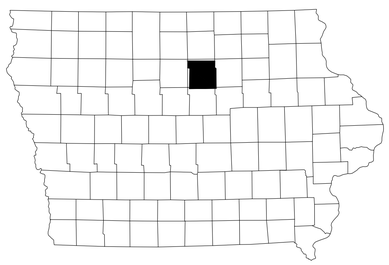
HAR892022C NUTRIENT REDUCTION WETLAND

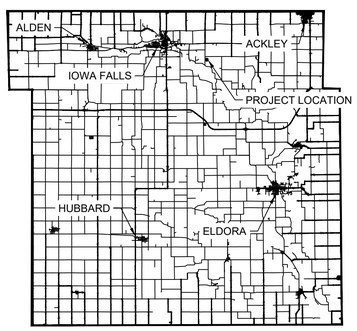
IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

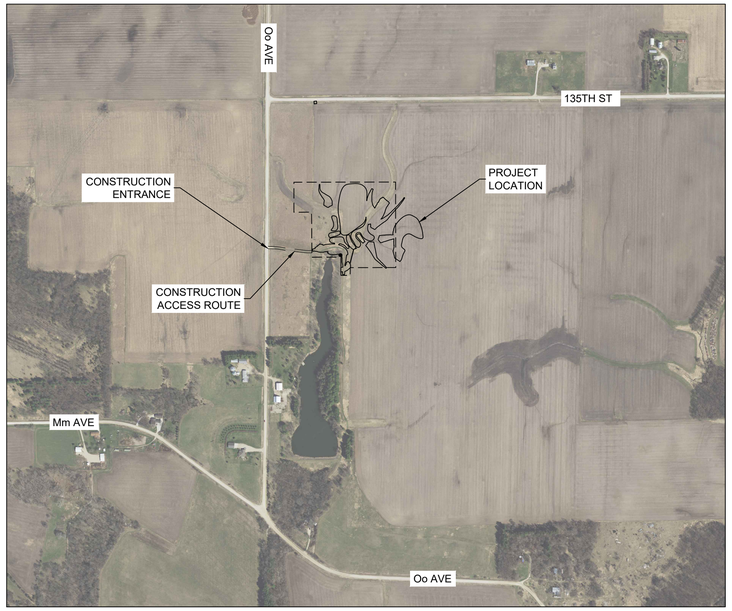
HARDIN COUNTY, IA

STATE OF IOWA



GUTHRIE COUNTY





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SITE ADDRESS:
14274 Oo AVE
IOWA FALLS, IA, 50126

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

CLIENT ACCEPTANCE

PRINTED NAME: _____

SIGNATURE: _____

CONTACT INFORMATION:

ENGINEER
SHIVE-HATTERY, INC
ATTN: DAN JENSEN
4125 WESTOWN PARKWAY, SUITE 100
WEST DES MOINES, IOWA 50266
PH: (515) 223-8104
FX: (515) 223-0622

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP
SARA SMITH, PE
502 E. 9TH STREET
DES MOINES, IA, 50319
PH: (515) 422-7335

LANDOWNER CONTACT:
BILL JENSEN
PH: (641) 373-3534

ONE-CALL TICKET NUMBER: _____

1-800-292-8989
www.iowaonecall.com

THE ENGINEERING JOB CLASS IS IV

NRCS NEM PART 105 CERTIFICATION

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

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: 6/5/2026

Printed or typed name: DANIEL JENSEN
License Number: 25063
My License Renewal Date is: DECEMBER 31, 2027
PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
ALL SHEETS

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

HAR892022C - SHOOFLY
JENSEN NR WETLAND

IDALS
HARDIN COUNTY, IA

06/05/2026
CONSTRUCTION DOCUMENTS
PROJECT NO: 2142204310
CLIENT NO: ---

C001

Dan Jensen

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ESTIMATED PROJECT QUANTITIES:

ITEM NO.	ITEM DESCRIPTION	UNIT	BID QUANTITY	SPEC #	AS-BUILT QUANTITY
1	SITE STRIPPING & PREPARATION	1	LS	IA CS-001	
2	CROP DAMAGE	0	AC	IA CS-001	
3	STRUCTURE & CHANNEL SEEDING	1.5	AC	IA CS-006	
4	BUFFER SEEDING	5.8	AC	IA CS-006	
5	MOBILIZATION AND DEMOBILIZATION	1	LS	CS-008	
6	DRAIN TILE INVESTIGATION AND REMOVAL	2,800	LF	IA CS-009	
7	EXCAVATION (GENERAL)	904	CY	IA CS-021	
8	EARTHFILL (GENERAL)	3,680	CY	IA CS-023	
9	EARTHFILL (GENERAL DAM)	1,358	CY	IA CS-023	
10	EARTHFILL (DAM CORE)	2,572	CY	IA CS-023	
11	EARTHFILL (SCARIFY AND RECOMPACT 9" LAYER OF WETLAND BOTTOM (P))	3,008	CY	IA CS-023	
12	TOPSOIL PLACEMENT	5,591	CY	IA CS-026	
13	4' X 4' WATER CONTROL STRUCTURE	1	EA	IA CS-031	
14	36" RCP DRAWDOWN WETLAND OUTLET PIPE	79	LF	IA CS-031	
15	6" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE	1,455	LF	IA CS-046	
16	8" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE	1,329	LF	IA CS-046	
17	10" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE	51	LF	IA CS-046	
18	12" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE	409	LF	IA CS-046	
19	STOP LOG STORAGE STRUCTURE	1	EA	IA CS-046	
20	8" CMP TILE OUTLETS (20 LF EACH)	3	EA	IA CS-051	
21	10" CMP TILE OUTLETS (20 LF EACH)	2	EA	IA CS-051	
22	12" CMP TILE OUTLETS (20 LF EACH)	1	EA	IA CS-051	
23	15" CMP TILE OUTLETS (20 LF EACH)	1	EA	IA CS-051	
24	RIP RAP	245	TON	IA CS-061	

WETLAND DATA:

PROJECT ID	HAR892022C	-----	LENGTH OF BERM	575	FEET
LANDOWNER(S)	DAVID & MARY JENSEN, SHOOFLY TRUST	-----	AUXILIARY SPILLWAY ELEVATION	1111.0	FEET
PRELIMINARY OR FINAL DESIGN	FINAL DESIGN	-----	AUXILIARY SPILLWAY WIDTH	150	FEET
DRAINAGE AREA	185.0	ACRES	WEIR WIDTH	48" BOX RISER W/ 36" RCP	FEET
WETLAND POOL AREA	2.5	ACRES	TIME OF CONCENTRATION	0.8	HOURS
DEEP WATER AREA (>3 FT DEEP)	0.16	ACRES	WEIGHTED RUNOFF CURVE NUMBER	62	-----
NORMAL POOL ELEVATION	1108.0	FEET	25-YEAR STORM DESIGN FLOW	144	CFS
AVERAGE POOL DEPTH	1.4	FEET	100-YEAR STORM DESIGN FLOW	270	CFS
MAXIMUM POOL DEPTH	5.0	FEET	100-YEAR FLOOD SURF. ELEVATION	1111.14	FEET
POOL STORAGE	3.5	ACRE-FEET	ESTIMATED SEDIMENT STORAGE	145	YEARS
BERM ELEVATION	1113.0	FEET	TOTAL EASEMENT AREA	12.29	ACRES
BERM STORAGE	34.9	ACRE-FEET			

ESTIMATE REFERENCE INFORMATION:

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 9,724 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 SEEDINGE: THIS ITEM INCLUDES SEEDING FOR ALL EMBANKENT AND TILE COVER BERM AREAS AND INCLUDES SEEDBED PREP, SEEDING, MULCHING, AND FERILIZER.
4	IA CS-006	BUFFER SEEDING: THIS ITEM INCLUDES SEEDING FOR ALL AREAS ABOVE NORMAL POOL AND WITHIN EASEMENT BOUNDARY, EXLUDING THOSE AREAS WHERE STUCTURE SEEDING IS SPECIFIED. SEE SEEDING PLAN. NO MULCH OR FERTLIZER 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.
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-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 THE DAM EMBANKMENT AS WELL AS ESTABLISHING POOL FINAL GRADE.
8	IA CS-023	EARTHFILL (GENERAL): THIS ITEM INCLUDES THE AMOUNT OF MATERIAL REQUIRED TO CONSTRUCT THE SUBMERGED BERMS AND ADDITIONAL FILL TO BE PLACED OVER TILE COVER BERMS ALONG WITH TOPSOIL FILL IN AREAS OUTSIDE OF EASEMENT. 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): 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): THIS ITEM INCLUDES THE EARTHFILL PLACEMENT AND COMPACTION NECESSARY TO CONSTRUCT THE EMABNKMENT CORE WITHIN THE EMBANKMENT, INCLUDING THE CORE TRENCH. 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 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 WITHIN THE POOL FOOTPRINT, 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-026	TOPSOIL PLACEMENT: THIS ITEM INCLUDES THE STRIPPING, SALVAGE, AND RE-SPREAD OF 6" OF EXISTING TOPSOIL FROM ALL AREAS WITHIN THE GRADING LIMITS. ALL DISTURBED AREAS SHALL RECEIVED 6" OF TOPSOIL RESPREAD. IN THE BORROW AREA, AN ADDITIONAL 6" (12" TOTAL) WILL BE STRIPPED TO GENERATE TOPOSIL FOR FILL PLACEMENT OUTSIDE OF THE EASEMENT.
13	IA CS-031	4' X 4' WATER CONTROL STRUCTURE : THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, AND MATERIALS FOR THE PLACEMENT OF THE 48" CONCRETE RISER STRUCTURE, FOOTING, STEEL, STOPLOGS, FABRICATION, PIPE CONNECTIONS, AND TRASH RACK.
14	IA CS-031	36" RCP DRAWDOWN WETLAND OUTLET PIPE: THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, AND MATERIALS REQUIRED FOR THE EXCAVATION, PLACEMENT OF THE REINFORCED CONCRETE PIPE, SUPPORT BLOCKS, OUTLET CRADLE , ANTI-SEEP COLLARS, AND BACKFILL.
15	IA CS-046	6" CORRUGATED PROFILE WALL (DUAL WALL) 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.
16	IA CS-046	8" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE: THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND BACKFILL OF THE 8" DUAL-WALL NON-PERFORATED HDPE DRAIN TILE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS.
17	IA CS-046	10" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE: THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND BACKFILL OF THE 10" DUAL-WALL NON-PERFORATED HDPE DRAIN TILE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS.
18	IA CS-046	12" CORRUGATED PROFILE WALL (DUAL WALL) POLYETHYLENE PIPE: THIS ITEM INCLUDES THE MATERIAL, EXCAVATION, PLACEMENT, JOINTING, AND BACKFILL OF THE 12" DUAL-WALL NON-PERFORATED HDPE DRAIN TILE. SEE SHEET C202 FOR LENGTHS, LOCATIONS AND ELEVATIONS.
19	IA CS-046	STOP LOG STORAGE STRUCTURE: THIS ITEM INCLUDES ALL LABOR, EQUIPMENT, AND MATERIALS FOR THE PLACEMENT OF STOPLOGS, STOP LOG REMOVAL TOOLS, AND STOP LOG STORAGE STUCTURE.
20	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.
21	IA CS-051	10" 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 10" CMP END SECTION FOR THE PROPOSED FIELD TILE OUTLET TO THE WETLAND. 10" CMP OUTLET SECTIONS ARE FOR 8 INCH TILES.
22	IA CS-051	12" 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 12" CMP END SECTION FOR THE PROPOSED FIELD TILE OUTLET TO THE WETLAND. 12" CMP OUTLET SECTIONS ARE FOR 10 INCH TILES.
23	IA CS-051	15" 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 15" CMP END SECTION FOR THE PROPOSED FIELD TILE OUTLET TO THE WETLAND. 15" CMP OUTLET SECTIONS ARE FOR 12 INCH TILES.
24	IA CS-061	RIP RAP, CLASS 'E' WITH GEOTEXTILE FABRIC': THIS ITEM INCLUDES THE EXCAVATION AND PLACEMENT OF CLASS 'E' REVETMENT OVER GEOTEXTILE FABRIC AT THE LOCATIONS SHOWN ON THE PLANS. 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.

