

CONSTRUCTION PLANS FOR IDALS PROJECT NO. WOR982203CS NUTRIENT REMOVAL WETLAND WORTH COUNTY, IOWA

February 2024

GOVERNING SPECIFICATIONS

THE SPECIFICATIONS AS PREPARED BY IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP AND BOLTON & MENK, INC. SHALL BE CONSIDERED AS PART OF THIS DOCUMENT. NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATIONS SHALL APPLY.

THE CURRENT EDITION OF THE "IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" SHALL GOVERN.

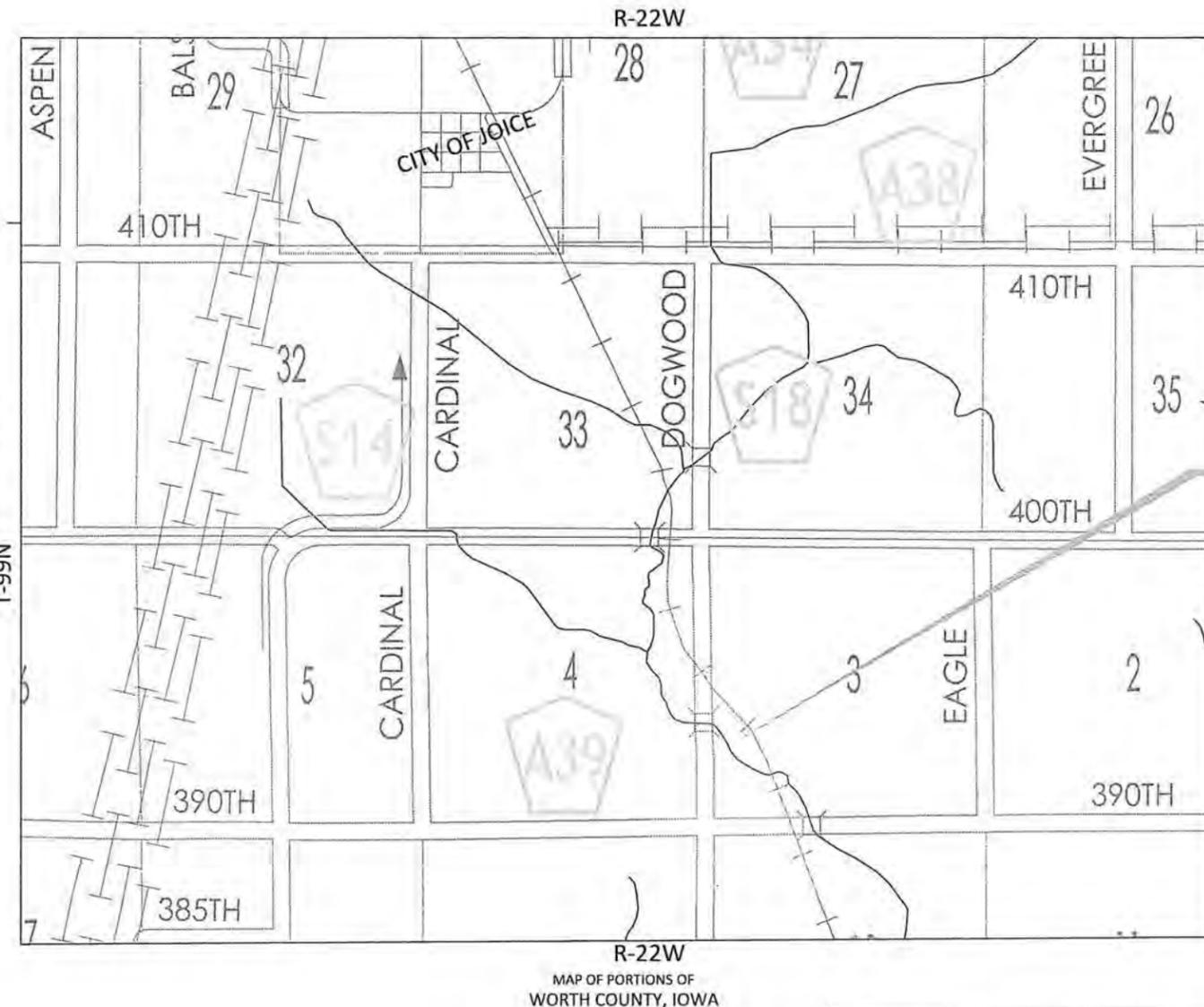
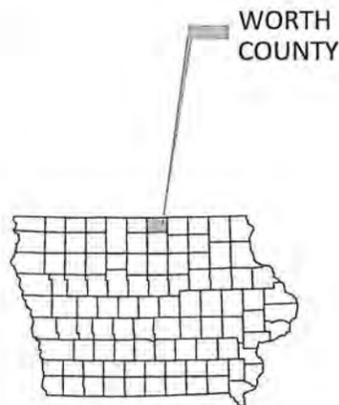
IOWA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION", SERIES 2021 AND ALL CURRENT GENERAL SUPPLEMENTAL SPECIFICATIONS AND MATERIALS INSTRUCTIONAL MEMORANDUM SHALL GOVERN AS REFERENCED.

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITH IN THE CONSTRUCTION OF THIS PROJECT.

NOTE: IF A CULTURAL RESOURCE IS IDENTIFIED DURING CONSTRUCTION, STOP WORK IMMEDIATELY AND NOTIFY THE ENGINEER.



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."



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M.01	PLAN & PROFILE - OUTLET STRUCTURE & SUMP INTAKE PIPE

THESE PLANS WERE PREPARED IN ACCORDANCE WITH NRCS ENGINEERING JOB CLASS IV. STANDARDS FOR TASKS ARE AS FOLLOWS:
656 - SITE DESIGN
410 - OUTLET CAPACITY
378 - POOL DESIGN
TO THE BEST OF MY PROFESSIONAL KNOWLEDGE JUDGEMENT, AND BELIEF, THESE PLANS MEET APPLICABLE NRCS STANDARDS.

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

Jonathan P. Rosengren
JONATHAN P. ROSENGREN, P.E.
REG. NO. 21661 DATE: Feb 27, 2024

MY LICENSE RENEWAL DATE IS 12/31/2024

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL PLAN SHEETS

DATUM EQUATION 1910 DATUM + 1318.80' = NAVD 88	PROJECT DATUM: STATE PLANE HORIZONTAL: IOWA NORTH VERTICAL: NAVD 1988
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	VALUE	UNIT	REQUIREMENT
WATERSHED AREA	8128	ACRES	20 acres direct watershed
POOL NORMAL WATER LEVEL (NWL) ELEV	1210.00	FT	
DESIGNED WETLAND POOL AREA (@ NWL)	4.15	ACRES	
PERCENT POOL AREA TO WATERSHED AREA	0.1	%	Range 0.1 to 2.4 of watershed area
MAXIMUM POOL DEPTH	2.25	FT	
AVERAGE POOL DEPTH	1.4	FT	
DEEP WATER AREA (DEPTH > 3 FT)	0.0	ACRES	
PERCENT DEEP WATER TO POOL AREA	0.0	%	Less than 25%
POOL STORAGE VOLUME AT NWL	2.52	ACRE-FT	
BERM ELEVATION	1212.00	FT	
POOL STORAGE VOLUME AT TOP OF DIKE	10.83	ACRE-FT	
PRIMARY WEIR ELEVATION	1210.00	FT	
PRIMARY WEIR WIDTH	16	FT	1001 SW 1/4 Modified Outlet Structure
EASEMENT AREA	10.6	ACRES	
AREA OF BUFFER	6.4	ACRES	
RATIO BUFFER AREA TO NWL POOL AREA	1.5		Less than 1.5
5-YEAR STORM HWL IN POOL	1210.38	FT	
5-YEAR PEAK INFLOW	38.91	CFS	
5-YEAR PEAK OUTFLOW	12.35	CFS	
10-YEAR STORM HWL IN POOL	1210.47	FT	
10-YEAR PEAK INFLOW	51.35	CFS	
10-YEAR PEAK OUTFLOW	16.99	CFS	
25-YEAR STORM HWL IN POOL	1210.60	FT	
25-YEAR PEAK INFLOW	71.55	CFS	
25-YEAR PEAK OUTFLOW	25.07	CFS	
100-YEAR STORM HWL IN POOL	1210.83	FT	
100-YEAR PEAK INFLOW	108.89	CFS	
100-YEAR PEAK OUTFLOW	40.86	CFS	

WETLAND POOL DEPTH (FT)	ELEV (FT)	INCREMENTAL AREA (FT ²)	CUMULATIVE VOLUME (FT ³)	CUMULATIVE VOLUME (AC-FT)
0.00	1208.00	566	0.00	0.00
0.25	1208.25	2,678	406	0.01
0.50	1208.50	16,328	2,781	0.06
0.75	1208.75	22,648	7,653	0.18
1.00	1209.00	31,450	14,416	0.33
1.25	1209.25	47,589	24,295	0.56
1.50	1209.50	65,313	38,408	0.88
1.75	1209.75	106,007	59,823	1.37
2.00	1210.00	180,774	95,671	2.20
2.50	1210.50	203,452	191,727	4.40
3.00	1211.00	248,615	304,744	7.00
3.50	1211.50	266,810	433,600	9.95
4.00	1212.00	281,549	570,690	13.10

CONTROL POINT/BENCH MARK			
NORTHING	EASTING	ELEVATION	DESCRIPTION
3947060.91	4939701.04	1211.259	X NE CORNER BRIDGE
3947080.59	4937732.61	1248.406	1/2IN REBAR
3948965.63	4937671.14	1218.405	MAG SPIKE IN HEADWALL
3950210.51	4937679.14	1236.039	1/2IN REBAR
3949668.17	4938920.22	1219.924	1/2IN REBAR



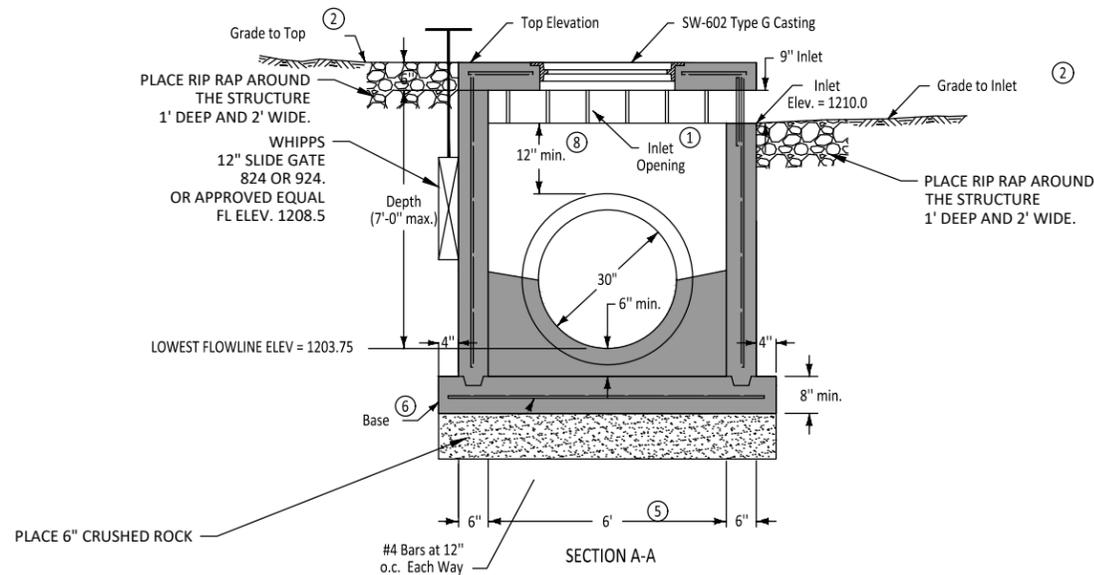
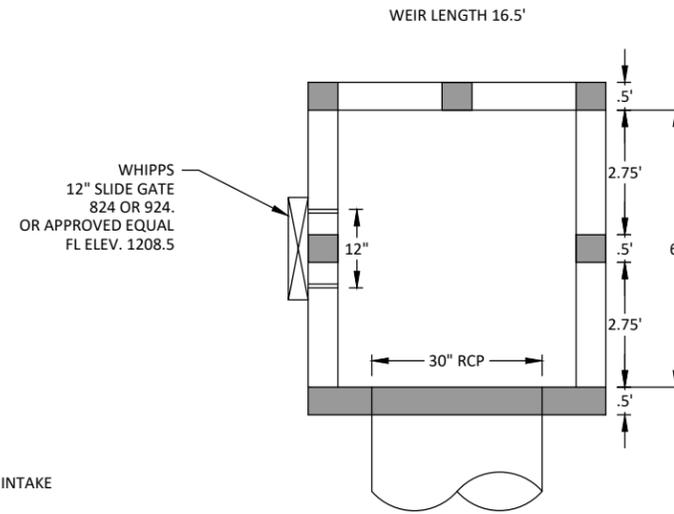
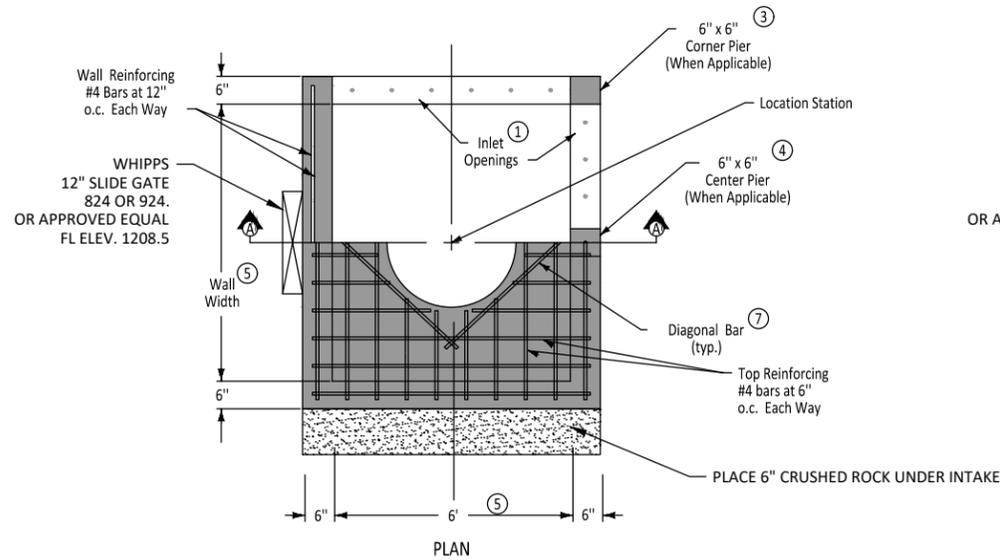
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IDALS WATER RESOURCES BUREAU
DUESENBURG WOR982203CS
OVERVIEW PLAN DESIGN

SHEET
A.02

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Structure may be built with openings on any or all sides. Provide openings and orientation as specified in the contract documents.

