

CONSTRUCTION PLANS FOR CREP PROJECT NO. BUT901622D

SITE GRADING, BERM CONSTRUCTION, WATER CONTROL STRUCTURES
RIP RAP, EROSION AND SEDIMENT CONTROL

BUTLER COUNTY, IOWA

AUGUST 2021

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 "SUDAS SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" SHALL GOVERN.

IOWA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION", SERIES 2015 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.

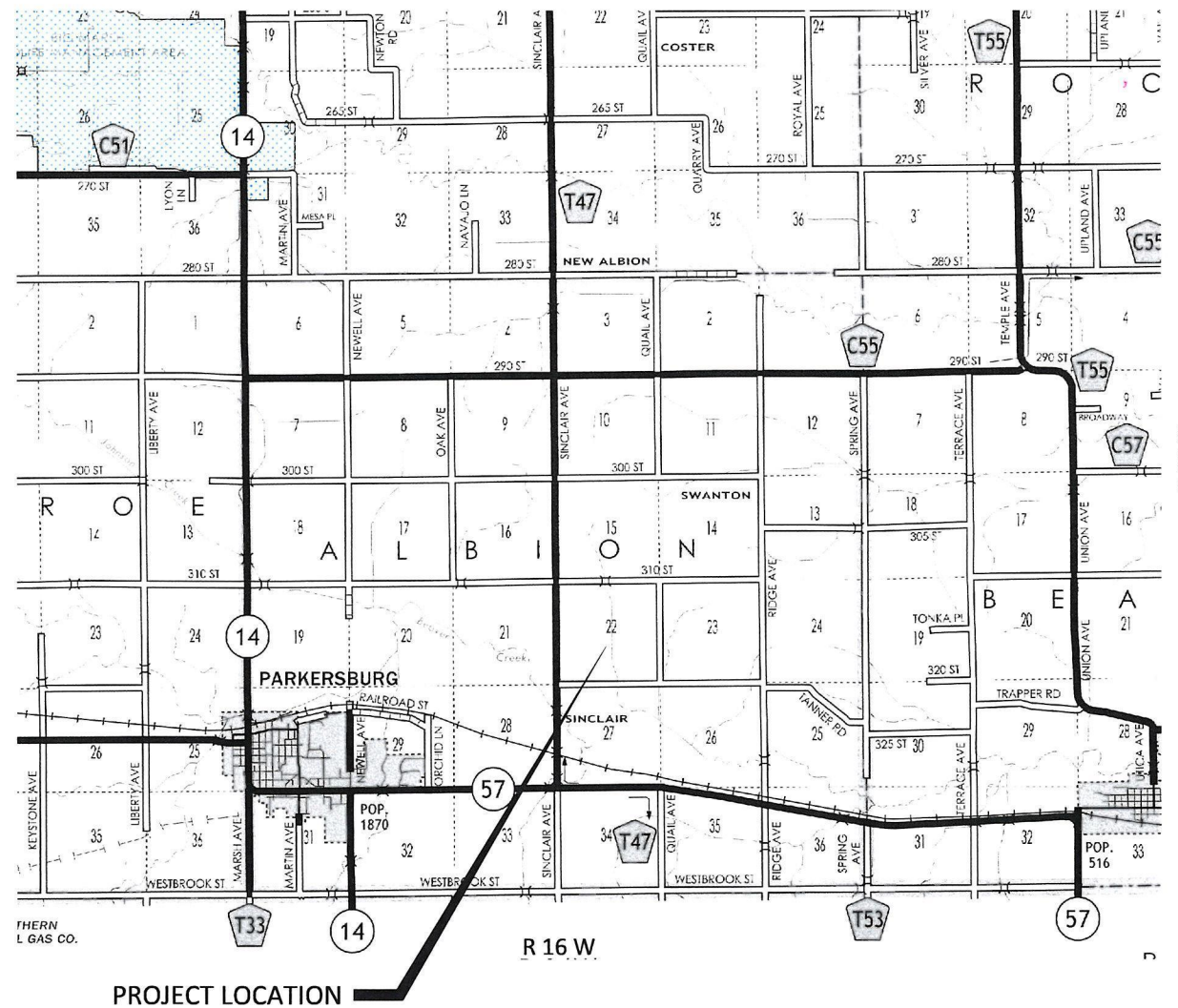
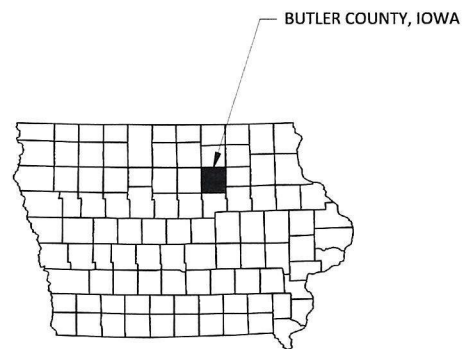


NOTE: THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY IOWA ONE CALL, 811 OR 1-800-292-8989.

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."

IF, DURING THE COURSE OF WORK, ITEMS OF HISTORICAL SIGNIFICANCE ARE FOUND, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY ENGINEER.

MAP OF PORTIONS
BUTLER COUNTY, IOWA



SHEET NUMBER	SHEET TITLE
A.01	TITLE SHEET
A.02	LEGEND SHEET
A.03	EXISTING SITE PLAN
A.04	PROPOSED SITE PLAN
C.01	ESTIMATED OF QUANTITIES AND REFERENCE NOTES
D.01, D.02	BYPASS PLAN AND PROFILE
D.03	BASIN OUTLET PLAN AND PROFILE
D.04, D.05	BERM PLAN AND PROFILE
D.06	BERM AND EMERGENCY SPILLWAY PLAN AND PROFILE
D.07	EXISTING OPEN DITCH PLAN AND PROFILE
K.01	STRUCTURE DETAILS
K.02	MODIFIED STRUCTURE DETAILS
K.03	MISCELLANEOUS TRENCH AND CONNECTION DETAILS
K.04	RCP INSTALLATION DETAILS
K.05	SEEDING AREAS

THIS PLAN SET CONTAINS 17 SHEETS.

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: June 21, 2023

MY LICENSE RENEWAL DATE IS 12/31/2024

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL PLAN SHEETS

IOWA ENGINEERING JOB APPROVAL AUTHORITY: JOB CLASS III

PROJECT DATUM:
NAD83, IOWA STATE PLANES, NORTH ZONE, U.S. FEET

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RMC			
RMC			
JPR			
A16.120760			

IOWA DEPARTMENT OF AGRICULTURE
BUTLER COUNTY CREP SITE PROJECT NO. BUT901622D
TITLE SHEET

SHEET
A.01

EXISTING TOPOGRAPHIC SYMBOLS

	ACCESS GRATE		REGULATION STATION GAS
	AIR CONDITION UNIT		SATELLITE DISH
	ANTENNA		SIGN NON TRAFFIC
	AUTO SPRINKLER CONNECTION		SIGN TRAFFIC
	BARRICADE PERMANENT		SIGNAL CONTROL CABINET
	BASKETBALL POST		SOIL BORING
	BENCH		SIREN
	BIRD FEEDER		TELEPHONE BOOTH
	BOLLARD		TILE INLET
	BUSH		TILE OUTLET
	CATCH BASIN RECTANGULAR CASTING		TILE RISER
	CATCH BASIN CIRCULAR CASTING		TRANSFORMER-ELECTRIC
	CURB STOP		TREE-CONIFEROUS
	CLEAN OUT		TREE-DEAD
	CULVERT END		TREE-DECIDUOUS
	DRINKING FOUNTAIN		TREE STUMP
	DOWN SPOUT		TRAFFIC ARM BARRIER
	FILL PIPE		TRAFFIC SIGNAL
	FIRE HYDRANT		TRASH CAN
	FLAG POLE		UTILITY MARKER
	FLARED END / APRON		VALVE
	FUEL PUMP		VALVE POST INDICATOR
	GRILL		VALVE VAULT
	GUY WIRE ANCHOR		VAULT
	HANDHOLE		VENT PIPE
	HANDICAP SPACE		WATER SPIGOT
	IRRIGATION SPRINKLER HEAD		WELL
	IRRIGATION VALVE BOX		WETLAND DELINEATED MARKER
	LIFT STATION CONTROL PANEL		WETLAND
	LIFT STATION		WET WELL
	LIGHT ON POLE		YARD HYDRANT
	LIGHT-GROUND		
	MAILBOX		

