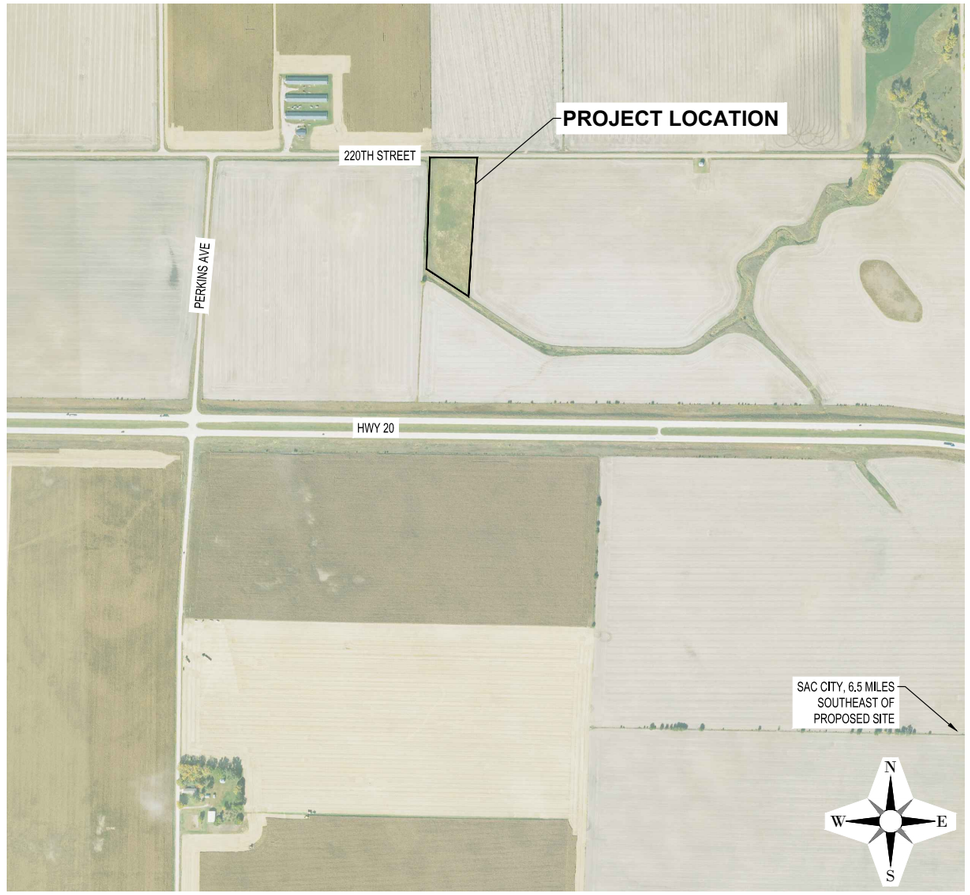
IDALS SAC883604B
NUTRIENT REDUCTION WETLAND
CONSTRUCTION PLANS

SAC COUNTY, IOWA

ISG PROJECT # 24-31714



LOCATION MAP

SEAL

LICENSED PROFESSIONAL ENGINEER
SPENCER D. PECH
P28161
IOWA

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

Spencer D Pech — 12-30-2025

(signature) (date)

Printed or typed name SPENCER D. PECH

License number P28161

My license renewal date is December 31, 2026

Pages or sheets covered by this seal:
ALL SHEETS

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, JUDGEMENT, AND BELIEF, THESE PLANS MEET THE APPLICABLE NRCS STANDARDS AND APPLICABLE LAWS AND REGULATIONS.

IA NRCS JOB CLASS IV

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, JUDGEMENT, BELIEF, THE PLANS MEET APPLICABLE NRCS STANDARDS.

Spencer D Pech — 12-30-2025

ENGINEER'S SIGNATURE DATE

CONTRACTOR IS RESPONSIBLE FOR CALLING IOWA ONE CALL

ONE CALL TICKET NO.

I HAVE REVIEWED AND AGREE WITH THE CONTENTS OF THE PLAN AND SPECIFICATIONS AS PREPARED.

LANDOWNER SIGNATURE DATE

IF A CULTURAL RESOURCE IS IDENTIFIED DURING CONSTRUCTION, WORK WILL STOP IMMEDIATELY AND THE LOCAL NRCS FIELD OFFICE WILL BE NOTIFIED.

I CERTIFY THAT THIS PRACTICE HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

CONTRACTORS SIGNATURE DATE

ENGINEER'S REP. SIGNATURE DATE

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GIS DISCLAIMER:

INFORMATION FOR THE BOUNDARY / LOT LINES, AND UNDERGROUND UTILITIES SHOWN WAS DERIVED FROM DIGITAL DATABASES AND IS FOR INFORMATIONAL PURPOSES ONLY. DATA MAY NOT HAVE BEEN PREPARED FOR, OR BE SUITABLE FOR: LEGAL, ENGINEERING, OR SURVEYING PURPOSES.

PROJECT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, THE OWNER - CONTRACTOR AGREEMENT, THE PROJECT MANUAL (WHICH INCLUDES GENERAL SUPPLEMENTARY CONDITIONS AND SPECIFICATIONS), DRAWINGS OF ALL DISCIPLINES AND ALL ADDENDA, MODIFICATIONS, AND CLARIFICATIONS ISSUED BY ARCHITECT/ENGINEER.
2. CONTRACT DOCUMENTS SHALL BE ISSUED TO ALL SUBCONTRACTORS BY THE GENERAL CONTRACTOR IN COMPLETE SETS IN ORDER TO ACHIEVE THE FULL EXTENT AND COMPLETE COORDINATION OF ALL WORK.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
4. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
5. DETAILS SHOWN ARE INTENDED TO BE INDICATIVE OF THE PROFILES AND TYPE OF DETAILING REQUIRED THROUGHOUT THE WORK. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO DETAILS SHOWN. WHERE SPECIFIC DIMENSIONS, DETAILS, OR DESIGN INTENT CANNOT BE DETERMINED, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
6. ALL MANUFACTURED ARTICLES, MATERIALS, AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, CLEANED, AND CONDITIONED ACCORDING TO MANUFACTURERS' INSTRUCTIONS. IN CASE OF DISCREPANCIES BETWEEN MANUFACTURERS' INSTRUCTIONS AND THE CONTRACT DOCUMENTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
7. ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
8. THE LOCATION AND TYPE OF ALL EXISTING UTILITIES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY AND ARE ACCURATE AND COMPLETE TO THE BEST OF THE KNOWLEDGE OF I & S GROUP, INC. (ISG). NO WARRANTY OR GUARANTEE IS IMPLIED. THE CONTRACTOR SHALL VERIFY THE SIZES, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
9. THE CONTRACTOR IS TO CONTACT "IOWA ONE CALL" FOR UTILITY LOCATIONS A MINIMUM OF 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION / CONSTRUCTION (1-800-292-8989).

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811

SHEET NOT VALID UNLESS THIS TEXT IS COLOR.

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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-TITLE
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

PROJECT INDEX:

OWNER:

IDALS
WATER RESOURCES BUREAU
HOOVER STATE OFFICE BUILDING
1305 E. WALNUT STREET
DES MOINES, IA 50319

PROJECT ADDRESS / LOCATION:

S04 T88N R36W
JACKSON TWP
SAC CITY, IOWA

MANAGING OFFICE:
I & S GROUP, INC. (ISG)

STORM LAKE OFFICE
1725 LAKE AVE. NORTH
STORM LAKE, IA 50588
PHONE: 712.732.7745
ENGINEER OF RECORD: SPENCER PECH
EMAIL: SPENCER.PECH@ISGINC.COM
PROJECT MANAGER: OWEN OELTJENBRUNS
EMAIL: OWEN.OELTJENBRUNS@ISGINC.COM

SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH SAC COUNTY'S REQUIREMENTS AND WITH THE IOWA NRCS STANDARD SPECIFICATIONS. COMPLIANCE WITH THE 2024 EDITION OF THE STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS) SHALL BE MADE AS A SUPPLEMENT WHEN INDICATED OR UNLESS DIRECTED OTHERWISE.

PROJECT DATUM

HORIZONTAL COORDINATES HAVE BEEN REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), ON THE IOWA REGIONAL COORDINATE SYSTEM (ZONE 4), IN U.S. SURVEY FEET. ELEVATIONS HAVE BEEN REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RTK GPS METHODS WERE USED TO ESTABLISH HORIZONTAL AND VERTICAL COORDINATES FOR THIS PROJECT.

B.M. ELEVATION=1281.88
CUT SQUARE IN TOP OF WEST 48" RCP CULVERT IN THE NW CORNER OF THE PROJECT

TOPOGRAPHIC SURVEY

THIS PROJECT'S TOPOGRAPHIC SURVEY CONSISTS OF DATA COLLECTED IN OCTOBER 2024 BY ISG.

TITLE

TITLE

SHEET

C0-10

SYMBOL LEGEND

EXISTING		PROPOSED
EX STM MH	STORM MANHOLE	
EX CB	STORM CATCH BASIN	
EX CO	STORM CLEANOUT	
	STORM CULVERT	
	DOWNSPOUT	
	ROOF DRAIN	
EX SAN MH	SANITARY MANHOLE	
EX CO	SANITARY CLEANOUT	
EX LIFT STATION LS	LIFT STATION	
	WATER REDUCER	
	WATER VALVE	
	WATER VALVE MAHOLE	
	WATER CURB STOP	
	WATER SHUT-OFF	
EX POST INDICATOR VALVE	POST INDICATOR VALVE	
	FIRE DEPARTMENT CONNECTION	
W	WELL	
EX MW	MONITORING WELL	
	LAWN SPRINKLER BOX	
	LAWN SPRINKLER HEAD	
	HYDRANT	
EX YARD HYD	YARD HYDRANT	
	UTILITY POLE	
	LIGHT POLE	
	GROUND LIGHT	
	GUY WIRE	
	TRANSFORMER	
EX HH	HANDHOLE	
EX ELEC MH	ELECTRIC MANHOLE	
EM	ELECTRIC METER	
V	UTILITY VAULT	
AC	AIR CONDITIONER	
GM	GAS METER	
GGV	GAS VALVE	
SB-1	SOIL BORING	
	FLAG POLE	
MB	MAILBOX	
EX SIGNAL	TRAFFIC SIGNAL	
	SIGN	
	STREET SIGN	
	WHEEL STOP	
RR	RAILROAD CROSSING SIGN	
	POST	
	DECIDUOUS TREE	
	CONIFEROUS TREE	
	BUSH	
	TREE STUMP	
	WETLAND / MARSH	
	ROCK / BOULDER	

NOTE:
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

LINETYPE LEGEND

EXISTING		PROPOSED
>>	STORM DRAIN	>>
>	SANITARY SEWER	>
II>	SANITARY SEWER FORCEMAIN	II>
I	WATER MAIN	I
G	GAS	G
OE	OVERHEAD ELECTRIC	OE
UE	UNDERGROUND ELECTRIC	UE
UT	UNDERGROUND TELEPHONE	UT
UTV	UNDERGROUND TV	UTV
OHL	OVERHEAD UTILITY	OHL
UTL	UNDERGROUND UTILITY	UTL
FBO	FIBER OPTIC	FBO
WET	WETLAND	WET
W	WATER EDGE	
	DITCH / SWALE	
x x	FENCE LINE	x x
	TREE LINE	
	PROPERTY / LOT LINE	
	RIGHT OF WAY LINE	
△ △	ACCESS CONTROL	
	EASEMENT LINE	

NOTE:
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT	GC	GENERAL CONTRACTOR	PSI	POUNDS PER SQUARE INCH
ADD	ADDENDUM	GFE	GARAGE FLOOR ELEVATION	PVC	POLYVINYL CHLORIDE
AFF	ABOVE FINISHED FLOOR	GL	GUTTER LINE	PVMT	PAVEMENT
AGG	AGGREGATE	GPM	GALLONS PER MINUTE	QTY	QUANTITY
APPROX	APPROXIMATE	GV	GATE VALVE	R	RIM
ARCH	ARCHITECT, ARCHITECTURAL	HDPE	HIGH DENSITY POLYETHYLENE	RAD	RADIUS
BFE	BASEMENT FLOOR ELEVATION	HD	HEAVY DUTY	RCP	REINFORCED CONCRETE PIPE
BIT	BITUMINOUS	HH	HANDHOLE	RD	ROOF DRAIN
BLDG	BUILDING	HMA	HOT MIX ASPHALT	REBAR	REINFORCING BAR
BM	BENCHMARK	HORIZ	HORIZONTAL	REM	REMOVE
CAD	COMPUTER-AIDED DESIGN	HR	HOUR	ROW	RIGHT OF WAY
CB	CATCH BASIN	HWL	HIGH WATER LEVEL	R/W	RIGHT OF WAY
CFS	CUBIC FEET PER SECOND	HWY	HIGHWAY	SAN	SANITARY
CF	CUBIC FOOT	HYD	HYDRANT	SCH	SCHEDULE
CI	CAST IRON	I	INVERT	SF	SQUARE FOOT
CIP	CAST IRON PIPE	ID	INSIDE DIAMETER	SPEC	SPECIFICATION
CIPC	CAST IN PLACE CONCRETE	IN	INCH	SQ	SQUARE
CJ	CONTROL JOINT	INV	INVERT	STA	STATION
CL	CENTERLINE	IP	IRON PIPE	STM	STORM
CMP	CORRUGATED METAL PIPE	IPS	IRON PIPE SIZE	SY	SQUARE YARD
CO	CLEANOUT	J-BOX	JUNCTION BOX	T/C	TOP OF CURB
CONC	CONCRETE	JT	JOINT	TEL	TELEPHONE
CONST	CONSTRUCTION	LF	LINEAR FEET	TEMP	TEMPORARY
CONT	CONTINUOUS	LIN	LINEAR	THRU	THROUGH
CR	COUNTY ROAD	LPS	LOW PRESSURE STEAM	TNFH	TOP NUT OF FIRE HYDRANT
CY	CUBIC YARD	LS	LUMP SUM	TRANS	TRANSFORMER
C&G	CURB AND GUTTER	LSO	LOWEST STRUCTURAL OPENING	TV	TELEVISION
DEMO	DEMOLITION	MAX	MAXIMUM	T/W	TOP OF WALL
DI	DROP INTAKE	MB	MAIL BOX	TYP	TYPICAL
DIA	DIAMETER	MECH	MECHANICAL	UT	UTILITY, UNDERGROUND TELEPHONE
DIM	DIMENSION	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
DS	DOWNSPOUT	MIN	MINIMUM	W/O	WITHOUT
EA	EACH	MISC	MISCELLANEOUS	W/	WITH
ELEC	ELECTRICAL	NO	NUMBER	YD	YARD
ELEV	ELEVATION	NTS	NOT TO SCALE	YR	YEAR
EOF	EMERGENCY OVERFLOW	NWL	NORMAL WATER LEVEL		
EQ	EQUAL	OC	ON CENTER		
EX	EXISTING	OCEW	ON CENTER EACH WAY		
F/G	FORM GRADE	OH	OVERHEAD		
FDC	FIRE DEPARTMENT CONNECTION	OHWL	ORDINARY HIGH WATER LEVEL		
FDN	FOUNDATION	OHD	OVERHEAD DOOR		
FES	FLARED END SECTION	OZ	OUNCE		
FFE	FINISHED FLOOR ELEVATION	PCC	PORTLAND CEMENT CONCRETE		
FPM	FEET PER MINUTE	PED	PEDESTAL, PEDESTRIAN		
FPS	FEET PER SECOND	PERF	PERFORATED		
FT	FOOT, FEET	PL	PROPERTY LINE		
FTG	FOOTING	PP	POLYPROPYLENE		
GA	GAUGE				
GAL	GALLON				
GALV	GALVANIZED				

CONSTRUCTION NOTES:

