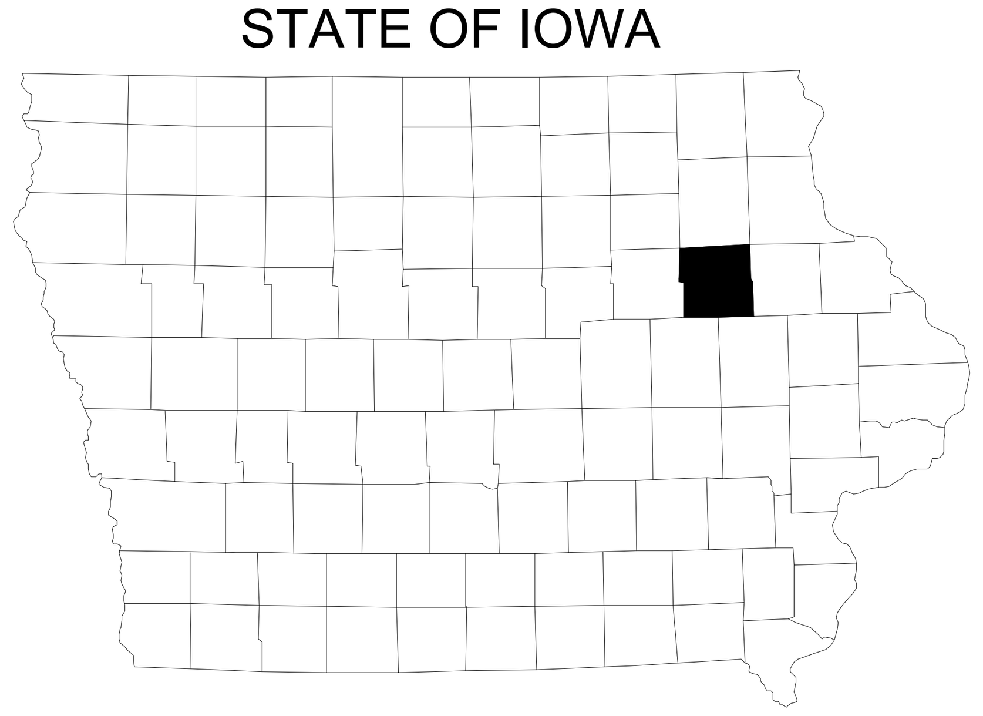
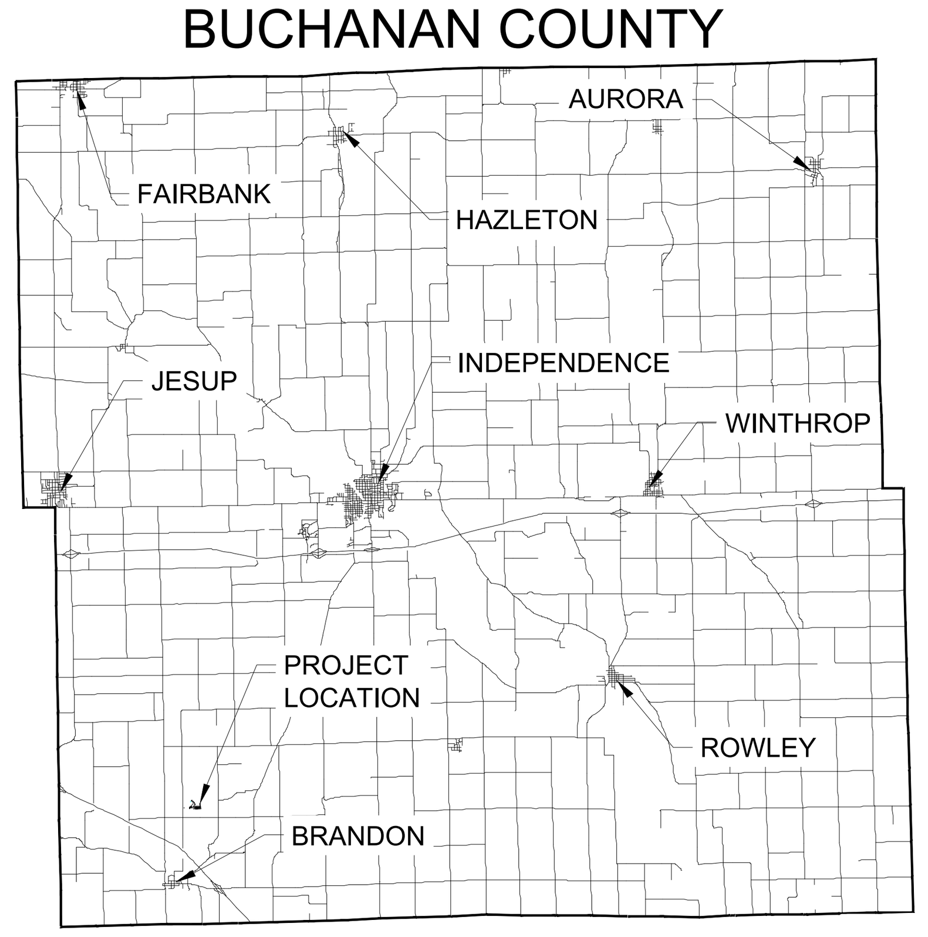
BUC871015D NUTRIENT REDUCTION WETLAND IDALS

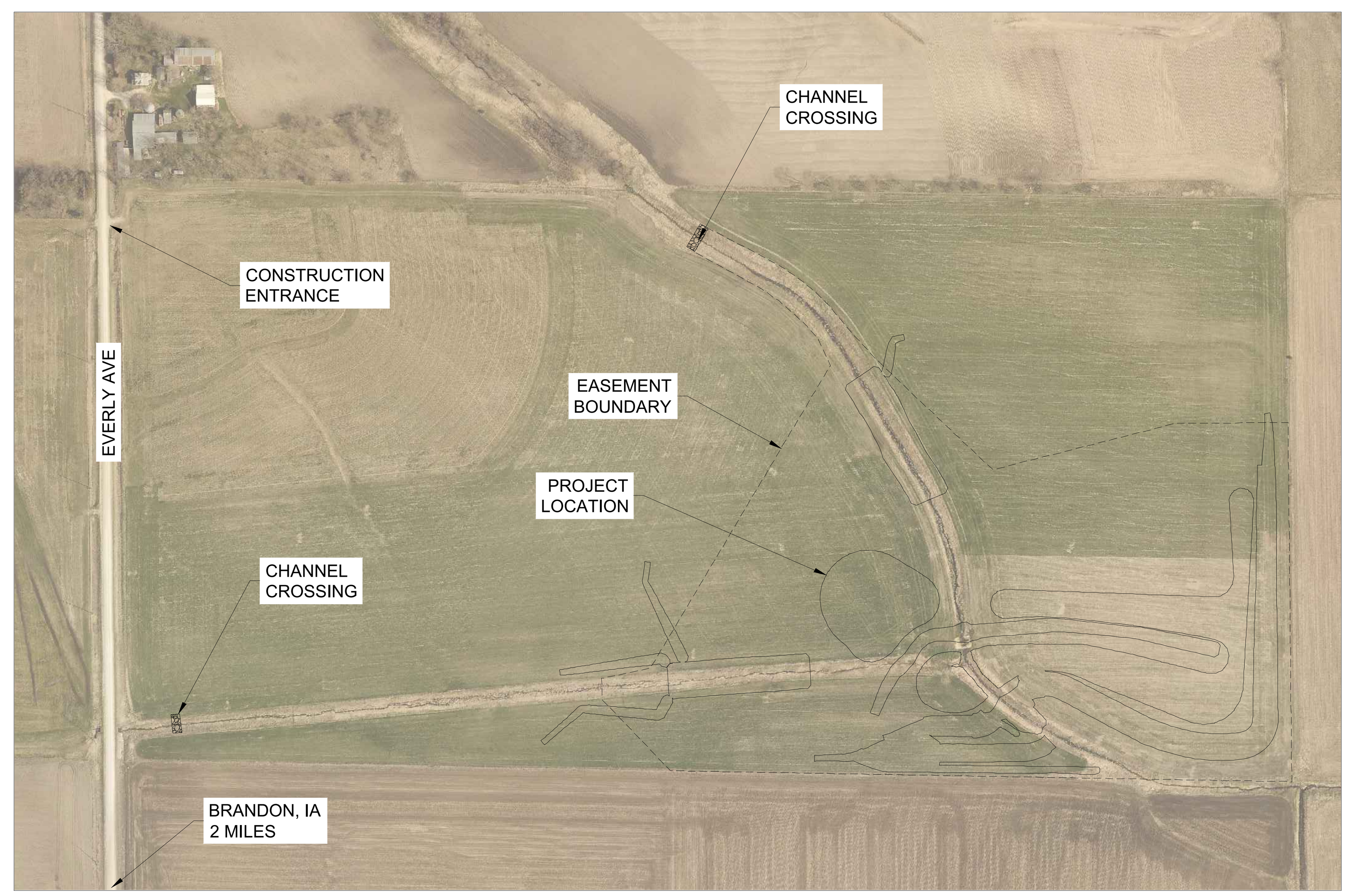
BUCHANAN COUNTY, IOWA

STATE OF IOWA



BUCHANAN COUNTY





CONTACT/SITE INFORMATION:

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WEST DES MOINES, IOWA 50266
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LANDOWNERS
DICK SLOAN
PH: (319) 558-6934

SITE ADDRESS:
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IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP
SARA SMITH, PE.,PHD
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PROJECT DRAWING COORDINATE SYSTEM:
HORIZONTAL: NAD83 IOWA STATE PLANE NORTH ZONE (1401)
VERTICAL: NAVD88
UNITS: U.S. SURVEY FEET

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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: [signature] Date: 8-20-2024

Printed or typed name: CHRIS R. MARVIN
License Number: 27417
My License Renewal Date is: DECEMBER 31, 2025
PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
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: Dan Jensen Date: 8-20-2024

Printed or typed name: DANIEL J. JENSEN
License Number: 25063
My License Renewal Date is: DECEMBER 31, 2025
PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
ALL SHEETS EXCLUDING C401

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

USDA

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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.

SHIVE-HATTERY
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515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska | Wisconsin

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND
IDALS
BUCHANAN COUNTY, IOWA

8/8/2024
FINAL DESIGN
PROJECT NO: 2142204320
CLIENT NO: —

C000

ESTIMATED QUANTITIES:

#	ITEM DESCRIPTION	QUANTITY	UNITS
1	SITE STRIPPING & PREPARATION	1	LS
2	CROP DAMAGE	0	AC
3	STRUCTURE & CHANNEL SEEDING	4.1	AC
4	BUFFER SEEDING	10.6	AC
5	MOBILIZATION AND DEMOBILIZATION	1	LS
6	DRAIN TILE INVESTIGATION AND REMOVAL	7,860	LF
7	STEEL SHEET PILING	1,094	SF
8	EARTHFILL (GENERAL (P))	2,431	CY
9	EARTHFILL (GENERAL DAM (P))	9,885	CY
10	EARTHFILL (DAM CORE (P))	3,026	CY
11	EARTHFILL (SCARIFY AND RECOMPACT 18" LAYER OF WETLAND BOTTOM, TWO 9" LIFTS (P)):	9,494	CY
12	EARTHFILL (SCARIFY AND RECOMPACT 9" LAYER OF WETLAND BOTTOM (P)):	7,513	CY
13	TOPSOIL PLACEMENT, 12 INCH	3,078	CY
14	TOPSOIL PLACEMENT, 6 INCH	5,492	CY
15	4" CORRUGATED PROFILE WALL (DUAL WALL, PERFORATED) POLYETHYLENE PIPE	1,194	LF
16	6" CORRUGATED PROFILE WALL (DUAL WALL, PERFORATED) POLYETHYLENE PIPE	1,096	LF
17	6" CORRUGATED PROFILE WALL (DUAL WALL, PERFORATED) POLYETHYLENE PIPE WITH POROUS BACKFILL	1,819	LF
18	6" CORRUGATED PROFILE WALL (DUAL WALL, NON-PERFORATED) POLYETHYLENE PIPE	1,357	LF
19	24" ALUMINIZED CMP DRAWDOWN RISER, 12 GA	1	EA
20	48" CMP WATER CONTROL STRUCTURE	1	EA
21	18" ALUMINIZED CMP WETLAND DRAWDOWN PIPE, 14GA	156	LF
22	18" ALUMINIZED CMP FLARED END SECITON	1	EA
23	8" CMP TILE OUTLETS (20 LF EACH)	5	EA
24	RIP RAP	1850	TON
25	2" CLEAN STONE	110	TON
26	EROSION STONE	220	TON
27	CONCRETE GROUT	198	CY
28	POLLUTION CONTROL, SILT FENCE	3160	LF
29	POLLUTION CONTROL, TURF REINFORCEMENT MAT, TYPE II	1430	SY

WETLAND DESIGN DATA:

PROJECT ID	BUC871015D	
LANDOWNER(S)	DICK SLOAN	
PRELIMINARY OR FINAL DESIGN	FINAL DESIGN	
DRAINAGE AREA	631	ACRES
WETLAND POOL AREA	9.97	ACRES
DEEP WATER AREA (>3 FT DEEP)	2.28	ACRES
NORMAL POOL ELEVATION	879.5	FEET
AVERAGE POOL DEPTH	1.93	FEET
MAXIMUM POOL DEPTH	5.0	FEET
POOL STORAGE	18.9	ACRE-FEET
BERM ELEVATION	882.5	FEET
BERM STORAGE	66.27	ACRE-FEET
LENGTH OF BERM	1811	FEET
AUXILIARY SPILLWAY ELEVATION	881.5	FEET
AUXILIARY SPILLWAY WIDTH	150	FEET
WEIR WIDTH	80	FEET
DROP HEIGHT	3	FEET
TIME OF CONCENTRATION	1.47	HOURS
WEIGHTED RUNOFF CURVE NUMBER	77	-----
25-YEAR STORM DESIGN FLOW	788	CFS
100-YEAR STORM DESIGN FLOW	1226	CFS
100-YEAR FLOOD SURF. ELEVATION	881.94	FEET
TOTAL EASEMENT AREA	25.17	ACRES

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 CUBIC YARDS OF TOP SOIL REMOVAL AS SHOWN IN THE PLANS. 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, EXCLUDING THOSE 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-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.
9	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.
10	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.
11	IA CS-023	EARTHFILL (SCARIFY AND RECOMPACT 18" LAYER OF WETLAND BOTTOM, TWO 9" LIFTS (P)): THIS ITEM INCLUDES SCARIFICATION AND LOOSENING OF A 18" LINER IN TWO LIFTS IN ALL EXCAVATED AREAS WITHIN THE WETLAND POOL. REMOVE AN ADDITIONAL 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.
12	IA CS-023	EARTHFILL (SCARIFY AND RECOMPACT 9" LAYER OF WETLAND BOTTOM (P)): THIS ITEM INCLUDES SCARIFICATION AND LOOSENING OF A 9 INCH SURFACE LAYER OF SOIL ON THE WETLAND POOL BOTTOM, 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. 12 INCH: THIS ITEM INCLUDES THE STRIPPING, SALVAGE, AND STOCKPILE 12" OF EXISTING MATERIAL FROM THE EMBANKMENT FOOTPRINT. RESPREAD 12" TOPSOIL WITHIN EMBANKMENT FOOTPRINT. ITEM WILL BE PAID BASED ON PLAN QUANTITY.
14	IA CS-026	TOPSOIL PLACEMENT. 6 INCH: THIS ITEM INCLUDES THE STRIPPING, SALVAGE, AND STOCKPILE 6" OF EXISTING MATERIAL FROM ALL OTHER DISTRUBED AREAS. RESPREAD 6" TOPSOIL IN ALL OTHER DISTURBED AREAS. ITEM WILL BE PAID BASED ON PLAN QUANTITY.
15	IA CS-026	4" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE: THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND BACKFILL OF THE 4" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS.
16	IA CS-046	6" CORRUGATED POLYETHYLENE PIPE (PERFORATED): THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND BACKFILL OF THE 6" DUAL-WALL PERFORATED HDPE DRAIN TILE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS.
17	IA CS-046	6" CORRUGATED PROFILE WALL (DUAL WALL, PERFORATED) POLYETHYLENE PIPE WITH POROUS BACKFILL: THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND POROUS BACKFILL OF THE 6" DUAL-WALL NON-PERFORATED HDPE DRAIN TILE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS. POROUS BACKFILL TO BE PEA GRAVEL.
18	IA CS-046	6" CORRUGATED PROFILE WALL (DUAL WALL, NON-PERFORATED) POLYETHYLENE PIPE: 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.
19	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.
20	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, PIPE CONNECTIONS, AND TRASH RACK.
21	IA CS-051	15" CMP DRAWDOWN WETLAND OUTLET PIPE: THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, MATERIALS REQUIRED FOR THE EXCAVATION, AND THE PLACEMENT OF THE CORRUGATE METAL PIPE.
22	IA CS-051	18" ALUMINIZED CMP FLARED END SECITON: THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, MATERIALS REQUIRED FOR THE EXCAVATION, AND THE PLACEMENT OF THE FLARED END SECTION AND REINFORCED CONRETE FES FOOTING.
23	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.
24	IA CS-061	RIP RAP: 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, SHEET PILE OUTLET CHANNEL, AND LOW WATER CROSSING. GEOTEXTILE FABRIC IS INCIDENTAL TO THIS ITEM. QUANTITY DETERMINATION IS BASED ON A UNIT WEIGHT OF 105 POUNDS PER CUBIC FOOT. PROVIDE WEIGHT TICKETS TO OWNER'S REPRESENTATIVE.
25	IA CS-061	2" CLEAN STONE: THIS ITEMS INCLUDES PROCUREMENT, PLACEMENT AND SPREADING OF 2 INCH CLEAN STONE AT THE CONSTRUCTION ENTRANCE. THIS ITEM ALSO INCLUDES LOW WATER CROSSING AND SHEET PILE OUTLET CHANNEL. QUANTITY DETERMINATION IS BASED ON A UNIT WEIGHT OF 130 POUNDS PER CUBIC FOOT.
26	IA CS-061	EROSION STONE: THIS ITEM INCLUDES PROCUREMENT, PLACEMENT AND SPREADING OF EROSION STONE AT THE LOW WATER CROSSINGS. QUANTITY DETERMINATION IS BASED ON A UNIT WEIGHT OF 120 POUNDS PER CUBIC FOOT.
27	IA CS-062	CONCRETE GROUT: GROUT MIX SHALL BE AS SPECIFIED AND SHALL BE PLACED USING A CONCRETE PUMPER. 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.
28	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.
29	IA CS-005	POLLUTION CONTROL, TURF REINFORCEMENT MAT, TYPE II: THIS ITEM INCLUDES PROCUREMENT AND INSTALLATION OF TYPE II TURF REINFORCING MAT IN ACOORDANCE WITH SUDAS 9040. INSTALLATION SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS.