Adjacent walls may have different widths based upon pipe configuration, but structure must be rectangular.

- (1) Construct inlet openings with 15-inch #4 epoxy-coated bars at 8 inches on center. Embed bars a minimum of 3 inches into walls and top at all openings.
- (2) Grade to inlet elevation on open sides. Grade to top elevation on closed sides.
- (3) Corner pier required between openings of two adjacent walls. Extend wall reinforcing vertically through pier. Install one additional 15-inch #4 bar in pier.
- (4) Center pier required at center of any inlet opening with length of 5 feet or greater. Extend wall reinforcing vertically through pier. Install one additional 15-inch #4 bar in pier.
- (5) Wall widths vary with pipe diameter. Provide 6 inches of wall width (minimum) each side of pipe opening. Minimum wall width is 36 inches. Maximum wall width is 72 inches.
- (6) Cast-in-place base shown. If base is precast integral with walls, the footprint of base is not required to extend beyond the outer edge of the walls.
- (7) Install four #4 diagonal bars at all pipe openings.
- (8) 12" minimum wall height above all pipes.

DETAIL - CONCRETE STRUCTURE (OUTLET) SW 513, MODIFIED

		NEW
FIGURE 6010.513	STANDARD ROAD PLAN	MODIFIED
REVISIONS: New. Replaces SUDAS Area Type "M-G" intake.		SW-513
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
OPEN-SIDED AREA INTAKE		

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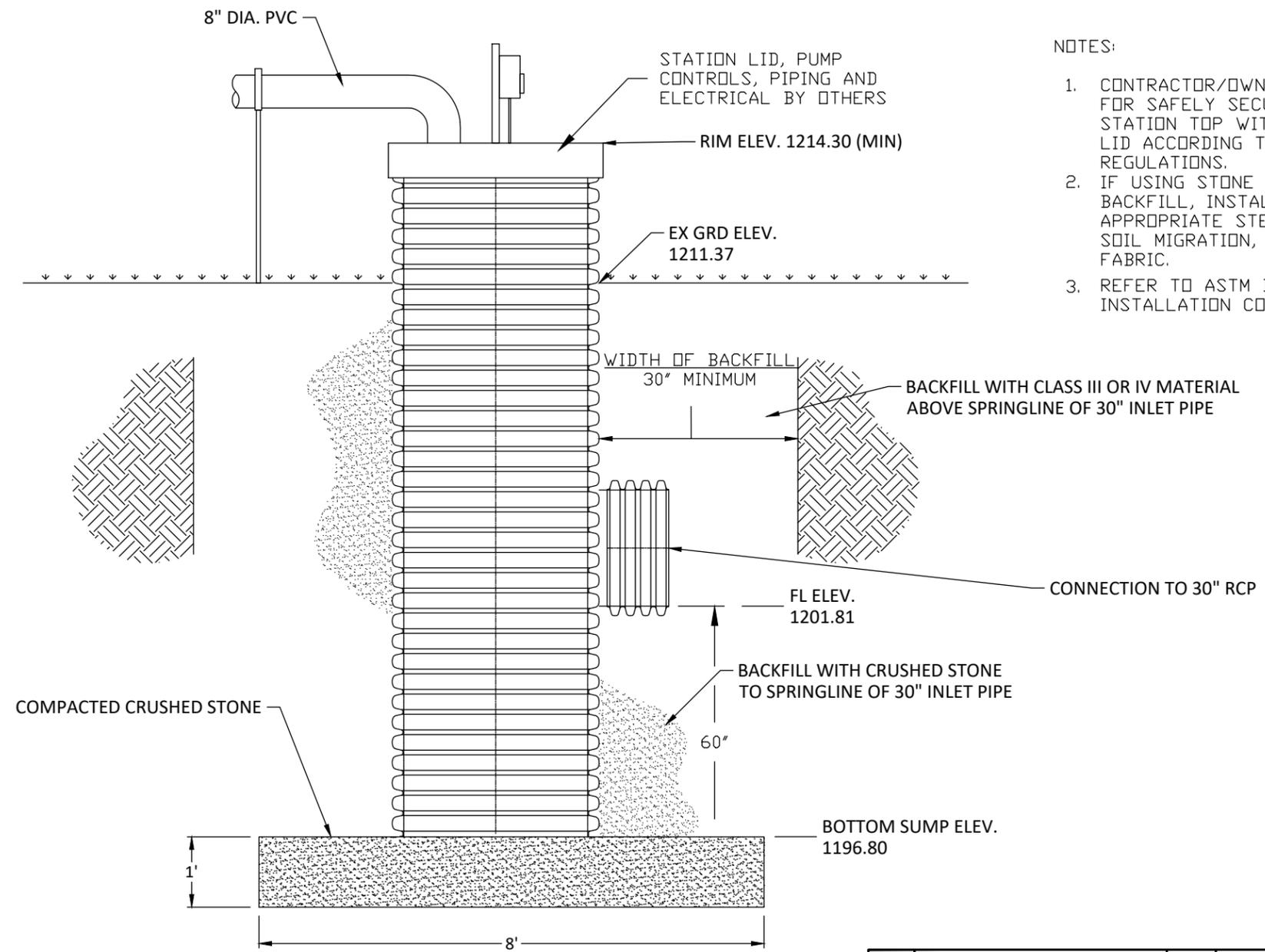
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IDALS WATER RESOURCES BUREAU
DUESENBURG WOR982203CS
IOWA DOT STRUCTURE DETAIL

SHEET
B.01

AG LIFT STATION INSTALLATION DETAIL



- NOTES:
1. CONTRACTOR/OWNER IS RESPONSIBLE FOR SAFELY SECURING THE LIFT STATION TOP WITH AN APPROPRIATE LID ACCORDING TO LOCAL CODES AND REGULATIONS.
 2. IF USING STONE MATERIAL AS BACKFILL, INSTALLER SHALL TAKE APPROPRIATE STEPS TO ADDRESS SOIL MIGRATION, I.E. GEOTEXTILE FABRIC.
 3. REFER TO ASTM D2321 FOR OTHER INSTALLATION CONSIDERATIONS.

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 ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS DETAIL BASED ON INFORMATION PROVIDED TO ADS. THIS DRAWING IS INTENDED TO DEPICT THE COMPONENTS AS REQUESTED. ADS HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THIS PROJECT, NOR HAS ADS INDEPENDENTLY VERIFIED THE INFORMATION SUPPLIED. THE INSTALLATION DETAILS PROVIDED HEREIN ARE GENERAL RECOMMENDATIONS AND ARE NOT SPECIFIC FOR THIS PROJECT. THE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION. IT IS THE DESIGN ENGINEERS RESPONSIBILITY TO ENSURE THE DETAILS PROVIDED HEREIN MEETS OR EXCEEDS THE APPLICABLE NATIONAL, STATE, OR LOCAL REQUIREMENTS AND TO ENSURE THAT THE DETAILS PROVIDED HEREIN ARE ACCEPTABLE FOR THIS PROJECT.

REV.	DESCRIPTION	BY	MM/DD/YY	CHK'D

AG LIFT STATION INSTALLATION DETAIL		ADVANCED DRAINAGE SYSTEMS, INC. OR APPROVED EQUAL	DRAWN BY: AWM DATE: 11/1/12 CDD BY: SCALE: NTS SHEET: 1 OF 1
DRAWING NUMBER: STD-408			4640 TRUEMAN BLVD HILLIARD, OHIO 43026

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 AG LIFT STATION DETAIL

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EXCAVATION AND BANK

SHAPING IS REQUIRED TO BE CARRIED OUT FROM BOTH SIDES OF THE OPEN DITCH, UNLESS OTHERWISE SPECIFIED ON PLANS. APPROXIMATELY EQUAL AMOUNTS OF SPOIL ARE TO BE PLACED ON BOTH SIDES OF THE DITCH, UNLESS OTHERWISE SPECIFIED ON PLANS.

CONTRACTOR SHALL LIMIT, AS MUCH AS PRACTICAL, DISTURBANCE OF STABLE VEGETATED BANKS WHICH LIE OUTSIDE THE DESIGN CROSS SECTION. WHERE THE DITCH IS WIDER THAN THE DESIGN CROSS SECTION, CONTRACTOR SHALL EXCAVATE AS REQUIRED TO SHAPE BOTTOM TO BASE OF SIDE SLOPES.

SPOIL BANK LEVELING

THE TOP 8 INCHES OF ALL LEVELED AND SHAPED SPOIL, OLD AND NEW, SHALL BE THOROUGHLY TILLED BY CONTRACTOR WITH A CHISEL PLOW OR SIMILAR IMPLEMENT. DISPOSE OF ROCKS AND OTHER DEBRIS EXPOSED BY THIS OPERATION. ENTIRE SOIL SURFACE SHALL BE SHAPED TO DRAIN AWAY FROM THE DITCH AND SHALL BE GENERALLY LEVEL WITH GENTLE UNDULATIONS ON A LINE PARALLEL TO DITCH. CHISELING AND FINISH GRADING ARE INCIDENTAL TO THE SPOIL BANK LEVELING BID ITEM.

MINOR SURFACE GRADING TO DRAIN SMALL IMPOUNDED AREAS AND THE CONSTRUCTION OF TEMPORARY FIELD ENTRANCES OR SURFACE WATER CONTROL DIKES IN THE PUBLIC ROAD DITCHES ARE INCIDENTAL TO THE SPOIL BANK LEVELING BID ITEM.

WHERE IT IS NECESSARY TO EXTEND OR RELAY TILE LINES. 12" OR LARGER IN DIAMETER TO REACH TILE EXTENSION PIPES, THE EXTENSION SHALL BE WITH CONCRETE OR SITE-SALVAGED DRAIN TILE SECTIONS IN A TRENCH WITH A MAXIMUM WIDTH 12" WIDER THAN THE TILE SECTIONS. USE NEW CLASS III CONCRETE DRAIN TILE WITH CLASS R-2 BEDDING. EXTEND ALL SMALLER TILE LINES WITH 10" DIAMETER SDR-35 PVC SEWER PIPE FITTED OVER TILE AND INTO OUTLET PIPE. NECESSARY EXTENSIONS OR RELAYS LESS THAN 20 FEET IN LENGTH MAY BE COMPLETED WHEN DISCOVERED. LONGER EXTENSIONS MUST BE FIRST APPROVED BY ENGINEER. CORRUGATED PLASTIC DRAIN TILE IS NOT PERMITTED.

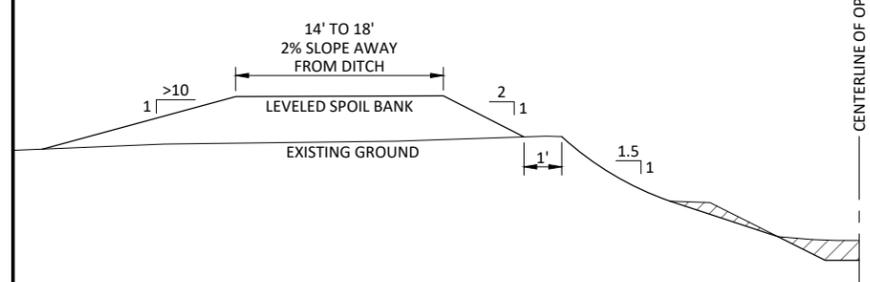
WHEN A TILE LINE IS FOUND TO BE CRUSHED, CRACKED, OR FILLED WITH SEDIMENT, CONTRACTOR IS TO NOTIFY ENGINEER PRIOR TO DOING ADDITIONAL WORK. ENGINEER WILL DETERMINE IF REPLACEMENT OR ABANDONMENT IS WARRANTED. TILE REPLACEMENT WILL NOT EXTEND BEYOND THE WORK LIMITS.

CONTRACTOR IS REQUIRED TO MAINTAIN AND PROVIDE A LOG OF ALL DRAIN TILE LINE EXTENSION AND REPLACEMENT WORK RECORDING LOCATION, EXISTING TILE MATERIAL, SIZE, STRENGTH & LENGTH OF MATERIALS INSTALLED, OTHER WORK PERFORMED AND MACHINE AND LABOR TIME. LOG KEEPING IS SUBSIDIARY TO THE CONTRACT. ALL APPROVED DRAIN TILE WORK WILL BE CONSIDERED EXTRA WORK IF NOT COVERED BY A BID ITEM. FAILURE TO MAINTAIN AN ACCURATE LOG WILL RESULT IN CONTRACTOR HAVING TO UNCOVER HIS WORK FOR VERIFICATION AT HIS COST.

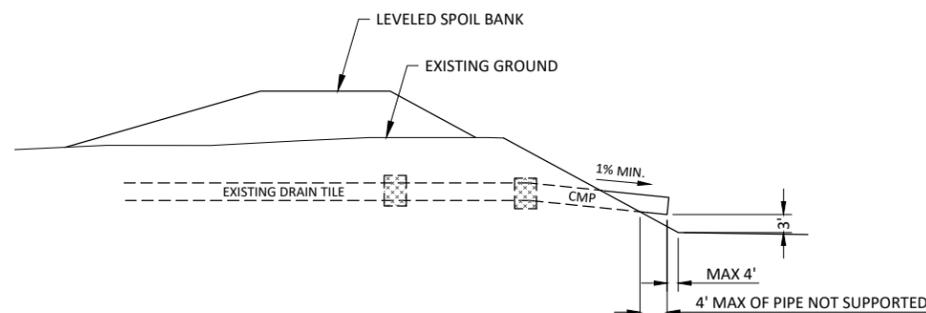
ALL CONNECTIONS OF DRAIN TILE TO EXTENSION PIPES OR TO SDR-35 PVC SEWER PIPES ARE TO BE ENCASED IN A PORTLAND CEMENT CONCRETE COLLAR AT LEAST 12" WIDE AND 6" THICK CONTINUOUS AROUND THE JOINT. THIS WORK IS INCIDENTAL TO THE DRAIN TILE EXTENSION PIPE BID ITEMS.