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 OR IDALS GUARANTEE THE PRACTICE TO 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

HAR892022C - SHOOFLY
JENSEN NR WETLAND

IDALS
HARDIN COUNTY, IA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 06/05/2026
PROJECT NO: 214220A310
FIELD BOOK: ---
CLIENT NO: ---

QUANTITIES & NOTES

C002

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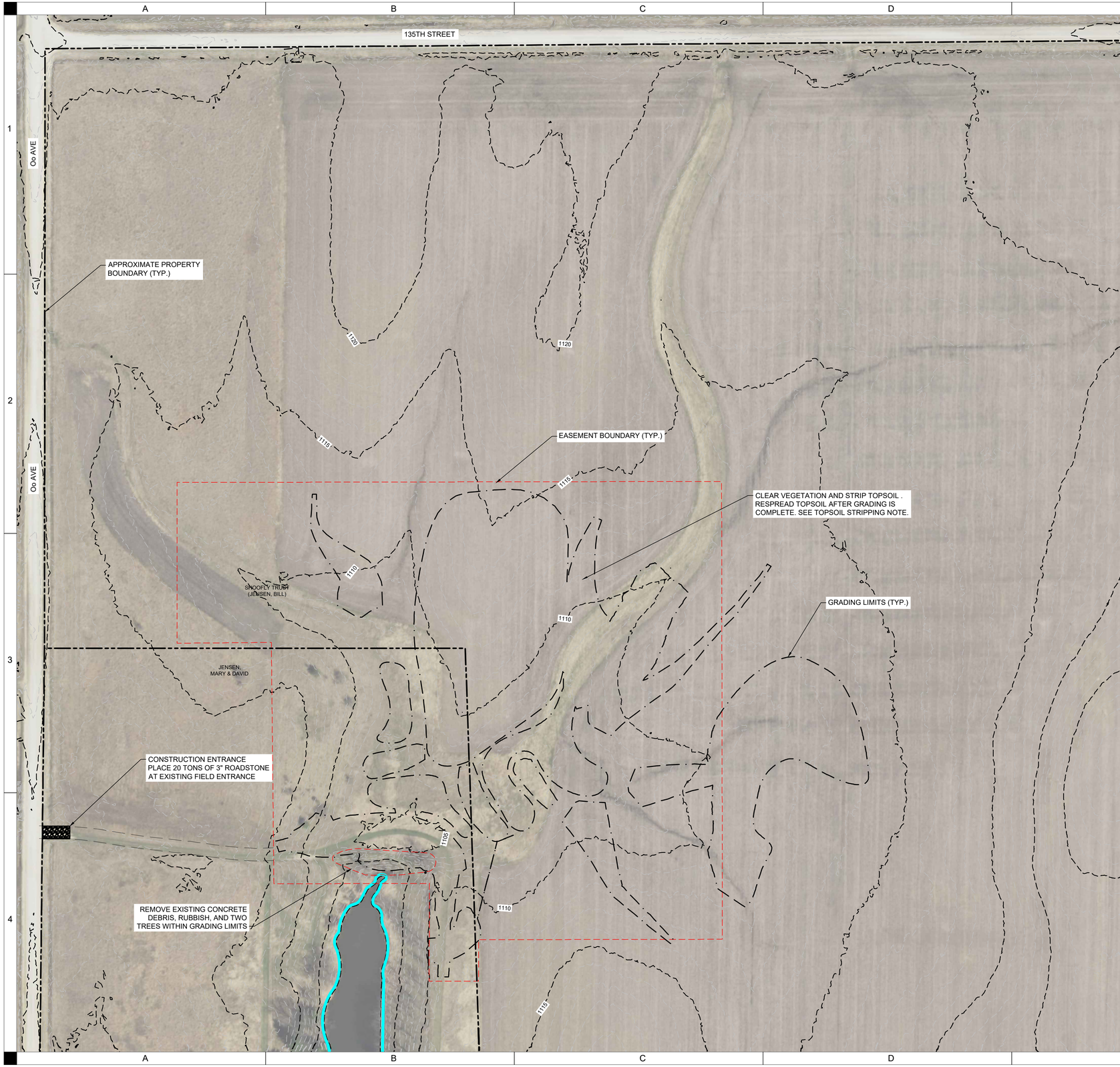

REMOVAL NOTES:

1. STRIP, STOCKPILE, AND RESPREAD 12" OF TOPSOIL IN THE EMBANKMENT FOOTPRINT (0.5 ACRES) AND 6" WITHIN ALL OTHER DISTURBED AREAS WITHIN THE EASEMENT BOUNDARY (3.0 ACRES). RESPREAD 12" OF TOPSOIL WITHIN EMBANKMENT FOOTPRINT AND 6" IN ALL OTHER DISTURBED AREAS.

SURVEY NOTES:

1. LIMITED TOPOGRAPHIC SURVEY COMPLETED BY SHIVE-HATTERY ENGINEERING ON DECEMBER 6TH, 2022.
2. SUPPLEMENTAL EXISTING SURFACE INFORMATION SHOWN WAS BASED ON LIGHT DETECTION AND RANGING (LIDAR) INFORMATION FROM IOWA DNR.
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, SOUTH ZONE

VERTICAL DATUM - NAVD88

GENERAL NOTES:

1. PROPERTY BOUNDARIES ARE APPROXIMATE AND BASED ON BEACON PROPERTY MAP, VERIFY PROPERTY BOUNDARIES

NORTH

0 40 80 160
SCALE IN FEET

LEGEND

DESCRIPTION	LINE TYPE
EASEMENT BOUNDARY	
EXISTING FENCE	
GRADING LIMITS	
MAJOR CONTOUR (EXISTING)	800
MINOR CONTOUR (EXISTING)	801
APPROX. PROPERTY BOUNDARY	

SHIVEHATTERY
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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

HAR892022C - SHOOFLY JENSEN NR WETLAND

IDALS

HARDIN COUNTY, IA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 06/05/2026
PROJECT NO: 214220/4310
FIELD BOOK: ---
CLIENT NO: ---

EXISTING SITE CONDITIONS

CD01

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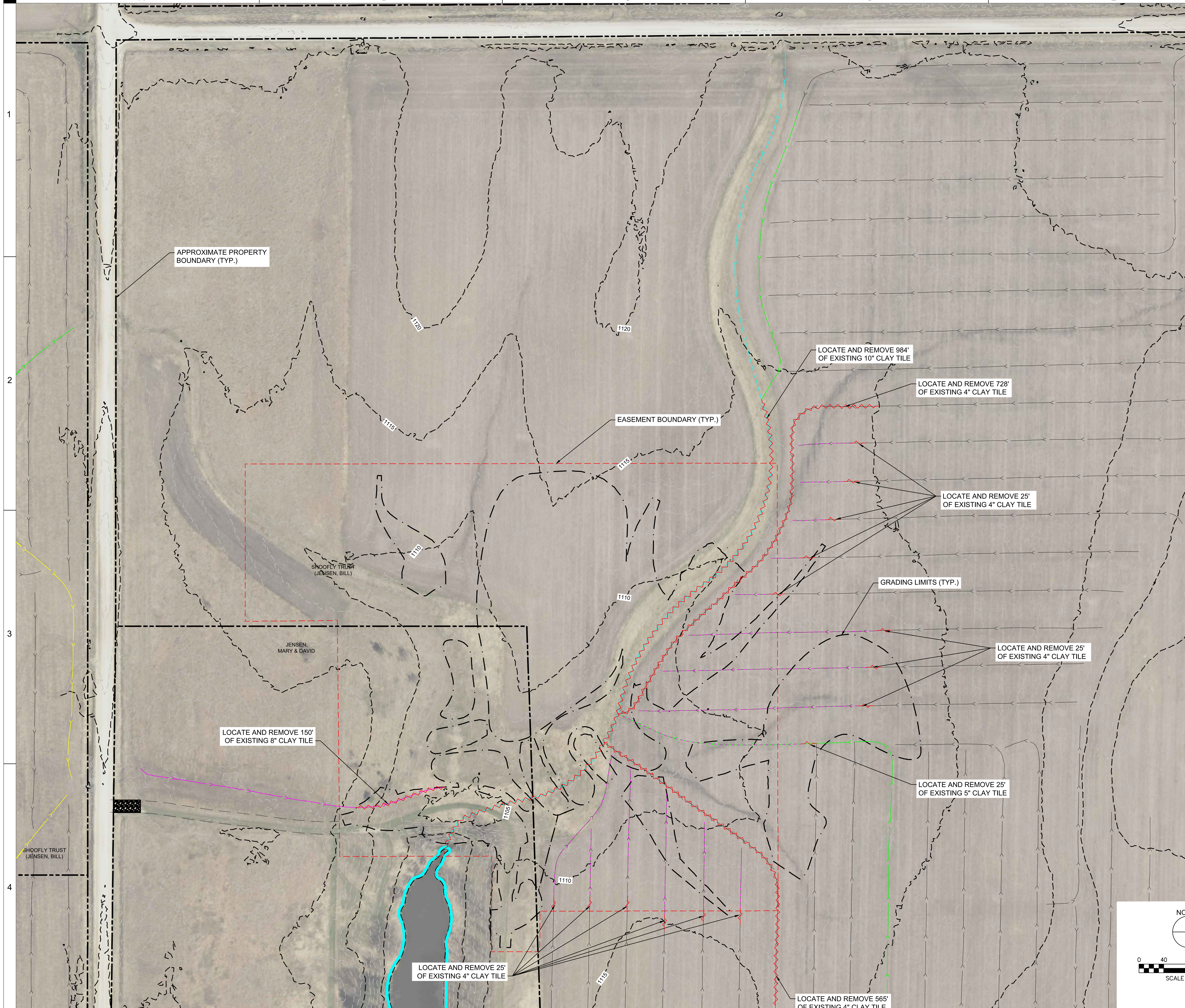

REMOVAL NOTES:

1. CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ALL PREVIOUSLY UNKNOWN TILE LINES WITHIN THE PROJECT AREA. DISCOVERED TILE LINES SHALL REMAIN UNCOVERED FOR FURTHER EVALUATION.
2. ALL DRAIN TILE FOUND DURING EXCAVATION SHALL BE REMOVED, EXTENDING 10 FEET BEYOND THE EMBANKMENT FOOTPRINT.

TILE INFORMATION

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

LEGEND

DESCRIPTION	LINE TYPE
EASEMENT BOUNDARY	
EXISTING DRAIN TILE, 4"	
EXISTING DRAIN TILE, 5"	
EXISTING DRAIN TILE, 8"	
EXISTING DRAIN TILE, 10"	
TILE ABANDON	
TILE REMOVAL	
EXISTING FENCE	
GRADING LIMITS	
MAJOR CONTOUR (EXISTING)	800
MINOR CONTOUR (EXISTING)	801
APPROX. PROPERTY BOUNDARY	

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IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