GENERAL NOTES

1. ACCESS - CONTRACTOR IS TO ARRANGE ACCESS WITH LANDOWNER PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE TO SECURE PERMISSION OF THE COUNTY ENGINEER TO CONSTRUCT TEMPORARY ACCESS IF NECESSARY.
2. EQUIPMENT STAGING: CONTRACTOR TO DESIGNATE EQUIPMENT STAGING AREA AT PRE-CONSTRUCTION MEETING.
   2.1. REFER TO THE PLANS FOR FLOOD PLAIN EXTENTS. THE CONTRACTOR IS RESPONSIBLE FOR MONITORING WEATHER AND REMOVING EQUIPEMENT FROM THE FLOODPLAIN IF AN ADVERSE EVENT IS EXPECTED.
3. WORK LIMITS ARE CONFINED TO THE EASEMENT AREA EXCEPT WHERE INDICATED ON PLANS. CONTRACTOR SHALL TRY TO MINIMIZE DISTURBANCE FOOTPRINT.
4. UTILITIES: CONTRACTOR IS RESPONSIBLE FOR CALLING IOWA ONE CALL (1-800-292-8989) AND MUST PROVIDE VERIFICATION (TICKET NO.) TO THE ENGINEER PRIOR TO MOBILIZATION. CONTRACTOR RESPONSIBLE FOR PROTECTION OF ALL UTILITIES AND IS RESPONSIBLE TO VERIFY LOCATION/ELEVATION OF ALL UTILITIES IN WORK AREA PRIOR TO EXCAVATION. A DESIGN ONE CALL WAS PERFORMED ON DECEMBER 31, 2024.
   4.1. EXPECTED WETLAND UTILITIES: NONE.
   4.2. EXPECTED FIELD ENTRANCE UTILITIES:
      4.2.1. MID-AMERICAN ELECTRIC
      4.2.2. MID-AMERICAN GAS
      4.2.3. WINDSTREAM COMMUNICATIONS
5. DEWATERING: CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING REASONABLE DRY WORKING CONDITIONS DURING CONSTRUCTION. ANY TEMPORARY DEWATERING IS TO BE AT CONTRACTOR'S DISCRETION AND INCIDENTAL TO ITEMS OF WORK.
6. TOPSOIL STRIPPING *(CS-IA-01)*:
   a. STRUCTURE AND BORROW AREAS SHALL BE STRIPPED OF NO LESS THAN TWELVE (12) INCHES.
   b. AREAS FOR TILE WORK SHALL BE STRIPPED NO LESS THAN TWELVE (12) INCHES.
   c. ALL OTHER AREAS TO BE STRIPPED TO NINE (9) INCHES.
7. TOPSOIL STOCKPILE: CONTRACTOR IS RESPONSIBLE FOR SEGREGATION TOPSOIL FROM EXCAVATION SPOILS THROUGHOUT CONSTRUCTION. CONTRACTOR IS TO DESCRIBE TOPSOIL MANAGEMENT AT PRECONSTRUCTION MEETING.
8. TOPSOIL SPREADING: ALL AREAS RECEIVING TOPSOIL DRESS SHALL BE UNDERCUT 6 INCHES AND TOPSOIL SHALL BE SPREAD AT LEAST 6 INCHES THICK TO THE DESIGN SURFACE, OR AS INDICATED ON PLANS.
9. EARTHFILL: ALL STRUCTURAL EARTHFILL SHALL BE PLACED AND COMPACTED IN LOOSE LIFTS NO THICKER THAN NINE (9) INCHES. ENGINEER MAY DIRECT THINNER LIFTS BASED ON AVAILABLE COMPACTION EQUIPMENT.
10. AREAS UNDER FILL SHALL BE SCARIFIED LIGHTLY BEFORE FIRST LIFT TO A DEPTH OF SIX (6) INCHES AND RECOMPACTED IN ACCORDANCE WITH SPECIFICATION IA-23, SECTION 6, METHOD 1.
11. CONSTRUCT CORE TRENCH UNDER ENTIRE DIKE ALIGNMENT AT CENTERLINE.
12. TESTING: CONTRACTOR TO ENSURE ADEQUATE MOISTURE AND DENSITY THROUGHOUT CONSTRUCTION. COMPACTION IS TO BE PERFORMED IN ACCORDANCE WITH SPECIFICATION IA-23 EARTHFILL. CONTRACTOR IS RESPONSIBLE FOR ENSURING SOILS MEET ADEQUATE MOISTURE REQUIREMENTS.
13. WEED CONTROL IA CS-06: CONTRACTOR IS REQUIRED TO CONTROL WEED GROWTH WITHIN THE WORK LIMITS AS NEEDED WITHIN THE CONSTRUCTION LIMITS, FOR THE APPROVED CONSTRUCTION WINDOW.
14. RUBBISH DISPOSAL IA CS-01: ROCKS, FENCE, AND RUBBISH ENCOUNTERED WITHIN THE EASEMENT AREA ARE TO BE DISPOSED OF BY BURIAL OR OTHER APPROVED MEANS. MISCELLANEOUS ROCKS AND RUBBISH ENCOUNTERED DURING EXCAVATION ARE TO BE INCLUDED FOR BURIAL AS WELL. A MINIMUM OF THREE (3) FEET OF COVER OVER BURIED RUBBISH IS REQUIRED. CONTACT ENGINEER PRIOR TO REMOVING ANY FENCE.
15. WORKMANSHIP: CONTRACTOR SHALL PERFORM ALL WORK WITH CRAFTSMAN-LIKE APPEARANCE AND LEAVE NO TRASH/DEBRIS AFTER DEMOBILIZATION.
16. SAFETY - CONTRACTOR IS RESPONSIBLE FOR SAFETY ON THE WORK SITE, INCLUDING THE BRACING OF, SHORING OF, SHAPING OF, AND/OR USE OF TRENCH BOX IN THE EXCAVATIONS. THIS INCLUDES KNOWLEDGE AND COMPLIANCE WITH ALL RULES AND REGULATIONS INTENDED TO PROTECT THE HEALTH AND SAFETY OF THE CONTRACTOR, ENGINEERS, AND OWNER'S PERSONNEL. ALL TRENCHING SHALL BE DONE ACCORDING TO OSHA STANDARDS FOR THE PROTECTION OF LIFE.
17. FLOODPLAIN: PROJECT WORK LIMITS RESIDE IN A MAPPED FLOODPLAIN. MATERIALS, EQUIPMENT, AND EXCESS SPOIL MAY NOT BE STOCKPILED OR STORED WITHIN THE FLOODPLAIN. FINAL GRADING SHOULD BE DONE TO ENSURE ANY SPOIL PLACEMENT AND FILL WITHIN THE FLOODPLAIN DOES NOT DEVIATE SIX (6) INCHES FROM EXISTING GRADE.
18. VEGETATION CLEARING & TREATMENT: VEGETATION MANAGEMENT TO BE DETERMINED BASED ON CONSTRUCTION SCHEDULE AND AVAILABLE SEEDING WINDOWS. CONTRACTOR IS EXPECTED TO BE ABLE TO PERFORM, MOWING/HAYING WITH REMOVAL (SUCH AS BIG ROUND BALES), CONTROL FIRE BURN, CHEMICAL BURN (BY LICENSED APPLICATOR), AND DISCING-HARROWING. FOR THE PURPOSES OF BIDDING, A CONTROL FIRE BURN, FOLLOWED BY 2 APPLICATIONS FOR CHEMICAL TERMINATION, FOLLOWED BY LIGHT DISCING WITH DRAG HARROW FOLLOWER IS EXPECTED.
19. THE CONTRACTOR IS REQUIRED TO CONTACT "IOWA ONE CALL" FOR UTILITY LOCATIONS A MINIMUM OF 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION/CONSTRUCTION, (1-800-292-8989),
20. IF A CULTURAL RESOURCE IS IDENTIFIED DURING CONSTRUCTION, STOP IMMEDIATELY AND NOTIFY THE LOCAL NATURAL RESOURCES CONSERVATION SERVICE OFFICE.
21. ALL CONSTRUCTION ACTIVITIES SHALL BR IN COMPLIANCE WITH NRCS NATIONAL AND STATE UTILITY SAFETY POLICY (NEM PART 503-SAFETY, SUBPART A - ENGINEERING ACTIVITIES AFFECTING UTILITIES 503.00 THROUGH 503.06)
22. CONSTRUCTION CONTRACT BETWEEN CONTRACTOR AND IDALS, PLANS, SPECIFICATIONS, PROJECT MANUAL, AND ADDENDA. ANY MODIFICATIONS MUST BE APPROVED BY IDALS.
23. NRCS DOES NOT GUARANTEE THAT THE POND WILL FILL AND/OR REMAIN FILLED WITH WATER TO THE PRINCIPAL SPILLWAY CREST ELEVATION.
24. PROPOSED DESIGN MEETS PRACTICE STANDARD DESIGN CRITERIA AND COMPLIES WITH APPLICABLE LAWS AND REGULATIONS SET FORTH IN 210-NEM-505.

TILE INSTALLATION

25. WORK LIMITS - OUTSIDE OF EASEMENT AREA, CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITY TO WITHIN A 90 FOOT WIDE CORRIDOR ALONG THE LENGTH OF THE TILE ALIGNMENTS AS SHOWN ON THE PLANS.
26. TILE INVESTIGATION - VERIFY LOCATIONS AND ELEVATIONS OF EXISTING TILE PRIOR TO CONSTRUCTION. TILE INVESTIGATION INCLUDES TIME NECESSARY TO LOCATE AND DIG EXISTING TILES. EXPLORATION FOR DESIGN FOR TILE ENCOUNTERED, BUT NOT SHOWN ON THE PLANS WILL BE PAID UNDER THIS ITEM.
27. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL TILE FOUND DURING THE TILE INVESTIGATION AND DURING WETLAND EXCAVATION.
28. CONTRACTOR SHALL MAKE EFFORT TO SEGREGATE ORGANIC TOPSOIL TO MINIMUM DEPTH OF 12 INCHES FOR ALL TILE WORK OUTSIDE OF EXCAVATION AND FILL AREAS.
29. FIELD TILE CONNECTIONS - CONNECTIONS TO INTERCEPTED FIELD TILE 12" DIAMETER AND LESS SHALL BE MADE AND ENCASED IN A PORTLAND CEMENT CONCRETE (PCC) COLLAR AT LEAST TWELVE (12) INCHES WIDE AND FOUR (4) INCHES THICK, CONTINUOUS AROUND THE JOINTS. ALTERNATIVE CONNECTIONS MUST BE APPROVED BY THE ENGINEER.
30. TILE TO BE INSTALLED IN ACCORDANCE WITH THE TILE INSTALLATION DETAILS ON SHEET C0-30. TILE FOUND TO BE FLOATING IN THE TRENCH SHALL BE REMOVED, THE TRENCH DEWATERED, AND THE TILE IMMEDIATELY INSTALLED.

INLET & CONTROL STRUCTURE NOTES

31. STRUCTURE SHOP DRAWINGS ARE REQUIRED FOR ENGINEER'S REVIEW AND APPROVAL BEFORE FABRICATION OF STRUCTURES, REFER TO INSPECTION TABLE.
32. CMP WATER CONTROL STRUCTURE TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
33. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE.
34. USE ASTM CLASS 1 MATERIAL TO BED AND LEVEL STRUCTURE. LOOSE EARTH FILL IS NOT PERMITTED AS BACKFILL TO LEVEL THE STRUCTURE.
35. CHECK TO ENSURE STRUCTURE IS LEVEL PRIOR TO BACKFILLING. PLACE BACK FILL MATERIAL AROUND STRUCTURE IN 6" LIFTS AND COMPACT BY HAND. DO NOT USE POWERED EQUIPMENT.
36. BACKFILL AROUND STRUCTURES SHALL BE COMPACTED BY HAND. NO MECHANICAL PACKING METHODS MAY BE USED.

ISG

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-C0-DETAILS
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

NOTES

SHEET

C0-20

ITEMS OF WORK

Bid Item	Sub-Item	Description	Specifications No.	Quantity	Unit or Select	As-Built
1	-	Site stripping & preparation	IA CS-001	1	LS	
2	-	Crop damage	IA CS-001	0	AC	
3	-	Straw Wattle	IA CS-005	738	LF	
4	-	Buffer Seeding	IA CS-006	4.2	AC	
5	-	Structure and Waterway/Channel Seeding	IA CS-006	0.7	AC	
6	-	Mobilization and Demobilization	IA CS-008	1	LS	
7	-	Drain Tile Investigation	IA CS-009	2	HR	
8	-	Drain Tile Removal & Burial	IA CS-009	579	LF	
9	-	Drain Tile Connection >18"	IA CS-009	3	EA	
10	-	Excavation (General)	IA CS-021	1,911	CY	
11	-	Earthfill (General)	IA CS-023	1,902	CY	
12	-	Topsoil Placement	IA CS-026	3,971	CY	
13	-	Modifed SW401 Outlet Structure, 48"	IA CS-031	1	EA	
14	-	Lift Station Structure, 60"	IA CS-031	1	EA	
15	-	Pump Assembly, Electrical, and Solar Panels	S-6	1	EA	
16	-	Wetland Outlet Pipe, Reinforced Concrete Pipe				
	A.	18"	IA CS-031	45	LF	
	B.	21"	IA CS-031	35	LF	
17	-	Pipe Apron, RCP w/ Metal Guard				
	A.	18"	IA CS-031	1	EA	
	B.	21"	IA CS-031	1	EA	
18	-	HDPE Dual Wall Corrugated Pipe				
	A.	24"	IA CS-046	579	LF	
	B.	15"	IA CS-046	67	LF	
19	-	2-Chamber Water Control Structure Assembly, 10'x15"	IA CS-051	1	EA	
20	-	CMP Water Control Structure	IA CS-051	1	EA	
21	-	Culvert, CMP				
	A.	12"	IA CS-051	40	LF	
22	-	Class E Riprap	IA CS-061	37	TN	
23	-	Class A Roadstone	IA CS-061	30	TN	
24	-	Trench Stabilization Material	IA CS-061	140	CY	

CONSERVATION PRACTICE STANDARDS
PRIMARY
656: CONSTRUCTED WETLAND
SUPPORTING
327: CONSERVATION COVER
342: CRITICAL AREA PLANTING
356: DIKE OR LEVEE
378: POND
587: STRUCTURE FOR WATER CONTROL
606: SUBSURFACE DRAIN
620: UNDERGROUND OUTLET

REQUIRED SHOP DRAWINGS AND INSPECTIONS

Bid Item	Sub-Item	Description	Specifications No.	Shop Drawing	Required Inspection or Survey
1	-	Site stripping & preparation	IA CS-001		Inspection: verify topsoil strip depth Review: by survey or contractor equipment (laser level, machine control)
2	-	Crop damage	IA CS-001		Inspection: area damaged Review: engineer's survey of damaged area
3	-	Straw Wattle	IA CS-005		
4	-	Buffer Seeding	IA CS-006	X	Inspection: seed bed preperation Review: visual
5	-	Structure and Waterway/Channel Seeding	IA CS-006	X	Inspection: seed bed preperation Review: visual
6	-	Mobilization and Demobilization	IA CS-008		
7	-	Drain Tile Investigation	IA CS-009		Inspection: condition of existing pipe Review: visual, survey of flow line elevations upon notice from contractor
8	-	Drain Tile Removal & Burial	IA CS-009		Inspection: crush and burial of removed pipe Review: visual, survey of flow line elevations upon notice from contractor
9	-	Drain Tile Connection >18"	IA CS-009	X	Inspection: installation of drop down tee connection and district tile connections Review: visual, survey of flow line elevations upon notice from contractor
10	-	Excavation (General)	IA CS-021		Inspection: soils suitability for earthen berm Review: visual, non-destructive field testing (ribboning)
11	-	Earthfill (General)	IA CS-023		Inspection: compaction of earthern berm Review: visual, field testing as required (proof roll, denting)
12	-	Topsoil Placement	IA CS-026		Inspection: subgrade to verify topsoiling depth Review: by survey or contractor equipment (laser level, machine control)
13	-	Modifed SW401 Outlet Structure, 48"	IA CS-031	X	Inspection: structure installation (concrete base, pipe connection, backfill) Review: visual
14	-	Lift Station Structure, 60"	IA CS-031	X	Inspection: structure installation (concrete base, backfill) Review: visual
15	-	Pump Assembly, Electrical, and Solar Panels	S-6	X	Inspection: assembly installation (pump, electrical, and solar panel installation) Review: visual
16	-	Wetland Outlet Pipe, Reinforced Concrete Pipe			
	A.	18"	IA CS-031	X	Inspection: initial blinding, use of ASTM Class 2 backfill Review: visual, engineer supplied pipe crawler (if conditions dictate), survey of flow line elevations upon notice from contractor
	B.	21"	IA CS-031	X	Inspection: initial blinding, use of ASTM Class 2 backfill Review: visual, engineer supplied pipe crawler (if conditions dictate), survey of flow line elevations upon notice from contractor
17	-	Pipe Apron, RCP w/ Metal Guard			
	A.	18"	IA CS-031	X	Inspection: water tight joint Review: visual
	B.	21"	IA CS-031	X	Inspection: water tight joint Review: visual
18	-	HDPE Dual Wall Corrugated Pipe			
	A.	24"	IA CS-046	X	Inspection: initial blinding, use of ASTM Class 2 backfill Review: visual, engineer supplied pipe crawler (if conditions dictate), survey of flow line elevations upon notice from contractor
	B.	15"	IA CS-046	X	Inspection: initial blinding, use of ASTM Class 2 backfill Review: visual, engineer supplied pipe crawler (if conditions dictate), survey of flow line elevations upon notice from contractor
19	-	2-Chamber Water Control Structure Assembly, 10'x15"	IA CS-051	X	Inspection: structure installation (concrete base, dissimilar pipe connection, backfill) Review: visual
20	-	CMP Water Control Structure	IA CS-051	X	Inspection: structure installation (concrete base, dissimilar pipe connection, backfill) Review: visual
21	-	Culvert, CMP			
	A.	12"	IA CS-051	X	Inspection: soil tight joints
22	-	Class E Riprap	IA CS-061	X	Inspection: subgrade preparation (less around riser), final installation Review: visual, survey or contractor equipment (laser level, machine control) as conditions dictate
23	-	Class A Roadstone	IA CS-061	X	Inspection: subgrade preparation with fabric, final installation Review: visual, survey or contractor equipment (laser level, machine control) as conditions dictate
24	-	Trench Stabilization Material	IA CS-061	X	Inspection: preparation, final installation Review: visual, survey or contractor equipment (laser level, machine control) as conditions dictate