PROPOSED TOPOGRAPHIC SYMBOLS

	CLEANOUT
	MANHOLE
	LIFT STATION
	STORM SEWER CIRCULAR CASTING
	STORM SEWER RECTANGULAR CASTING
	STORM SEWER FLARED END / APRON
	STORM SEWER OUTLET STRUCTURE
	STORM SEWER OVERFLOW STRUCTURE
	CURB BOX
	FIRE HYDRANT
	WATER VALVE
	WATER REDUCER
	WATER BEND
	WATER TEE
	WATER CROSS
	WATER SLEEVE
	WATER CAP / PLUG
	RIP RAP
	DRAINAGE FLOW
	TRAFFIC SIGNS

SURVEY SYMBOLS

	BENCHMARK LOCATION
	CONTROL POINT
	MONUMENT FOUND
	CAST IRON MONUMENT
	STONE MONUMENT

EXISTING TOPOGRAPHIC LINES

	RETAINING WALL
	FENCE
	FENCE-DECORATIVE
	GUARD RAIL
	TREE LINE
	BUSH LINE

SURVEY LINES

	CONTROLLED ACCESS BOUNDARY
	CENTERLINE
	EXISTING EASEMENT LINE
	PROPOSED EASEMENT LINE
	EXISTING LOT LINE
	PROPOSED LOT LINE
	EXISTING RIGHT-OF-WAY
	PROPOSED RIGHT-OF-WAY
	SETBACK LINE
	SECTION LINE
	QUARTER LINE
	SIXTEENTH LINE
	TEMPORARY EASEMENT

EXISTING UTILITY LINES

	FORCEMAIN
	SANITARY SEWER
	SANITARY SERVICE
	STORM SEWER
	STORM SEWER DRAIN TILE
	WATERMAIN
	WATER SERVICE

PROPOSED UTILITY LINES

	FORCEMAIN
	SANITARY SEWER
	SANITARY SERVICE
	STORM SEWER
	STORM SEWER DRAIN TILE
	WATERMAIN
	WATER SERVICE
	PIPE CASING

GRADING INFORMATION

	EXISTING CONTOUR MINOR
	EXISTING CONTOUR MAJOR
	PROPOSED CONTOUR MINOR
	PROPOSED CONTOUR MAJOR
	PROPOSED GRADING LIMITS / SLOPE LIMITS
	PROPOSED SPOT ELEVATION
	RISE:RUN (SLOPE)

HATCH PATTERNS

	BITUMINOUS		GRAVEL
	CONCRETE		

EXISTING PRIVATE UTILITY LINES

NOTE:
EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY IOWA ONE CALL, 1-800-292-8989.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY 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"

	UNDERGROUND FIBER OPTIC
	UNDERGROUND ELECTRIC
	UNDERGROUND GAS
	UNDERGROUND COMMUNICATION
	OVERHEAD ELECTRIC
	OVERHEAD COMMUNICATION
	OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-02.

UTILITY QUALITY LEVELS:

QUALITY LEVEL D: PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

QUALITY LEVEL C: INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. INCLUDES QUALITY LEVEL D ACTIVITIES.

QUALITY LEVEL B: INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND COLLECTING THE INFORMATION THROUGH A SURVEY METHOD. INCLUDES QUALITY LEVEL C AND D TASKS.

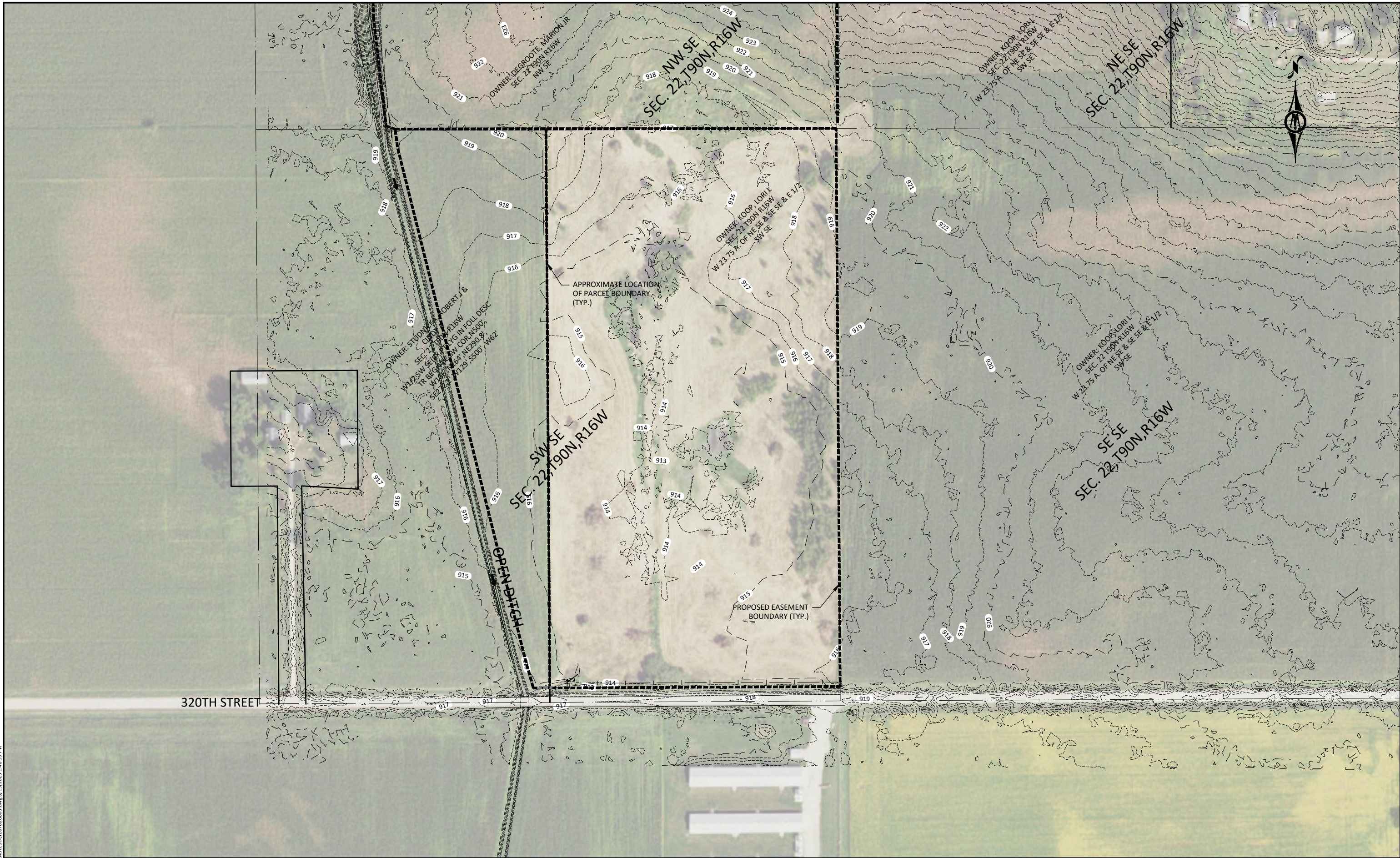
QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GRAV	GRAVEL	RSC	RIGID STEEL CONDUIT
ADJ	ADJUST	GU	GUTTER	RT	RIGHT
ALT	ALTERNATE	GV	GATE VALVE	SAN	SANITARY SEWER
B-B	BACK TO BACK	HDPE	HIGH DENSITY POLYETHYLENE	SCH	SCHEDULE
BIT	BITUMINOUS	HH	HANDHOLE	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL	CLASS	MAX	MAXIMUM	TYP	TYPICAL
CLVT	CULVERT	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VERT	VERTICAL
C.O.	CHANGE ORDER	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
COMM	COMMUNICATION	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CON	CONCRETE	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
CSP	CORRUGATED STEEL PIPE	NTS	NOT TO SCALE	WM	WATERMAIN
DIA	DIAMETER	NWL	NORMAL WATER LEVEL		
DIP	DUCTILE IRON PIPE	OHW	ORDINARY HIGH WATER LEVEL		
DWY	DRIVEWAY	PC	POINT OF CURVE	AC	ACRES
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CF	CUBIC FEET
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CV	COMPACTED VOLUME
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CY	CUBIC YARD
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EA	EACH
ER	END RADIUS	PERM	PERMANENT	EV	EXCAVATED VOLUME
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LB	POUND
EX	EXISTING	PL	PROPERTY LINE	LF	LINEAR FEET
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LS	LUMP SUM
F-F	FACE TO FACE	PT	POINT OF TANGENT	LV	LOOSE VOLUME
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SF	SQUARE FEET
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SV	STOCKPILE VOLUME
FM	FORCEMAIN	R	RADIUS	SY	SQUARE YARD
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		



