTALLATION OF TYPE 5B TURF REINFORCING MAT IN ACOORDANCE WITH SUDAS 9040. INSTALLATION SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS.
24	IA CS-005	POLLUTION CONTROL, SILT FENCE: THIS ITEM INCLUDES PROCUREMENT AND INSTALLATION OF SILT FENCE DITCH CHECKS AS SHOWN ON THE PLANS AND AS DETAILED.

GENERAL NOTES:

1. THE LOCATIONS OF UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS PLOTTED ON THIS DRAWING ARE APPROXIMATE ONLY AND WERE OBTAINED FROM RECORDS MADE AVAILABLE TO SHIVE-HATTERY, INC. THERE MAY BE OTHER EXISTING UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS NOT KNOWN TO SHIVE-HATTERY, INC. AND NOT SHOWN ON THIS DRAWING. THE VERIFICATION OF EXISTENCE OF, AND THE DETERMINATION OF THE EXACT LOCATION OF, UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR(S).
2. IOWA CODE 480, UNDERGROUND FACILITIES INFORMATION, REQUIRES VERBAL NOTICE TO IOWA ONE-CALL 1-800-292-8989, NOT LESS THAN 48 HOURS BEFORE EXCAVATING, EXCLUDING WEEKENDS AND HOLIDAYS.
3. THE MEANS OF THE WORK AND THE SAFETY OF THE CONTRACTOR'S EMPLOYEES ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
4. NO WORK SHALL BE PERFORMED BEYOND THE PROJECT LIMITS WITHOUT PRIOR AUTHORIZATION FROM THE OWNER'S REPRESENTATIVE.
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.
6. ALL DEBRIS AND TRASH ENCOUNTERED DURING CONSTRUCTION WITHIN THE PROJECT LIMITS, OR DIRECTED BY THE ENGINEER, SHALL BE PROPERLY DISPOSED OF.
7. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION DE-WATERING THAT IS REQUIRED AT NO ADDITIONAL COST TO THE DIVISION.
8. REPAIR OR REPLACE DAMAGE TO EXISTING FACILITIES (TILE, UTILITIES, FENCES, ETC.) DESIGNATED TO REMAIN, AT NO ADDITIONAL EXPENSE TO THE OWNER. ALL AREAS DISTURBED BY CONSTRUCTION, INCLUDING STAGING AREAS AND HAUL ROUTES, ARE TO BE REWORKED TO THEIR EXISTING CONDITIONS AND SEEDED AT NO ADDITIONAL COST TO THE DIVISION IF OUTSIDE OF PROJECT LIMITS AND NOT APPROVED BY ENGINEER.
9. WORK WHICH DOES NOT CONFORM TO THE REQUIREMENTS OF THE CONTRACT WILL BE CONSIDERED UNACCEPTABLE. UNACCEPTABLE WORK, WHETHER THE RESULT OF POOR WORKMANSHIP, USE OF DEFECTIVE MATERIALS, DAMAGE THROUGH CARELESSNESS OR ANY OTHER CAUSE, FOUND TO EXIST PRIOR TO THE FINAL ACCEPTANCE OF THE WORK, SHALL BE REMOVED AND REPLACED IN AN ACCEPTABLE MANNER, AS REQUIRED BY THE OWNER AT THE CONTRACTOR'S EXPENSE.
10. WORK DONE CONTRARY TO THE INSTRUCTIONS OF THE OWNER'S REPRESENTATIVE, WORK DONE BEYOND THE LINES SHOWN ON THE PLANS OR ANY EXTRA WORK DONE WITHOUT AUTHORITY WILL NOT BE PAID FOR.
11. A SHRINKAGE FACTOR OF 20% 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.
12. CONTOURS AND SPOT ELEVATIONS SHOWN ARE TO FINISHED GRADE.
13. THE CONTRACTOR SHALL KEEP ALL ROADS OPEN TO THROUGH TRAFFIC AT ALL TIMES.
14. ALL WORK WITHIN THE PUBLIC RIGHT OF WAY SHALL BE COORDINATED WITH THE GOVERNING AUTHORITY AND SHALL BE DONE IN ACCORDANCE WITH THEIR STANDARDS.
15. SUBMIT MANUFACTURER'S CERTIFICATION AND MATERIAL DATA FOR ALL MATERIALS DELIVERED TO THE PROJECT SITE AS REQUESTED BY THE OWNER'S REPRESENTATIVE.
16. CONSTRUCTION SURVEY STAKING WILL BE PAID FOR BY THE OWNER AND PROVIDED BY THE ENGINEER. CONTROL POINTS WILL BE SET FOR USE WITH GPS CONTROLLED GRADING, IF DESIRED. CONTRACTOR SHALL PRESERVE STAKES TO THE EXTENT FEASIBLE. ANY RE-STAKING COSTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
17. NEITHER SHIVE-HATTERY NOR IDALS GUARANTEE THIS PRACTICE WILL HOLD A PERMANENT POOL OF WATER.

CULTURAL RESOURCES NOTE:

1. IF A CULTURAL RESOURCE IS IDENTIFIED DURING CONSTRUCTION, STOP IMMEDIATELY AND NOTIFY LOCAL NATURAL RESOURCES CONSERVATION SERVICE OFFICE.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska | Wisconsin

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BEN850929B WETLAND

IDALS

BENTON COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 10-08-2026
PROJECT NO: 224001279O
FIELD BOOK: ---
CLIENT NO: ---

PROJECT, QUANTITIES & NOTES

C001

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LEGEND

DESCRIPTION	PROPOSED LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER ELEVATION	
PROPOSED DUAL WALL TILE	
EXISTING TILE	
100-YR STORM BOUNCE	
MAJOR CONTOUR	800
MINOR CONTOUR	801
EXISTING CONTOUR - MAJOR	800
EXISTING CONTOUR - MINOR	801
EXISTING STREAM	
EASEMENT BOUNDARY	

PROTECT EXISTING TREE

PLUNGE POOL OUTLET RIPRAP PROTECTION
PLACE 160 TONS CLASS 'E' RIPRAP 2' THICK
OVER NON-WOVEN GEOTEXTILE

DRAWDOWN STRUCTURE
- SEE C202 AND C303

OVER-EXCAVATE STREAM CHANNEL
WITHIN EMBANKMENT FOOTPRINT
DEPTH = 5 FEET
ESTIMATED QUANTITY = 259 CY

TOP OF DAM
ELEVATION = 826.00
TOP WIDTH = 12 FEET

EMBANKMENT GRADING LIMITS
AREA = 0.8 ACRES

EASEMENT
BOUNDARY (TYP.)

10' WIDE WAVE BENCH
- SEE DETAIL

INTERIOR WETLAND BERM
ELEV = 820.50
TOP WIDTH = 20 FEET
SIDE SLOPES = 10:1

TURF REINFORCEMENT
MAT, TYPE 5B
AREA = 430 SY

PLUNGE POOL
OUTLET CHANNEL
WIDTH = 25 FEET
DEPTH = 2 FEET

TILE OUTLET
11 TONS CLASS
'E' RIPRAP

SHEET PILE
CREST WIDTH = 25 FEET
TOTAL WIDTH = 75 FEET
CREST ELEVATION = 821.00
- SEE SHEET C302 AND C401

FILL IN DEEP CHANNEL
AREAS WITH
COHESIVE MATERIAL

GROUTED RIPRAP PLUNGE POOL
320 TONS CLASS 'E' RIPRAP
63 CY CONCRETE GROUT

WETLAND DRAINAGE CHANNEL
BOTTOM WIDTH = 3 FEET
SIDE SLOPES = 4:1

100-YEAR STORM BOUNCE
ELEVATION = 824.24
AREA = 4.3 ACRES

GROUTED RIPRAP ABOVE SHEET PILE
50 TONS CLASS 'E' RIPRAP
9 CY CONCRETE GROUT

FOREBAY OUTLET PROTECTION
30 TONS CLASS 'E' RIPRAP 2'
THICK OVER NON-WOVEN
GEOTEXTILE FABRIC

TOP OF DAM
ELEVATION = 826.00
AREA = 6.1 ACRES

15 TONS CLASS 'E' RIP RAP MOUNDED
AROUND INTAKE RISER, PLACE WITH CARE
TO ENSURE INTEGRITY OF CMP PIPE

TILE OUTLET
11 TONS CLASS
'E' RIPRAP

INTERIOR WETLAND BERM
ELEV = 820.90
TOP WIDTH = 20 FEET
SIDE SLOPES = 10:1

TILE OUTLET
11 TONS CLASS
'E' RIPRAP

FOREBAY INLET PROTECTION
60 TONS CLASS 'E' RIPRAP 2'
THICK OVER NON-WOVEN
GEOTEXTILE FABRIC

WETLAND FOREBAY
SIZE = 40' X 170'
DEPTH = 4 FEET

NORMAL WATER LEVEL
ELEVATION = 821.00
AREA = 2.2 ACRES

PROPOSED TILE (TYP.)
- SEE SHEET C202

FILL IN CHANNEL

BORROW GRADING LIMITS
AREA = 1.7 ACRES

EXISTING TILE (TYP.)

NORTH

0 20 40 80
SCALE IN FEET

TILE NOTES

1. THE INVERT ELEVATIONS AND SLOPES FOR PROPOSED DRAIN TILES ON THIS PLAN ARE BASED ON ASSUMED DEPTHS OF EXISTING DRAIN TILES. CONTRACTOR TO LOCATE AND CONNECT PROPOSED DRAIN TILES TO EXISTING TILES WHERE FEASIBLE. COORDINATE WITH ENGINEER.
2. INTERCEPT ALL CROSSING TILES AND CAP DOWNSTREAM ENDS.
3. MAINTAIN A MINIMUM OF 3' OF COVER OVER TOP OF PROPOSED TILES AND A MINIMUM SLOPE OF 0.30%.