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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-C0-DETAILS
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

QUANTITIES AND INSPECTION TABLE

SHEET

C0-21

ESTIMATE REFERENCE INFORMATION

ITEM NO.	SPECIFICATION NO.	ITEM	DESCRIPTION
1	IA CS-001	Site stripping & preparation	Estimated quantity of material to be stripped is 5,727 CY. Stripping associated with pipe and structure installation is considered incidental to those bid items and not included in referenced quantity. Existing site is enrolled in USDA Easement, depending on time of year contractor may need to cut and big round bale existing vegetation prior to excavation. Reserve bales for mulching.
2	IA CS-001	Crop damage	No crop damages are anticipated outside the easement area. Notify the engineer and owner prior to incurring crop damages.
3	IA CS-005	Straw Wattle	This item shall consist of installing item in locations marked in drawings. Item is to be installed according to SUDAS Division 9, Section 9040. Refer SUDAS 9040.105; 9" nominal diameter. Payment and measuring shall be made based on linear foot of item placed.
4	IA CS-006	Buffer Seeding	Temporary stabilization seeding associated with open excavation not actively worked in times of fair weather is not included. Seeding shall not be done in the floodplain when any cummulative precipitation of 4 inches or more is projected in the 10 day forecast, or 2.5 inches or precipitation is projected in a 24 hour period.
5	IA CS-006	Structure and Waterway/Channel Seeding	Temporary stabilization seeding associated with open excavation not actively worked in times of fair weather is not included. Seeding shall not be done in the floodplain when any cummulative precipitation of 4 inches or more is projected in the 10 day forecast, or 2.5 inches or precipitation is projected in a 24 hour period. Use reserved big round bales from site prepartion for mulching.
6	IA CS-008	Mobilization and Demobilization	Contractor is responsible to monitor ditch conditions and move equipment and materials if risk of flood is imminent. Loss of materials stored on site due to negligence shall be replaced by the contractor at no additional cost. Includes all pre and post construction control necessary. Includes all items necessary for the installation of the sign provided by Iowa Department of Agriculture and Land Stewardship as shown in within the project specifications. Contractor is required to stabilize disturbed areas per site restoration plan within 14 days after final disturbance.Contractor to minimize overall disturbed areas as responsible work progression dictates. Temporary sediment controls are required for unfinished, inactive grading areas that remain bare longer than 14 days.
7	IA CS-009	Drain Tile Investigation	Includes labor necessary to locating existing tiles within project area. District and private tile investigation shall be completed prior to any work done to verify elevations and give proper lead times for any design changes.
8	IA CS-009	Drain Tile Removal & Burial	Includes all materials and labor necessary to the removal of the Drainage District concrete pipe. This item also includes the crush and burial of the removed pipe as shown on plan detail.
9	IA CS-009	Drain Tile Connection >18"	This item includes all items necessary for the installation of the HDPE TEE connection between the district tile and diversion tile as well as the installation of the HDPE elbow. All fittings and connections to be installed in accordance to detail AG160. Crushed rock used as backfill around connection and fittings is subsidary to the tile connection installation.
10	IA CS-021	Excavation (General)	This item shall consist of the excavation necessary to construct wetland and core trench. Excavation for the installation, removal, and burial of pipe is to be incidental to the pipe installation and drain tile removal and burial. Earthwork quantities are considered plan quantities and shall be considered final and no additional payment will be allowed.
11	IA CS-023	Earthfill (General)	This item shall consist of the earthfill necessary to construct the solar panel pad, submerged berms, dike, and core trench and additional fill to be placed over the tile to provide adequate cover. Compaction in constructed wetland area shall be by method 1 per IA CS-023. Earthwork quantities are considered plan quantities and shall be considered final and no additional payment will be allowed.
12	IA CS-026	Topsoil Placement	Topsoil shall be stockpiled separate from excavated soils. Place topsoil in disturbed areas due to pipe installation and wetland construction, refer to site restoration plan. Estimated quantity of topsoil to be placed is 3,971 CY.
13	IA CS-031	Modifed SW401 Outlet Structure, 48"	Item consists of all neccesary materials, labor, and transportation necessary for the installation of the SW401 concrete manhole with SW604 Type 3B grate. Contractor may present an alternative structure to be approved by engineer.
14	IA CS-031	Lift Station Structure, 60"	This item shall consist of all necessary materials, labor, and transportation necessary for the installation of the 60" HP & Precast Concrete Lift Station Structure as shown on detail AG400. 60" precast concrete based structure shall be a SUDAS SW-401 precast riser section. Item includes watertight and stable concrete to HP connection and connection to dispersion line. Includes all excavation, bedding, and backfill as well as the cover for the structure. Shop drawing submittal shall describe the connection from the precast base to the HP riser.
15	S-6	Pump Assembly, Electrical, and Solar Panels	This item shall consist of all necessary materials, labor, and transportation necessary for the installation of pump assembly. Includes the materials and labor required for the installation of the electric panel and wiring, solar panels, outlet pipe and pipe supports as seen in plans. Pump assembly must be a complete solar powered submersible pump kit including CP06 7.5HP Carry Pump or approved equivalent by engineer. Pump and control panel shall be capable of automatically pumping 600 gpm and a total dynamic head of 17 feet. Pump system shall be provided with timer or other safety feature to control amount of pump on/off cycled per hour, in accordance with manufacturer's recommendations. Shop drawings shall be provided by pump manufacturer displaying all pertinent details to provide a complete pumping system. Contractor shall provide a representative from the pump manufacturer (at end of project) to assist in pump startup to ensure pumping system has been installed in accodarance with the manufacturer's guidelines and design intent. Item includes all pump power and control cords, lifting cables, couplers, anchors, transducer, pipe, valves, and other related equipment.
16	IA CS-031	Wetland Outlet Pipe, Reinforced Concrete Pipe	This item includes all materials, labor, and transportation necessary to the installation of the RCP pipe. Pipe connections shall be watertight, wrapped and mechnically tied per Iowa DOT DR-121 Type II sealed joints. Includes trench excavation and granular backfill as shown on pipe installation details. Granular backfill shall be Class 1 or Class 2 material and is subsidiary to the pipe installation. Alternate pipe trench to have prior approval from engineer. An unstable trench shall be stabilized with trench stabilization material upon approval from the engineer. Trench Stabilization Material, if approved by engineer, will be paid under a seperate bid item. Item also includes all shoring/bracing required for surrounding utilities and structure to properly install pipe. Contractor shall field verify utility locations and elevations prior to installation of the RCP.
17	IA CS-031	Pipe Apron, RCP w/ Metal Guard	Inlcudes all materials, labor, and transportation necessary for the installation of the concrete pipe apron and metal guard per SUDAS 4030.222, Type 2 and SUDAS 4030.224 where specified on plans. Pipe connections shall be watertight, wrapped and mechnically tied per Iowa DOT DR-121 Type II sealed joints.
18	IA CS-046	HDPE Dual Wall Corrugated Pipe	This item includes all materials, labor, and transportation necessary for the installation of the HDPE pipe. Includes trench excavation and granular backfill as shown on pipe installation details. Item includes linear measurement through alignment turns, prefabricated elbows, and tee sections. Fabrication and installation of fittings are subsidiary to this item. HDPE shall have gasketed joints. Granular backfill shall be Class 1 or Class 2 material and is subsidiary to the pipe installation. Alternate pipe trench to have prior approval from engineer. An unstable trench shall be stabilized with trench stabilization material upon approval from the engineer. Trench Stabilization Material, if approved by engineer, will be paid under a seperate bid item. Item also includes all shoring/bracing required for surrounding utilities and structure to properly install pipe. Contractor shall field verify utility locations and elevations prior to installation of the HDPE pipe.
19	IA CS-051	2-Chamber Water Control Structure Assembly, 10'x15"	Includes all materials, labor, and transportation necessary for the installation of the 2-Chamber WCS. Including CMP sleeve with lockable lid, aluminized metal footing ring, granular backfill, and crushed stone. Water Control Structure shall be Agri-drain or approved equivalent by engineer. All CMP shall be 14 GA minimum.
20	IA CS-051	CMP Water Control Structure	This item shall consist of all necessary materials, labor, and transportation necessary for the installation of the CMP water control structure (WCS). Includes all stop log materials as described on the plans. All CMP for structure, riser, and associated pipe shall be 14 GA minimum. Includes 4-ft cmp stubs on each side of structure. All joints shall be watertight
21	IA CS-051	Culvert, CMP	All piping must be 14 GA minimum. Includes granular backfill necessary for installation.
22	IA CS-061	Class E Riprap	Material shall comply with gradation of Iowa DOT Specification 4130.02, Class E. Payment will be for actual tons placed based on scale tickets.
23	IA CS-061	Class A Roadstone	Material shall comply with gradation of Iowa DOT Specification 4130.02, Class A. Payment will be for actual tons placed based on scale tickets.
24	IA CS-061	Trench Stabilization Material	Includes furnishing, stockpiling, and installing the specificed material. Material shall meet ASTM D2321 Class 1 (Crushed Rock, Angular). Material must be crushed and angular. Rounded pebbled, stones, or "river rock" will not be accepted. Item will only be paid fpr HDPE Dual-Wall pipe and RC pipe bedding upon approval of engineer. Stabilization material used for other bid items such as structure foundation or tile connections is considered incidental to that specific bid item and will not be paid under this item.

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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
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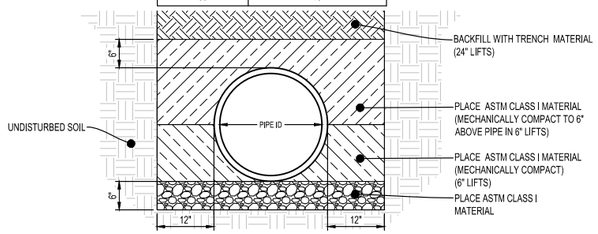
TITLE

ESTIMATE REFERENCE

SHEET

C0-22

PIPE DIAMETER (IN)	TRENCH STABILIZATION MATERIAL (CY/20 LF)
8	3,5
10	3,5
12	4,5
15	5
18	6
24	7,5
30	9,5
36	11
42	13
48	14,5
60	19

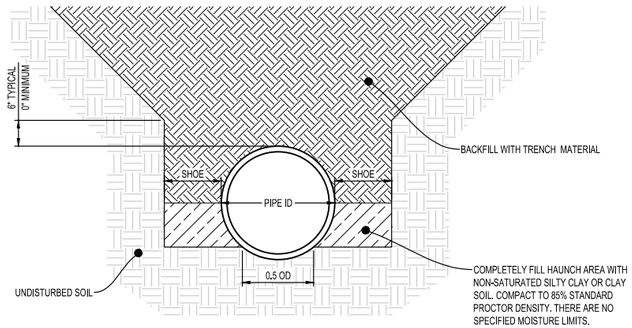


NOTES:

1. GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
2. THE SHOE WIDTH SHALL BE 12" OR THE PIPE MANUFACTURER'S SPECIFICATIONS, WHICHEVER IS GREATER.
3. TRENCH STABILIZATION MATERIAL SHALL BE ASTM CLASS I MATERIAL AND SHALL BE PAID FOR BY THE CUBIC YARD, ONLY WHERE APPROVED BY THE FIELD ENGINEER.
4. CONTRACTOR SHALL NOT EXCEED VOLUMES PER LINEAR FOOT TABULATION IN THE CHART ABOVE UNLESS APPROVED BY THE ENGINEER.

RCP & HDPE WITH GRANULAR FOUNDATION & TRENCH STABILIZATION MATERIAL

NTS AG152-MN

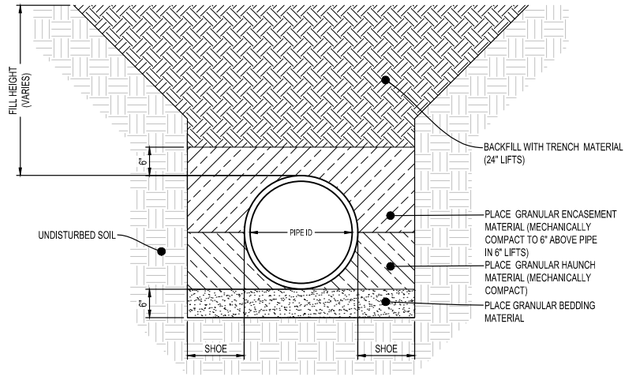


NOTES:

1. THE SHOE WIDTH SHALL BE THE SAME AS THE COMPACTING MECHANISMS WIDTH OR THE PIPE MANUFACTURER'S SPECIFICATIONS, WHICHEVER IS GREATER.
2. THE FIRST LIFT OF BACKFILL SHALL BE PLACED WITH AN EXCAVATOR WITH NO MORE THAN 2' OF DROP.
3. WHERE TRENCH BOTTOM IN UNDISTURBED SOIL, SHAPE TRENCH BASE GROOVE TO MATCH MINIMUM ⅛ OF THE OUTER CIRCUMFERENCE OF THE PIPE. WHERE THE SHAPED GROOVE CANNOT BE CONSTRUCTED INTO UNDISTRUBED GROUND OR WHERE EXCESS CUT OCCURS, REFER TO HDPE FLAT BOTTOM TRENCH DETAIL.
4. MODIFIED TRENCH IS INTENDED TO BE USED AS AN ACCEPTABLE ALTERNATIVE WHEN SOILS ARE NOT SUITABLE TO MEET HDPE SPOON TRENCH DETAIL REQUIREMENTS. MODIFIED TRENCH MAY ONLY BE UTILIZED WITH PRIOR APPROVAL OF ENGINEER.

RCP MODIFIED TRENCH

NTS AG170-IA

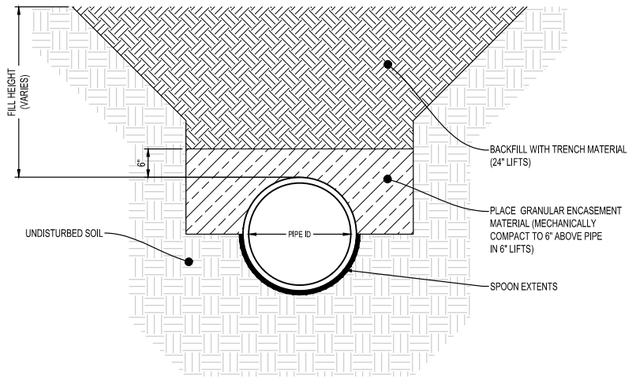


NOTE:

1. GRANULAR BEDDING, GRANULAR ENCASEMENT, AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
2. ALL PIPE WITH A FILL HEIGHT GREATER THAN 15-FEET SHALL BE FULLY ENCASED IN ASTM CLASS I MATERIAL.
3. THE SHOE WIDTH SHALL BE THE SAME AS THE COMPACTING MECHANISMS WIDTH OR THE PIPE MANUFACTURER'S SPECIFICATIONS, WHICHEVER IS GREATER.

RCP & HDPE FLAT BOTTOM TRENCH

NTS AG110-U

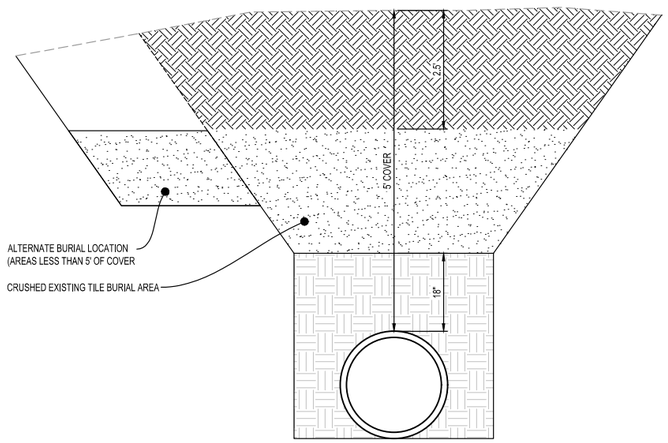


NOTES:

1. GRANULAR ENCASEMENT AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
2. SPOON DIMENSIONS SHALL COMPLY WITH PIPE MANUFACTURER'S SPECIFICATIONS.
3. ALL PIPE WITH A FILL HEIGHT GREATER THAN 15-FEET SHALL BE FULLY ENCASED IN ASTM CLASS I MATERIAL.