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RMC			
RMC			
JPR			
CLIENT PROJ. NO. A16.120760			



320TH STREET

GREEN HIGHWAY

NW SE
SEC. 22, T90N, R16W

NE SE
SEC. 22, T90N, R16W

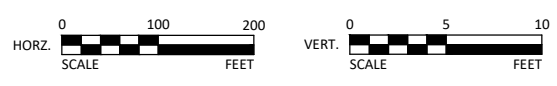
SW SE
SEC. 22, T90N, R16W

SE SE
SEC. 22, T90N, R16W

APPROXIMATE LOCATION
OF PARCEL BOUNDARY
(TYP.)

PROPOSED EASEMENT
BOUNDARY (TYP.)

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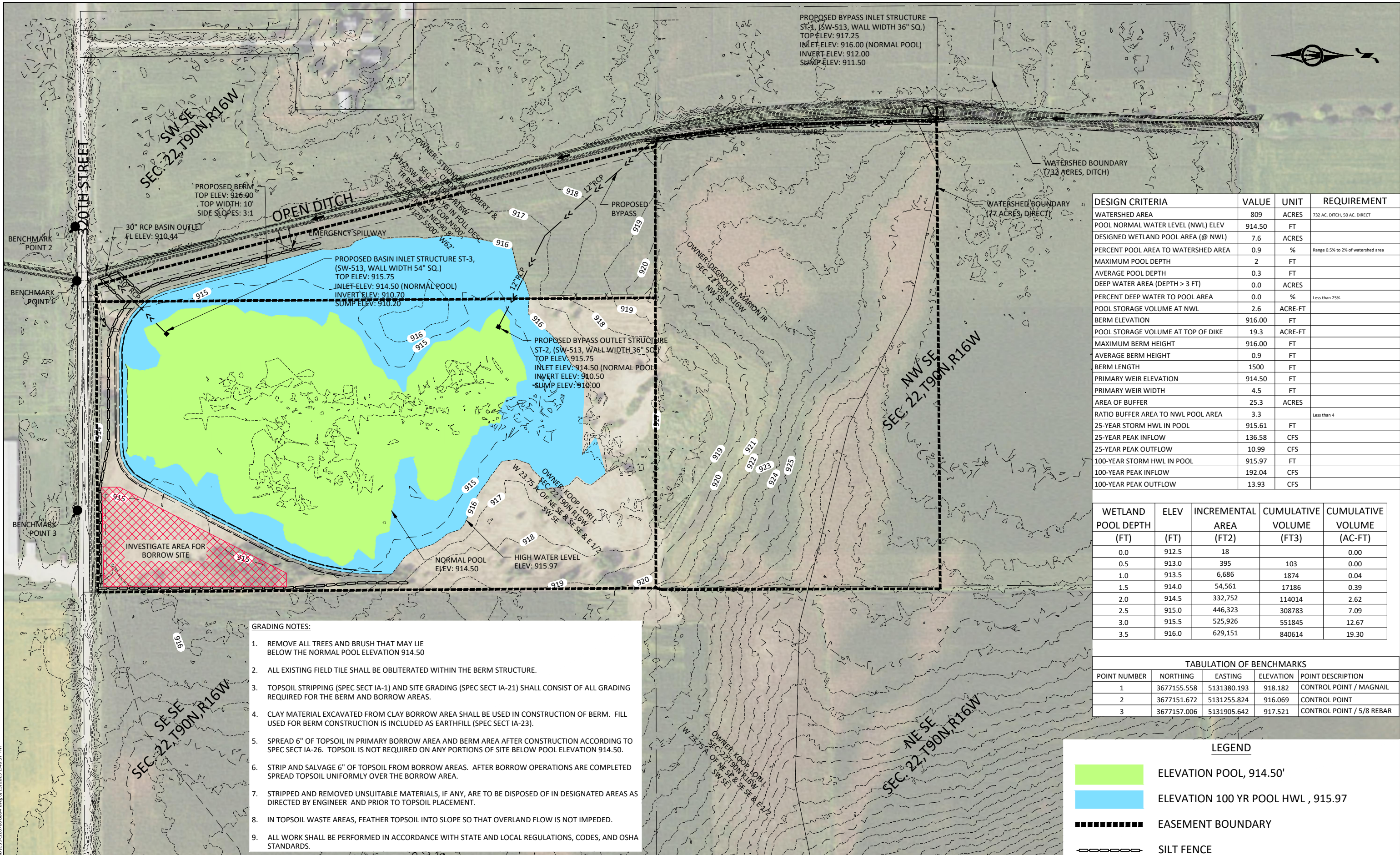
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IOWA DEPARTMENT OF AGRICULTURE
BUTLER COUNTY CREP SITE PROJECT NO. BUT901622D

EXISTING SITE PLAN

SHEET
A.03



DESIGN CRITERIA	VALUE	UNIT	REQUIREMENT
WATERSHED AREA	809	ACRES	732 AC. DITCH, 50 AC. DIRECT
POOL NORMAL WATER LEVEL (NWL) ELEV	914.50	FT	
DESIGNED WETLAND POOL AREA (@ NWL)	7.6	ACRES	
PERCENT POOL AREA TO WATERSHED AREA	0.9	%	Range 0.5% to 2% of watershed area
MAXIMUM POOL DEPTH	2	FT	
AVERAGE POOL DEPTH	0.3	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	2.6	ACRE-FT	
BERM ELEVATION	916.00	FT	
POOL STORAGE VOLUME AT TOP OF DIKE	19.3	ACRE-FT	
MAXIMUM BERM HEIGHT	916.00	FT	
AVERAGE BERM HEIGHT	0.9	FT	
BERM LENGTH	1500	FT	
PRIMARY WEIR ELEVATION	914.50	FT	
PRIMARY WEIR WIDTH	4.5	FT	
AREA OF BUFFER	25.3	ACRES	
RATIO BUFFER AREA TO NWL POOL AREA	3.3		Less than 4
25-YEAR STORM HWL IN POOL	915.61	FT	
25-YEAR PEAK INFLOW	136.58	CFS	
25-YEAR PEAK OUTFLOW	10.99	CFS	
100-YEAR STORM HWL IN POOL	915.97	FT	
100-YEAR PEAK INFLOW	192.04	CFS	
100-YEAR PEAK OUTFLOW	13.93	CFS	

WETLAND POOL DEPTH (FT)	ELEV (FT)	INCREMENTAL AREA (FT2)	CUMULATIVE VOLUME (FT3)	CUMULATIVE VOLUME (AC-FT)
0.0	912.5	18		0.00
0.5	913.0	395	103	0.00
1.0	913.5	6,686	1874	0.04
1.5	914.0	54,561	17186	0.39
2.0	914.5	332,752	114014	2.62
2.5	915.0	446,323	308783	7.09
3.0	915.5	525,926	551845	12.67
3.5	916.0	629,151	840614	19.30

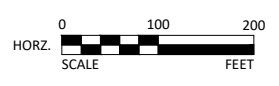
TABULATION OF BENCHMARKS				
POINT NUMBER	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION
1	3677155.558	5131380.193	918.182	CONTROL POINT / MAGNAIL
2	3677151.672	5131255.824	916.069	CONTROL POINT
3	3677157.006	5131905.642	917.521	CONTROL POINT / 5/8 REBAR