WETLAND PARAMETERS

DRAINAGE AREA = 183.91 ACRES
NORMAL POOL AREA = 2.19 ACRES
SA/DA RATIO = 1.19%

HYDRAULIC PARAMTERS

TOP OF BERM ELEVATION = 826.00
NORMAL WATER ELEVATION = 821.00
STORAGE AT NWL = 1.96 ACRE-FEET
STORAGE AT TOP OF DAM = 21.11 ACRE-FEET

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BEN850929B WETLAND

IDALS
BENTON COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 10-08-2026
PROJECT NO: 24001270
FIELD BOOK: ---
CLIENT NO: ---

GRADING PLAN

C201

LEGEND

DESCRIPTION	PROPOSED LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER ELEVATION	
PROPOSED DUAL WALL TILE	
EXISTING TILE	
100-YR STORM BOUNCE	
MAJOR CONTOUR	800
MINOR CONTOUR	801
EXISTING CONTOUR - MAJOR	800
EXISTING CONTOUR - MINOR	801
EXISTING STREAM	
EASEMENT BOUNDARY	

DRAWDOWN PIPE B
61 LF 18" CMP @ 0.00%

FLARED END SECTION (18" CMP)
RIM = 816.71
IE = 815.00 DRAWDOWN PIPE B S

WATER CONTROL STRUCTURE (48" CMP)
RIM = 827.00
IE = 815.00 DRAWDOWN PIPE A S
IE = 815.00 DRAWDOWN PIPE B N

DRAWDOWN RISER (24" CMP)
RIM = 820.50
IE = 815.00 DRAWDOWN PIPE A N

DRAWDOWN PIPE A
49 LF 18" CMP @ 0.00%

TILE 1.1
20 LF 8" CMP TILE OUTLET @ 0.58%
START IE = 822.12
END IE = 822.00

.8" CMP TILE OUTLET
IE = 822.00

TILE 1.2
323 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 0.58%
START IE = 824.00
END IE = 822.12

8" CMP TILE OUTLET
IE = 822.00

TILE 3.2
31 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 1.10%
START IE = 822.56
END IE = 822.22

TILE 3.1
20 LF 8" CMP TILE OUTLET @ 1.10%
START IE = 822.22
END IE = 822.00

TILE 3.3
90 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 1.10%
START IE = 823.54
END IE = 822.56

8" CMP TILE OUTLET
IE = 822.00

TILE 2.1
20 LF 8" CMP TILE OUTLET @ 0.33%
START IE = 822.07
END IE = 822.00

TILE 2.2
105 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 0.33%
START IE = 822.41
END IE = 822.07

TILE 2.5
79 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 0.33%
START IE = 823.70
END IE = 823.44

TILE 3.4
215 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 1.10%
START IE = 825.90
END IE = 823.54

TILE 2.3
150 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 0.33%
START IE = 822.90
END IE = 822.41

TILE 2.4
165 LF 6" DUAL WALL HDPE (NON-PERFORATED) @ 0.33%
START IE = 823.44
END IE = 822.90

NORTH

0 20 40 80
SCALE IN FEET

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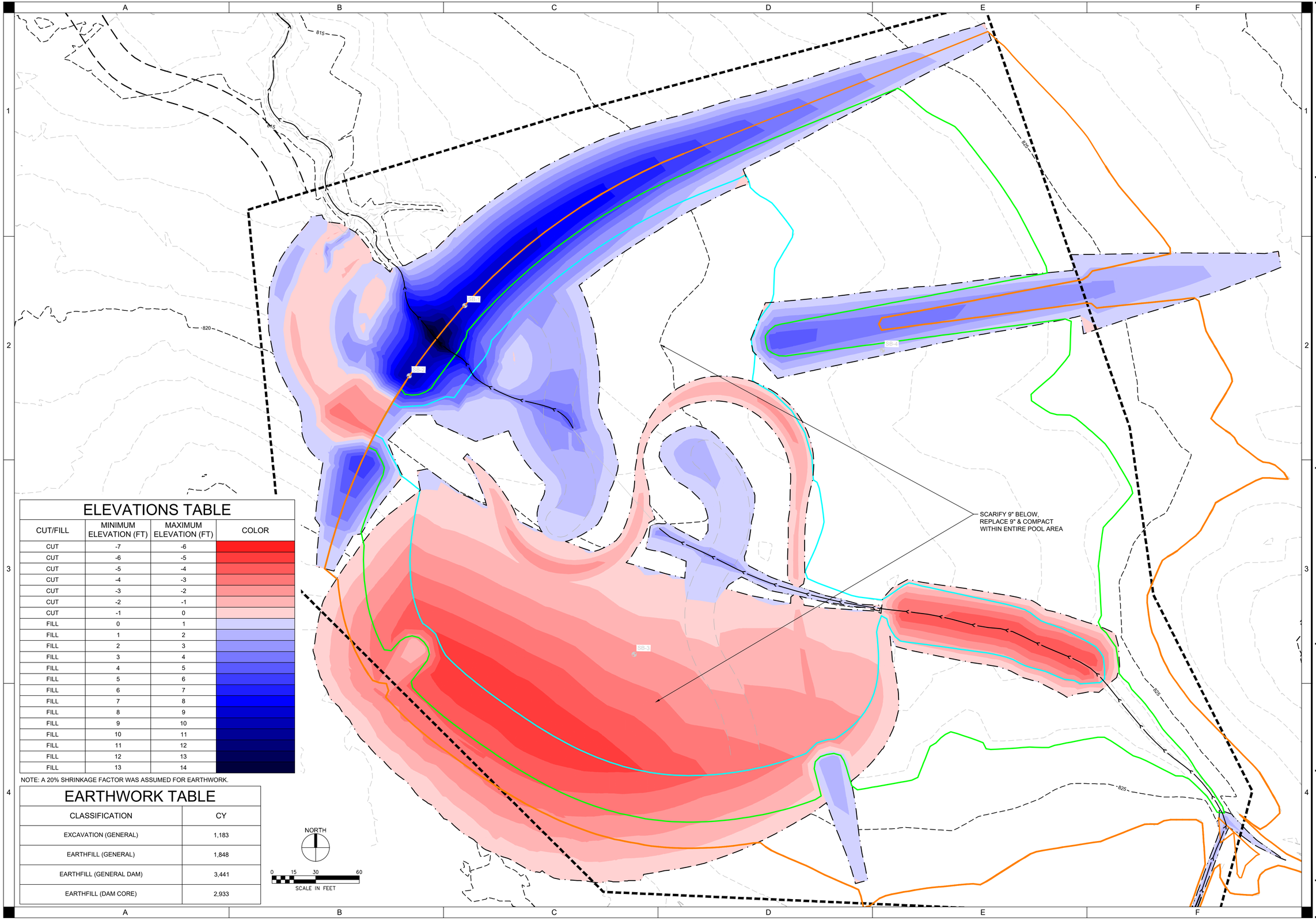
BEN850929B WETLAND

IDALS
BENTON COUNTY, IOWA

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APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 10-08-2026
PROJECT NO: 224001279
FIELD BOOK: ---
CLIENT NO: ---

TILE AND OUTLET PLAN

C202



ELEVATIONS TABLE

CUT/FILL	MINIMUM ELEVATION (FT)	MAXIMUM ELEVATION (FT)	COLOR
CUT	-7	-6	
CUT	-6	-5	
CUT	-5	-4	
CUT	-4	-3	
CUT	-3	-2	
CUT	-2	-1	
CUT	-1	0	
FILL	0	1	
FILL	1	2	
FILL	2	3	
FILL	3	4	
FILL	4	5	
FILL	5	6	
FILL	6	7	
FILL	7	8	
FILL	8	9	
FILL	9	10	
FILL	10	11	
FILL	11	12	
FILL	12	13	
FILL	13	14	

NOTE: A 20% SHRINKAGE FACTOR WAS ASSUMED FOR EARTHWORK.

EARTHWORK TABLE

CLASSIFICATION	CY
EXCAVATION (GENERAL)	1,183
EARTHFILL (GENERAL)	1,848
EARTHFILL (GENERAL DAM)	3,441
EARTHFILL (DAM CORE)	2,933

NORTH

0 15 30 60
SCALE IN FEET

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CUT-FILL PLAN

C203

GRADING LIMITS (TYP.)

EASEMENT BOUNDARY (TYP.)