HAR892022C - SHOOFLY JENSEN NR WETLAND

IDALS

HARDIN COUNTY, IA

DRAWN: GHK
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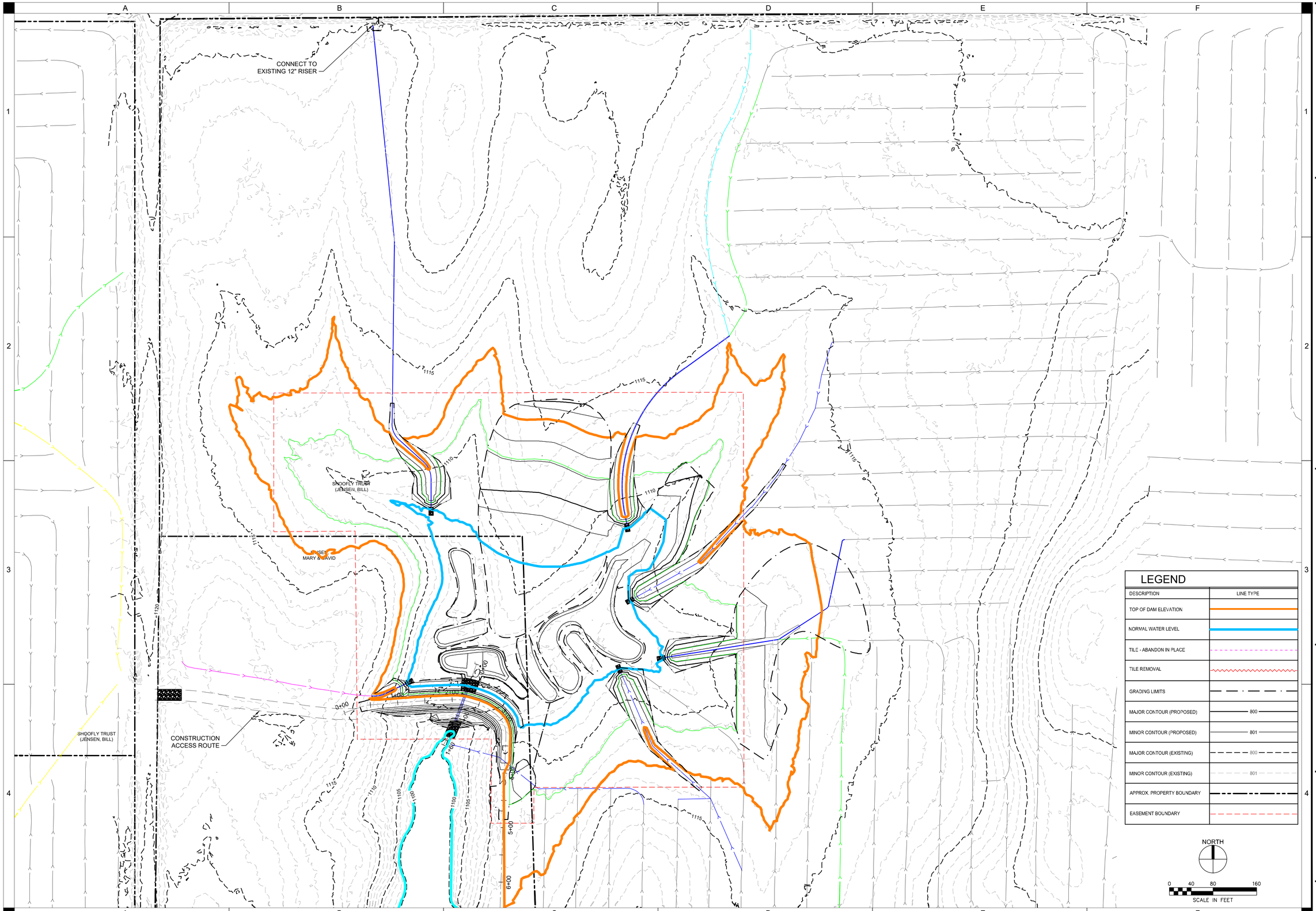
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 06/05/2026
PROJECT NO: 2142204310
FIELD BOOK: --
CLIENT NO: --

EXISTING TILE REMOVAL

CD02



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IDALS
HARDIN COUNTY, IA

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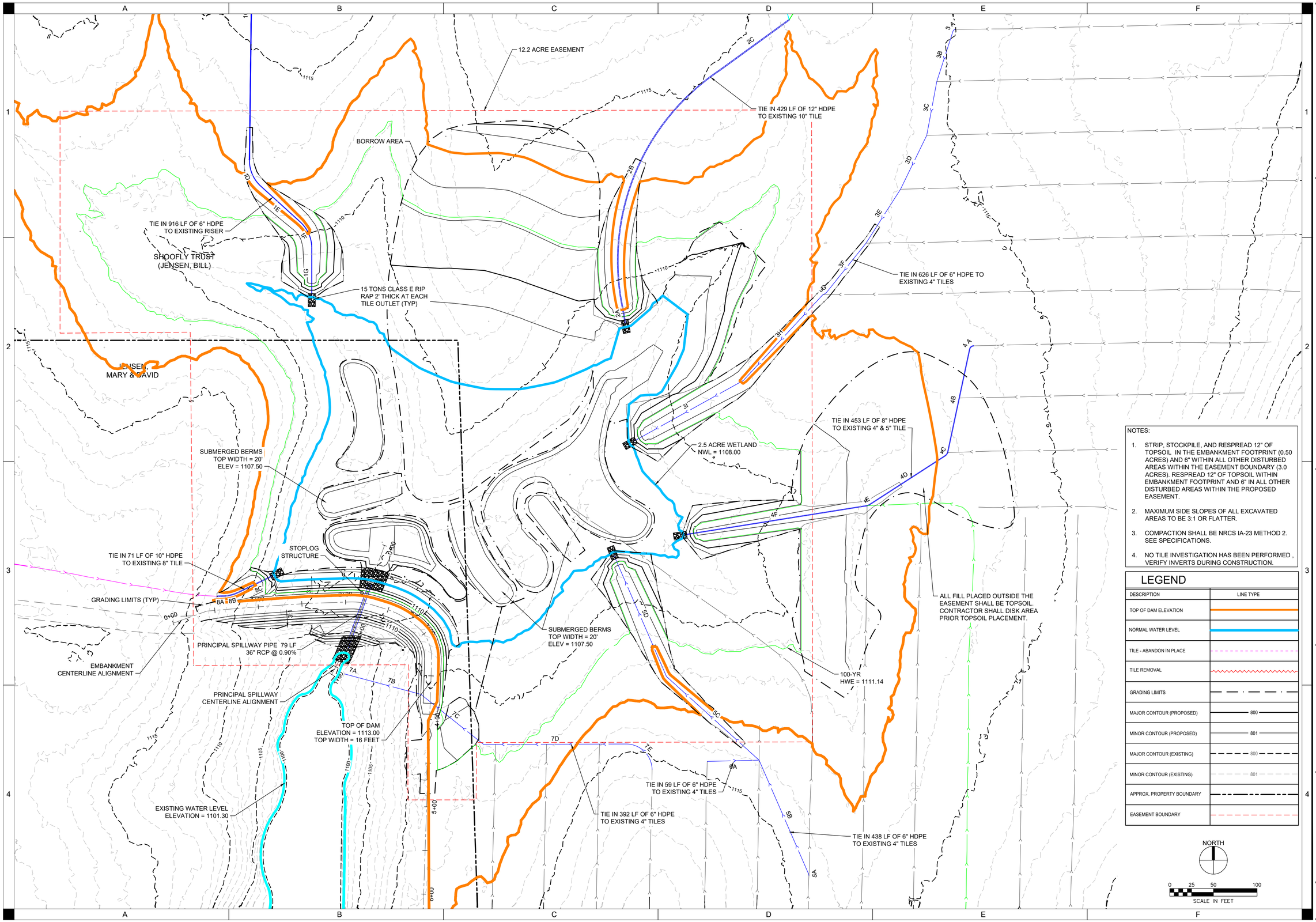
PROJECT NO: 214220431 0
FIELD BOOK: ---
CLIENT NO: ---

OVERALL GRADING PLAN

C201



NOTES:

1. STRIP, STOCKPILE, AND RESPREAD 12" OF TOPSOIL IN THE EMBANKMENT FOOTPRINT (0.50 ACRES) AND 6" WITHIN ALL OTHER DISTURBED AREAS WITHIN THE EASEMENT BOUNDARY (3.0 ACRES). RESPREAD 12" OF TOPSOIL WITHIN EMBANKMENT FOOTPRINT AND 6" IN ALL OTHER DISTURBED AREAS WITHIN THE PROPOSED EASEMENT.
2. MAXIMUM SIDE SLOPES OF ALL EXCAVATED AREAS TO BE 3:1 OR FLATTER.
3. COMPACTION SHALL BE NRCS IA-23 METHOD 2. SEE SPECIFICATIONS.
4. NO TILE INVESTIGATION HAS BEEN PERFORMED , VERIFY INVERTS DURING CONSTRUCTION.

LEGEND

DESCRIPTION	LINE TYPE
TOP OF DAM ELEVATION	
NORMAL WATER LEVEL	
TILE - ABANDON IN PLACE	
TILE REMOVAL	
GRADING LIMITS	
MAJOR CONTOUR (PROPOSED)	800
MINOR CONTOUR (PROPOSED)	801
MAJOR CONTOUR (EXISTING)	800
MINOR CONTOUR (EXISTING)	801
APPROX. PROPERTY BOUNDARY	
EASEMENT BOUNDARY	

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PROJECT NO: 214220431.0
FIELD BOOK: ---
CLIENT NO: ---

GRADING PLAN

C202

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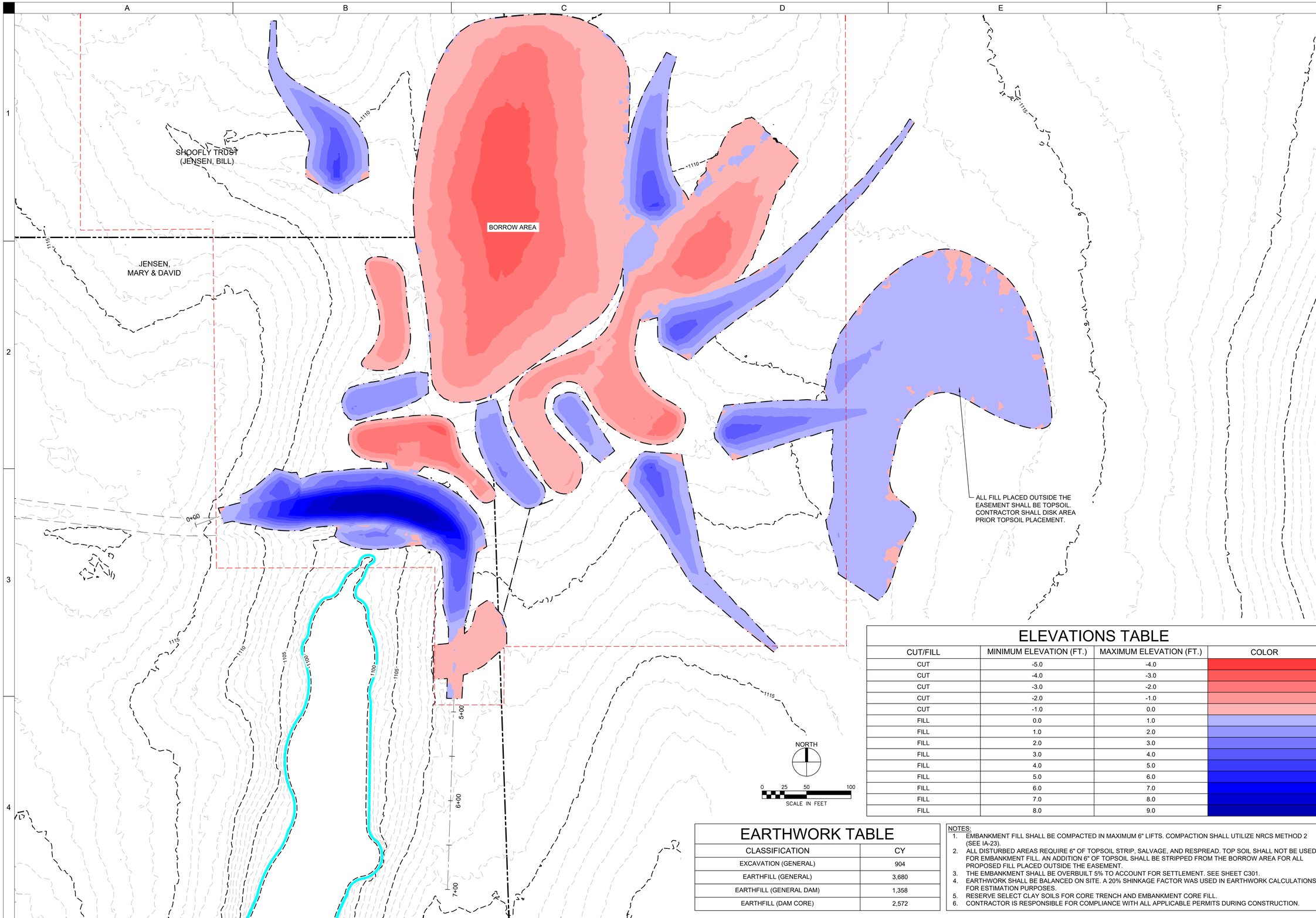

ELEVATIONS TABLE

CUT/FILL	MINIMUM ELEVATION (FT.)	MAXIMUM ELEVATION (FT.)	COLOR
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	
FILL	7.0	8.0	
FILL	8.0	9.0	

EARTHWORK TABLE

CLASSIFICATION	CY
EXCAVATION (GENERAL)	904
EARTHFILL (GENERAL)	3,680
EARTHFILL (GENERAL DAM)	1,358
EARTHFILL (DAM CORE)	2,572

NOTES:
1. EMBANKMENT FILL SHALL BE COMPACTED IN MAXIMUM 6" LIFTS. COMPACTION SHALL UTILIZE NRCS METHOD 2 (SEE IA-23).
2. ALL DISTURBED AREAS REQUIRE 6" OF TOPSOIL STRIP, SALVAGE, AND RESPREAD. TOP SOIL SHALL NOT BE USED FOR EMBANKMENT FILL. AN ADDITION 6" OF TOPSOIL SHALL BE STRIPPED FROM THE BORROW AREA FOR ALL PROPOSED FILL PLACED OUTSIDE THE EASEMENT.
3. THE EMBANKMENT SHALL BE OVERBUILT 5% TO ACCOUNT FOR SETTLEMENT. SEE SHEET C301.
4. EARTHWORK SHALL BE BALANCED ON SITE. A 20% SHINKAGE FACTOR WAS USED IN EARTHWORK CALCULATIONS FOR ESTIMATION PURPOSES.
5. RESERVE SELECT CLAY SOILS FOR CORE TRENCH AND EMBANKMENT CORE FILL.
6. CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PERMITS DURING CONSTRUCTION.