RCP & HDPE SPOON TRENCH

NTS AG140-U



EXISTING TILE DISPOSAL

NTS AG190

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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

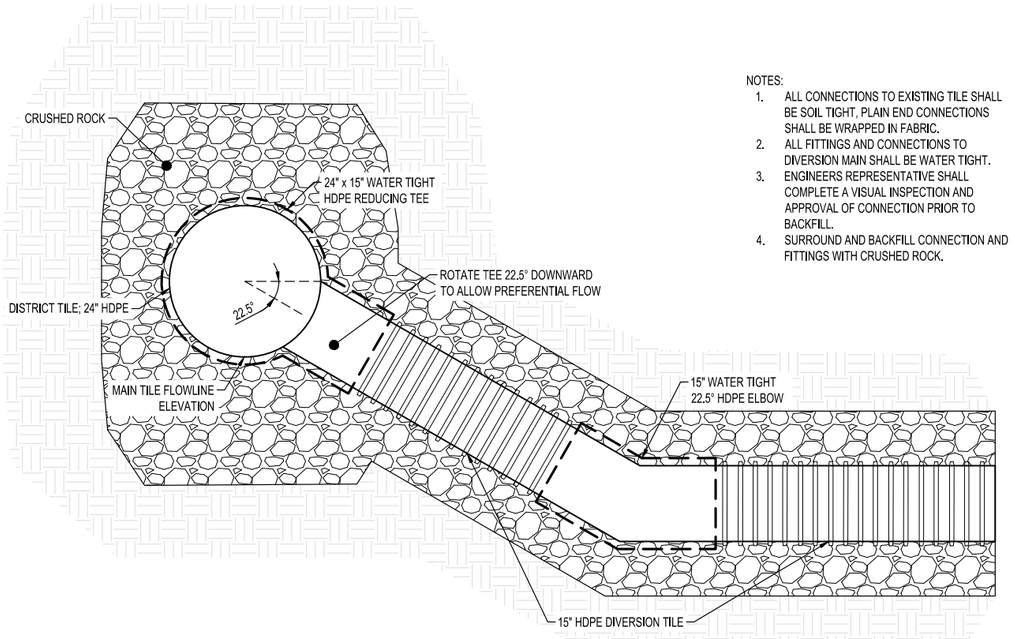
PROJECT NO.	24-31714
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TITLE

SITE DETAILS

SHEET

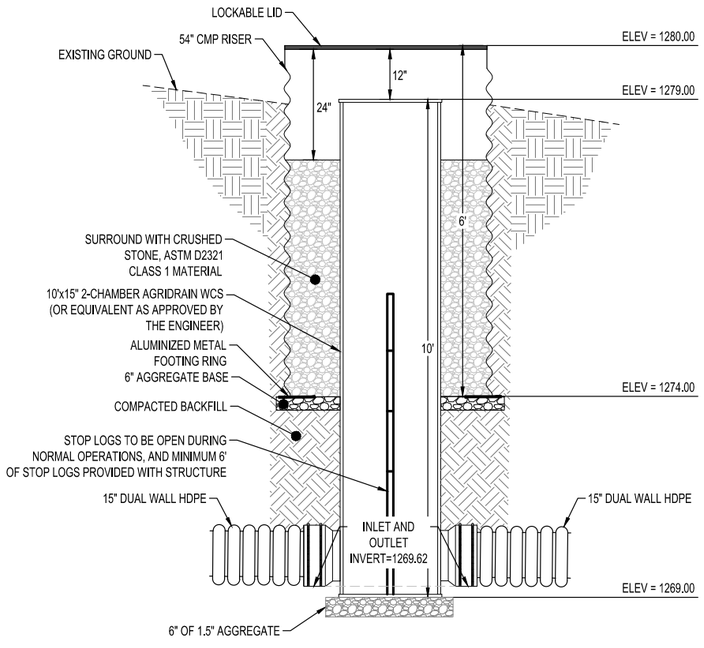
C0-30



NOTES:
1. ALL CONNECTIONS TO EXISTING TILE SHALL BE SOIL TIGHT, PLAIN END CONNECTIONS SHALL BE WRAPPED IN FABRIC.
2. ALL FITTINGS AND CONNECTIONS TO DIVERSION MAIN SHALL BE WATER TIGHT.
3. ENGINEERS REPRESENTATIVE SHALL COMPLETE A VISUAL INSPECTION AND APPROVAL OF CONNECTION PRIOR TO BACKFILL.
4. SURROUND AND BACKFILL CONNECTION AND FITTINGS WITH CRUSHED ROCK.

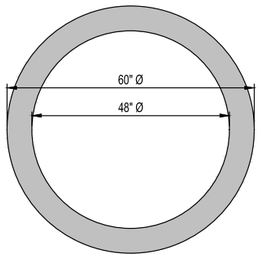
DRAINAGE DISTRICT NO. 4 TILE CONNECTION DETAIL

NTS AG160



PUMP INLET WATER CONTROL STRUCTURE

NTS



ALUMINIZED METAL FOOTING RING DETAIL

WATER CONTROL STRUCTURE NOTES

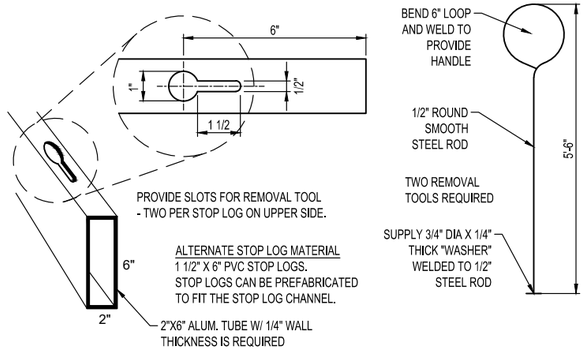
1. STRUCTURE SHOP DRAWINGS ARE REQUIRED FOR ENGINEER'S REVIEW AND APPROVAL BEFORE FABRICATION OF WATER CONTROL STRUCTURE.
2. STRUCTURE IS TO BE CONSTRUCTED OF ALUMINIZED CORRUGATED METAL PIPE.
3. STOP LOG CHANNEL IS TO BE ANCHORED TO THE WALLS AND FLOOR PRIOR TO PLACING CONCRETE INVERT.
4. A CONCRETE INVERT IS TO BE INSTALLED AFTER STOP LOG CHANNEL IS INSTALLED. THE BOTTOM STOP LOG IS TO BE CAST INTO THE INVERT WITH THREE HALF INCH Ø "J BOLTS" FASTENED TO THE BOTTOM STOP LOG. NO LIFTING HOLES ARE REQUIRED FOR THIS BOTTOM LOG.
5. PLACE/POUR BASE OF STRUCTURE ON FIRM UNDISTURBED EARTH FOUNDATION APPROVED BY ENGINEER.
6. A-LOK (OR EQUIVALENT) WATERTIGHT SEALS ARE REQUIRED FOR PIPE CONNECTIONS TO THE DRAWDOWN CONTROL STRUCTURE.
7. MANHOLE STEPS ARE TO BE INSTALLED FOR MAINTENANCE ACCESS TO THE STOP LOGS.
8. STOP LOG ASSEMBLY SHALL BE WATER TIGHT AND CONFORM TO WHIPPS, INC. OR AN APPROVED EQUAL. ALL STRUCTURE JOINTS TO BE WATER TIGHT TO LIMIT ANY WATER MIGRATING THROUGH JOINTS AND AROUND THE STOP LOG CHANNEL.
9. ALL CMP FOR CONTROL STRUCTURE, RISER, AND ASSOCIATED PIPE SHALL BE 14 GA MINIMUM

STOP LOG CHANNEL NOTES

1. ALL STEEL SHALL BE FY=36 KSI.
2. STOP LOG CHANNEL SHALL BE FURNISHED AS ONE CONTINUOUS PIECE W/ CONTINUOUS WELDS
3. ALL STEEL STOP LOG CHANNEL COMPONENTS ARE TO BE ALUMINIZED AFTER WELDING AND DRILLING IS COMPLETE
4. CONTRACTOR IS TO APPLY SEALANT VERY GENEROUSLY TO BACKSIDE OF STOP LOG CHANNEL TO ENSURE WATERTIGHT SEAL. SEALANT SHALL BE SIKA 30 YEAR INDUSTRIAL CAULK IN LIMESTONE GREY OR APPROVED EQUIVALENT.

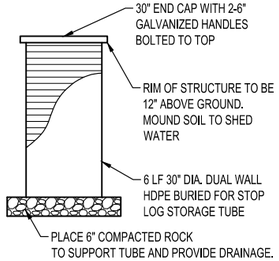
COVER/STOP LOG STORAGE NOTES

1. PROVIDE COMPATIBLE GRATE WITH LOCKING MECHANISM AND LIFTING HANDLE (AGRIDRAIN GR30P OR APPROVED EQUIVALENT).
2. BOTH PADLOCKS FOR ACCESS DOOR AND STOPLOG STORAGE TUBE SHALL BE KEYED ALIKE. FOUR KEYS ARE TO BE SUPPLIED UPON PROJECT COMPLETION.
3. STOP LOG STORAGE IS TO BE PLACED CENTERED ON THE TOP OF BERM OFFSET SO AN NOT TO INTERFERE WITH ANTI-SEEP COLLARS OR WATER CONTROL STRUCTURE PIPING.
4. STOP LOGS NOT USED ARE TO BE PLACED IN THE STOP LOG STORAGE.



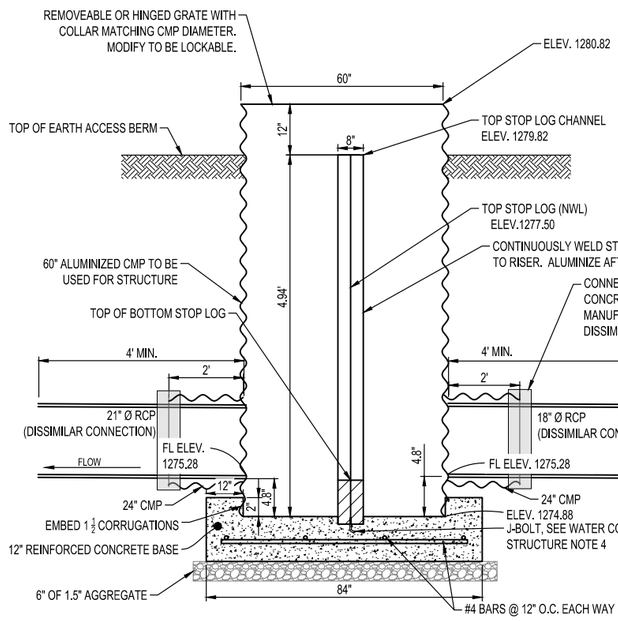
STOP LOG & REMOVAL TOOL DETAILS

NTS XX9999



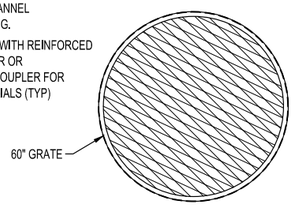
COVER & STOP LOG STORAGE DETAILS

NTS XX9999



LID NOTES

1. LID TO BE SECURED TO CMP WITH EITHER COMPRESSION BAND OR SET SCREWS
2. BAND IS TO EXTEND APPROXIMATELY 3 INCHES BELOW THE STRUCTURE RIM.
3. LID SHALL HAVE MINIMAL OPENINGS AND HOLES AND BE RELATIVELY IMPERMEABLE TO WATER.
4. MINIMUM THICKNESS OF LID MATERIAL TO BE $\frac{3}{32}$" AND NO BIGGER THAN $\frac{3}{16}$" CARBON STEEL.
5. LID SHALL HAVE 2 BARREL HINGES ALLOWING FOR >105 DEGREE OPENING.
6. REFER TO IA CS-051 FOR COATING REQUIREMENTS.



CMP WATER CONTROL STRUCTURE

NTS AG410

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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

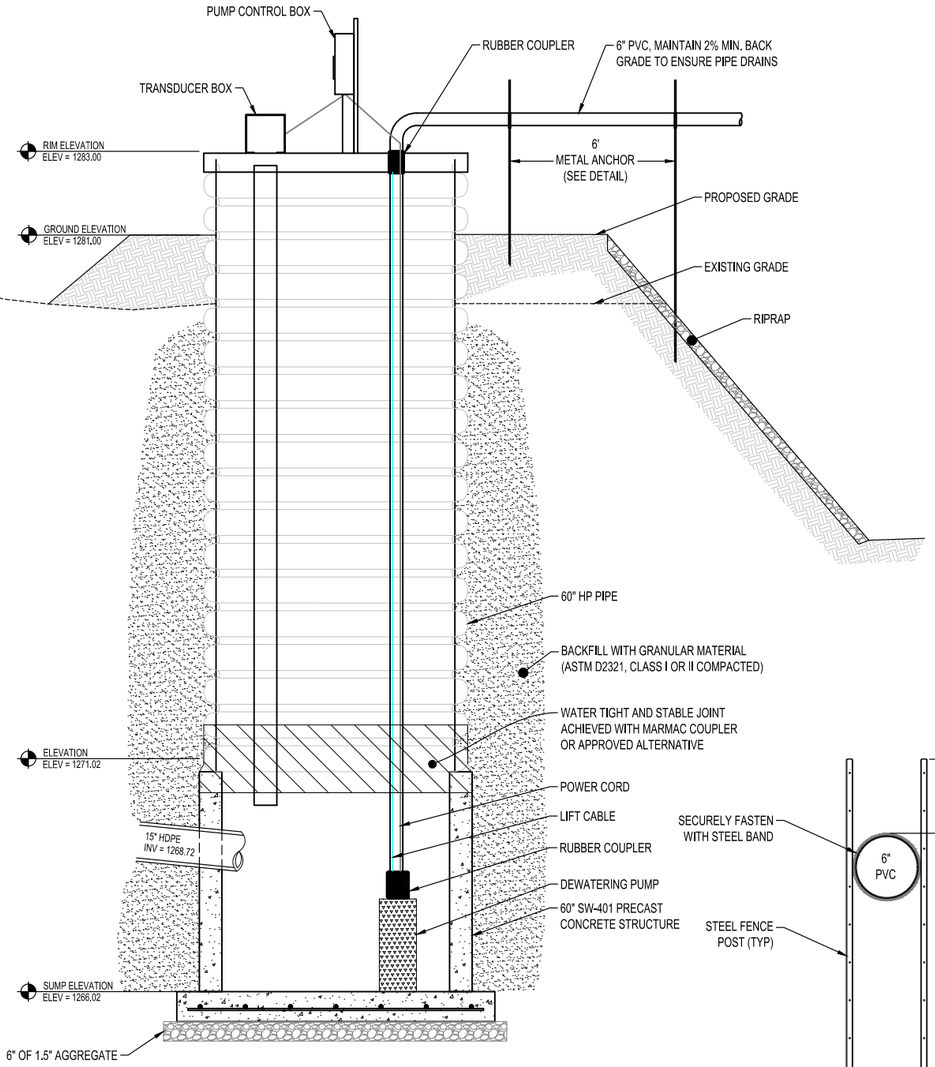
PROJECT NO.	24-31714
FILE NAME	31714-C0-DETAILS
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

SITE DETAILS

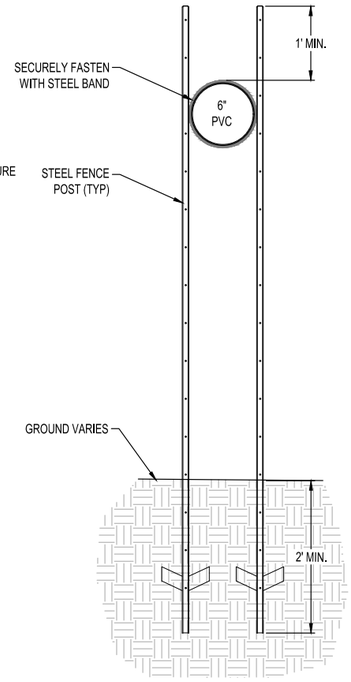
SHEET

C0-31



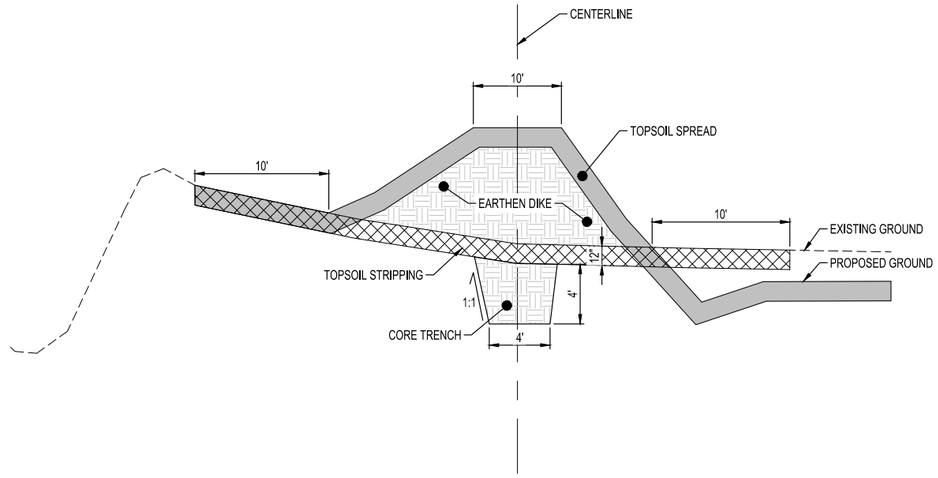
LIFT STATION DETAIL

NTS AG400



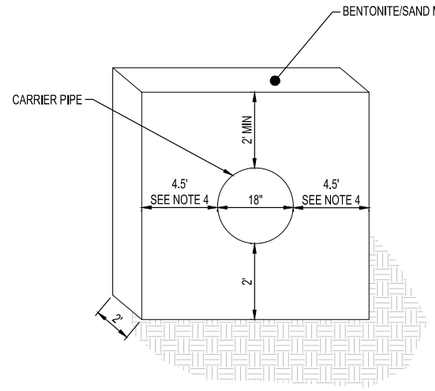
METAL ANCHOR DETAIL

NTS



DIKE AND CORE TRENCH TYPICAL SECTION

NTS AG300



TRENCH DAM

NTS AG310

NOTES

1. BETONITE SHALL BE EITHER IN GRANULAR OR CHIP FORM, WITH A MAXIMUM NOMINAL SIZE OF 3/8" MIXED WITH NO MORE THAN 80% SAND (C33).
2. THE TRENCH DAM (ANTI-SEEP COLLAR) SHALL EXTEND AT LEAST 6" BEYOND THE STANDARD PIPE TRENCH.
3. PLACEMENT OF THE COLLAR SHALL NOT BE WITHIN 2-FEET OF A PIPE JOINT.
4. MINIMUM DISTANCE FROM EDGE OF PIPE IS 3x PIPE DIAMETER OR 6" BEYOND TRENCH EXTENTS, WHICHEVER IS GREATER (TYP).