DRAWDOWN STRUCTURE - SEE SHEET C303

GROUTED RIPRAP PLUNGE POOL - SEE SHEET C302

TOP OF DAM
TOP WIDTH = 12 FEET
ELEV = 826.00

EMBANKMENT CENTERLINE ALIGNMENT

10' WIDE WAVE BENCH - SEE DETAIL

NORMAL WATER LEVEL
ELEV = 821.00

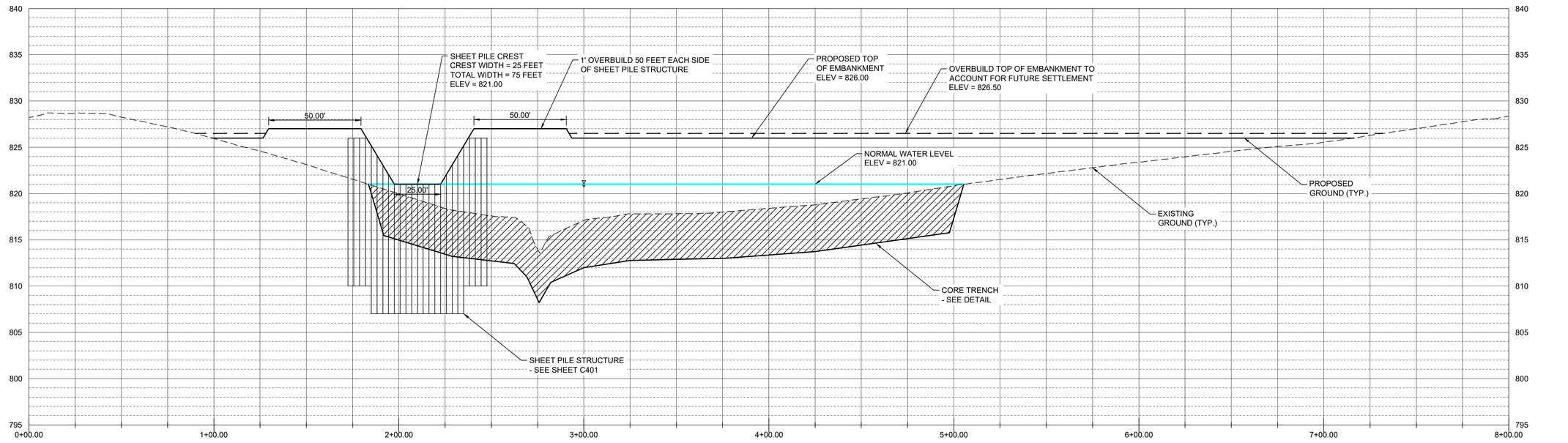
PROPOSED TILE - SEE SHEET C304

100-YEAR STORM BOUNCE
ELEV = 824.24

TOP OF DAM
ELEV = 826.00

NORTH

SCALE IN FEET
0 15 30 60



VERTICAL SCALE:
0 3 6 12
SCALE IN FEET

HORIZONTAL SCALE:
0 15 30 60
SCALE IN FEET

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IDALS

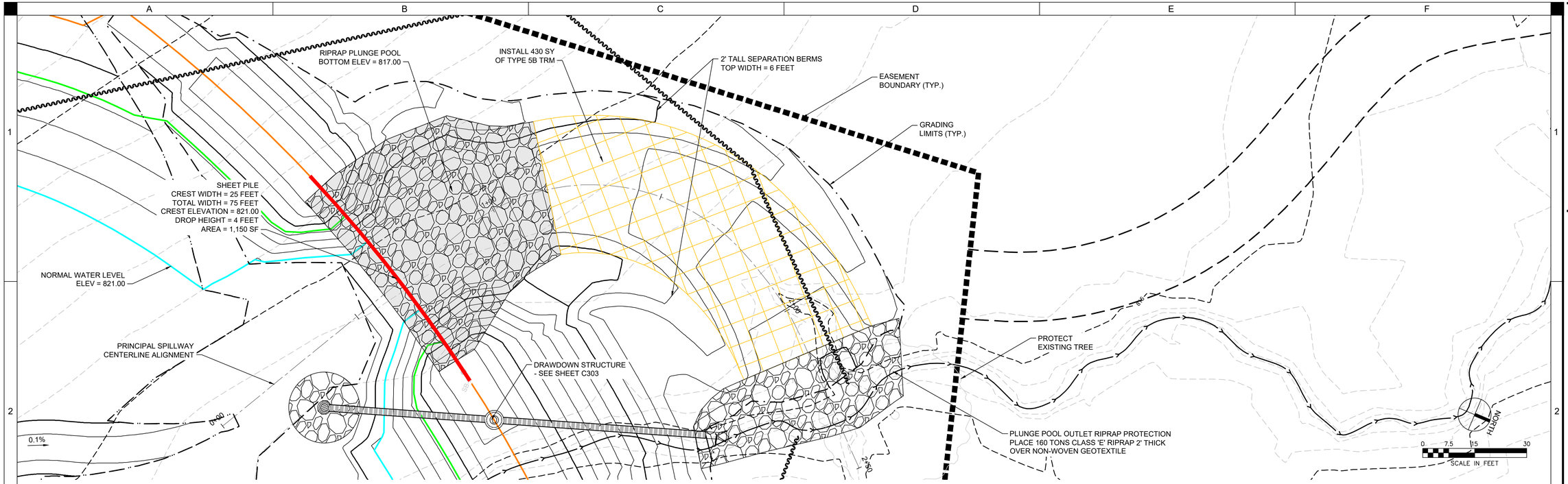
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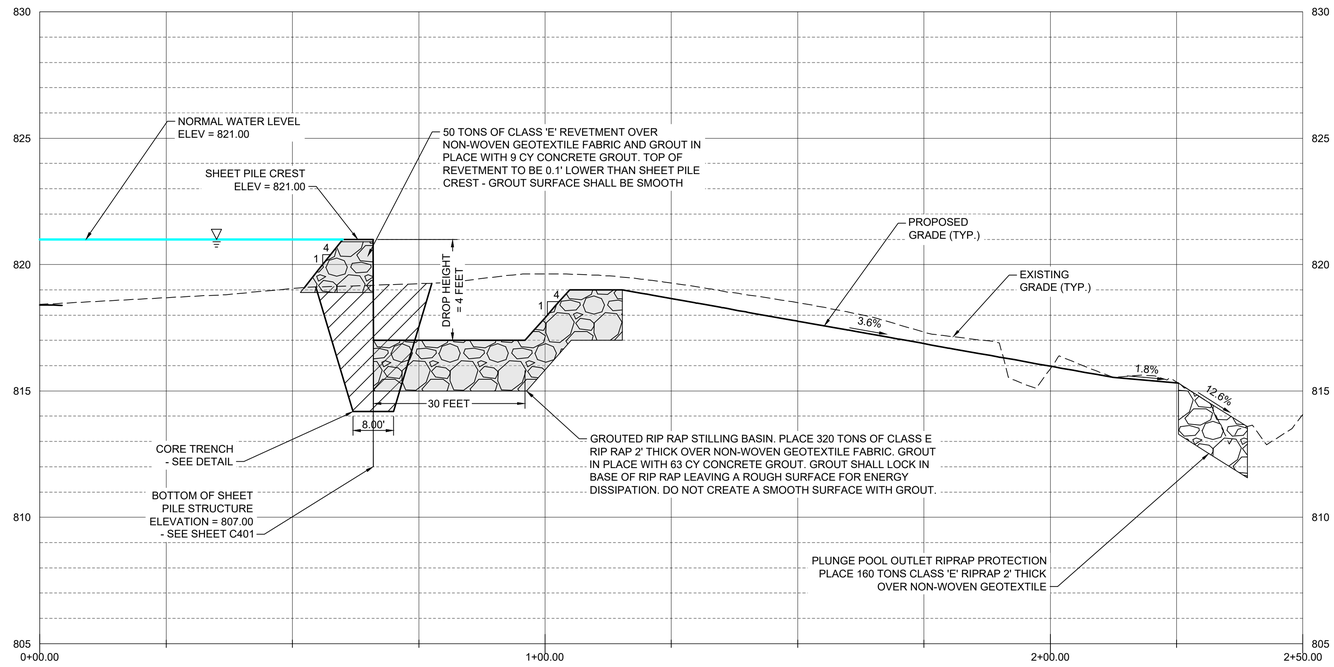
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EMBANKMENT PLAN & PROFILE

C301

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VERTICAL SCALE:
0 1.5 3 6
SCALE IN FEET