- GRADING NOTES:**
- REMOVE ALL TREES AND BRUSH THAT MAY LIE BELOW THE NORMAL POOL ELEVATION 914.50
 - ALL EXISTING FIELD TILE SHALL BE OBLITERATED WITHIN THE BERM STRUCTURE.
 - TOPSOIL STRIPPING (SPEC SECT IA-1) AND SITE GRADING (SPEC SECT IA-21) SHALL CONSIST OF ALL GRADING REQUIRED FOR THE BERM AND BORROW AREAS.
 - CLAY MATERIAL EXCAVATED FROM CLAY BORROW AREA SHALL BE USED IN CONSTRUCTION OF BERM. FILL USED FOR BERM CONSTRUCTION IS INCLUDED AS EARTHFILL (SPEC SECT IA-23).
 - SPREAD 6" OF TOPSOIL IN PRIMARY BORROW AREA AND BERM AREA AFTER CONSTRUCTION ACCORDING TO SPEC SECT IA-26. TOPSOIL IS NOT REQUIRED ON ANY PORTIONS OF SITE BELOW POOL ELEVATION 914.50.
 - STRIP AND SALVAGE 6" OF TOPSOIL FROM BORROW AREAS. AFTER BORROW OPERATIONS ARE COMPLETED SPREAD TOPSOIL UNIFORMLY OVER THE BORROW AREA.
 - STRIPPED AND REMOVED UNSUITABLE MATERIALS, IF ANY, ARE TO BE DISPOSED OF IN DESIGNATED AREAS AS DIRECTED BY ENGINEER AND PRIOR TO TOPSOIL PLACEMENT.
 - IN TOPSOIL WASTE AREAS, FEATHER TOPSOIL INTO SLOPE SO THAT OVERLAND FLOW IS NOT IMPEDED.
 - ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS, CODES, AND OSHA STANDARDS.

LEGEND

- ELEVATION POOL, 914.50'
- ELEVATION 100 YR POOL HWL, 915.97
- EASEMENT BOUNDARY
- SILT FENCE

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IOWA DEPARTMENT OF AGRICULTURE
BUTLER COUNTY CREP SITE PROJECT NO. BUT901622D
PROPOSED SITE PLAN

SHEET
A.04

ESTIMATE REFERENCE INFORMATION	
ITEM NO.	DESCRIPTION
1	TOPSOIL, STRIP, SALVAGE AND RESPREAD THIS IS THE QUANTITY TO REMOVE, SALVAGE AND STOCKPILE 12" OF EXISTING MATERIAL FROM ALL AREAS TO BE EXCAVATED OR DISTURBED TO INCLUDE THE 1' BERM SUBCUT. ALL AREAS TO RECEIVE SEED, BORROW AREAS AND EXCAVATIONS BELOW THE NORMAL POOL ELEVATION SHALL HAVE A MINIMUM OF 6" OF TOPSOIL PLACED.
2	CLEARING AND GRUBBING THIS SHALL BE CONSIDERED FULL COMPENSATION TO REMOVE ALL TREES, STUMPS AND BRUSH FROM WITHIN THE WETLAND NORMAL POOL, BERM EMBANKMENT AND BORROW AREAS.
3	STRUCTURE SEEDING, FERTILIZING AND MULCHING REFER TO SHEET NO. K .05. THIS SEED IS FOR THE EMBANKMENT AND BERM AREA, AND AREAS WHERE THE GROUND SLOPES WILL BE STEEPER THAN 5:1. THIS WILL INCLUDE ANY TOPSOIL WASTE AREAS OR SLOPES FROM THE BORROW AREA TO THE EXISTING GROUND. MULCHING SHALL BE INCLUDED FOR THIS AREA.
4	BUFFER SEEDING REFER TO SHEET NO. K .05. THIS SEEDING IS FOR ALL OTHER AREAS ABOVE THE NORMAL POOL ELEVATION AND ARE NOT PART OF THE STRUCTURE AND CHANNEL SEEDING. NO MULCH ON THIS AREA.
5	MOBILIZATION/DEMOLIBIZATION THIS WORK SHALL INCLUDE THE MOBILIZATION AND DEMOLIBIZATION OF THE CONTRACTOR'S FORCES AND EQUIPMENT FOR PERFORMING THE WORK UNDER THE CONTRACT. THE USE OF THE TEMPORARY CONSTRUCTION ACCESS AND STAGING AREA SHALL INCLUDE DEEP TILLAGE OF THE AREA ONCE CONSTRUCTION IS COMPLETE AND IS CONSIDERED INCIDENTAL TO THIS ITEM.
6	DRAINAGE TILE INVESTIGATION AND REMOVAL THIS ITEM WILL CONSIST OF THE EXPLORATORY EXCAVATIONS REQUIRED TO LOCATE AND ABANDON THE TILES SHOWN ON THE PLANS OR NOT SHOWN. THIS IS FULL COMPENSATION FOR THE EXCAVATION, BACKFILLING, ABANDONMENT OF THE TILE AND TRENCHES WITHIN THE PERMANENT EASEMENT BOUNDARY.
7	EXCAVATION THIS INCLUDES THE CONSTRUCTION OF THE EMBANKMENT BERM (DIKE) OF 1,000 CY TO THE SLOPES AND ELEVATIONS DETAILED ON THE PLANS. THE CONTRACTOR SHALL PROVIDE A MINIMUM ALLOWABLE SETTLEMENT OF 5% OF THE TOTAL FILL DEPTH WHEN CONSTRUCTING THE BERM. THIS ADDITIONAL QUANTITY OF MATERIAL IS NOT FIGURED INTO THE BID QUANTITY. MATERIAL SHALL BE SELECT SOILS FROM A BORROW SITE WITHIN THE EASEMENT BOUNDARY, COMPACTED TO METHOD 2 (IA-23-2) AND CONSIDERED INCIDENTAL TO THIS ITEM. THIS QUANTITY ASSUMED A 35% SHRINKAGE FACTOR ON THE MATERIAL.
8	RCP, 12" DIAMETER REFER TO SHEET NO'S. D .01, D .02 AND K .03. THIS IS FULL COMPENSATION FOR INSTALLATION, BEDDING AND BACKFILLING OF THE BYPASS PIPING. LENGTH IS BASED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE AND THROUGH BENDS. TRENCH INSTALLATION SHALL BE MODIFIED TRENCH INSTALLATION TYPE 4 (SEE SHEET K.03), WITH CLASS IV PIPE, TONGUE AND GROOVE JOINTS WRAPPED WITH ENGINEERING FABRIC.
9	RCP, 30" DIAMETER REFER TO SHEET NO. D .03 AND K .02. THIS IS FULL COMPENSATION FOR INSTALLATION, BEDDING AND BACKFILLING OF THE OUTLET PIPING. LENGTH IS BASED FROM CENTER OF STRUCTURE TO APRON. BEDDING SHALL BE SELECT CLAY, HAND TAMPED TO SPRINGLINE, CLASS III PIPE, TONGUE AND GROOVE JOINTS WRAPPED WITH ENGINEERING FABRIC. JOINTS SHALL BE TIED FROM APRON TO TWO (2) JOINTS UPSTREAM.
10	STRUCTURE, SW-513, (36" WALL WIDTH) REFER TO SHEET NO. K .01. THIS SHALL BE CONSTRUCTED ACCORDING TO IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS. THE CASTING LID SHALL BE BOLTED TO THE CASTING.
11	STRUCTURE, SW-513, (54" WALL WIDTH) REFER TO SHEET NO. K .01. THIS SHALL BE CONSTRUCTED ACCORDING TO IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS. THE CASTING LID SHALL BE BOLTED TO THE CASTING.
12	APRON, RCP, 30" DIAMETER THIS SHALL BE CONSTRUCTED ACCORDING TO IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS. ALL JOINTS SHALL BE CONNECTED PIPE JOINTS, SEE IOWA D.O.T. STANDARD ROAD PLAN DR-121
13	FOOTING FOR CONCRETE PIPE APRON, D=30" THIS SHALL BE CONSTRUCTED ACCORDING TO IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AS DETAILED IN FIGURE 4030.221.
14	RIP RAP, CLASS 'E' THIS ITEM INCLUDES EXCAVATION, GEOTEXTILE FABRIC PLACEMENT (150 SY) AND RIP RAP MATERIAL PLACEMENT AS SHOWN PER PLANS. THIS MATERIAL SHALL MEET THE IOWA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION", SERIES 2015, SECTION 2507 FOR CLASS 'E' REVETMENT. THIS MATERIAL WILL BE FOR THE CONSTRUCTION OF THE RIP RAP RIFFLE (SEE SHEET NO. K .04) AND OUTLET OF 30" APRON.
15	SILT FENCE OR SILT FENCE DITCH CHECKS REFER TO SHEET NO. A .04 FOR LOCATION OF 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.