ISG

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SAC COUNTY IOWA

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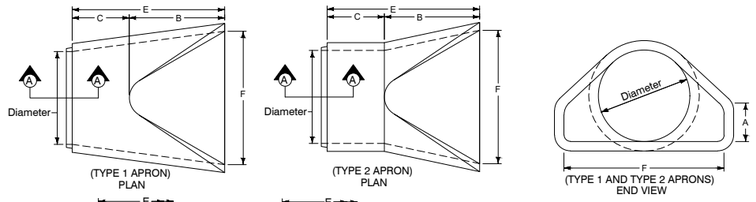
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SITE DETAILS

SHEET

C0-32



Dimension 'E' shown is the minimum and is considered the design length. Adjust for any difference between the actual length of concrete apron installed and the length indicated below for the length of concrete culvert pipe furnished.

1. Tongue end used on inlet end section. Groove end used on outlet end section.

TYPE 1 APRONS						
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F
12"	2.4:1	4"	2'-0"	4'-3 3/8"	6'-5 7/8"	2'-0"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	2.4:1	9"	3'-0"	3'-1 3/4"	6'-1 3/4"	3'-5"
24"	2.5:1	9 1/2"	3'-7 3/4"	2'-6"	6'-1 3/4"	4'-0"
27"	2.5:1	10 1/2"	4'-1"	2'-0"	6'-1 3/4"	4'-4"
30"	2.5:1	12"	4'-6"	1'-7 7/8"	6'-1 3/4"	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.8:1	27"	5'-0"	3'-0"	8'-0"	7'-6"
60"	1.6:1	29 1/2"	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.6:1	30"	6'-6"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.3:1	29 1/2"	6'-9"	2'-6 1/2"	9'-3 1/2"	10'-0"

TYPE 2 APRONS						
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F
12"	2.4:1	4"	2'-0"	4'-3 3/8"	6'-5 7/8"	2'-0"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	2.4:1	9"	3'-0"	3'-1 3/4"	6'-1 3/4"	3'-5"
24"	2.5:1	9 1/2"	3'-7 3/4"	2'-6"	6'-1 3/4"	4'-0"
27"	2.5:1	10 1/2"	4'-1"	2'-0"	6'-1 3/4"	4'-4"
30"	2.5:1	12"	4'-6"	1'-7 7/8"	6'-1 3/4"	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.9:1	24 1/2"	5'-5"	2'-7"	8'-0"	7'-6"
60"	1.4:1	24 1/2"	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.4:1	24"	6'-6"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.5:1	23 1/2"	7'-6 1/2"	1'-9"	9'-3 1/2"	10'-0"

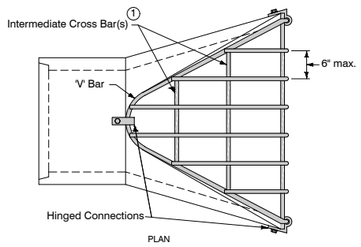
FIGURE 4020.223 SHEET 1 OF 1

SUDAS

REVISION
New 10-18-16
4030.222
SHEET 1 of 1

SUDAS Standard Specifications

CIRCULAR CONCRETE APRONS



Provide guard dimensions to fit with type of apron provided. Ensure 'V' Bar completely rests on apron.

1. All guards must include at least one intermediate cross bar. If pipe diameter, or equivalent diameter, is 60 inches or greater, use two intermediate cross bars equally spaced.

ROUND		ARCH		ELLIPTICAL	
PIPE SIZE	H	EQUIVALENT DIAMETER	H	EQUIVALENT DIAMETER	H
12"	2 1/2"	18" to 24"	4"	18"	3"
15"	3"	30" to 36"	5"	24"	4"
18" - 24"	4"	42" to 54"	6"	30" to 36"	5"
27" - 36"	5"	60" to 72"	7"	42" to 54"	6"
42" - 54"	6"			60"	7"
60" - 72"	7"				
78" - 90"	8"				

BAR SIZES				
	PIPE SIZE (DIA. or EQUIV.)	HOLE DIA. REQ'D.	BOLT DIA.	BAR SIZE
ROUND	12" - 24"	3/4"	3/4"	#4
	27" - 48"	7/8"	3/4"	1"
	54" - 90"	1 1/8"	1"	1 1/4"
ARCH	up to 24" eq.	7/8"	3/4"	1"
	30" to 48"	1"	7/8"	1"
	54" to 72"	1 1/8"	1"	1 1/4"
ELLIPTICAL	up to 24" eq.	3/4"	3/4"	3/4"
	30" to 48"	1"	7/8"	1"
	54" to 60"	1 1/8"	1"	1 1/4"
BOLT LENGTH = PIPE WALL THICKNESS + 2 1/2"				

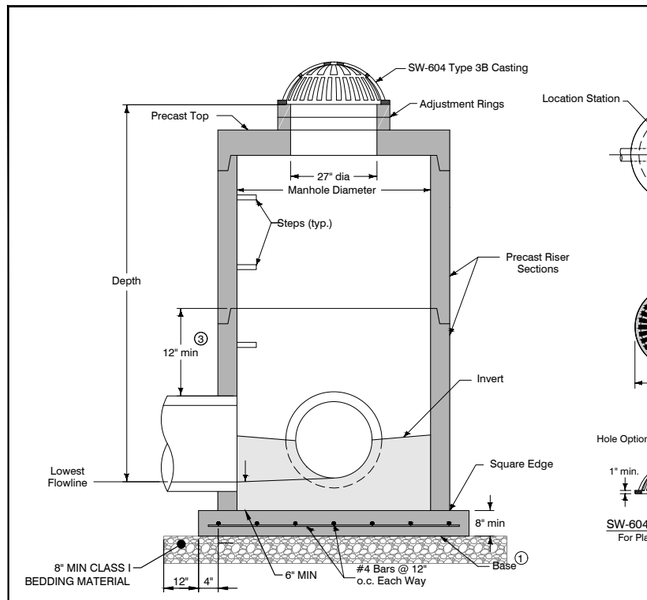
FIGURE 4020.224 SHEET 1 OF 1

SUDAS

REVISION
New 10-18-16
4030.224
SHEET 1 of 1

SUDAS Standard Specifications

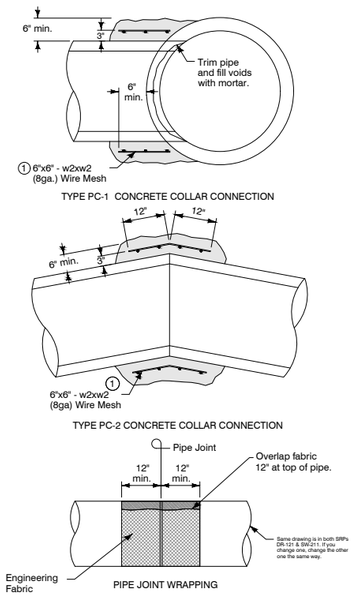
CONCRETE PIPE APRON GUARD

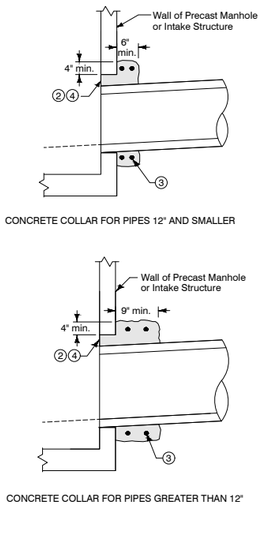


1. Cast-in-place base shown. If base is precast integral with bottom riser, the footprint of the base is not required to extend beyond the outer edge of the riser.
2. For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
3. 12 inch minimum riser height above all pipe openings.

Manhole Diameter (inches)	Maximum Pipe Diameter (inches) for 2 Pipes (2) At 180° Separation	At 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42

MODIFIED SW401 OUTLET STRUCTURE DETAIL
NTS AG472





1. Lap ends of wire mesh a minimum of 6 inches.
2. Concrete collar is required when annular space between the outside of the pipe and the wall of the structure is 2 inches or greater.
3. Provide two #4 hoop bars in concrete collar. Lap bars a minimum of 6 inches.
4. Trowel concrete flush with inside wall of structure.

FIGURE 4020.211 SHEET 1 OF 1

SUDAS | IOWADOT

REVISION
2 10-17-18
SW-211
SHEET 1 of 1

FIGURE 4020.211 | STANDARD ROAD PLAN

REVISIONS: Removed "inset" callout on Pipe to Structure View. Retitled and replaced old Iowa DOT and SUDAS logos with new logos.

Paul D. Wiegand, SUDAS DIRECTOR | Adrian Smith, DESIGN METHODS ENGINEER

STORM SEWER PIPE CONNECTIONS

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SAC COUNTY IOWA

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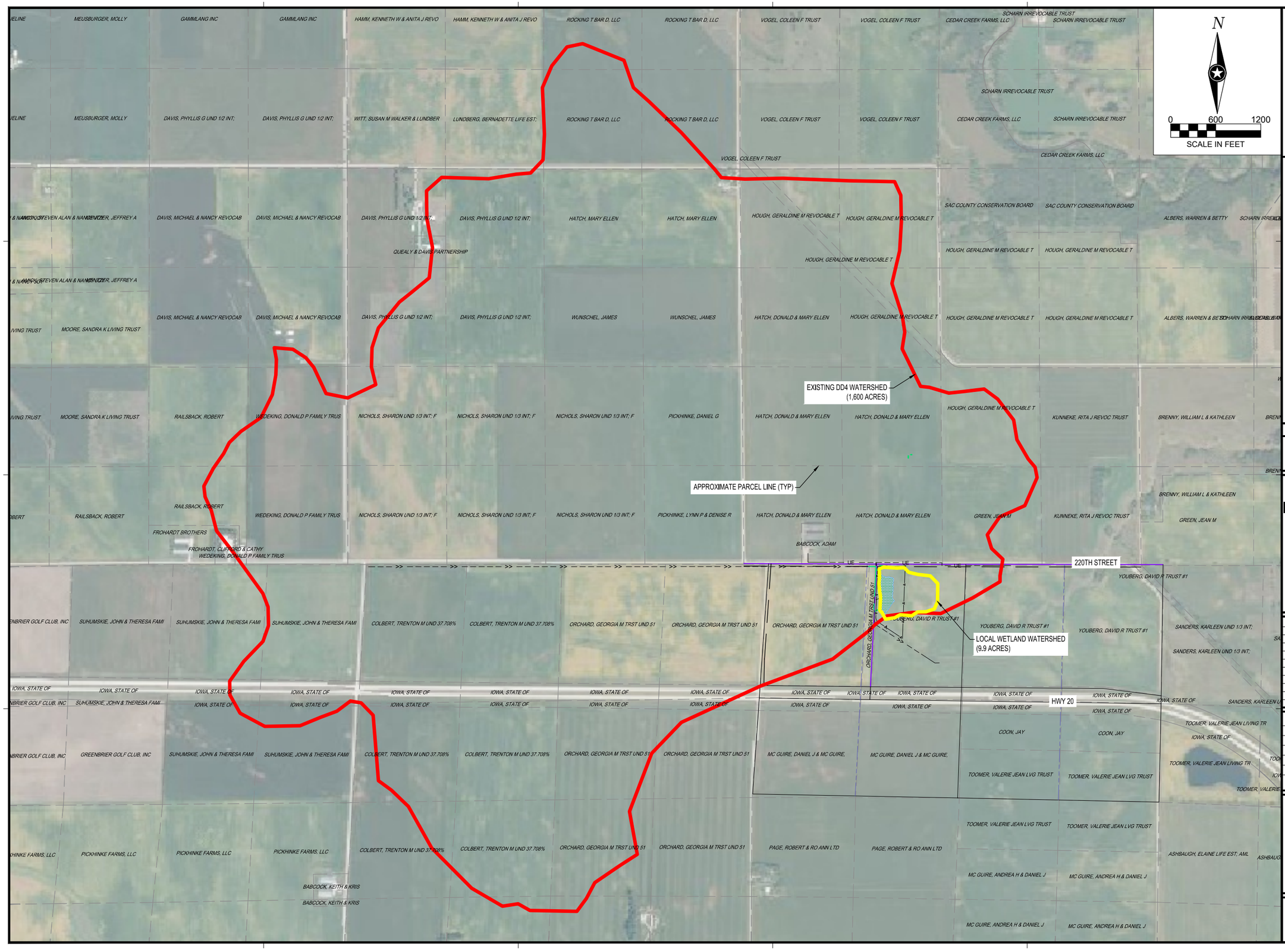
PROJECT NO.	24-31714
FILE NAME	31714-C0-DETAILS
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

SITE DETAILS

SHEET

C0-33



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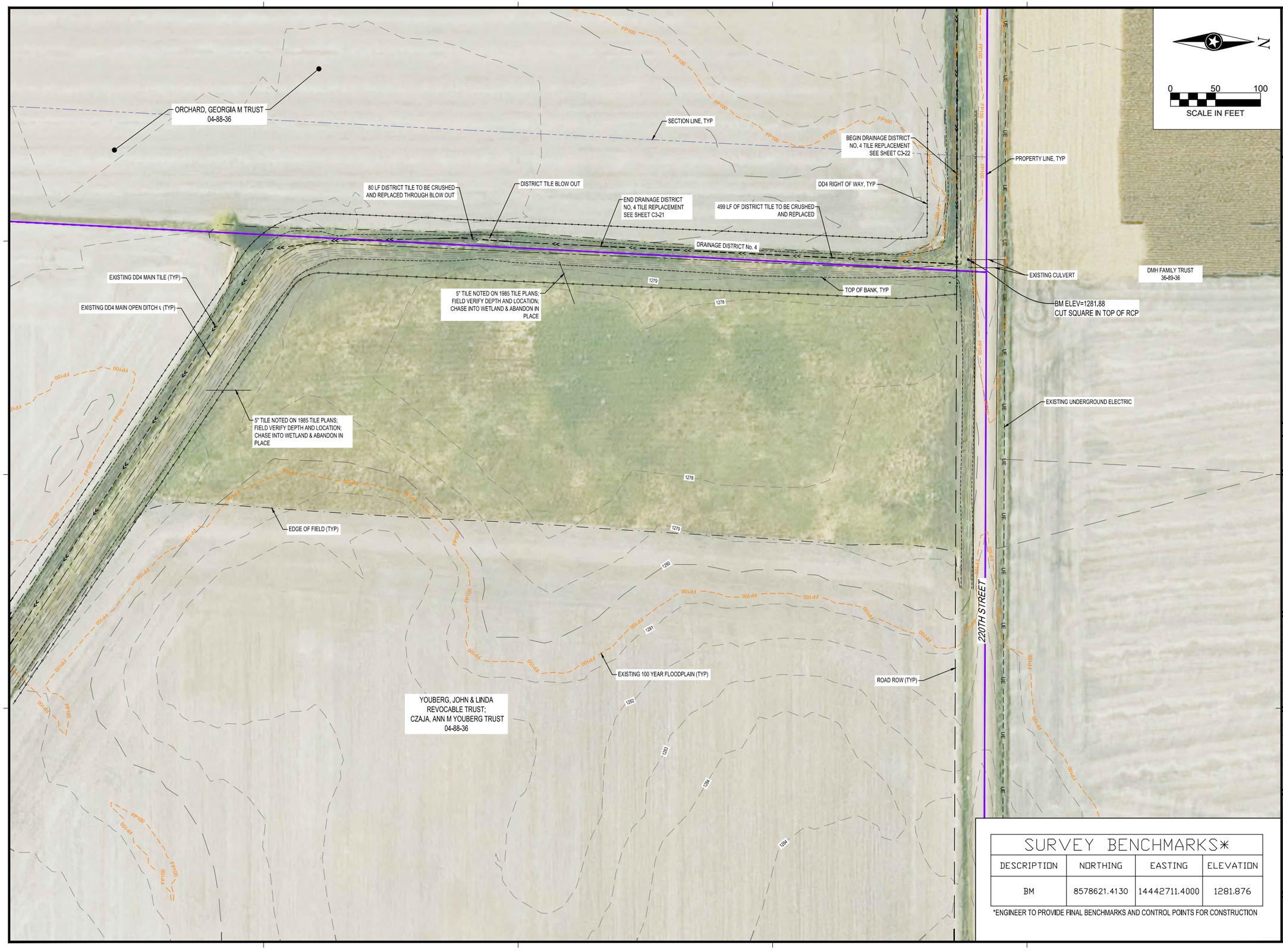
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DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