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 OWNERS 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 OWNERS 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
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Iowa | Illinois | Indiana | Nebraska | Wisconsin

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS

BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 214220320
FIELD BOOK: ---
CLIENT NO: ---

PROJECT QUANTITIES & NOTES

C001

LEGEND

- PROPERTY LINE (APPROX)
- EASEMENT BOUNDARY
- SOIL BORING — SB
- EXISTING CONTOUR - MAJOR — 1100
- EXISTING CONTOUR - MINOR — 1101
- EXISTING DRAIN TILE
- EXISTING FENCE
- 100-YEAR BOUNCE
- PROPOSED DRAIN TILE (TO POOL)
- PROPOSED DRAIN TILE (TO STREAM)

SURVEY NOTES:

1. LIMITED TOPOGRAPHIC SURVEY COMPLETED BY SHIVE-HATTERY ON DECEMBER 8, 2022.
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. SCARIFY AND RE-COMPACT 9 INCHES OF SOIL IN ENTIRE WETLAND FOOTPRINT. ADDITIONALLY, IN EXCAVATED AREAS WITHIN THE POOL, AN ADDITIONAL 9 INCHES OF SOIL. SCARIFY AND RE-COMPACT 9 INCHES BELOW, REPLACE 9 INCHES, AND RE-COMPACT (18 INCH LINER IN TWO LIFTS). RESPREAD TOPSOIL AFTER COMPLETION.
3. A GEOTECHNICAL REPORT WAS PREPARED BY TERRACON ON JANUARY 8, 2024.

TILE INFORMATION

LIMITED TILE INVESTIGATION WAS COMPLETED BY SHIVE-HATTERY ON JUNE 18, 2024. LOCATED TILE INFORMATION IS INCLUDED ON THIS SHEET AT SELECT LOCATIONS. ALL OTHER TILE INFORMATION IS APPROXIMATE AND WAS PROVIDED BY THE LANDOWNER.

STABILIZED LOW WATER CROSSING 125 TONS CLASS E RIP RAP, 40 TONS 2" CLEAN STONE, AND 110 TONS EROSION STONE - SEE DETAIL

PROPOSED DRAIN TILE TO POOL (TYP.)

30 TONS 2" CLEAN STONE 12" THICK

CONSTRUCTION ENTRANCE

EASEMENT BOUNDARY (TYP.)

LOCATE EXISTING TILE FOR CONNECTIONS TO PROPOSED TILE WHERE ELEVATIONS ALLOW. CRUSH AND BURY 10 FEET (MIN) TILE DOWNSTREAM AND CAP UPSTREAM END OF TILE TO REMAIN.

WHERE ELEVATIONS DO NOT ALLOW, BRIDGE EXISTING TILE OVER OR UNDER PROPOSED TILE AND MAINTAIN TILE DRAINAGE AROUND WETLAND. COORDINATE WITH ENGINEER.

LOCATE EXISTING TILE FOR CONNECTIONS TO PROPOSED TILE WHERE ELEVATIONS ALLOW. CRUSH AND BURY 10 FEET (MIN) TILE DOWNSTREAM AND CAP UPSTREAM END OF TILE TO REMAIN.

WHERE ELEVATIONS DO NOT ALLOW, BRIDGE EXISTING TILE OVER OR UNDER PROPOSED TILE AND MAINTAIN TILE DRAINAGE AROUND WETLAND. COORDINATE WITH ENGINEER.

100-YEAR STORM BOUNCE (TYP.)

LOCATE, CRUSH, AND BURY ALL TILE WITHIN PROPOSED WETLAND POOL. FOR TILE RUNNING UNDER THE WETLAND BERM, REMOVE TILE AND BACKFILL TRENCH WITH CLAY EXTENDING 10 FEET BEYOND THE FOOTPRINT OF THE BERM.

SCARIFY 9" & RE-COMPACT WITHIN ENTIRE POOL AREA

LOCATE AND REMOVE EXISTING TILE

PROTECT ALL TILE TO REMAIN IN PLACE. CONTRACTOR RESPONSIBLE FOR REMAIN OF ANY DAMAGE CAUSED BY CONSTRUCTION AT NO ADDITIONAL COST TO THE DIVISION. (TYP.)

EVERLY AVE

STABILIZED LOW WATER CROSSING 125 TONS CLASS E RIP RAP, 40 TONS 2" CLEAN STONE, AND 110 TONS EROSION STONE - SEE DETAIL

SCARIFY 9" BELOW, REPLACE 9" & COMPACT WITHIN BORROW AREA FOOTPRINT

GRADING LIMITS

SB 1 SB 2 SB 3 SB 4

EXISTING FENCE LINE

PROPOSED DRAIN TILE TO STREAM (TYP.)

EXISTING STREAM CENTERLEK

EXISTING 12 INCH PLASTIC TILE OUTLET TO CREEK

LOCATE, CRUSH, AND BURY ALL TILE WITHIN PROPOSED WETLAND POOL. FOR TILE RUNNING UNDER THE WETLAND BERM, REMOVE TILE AND BACKFILL TRENCH WITH CLAY EXTENDING 10 FEET BEYOND THE FOOTPRINT OF THE BERM.

NORTH

0 60 120 240

SCALE IN FEET

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BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: DJJ
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 21422043320
FIELD BOOK: ---
CLIENT NO: ---

EXISTING CONDITIONS AND REMOVALS

CD01

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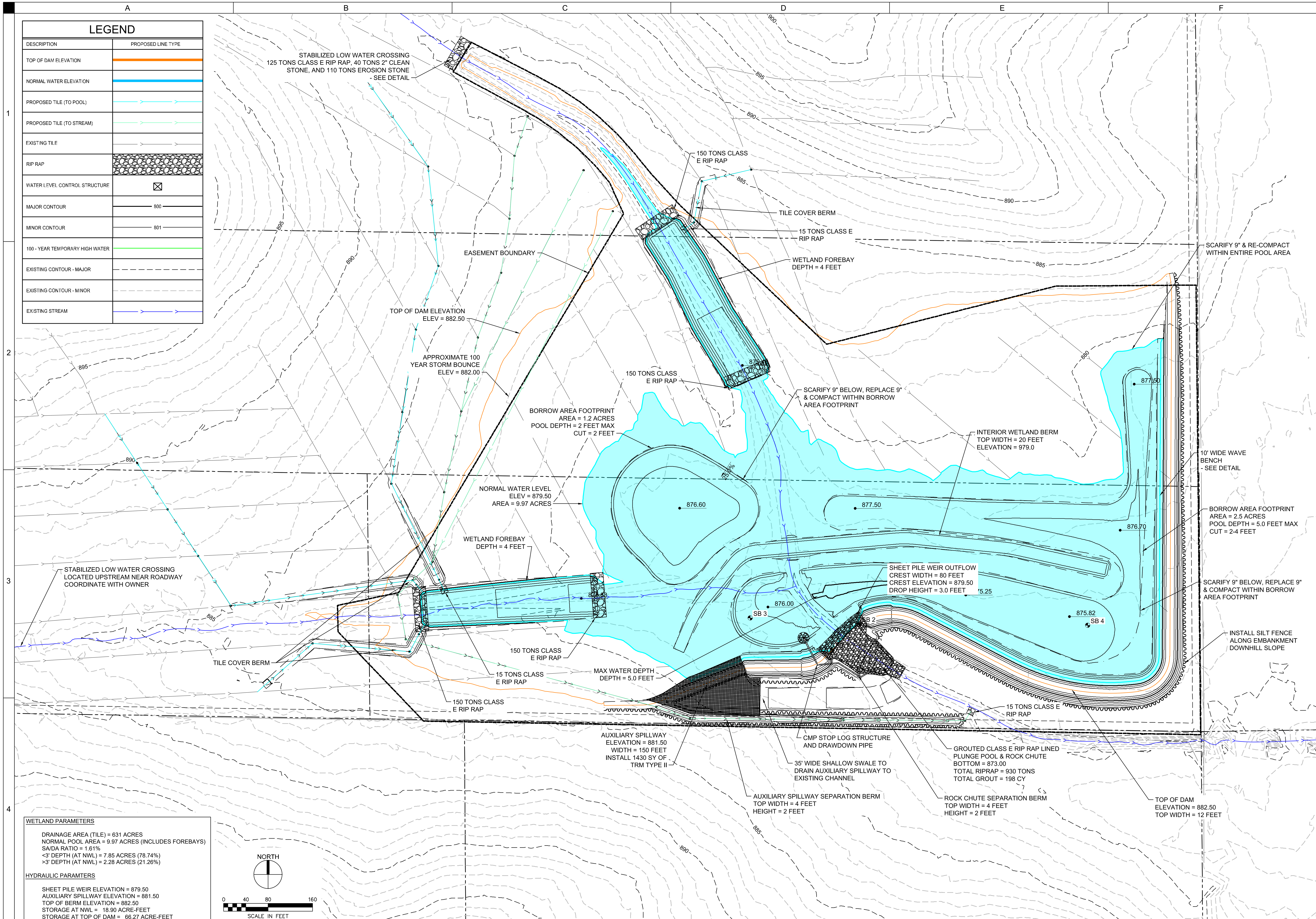
LEGEND

DESCRIPTION	PROPOSED LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER ELEVATION	
PROPOSED TILE (TO POOL)	
PROPOSED TILE (TO STREAM)	
EXISTING TILE	
RIP RAP	
WATER LEVEL CONTROL STRUCTURE	⊠
MAJOR CONTOUR	800
MINOR CONTOUR	801
100 - YEAR TEMPORARY HIGH WATER	
EXISTING CONTOUR - MAJOR	
EXISTING CONTOUR - MINOR	
EXISTING STREAM	



STABILIZED LOW WATER CROSSING
125 TONS CLASS E RIP RAP, 40 TONS 2" CLEAN STONE, AND 110 TONS EROSION STONE - SEE DETAIL
150 TONS CLASS E RIP RAP
TILE COVER BERM
15 TONS CLASS E RIP RAP
WETLAND FOREBAY DEPTH = 4 FEET
EASEMENT BOUNDARY
SCARIFY 9" & RE-COMPACT WITHIN ENTIRE POOL AREA
TOP OF DAM ELEVATION ELEV = 882.50
APPROXIMATE 100 YEAR STORM BOUNCE ELEV = 882.00
150 TONS CLASS E RIP RAP
SCARIFY 9" BELOW, REPLACE 9" & COMPACT WITHIN BORROW AREA FOOTPRINT
BORROW AREA FOOTPRINT AREA = 1.2 ACRES POOL DEPTH = 2 FEET MAX CUT = 2 FEET
INTERIOR WETLAND BERM TOP WIDTH = 20 FEET ELEVATION = 979.0
10' WIDE WAVE BENCH - SEE DETAIL
NORMAL WATER LEVEL ELEV = 879.50 AREA = 9.97 ACRES
876.60
877.50
877.50
876.70
BORROW AREA FOOTPRINT AREA = 2.5 ACRES POOL DEPTH = 5.0 FEET MAX CUT = 2-4 FEET
WETLAND FOREBAY DEPTH = 4 FEET
SHEET PILE WEIR OUTFLOW CREST WIDTH = 80 FEET CREST ELEVATION = 879.50 DROP HEIGHT = 3.0 FEET
875.25
SCARIFY 9" BELOW, REPLACE 9" & COMPACT WITHIN BORROW AREA FOOTPRINT
STABILIZED LOW WATER CROSSING LOCATED UPSTREAM NEAR ROADWAY COORDINATE WITH OWNER
SB 3
876.00
SB 2
875.82
SB 4
INSTALL SILT FENCE ALONG EMBANKMENT DOWNHILL SLOPE
150 TONS CLASS E RIP RAP
TILE COVER BERM
15 TONS CLASS E RIP RAP
MAX WATER DEPTH DEPTH = 5.0 FEET
150 TONS CLASS E RIP RAP
15 TONS CLASS E RIP RAP
AUXILIARY SPILLWAY ELEVATION = 881.50 WIDTH = 150 FEET INSTALL 1430 SY OF TRM TYPE II
CMP STOP LOG STRUCTURE AND DRAWDOWN PIPE
35' WIDE SHALLOW SWALE TO DRAIN AUXILIARY SPILLWAY TO EXISTING CHANNEL
GROUTED CLASS E RIP RAP LINED PLUNGE POOL & ROCK CHUTE BOTTOM = 873.00 TOTAL RIPRAP = 930 TONS TOTAL GROUT = 198 CY
AUXILIARY SPILLWAY SEPARATION BERM TOP WIDTH = 4 FEET HEIGHT = 2 FEET
ROCK CHUTE SEPARATION BERM TOP WIDTH = 4 FEET HEIGHT = 2 FEET
TOP OF DAM ELEVATION = 882.50 TOP WIDTH = 12 FEET
NORTH
0 40 80 160
SCALE IN FEET

WETLAND PARAMETERS

DRAINAGE AREA (TILE) = 631 ACRES
NORMAL POOL AREA = 9.97 ACRES (INCLUDES FOREBAYS)
SA/DA RATIO = 1.61%
<3' DEPTH (AT NWL) = 7.85 ACRES (78.74%)
>3' DEPTH (AT NWL) = 2.28 ACRES (21.26%)

HYDRAULIC PARAMETERS

SHEET PILE WEIR ELEVATION = 879.50
AUXILIARY SPILLWAY ELEVATION = 881.50
TOP OF BERM ELEVATION = 882.50
STORAGE AT NWL = 18.90 ACRE-FEET
STORAGE AT TOP OF DAM = 66.27 ACRE-FEET

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: DJJ
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 2142204320
FIELD BOOK: ---
CLIENT NO: ---

OVERALL GRADING PLAN

C201

LEGEND

DESCRIPTION	PROPOSED LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER ELEVATION	
PROPOSED TILE (TO POOL)	
PROPOSED TILE (TO STREAM)	
EXISTING TILE	
RIP RAP	
WATER LEVEL CONTROL STRUCTURE	
MAJOR CONTOUR	800
MINOR CONTOUR	801
100 - YEAR TEMPORARY HIGH WATER	
EXISTING CONTOUR - MAJOR	
EXISTING CONTOUR - MINOR	
EXISTING STREAM	

6" DUAL WALL HDPE W/ POROUS BACKFILL
225 LF @ 0.3%
START IE = 883.6
END IE = 882.9

6" DUAL WALL HDPE W/ POROUS BACKFILL
98 LF @ 0.3%
START IE = 880.6
END IE = 880.2

6" DUAL WALL HDPE W/ POROUS BACKFILL
180 LF @ 0.3%
START IE = 882.9
END IE = 882.4

6" DUAL WALL HDPE W/ POROUS BACKFILL
123 LF @ 0.3%
START IE = 880.2
END IE = 879.9

6" DUAL WALL HDPE W/ POROUS BACKFILL
121 LF @ 0.3%
START IE = 882.4
END IE = 882.0

6" DUAL WALL HDPE W/ POROUS BACKFILL
150 LF @ 0.3%
START IE = 882.0
END IE = 881.6

6" DUAL WALL HDPE W/ POROUS BACKFILL
130 LF @ 0.3%
START IE = 881.6
END IE = 881.2

6" DUAL WALL HDPE W/ POROUS BACKFILL
193 LF @ -0.3%
START IE = 881.2
END IE = 880.6

6" DUAL WALL HDPE W/ POROUS BACKFILL
75 LF @ 0.4%
START IE = 881.2
END IE = 880.9

6" DUAL WALL HDPE W/ POROUS BACKFILL
113 LF @ 0.3%
START IE = 880.9
END IE = 880.6

4" DUAL WALL HDPE
486 LF @ 0.3%
START IE = 880.8
END IE = 879.5

4" DUAL WALL HDPE
708 LF @ 0.2%
START IE = 879.9
END IE = 878.7

6" NON-PERFORATED DUAL WALL HDPE
91 LF @ 1.6%
START IE = 882.1
END IE = 880.7

6" NON-PERFORATED DUAL WALL HDPE
75 LF @ 0.2%
START IE = 880.7
END IE = 880.5

8" CMP TILE OUTLET
20 LF @ 0.2%
START IE = 880.5
END IE = 880.5

6" DUAL WALL HDPE W/ POROUS BACKFILL
136 LF @ 0.3%
START IE = 879.9
END IE = 879.5

6" DUAL WALL HDPE W/ POROUS BACKFILL
148 LF @ 0.3%
START IE = 879.5
END IE = 879.1

6" DUAL WALL HDPE W/ POROUS BACKFILL
127 LF @ 0.3%
START IE = 879.1
END IE = 878.7

6" NON-PERFORATED DUAL WALL HDPE
86 LF @ 0.6%
START IE = 878.7
END IE = 878.2

8" CMP TILE OUTLET
20 LF @ -0.3%
START IE = 880.6
END IE = 880.5

6" NON-PERFORATED DUAL WALL HDPE
81 LF @ 0.3%
START IE = 878.2
END IE = 877.9

8" CMP TILE OUTLET
20 LF @ 0.3%
START IE = 880.6
END IE = 880.5

6" DUAL WALL HDPE
106 LF @ 2.1%
START IE = 888.3
END IE = 886.0

6" DUAL WALL HDPE
100 LF @ 2.0%
START IE = 886.0
END IE = 884.0

6" DUAL WALL HDPE
100 LF @ 1.1%
START IE = 884.0
END IE = 882.9

6" DUAL WALL HDPE
10 LF @ 0.2%
START IE = 880.6
END IE = 880.5

6" DUAL WALL HDPE
107 LF @ 1.6%
START IE = 882.9
END IE = 881.2

6" DUAL WALL HDPE
330 LF @ 0.2%
START IE = 881.2
END IE = 880.6

6" NON-PERFORATED DUAL WALL HDPE
466 LF @ 0.3%
START IE = 877.9
END IE = 876.3

6" DUAL WALL HDPE
132 LF @ 0.3%
START IE = 881.6
END IE = 881.2

6" DUAL WALL HDPE
175 LF @ 0.3%
START IE = 881.2
END IE = 880.7

6" DUAL WALL HDPE
36 LF @ 0.3%
START IE = 880.7
END IE = 880.6

6" NON-PERFORATED DUAL WALL HDPE
494 LF @ 0.4%
START IE = 876.0
END IE = 874.1

6" NON-PERFORATED DUAL WALL HDPE
64 LF @ 0.4%
START IE = 876.3
END IE = 876.0

8" CMP TILE OUTLET
20 LF @ 0.3%
START IE = 874.1
END IE = 874.0

876.60
877.50
876.70
875.25
876.00
875.82
877.50
SB 2
SB 3
SB 4
1.4%

TILE NOTES:

1. THE INVERT ELEVATIONS FOR PROPOSED DRAIN TILES ON THIS PLAN ARE BASED ON ASSUMED DEPTHS OF EXITING DRAIN TILES. CONTRACTOR TO LOCATE AND CONNECT PROPOSED DRAIN TILES TO EXISTING TILES, COORDINATE WITH ENGINEER.
2. INTERCEPT ALL CROSSING TILES AND CAP DOWNSTREAM ENDS
3. TILE TO BE PERFORATED IF NOT SPECIFIED AS NON-PERFORATED.