Standard Pipe Work Abbreviations

- UAC = Use As Constructed RS&R = Remove, Salvage, & Reinstall
- TE = Tile Extension SD = Surface Drain
- AG = Animal Guard CMP = Corrugated Metal Pipe
- FG = Flood Gate RCP = Reinforced Concrete Pipe

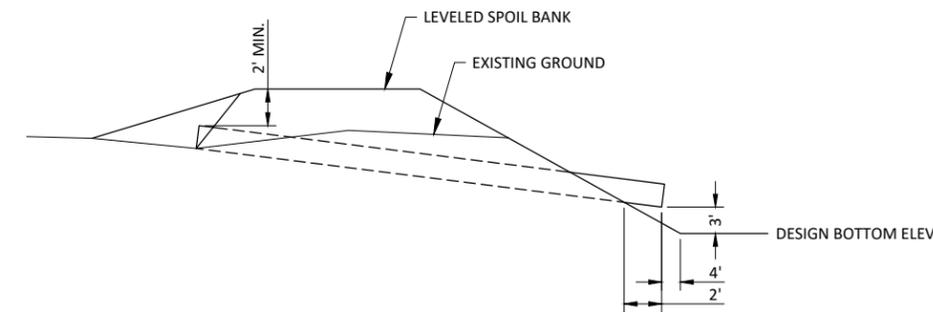
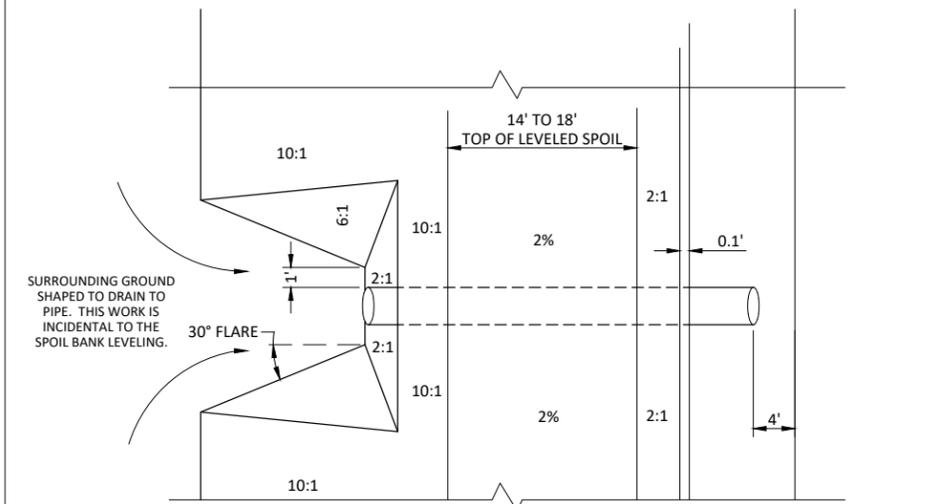


TYPICAL OPEN DITCH EXCAVATION & SPOIL LEVELING



1 TYPICAL BANK SECTION
D.04
NOT TO SCALE

TYPICAL BANK SECTION WITH TILE EXTENSION INSTALLATION



TYPICAL SURFACE DRAIN INSTALLATION

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IDALS WATER RESOURCES BUREAU
DUESENBURG WOR982203CS
TYPICAL DITCH DETAIL

SHEET
B.03

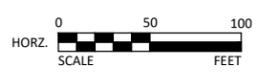


ONLY AREAS NOTED OR DISTURBED DURING CONSTRUCTION WILL RECEIVE BUFFER SEEDING.

LEGEND

- PONDED AREA
- BUFFER SEEDING
- STRUCTURE SEEDING

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IDALS WATER RESOURCES BUREAU
DUESENBURG WOR982203CS
SEEDING MAP

SHEET
B.04

Quantity Estimate - Duesenberg

PROJECT: WOR982203C
CREP:

WQI: x

BID ITEM	SUB-ITEM	DESCRIPTION	SPECIFICATIONS		PLAN NO.	Estimated Quantities	ESTIMATED QUANTITIES
			No.	Page			
1	-	SITE STRIPPING & PREPARATION	IA CS-001	1-2	A.02, D.01, D.02, D.03, D.04, D.05	1	LS
2	-	CROP DAMAGE	IA CS-001	1-2		0	AC
3	-	STRUCTURE & CHANNEL SEEDING	IA CS-006	6 - 9	B.04	2.0	AC
4	-	BUFFER SEEDING	IA CS-006	6 - 9	B.04	0.6	AC
5	-	MOBILIZATION AND DEMOBILIZATION	CS-008	10 - 12		1	LS
6	-	DRAIN TILE INVESTIGATION AND REMOVAL	IA CS-009	13 - 16	A.02	6	HR.
7	-	*EXCAVATION (GENERAL)	IA CS-021	19 - 21	A.02,D.01,D.02, D.03,D.04,D.05,M.01	2285	CY
8	-	EARTHFILL (GENERAL)	IA-CS-023	22 - 26	A.02,D.01,D.02, D.03,D.04,D.05,M.01	4389	CY
9	-	TOPSOIL PLACEMENT	IA CS-026	26 - 27	A.02, D.01, D.02, D.03, D.04, D.05	4068	CY
10	-	RIPRAP	IA-CS-61	41 - 42	A.02,B.01,D.01,D.02, D.04,D.05,M.01	100	TON
11	-	CONCRETE STRUCTURE (OUTLET) SW 513, MODIFIED	IA CS-031 6010-1.08-B	28 - 33	A.02, B.01, D.01, D.04, M.01	1	EA
12	-	OTHER: REINFORCED CONC. PIPE, GASKETED (RCP), 30" DIAMETER	IA-CS-46, SUDAS DIV4, 4020	34 - 36	A.02, D.01, D.02, D.04, D.05, M.01	138	LF
13	-	**OTHER: 15" DIA CMP (EXISTING REMOVE, RELAY)	IA-CS-51	37 - 40	A.02, B.03, D.01, D.04	40	LF
14	-	OTHER: SLIDE GATE	CPS-587	43 - 44	A.02, B.01, D.01, D.04, M.01	1	EA
15	-	OTHER: LIFT STATION (INCLUDES 5.0 HP AXIAL FLOW ELECTRIC PUMP)	CPS-533	45 - 52	A.02,B.02,D.02, D.04,D.05,M.01	1	LS
16	-	OTHER: ELECTRIC TRANSMISSION TO PUMP	CPS-533	45 - 52	A.02	1	LS
17	-	OTHER: POLLUTION CONTROL (SILT FENCE OR SILT FENCE DITCH CHECKS)	IA-CS-005 9040-1.08-N-1	45 - 52	A.02	100	LF

* INCLUDES 3218 CY FOR EARTH FILL
** CONTRACTOR SHALL USE CARE NOT TO DAMAGE CULVERT DURING REMOVAL

ESTIMATE REFERENCE INFORMATION	
ITEM NO.	DESCRIPTION
1	SITE STRIPPING & PREPARATION THIS ITEM INCLUDES REMOVAL OF VEGETATION FROM ALL AREAS PRIOR TO STRIPPING TOPSOIL, CLEARING AND GRUBBING, AND ANY FENCE REMOVAL/REPLACEMENT NEEDED TO ACCESS AREAS ON PROJECT.
2	CROP DAMAGE THIS ITEM IS TO PROVIDE A MECHANISM TO PROVIDE COMPENSATION IN THE EVENT THERE IS CROP DAMAGE. THE UNIT RATE WILL BE DETERMINED BY THE DIVISION AND ADDED TO THE CONSTRUCTION CONTRACT WITH A CHANGE ORDER. PAYMENT WILL BE MADE TO CONTRACTOR WHO WILL PAY LANDOWNER OR TENANT.
3	STRUCTURE & CHANNEL SEEDING INCLUDES SEEDING OF AREAS DISTURBED AND CONSTRUCTED EMBANKMENT AND DRAINAGE DITCH SLOPE FLATTENING.
4	BUFFER SEEDING NATIVE GRASS SEEDING FOR AREAS DISTURBED FOR CONSTRUCTION. SEED MIXTURE AND SEED BED PREPARATIONS ARE TO FOLLOW NRCS IA-6 SPECIFICATIONS.
5	MOBILIZATION AND DEMOBILIZATION SHALL INCLUDE DEEP TILLAGE OF ANY COMPACTED PATHWAYS ONCE CONSTRUCTION IS COMPLETE AND IS CONSIDERED INCIDENTAL TO THIS ITEM.
6	DRAIN TILE INVESTIGATION AND REMOVAL THIS ITEM WILL CONSIST OF THE EXPLORATORY EXCAVATIONS REQUIRED TO LOCATE THE TILES SHOWN ON THE PLANS OR NOT SHOWN. CONTRACTOR SHALL VERIFY THAT TILE FROM AGRIDRAIN STRUCTURE WILL STILL FUNCTION AFTER EXISTING CMP IS REMOVED AND REPLACED TO GRADE DRAINAGE DITCH SLOPES. THAT WILL BE REMOVED THIS IS FULL COMPENSATION FOR TIME REQUIRED TO EXCAVATE, BACKFILL THE TILE TRENCHES WITHIN THE PERMANENT EASEMENT BOUNDARY AND MAKE REPAIRS TO EXISTING TILE AS NECESSARY. MATERIAL COSTS FOR ITEMS NEEDED TO MAKE REPAIRS WILL BE NEGOTIATED AS EXTRA WORK. WORK TO SURFACE OUTLET EXISTING TILES IF NEEDED WILL ALSO BE INCLUDED IN THIS ITEM.
7	*EXCAVATION (GENERAL) THIS ITEM INCLUDES REMOVAL OF MATERIAL FROM THE WETLAND BASINS (EST. 3,520 CY.) DRAINAGE DITCH SLOPES (EST. 3055 CY.) AND PROPOSED CHANNELS (EST. 99 CY) AS SHOWN ON THE PLANS. 4,389 CY. OF THIS MATERIAL SHALL BE USED FOR CONSTRUCTION OR THE PROPOSED EMBANKMENT AND PAID FOR UNDER THE ITEM FOR EARTHFILL. EXTRA MATERIAL MAY BE WASTED ALONG THE TOP OF THE DRAINAGE DITCH.
8	EARTHFILL (GENERAL) THIS ITEM IS FULL COMPENSATION FOR CONSTRUCTING THE EMBANKMENTS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL PROVIDE A MINIMUM ALLOWABLE SETTLEMENT OF 5% OF THE TOTAL FILL DEPTH WHEN CONSTRUCTING THESE EMBANKMENTS. THE QUANTITY INCLUDES A 35% SHRINKAGE FACTOR.
9	TOPSOIL PLACEMENT ITEM IS TO SLAVAGE, STOCKPILE, AND SPREAD TOPSOIL FOR EMBANKMENT, WETLAND BORROW AREAS, DIVERSION BERMS AND PUMP CHANNEL. QUANTITY INCLUDES A 50% SHRINKAGE FACTOR
10	RIPRAP THIS ITEM IS FOR INSTALLING RIPRAP FROM THE SHORELINE OF THE WETLAND TO THE SW-513 OUTLET STRUCTURE AND SLUICE GATE, ON TOP OF THE AUXILIARY SPILLWAY, AND AROUND THE PUMP INLET PIPE AND WETLAND OUTLET PIPE ON THE DITCH SIDES. ENGINEERING FABRIC IS NOT REQUIRED.
11	CONCRETE STRUCTURE (OUTLET) SW 513, MODIFIED THIS ITEM IS FULL COMPENSATION TO FURNISH AND INSTALL THE MODIFIED SW-513 INCLUDING ALL MODIFICATIONS AND CONNECTIONS SHOWN ON SHEET B.01. PRICE INCLUDES ALL COSTS ASSOCIATED WITH BEDDING AND BACKFILLING THIS ITEM.
12	OTHER: REINFORCED CONC. PIPE, GASKETED (RCP), 30" DIAMETER THIS ITEM IS FURNISH AND INSTALL 30" DIAMETER CLASS III, GASKETED RCP FOR THE PUMP INTAKE AND POND OUTLET STRUCTURE. THE LAST THREE PIPE JOINTS TO THE THE DITCH SHALL BE TIED ON BOTH PIPES. PRICE INCLUDES FURNISHING AND INSTALLING APRON SECTIONS WITH BAR GUARDS ON BOTH PIPES.
13	**OTHER: 15" DIA CMP (EXISTING REMOVE, RELAY) THIS IS ITEM IS TO REMOVE AND RELAY AN EXISTING 15" DIAMETER CMP TO ALLOW DRAINAGE DITCH SLOPE TO BE REGRADED. CONTRACTOR SHALL USE CAUTION TO AVOID DAMAGE TO EXISTING TILE UPSTREAM OF CMP OUTLET SO THAT THE EXISTING AGRIDRAIN STRUCTURE ON THE SOUTH SIDE OF THE FOOD PLOT WILL CONTINUE TO FUNCTION.
14	OTHER: SLIDE GATE THIS ITEM INCLUDES ALL COSTS TO FURNISH AND INSTALL A 12" ROUND SLIDE GATE TO THE MODIFIED SW-513 OUTLET STRUCTURE. THE SLIDEGATE SHALL BE A WHIPPS 12" SLIDE GATE MODEL 824 OR P24, OR APPROVED EQUAL. THE SLIDE GATE SHALL HAVE A HAND WHEEL ACTUATOR.
15	OTHER: LIFT STATION (INCLUDES 5.0 HP AXIAL FLOW ELECTRIC PUMP) THIS ITEM IS TO FURNISH AND INSTALL A LIFT STATION. INCLUDES AS INCIDENTAL, INSTALLATION OF SUMP,-ADS AG LIFT STATION AS SHOWN ON SHEET B.02 WITH A 5 HP CARRY CPO6, AXIAL FLOW PUMP/W 8.5 ° IMPELLER, PART NO CPO6-0050-233-08,VARIABLE SPEED DRIVE VFD-0050-321-E 40 AMP BREAKER, AND LEVEL TRANSDUCER, OR APPROVED EQUAL; CONNECTION TO 30" RCP CULVERT FROM DITCH, ALL NECESSARY BEDDING, CONNECTION TO ELECTRIC LINC. CONTROL PANEL, SUMP LID, 8" DIAMETER PVC OUTLET PIPE, AND ALL APPURTENANT ITEMS TO PROVIDE A FUNCTIONAL LIFT STATION. ADVANCE DRAINAGE SYSTEMS HAS ASSEMBLED A LIFT STATION COMPLETE PACKAGE FOR THIS PROJECT. CONTRACT SHOULD PROVIDE COSTUMER SERVICE REPRESENTATIVE QUOTE NUMBER: Q-935083 IF UTILIZING THIS OPTION.
16	OTHER: ELECTRIC TRANSMISSION TO PUMP THIS ITEM IS TO FURNISH ELECTRIC POWER AND METER FOR THE PUMP INSTALLATION. HEARTLAND POWER COOPERATIVE WILL INSTALL A TRANSFORMER ON THE POWER POLE NEAREST THE PUMP LOCATION. ITEM INCLUDES METER, METER SOCKET W/DISCONNECT, CONDUIT AND ELECTRIC LINC TO TRANSFORMER, TRENCHING A POWER LINC FROM METER METER DISCONNECT TO THE PUMP CONTROL PANEL. POWER TO CONTROL PANEL WILL BE 240 VOLT, SINGLE PHASE. CONNECTION INCLUDES METER, 40 AMP BEAKER AND DISCONNECT, TRENCHED POWER LINE, AND CONNECTION TO PUMP CONTROL PANL
17	OTHER: POLLUTION CONTROL (SILT FENCE OR SILT FENCE DITCH CHECKS) SILT FENCE OR SILT FENCE DITCH CHECKS TO BE INSTALLED DURING CONSTRUCTION. ITEM INCLUDES ANCHORING POSTS, MAINTENANCE AND CLEANING, REMOVAL AND RESTORATION OF THE AREA TO FINISHED GRADE, AND DISPOSAL.