EXISTING SITE - WATERSHED

SHEET

C2-10



SURVEY BENCHMARKS*			
DESCRIPTION	NORTHING	EASTING	ELEVATION
BM	8578621.4130	14442711.4000	1281.876

*ENGINEER TO PROVIDE FINAL BENCHMARKS AND CONTROL POINTS FOR CONSTRUCTION

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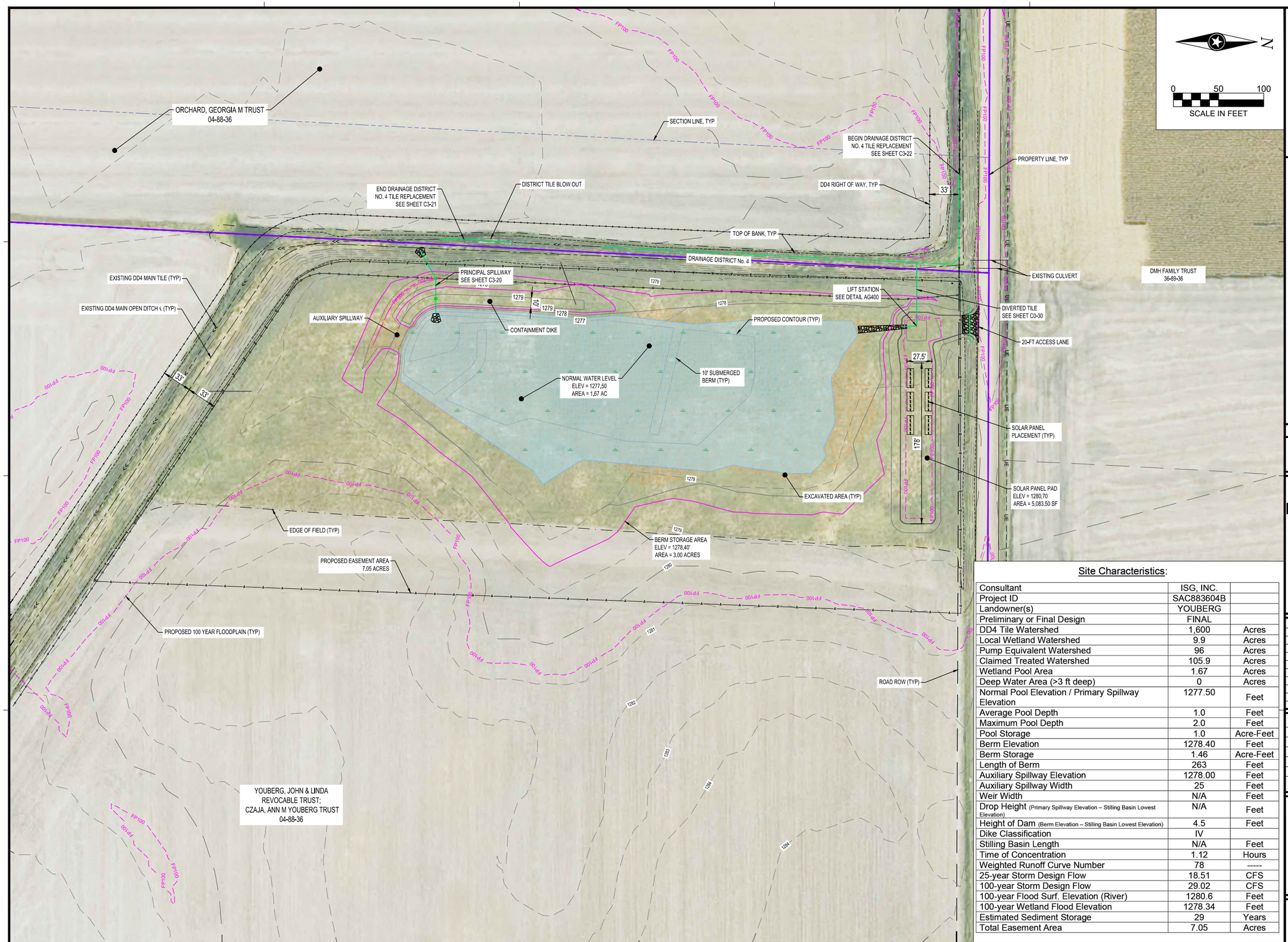
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FILE NAME	31714-C2-EXIS
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ORIGINAL ISSUE DATE	12/30/2025
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TITLE

EXISTING SITE REMOVALS

SHEET

C2-11



Site Characteristics:

Consultant	ISG, INC.	
Project ID	SAC883604B	
Landowner(s)	YOUBERG	
Preliminary or Final Design	FINAL	
DD4 Tile Watershed	1,600	Acres
Local Wetland Watershed	9.9	Acres
Pump Equivalent Watershed	96	Acres
Claimed Treated Watershed	105.9	Acres
Wetland Pool Area	1.67	Acres
Deep Water Area (>3 ft deep)	0	Acres
Normal Pool Elevation / Primary Spillway Elevation	1277.50	Feet
Average Pool Depth	1.0	Feet
Maximum Pool Depth	2.0	Feet
Pool Storage	1.0	Acre-Feet
Berm Elevation	1278.40	Feet
Berm Storage	1.46	Acre-Feet
Length of Berm	263	Feet
Auxiliary Spillway Elevation	1278.00	Feet
Auxiliary Spillway Width	25	Feet
Weir Width	N/A	Feet
Drop Height (Primary Spillway Elevation – Stilling Basin Lowest Elevation)	N/A	Feet
Height of Dam (Berm Elevation – Stilling Basin Lowest Elevation)	4.5	Feet
Dike Classification	IV	
Stilling Basin Length	N/A	Feet
Time of Concentration	1.12	Hours
Weighted Runoff Curve Number	78	-----
25-year Storm Design Flow	18.51	CFS
100-year Storm Design Flow	29.02	CFS
100-year Flood Surf. Elevation (River)	1280.6	Feet
100-year Wetland Flood Elevation	1278.34	Feet
Estimated Sediment Storage	29	Years
Total Easement Area	7.05	Acres

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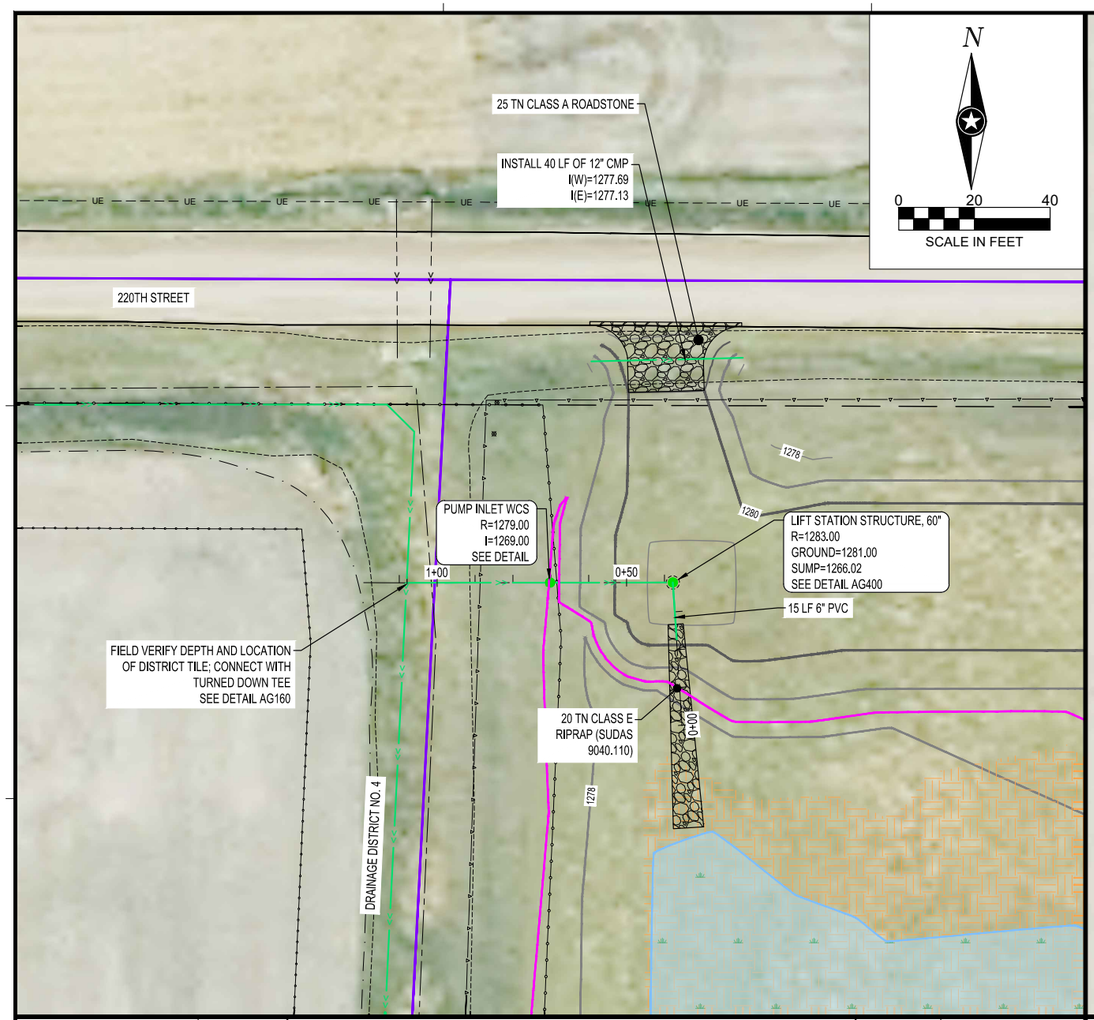
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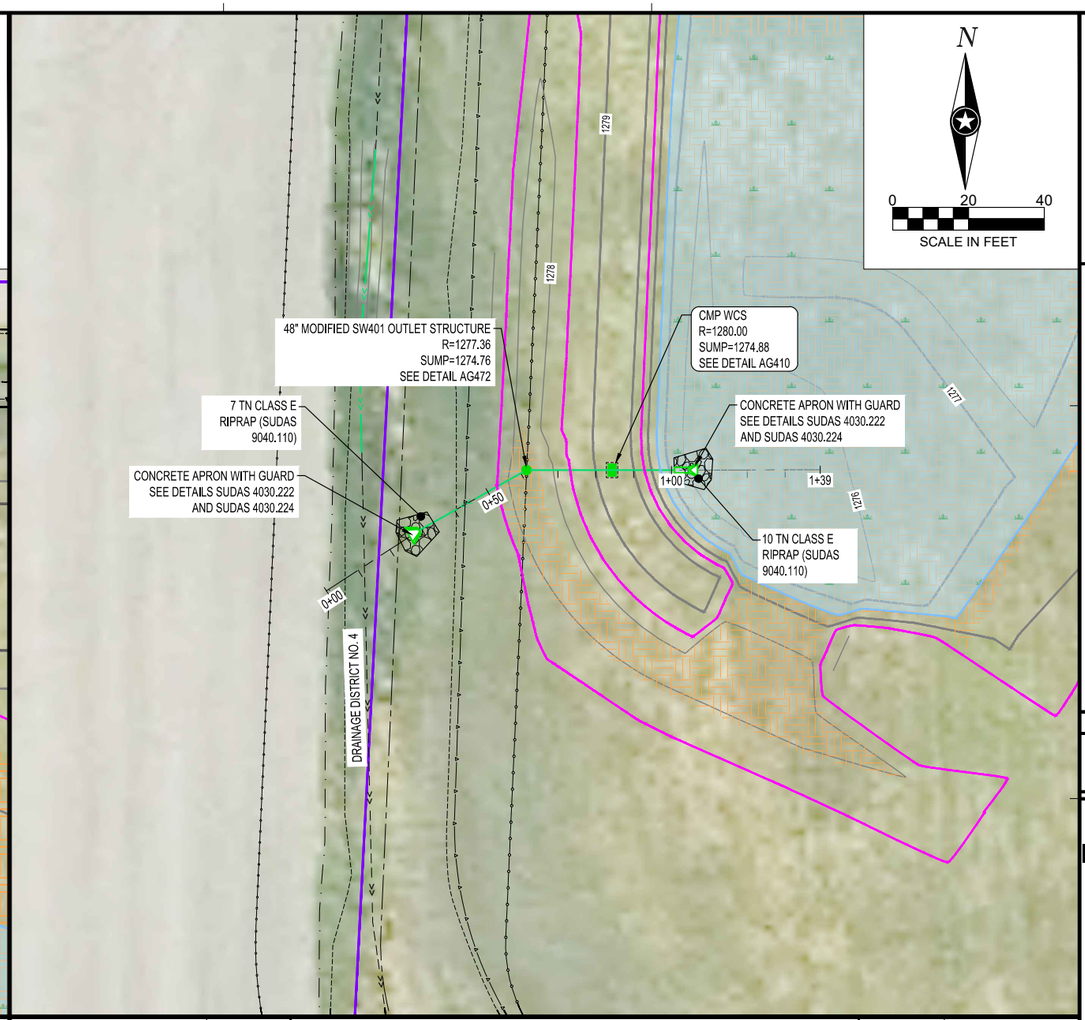
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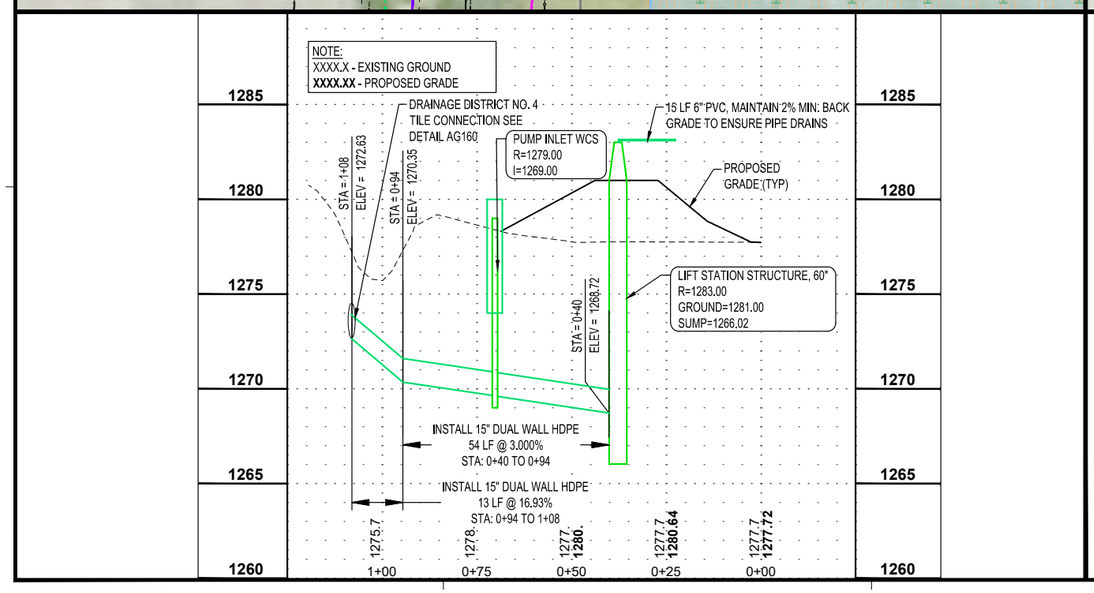
SITE PLAN