ESTIMATED PROJECT QUANTITIES						
ITEM NO.	WORK OR MATERIALS	NRCS SPEC NO.	SUDAS SPEC NO.	TOTAL	UNIT	AS BUILT QTY
1	TOPSOIL, STRIP, SALVAGE AND RESPREAD	IA-1, 26		3,166	CY	
2	CLEARING AND GRUBBING	IA-1		1	LS	
3	STRUCTURE SEEDING, FERTILIZING AND MULCHING	IA-6		0.6	AC	
4	BUFFER SEEDING	IA-6		2.0	AC	
5	MOBILIZATION/DEMOLIBIZATION	IA-8		1	LS	
6	DRAINAGE TILE INVESTIGATION AND REMOVAL	IA-9		1	LS	
7	EXCAVATION	IA-21, 23		1,000	CY	
8	RCP, 12" DIAMETER	IA-46		1,221	LF	
9	RCP, 30" DIAMETER	IA-46		191	LF	
10	STRUCTURE, SW-513, (36" WALL WIDTH)		6010-108-B1	2	EA	
11	STRUCTURE, SW-513, (54" WALL WIDTH)		6010-108-B2	1	EA	
12	APRON, RCP, 30" DIAMETER		4030-108-B-1	1	EA	
13	FOOTING FOR CONCRETE PIPE APRON, D=30"		4030-108-C-1	1	EA	
14	SILT FENCE OR SILT FENCE DITCH CHECKS		9040-108-N-1	2,000	LF	

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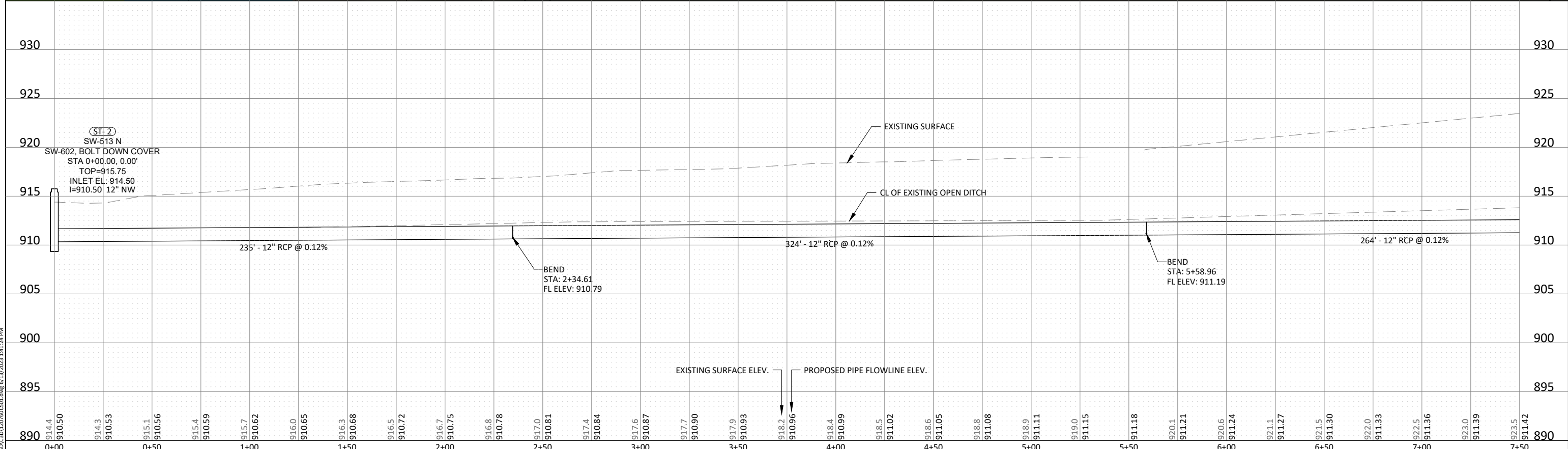
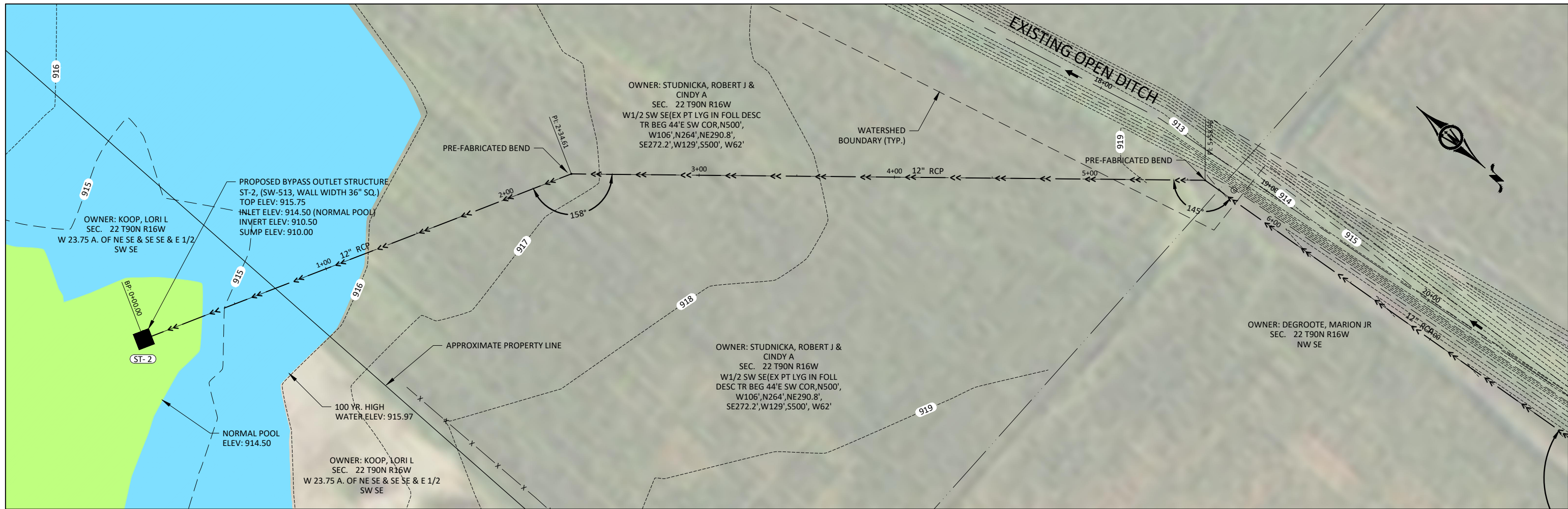


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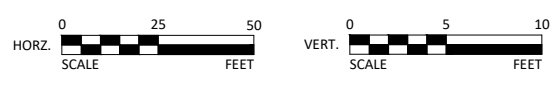
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BUTLER COUNTY CREP SITE PROJECT NO. BUT901622D
ESTIMATE OF QUANTITIES AND REFERENCE NOTES