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IDALS WATER RESOURCES BUREAU
DUESENBURG WOR982203CS
ESTIMATE QUANTITIES & REFERENCE INFORMATION

SHEET
C.01

CONSTRUCTION NOTES - FOR OPEN DITCH SEEDING AND FERTILIZING

PLAN NOTES SUPERSEDE CONFLICTING PROVISIONS IN THE TECHNICAL SPECIFICATIONS.

1. MEASUREMENT AND PAYMENT.

- A. MEASUREMENT:** MEASURE AT 100 FOOT STATIONS ALONG CENTERLINE OF DITCH.
- B. PAYMENT:** UNIT PRICE PER 100 FOOT STATIONS SHALL BE FULL COMPENSATION FOR SEEDING AND FERTILIZING DISTURBED BANKS AT THE RATES SPECIFIED IN THE CONTRACT DOCUMENTS.
- C. INCLUDES:** SUPPLYING SEED SACKS AND TAGS AND FERTILIZER TAGS OR OTHER EVIDENCE OF COMPLIANCE WITH THE SPECS TO THE ENGINEER. ALL REQUIRED SEED TREATMENTS, ANY NECESSARY SEED BED PREPARATION, LABOR, EQUIPMENT, TOOLS, AND MISCELLANEOUS ASSOCIATED WORK NECESSARY TO COMPLETE ITEM ON ONE SIDE OR BOTH SIDES RESPECTIVELY AS SPECIFIED.

2. SEED MIXTURE.

BROME GRASS	50 LB/AC (1.15 LB/1000 SF) PLS
WINTER RYE	84 LB/AC (1.95 LB/1000 SF) PLS
OATS	80 LB/AC PLS (1.85 LB/1000 SF) PLS

SEED SHALL BE TREATED WITH STICKING AGENT, INOCULANT, AND FUNGICIDE WHEN APPROPRIATE.

3. FERTILIZER. USE FERTILIZER OF THE GRADE, TYPE, AND FORM SPECIFIED THAT COMPLIES WITH RULES OF THE IOWA DEPARTMENT OF AGRICULTURE AN LAND STEWARDSHIP AND THE FOLLOWING REQUIREMENTS:

- A. GRADE:** IDENTIFY THE GRADE OF FERTILIZER ACCORDING TO THE PERCENT NITROGEN (N), PERCENT OF AVAILABLE PHOSPHORIC ACID (P₂O₅), AND PERCENT WATER SOLUBLE POTASSIUM (K₂O), IN THAT ORDER, AND BASE APPROVAL ON THAT IDENTIFICATION.

THE CONTRACTOR MAY SUBSTITUTE OTHER FERTILIZER CONTAINING ANALYSIS PERCENTAGES DIFFERENT FROM THOSE SPECIFIED, PROVIDED THAT THE MINIMUM AMOUNTS OF ACTUAL NITROGEN, PHOSPHATE, AND POTASH PER ACRE ARE SUPPLIED, AND THAT IN NO CASE DOES THE TOTAL AMOUNT PER ACRE OF THE THREE FERTILIZER ELEMENTS BE EXCEEDED BY 30% OF THE FOLLIWING MINIMUM AMOUNTS.

- B. TYPE:** USE FERTILIZER THAT CAN BE UNIFORMLY DISTRIBUTED BY THE APPLICATION EQUIPMENT. FURNISH FERTILIZER EITHER AS SEPARATE INGREDIENTS OR IN CHEMICALLY-COMBINED FORM.

PRE-SEEDING FERTILIZER: 6-20-20 - 500 LB/AC (11 LB/1000 SF)

POST EMERGENCE FERTILIZER: 48-0-0 (UREA) - 65 LB/AC (1.5 LB/1000 SF)

4. DAILY SEEDING. BETWEEN APRIL 1 AND OCTOBER 15, DISTURBED OPEN DITCH BANK SLOPES ABOVE THE NORMAL WATER SURFACE ARE TO BE FERTILIZED AND SEEDED WITH A PORTABLE CYCLONE SEEDER OR BY OTHER APPROVED MEANS AT LEAST ONCE (MINIMUM) AT THE END OF EACH DAY OF WORK.

FERTILIZER AND SEED SHALL BE PLACED AND SOWN AS SOON AS PRACTICAL ON THE FRESH CUT SLOPE WHILE THE CUT IS STILL WET AND ALL PLACED MATERIAL WILL ADHERE. NO SPECIAL PREPARATION OF AREAS TO BE SEEDED WILL BE REQUIRED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

DITCH BANK SLOPES FINISHED AFTER OCTOBER 15 ARE TO BE FERTILIZED AND SEEDED BETWEEN APRIL 1 AND APRIL 20. AFTER SEED HAS GERMINATED, CONTRACTOR SHALL APPLY POST EMERGENCE FERTILIZER AT THE SPECIFIED RATE.

5. NON-DAILY SEEDING. THE CONTRACTOR MAY OPT TO FOREGO DAILY SEED APPLICATIONS AND INSTEAD SEED LONG REACHES OF THE DITCH AT A TIME. UNDER THIS OPTION, CONTRACTOR MUST WET AND DISTURB TO A DEPTH OF 2 INCHES THE DENUDED DITCH BANK WITH A BOBCAT SCARIFIER (OR OTHER APPROVED MEANS OF BANK DISTURBANCE) PRIOR TO APPLYING FERTILIZER AND SEED.

ENGINEER AT ENGINEER'S SOLE DISCRETION MAY REQUIRE UP TO TWO ADDITIONAL PASSES IF DITCH BANKS ARE NOT SUFFICIENTLY DISTURBED.

AFTER SEED HAS GERMINATED, CONTRACTOR SHALL APPLY POST EMERGENCE FERTILIZER AT THE SPECIFIED RATE. MOUNT DISTURBANCE IMPLEMENT ON APPROPRIATE EQUIPMENT OR SKID TO PROTECT DITCH BANK FROM DAMAGE.

6. ACCEPTABLE DISTURBANCE METHODS/EQUIPMENT.

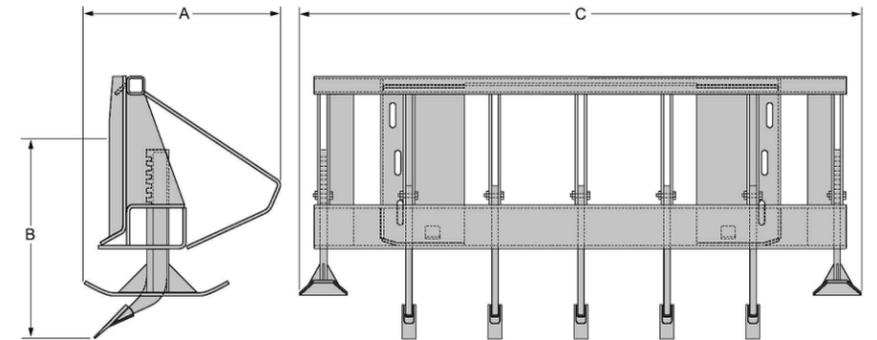
6.1. DAILY SEEDING: FINAL PASS OF EXCAVATOR SHALL BE WITH A TOOTHED BUCKET TO SUFFICIENTLY DISTURB THE DITCH BANK TO MORE EFFECTIVELY HOLD SEED.

6.2. NON-DAILY SEEDING: IF CONTRACTOR CHOOSES TO SEED LONG REACHES, A BOBCAT SCARIFIER SHALL BE USED TO DISTURB THE BANK TO A DEPTH OF 2 INCHES.

7. NATIVE GRASS OPEN DITCH SEEDING: PERFORM SEEDING BETWEEN APRIL 15 TO JULY 1 OR NOVEMBER 15 TO FREEZE UPON DISTURBED OPEN DITCH BANK SLOPES ABOVE THE NORMAL WATER SURFACE.

SEED MIX SHALL COMPLY WITH TABLE 1 ON THIS SHEET. NO FERTILIZER IS REQUIRED FOR NATIVE GRASSES.

SLOPES WHICH ARE NOT TRAVERSABLE ARE TO BE HYDRAULICALLY SEEDED AND MULCHED. CONTRACTOR MUST DISTURB DITCH BANK AS SPECIFIED ON THIS SHEET PRIOR TO APPLYING SEED. ENGINEER MAY REQUIRE ADDITIONAL PASSES IF DITCH BANKS ARE NOT SUFFICIENTLY DISTURBED. HYDRAULIC SEEDING SHALL CONFORM TO SUDAS SECTION 9010-108-B-3.



Main features

- Scarifier includes two depth guides and five teeth.
- Adjustable depth skids for presetting digging depth.
- Prepares hard-pack ground for digging or landscaping.
- Standard five-tooth unit with additional teeth available.
- Bob-Tech™ mounted for easy attachment changes.
- Rips light asphalt for removal.



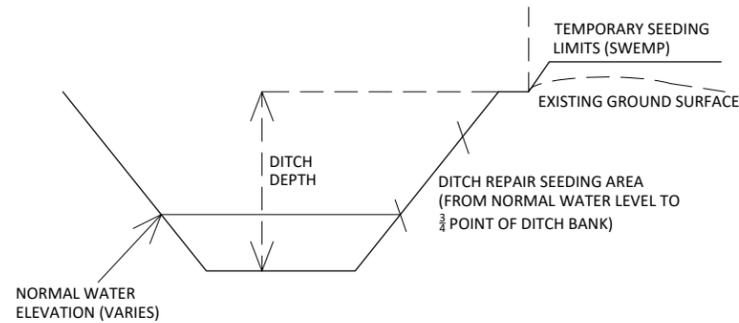
Item number
6563526

Weights and dimensions

	Operating weight	Shipping weight	Overall Width (C)	Overall Height (B)	Overall length (A)
Scarifier	350 lbs	350 lbs	60 in.	26 in.	24 in.

Characteristics and performance

	Number of Teeth	Maximum Dig Depth (approximate)
Scarifier	5	6 in.



DITCH DEPTH (FT)	1/2 BANK	3/4 BANK	FULL BANK
6	270	541	811
8	451	811	1172
10	631	1082	1532
12	811	1352	1893
14	992	1622	2253
16	1172	1893	2614
18	1352	2163	2975

DITCH DEPTH (FT)	1/2 BANK	3/4 BANK	FULL BANK
6	335	671	1006
8	559	1006	1453
10	783	1342	1901
12	1006	1677	2348
14	1230	2012	2795
16	1453	2348	3242
18	1677	2683	3690

SPECIES	LBS/ACRE
SWITCHGRASS	2.0
BIG BLUESTEM	4.0
INDIAN GRASS	4.0
LITTLE BLUESTEM	3.0
CANADA WILDRYE	4.0

ALL AREAS STEEPER THAN 4:1 SHALL REQUIRE MULCH AND A 1.0 BU/AC OAT COVER CROP.