NORTH

0 40 80 160
SCALE IN FEET

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BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 214220320
FIELD BOOK: ---
CLIENT NO: ---

PROPOSED TILE PLAN

C202

LEGEND

DESCRIPTION	PROPOSED LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER ELEVATION	
PROPOSED TILE (TO POOL)	
PROPOSED TILE (TO STREAM)	
EXISTING TILE	
RIP RAP	
WATER LEVEL CONTROL STRUCTURE	
MAJOR CONTOUR	800
MINOR CONTOUR	801
100 - YEAR TEMPORARY HIGH WATER	
EXISTING CONTOUR - MAJOR	
EXISTING CONTOUR - MINOR	
EXISTING STREAM	

150 TONS CLASS E RIP RAP

885

890

15 TONS CLASS E RIP RAP

WETLAND FOREBAY DEPTH = 4 FEET

885

SCARIFY 9" & RE-COMPACT WITHIN ENTIRE POOL AREA

EASEMENT BOUNDARY

TOP OF DAM ELEVATION ELEV = 882.50

APPROXIMATE 100 YEAR STORM BOUNCE ELEV = 882.00

880

877.50

150 TONS CLASS E RIP RAP

SCARIFY 9" BELOW, REPLACE 9" & COMPACT WITHIN BORROW AREA FOOTPRINT

BORROW AREA FOOTPRINT
AREA = 1.2 ACRES
POOL DEPTH = 2 FEET MAX
CUT = 2 FEET

INTERIOR WETLAND BERM
TOP WIDTH = 20 FEET
ELEVATION = 979.0

10' WIDE WAVE BENCH - SEE DETAIL

NORMAL WATER LEVEL
ELEV = 879.50
AREA = 9.97 ACRES

876.60

877.50

876.70

BORROW AREA FOOTPRINT
AREA = 2.5 ACRES
POOL DEPTH = 5.0 FEET MAX
CUT = 2-4 FEET

WETLAND FOREBAY DEPTH = 4 FEET

SHEET PILE WEIR OUTFLOW
CREST WIDTH = 80 FEET
CREST ELEVATION = 879.50
DROP HEIGHT = 3.0 FEET

875.25

SCARIFY 9" BELOW, REPLACE 9" & COMPACT WITHIN BORROW AREA FOOTPRINT

876.00

SB 3

SB 2

875.82

SB 4

INSTALL SILT FENCE ALONG EMBANKMENT DOWNHILL SLOPE

15 TONS CLASS E RIP RAP

150 TONS CLASS E RIP RAP

MAX WATER DEPTH
DEPTH = 5.0 FEET

15 TONS CLASS E RIP RAP

150 TONS CLASS E RIP RAP

CMP STOP LOG STRUCTURE AND DRAWDOWN PIPE

AUXILIARY SPILLWAY
ELEVATION = 881.50
WIDTH = 150 FEET
INSTALL 1430 SY OF TRM TYPE II

35' WIDE SHALLOW SWALE TO DRAIN AUXILIARY SPILLWAY TO EXISTING CHANNEL

GROUTED CLASS E RIP RAP LINED PLUNGE POOL & ROCK CHUTE
BOTTOM = 873.00
TOTAL RIPRAP = 930 TONS
TOTAL GROUT = 198 CY

TOP OF DAM
ELEVATION = 882.50
TOP WIDTH = 12 FEET

NORTH

0 30 60 120

SCALE IN FEET

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS

BUCHANAN COUNTY, IOWA

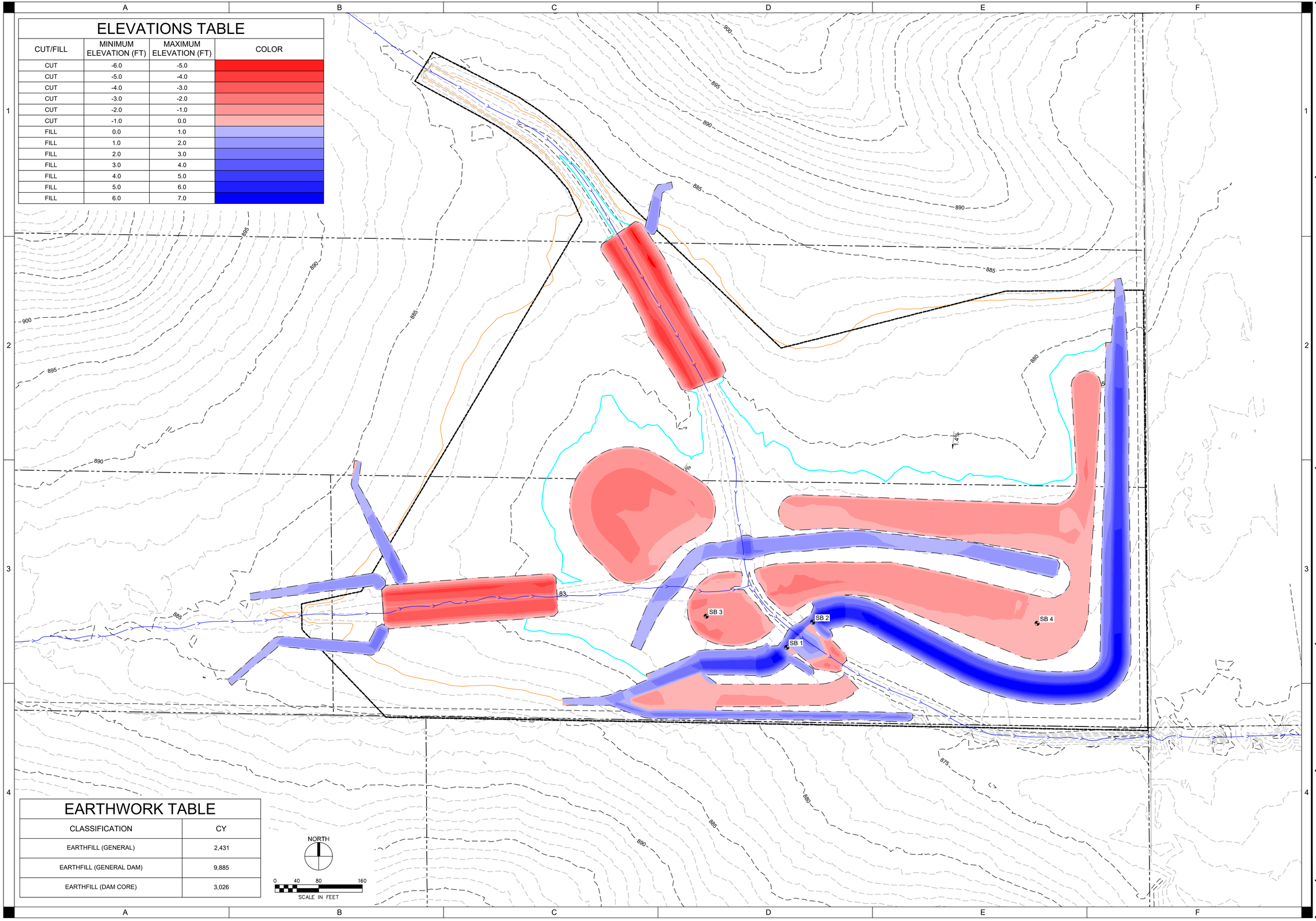
DRAWN:	GHK
APPROVED:	DJJ
ISSUED FOR:	FINAL DESIGN
DATE:	8/7/2024
PROJECT NO:	21422043 20
FIELD BOOK:	---
CLIENT NO:	---

GRADING PLAN

C203

ELEVATIONS TABLE

CUT/FILL	MINIMUM ELEVATION (FT)	MAXIMUM ELEVATION (FT)	COLOR
CUT	-6.0	-5.0	
CUT	-5.0	-4.0	
CUT	-4.0	-3.0	
CUT	-3.0	-2.0	
CUT	-2.0	-1.0	
CUT	-1.0	0.0	
FILL	0.0	1.0	
FILL	1.0	2.0	
FILL	2.0	3.0	
FILL	3.0	4.0	
FILL	4.0	5.0	
FILL	5.0	6.0	
FILL	6.0	7.0	



EARTHWORK TABLE

CLASSIFICATION	CY
EARTHFILL (GENERAL)	2,431
EARTHFILL (GENERAL DAM)	9,885
EARTHFILL (DAM CORE)	3,026

NORTH

0 40 80 160
SCALE IN FEET

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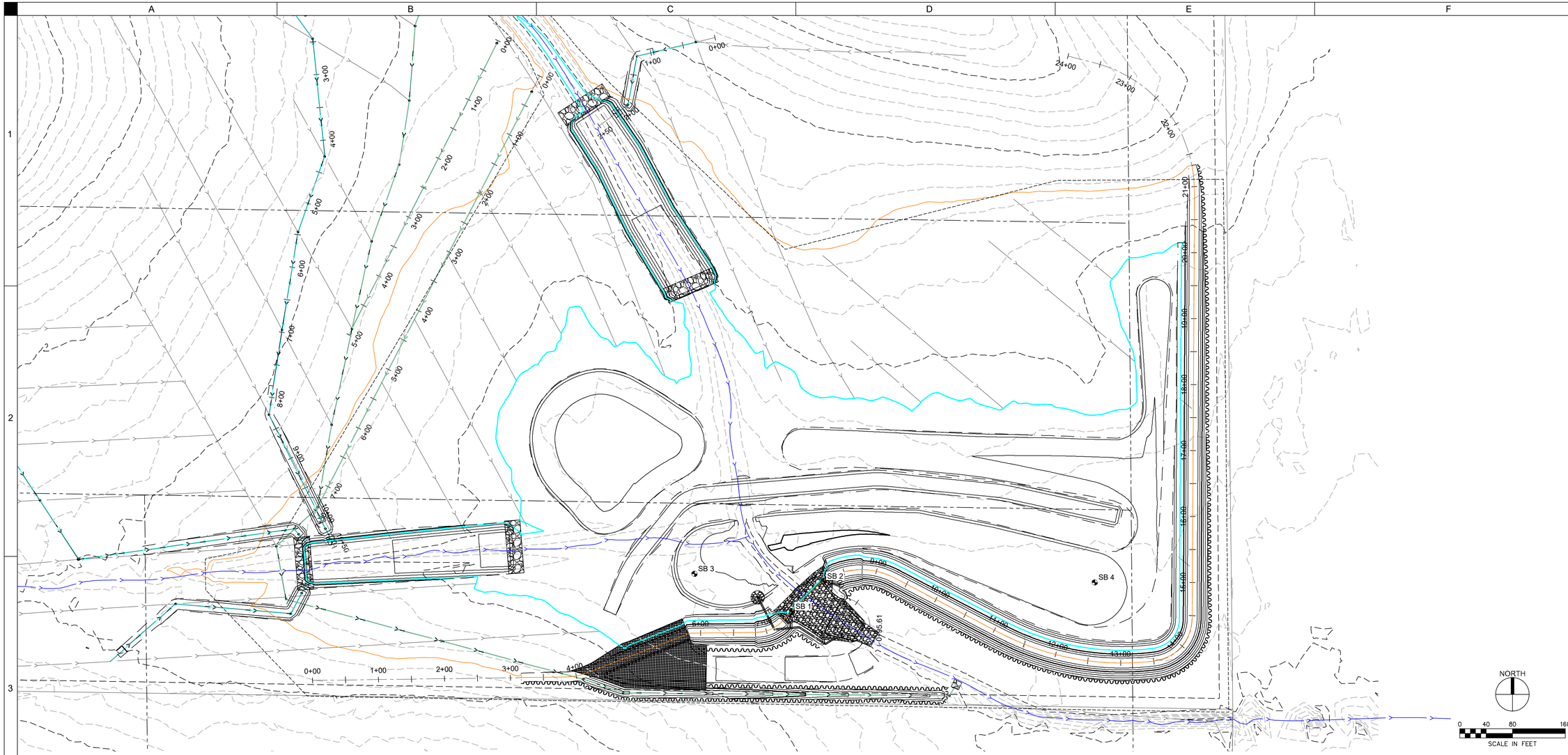
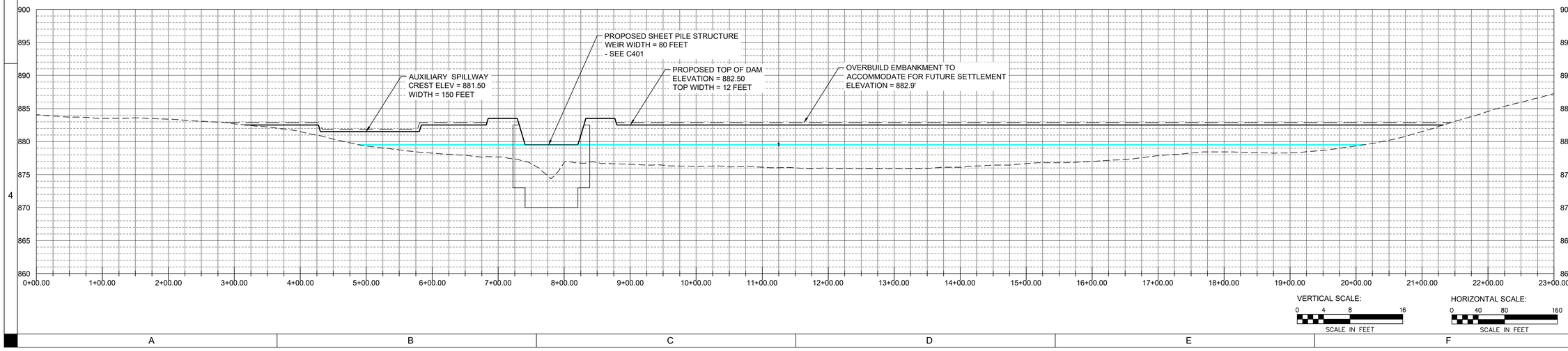
CUT-FILL PLAN

C204





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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

EMBANKMENT PLAN AND PROFILE

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 2142204320
FIELD BOOK: ---
CLIENT NO: ---

C301

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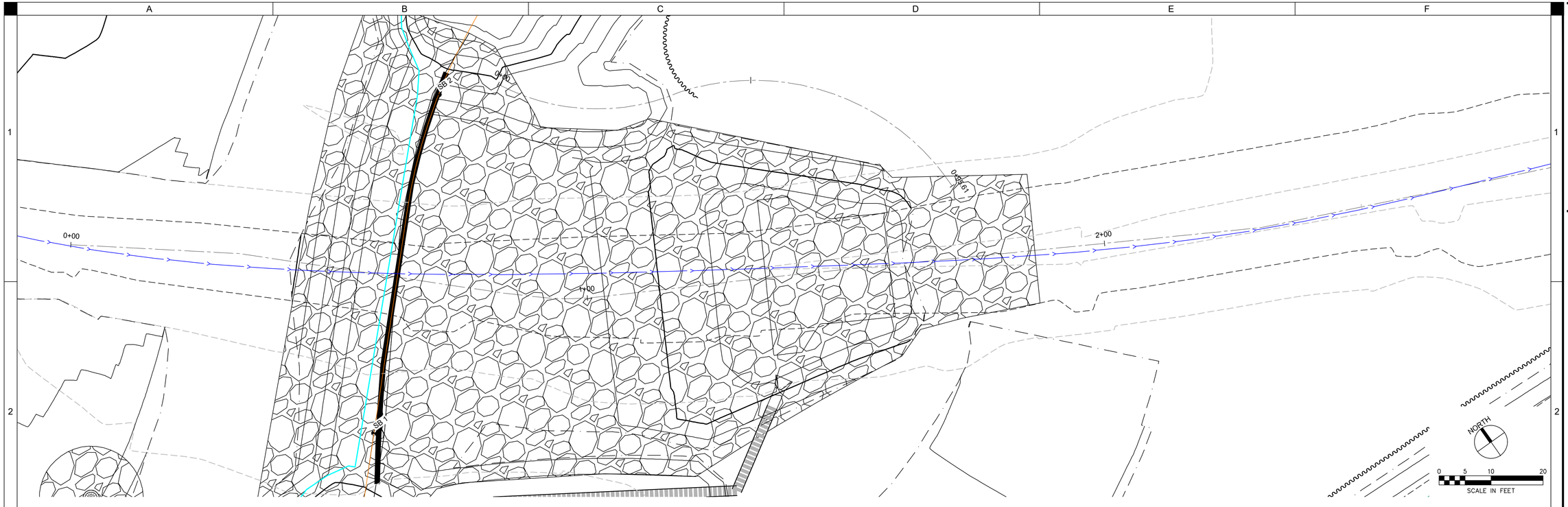

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IOWA DEPARTMENT OF NATURAL RESOURCES • AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 214220/4320
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CLIENT NO: ---

PRINCIPAL SPILLWAY PLAN AND PROFILE

C302

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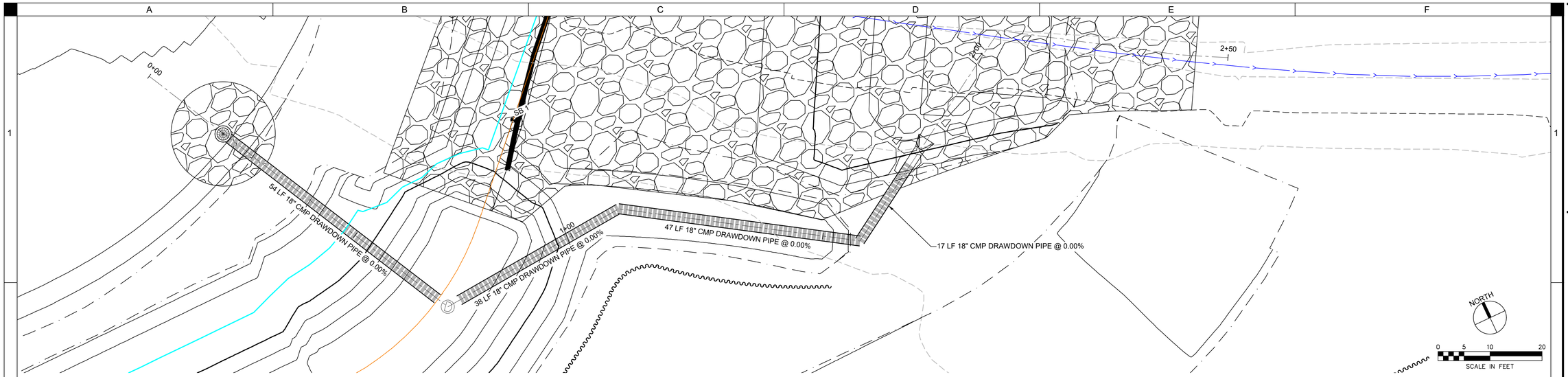

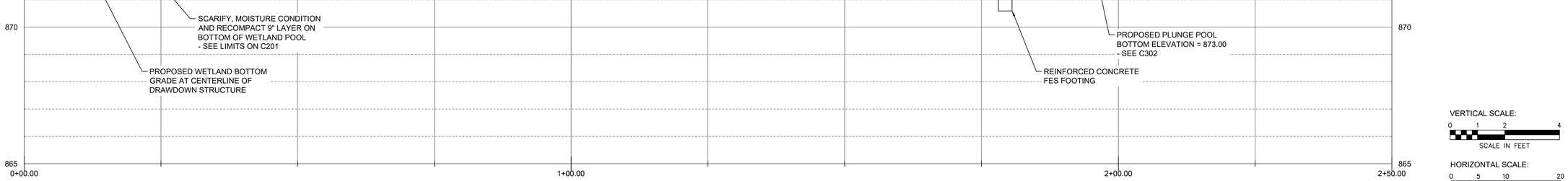

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 214220#320
FIELD BOOK: ---
CLIENT NO: ---