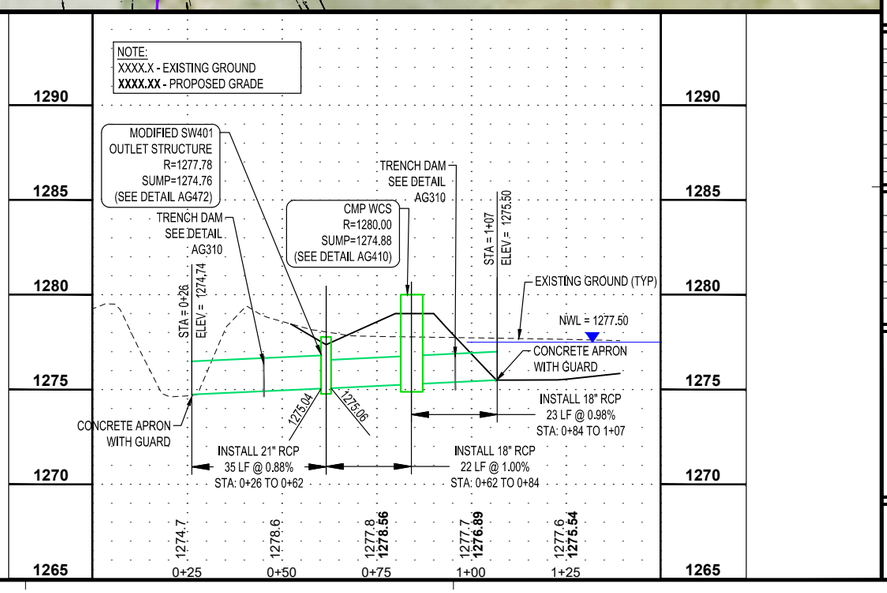
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C3-10









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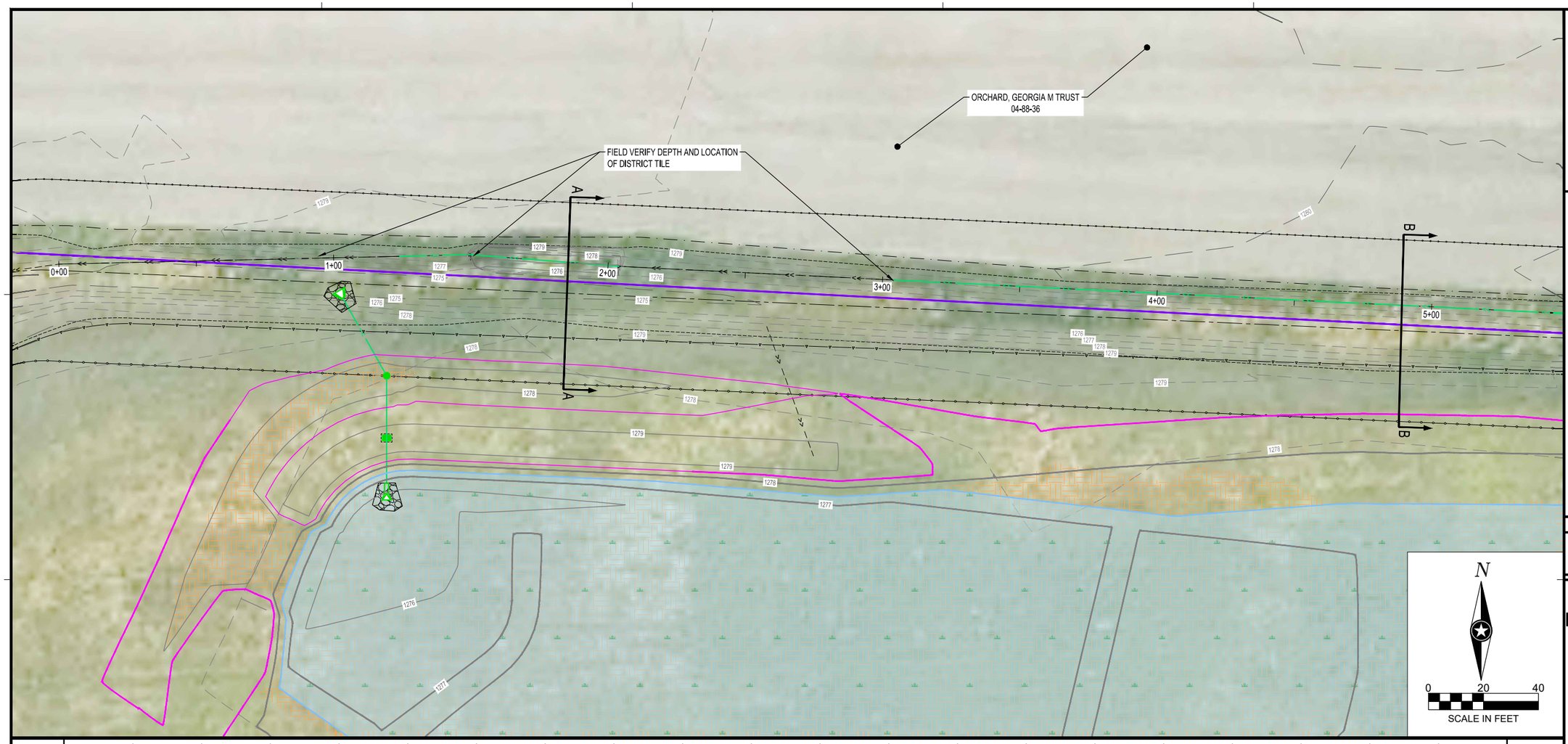
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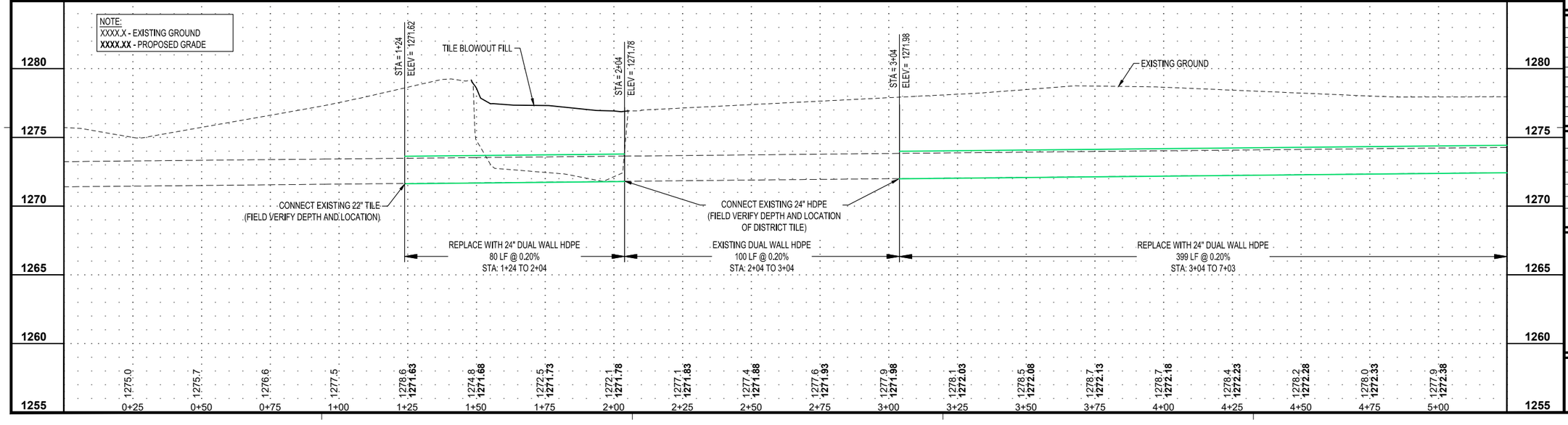
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PLAN - PROFILE (INLET-OUTLET)

SHEET

C3-20





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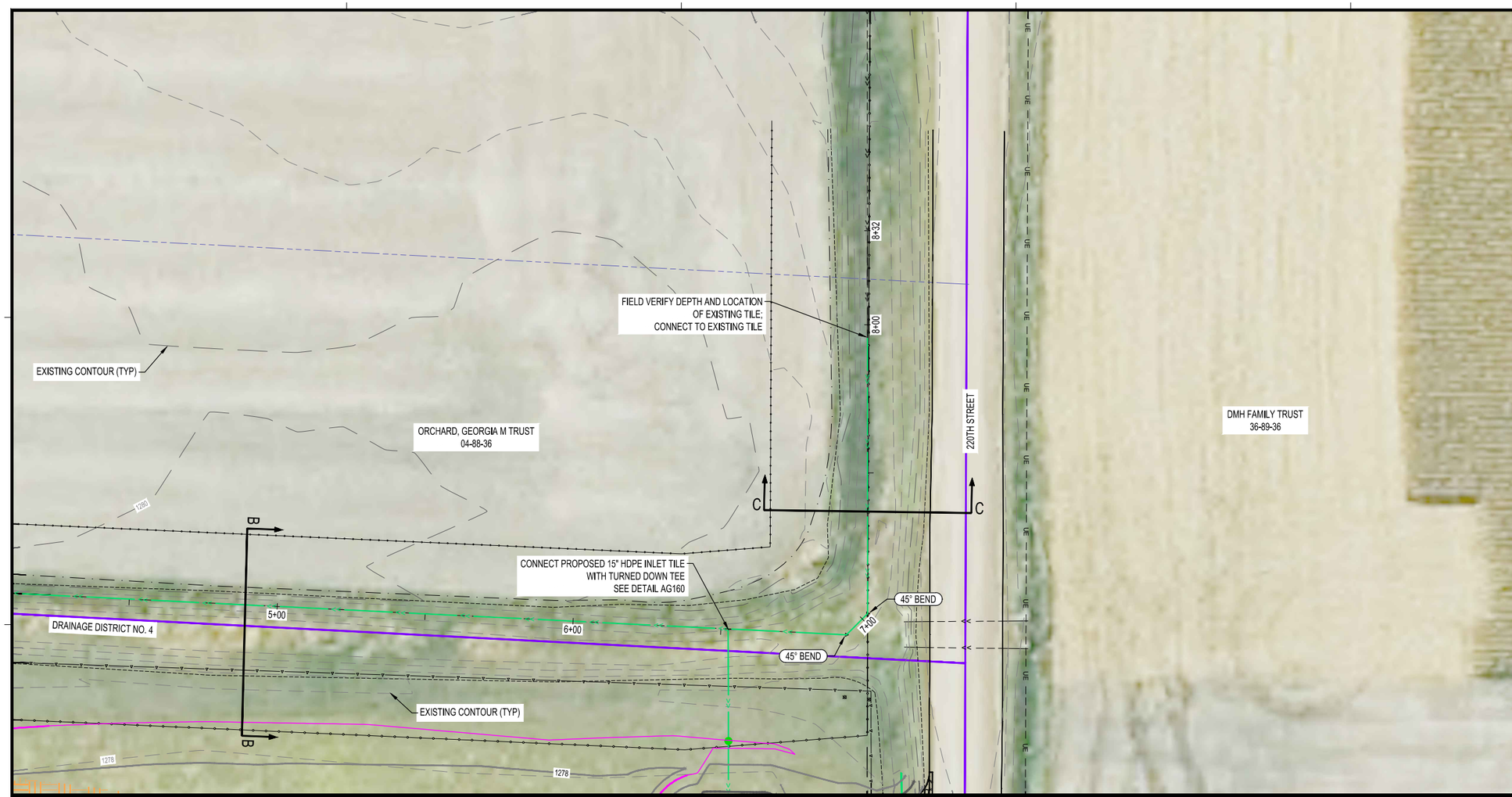
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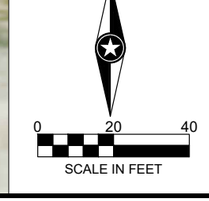
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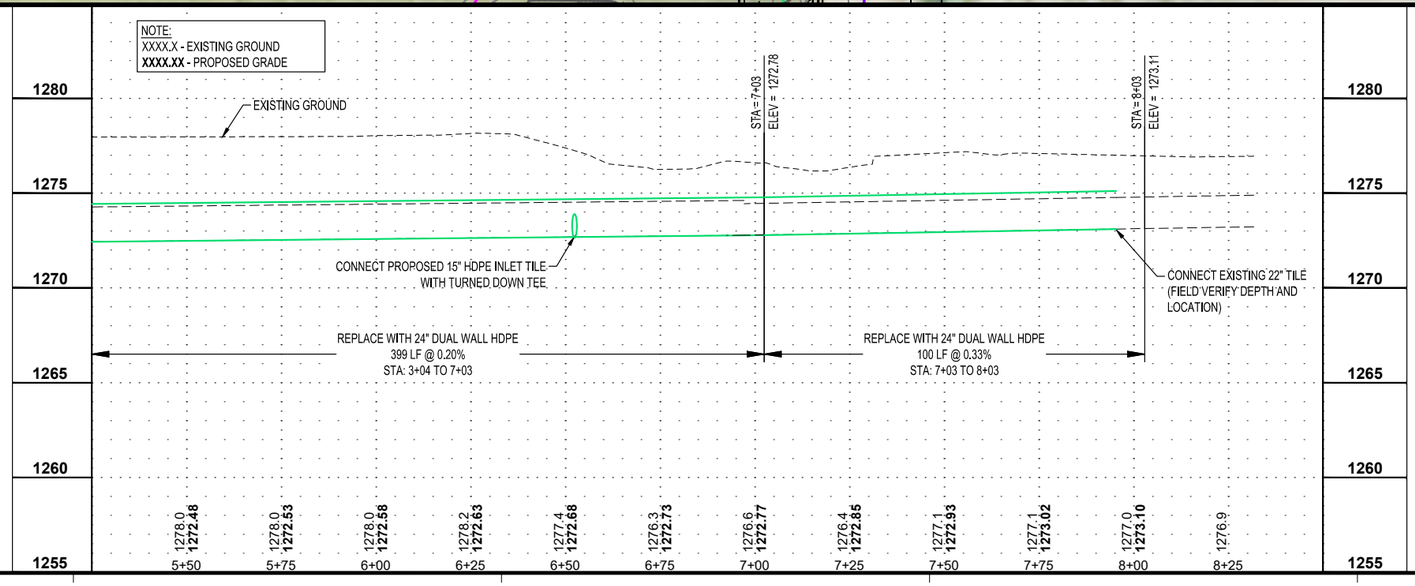
PLAN - PROFILE (DISTRICT TILE)

SHEET

C3-21







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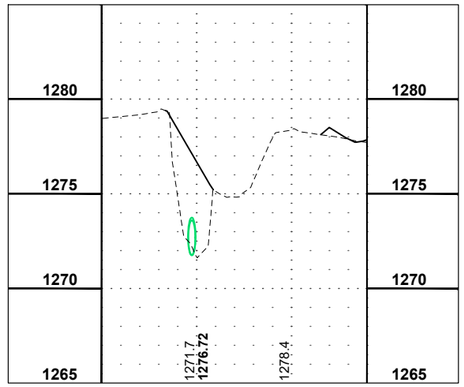
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PLAN - PROFILE (DISTRICT TILE)

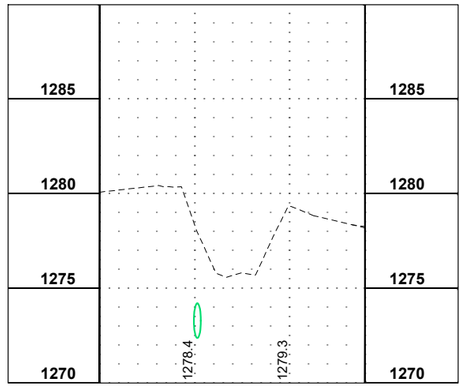
SHEET

C3-22

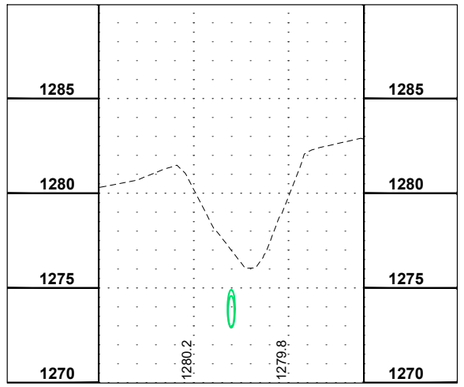
SECTION A-A



SECTION B-B



SECTION C-C



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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-C31-PROFILE
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

CROSS SECTIONS

SHEET

C3-30



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IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