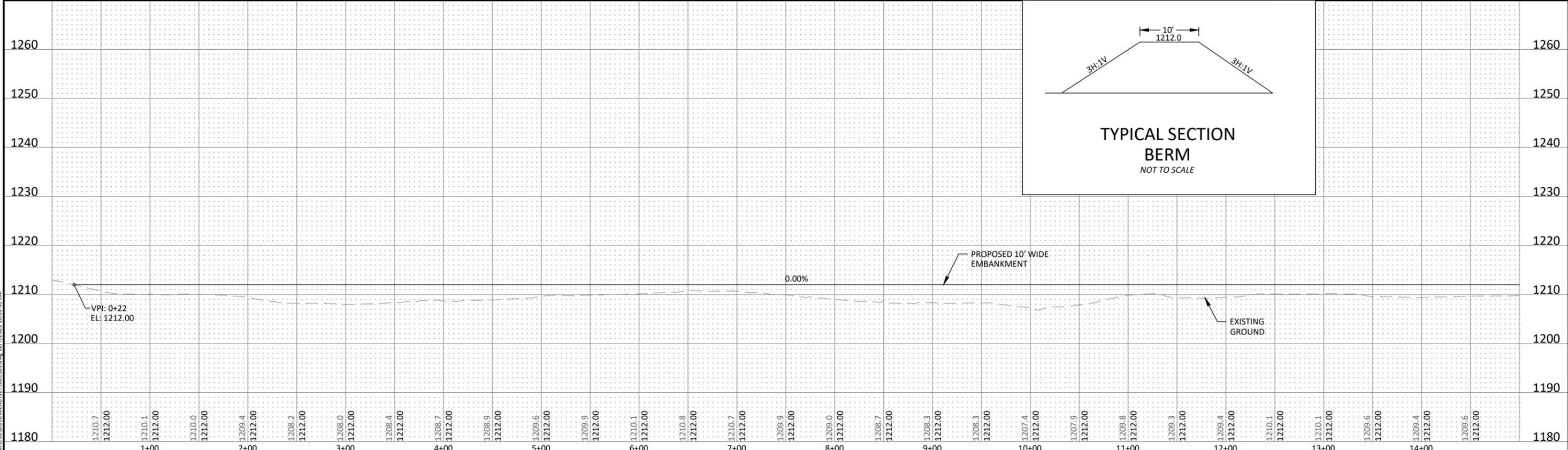
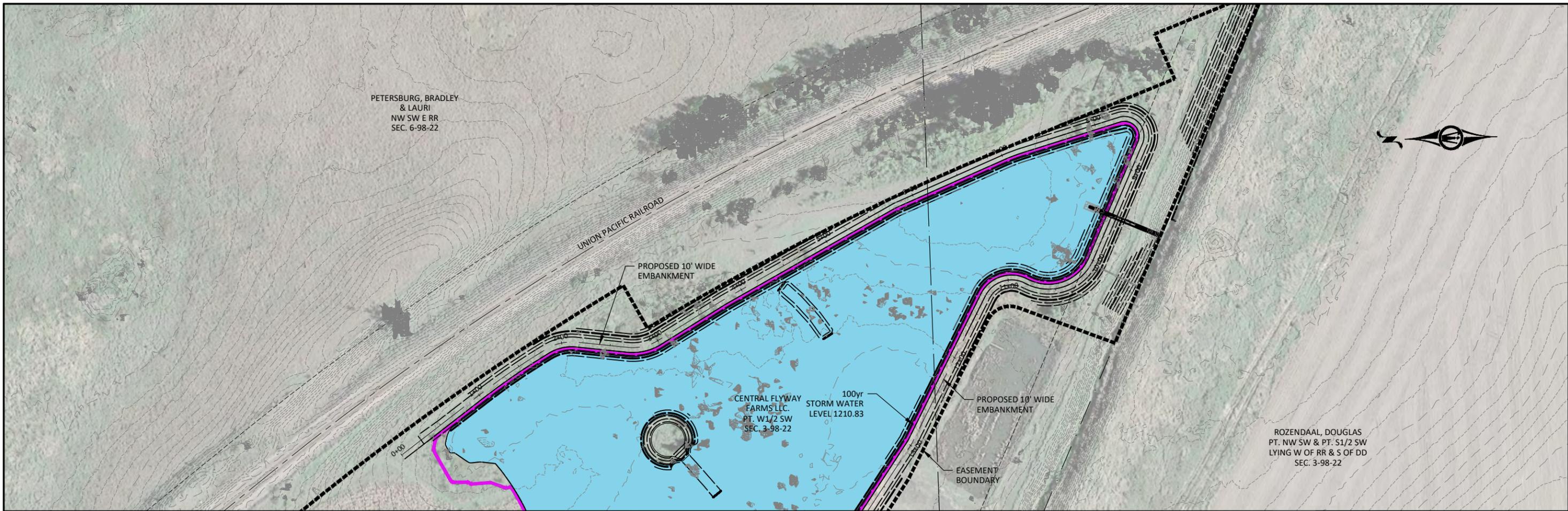
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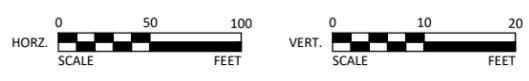
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IDALS WATER RESOURCES BUREAU
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OPEN DITCH SEEDING CONSTRUCTION NOTES



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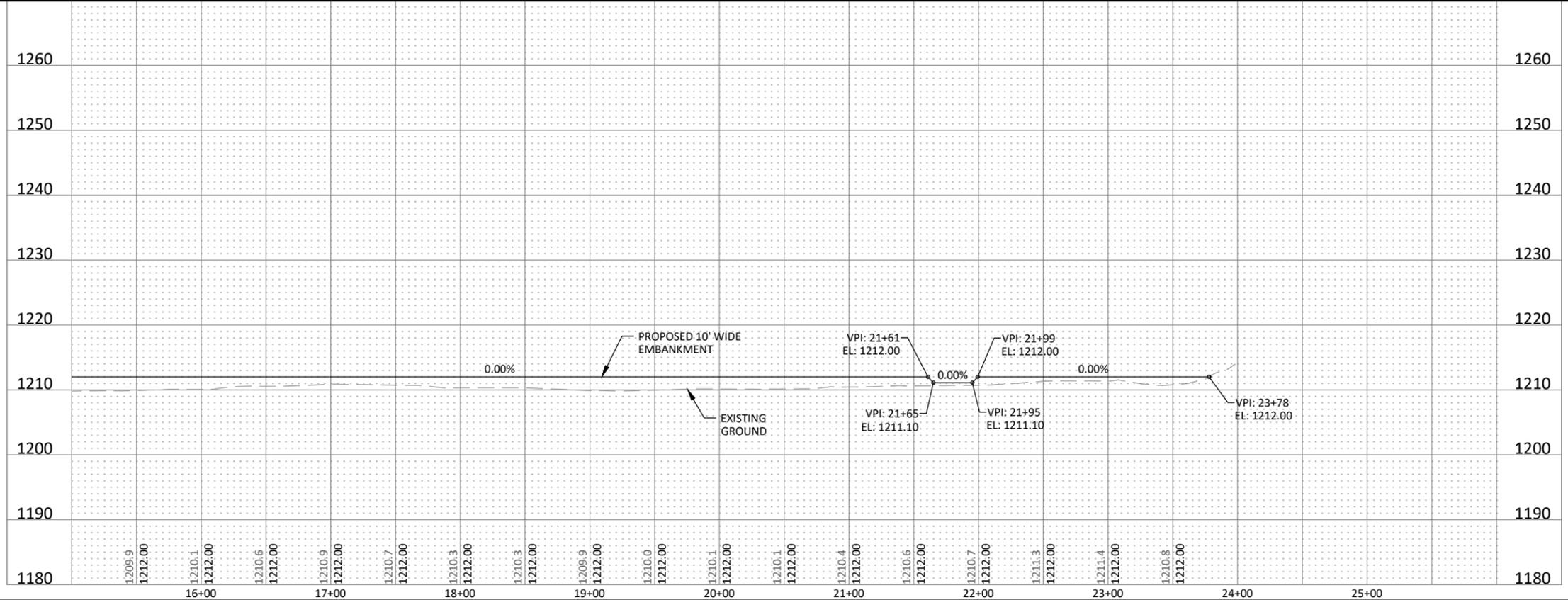
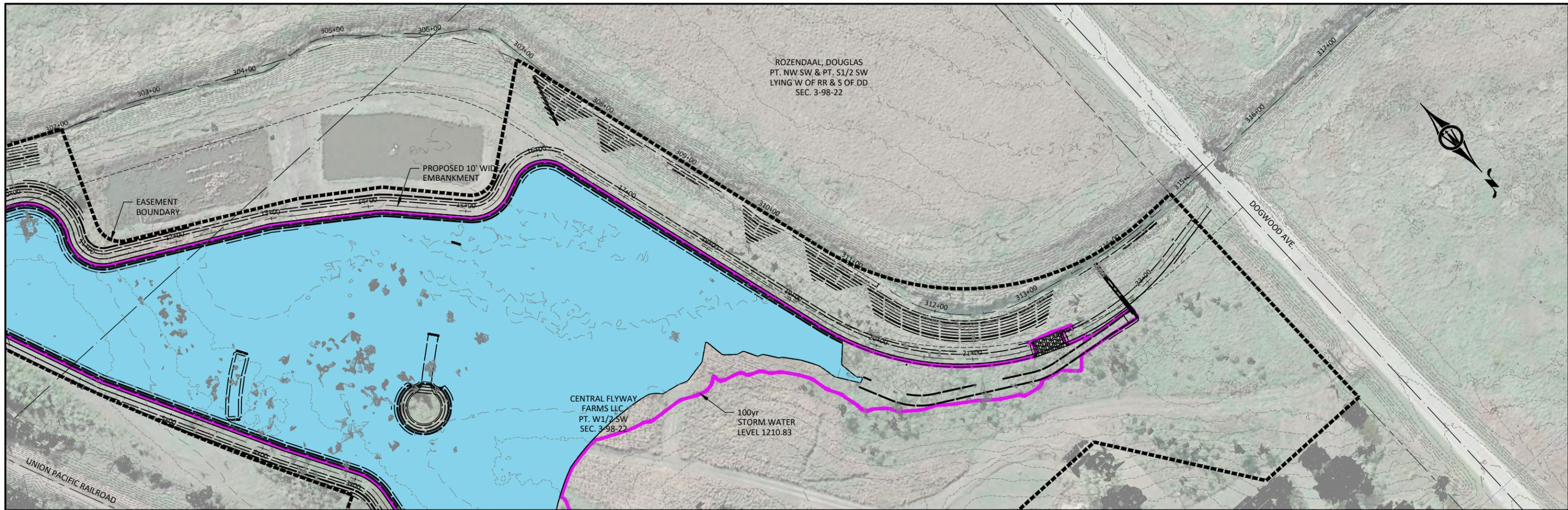


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 PLAN & PROFILE - 10' WIDE EMBANKMENT