DRAWDOWN STRUCTURE PLAN AND PROFILE

C303

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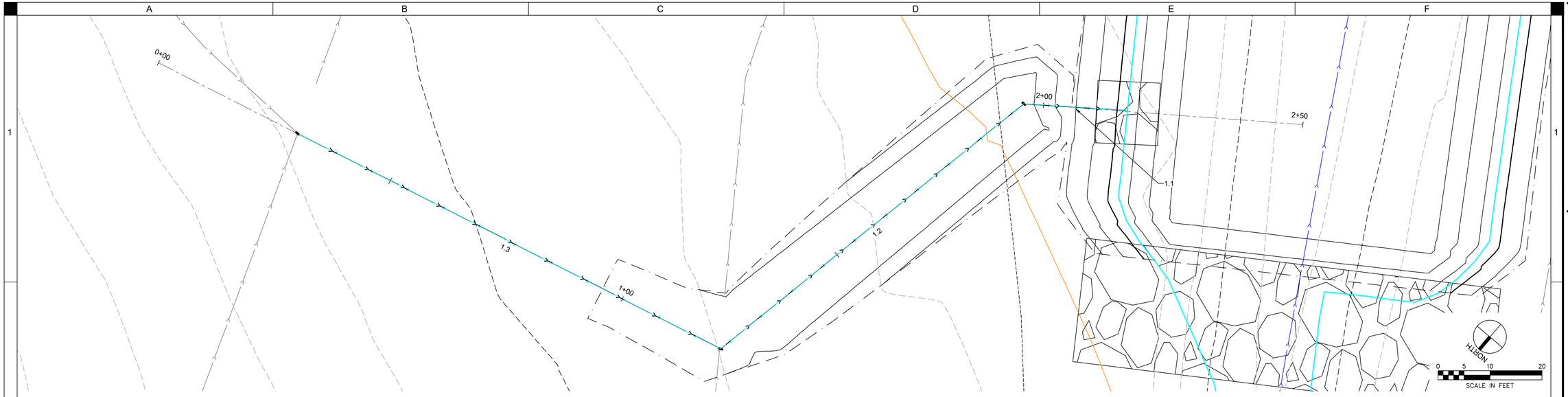

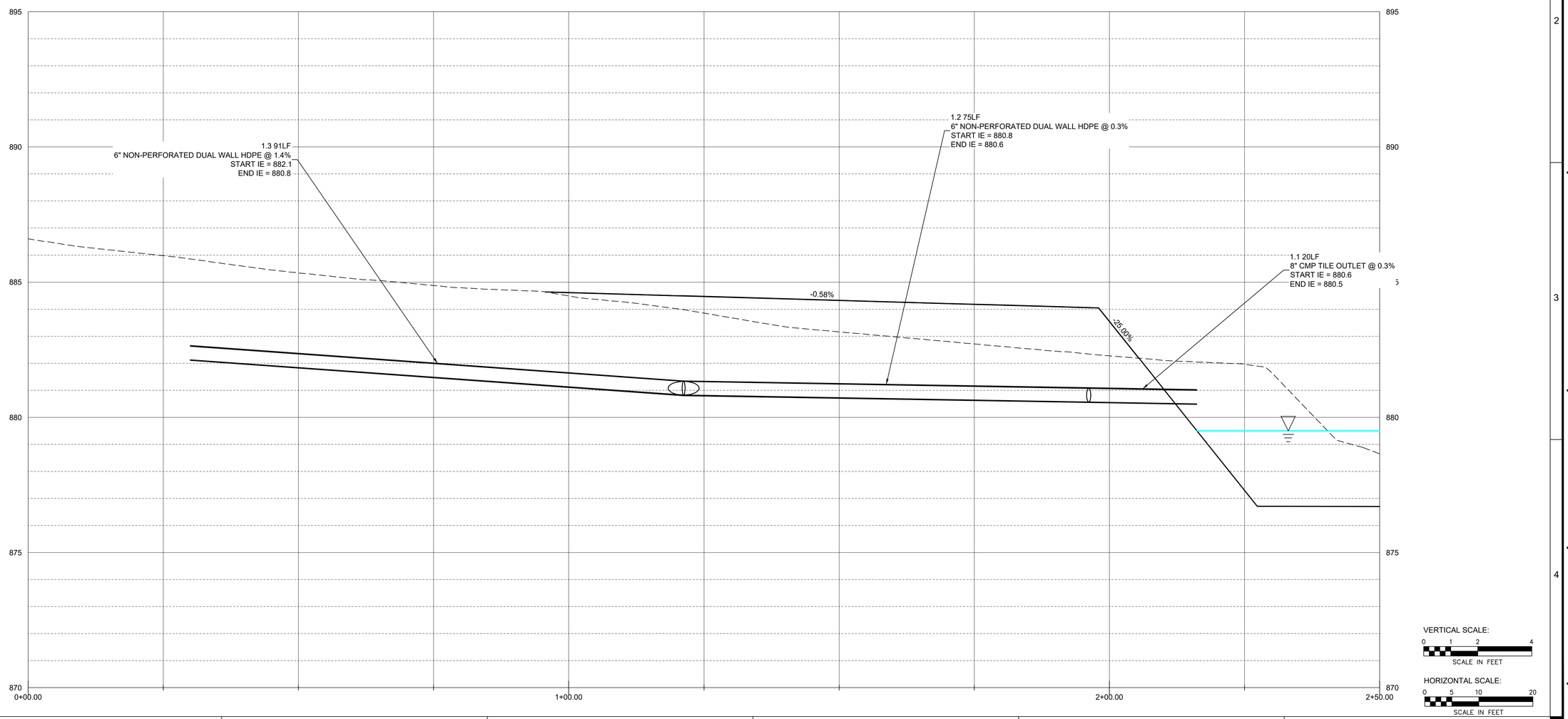

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS

BUCHANAN COUNTY, IOWA

DRAWN:	GHK
APPROVED:	DJJ
ISSUED FOR:	FINAL DESIGN
DATE:	8/8/2024
PROJECT NO:	214220/4320
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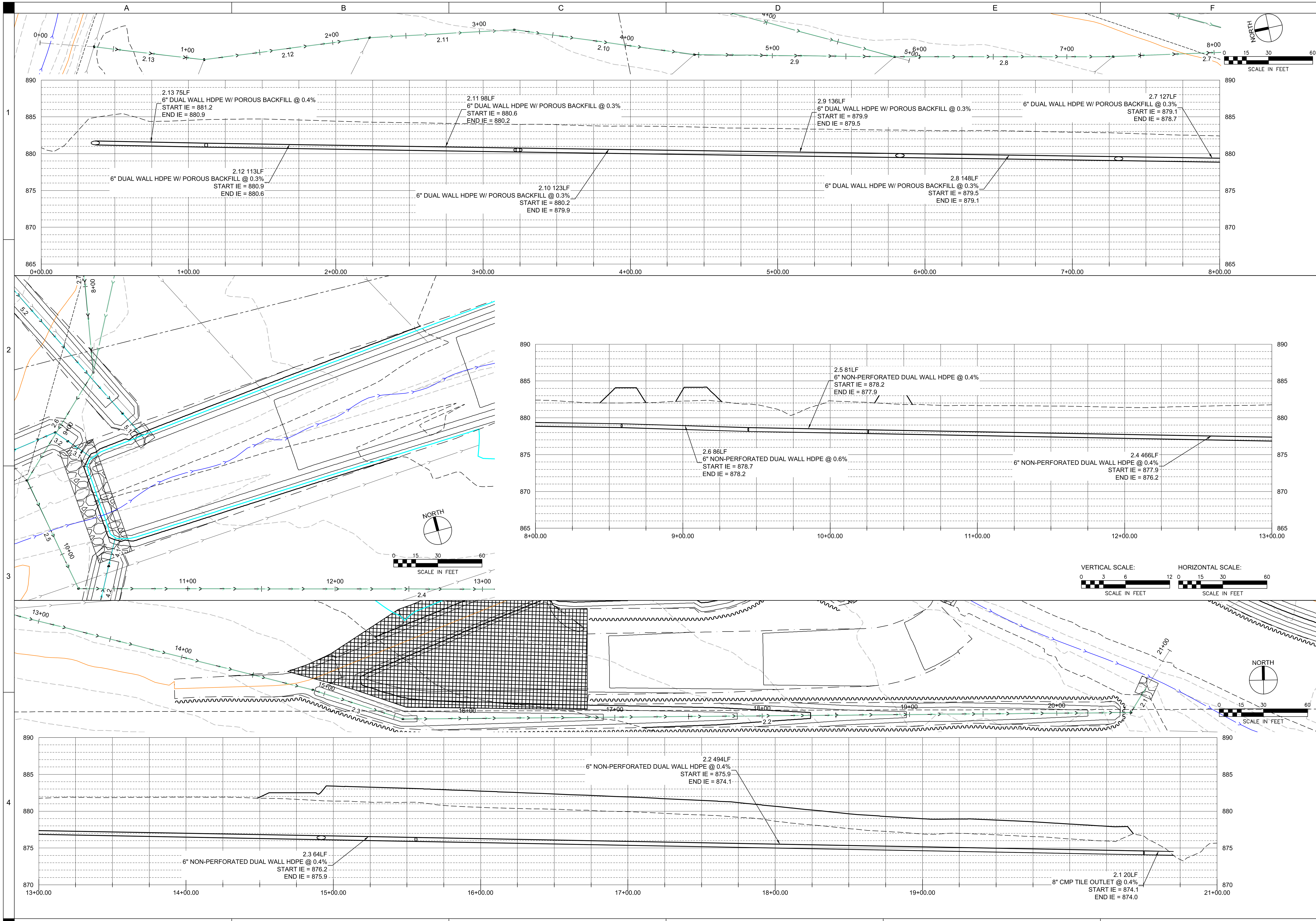
DRAIN TILE PLAN AND PROFILE

C304



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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

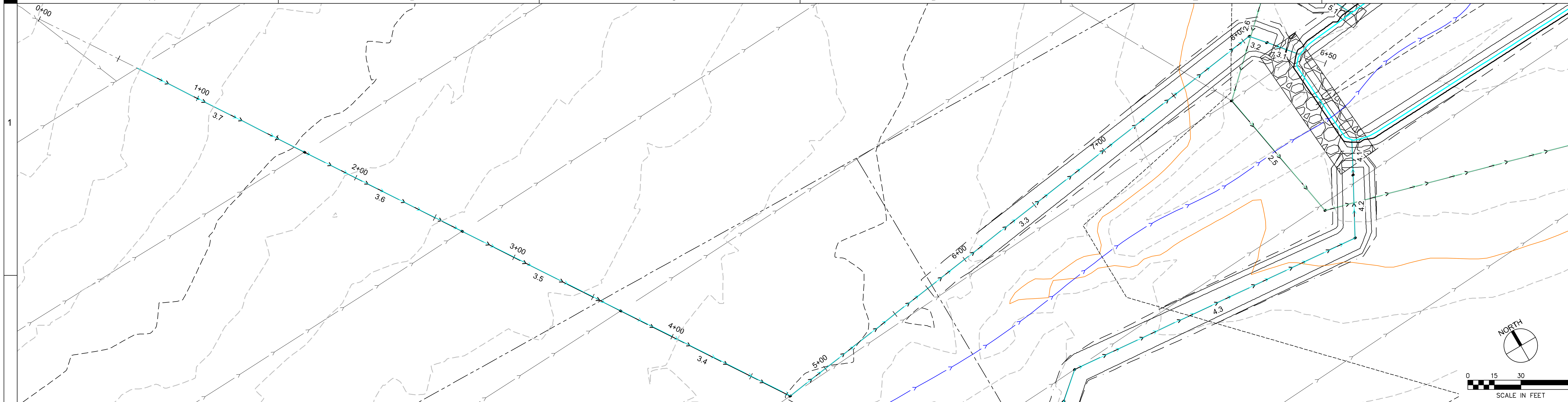
BUC871015D WETLAND

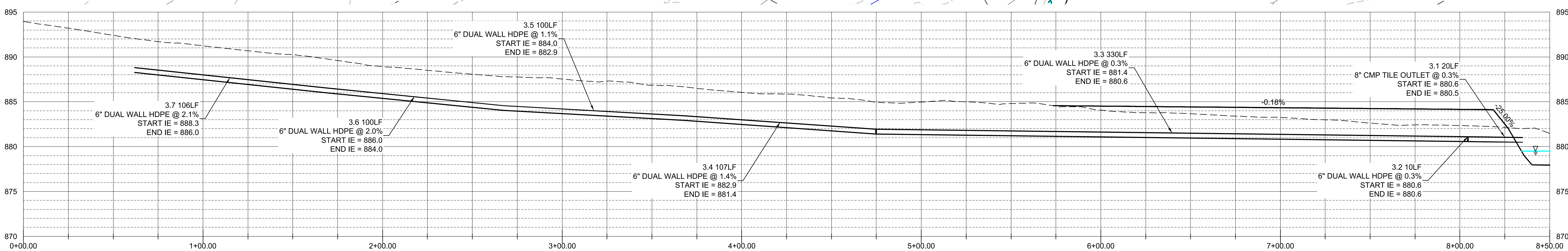
IDALS
BUCHANAN COUNTY, IOWA

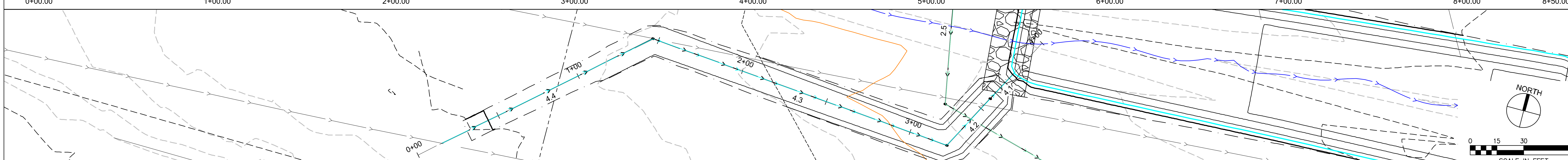
DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/8/2024
PROJECT NO: 2142204320
FIELD BOOK: ---
CLIENT NO: ---

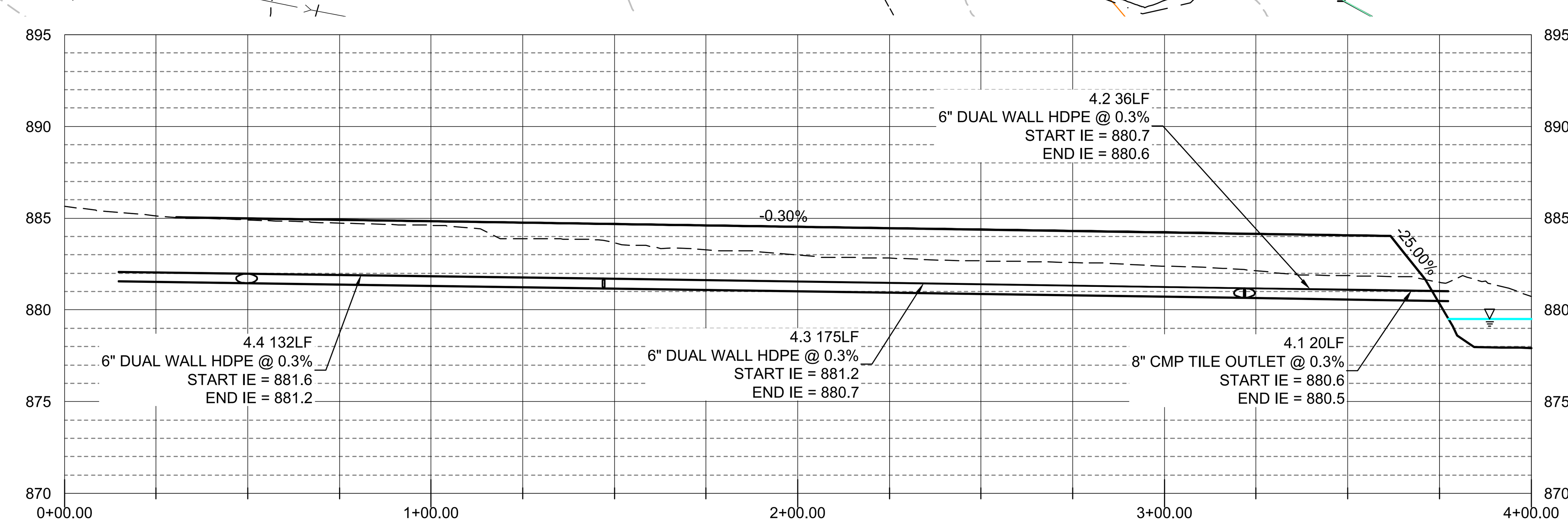
DRAIN TILE PLAN AND PROFILE

C305









VERTICAL SCALE: 0 3 6 12 SCALE IN FEET

HORIZONTAL SCALE: 0 15 30 60 SCALE IN FEET

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BUC871015D WETLAND

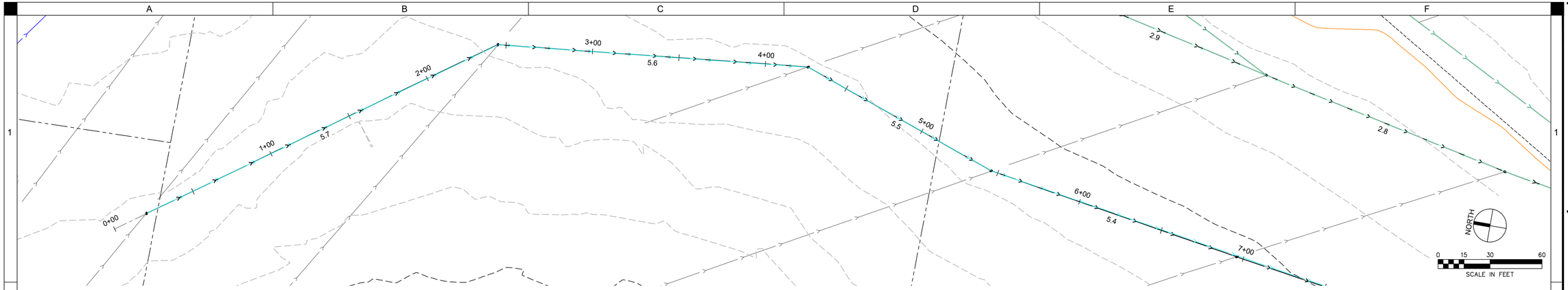
IDALS

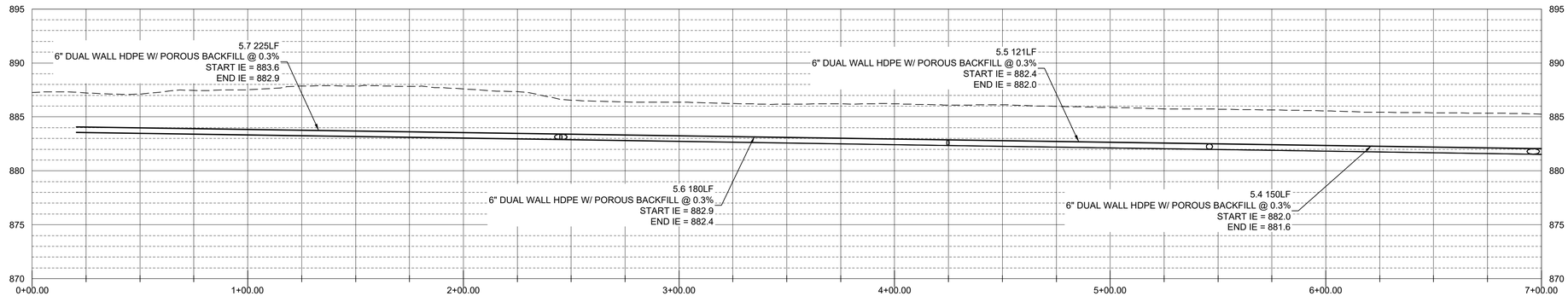
BUCHANAN COUNTY, IOWA

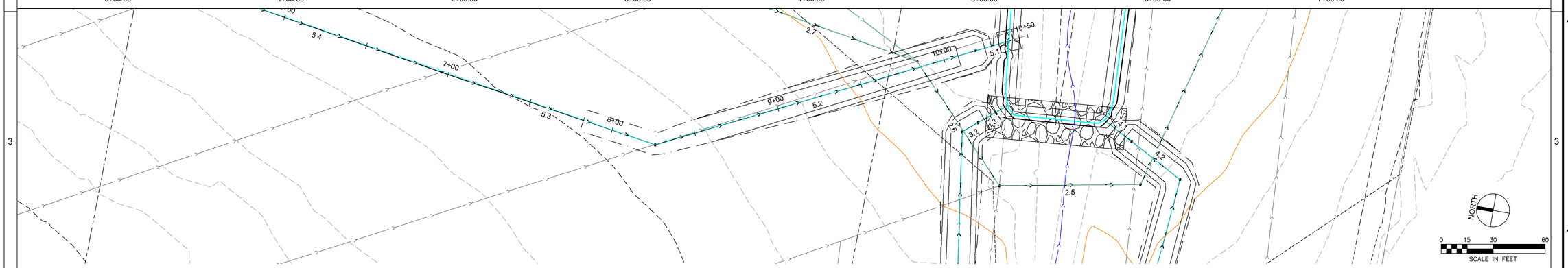
DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/8/2024
PROJECT NO: 2142204320
FIELD BOOK: ---
CLIENT NO: ---