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PROJECT NO: 214220431O
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CLIENT NO: ---

CUT-FILL PLAN

C203

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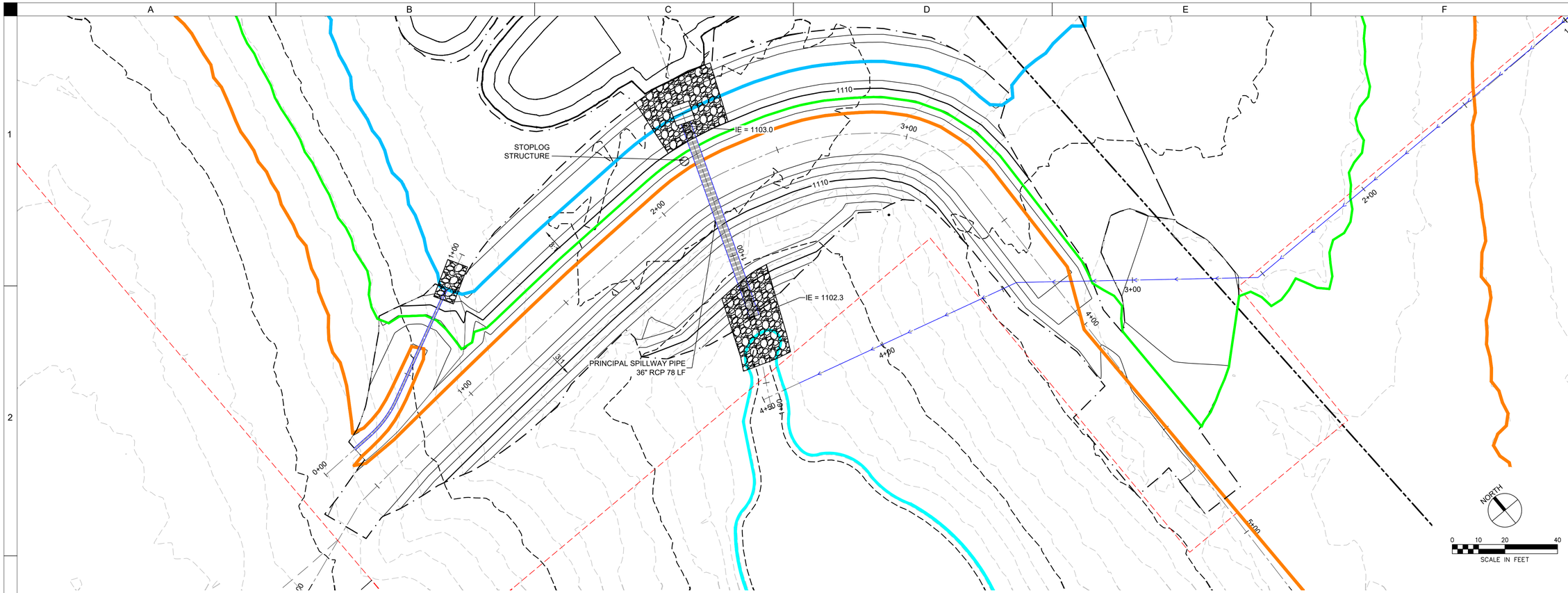

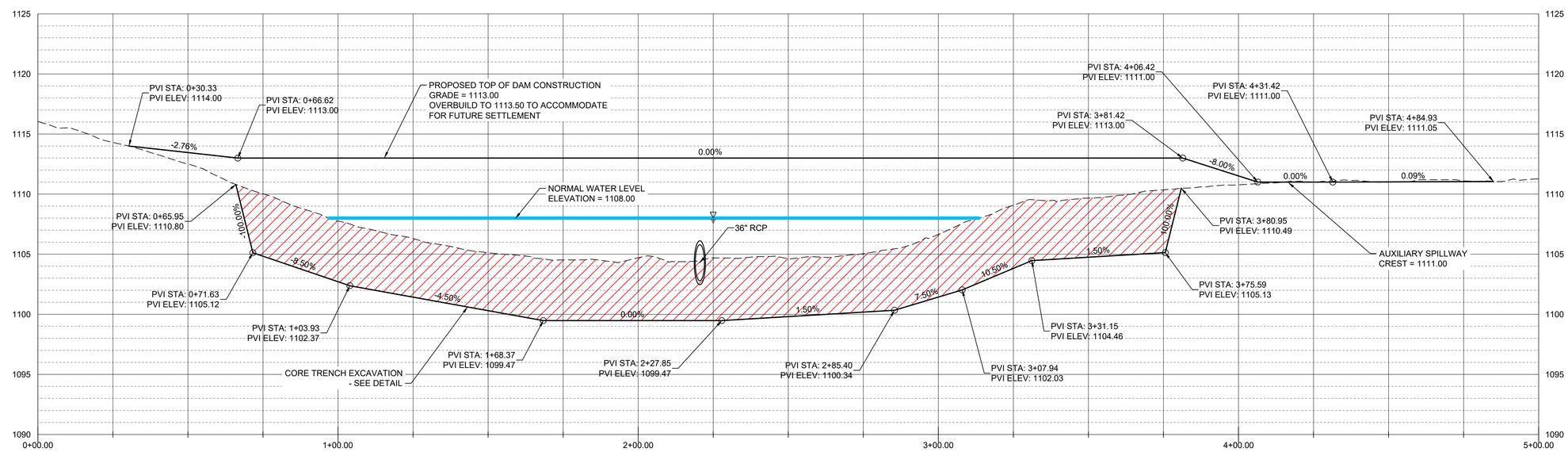

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FIELD BOOK: ---
CLIENT NO: ---

EMBANKMENT PLAN & PROFILE

C301

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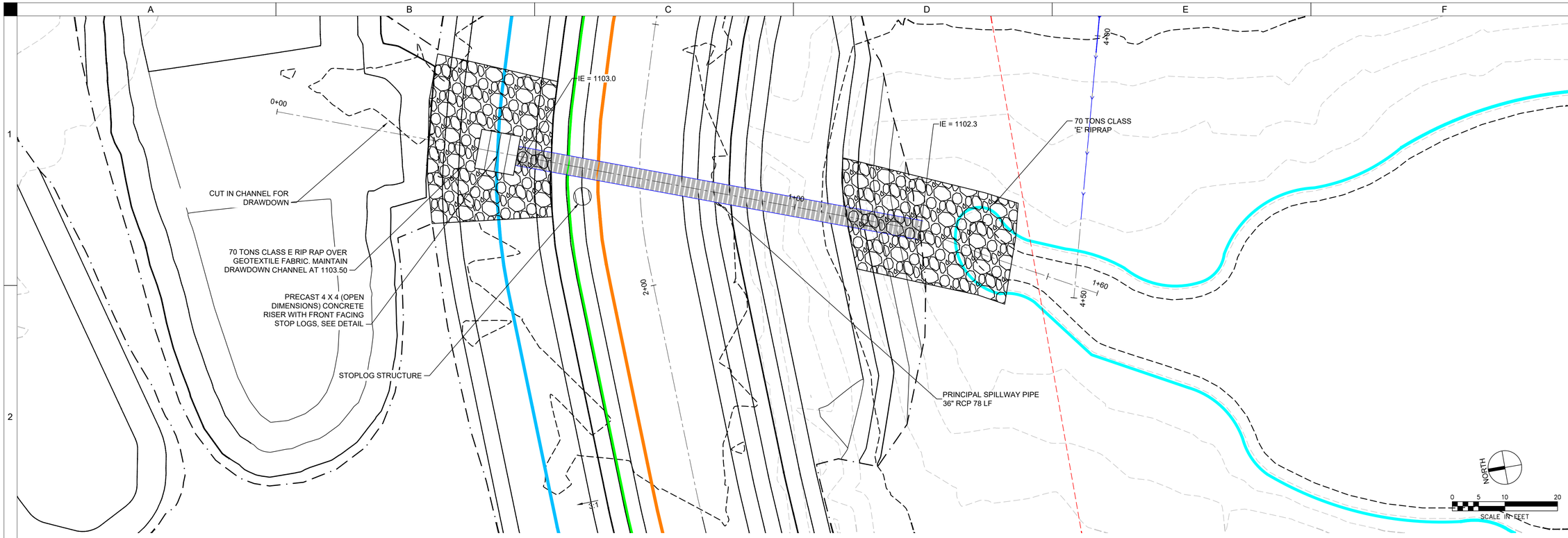

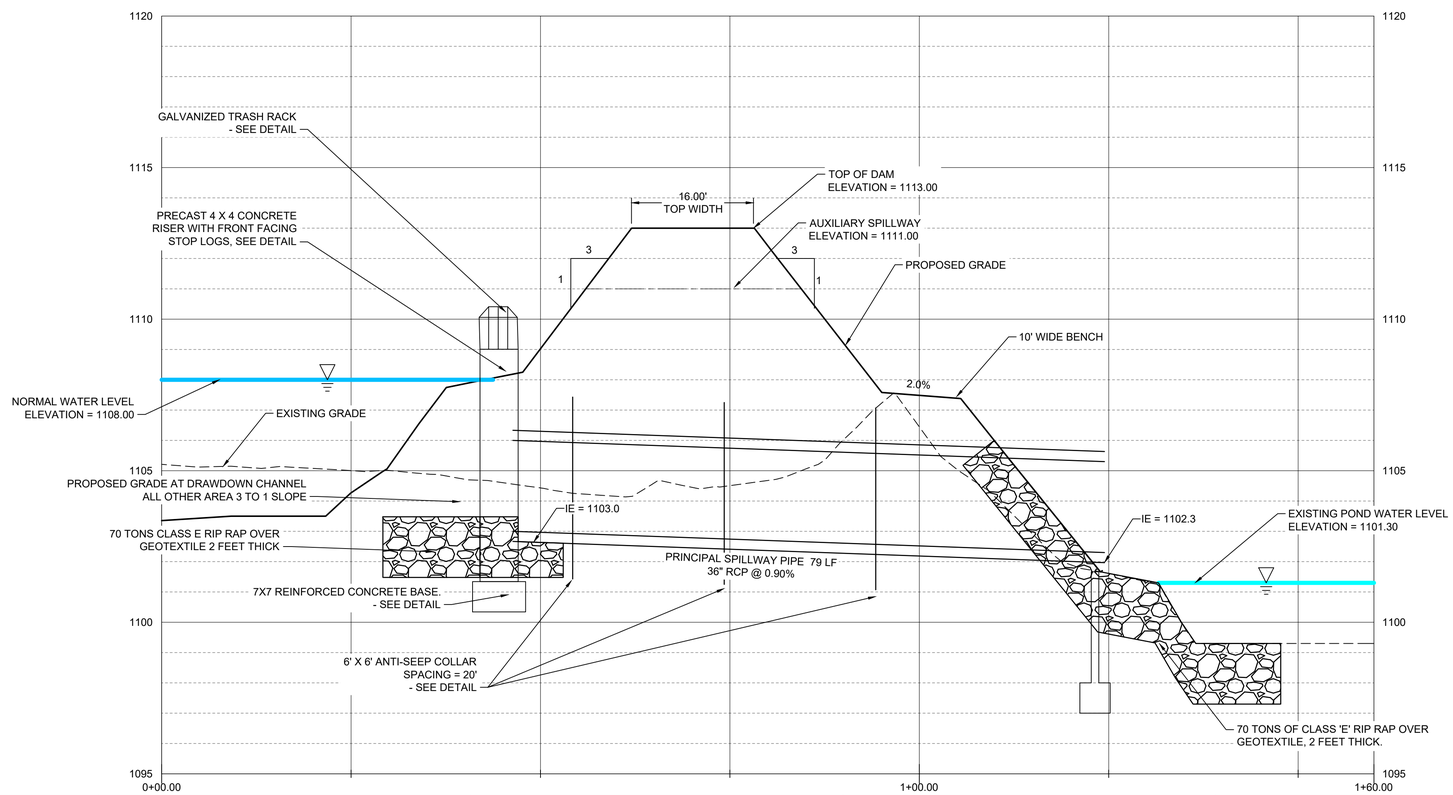

HORIZONTAL SCALE
0 5 10 20
SCALE IN FEET

VERTICAL SCALE
0 1.25 2.5 5
SCALE IN FEET

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CLIENT NO: ---

PRINCIPAL SPILLWAY PLAN & PROFILE

C302

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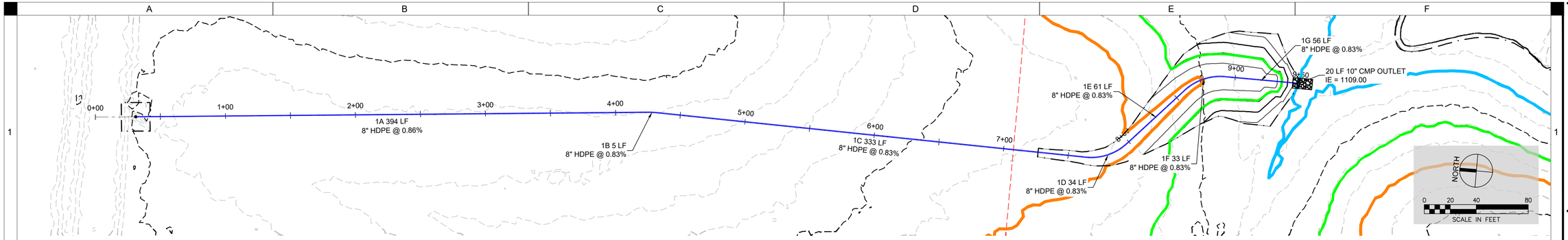