SHEET
D.01



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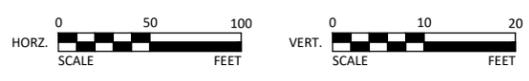
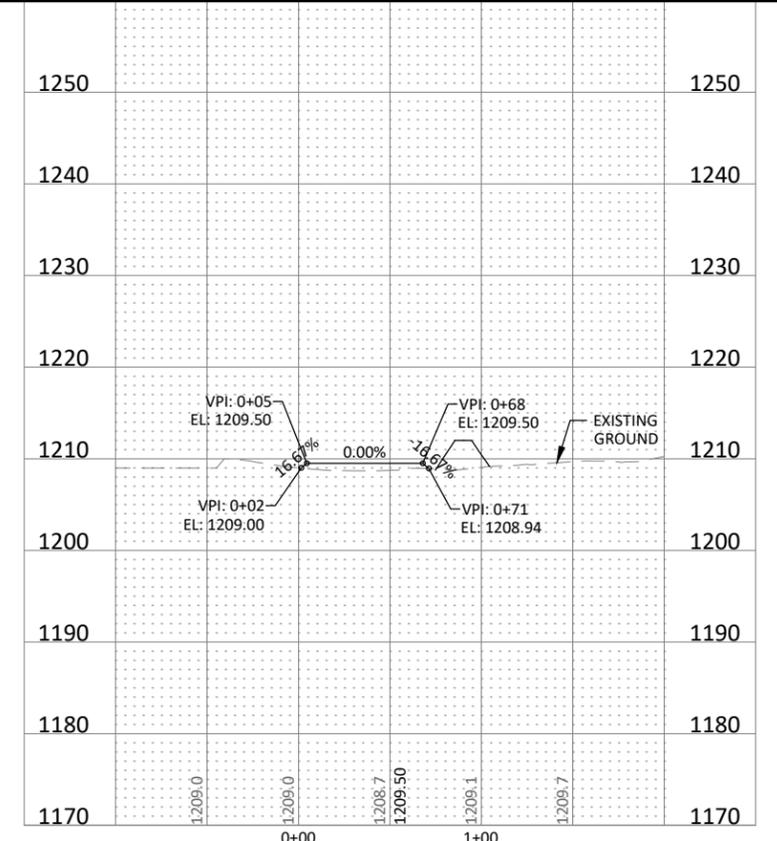
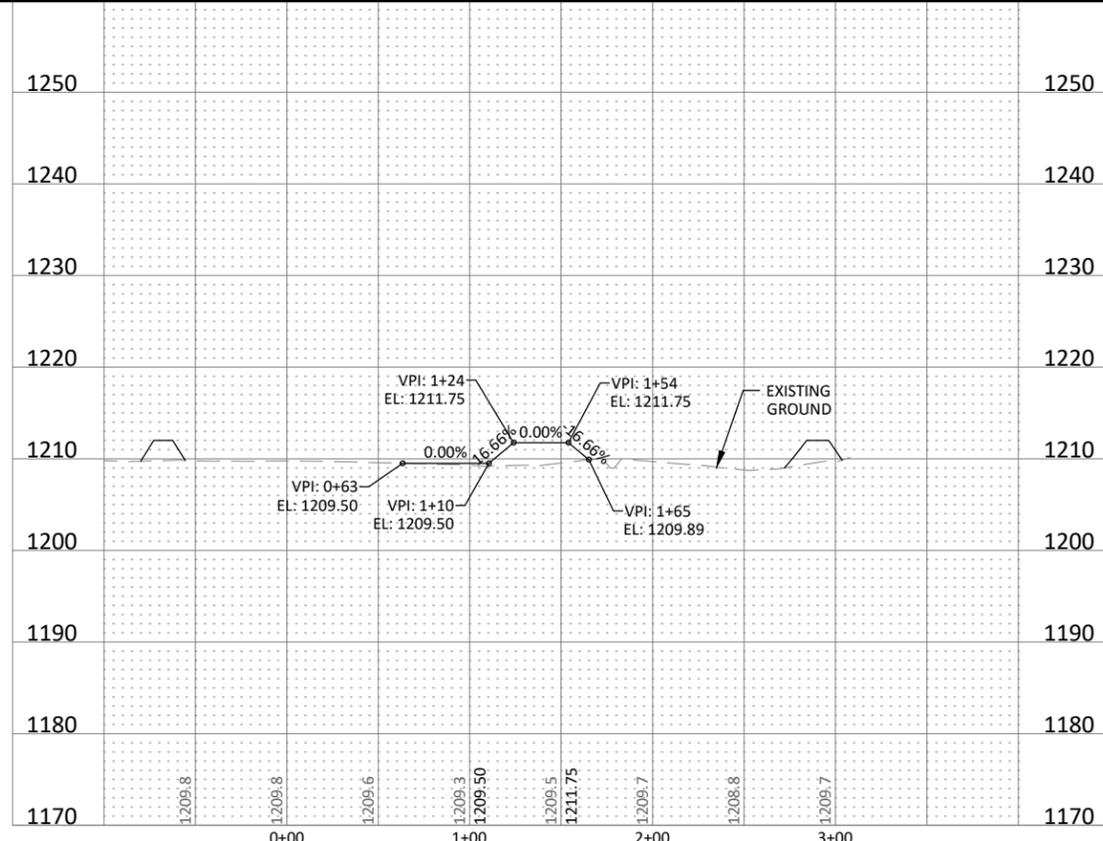
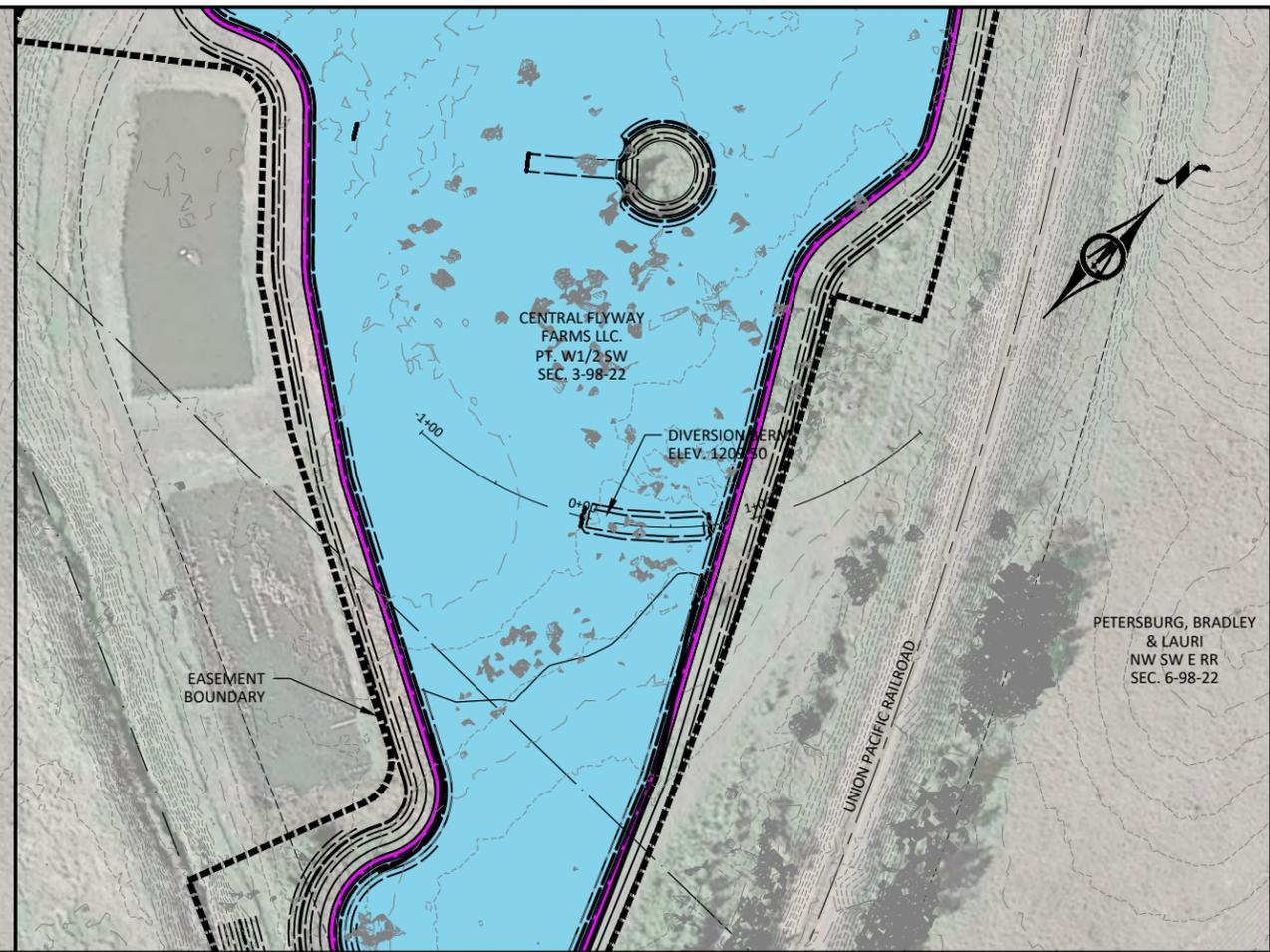
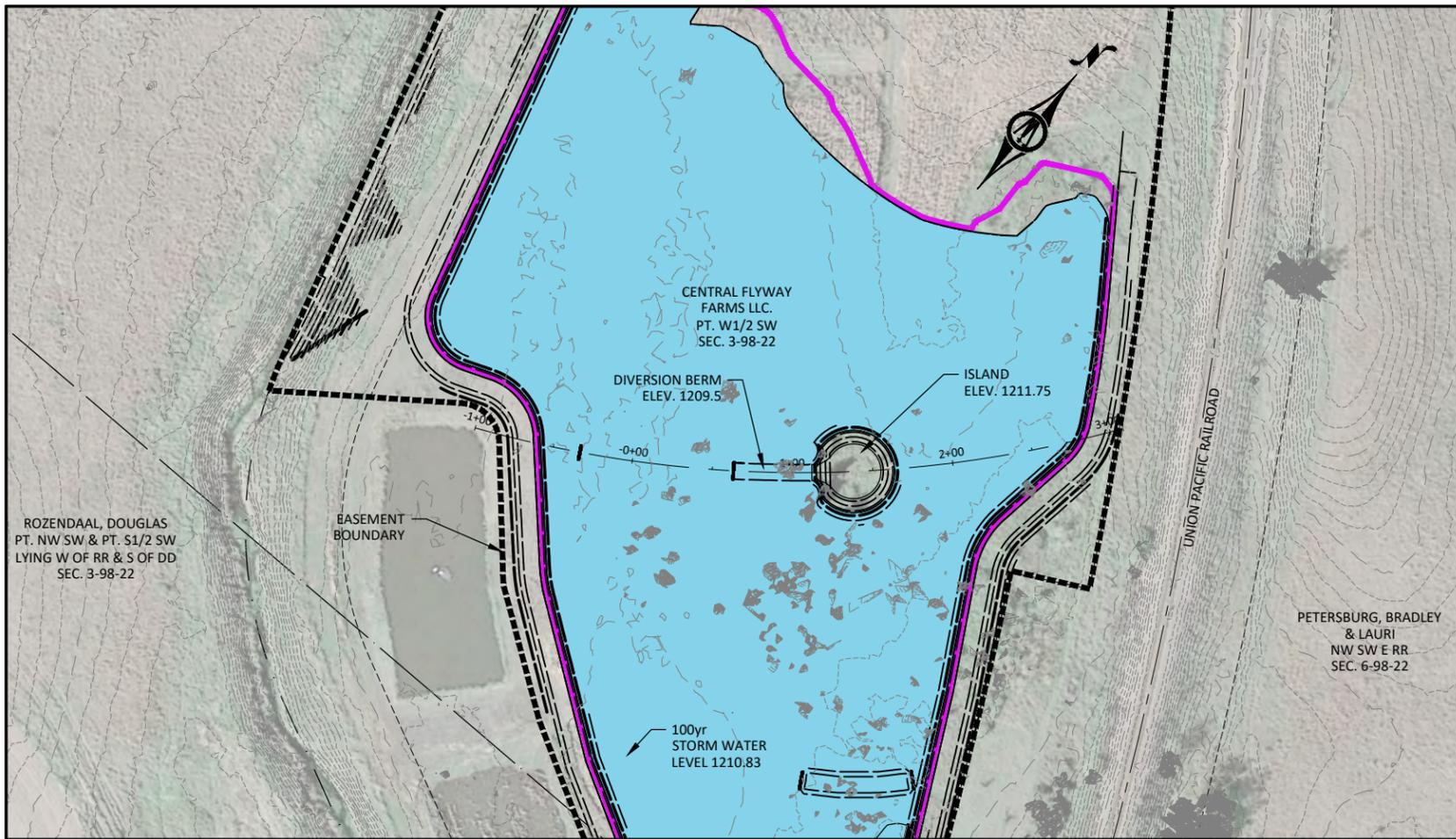