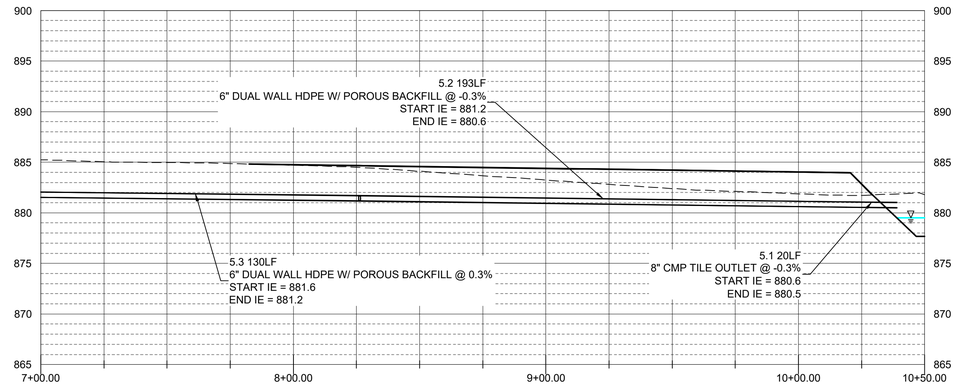
DRAIN TILE PLAN AND PROFILE

C306









VERTICAL SCALE:
0 3 6 12
SCALE IN FEET

HORIZONTAL SCALE:
0 15 30 60
SCALE IN FEET

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BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/8/2024
PROJECT NO: 214220432
FIELD BOOK: ---
CLIENT NO: ---

DRAIN TILE PLAN AND PROFILE

C307

SHEET PILE GENERAL NOTES:

1. DESIGN SHEET PILE AREA IS 1094 SF AFTER TRIMMING

2. SHEET PILING REQUIREMENTS DESIGN BASIS - SKYLINE STEEL/NUCOR SCZ14 OR ENGINEER APPROVED EQUAL
   - 2.1. MINIMUM SECTION MODULUS OF 14.36IN^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.

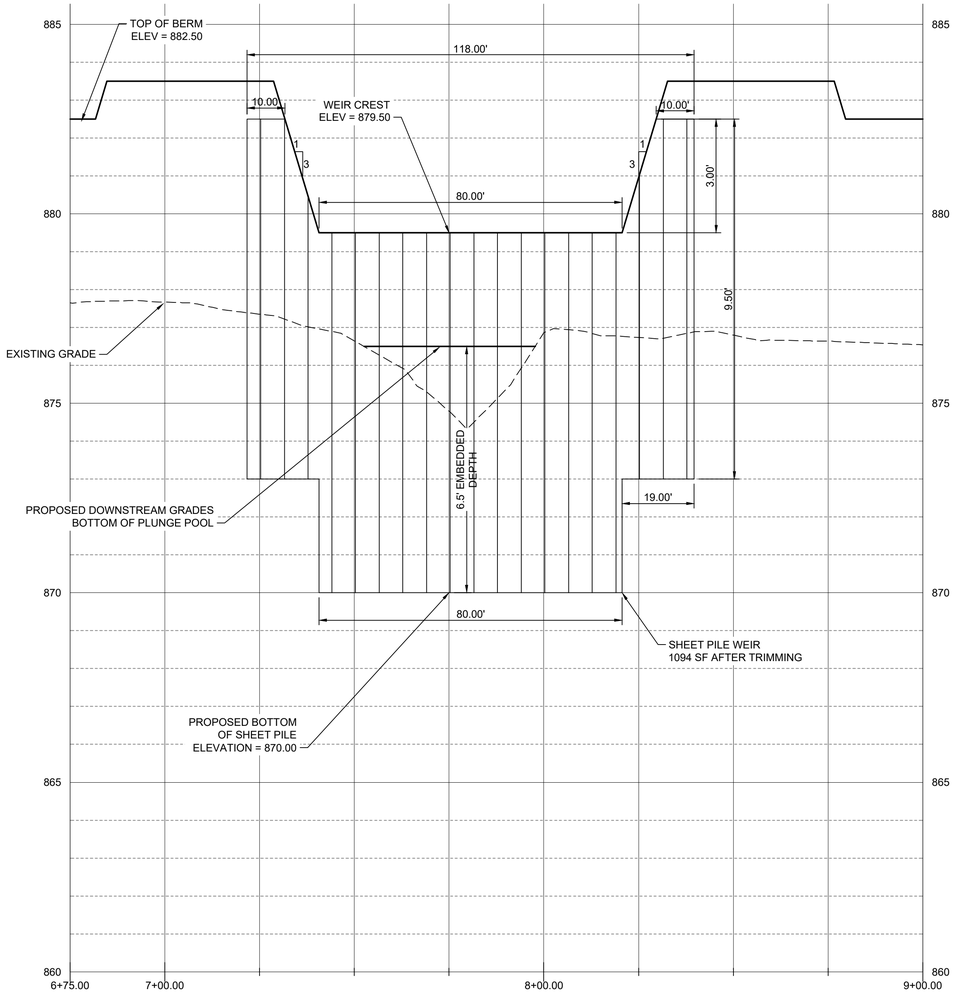
7. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATION OF AISC. FABRICATOR SHALL SUBMIT SHOP DRAWINGS AND FABRICATE AFTER ENGINEER'S REVIEW AND APPROVAL.

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.

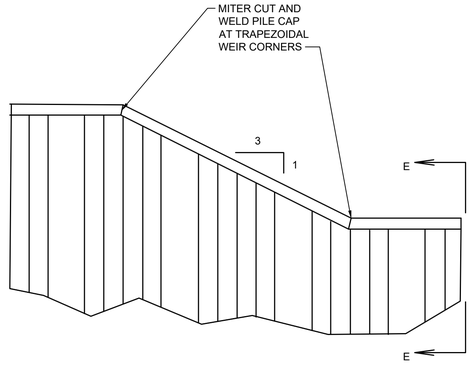
10. A TEMPORARY BERM TO HOLD / GUIDE SHEETPILE DURING CONSTRUCTION IS RECOMMENDED.

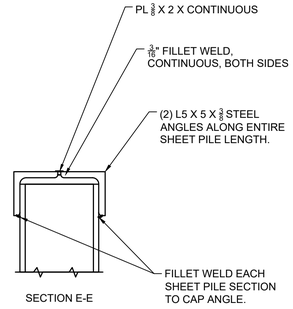
11. NOTIFY ENGINEER IMMEDIATELY IF BEDROCK IS ENCOUNTERED PRIOR TO INSTALLATION OF SHEET PILE TO DESIGN DEPTHS.



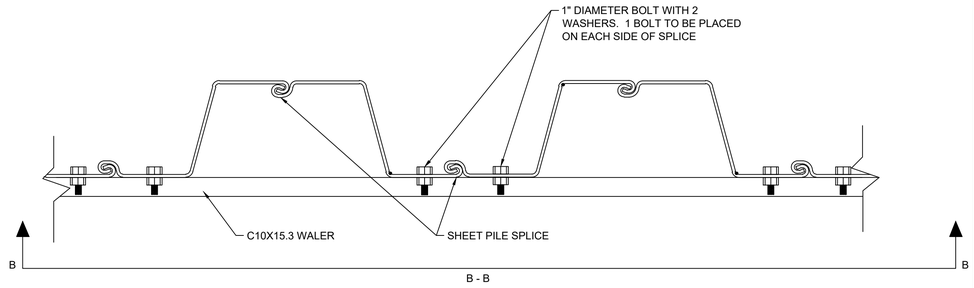
SHEET PILE CENTERLINE PROFILE

HORIZONTAL SCALE: 1"= 15', VERTICAL SCALE: 1"= 1.5'





A C401 NTS WELDED PILE CAP OPTION DETAIL



*NOTE: SHEET PILE BEYOND NOT SHOWN.

B C401 NTS BOLTED WALER OPTION DETAIL

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BUC871015D WETLAND

IDALS

BUCHANAN COUNTY, IOWA

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 214220320
FIELD BOOK: ---
CLIENT NO: ---

SHEET PILE DESIGN

C401

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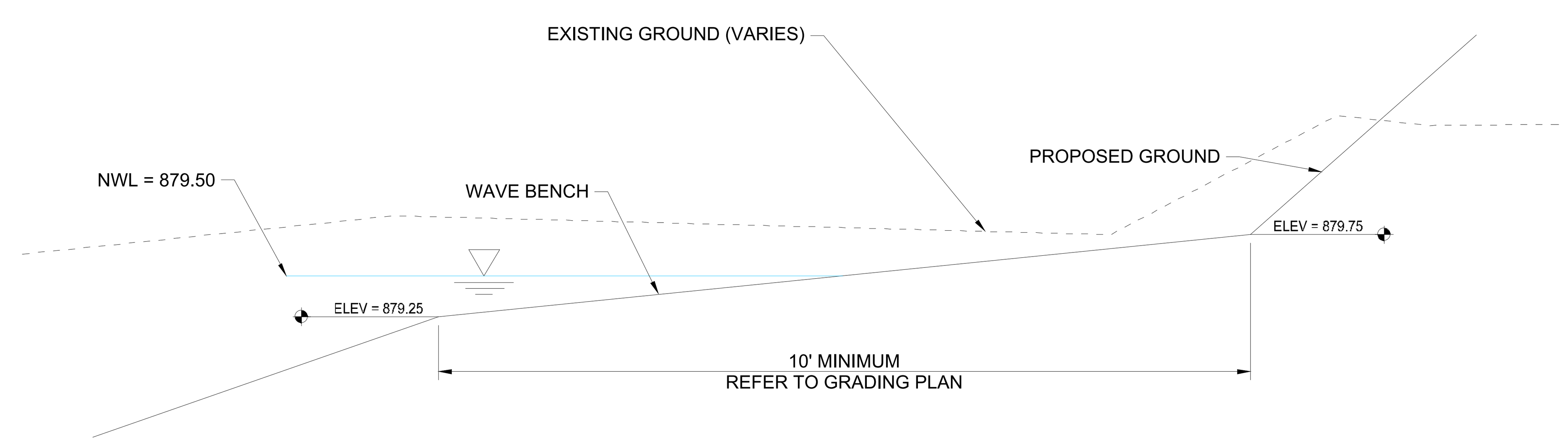
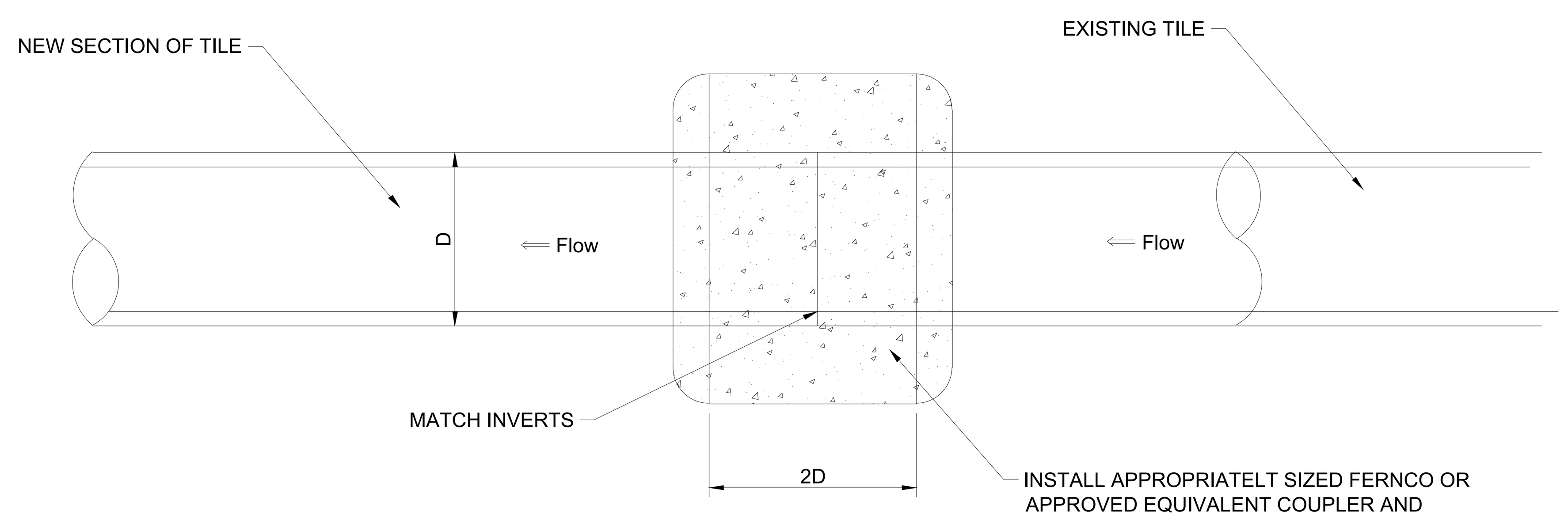
A1 WAVE PROTECTION BENCH AT NWL