HORIZONTAL SCALE:
0 7.5 15 30
SCALE IN FEET

PRINCIPAL SPILLWAY PLAN & PROFILE

C302

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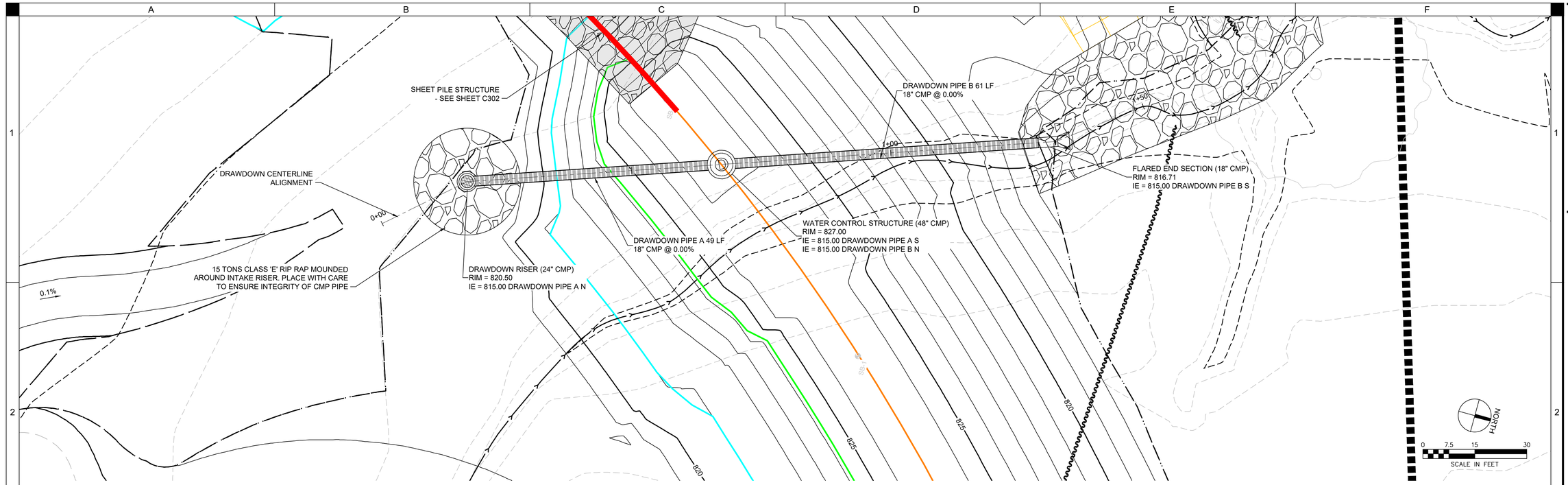
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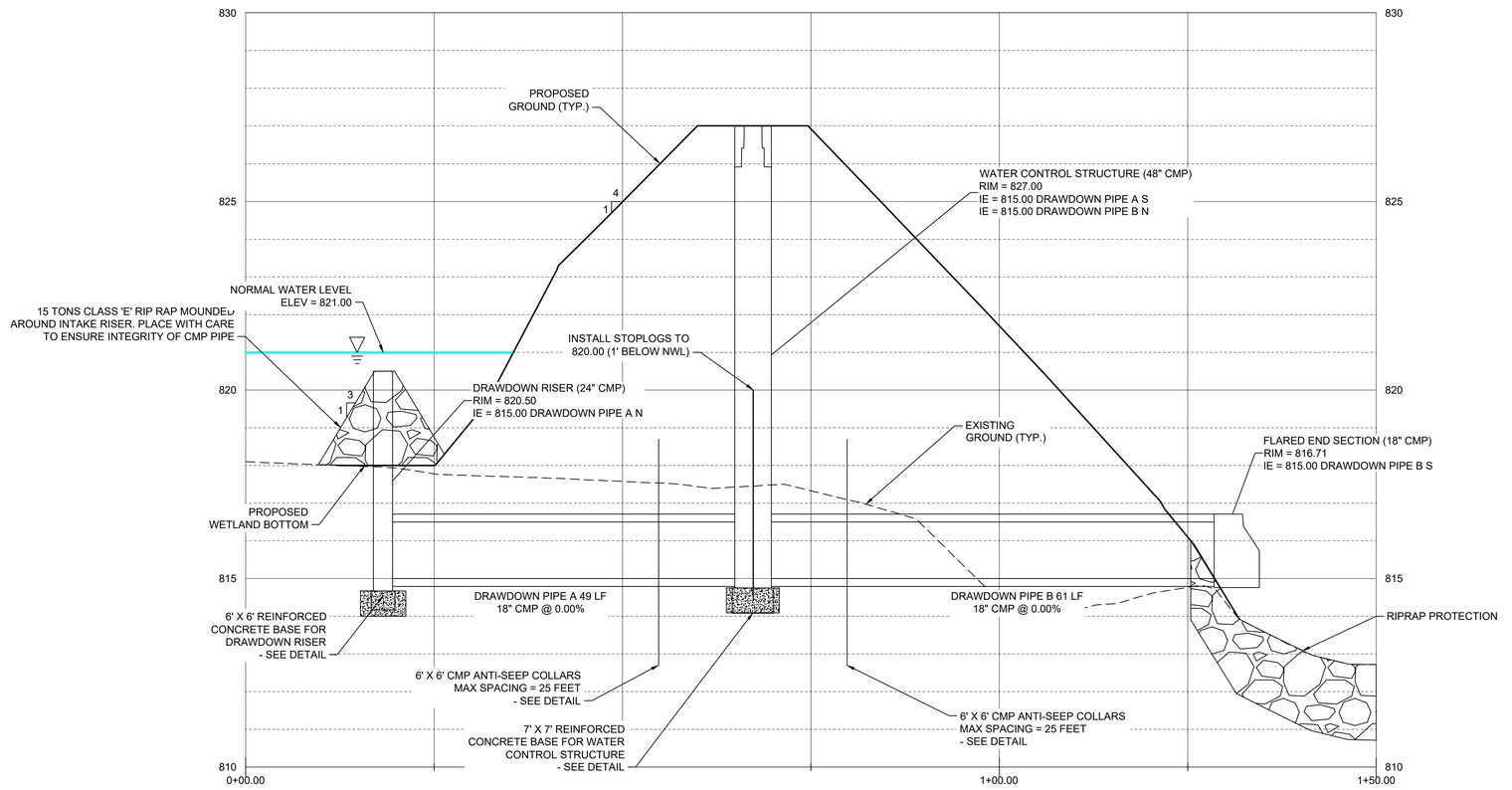
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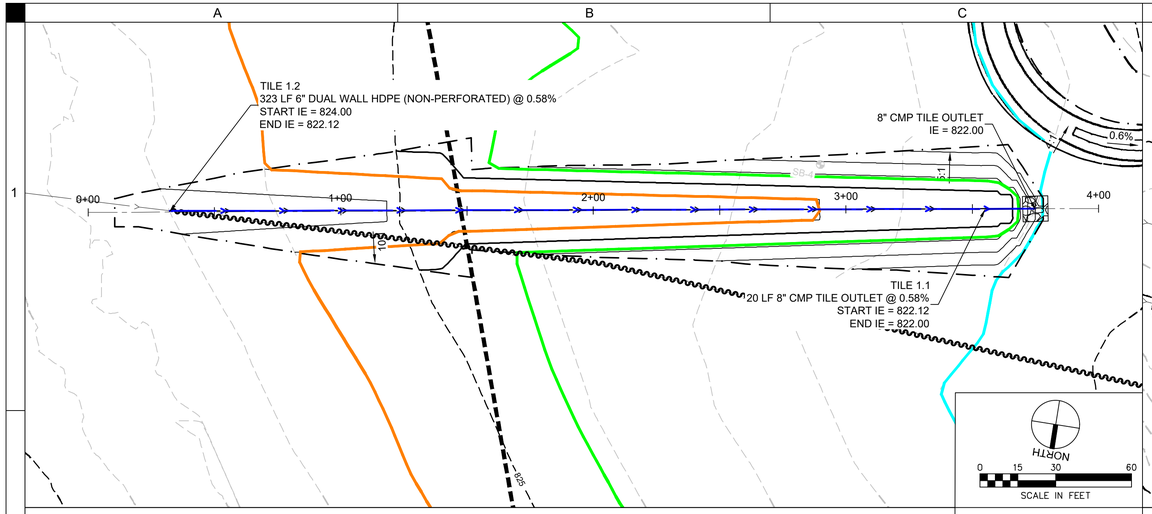
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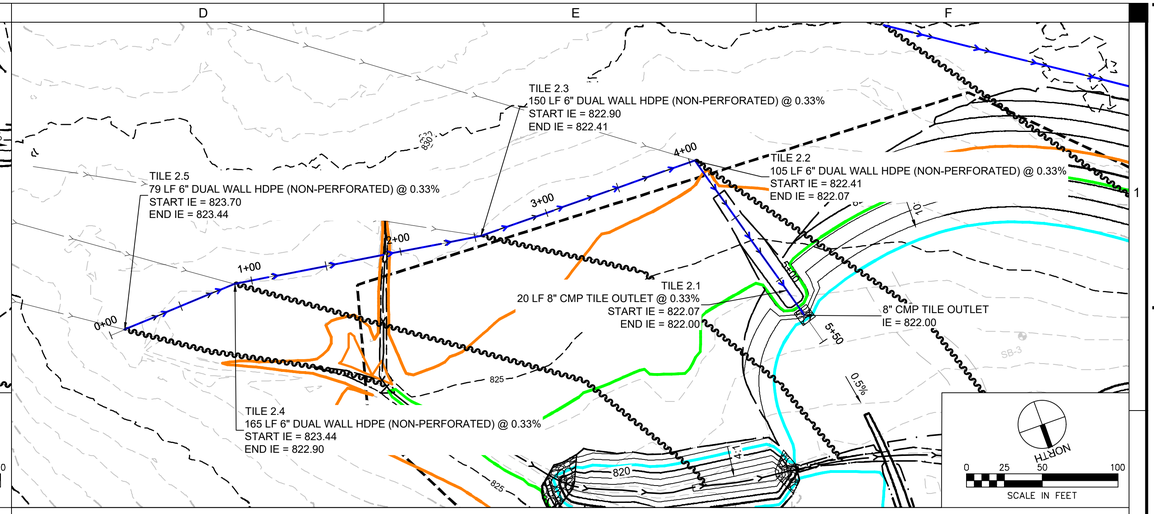
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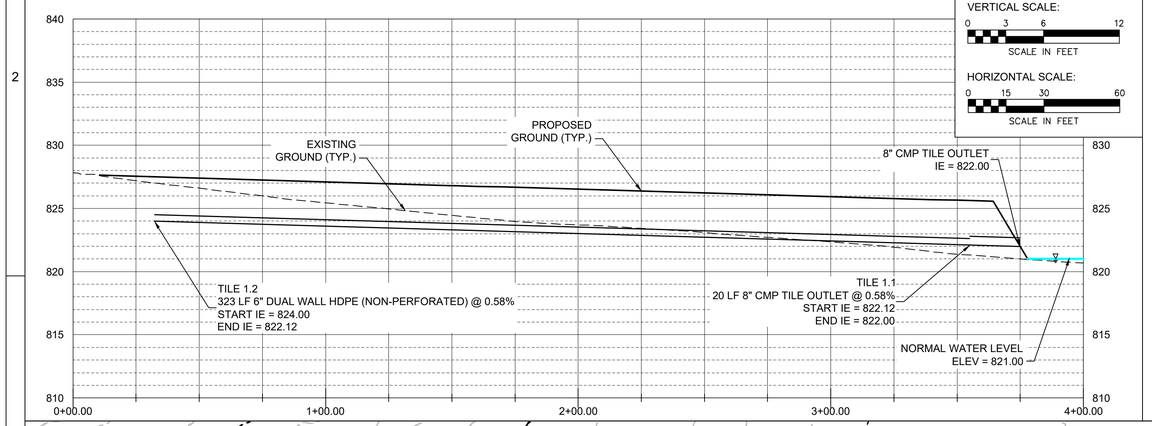
DRAWDOWN PLAN & PROFILE

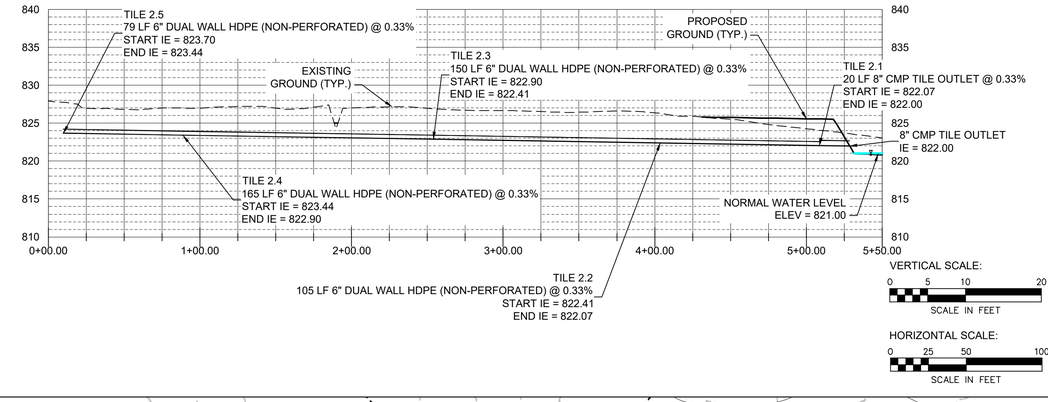
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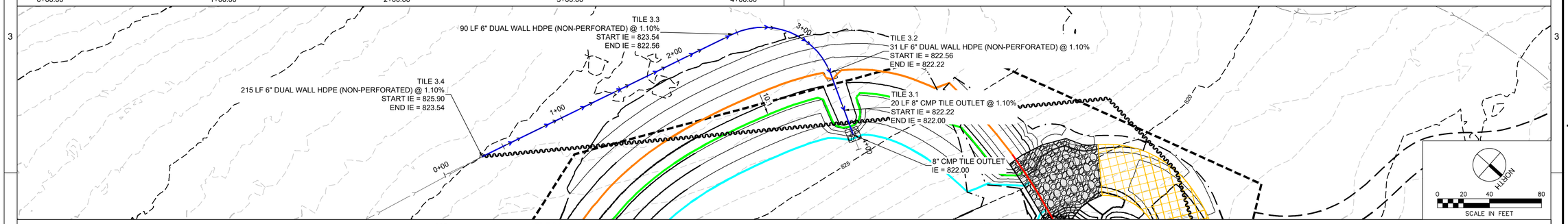
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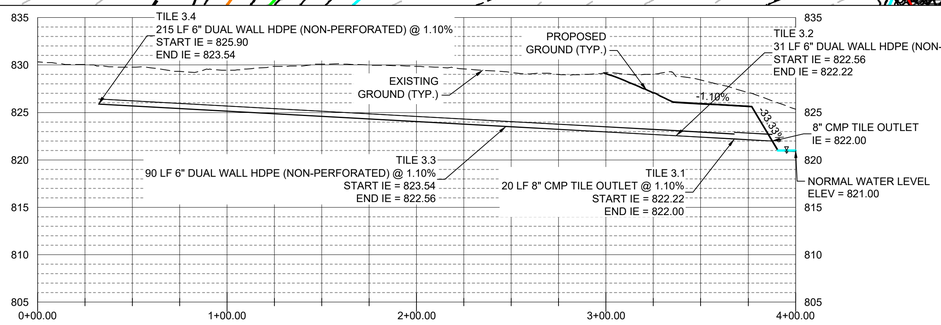