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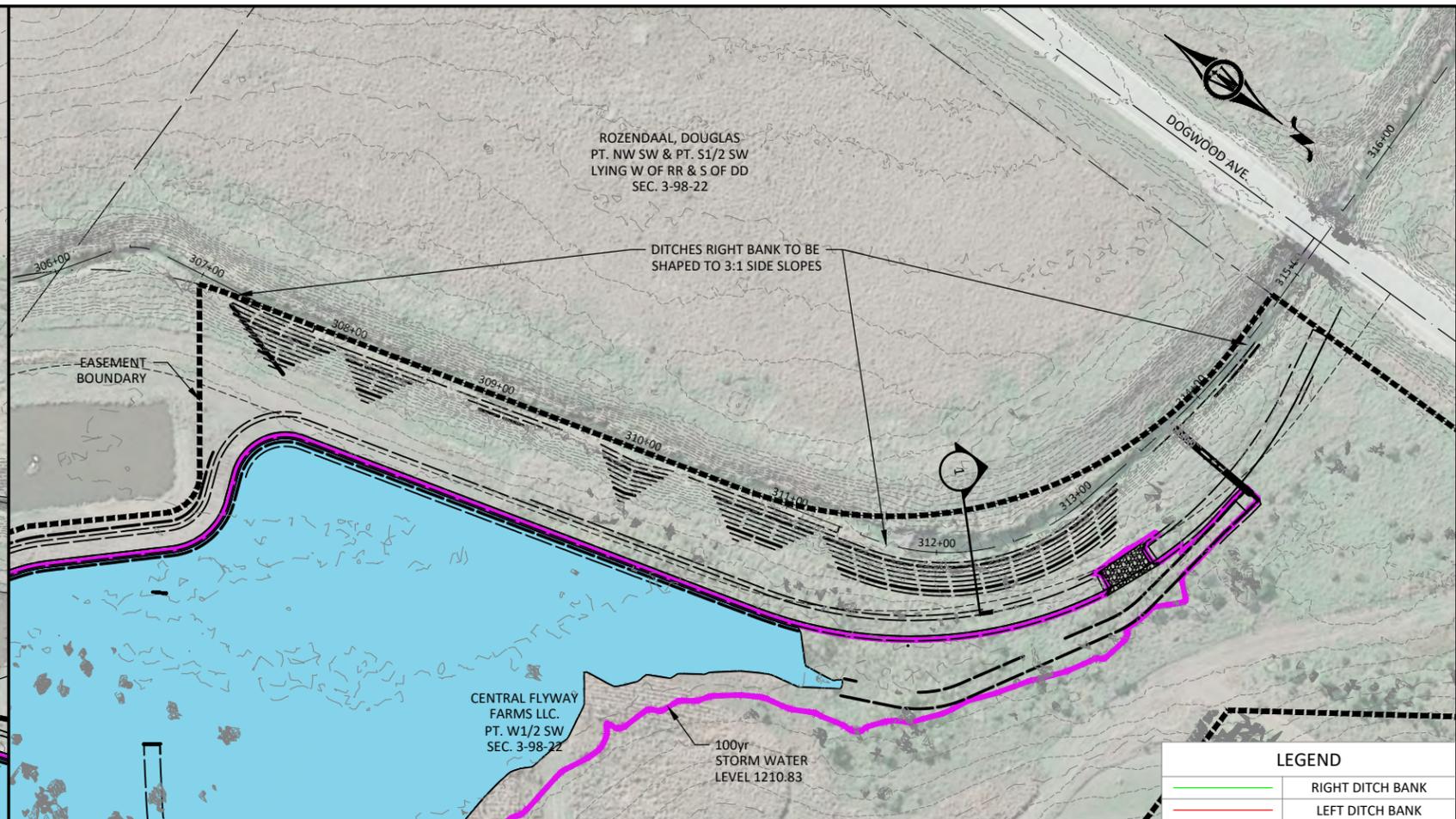
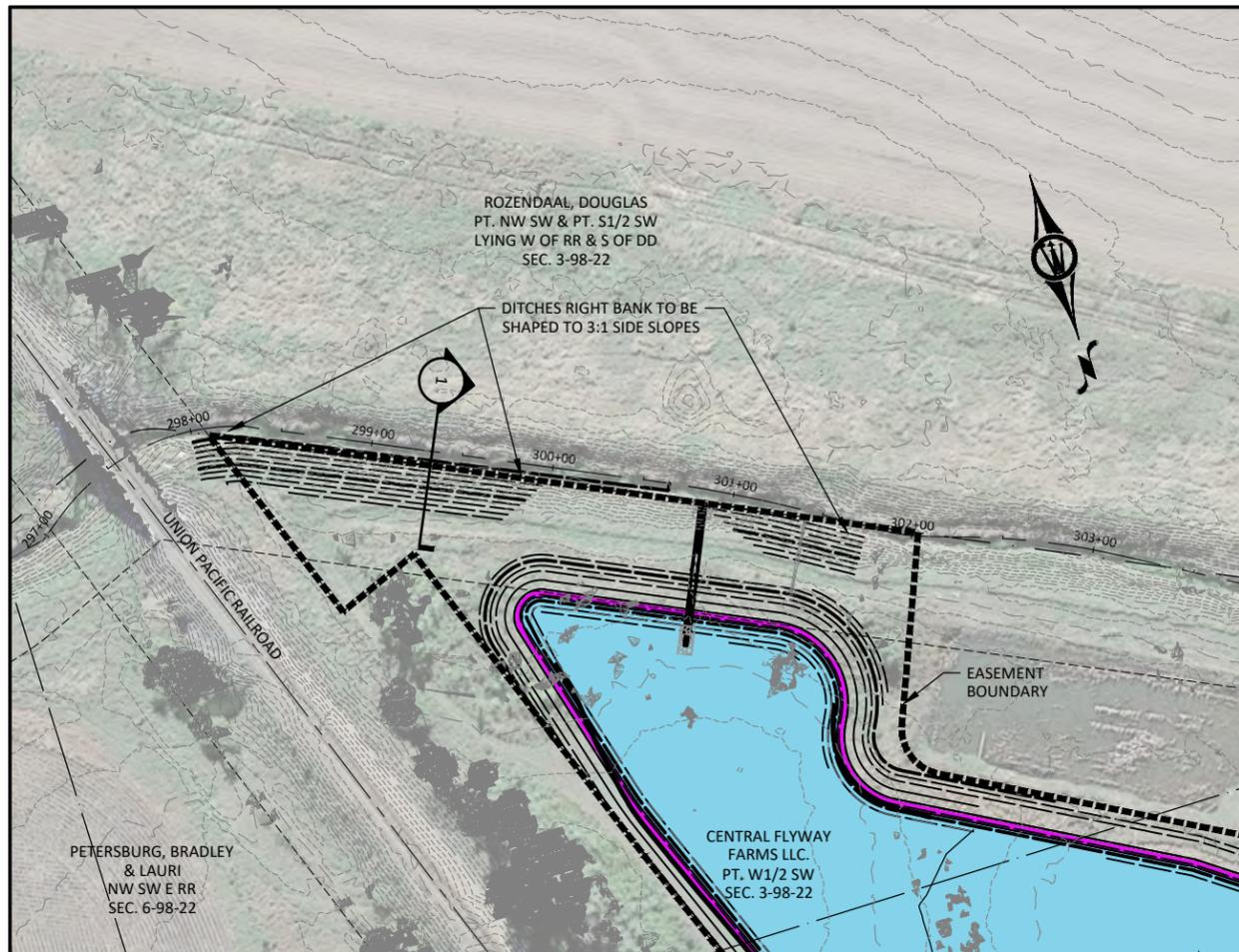
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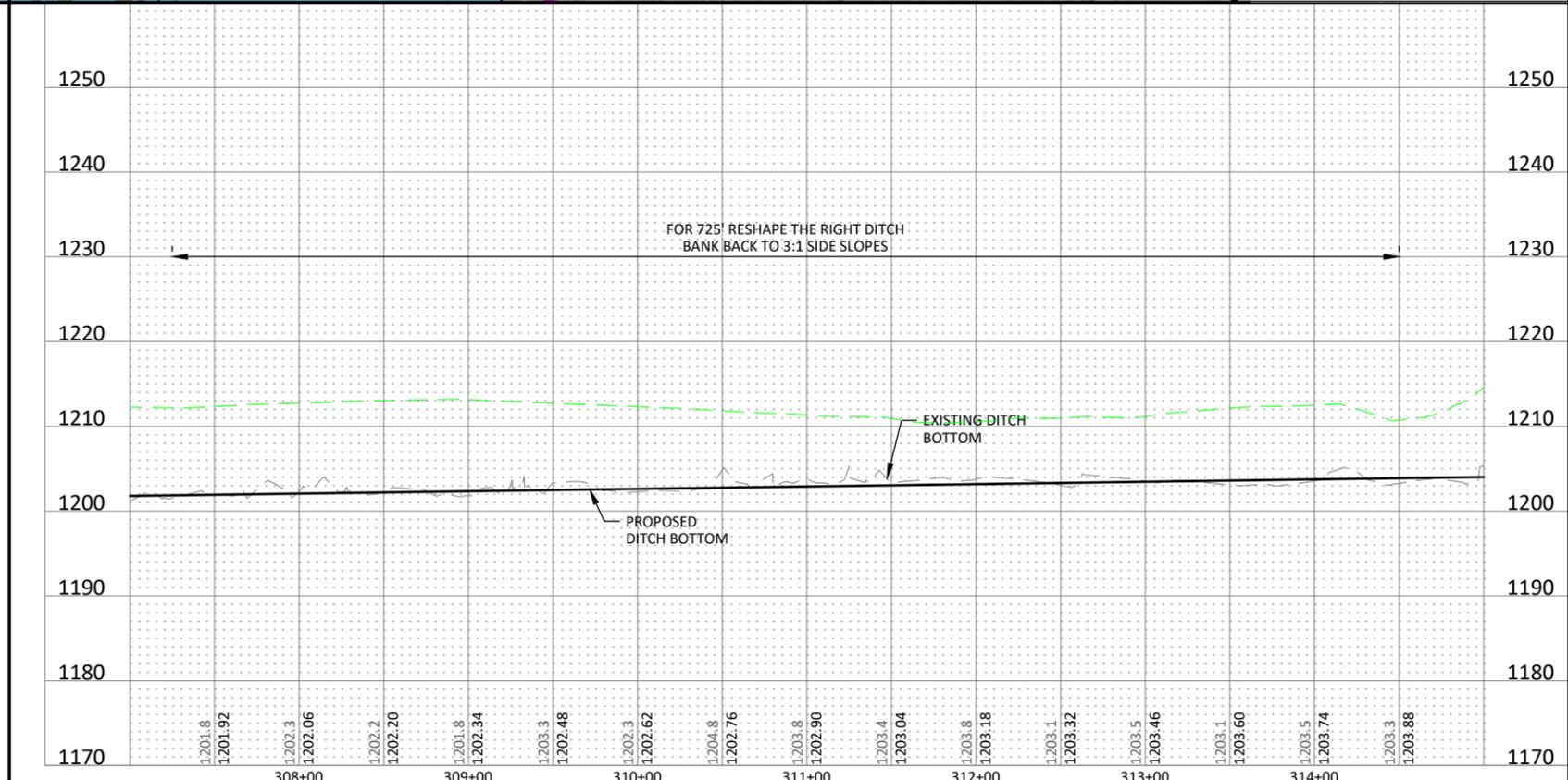
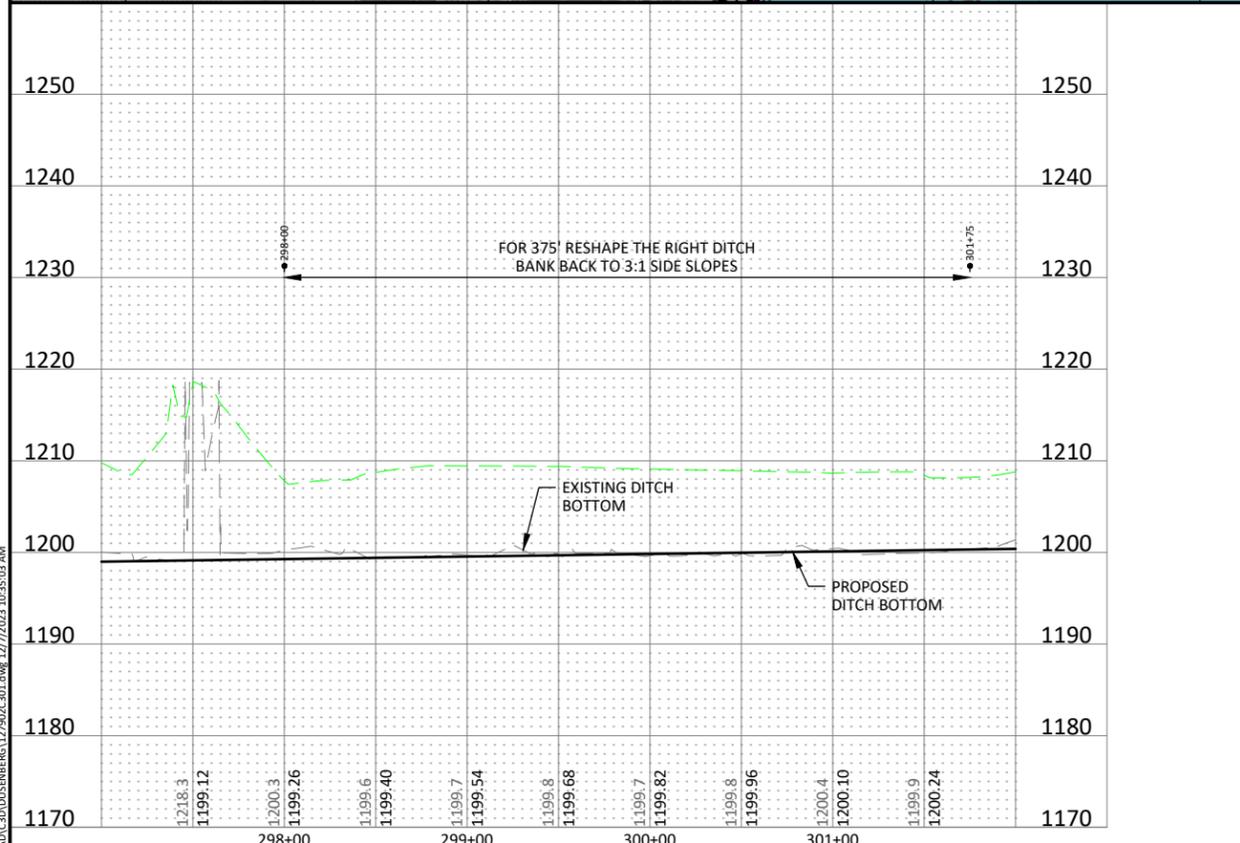
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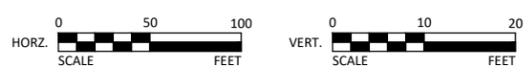
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LEGEND	
	RIGHT DITCH BANK
	LEFT DITCH BANK



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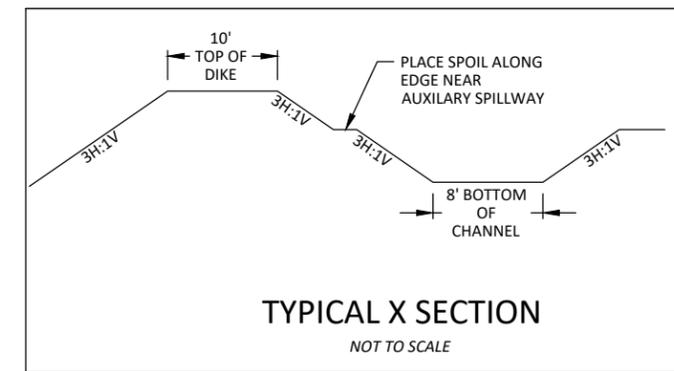
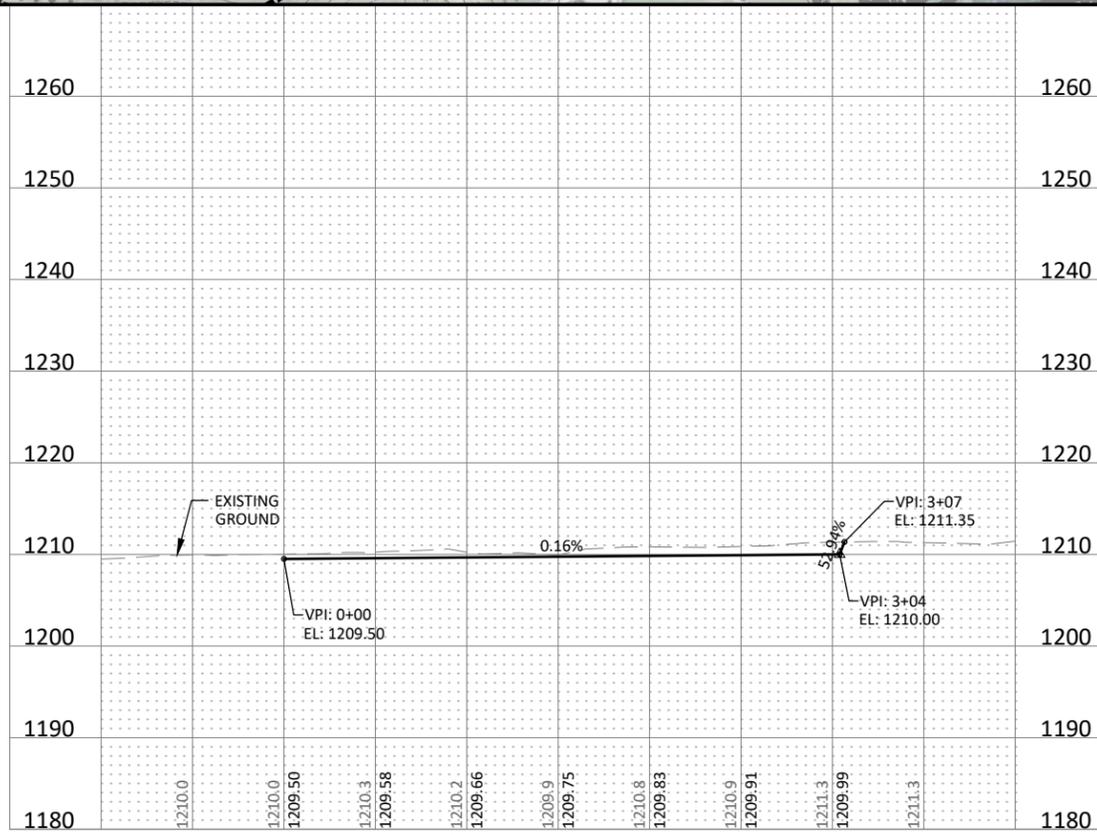
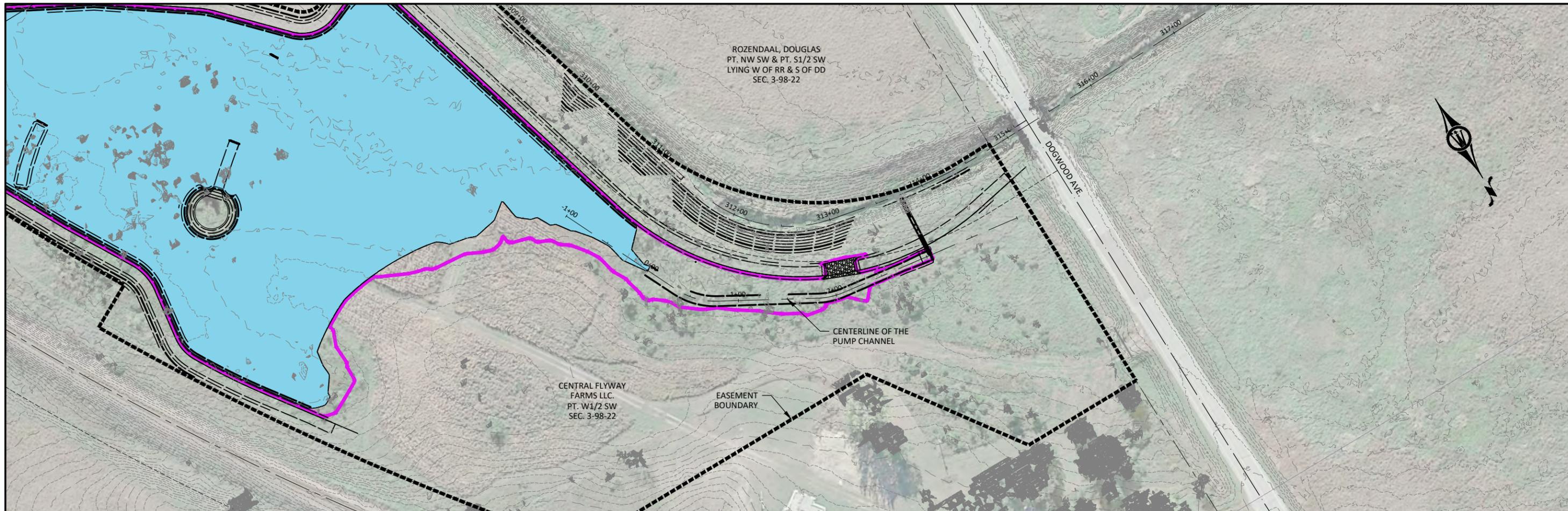