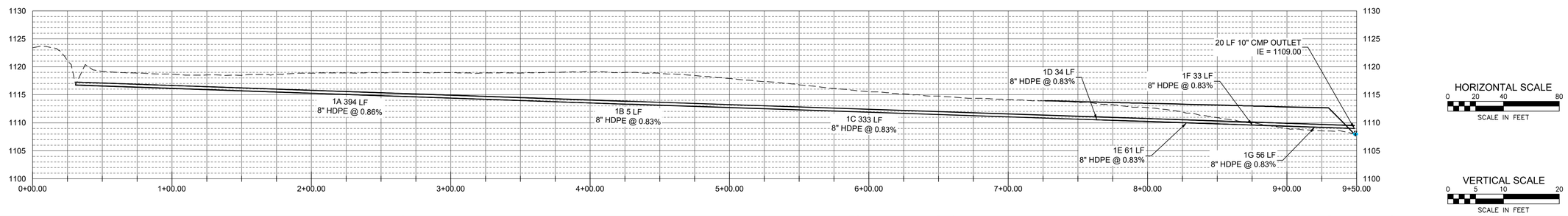

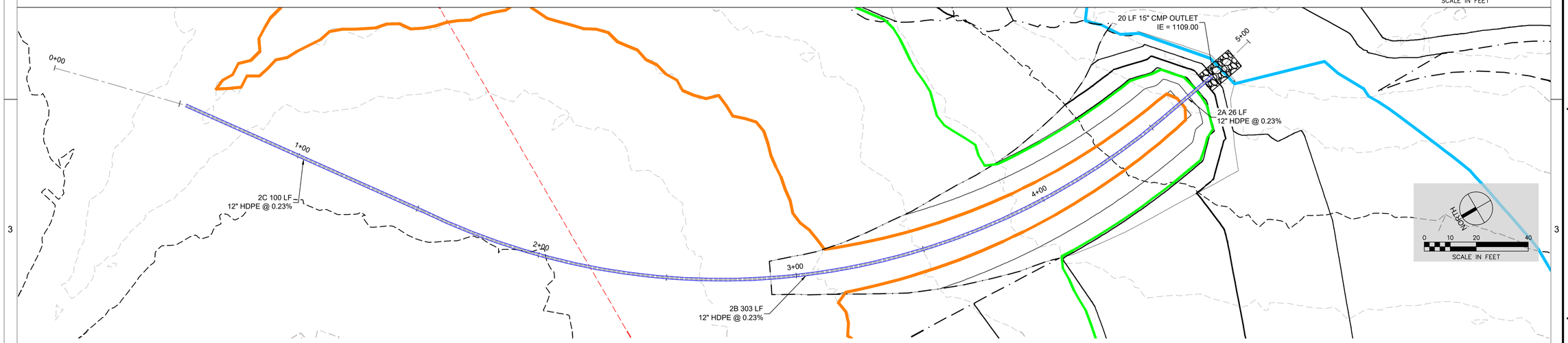

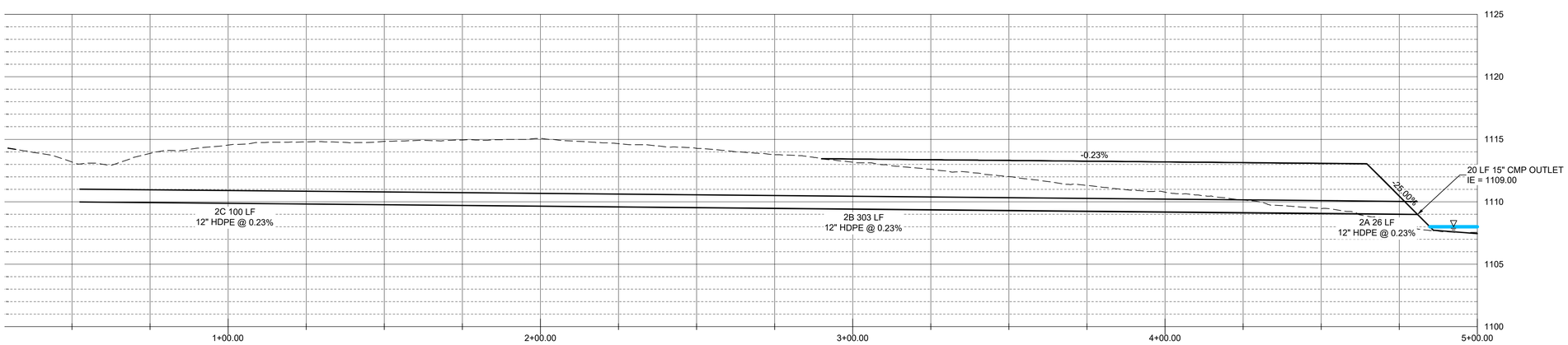

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FIELD BOOK: ---
CLIENT NO: ---

PROPOSED TILE PLAN AND PROFILE

C303

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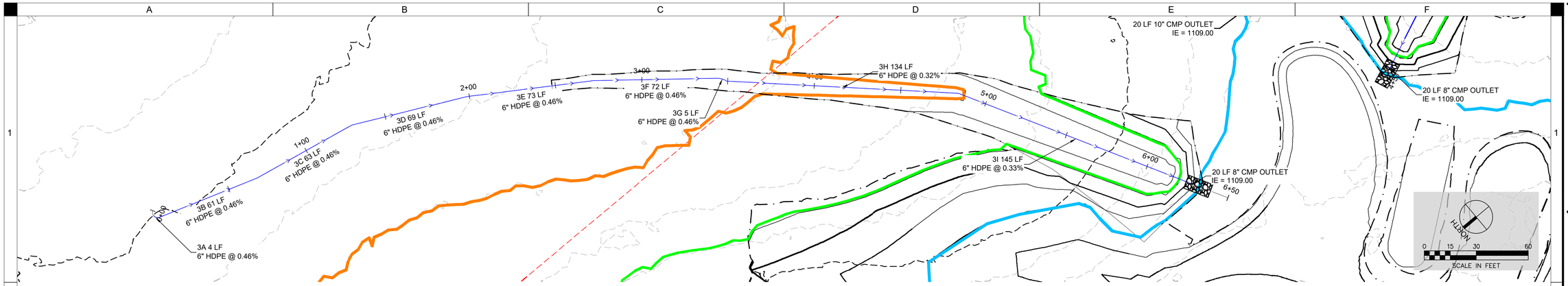

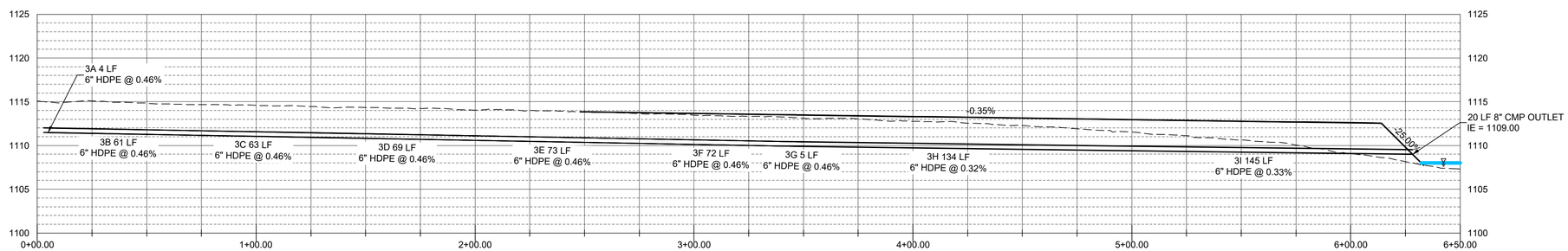

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SCALE IN FEET

VERTICAL SCALE
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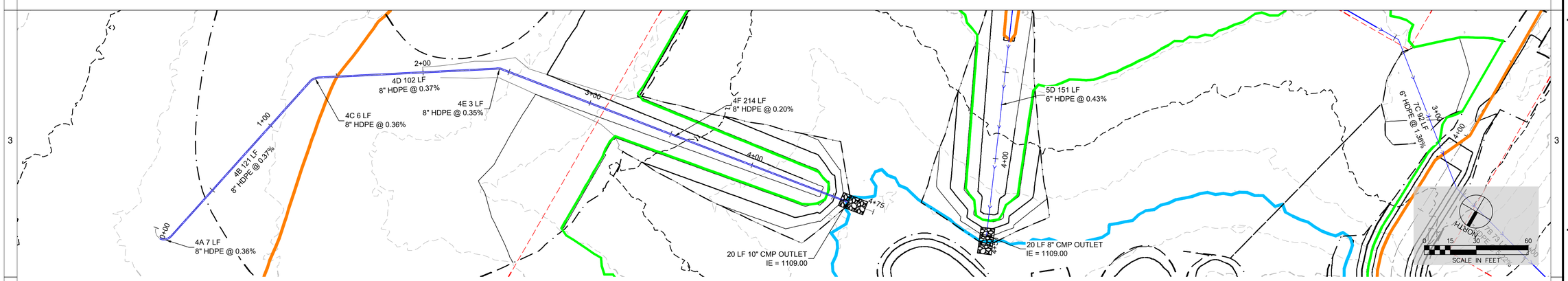
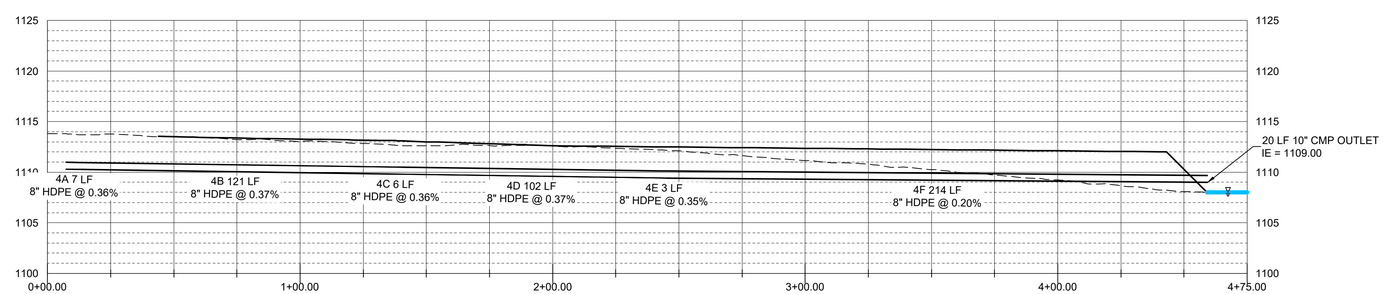
SCALE IN FEET





HORIZONTAL SCALE
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SCALE IN FEET

VERTICAL SCALE
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SCALE IN FEET