NOT TO SCALE



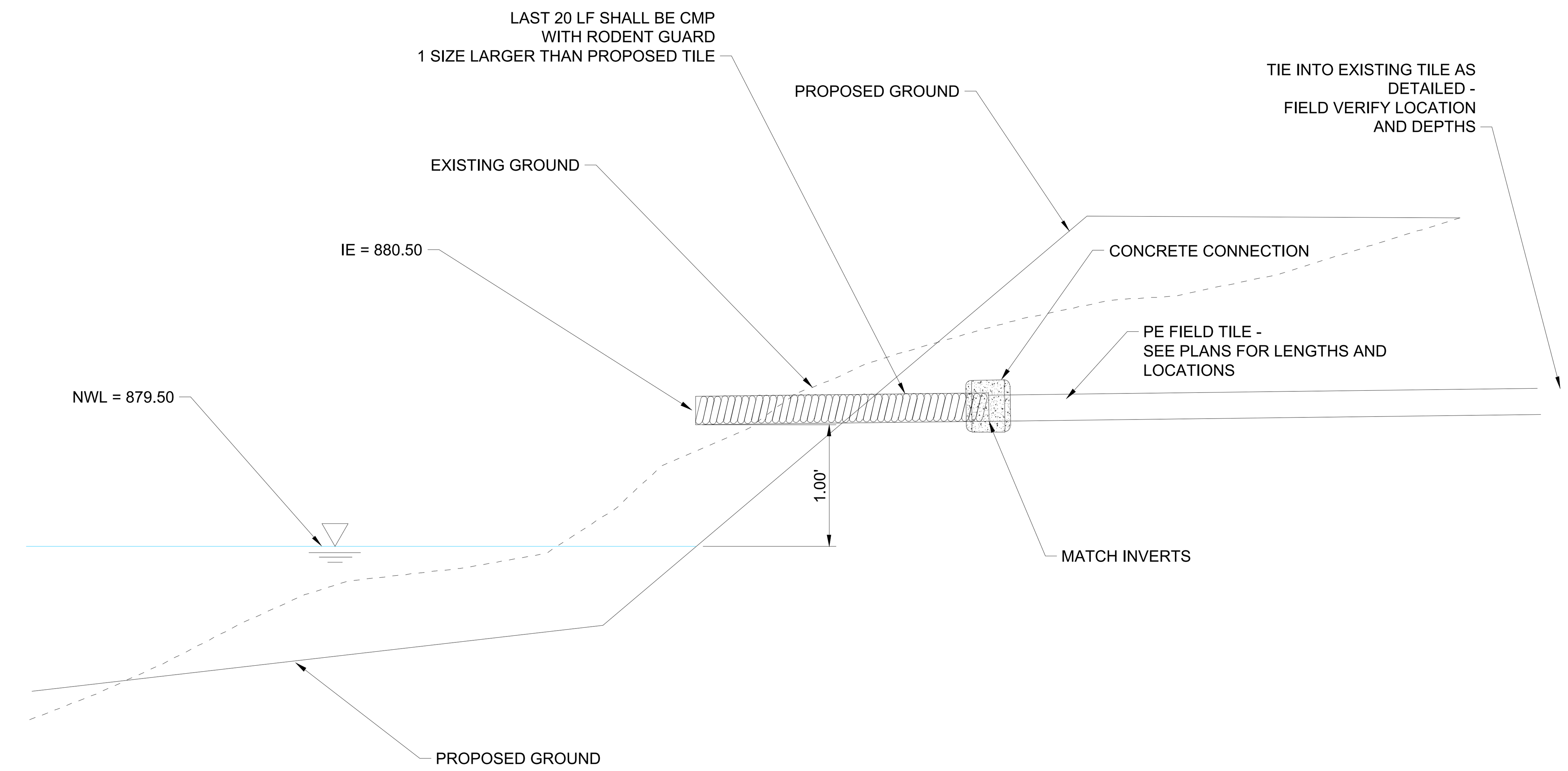
A2 FIELD TILE REPAIR CONNECTION

NOT TO SCALE



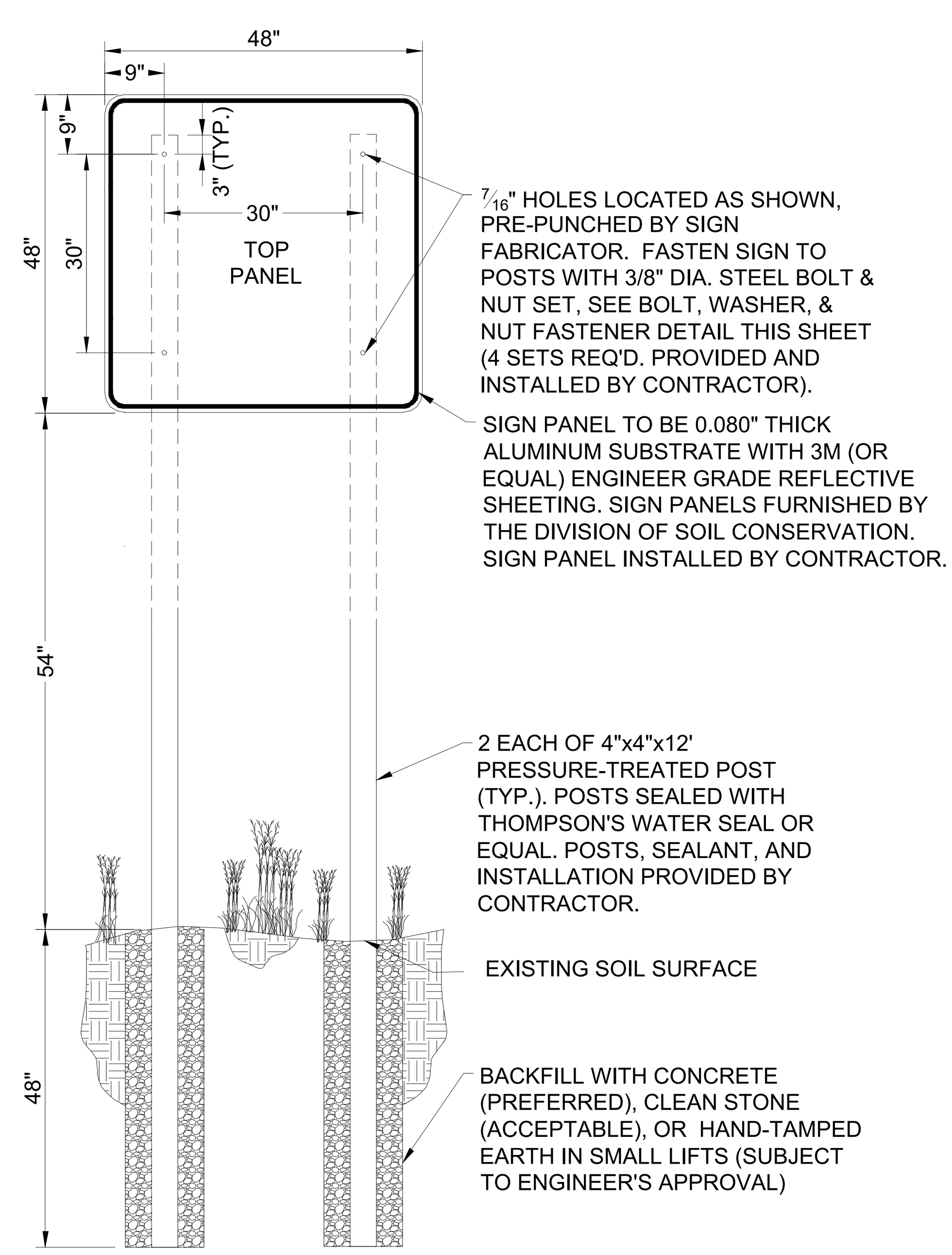
D2 TILE OUTLET AT WETLAND

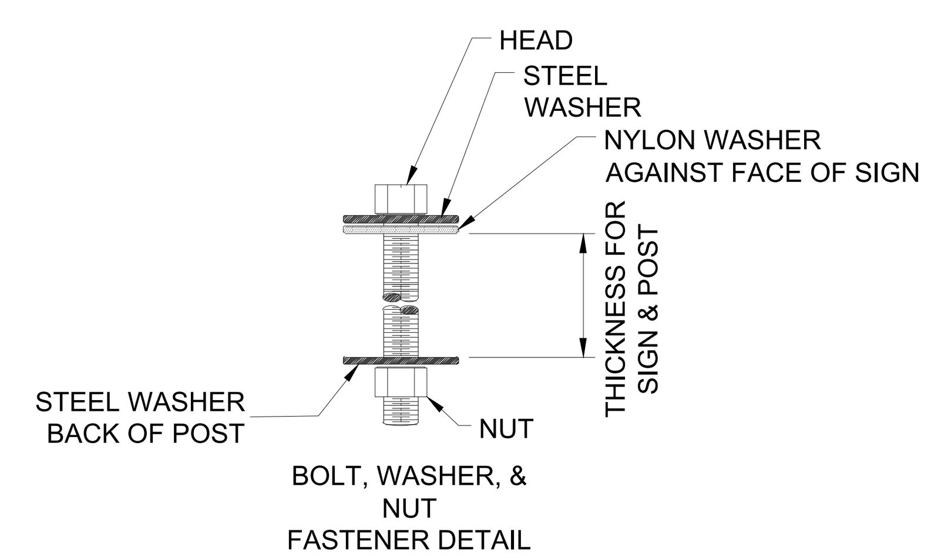
NOT TO SCALE



A4 PROJECT SIGN

NOT TO SCALE





BOLT, WASHER, & NUT FASTENER DETAIL

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.

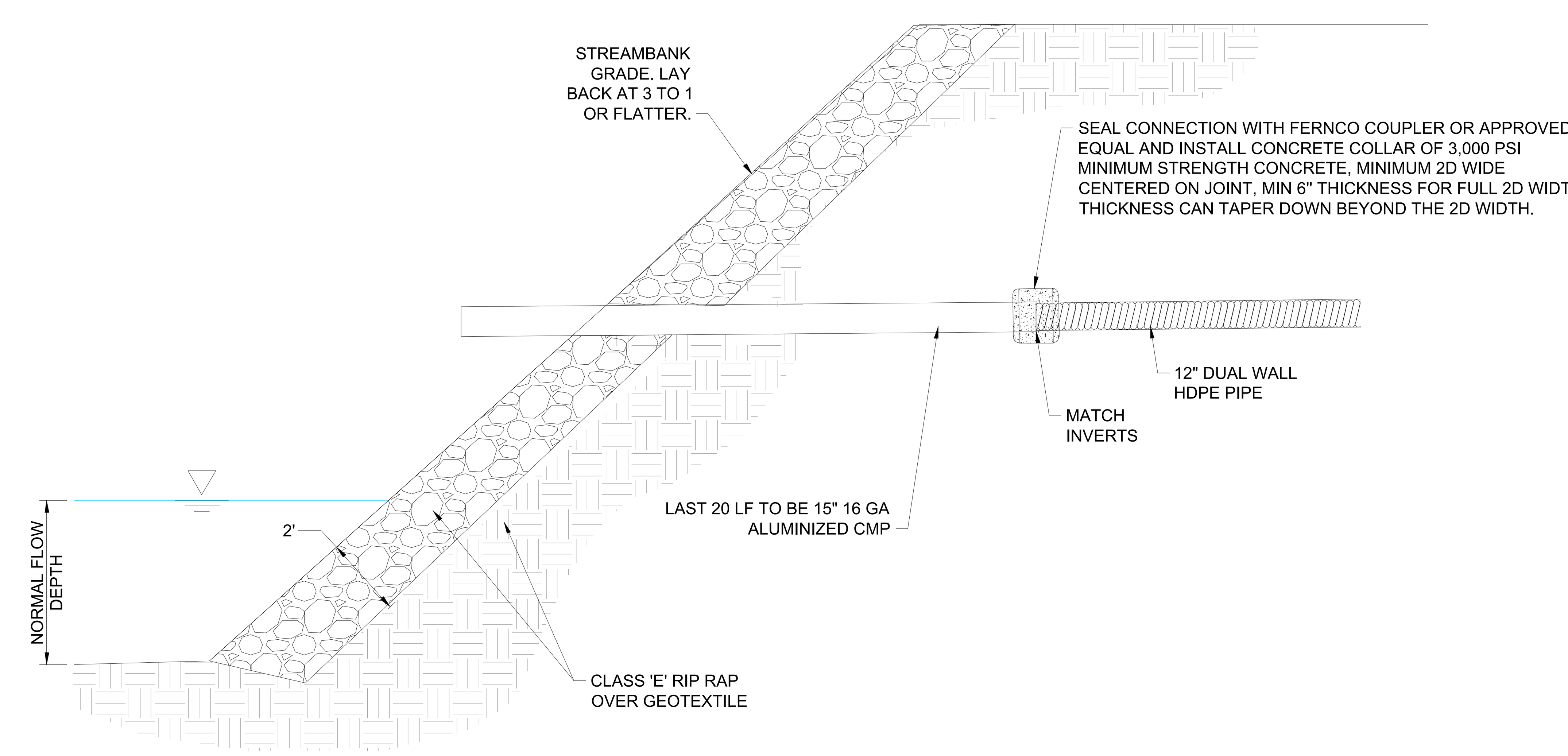
7. COSTS FOR POSTS, HARDWARE, WOOD SEALANT AND SIGN INSTALLATION SHALL BE INCIDENTAL TO MOBILIZATION.

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.

D4 TILE OUTLET TO STREAM

NOT TO SCALE



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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

BUC871015D WETLAND

IDALS

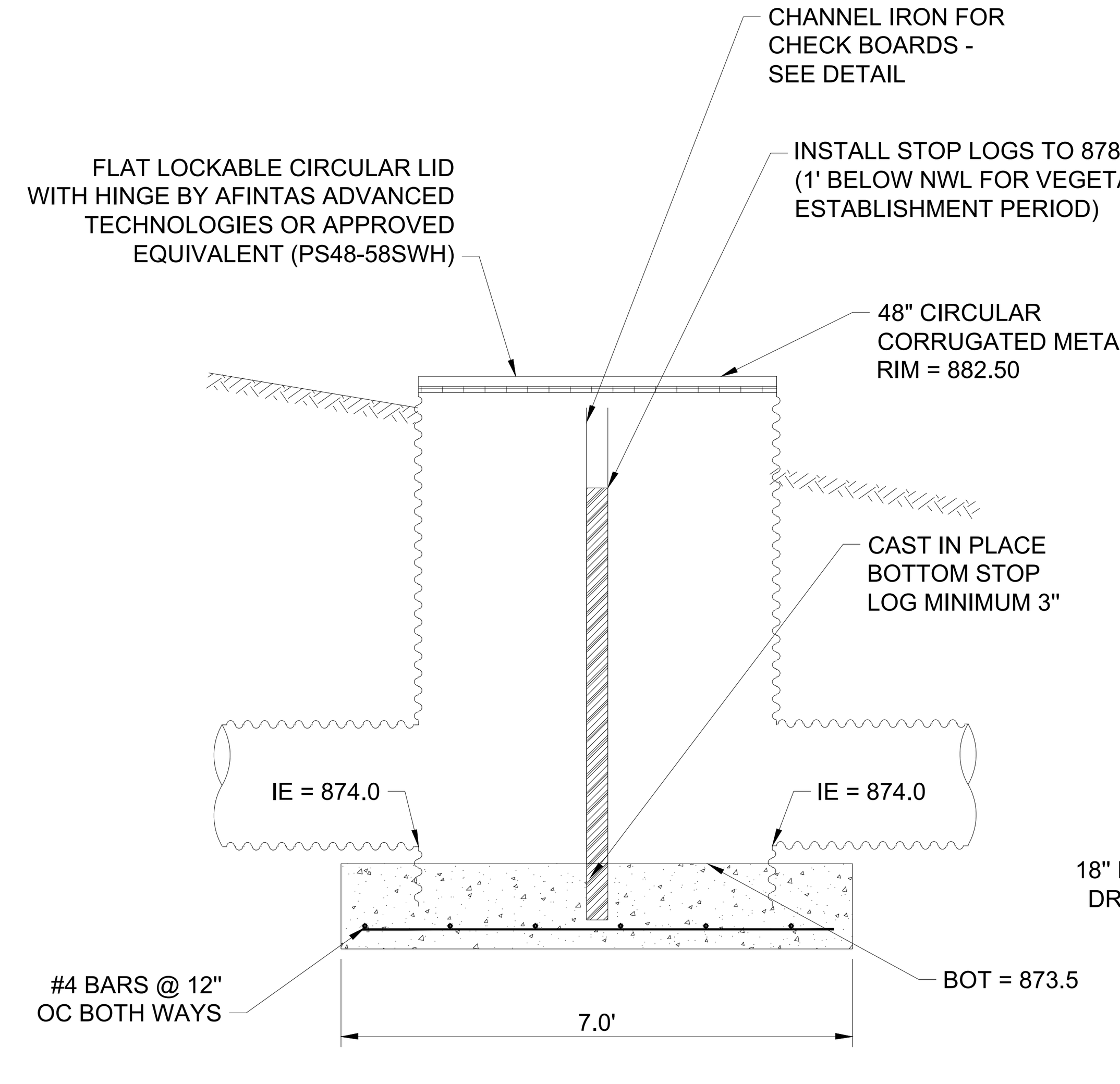
BUCHANAN COUNTY, IOWA

DRAWN:	GHK
APPROVED:	DJJ
ISSUED FOR:	FINAL DESIGN
DATE:	8/7/2024
PROJECT NO:	2142204320
FIELD BOOK:	--
CLIENT NO:	--

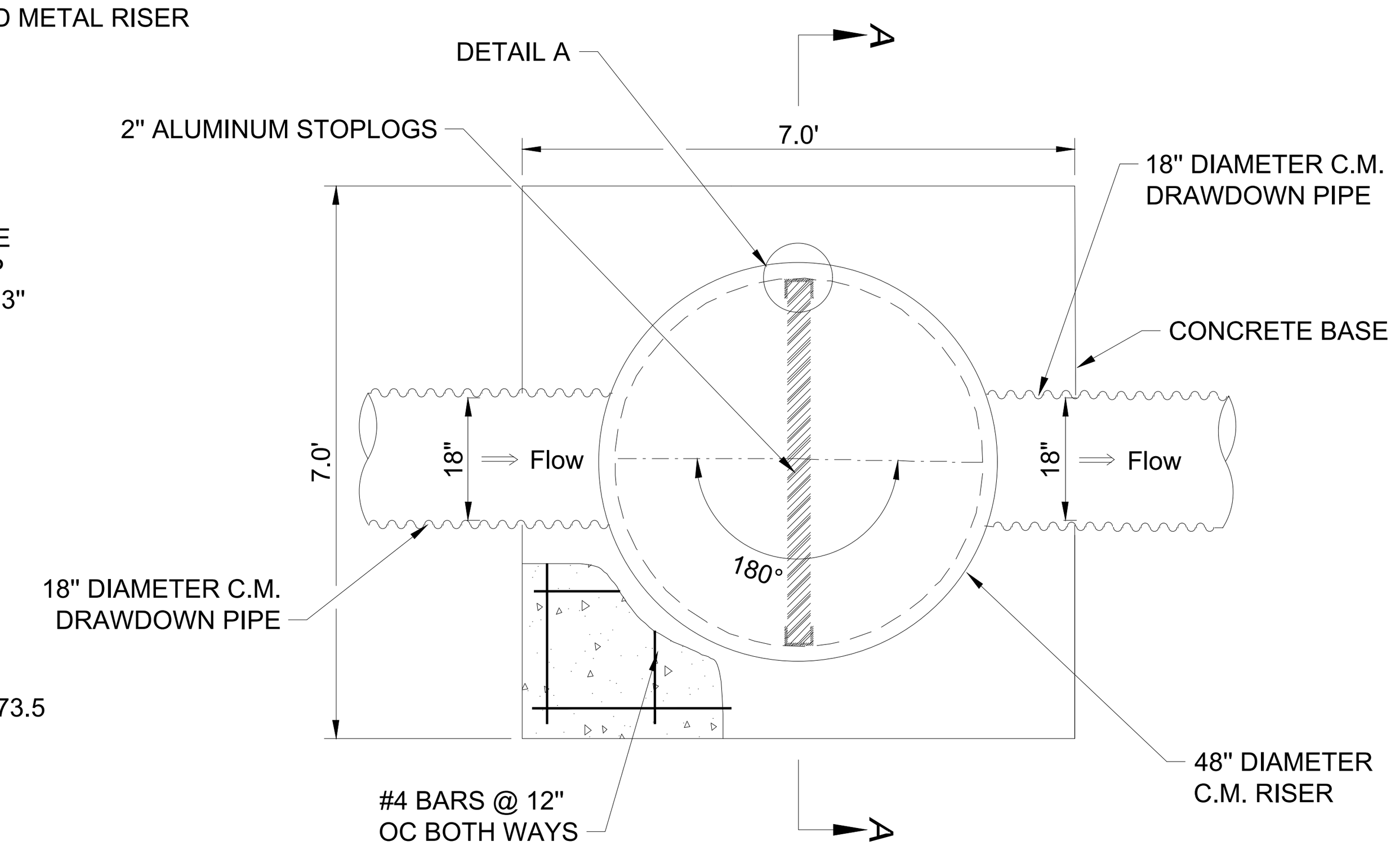
CONSTRUCTION DETAILS

C501

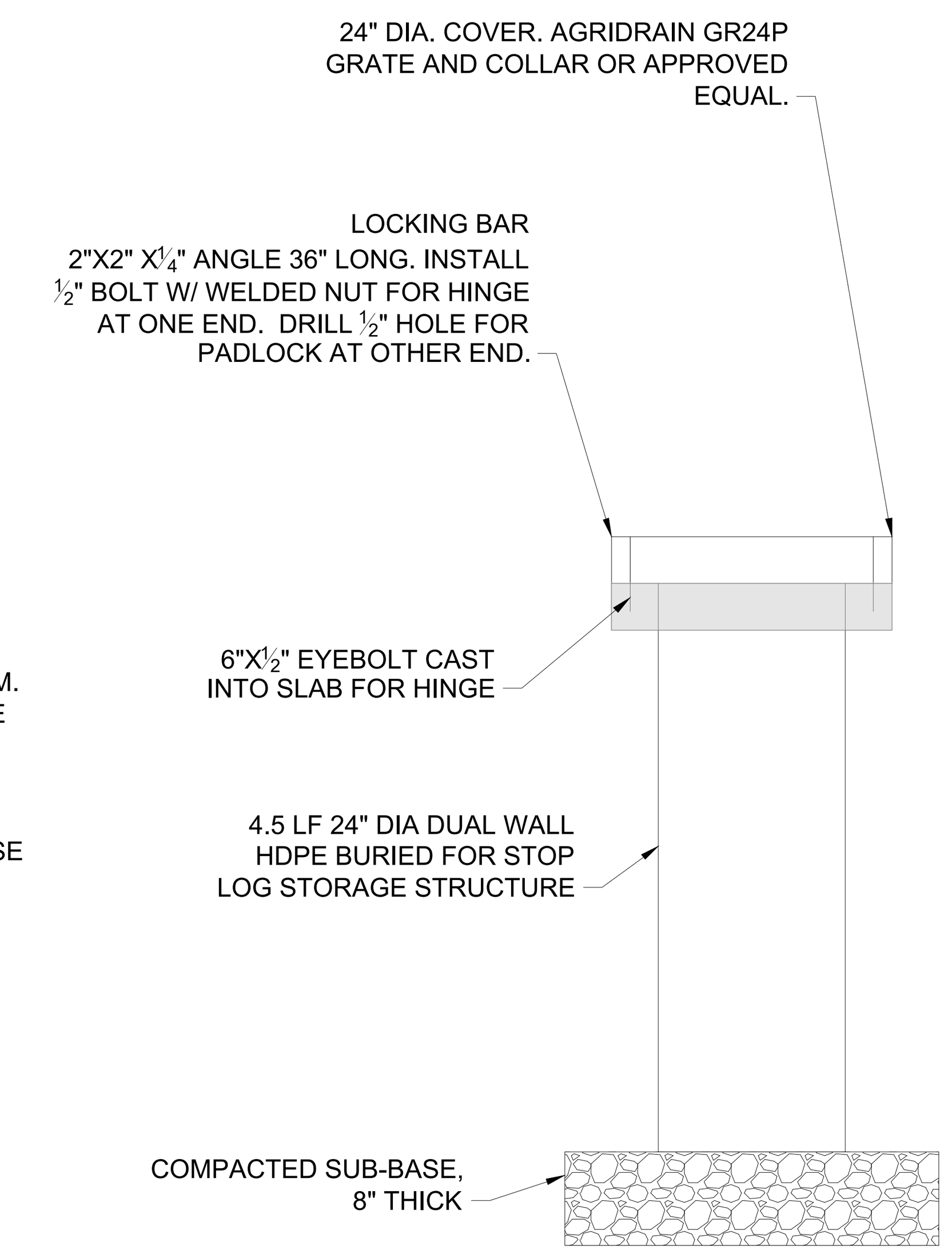
NOTES:
1) PROVIDE STRUCTURE SHOP DRAWINGS FOR ENGINEERS REVIEW AND APPROVAL BEFORE FABRICATION OF WATER CONTROL STRUCTURE.
2) WATER CONTROL STRUCTURE TO BE PRE FABRICATED CORRUGATED METAL RISER STRUCTURE WITH WATERTIGHT SEALS AT SECTION JOINTS AND PIPE PENETRATIONS.
3) STOP LOG CHANNEL IS TO BE ANCHORED 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 ½" DIA "J BOLTS".
5) PROVIDE MATCHING PADLOCKS FOR ALL LOCKING STRUCTURES. PROVIDE OWNER WITH FOUR KEYS.