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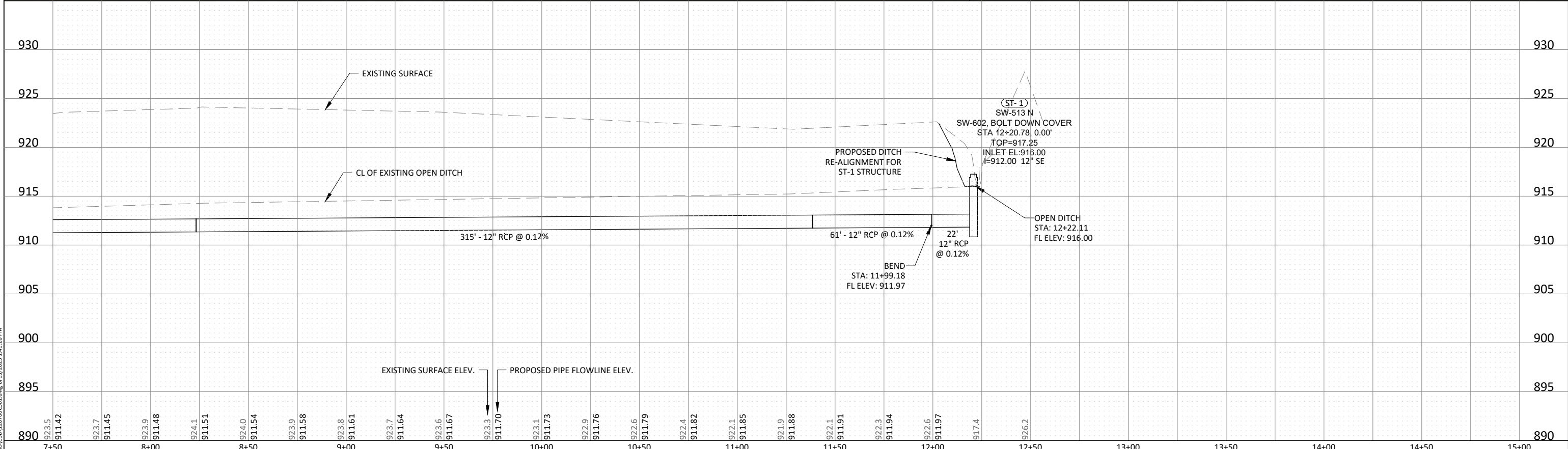
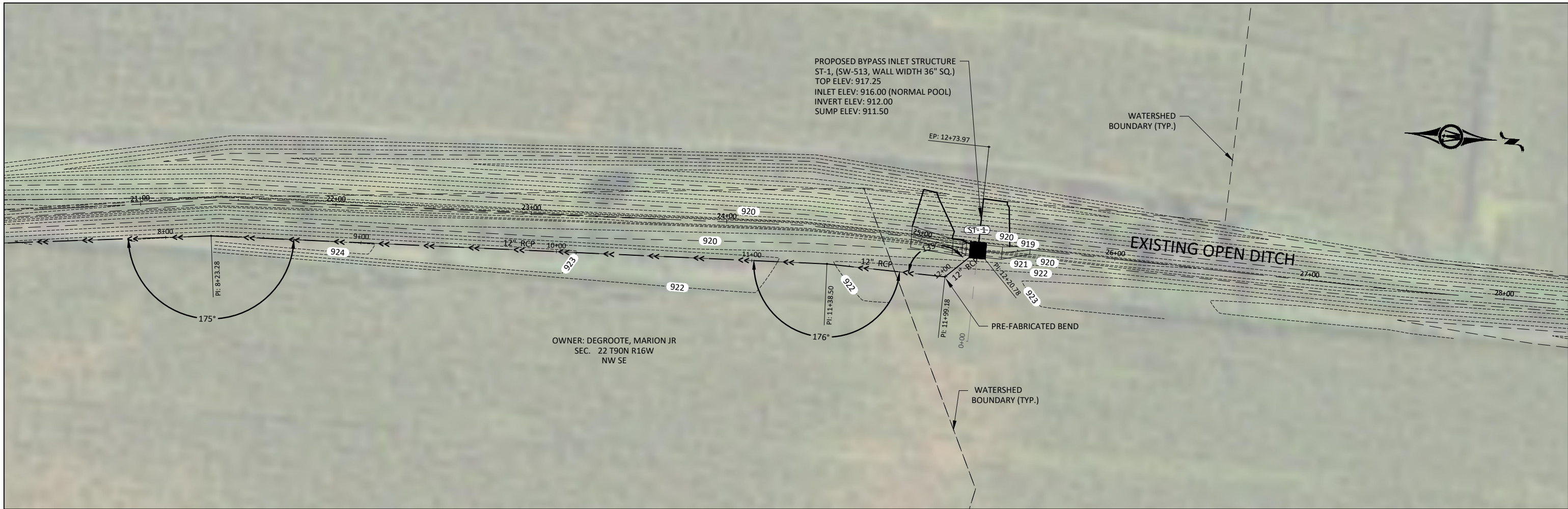


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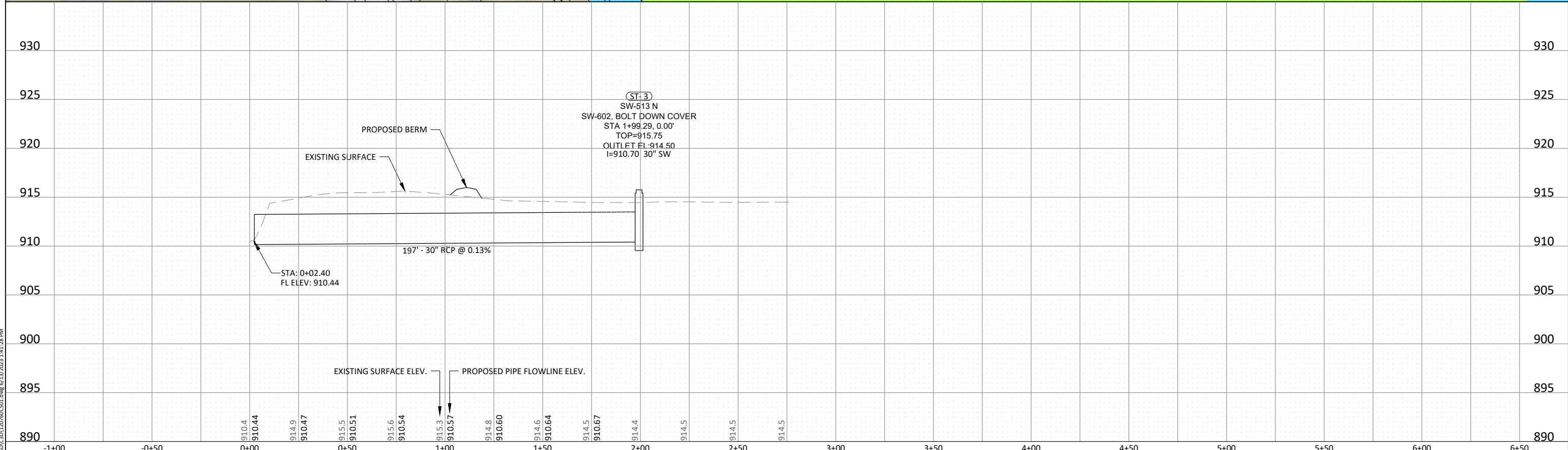
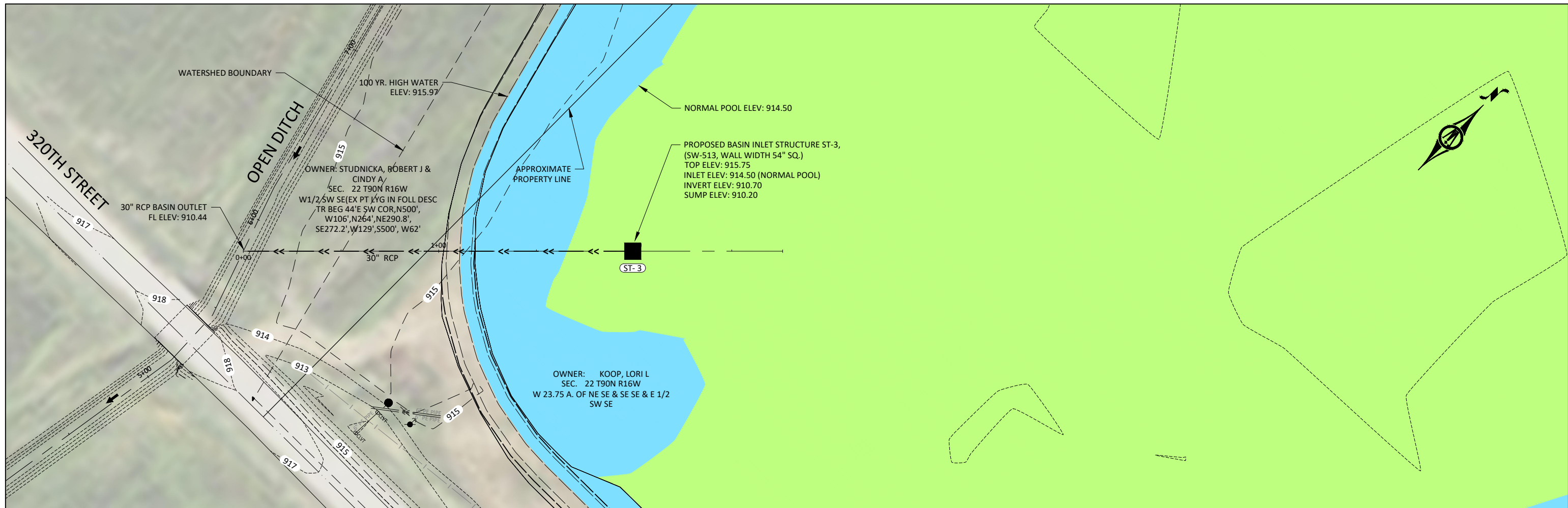