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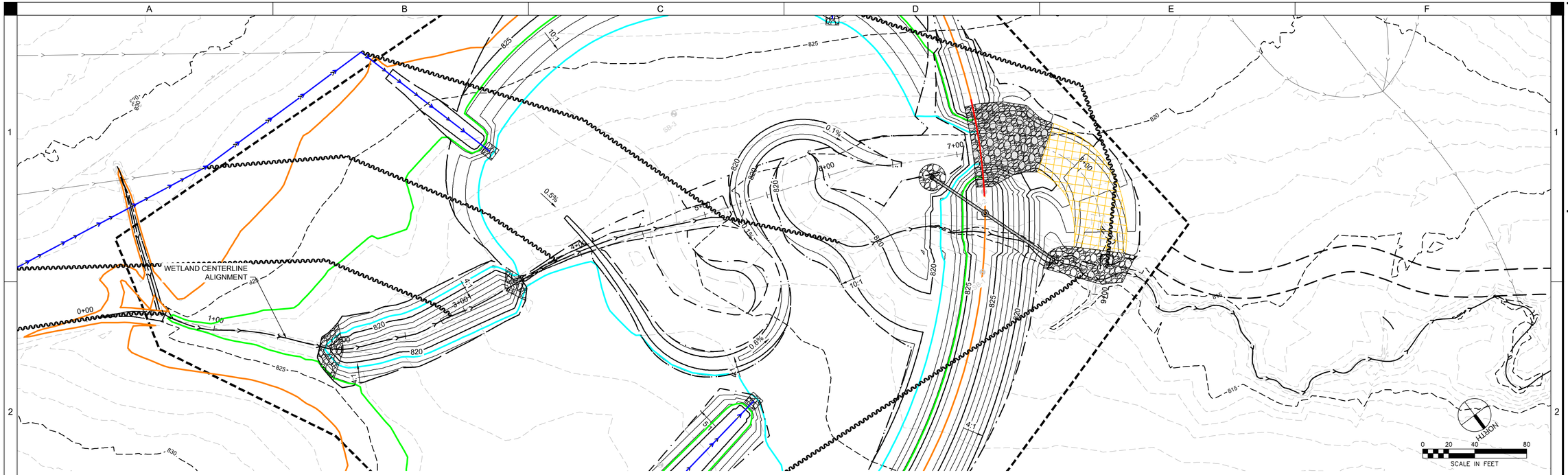
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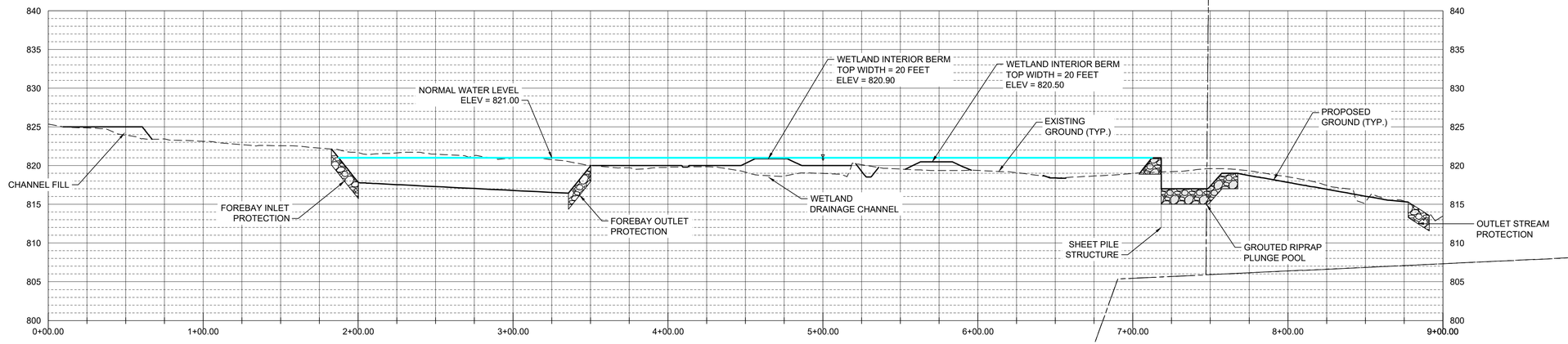
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TILE PLAN & PROFILE

C304

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VERTICAL SCALE:
0 2 4 8
SCALE IN FEET

HORIZONTAL SCALE:
0 20 40 80
SCALE IN FEET

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BEN850929B WETLAND

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BENTON COUNTY, IOWA

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PROJECT NO: 224001279O
FIELD BOOK: ---
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WETLAND PLAN & PROFILE

C305

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SHEET PILE GENERAL NOTES:

1. DESIGN SHEET PILE AREA IS 1,150 SF AFTER TRIMMING

2. SHEET PILING REQUIREMENTS DESIGN BASIS - SKYLINE STEEL/NUCOR SCZ 14 OR ENGINEER APPROVED EQUAL
   - 2.1. MINIMUM SECTION MODULUS OF 14.36 IN^3 PER FOOT OF WALL.
   - 2.2. MINIMUM GRADE OF STEEL IS 50 KSI
   - 2.3. MINIMUM MOMENT OF INERTIA OF 71.82 IN^4 PER FOOT OF WALL.
   - 2.4. MINIMUM THICKNESS OF 0.25"
   - 2.5. ALL SHEET PILING SHALL MEET ASTM A-572 GR50.
   - 2.6. ALL BOLTS SHALL MEET ASTM A307 GRADE A.
   - 2.7. ALL WASHERS SHALL MEET ASTM F436.
   - 2.8. ALL NUTS SHALL MEET ASTM A563.

3. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS OF PROPOSED SHEET PILE SYSTEM FOR APPROVAL BY ENGINEER.

4. SHEET PILE ATTACHMENT TO WALER:
   - 4.1. SHEET PILE WALER/PILE CAP MAY BE BOLTED OR WELDED. SEE DETAILS FOR OPTIONS.
   - 4.2. BOLTED WALER OPTION
     - 4.2.1. ALL BOLTS WILL BE 1" DIAMETER WITH 2 WASHERS. BOLT SHALL BE EXTENDED AT A MINIMUM OF $\frac{3}{8}$" BEYOND THE NUT.
     - 4.2.2. ALL HOLES SHALL BE FIELD DRILLED TO $1\frac{1}{16}$" DIAMETER. TORCH, PLASMA CUTTING, OR OTHER METHODS RESULTING IN AN IMPERFECT HOLE WILL NOT BE PERMITTED.
     - 4.2.3. THE WALER SHALL BE PLACED ON THE DOWNSTREAM SIDE OF THE WEIR.
   - 4.3. WELDED PILE CAP OPTION
     - 4.3.1. AT THE CONTRACTORS OPTION, A WELDED PILE CAP MAY BE INSTALLED IN LIEU OF THE BOLTED WALER. SEE PILE CAP OPTION DETAIL.
     - 4.3.2. WELDING SHALL BE IN ACCORDANCE WITH THE STRUCTURAL WELDING CODE, AWS D1.1, LATEST EDITION, AND SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY USING E70XX ELECTRODES.

5. ANY HOLES LEFT IN SHEET PILE SHALL BE CLOSED OFF.

6. AFTER SHEETING AND WALER INSTALLATION, ALL SHEETING IS TO BE CUT TO CONFORM WITH THE 3:1 SIDE SLOPE OF THE WEIR, MEET DESIGN ELEVATIONS, AND TO REMOVE ANY DAMAGE CAUSED BY DRIVING.