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CLIENT NO: --

PROPOSED TILE PLAN AND PROFILE

C304

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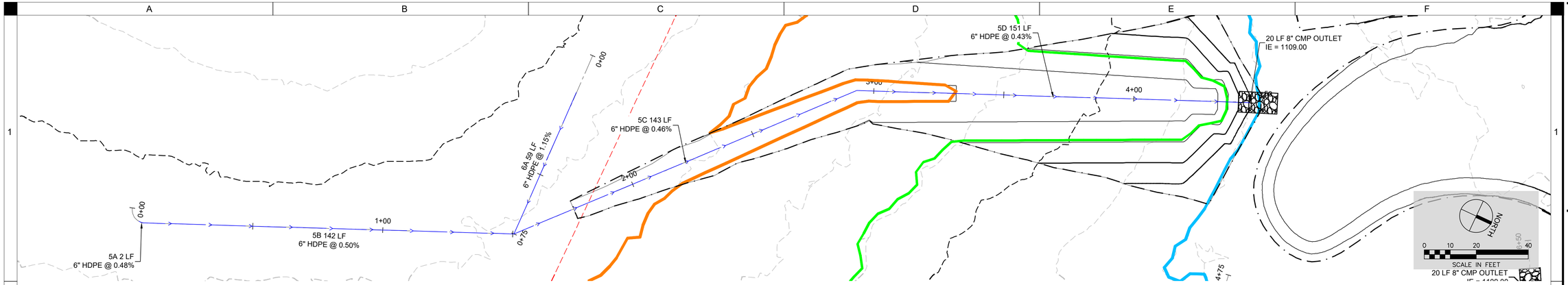

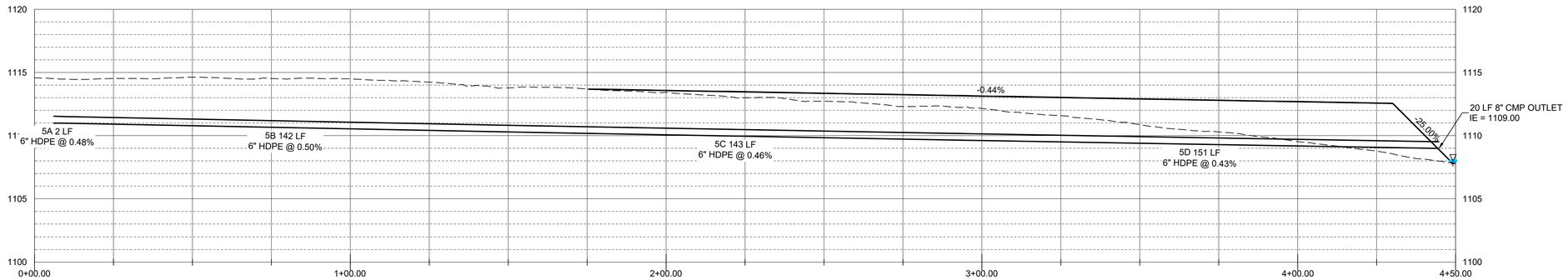

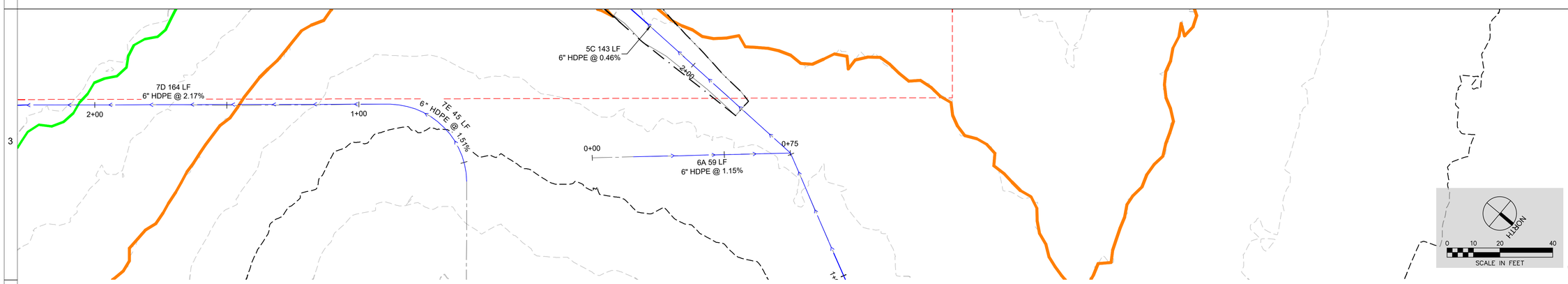

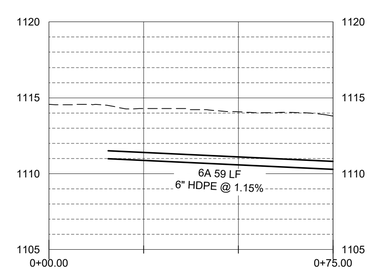

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VERTICAL SCALE
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SCALE IN FEET

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PROJECT NO: 214220431O
FIELD BOOK: --
CLIENT NO: --

PROPOSED TILE PLAN AND PROFILE

C305

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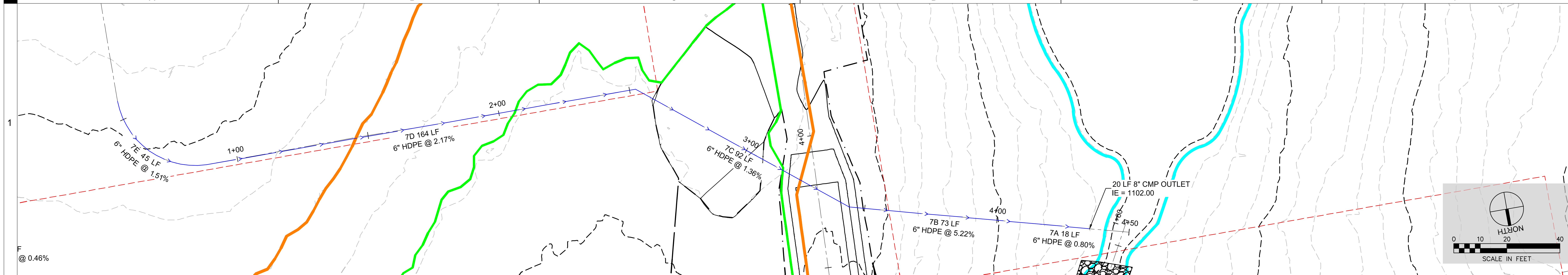

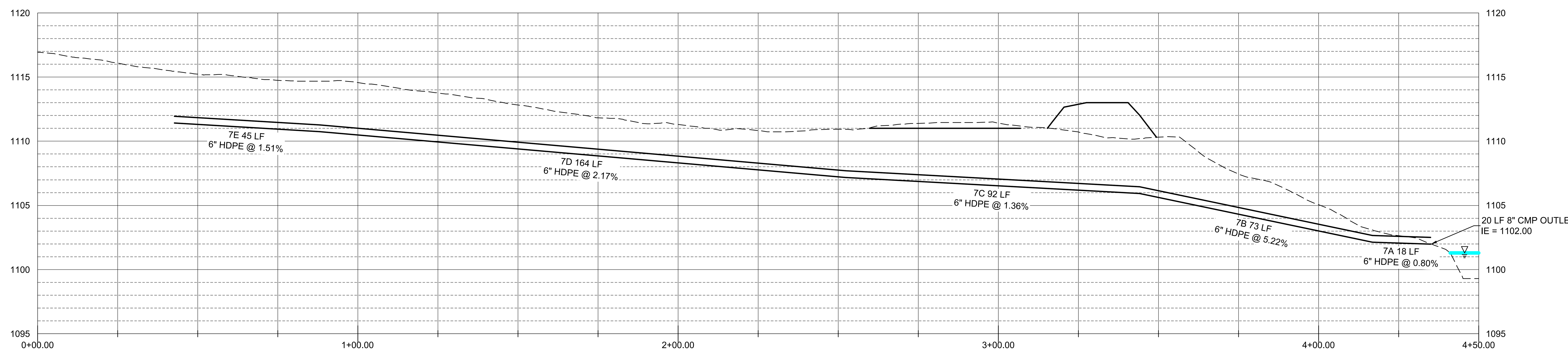

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VERTICAL SCALE
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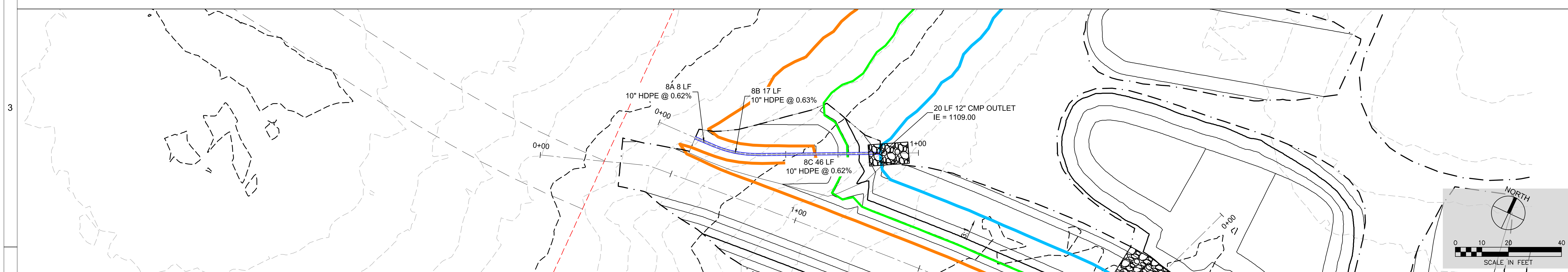

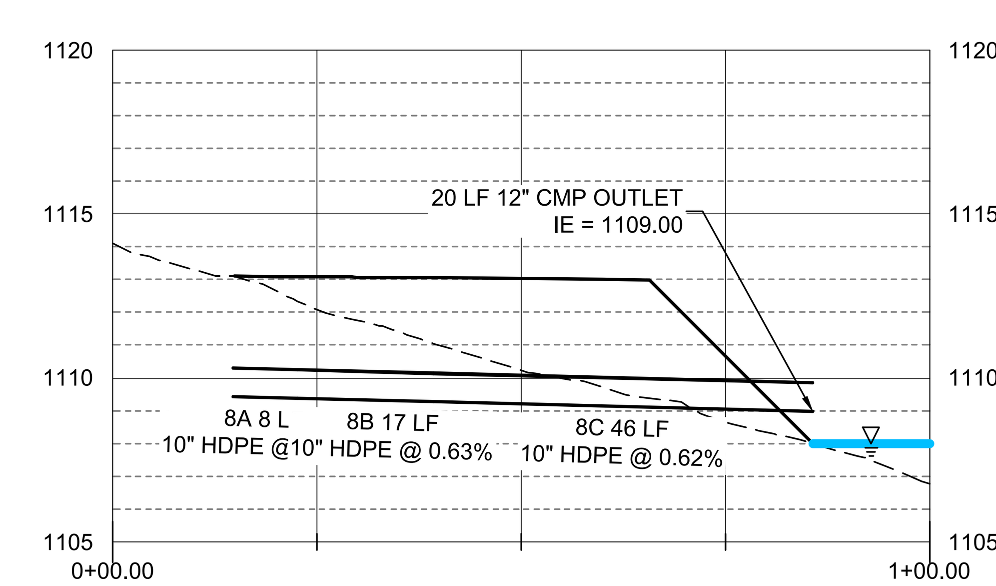

HORIZONTAL SCALE
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SCALE IN FEET

VERTICAL SCALE
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SCALE IN FEET