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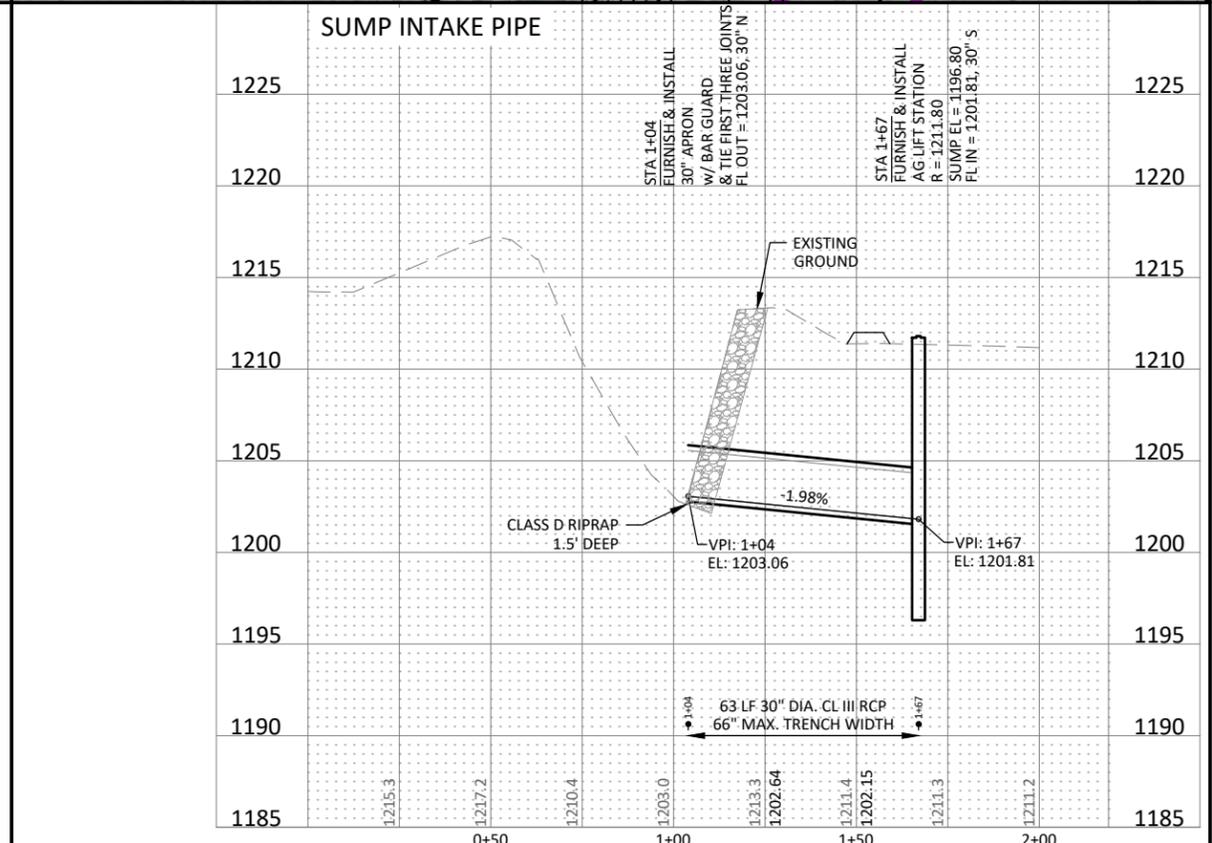
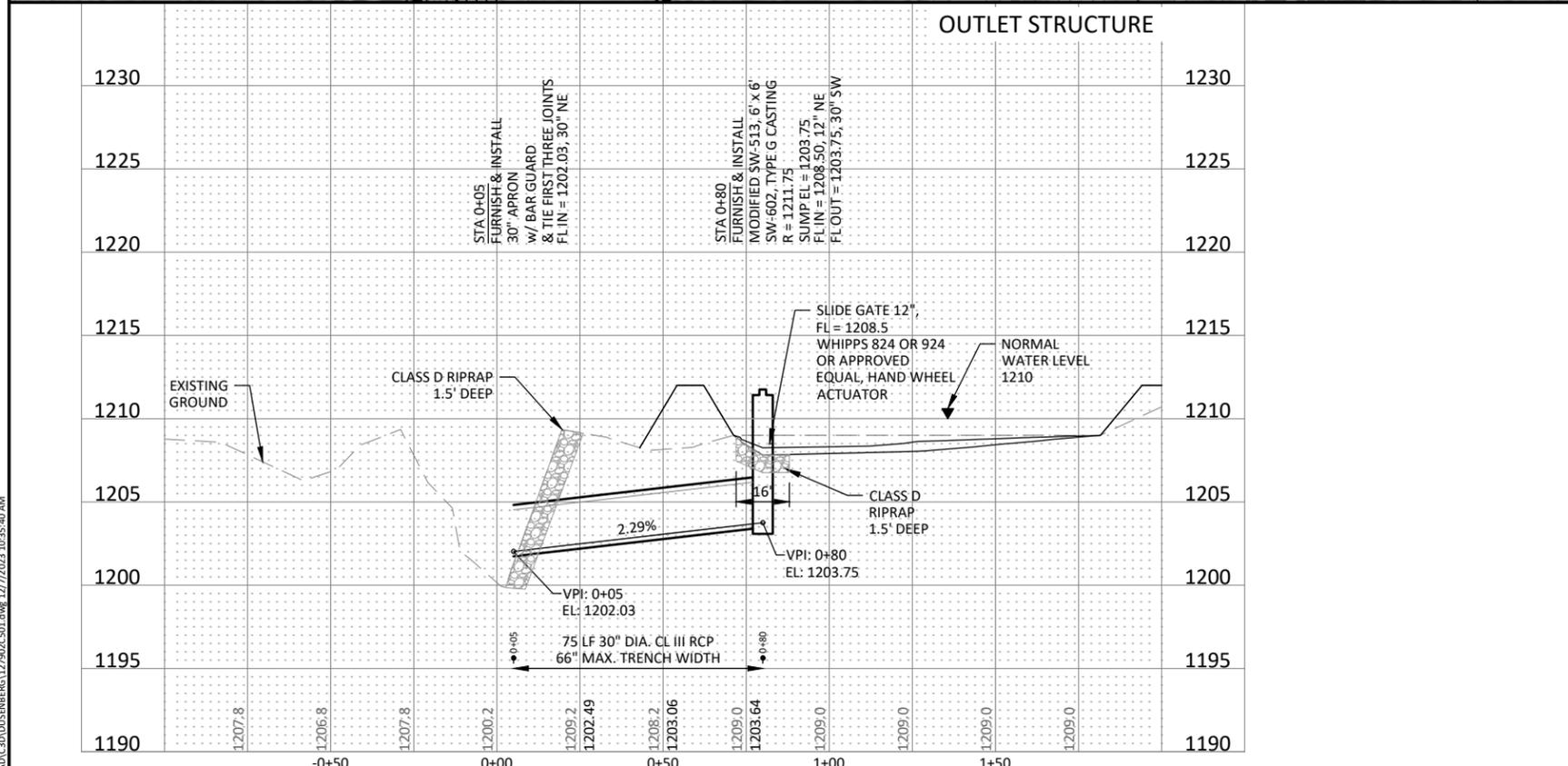
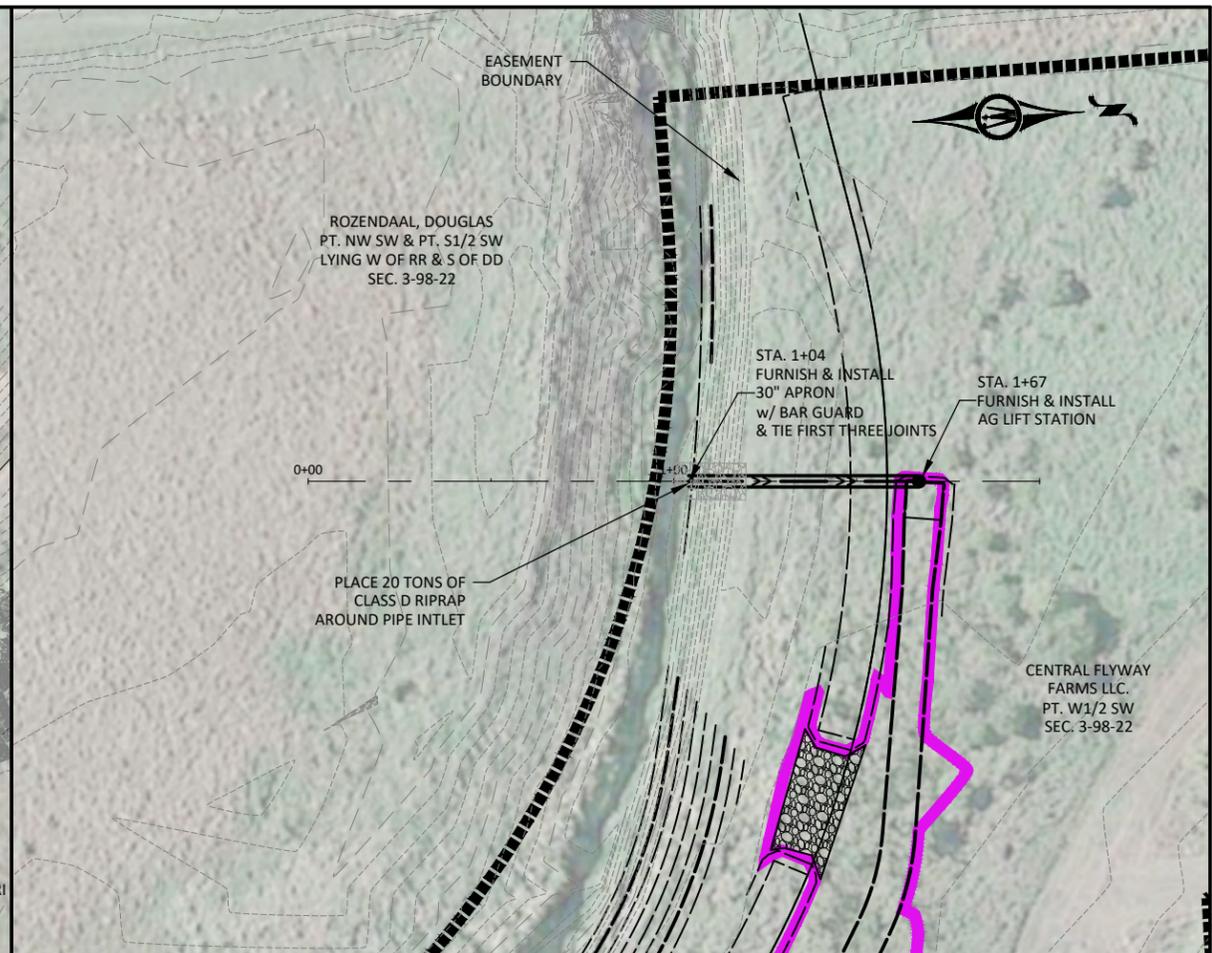
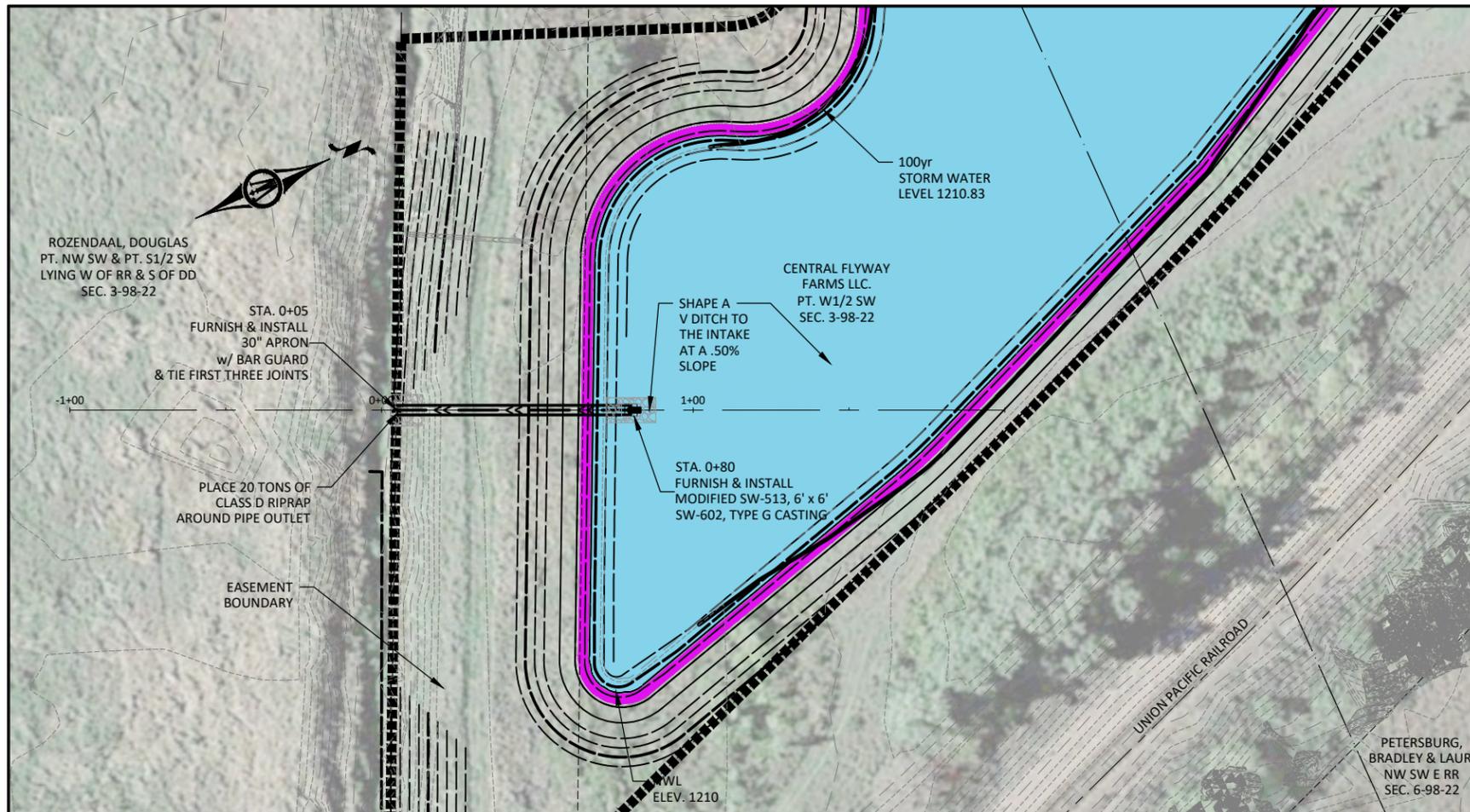


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