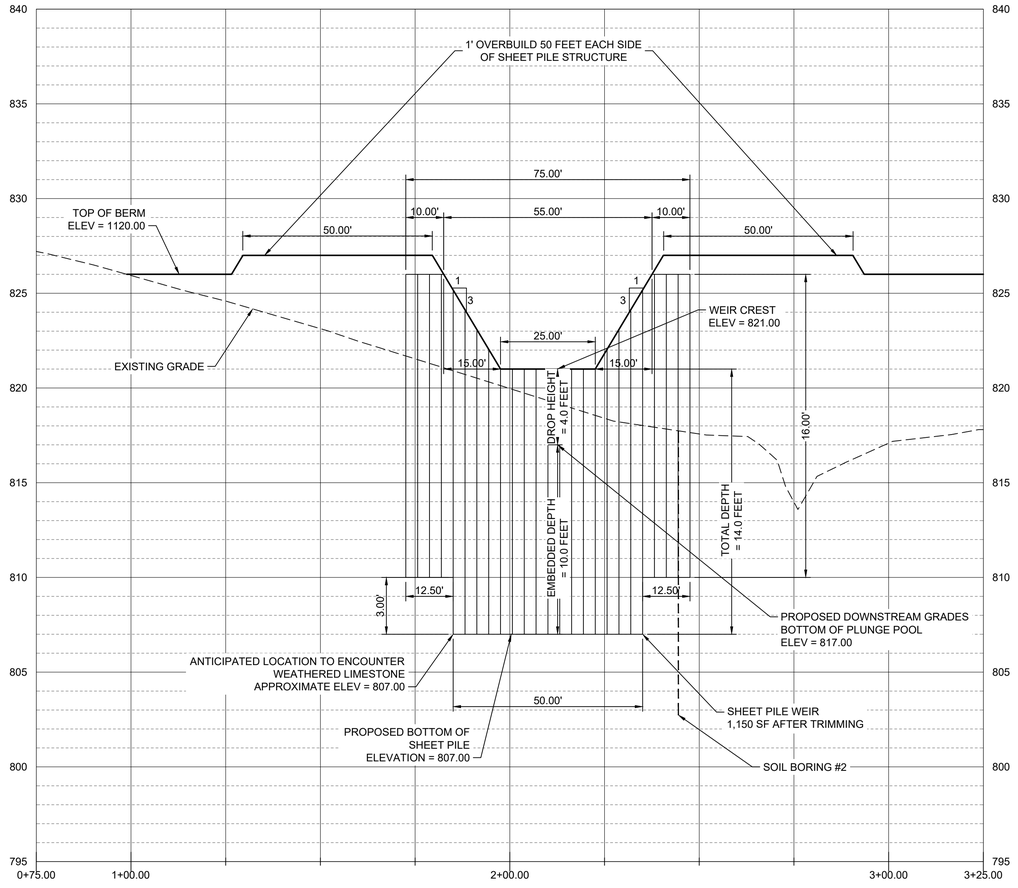
7. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATION OF AISC. FABRICATOR SHALL SUBMIT SHOP DRAWINGS AND FABRICATE AFTER ENGINEER'S REVIEW AND APPROVAL.

8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALLOWABLE CONSTRUCTION LIVE LOADS.

9. PROVIDE ALL NECESSARY TEMPORARY BRACING, SHORING, GUYING, OR OTHER MEANS TO AVOID EXCESSIVE STRESSES AND TO HOLD STRUCTURAL ELEMENTS IN PLACED DURING CONSTRUCTION.

10. A TEMPORARY BERM TO HOLD / GUIDE SHEETPILE DURING CONSTRUCTION IS RECOMMENDED.

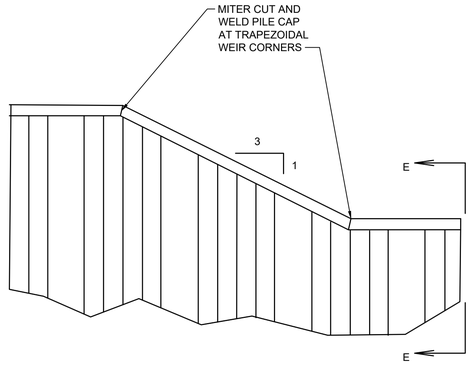
11. NOTIFY ENGINEER IMMEDIATELY IF BEDROCK IS ENCOUNTERED PRIOR TO INSTALLATION OF SHEET PILE TO DESIGN DEPTHS.
    - 11.1. WEATHERED LIMESTONE EXPECTED AT ELEVATION OF 807.00. DESIGN EMBEDMENT INTO ROCK OF 2'-0" MIN. MAY BE NECESSARY IF ROCK IS ENCOUNTERED HIGHER.
    - 11.2. PREDILLING OF THE ROCK WILL BE NEEDED TO DEVELOP SUFFICIENT SHEET PILE PENETRATION. POST-GROUT AGAINST SHEET PILE TO DEVELOP SHEET PILE STRENGTH LAYER.

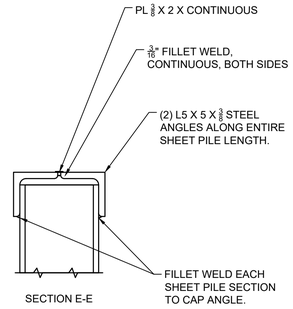


VERTICAL SCALE:
0 2 4 8
SCALE IN FEET

HORIZONTAL SCALE:
0 10 20 40
SCALE IN FEET

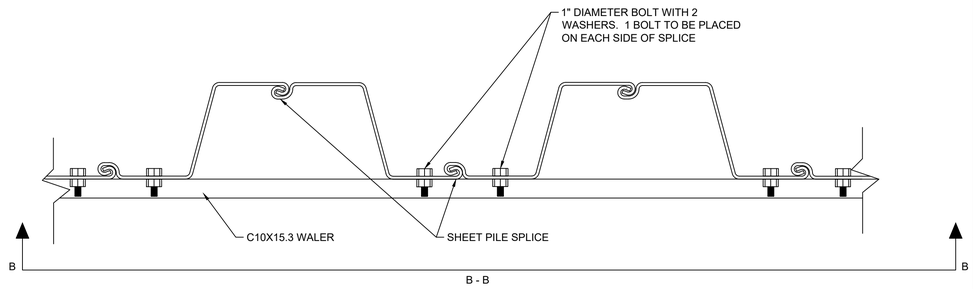
SHEET PILE CENTERLINE PROFILE
HORIZONTAL SCALE: 1"= 15', VERTICAL SCALE: 1"= 1.5'

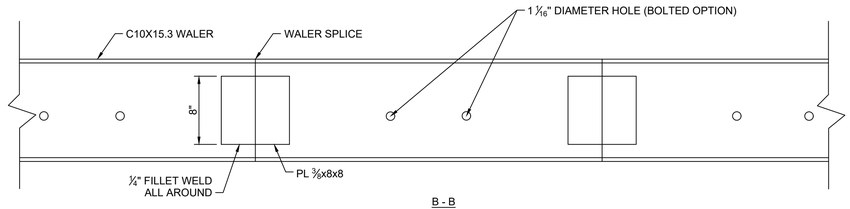




SECTION E-E

A C401 NTS
WELDED PILE CAP OPTION DETAIL





B - B

*NOTE: SHEET PILE BEYOND NOT SHOWN.

B C401 NTS
BOLTED WALER OPTION DETAIL

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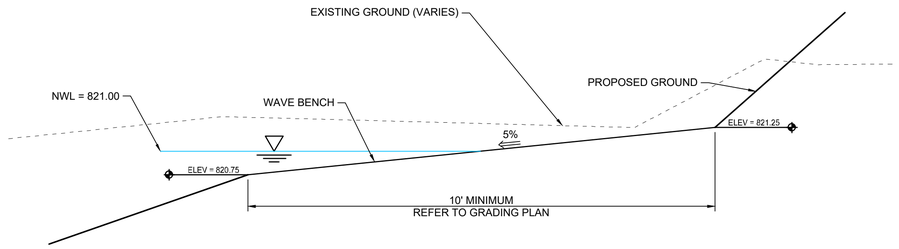
BEN850929B WETLAND
IDALS
BENTON COUNTY, IOWA

SHEET PILE DESIGN

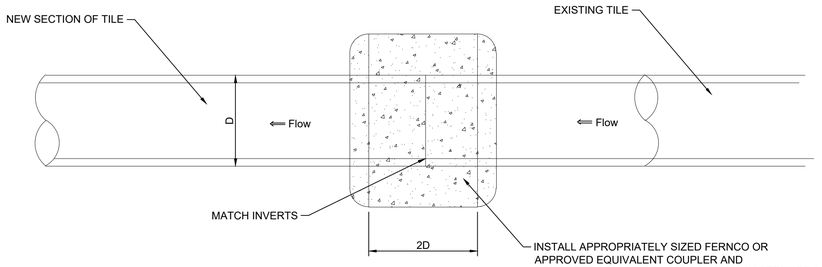
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APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 10-08-2026
PROJECT NO: 224001279O
FIELD BOOK: ---
CLIENT NO: ---

C401

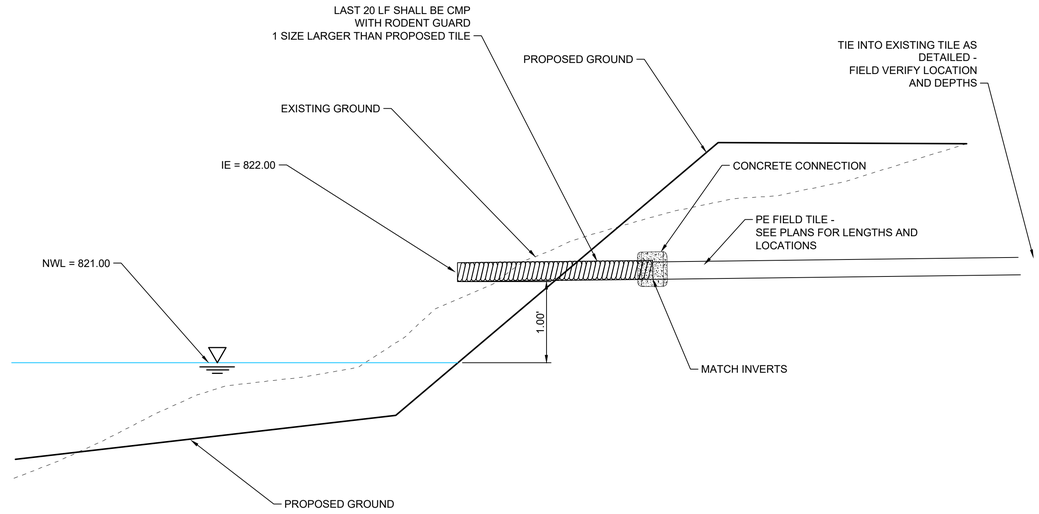
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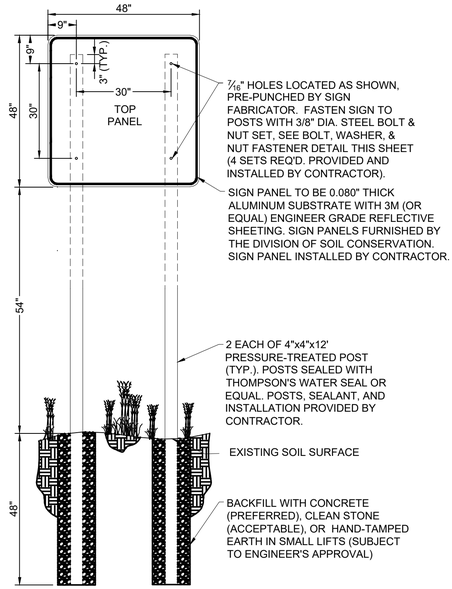
A1 WAVE PROTECTION BENCH AT NWL
NOT TO SCALE

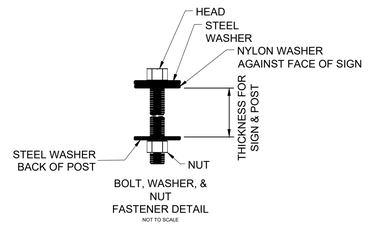


A2 FIELD TILE REPAIR CONNECTION
NOT TO SCALE



D2 TILE OUTLET AT WETLAND
NOT TO SCALE





SIGNAGE NOTES:

1. DIVISION WILL FURNISH SIGN PANEL. CONTRACTOR IS RESPONSIBLE FOR PROVIDING POSTS, HARDWARE, AND INSTALLATION.

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 OR RUST RESISTANT.