SECTIONAL ELEVATION A-A RISER DETAIL



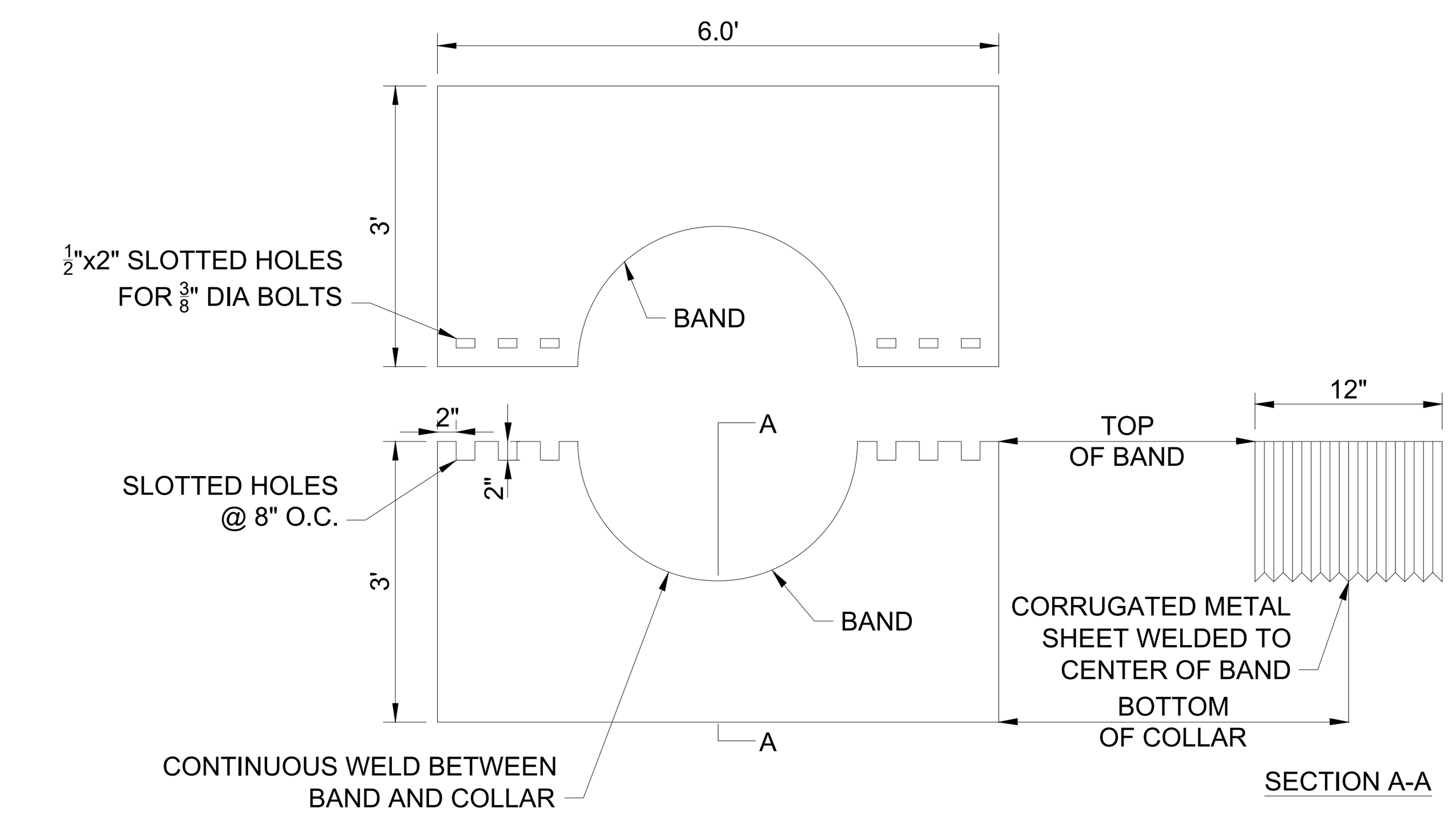
PLAN VIEW



STOP LOG STORAGE STRUCTURE

A2 WATER CONTROL STRUCTURE AND APPURTENANCES

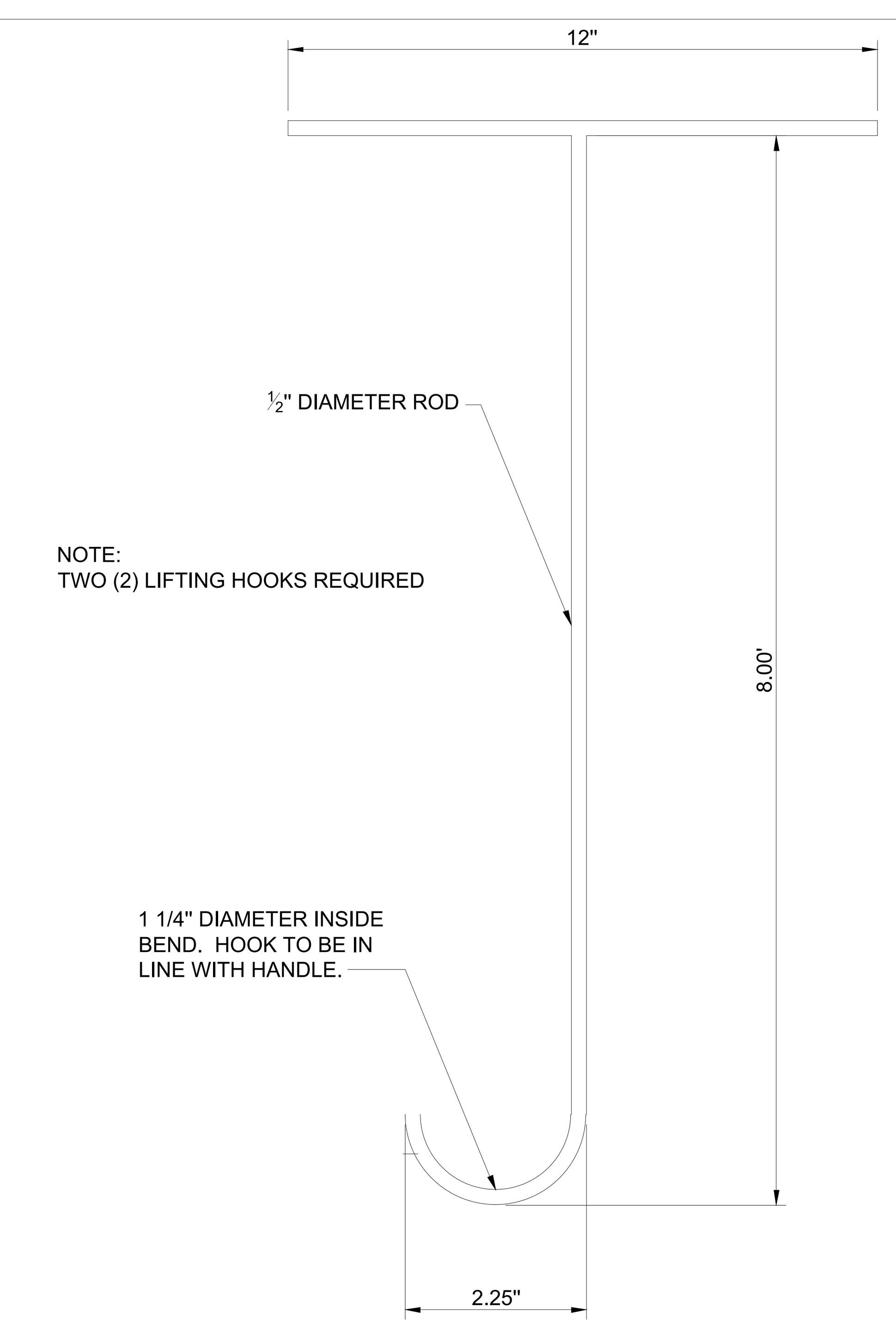
NOT TO SCALE



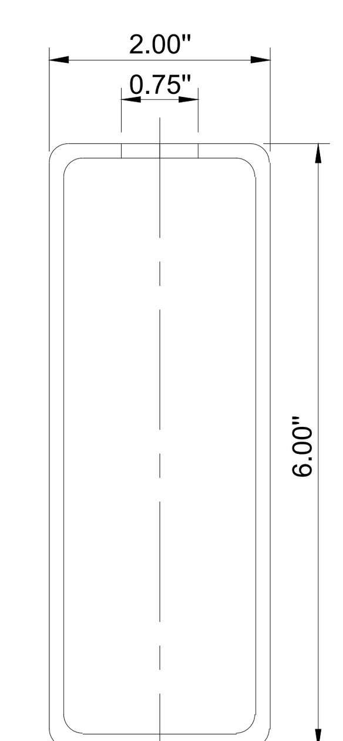
NOTE:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FROM FABRICATOR FOR ENGINEER REVIEW.

E2 CMP ANTI-SEEPAGE COLLAR

NOT TO SCALE



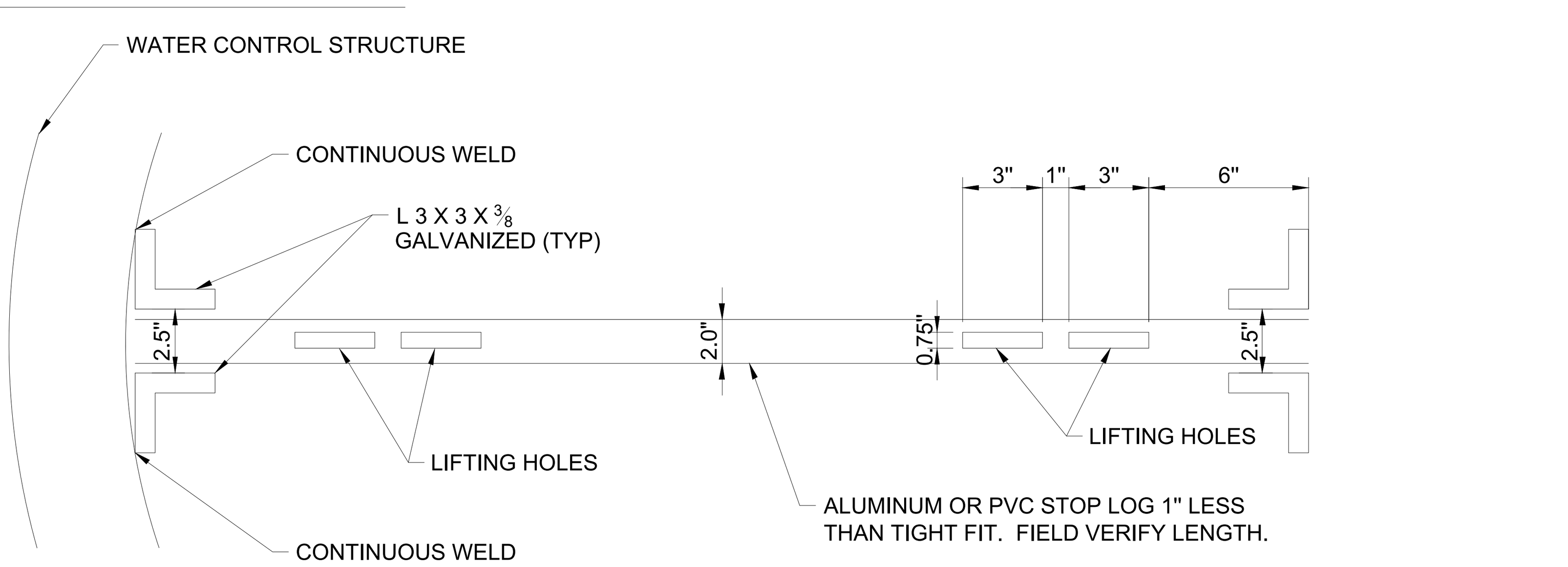
NOTE:
TWO (2) LIFTING HOOKS REQUIRED



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 12 STOP-LOGS TO THE SITE. THE COST OF THE STOP-LOG WORK IS INCIDENTAL TO THE OUTLET CONTROL STRUCTURE.

STOP LOG CROSS SECTION

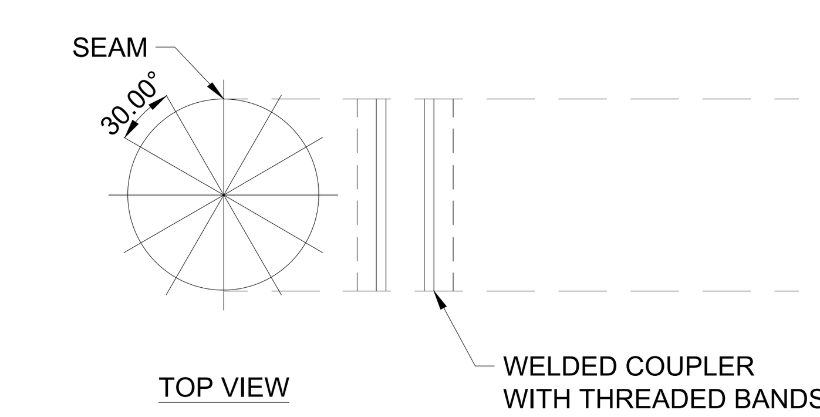
NTS

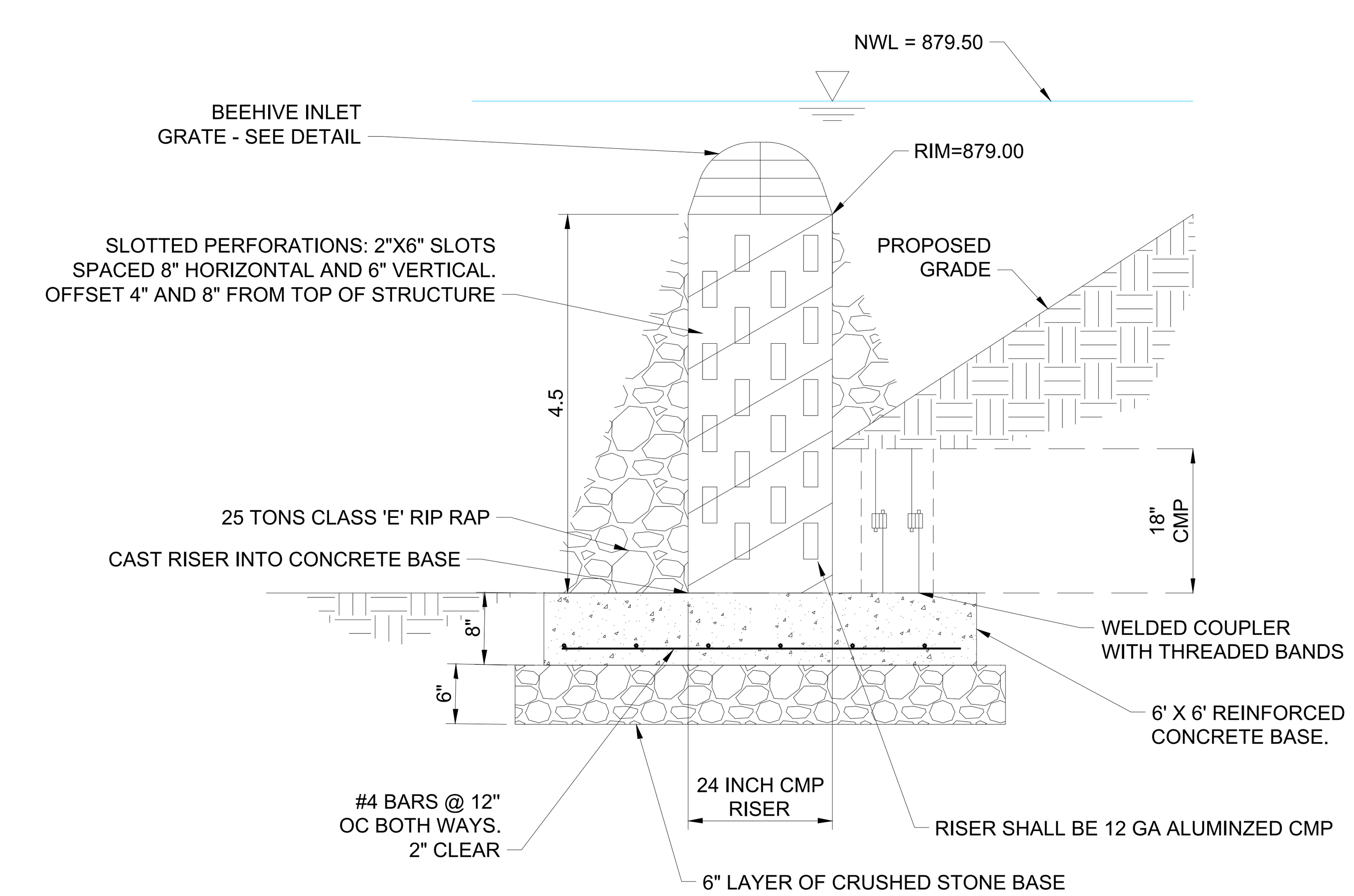


NOTES:
1. CONTRACTOR TO DRILL ⅜" HOLES IN TOP OF STOP LOG CHANNELS AND PROVIDE TWO (2) PADDLE LOCKS TO LOCK THROUGH CHANNELS TO PREVENT LOGS FROM BEING LIFTED OUT WHEN LOCK IS IN PLACE.
2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FROM FABRICATOR FOR ENGINEER REVIEW.