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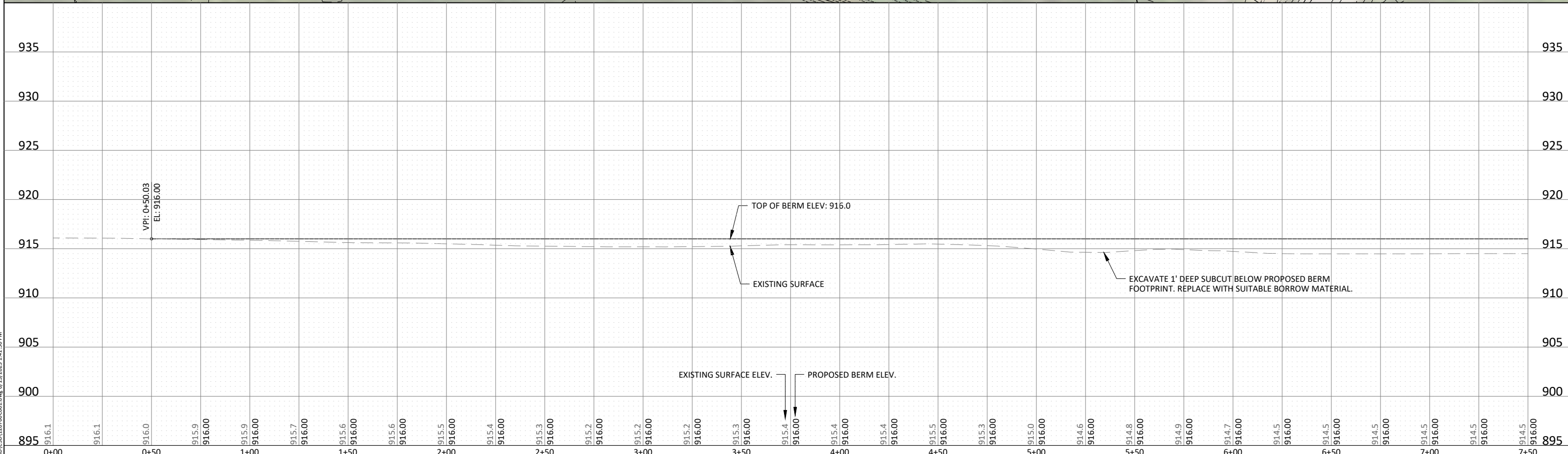
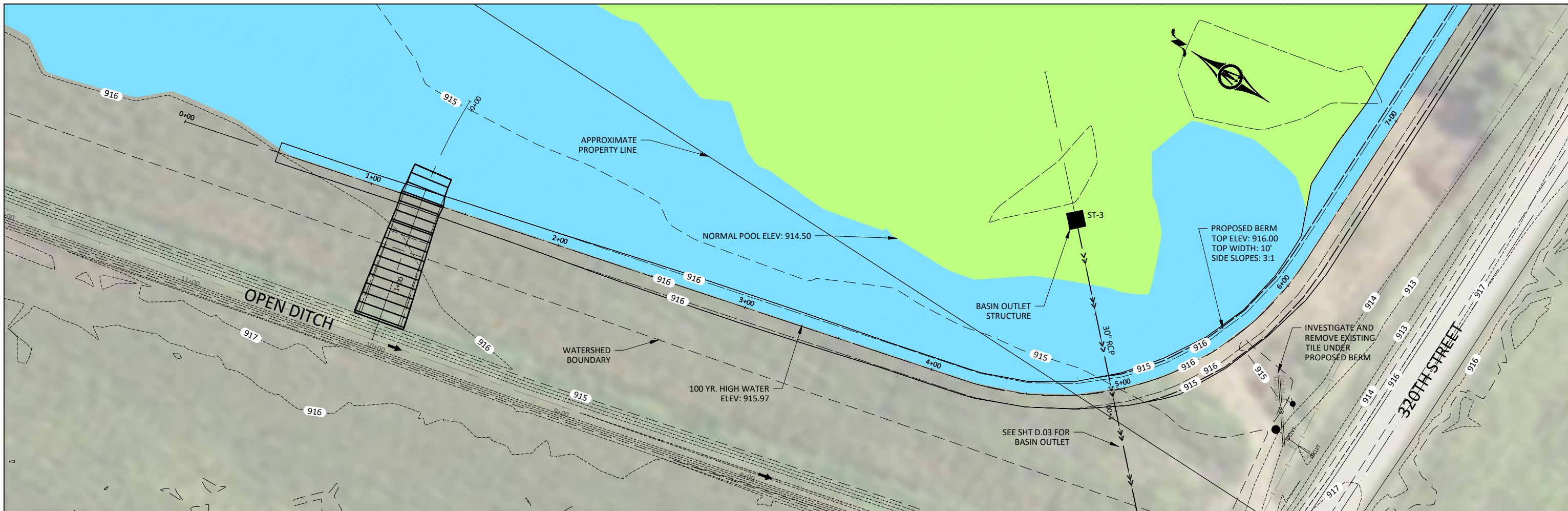