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 DIVISION AND LANDOWNER APPROVAL 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 UNLESS NOTED OTHERWISE.

A4 PROJECT SIGN
NOT TO SCALE

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BEN850929B WETLAND

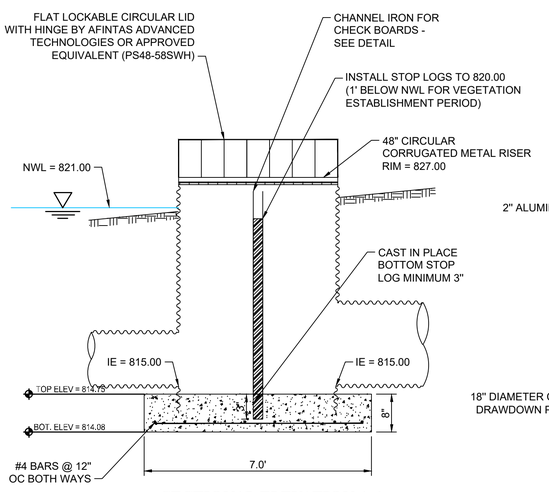
IDALS
BENTON COUNTY, IOWA

DRAWN: GHK
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ISSUED FOR: FINAL DESIGN
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FIELD BOOK: ---
CLIENT NO: ---

CONSTRUCTION DETAILS

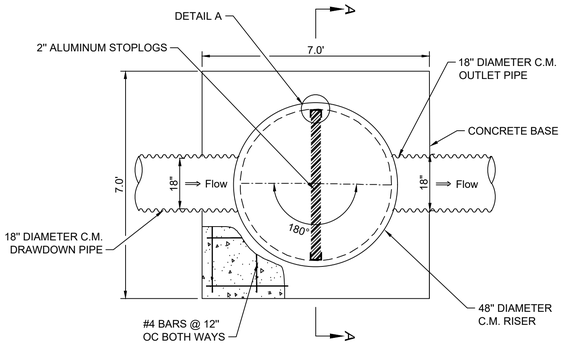
C501

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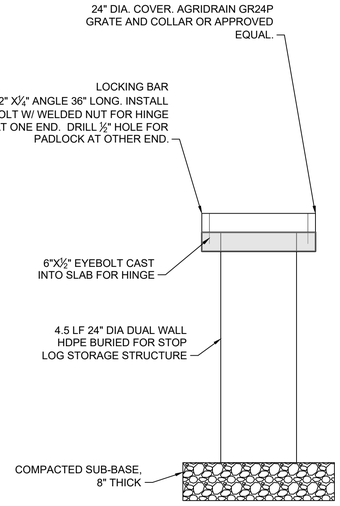


SECTIONAL ELEVATION A-A
RISER DETAIL

NOTES:
1) PROVIDE STRUCTURE SHOP DRAWINGS FOR ENGINEERS REVIEW AND APPROVAL BEFORE FABRICATION OF WATER CONTROL STRUCTURE.
2) WATER CONTROL STRUCTURE TO BE PRE FABRICATED CORRUGATED METAL RISER STRUCTURE WITH WATERTIGHT SEALS AT SECTION JOINTS AND PIPE PENETRATIONS.
3) STOP LOG CHANNEL IS TO BE ANCHORED TO THE WALLS AND FLOOR PRIOR TO PLACING CONCRETE INVERT.
4) POUR CONCRETE INVERT AFTER STOP LOG CHANNEL IS INSTALLED. CAST BOTTOM STOP LOG INTO PLACE WITH THREE ¾" DIA "J BOLTS".
5) PROVIDE MATCHING PADLOCKS FOR ALL LOCKING STRUCTURES. PROVIDE OWNER WITH FOUR KEYS.

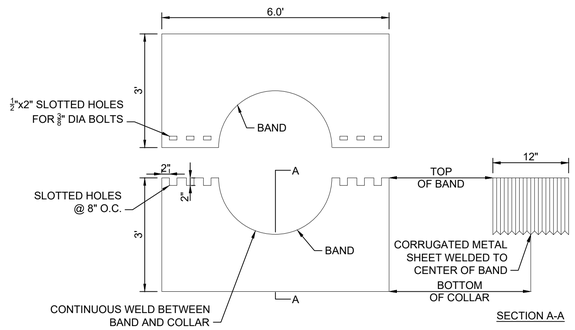


PLAN VIEW



STOP LOG STORAGE STRUCTURE

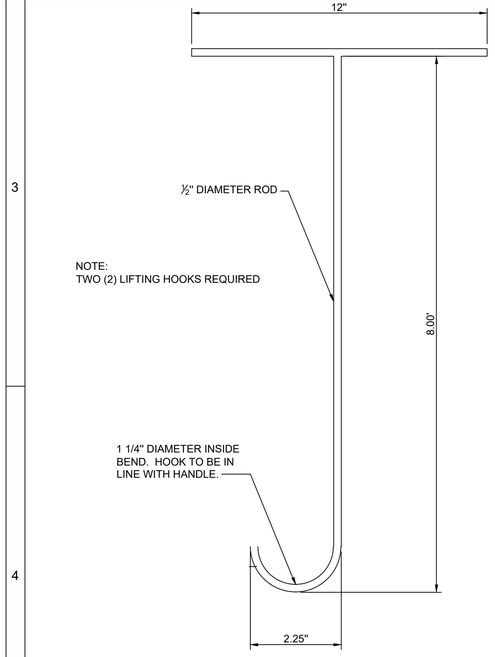
A2 WATER CONTROL STRUCTURE AND APPURTENANCES
NOT TO SCALE

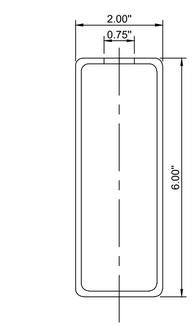


NOTE:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FROM FABRICATOR FOR ENGINEER REVIEW.

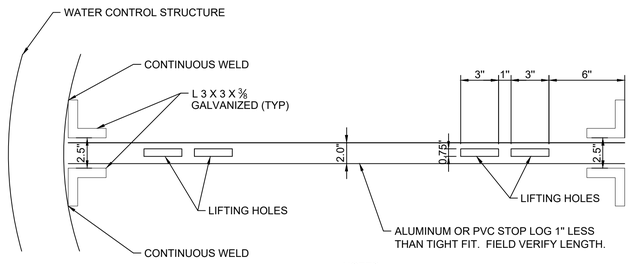
E2 CMP ANTI-SEEPAGE COLLAR
NOT TO SCALE





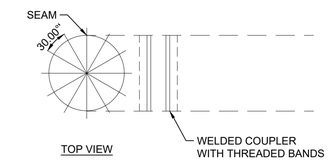
NOTE:
ALL ALUMINUM OR PVC STOP-LOGS SHALL BE PROVIDED BY CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR CUTTING STOP-LOGS AS SHOWN. THE 0.75" DIMENSION IS CRITICAL AND NEEDS TO BE CENTERED IN THE STOP-LOG TO AVOID LEAKAGE. THE FINISHED SURFACE SHALL BE SMOOTH TO PROVIDE A FLAT SURFACE FOR THE STOP-LOG ABOVE IT. THE CONTRACTOR SHALL DELIVER 13 STOP-LOGS TO THE SITE. THE COST OF THE STOP-LOG WORK IS INCIDENTAL TO THE OUTLET CONTROL STRUCTURE.

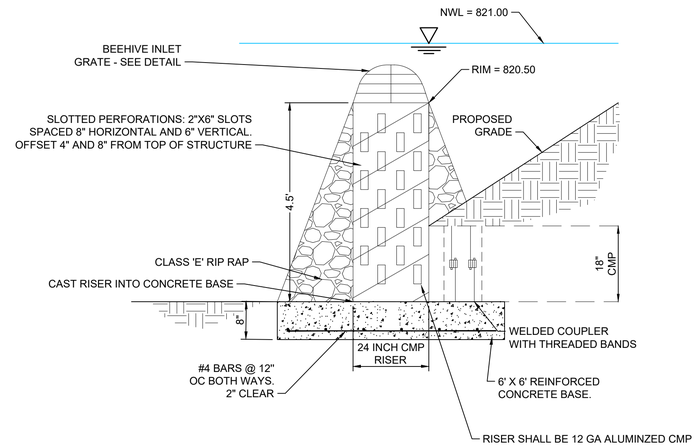
STOP LOG CROSS SECTION
NTS



NOTES:
1. CONTRACTOR TO DRILL ¾" HOLES IN TOP OF STOP LOG CHANNELS AND PROVIDE TWO (2) PADDLE LOCKS TO LOCK THROUGH CHANNELS TO PREVENT LOGS FROM BEING LIFTED OUT WHEN LOCK IS IN PLACE.
2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FROM FABRICATOR FOR ENGINEER REVIEW.