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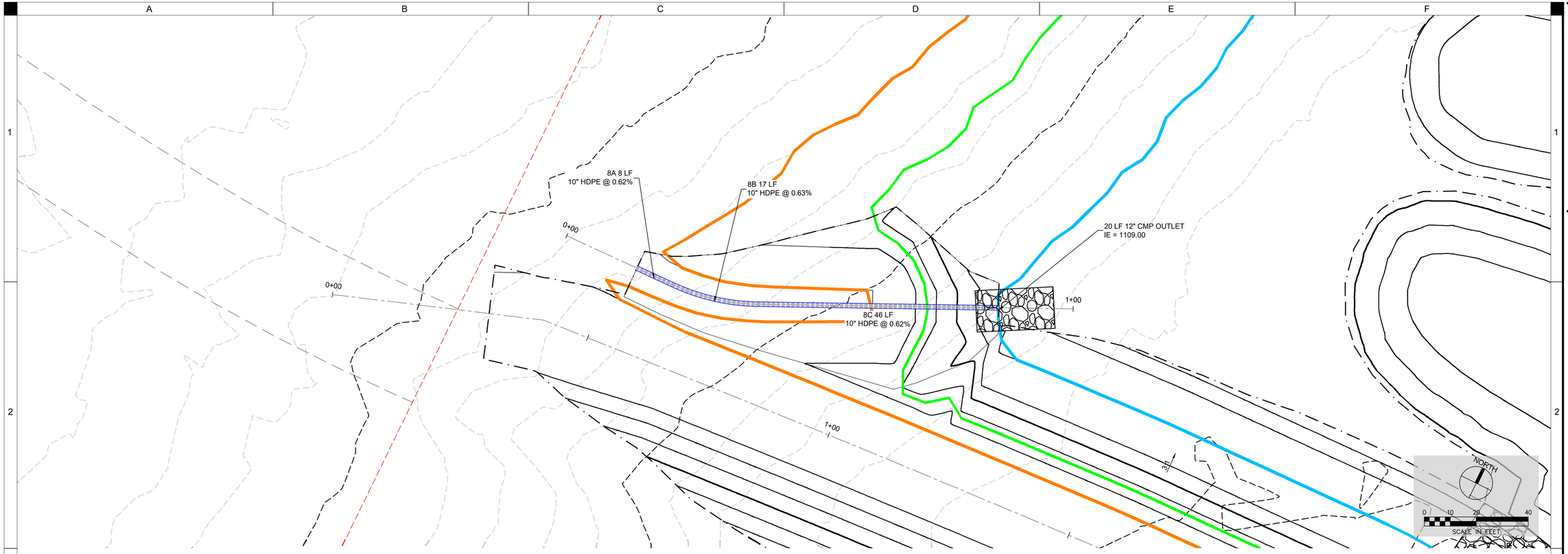
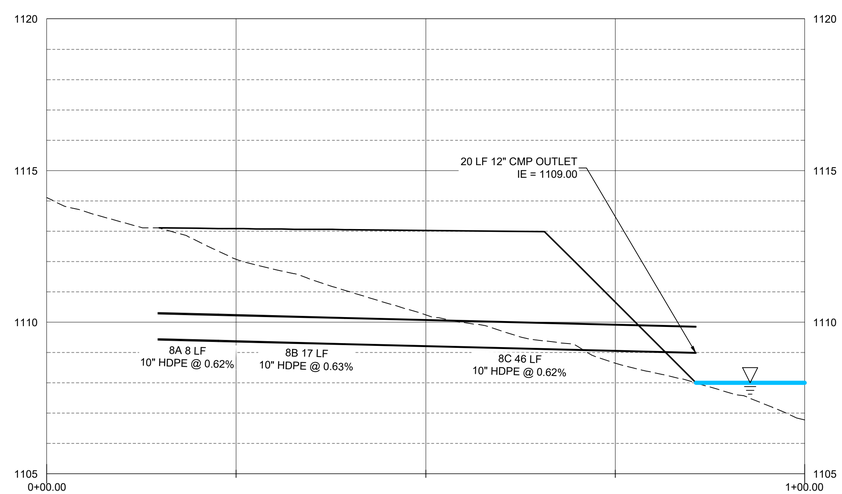
PROJECT NO: 2142204310
FIELD BOOK: ---
CLIENT NO: ---

PROPOSED TILE PLAN AND PROFILE

C306





HORIZONTAL SCALE
0 5 10 20
SCALE IN FEET

VERTICAL SCALE
0 1.25 2.5 5
SCALE IN FEET

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HARDIN COUNTY, IA

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FIELD BOOK: ---
CLIENT NO: ---

PROPOSED TILE PLAN AND PROFILE

C307

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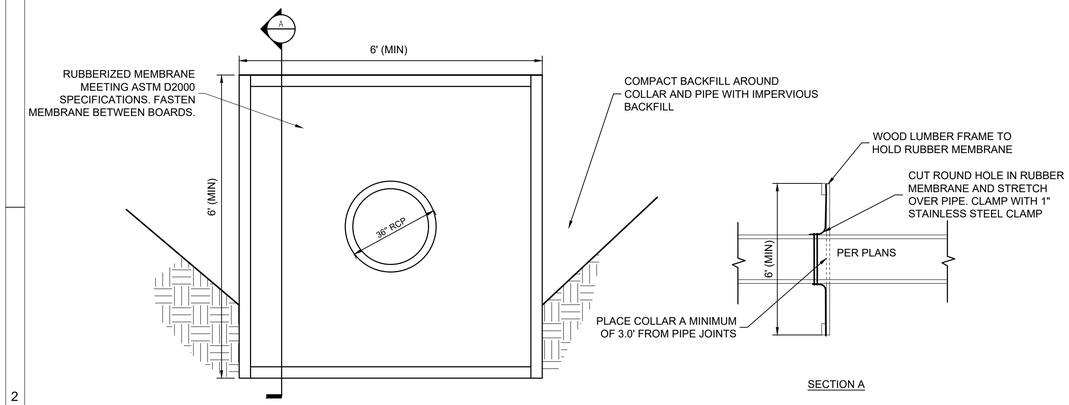
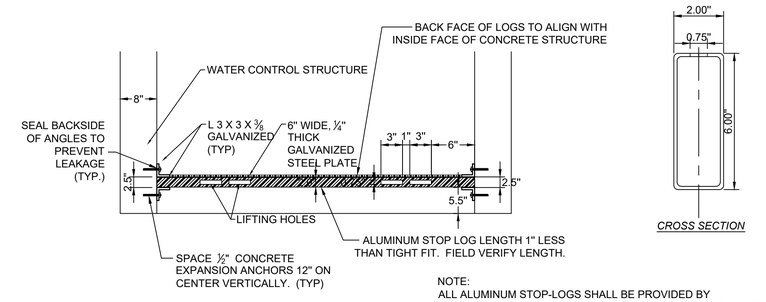


NOTE:
MINIMUM THREE ANTI-SEEPAGE COLLARS SHALL BE INSTALLED ALONG THE PRINCIPAL SPILLWAY AS SHOWN ON SHEET C301.

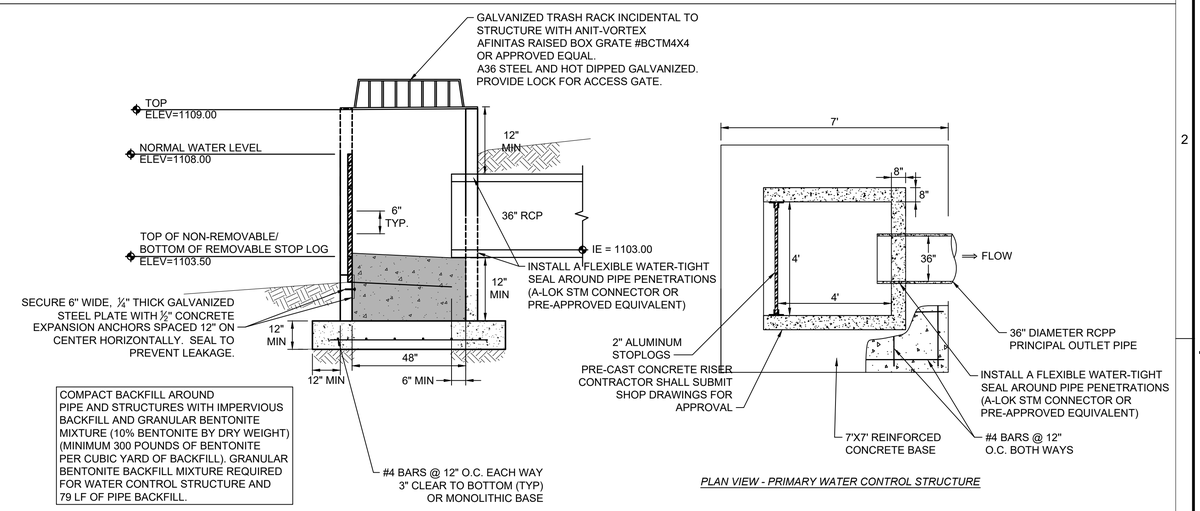
A2 RUBBER MEMBRANE ANTI-SEEPAGE COLLAR
NOT TO SCALE



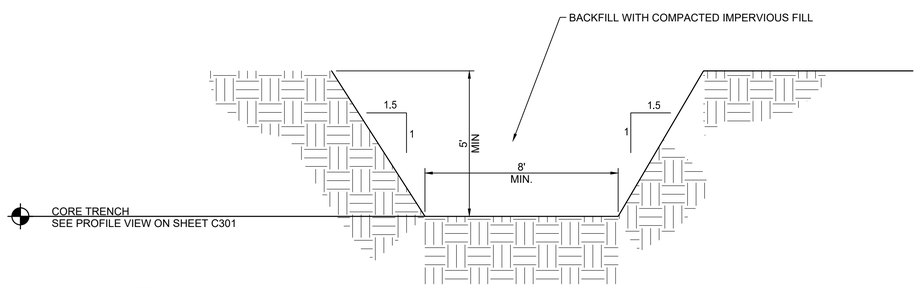
NOTE:
CONTRACTOR TO DRILL ⅜" HOLES IN TOP OF STOP LOG CHANNELS AND PROVIDE TWO (2) PADLOCKS TO LOCK THROUGH CHANNELS TO PREVENT LOGS FROM BEING LIFTED OUT WHEN LOCK IS IN PLACE.

NOTE:
ALL ALUMINUM 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 EIGHT (8) STOP-LOGS TO THE SITE. THE COST OF THE STOP-LOG WORK IS INCIDENTAL TO THE OUTLET CONTROL STRUCTURE.

D1 STOP LOGS AND CHANNEL
NOT TO SCALE



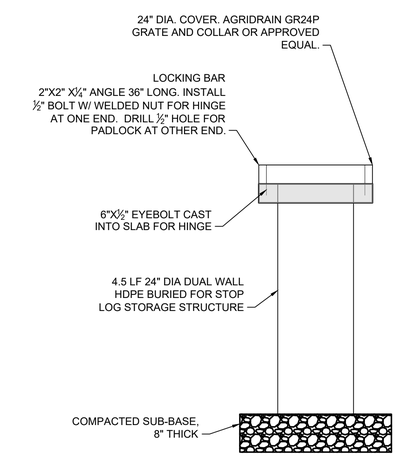
D3 WATER CONTROL STRUCTURE AND PRINCIPAL OUTLET (MODIFIED SW-302)
NOT TO SCALE



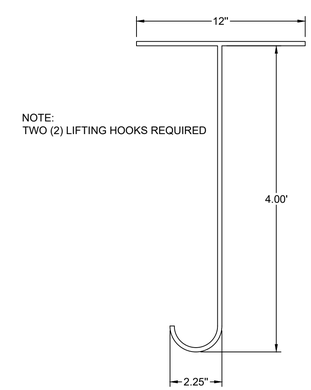
NOTE:
ALL DRAIN TILE IDENTIFIED DURING CORE TRENCH EXCAVATION TO BE RECORDED. REMOVE DRAIN TILES IN THEIR ENTIRETY FROM EMBANKMENT FOOTPRINT

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

A4 TYPICAL CORE TRENCH SECTION
NOT TO SCALE



D4 STOP LOG STORAGE STRUCTURE
NOT TO SCALE



NOTE:
TWO (2) LIFTING HOOKS REQUIRED

F4 STOP LOG LIFTING HOOK
NOT TO SCALE

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HAR892022C - SHOOFLY JENSEN NR WETLAND

IDALS
HARDIN COUNTY, IA

DRAWN: GHK
APPROVED: DJJ
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 06/05/2026
PROJECT NO: 214220310
FIELD BOOK: ---
CLIENT NO: ---