A4 STOP LOG AND LIFTING HOOK

NOT TO SCALE





E4 CORRUGATED METAL RISER

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

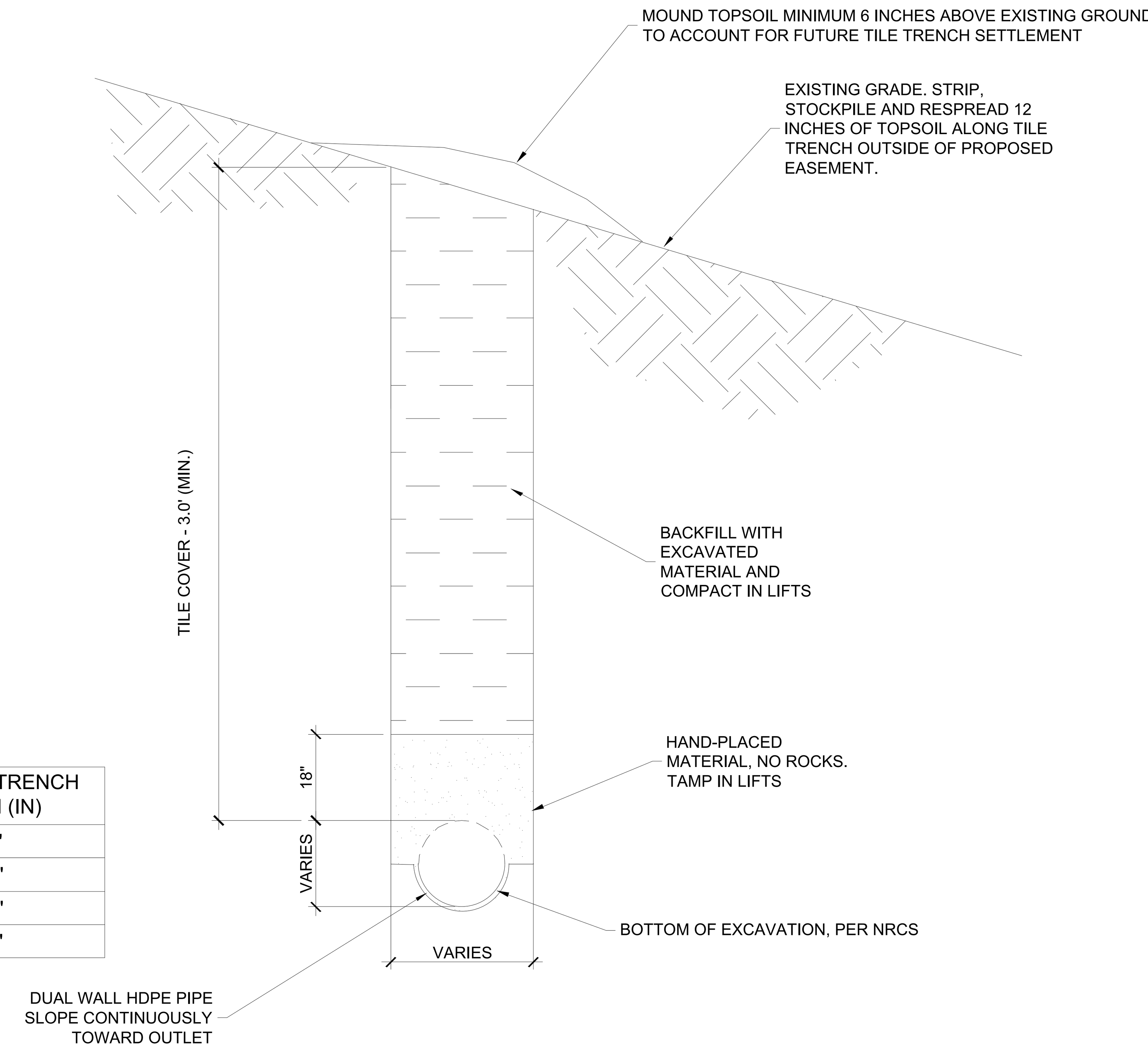
BUC871015D WETLAND

IDALS
BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 2142204320
FIELD BOOK: —
CLIENT NO: —

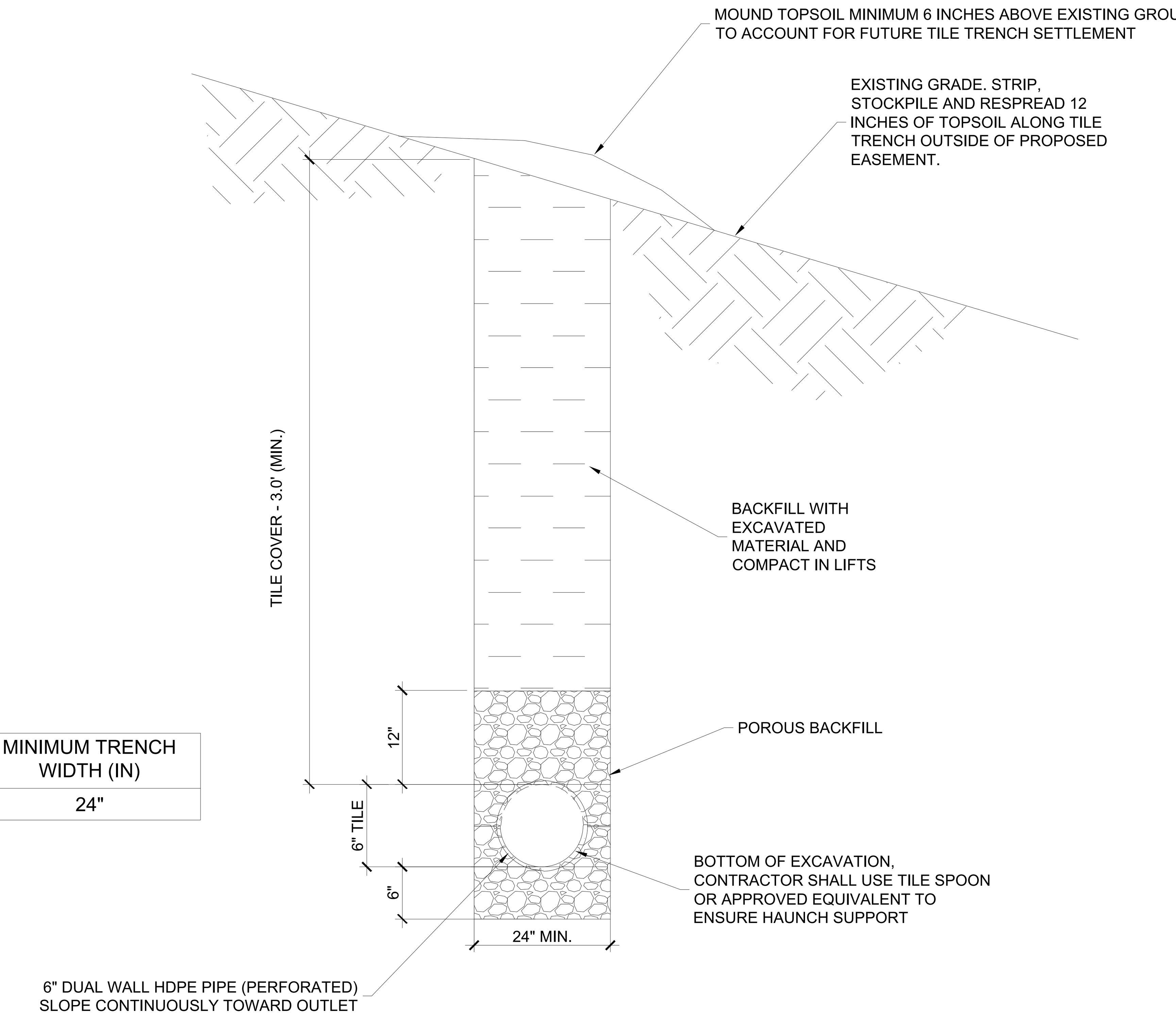
CONSTRUCTION DETAILS

C502



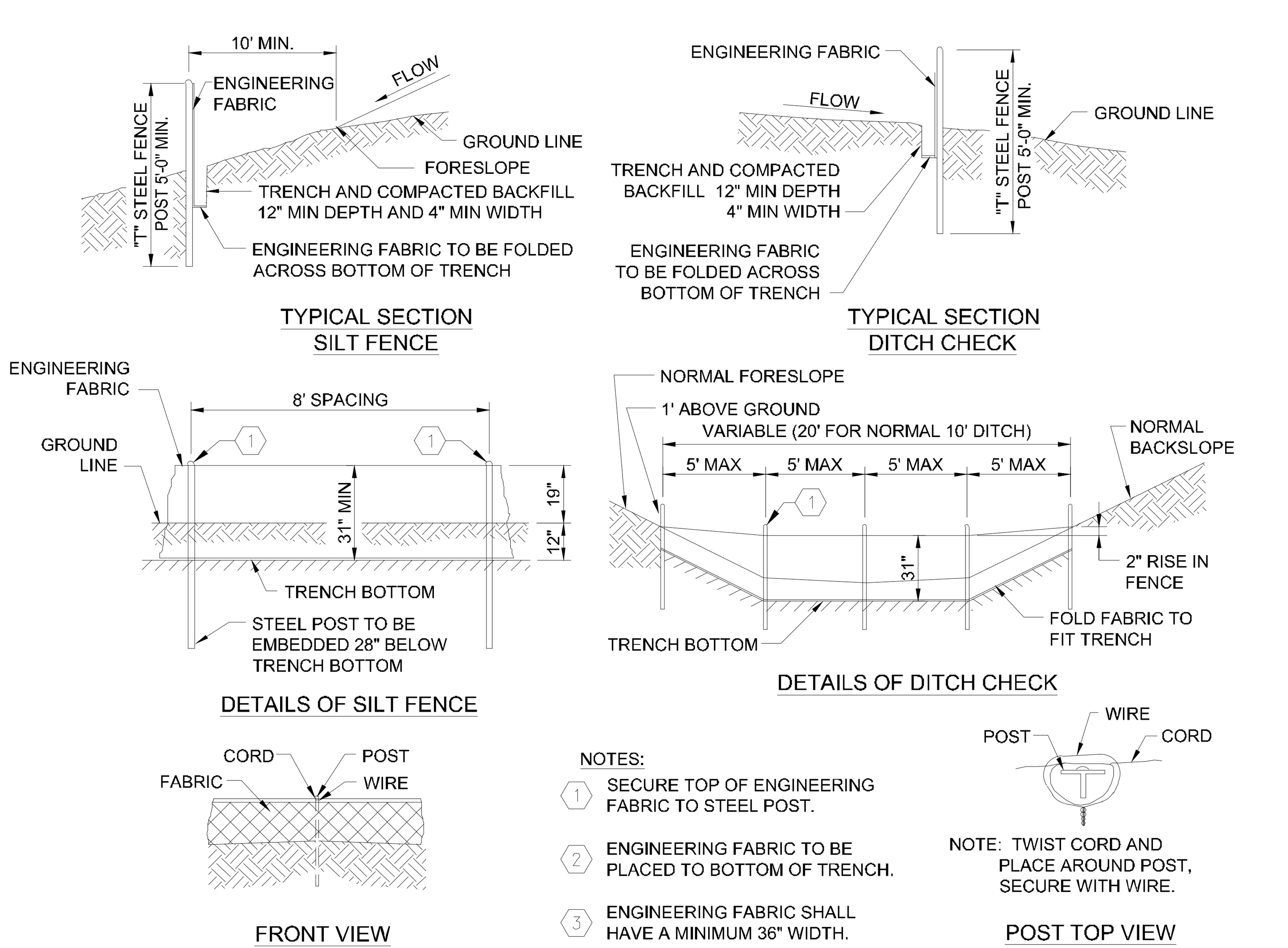
PIPE SIZE (IN)	MINIMUM TRENCH WIDTH (IN)
6"	18"
8"	20"
12"	24"
18"	30"

A2 TILE TRENCH
NOT TO SCALE

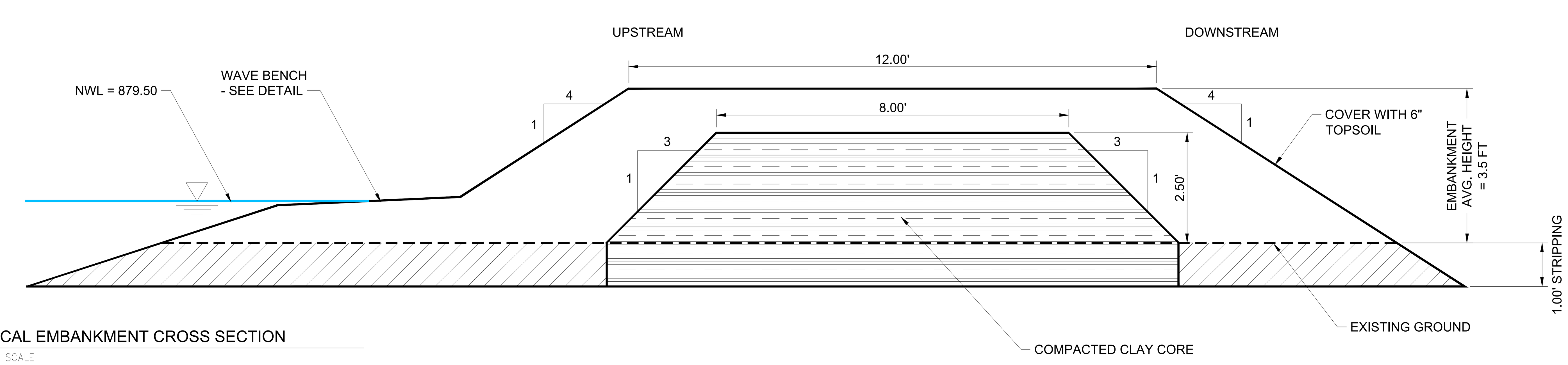


PIPE SIZE (IN)	MINIMUM TRENCH WIDTH (IN)
6"	24"

D2 TILE TRENCH WITH POROUS BACKFILL
NOT TO SCALE



A4 SILT FENCE
NOT TO SCALE



C3 TYPICAL EMBANKMENT CROSS SECTION
NOT TO SCALE

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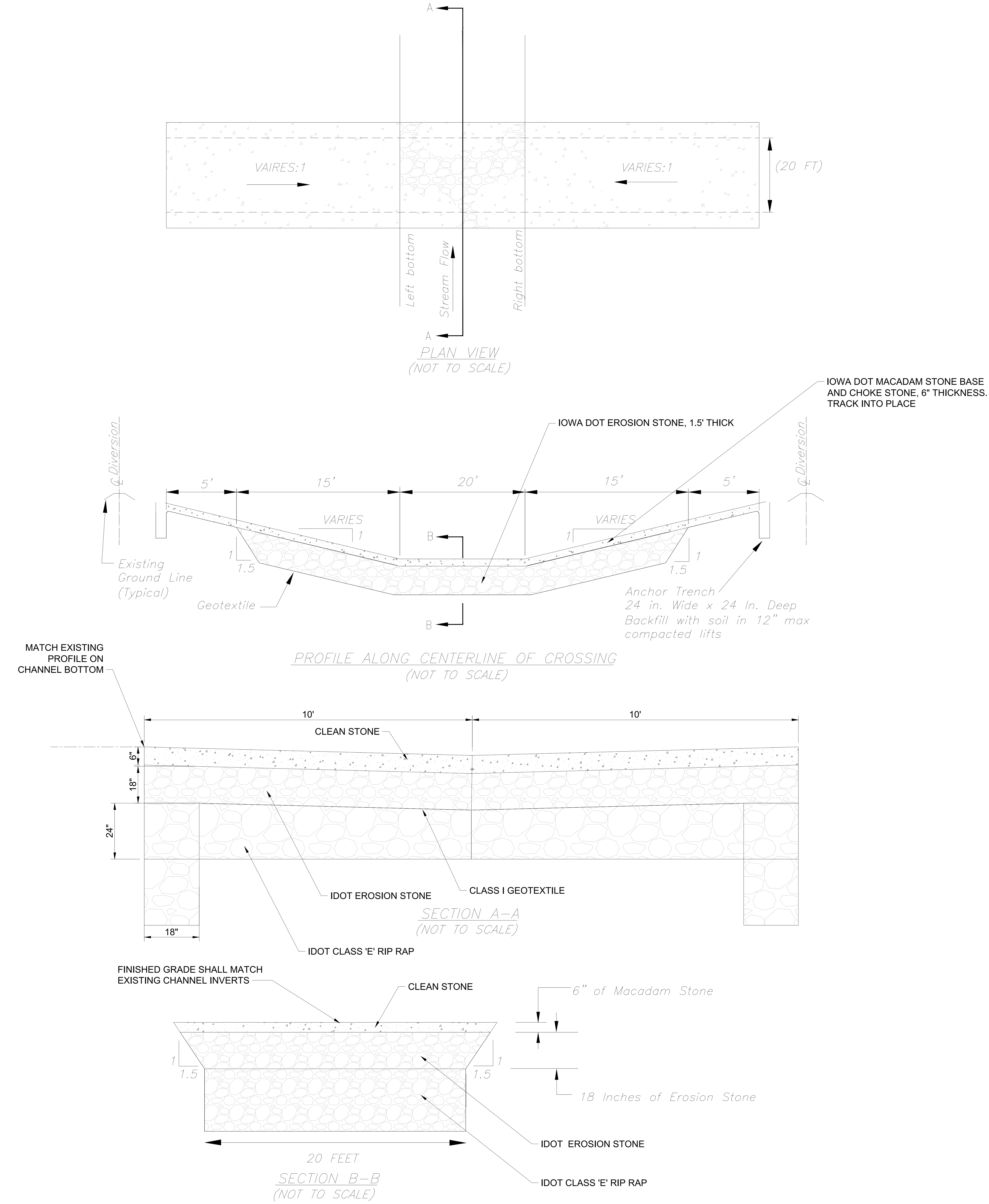
CONSTRUCTION DETAILS

C503



A4 LOW WATER CROSSING
NOT TO SCALE

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CONSTRUCTION DETAILS

C504

BUFFER SEEDING
SEED ALL AREAS OUTSIDE OF NORMAL WATER LEVEL
TO EASEMENT BOUNDARY EXCEPT FOR AREAS SHOWN
AREA = 10.6 ACRES

STRUCTURE SEEDING
SEED EMBANKMENT, PROPOSED CHANNELS, TILE COVER
BERM FOOTPRINTS, AND ANY OTHER AREAS SHOWN
AREA = 4.1 ACRES

878.45
876.60
877.50
876.70
875.83
876.00
875.25
875.82
1.4%
18" RCP

LEGEND

DESCRIPTION	LINE TYPE
FENCE	
GRADING LIMITS	
EASEMENT BOUNDARY	
MAJOR CONTOUR (EXISTING)	800
MINOR CONTOUR (EXISTING)	801
STRUCTURE SEEDING	
BUFFER SEEDING	

NORTH

0 40 80 160
SCALE IN FEET

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BUC871015D WETLAND

IDALS

BUCHANAN COUNTY, IOWA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: FINAL DESIGN
DATE: 8/7/2024
PROJECT NO: 214220320
FIELD BOOK: ---
CLIENT NO: ---

SEEDING PLAN

C601

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