A4 STOP LOG AND LIFTING HOOK
NOT TO SCALE





E4 CORRUGATED METAL RISER
NOT TO SCALE

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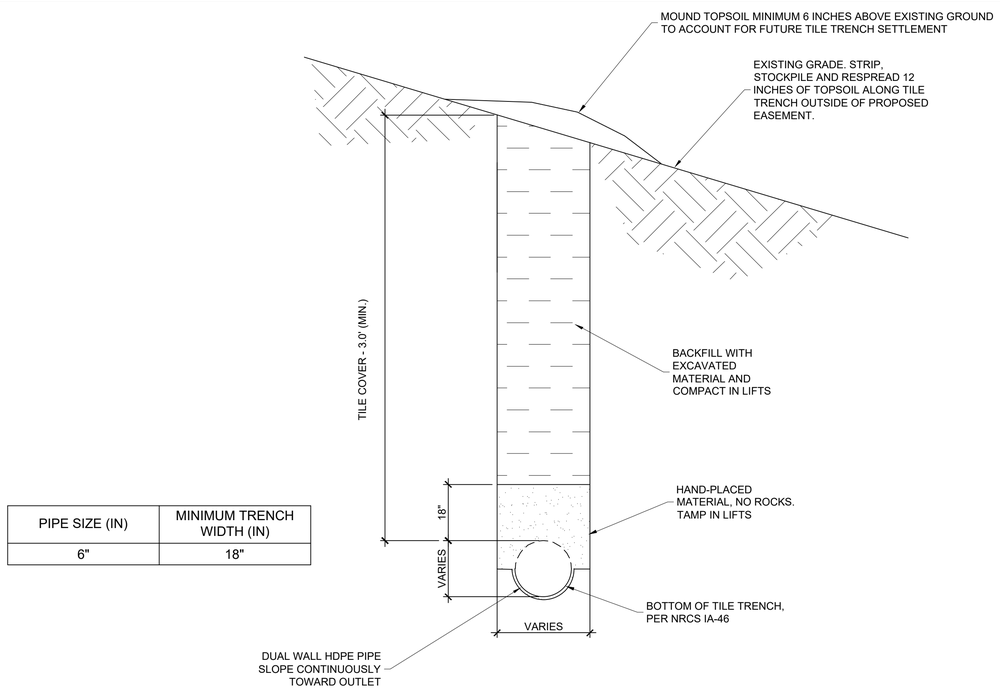
BEN850929B WETLAND
IDALS
BENTON COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 10-08-2026
PROJECT NO: 2240012790
FIELD BOOK: ---
CLIENT NO: ---

CONSTRUCTION DETAILS

C502

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PIPE SIZE (IN)	MINIMUM TRENCH WIDTH (IN)
6"	18"

A2 TILE TRENCH
NOT TO SCALE

A4 SILT FENCE
NOT TO SCALE

NOTE:
ALL DRAIN TILE IDENTIFIED DURING CORE TRENCH EXCAVATION TO BE RECORDED. REMOVE DRAIN TILES IN THEIR ENTIRETY EXTENDING 10' BEYOND EMBANKMENT FOOTPRINT

NOTE:
PROJECT ENGINEER TO VERIFY THAT CORE TRENCH EXCAVATION TERMINATES IN SUITABLE SOILS PRIOR TO BACKFILLING.

C3 TYPICAL EMBANKMENT CROSS SECTION
NOT TO SCALE

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BEN850929B WETLAND

IDALS
BENTON COUNTY, IOWA

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PROJECT NO: 224001279
FIELD BOOK: ---
CLIENT NO: ---

CONSTRUCTION DETAILS

C503

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STRUCTURE SEEDING
AREA = 0.9 ACRES

EASEMENT
BOUNDARY (TYP.)

INSTALL 515 LF
OF SILT FENCE
- SEE DETAIL

NORMAL WATER LEVEL
ELEV = 821.00

STRUCTURE SEEDING
AREA = 0.3 ACRES

BUFFER SEEDING
AREA = 3.8 ACRES

NORTH

0 20 40 80
SCALE IN FEET

LEGEND

DESCRIPTION	PROPOSED LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER ELEVATION	
FEMA 100-YEAR FLOODPLAIN	
MAJOR CONTOUR	800
MINOR CONTOUR	801
EXISTING CONTOUR - MAJOR	800
EXISTING CONTOUR - MINOR	801
EXISTING STREAM	
EASEMENT BOUNDARY	
BUFFER SEEDING	
STRUCTURE SEEDING	
SILT FENCE	

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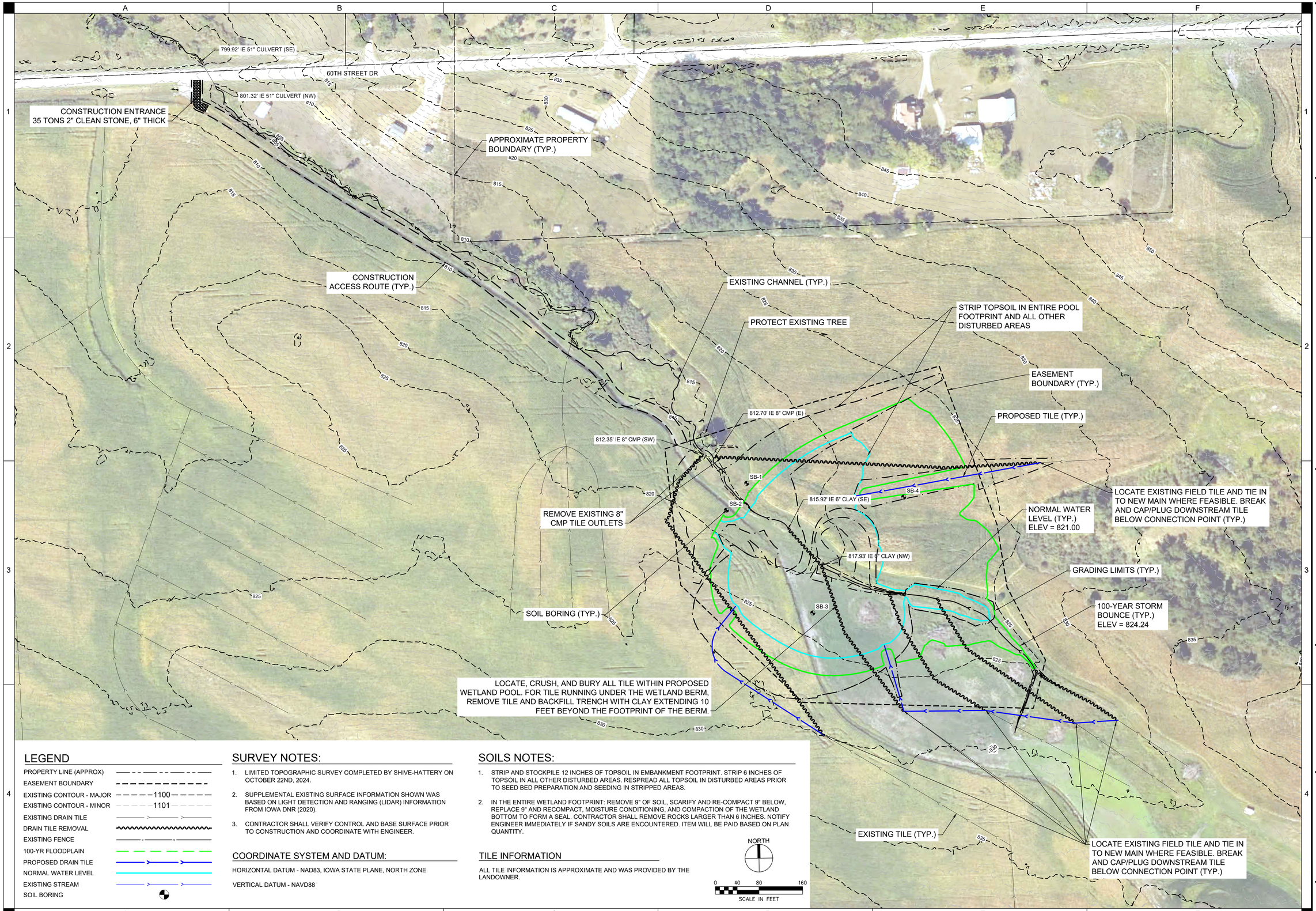
IDALS
BENTON COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 10-08-2025
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CLIENT NO: ---

SEEDING PLAN

C601

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LEGEND

- PROPERTY LINE (APPROX)
- EASEMENT BOUNDARY
- EXISTING CONTOUR - MAJOR (1100)
- EXISTING CONTOUR - MINOR (1101)
- EXISTING DRAIN TILE
- DRAIN TILE REMOVAL
- EXISTING FENCE
- 100-YR FLOODPLAIN
- PROPOSED DRAIN TILE
- NORMAL WATER LEVEL
- EXISTING STREAM
- SOIL BORING

SURVEY NOTES:

1. LIMITED TOPOGRAPHIC SURVEY COMPLETED BY SHIVE-HATTERY ON OCTOBER 22ND, 2024.
2. SUPPLEMENTAL EXISTING SURFACE INFORMATION SHOWN WAS BASED ON LIGHT DETECTION AND RANGING (LIDAR) INFORMATION FROM IOWA DNR (2020).
3. CONTRACTOR SHALL VERIFY CONTROL AND BASE SURFACE PRIOR TO CONSTRUCTION AND COORDINATE WITH ENGINEER.

COORDINATE SYSTEM AND DATUM:

HORIZONTAL DATUM - NAD83, IOWA STATE PLANE, NORTH ZONE

VERTICAL DATUM - NAVD88

SOILS NOTES:

1. STRIP AND STOCKPILE 12 INCHES OF TOPSOIL IN EMBANKMENT FOOTPRINT. STRIP 6 INCHES OF TOPSOIL IN ALL OTHER DISTURBED AREAS. RESPREAD ALL TOPSOIL IN DISTURBED AREAS PRIOR TO SEED BED PREPARATION AND SEEDING IN STRIPPED AREAS.
2. IN THE ENTIRE WETLAND FOOTPRINT: REMOVE 9" OF SOIL, SCARIFY AND RE-COMPACT 9" BELOW, REPLACE 9" AND RECOMPACT, MOISTURE CONDITIONING, AND COMPACTION OF THE WETLAND BOTTOM TO FORM A SEAL. CONTRACTOR SHALL REMOVE ROCKS LARGER THAN 6 INCHES. NOTIFY ENGINEER IMMEDIATELY IF SANDY SOILS ARE ENCOUNTERED. ITEM WILL BE PAID BASED ON PLAN QUANTITY.

TILE INFORMATION

ALL TILE INFORMATION IS APPROXIMATE AND WAS PROVIDED BY THE LANDOWNER.

NORTH

0 40 80 160

SCALE IN FEET

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BEN850929B WETLAND

IDALS

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EXISTING CONDITIONS & REMOVALS

CD01

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