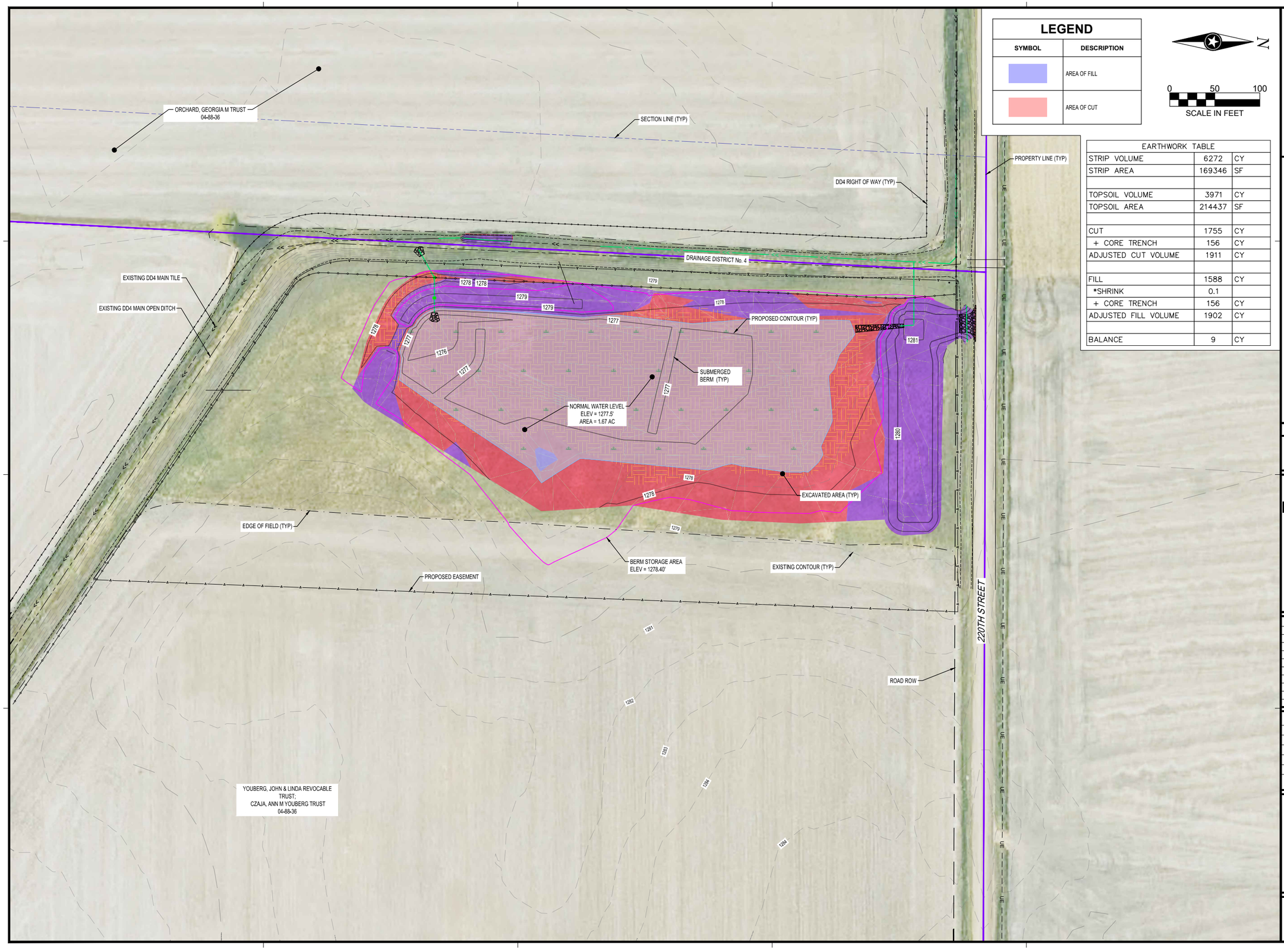
PROJECT NO.	24-31714
FILE NAME	31714-C4-GRADE
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

GRADING PLAN

SHEET

C4-10



LEGEND

SYMBOL	DESCRIPTION
	AREA OF FILL
	AREA OF CUT

N

0 50 100
SCALE IN FEET

EARTHWORK TABLE		
STRIP VOLUME	6272	CY
STRIP AREA	169346	SF
TOPSOIL VOLUME	3971	CY
TOPSOIL AREA	214437	SF
CUT	1755	CY
+ CORE TRENCH	156	CY
ADJUSTED CUT VOLUME	1911	CY
FILL	1588	CY
*SHRINK	0.1	
+ CORE TRENCH	156	CY
ADJUSTED FILL VOLUME	1902	CY
BALANCE	9	CY

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SAC COUNTY IOWA

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DATE	DESCRIPTION	BY

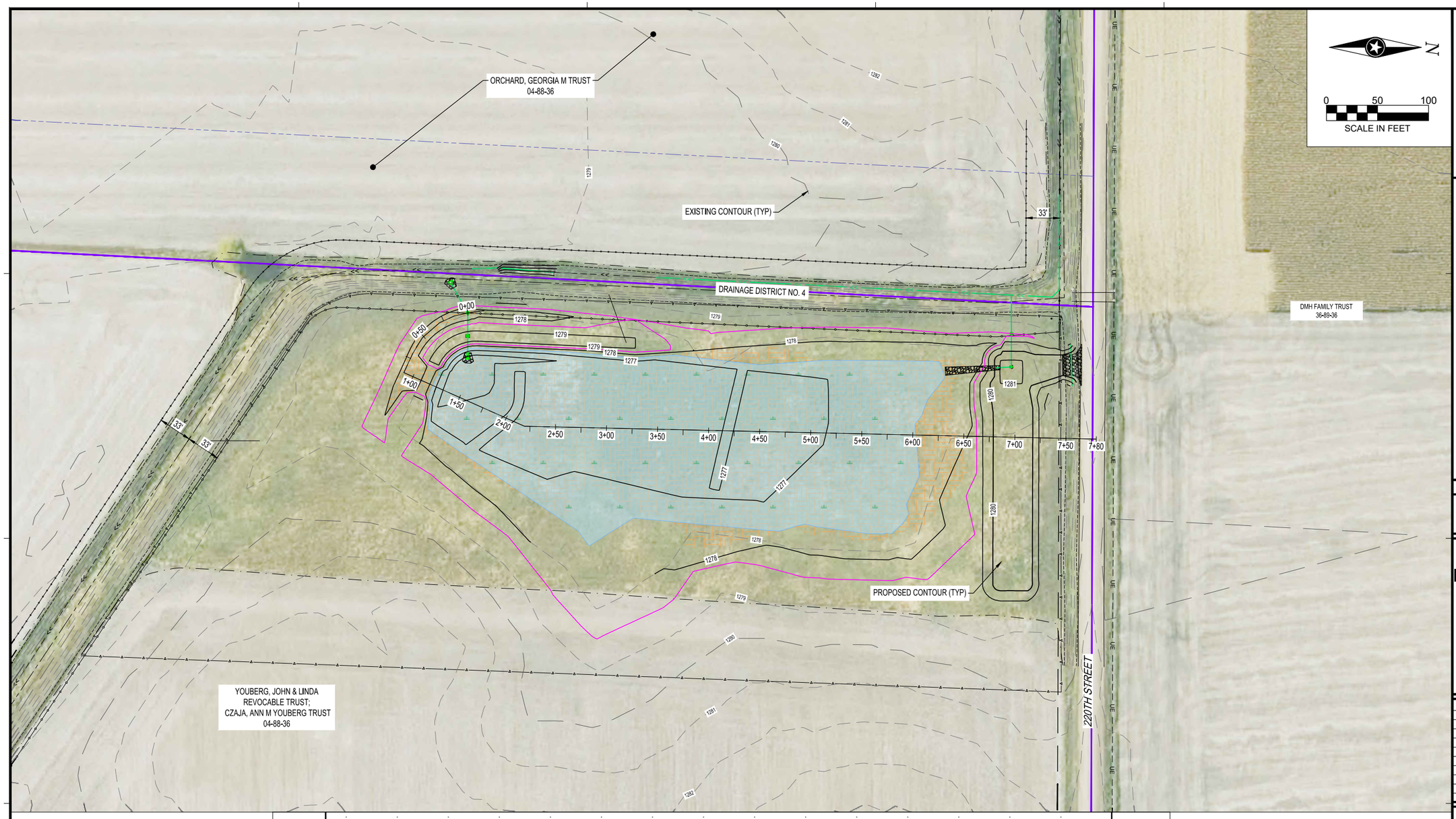
PROJECT NO.	24-31714
FILE NAME	31714-C4-CUT-FILL
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

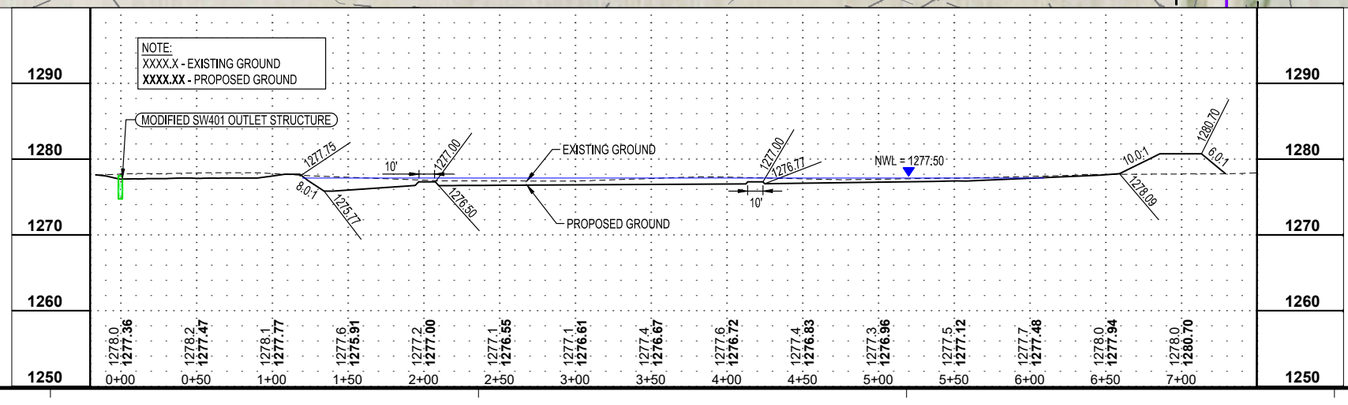
TITLE

CUT - FILL

SHEET

C4-20





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NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-C4-CROSS SECTION
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

CROSS SECTION

SHEET

C4-30



EROSION CONTROL LEGEND

SYMBOL	DESCRIPTION
	RIP RAP, CLASS E OR EROSION STONE
	BUFFER SEEDING
	STRUCTURE/CHANNEL SEEDING
	STRAW WATTLE
101	EXISTING CONTOUR (MINOR INTERVAL)
100	EXISTING CONTOUR (MAJOR INTERVAL)
101	PROPOSED CONTOUR (MINOR INTERVAL)
100	PROPOSED CONTOUR (MAJOR INTERVAL)

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NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-C1-RESTORATION
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

SITE RESTORATION PLAN

SHEET

C5-10

ELECTRICAL SPECIFICATIONS

1.01. BASIC ELECTRICAL REQUIREMENTS

A. The Electrical Contract Installation shall include a complete Electrical Installation for the project. All conduit, fixtures and equipment herein specified, mentioned or shown on Drawings, shall be furnished and installed in place, connected up and ready for normal operation except for such items as are specifically mentioned to be furnished by others.

B. The Electrical Installation shall meet all applicable local, state and federal codes and standards. All permits necessary for a complete electrical installation shall be paid for by this Contractor.

C. Except in those municipalities which provide state-approved electrical inspection, all installation of electrical equipment wiring shall be inspected by the State Board of Electricity. Allowance shall be made in the bid and contract for the cost of such inspection.

D. Furnish products listed by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction.

E. The Electrical Contractor is responsible for contacting the utility company and coordinating the power connection for the service. Include all costs in bid.

F. This Contractor shall coordinate his work with other Contractors on this job. Any conflict which cannot be resolved shall be settled by the Architect/Engineer.

G. Field verification of scale dimensions on plans is directed since actual locations, distances and levels will be governed by actual field conditions.

H. The Contractors shall check civil, structural, mechanical, and electrical plans to avert possible installation conflicts. Should drastic changes from original plans be necessary to resolve such conflicts this Contractor shall notify the Architect/Engineer and secure written approval and agreement on necessary adjustments before the installation is started.

I. This Contractor shall be responsible for the proper installation and working of everything in this contract and shall guarantee to remedy free of charge any defects in workmanship and materials that may appear to give or gives rise to trouble of any kind for a period of one year from date of final substantial completion.

1.02. LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Nonmetallic-sheathed cable, underground feeder and branch-circuit cable, service entrance cable, and armored cable is not permitted.

D. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.

E. Provide copper conductors except where aluminum conductors are specifically indicated or permitted for substitution. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.

F. Minimum Conductor Size:

1. Branch Circuits: 12 AWG.
   (a) Exceptions:
      (i) 20 A, 120 V circuits longer than 75 feet (23 m): 10 AWG, for voltage drop.
      (ii) 20 A, 120 V circuits longer than 150 feet (46 m): 8 AWG, for voltage drop.

G. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.

H. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

1.03. GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

A. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.

1. Provide continuous grounding electrode conductors without splice or joint.
2. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.

B. Metal Underground Water Pipe(s):

1. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.

C. Ground Rod Electrode(s):

1. Provide two electrodes unless otherwise indicated or required.

D. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

E. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.

1.04. CONDUIT

A. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, implies all applications are acceptable. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

B. Underground:

1. Use rigid PVC conduit (Schedule 40) or galvanized steel rigid metal conduit.
2. Where rigid polyvinyl (PVC) conduit larger than 2 inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit elbows for bends.

C. Exposed, Exterior: Use galvanized steel rigid metal conduit or galvanized electrical metallic tubing (EMT).

D. Minimum Conduit Size, Unless Otherwise Indicated:

1. Underground, Exterior: 1 inch (27 mm) trade size.

E. Provide independent support from structure. Do not provide support from piping, ductwork, or other systems.

F. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.

1.05. IDENTIFICATION FOR ELECTRICAL SYSTEMS

A. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.

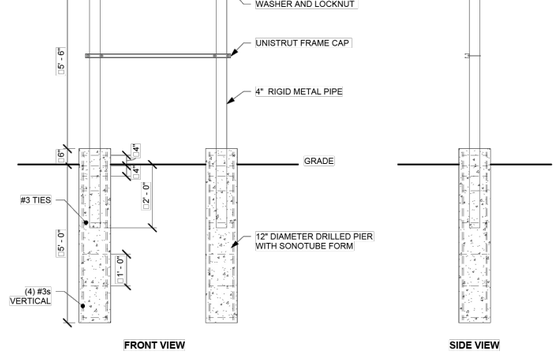
B. Use identification nameplate at each piece of service equipment to identify the available fault current and the date calculations were performed.

C. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.

D. Use identification label or engraved wall plate to identify serving branch circuit for all receptacles.

END OF SPECIFICATION

ALL UNISTRUT, FASTENERS, AND ASSOCIATED MATERALS SHALL BE GALVANIZED STEEL.
DETAIL IS MEANT TO CONVEY MINIMUM CONSTRUCTION REQUIREMENTS.
MAXIMUM DISTANCE BETWEEN VERTICAL SUPPORTS IS SHOWN.
CONTRACTOR RESPONSIBLE FOR SIZING, SUPPLYING, AND CONSTRUCTING STRUCTURE WITH ALL NEEDED MATERIALS TO SUPPORT ALL REQUIRED EQUIPMENT PER PLANS AND SPECIFICATIONS. INCREASE STUCTURE LENGTH WITH ADDITIONAL VERTICAL SUPPORTS AS REQUIRED.
UNISTRUT MAY BE PLACED ON BOTH SIDES OF STRUCTURE FOR INSTALLATION OF EQUIPMENT.
F&I UNISTRUT AS REQUIRED TO PROPERLY SECURE EQUIPMENT. ENCLOSURES SHALL BE SECURED AT TOP AND BOTTOM, AND ADDITIONAL SUPPORTS SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER OR REQUIRED.



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PROJECT

IDALS SAC883604B

NUTRIENT REDUCTION WETLAND

SAC COUNTY IOWA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	24-31714
FILE NAME	31714-E-1-ELEC
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

ELECTRICAL SPECIFICATIONS

SHEET

E2.00



PLAN NOTES:

1. INSTALL SOLAR POWERED PUMP CONTROL PANEL AND ALL ASSOCIATED EQUIPMENT AS RECOMMENDED BY THE EQUIPMENT SUPPLIER TO MAKE A COMPLETE WORKING SYSTEM. FURNISH AND INSTALL FREE STANDING SUPPORT STRUCTURE, REFER TO DETAIL.
2. INSTALL WET WELL LEVEL SENSORS (BY EQUIPMENT SUPPLIER). INSTALL INTEGRAL SENSOR CABLES IN CONDUIT TO PUMP CONTROL PANEL WITHOUT SPLICING.
3. INSTALL SOLAR PANELS AND ALL ASSOCIATED EQUIPMENT AS RECOMMENDED BY EQUIPMENT SUPPLIER TO MAKE A COMPLETE WORKING SYSTEM. FURNISH AND INSTALL CONDUCTORS IN CONDUIT BETWEEN SOLAR PANELS AND PUMP CONTROL PANEL EQUIPMENT AS RECOMMENDED BY EQUIPMENT SUPPLIER TO MAKE A COMPLETE WORKING SYSTEM.

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PROJECT NO.	24-31714
FILE NAME	31714-E-1-ELEC
DRAWN BY	JAT
DESIGNED BY	HPT
REVIEWED BY	SDP
ORIGINAL ISSUE DATE	12/30/2025
CLIENT PROJECT NO.	-

TITLE

SITE ELECTRICAL PLAN

SHEET

E2.01