CONSTRUCTION DETAILS

C501

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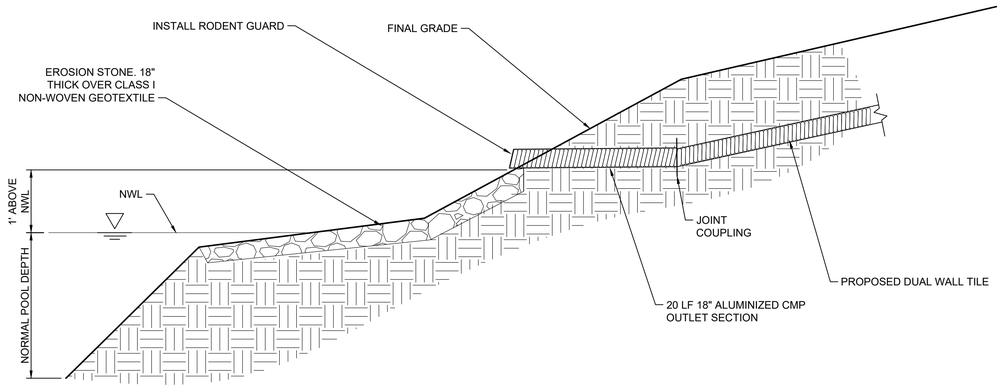
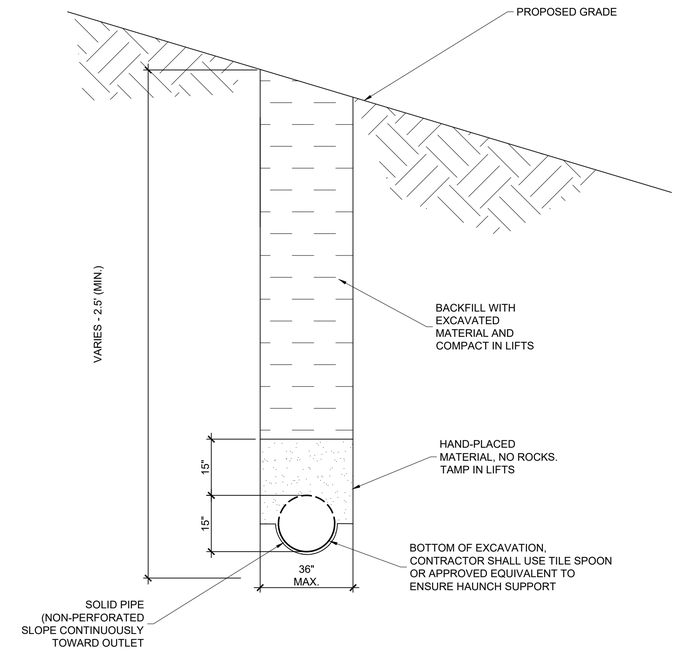
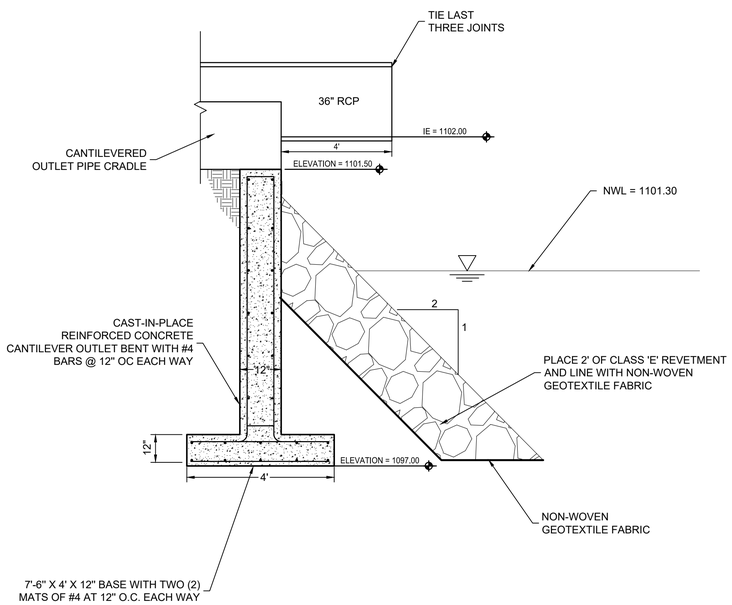


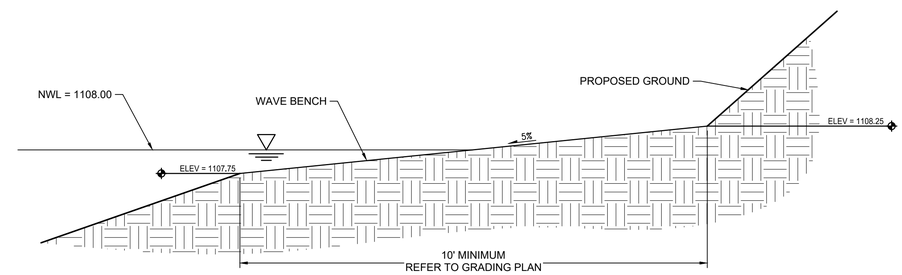
A2 TILE DAYLIGHT AT WETLAND
NOT TO SCALE



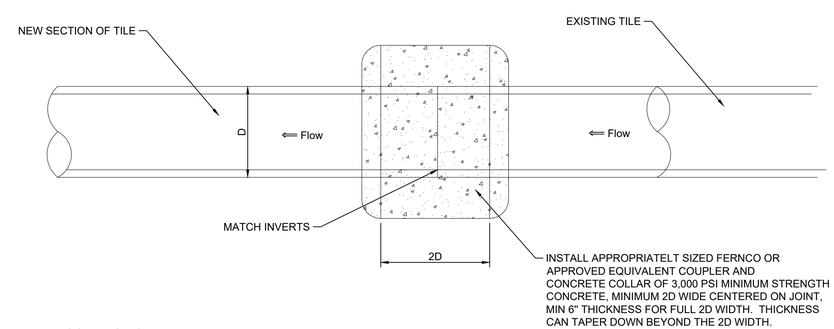
D2 TILE TRENCH
NOT TO SCALE



A4 PIPE CANTLIEVER OUTLET
NOT TO SCALE



D3 WAVE PROTECTION BENCH AT NWL
NOT TO SCALE



D4 FIELD TILE REPAIR CONNECTION
NOT TO SCALE

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CONSTRUCTION DETAILS

C502

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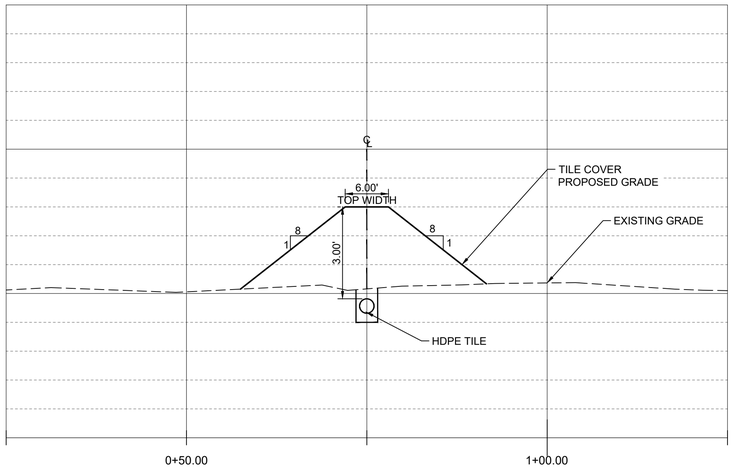
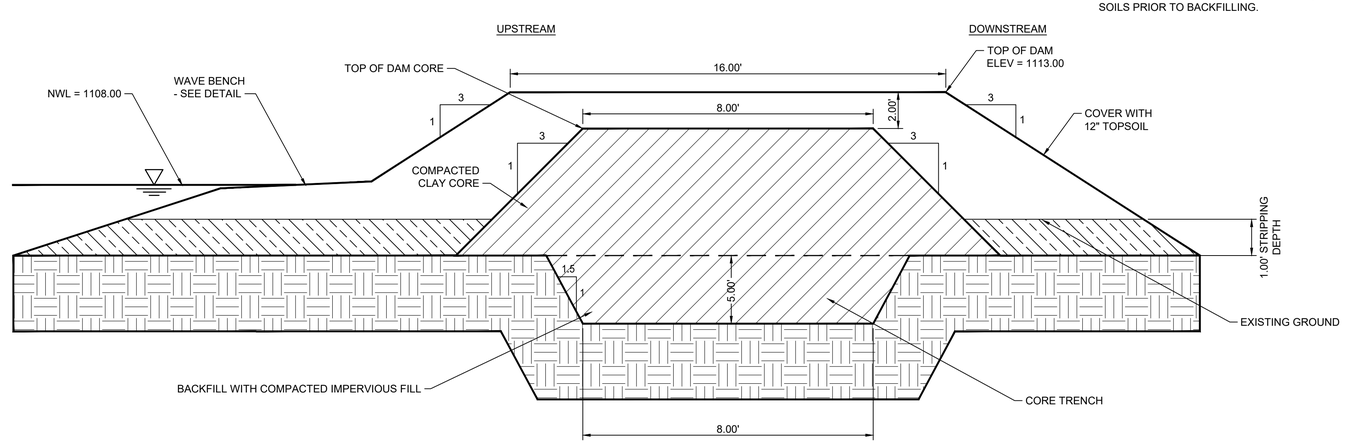


A2 TILE COVER BERM
NOT TO SCALE

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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C503

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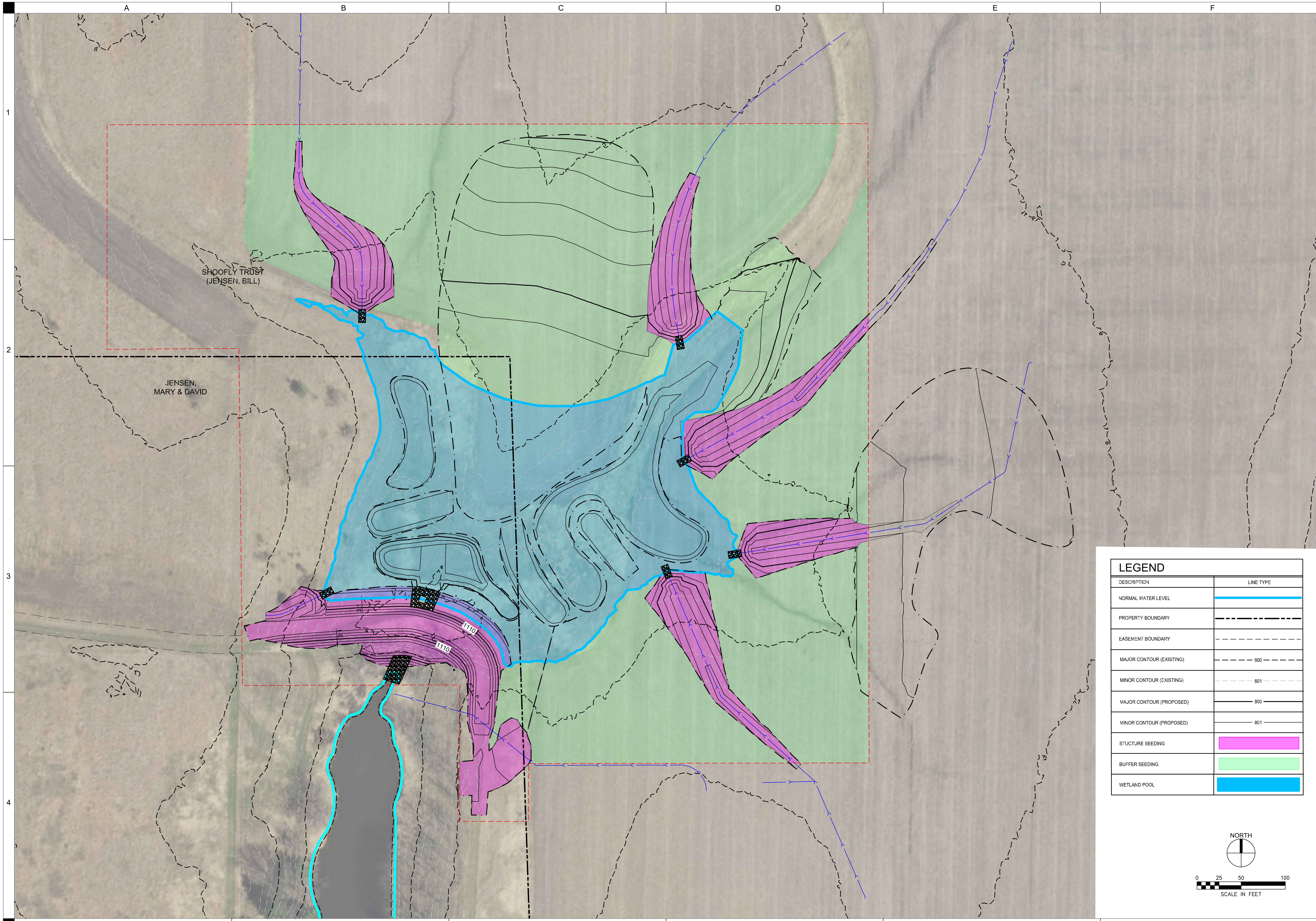

LEGEND

DESCRIPTION	LINE TYPE
NORMAL WATER LEVEL	
PROPERTY BOUNDARY	
EASEMENT BOUNDARY	
MAJOR CONTOUR (EXISTING)	800
MINOR CONTOUR (EXISTING)	801
MAJOR CONTOUR (PROPOSED)	800
MINOR CONTOUR (PROPOSED)	801
STUCTURE SEEDING	
BUFFER SEEDING	
WETLAND POOL	

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FIELD BOOK: --
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SEEDING PLAN

C601