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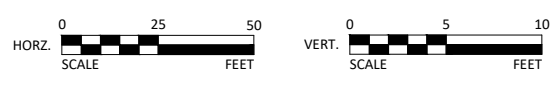
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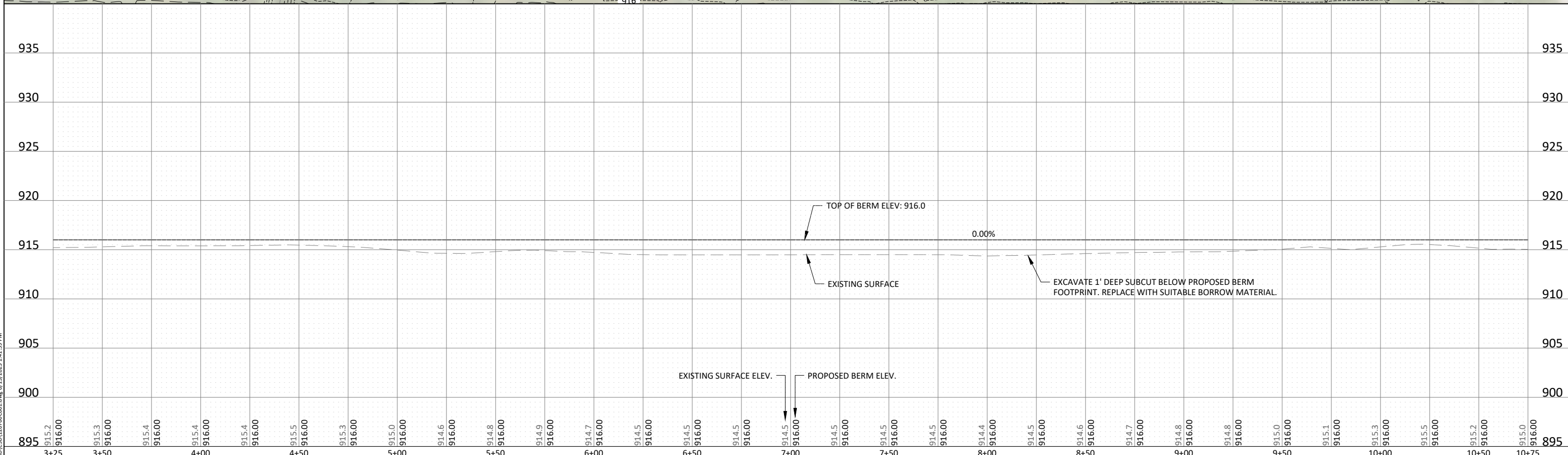
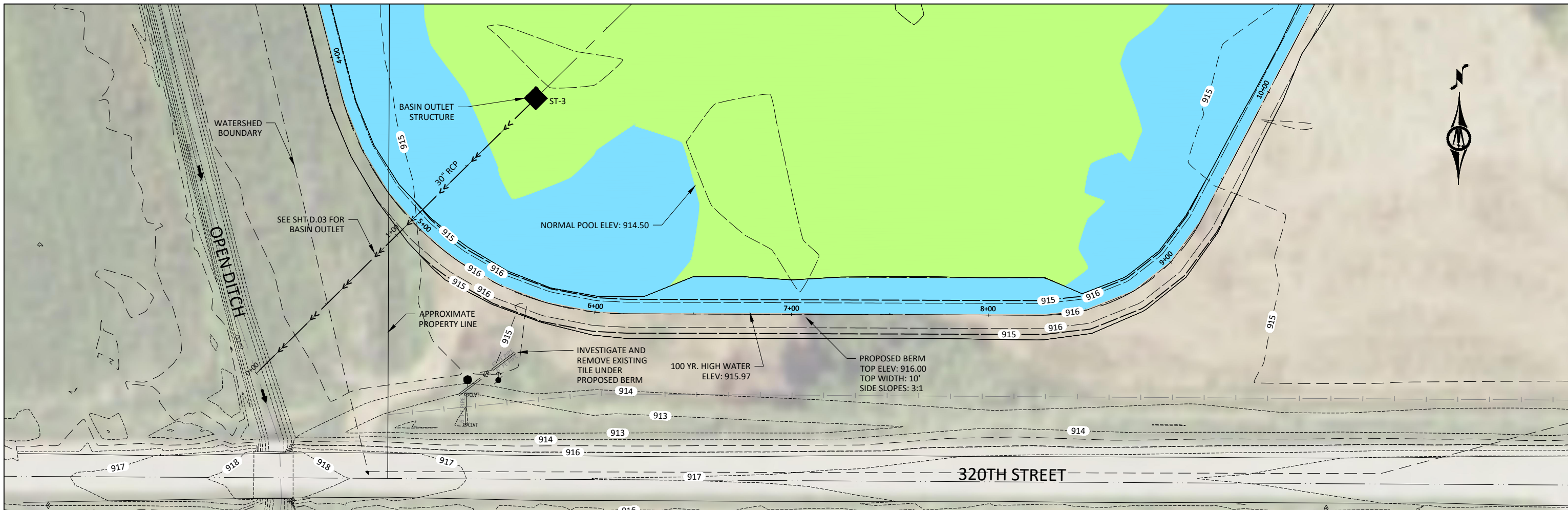


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BERM PLAN AND PROFILE

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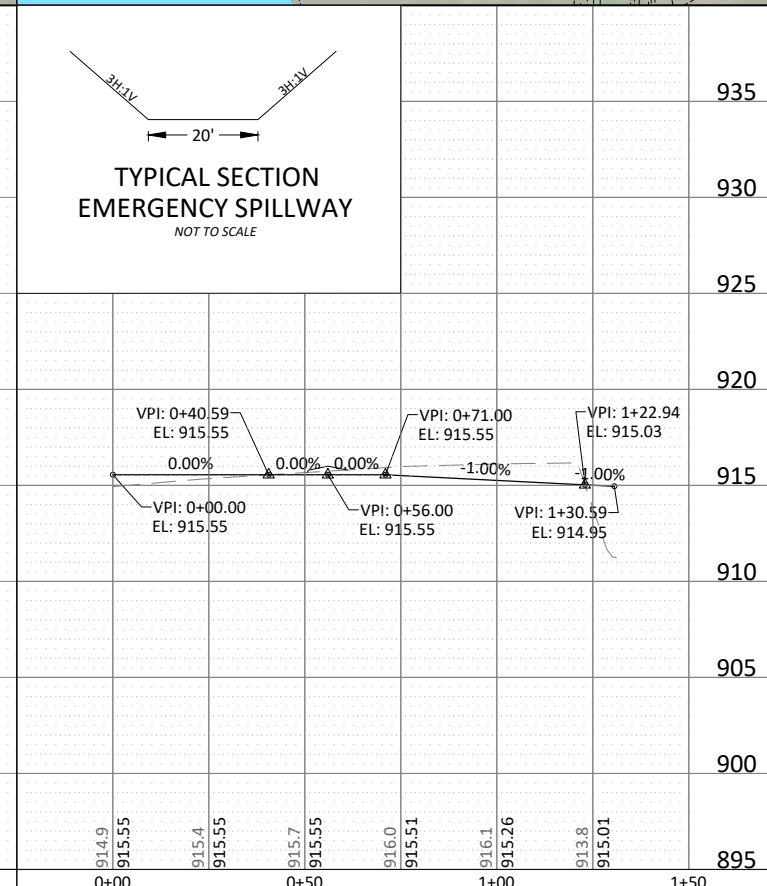
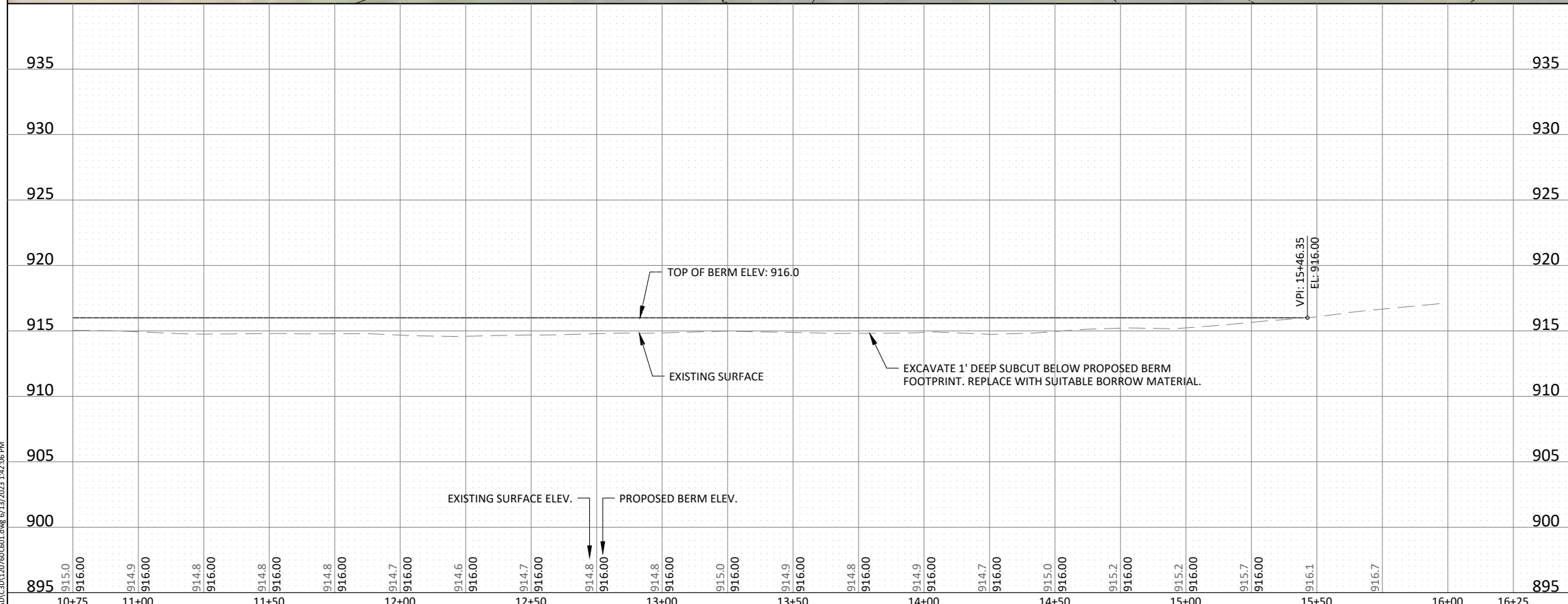
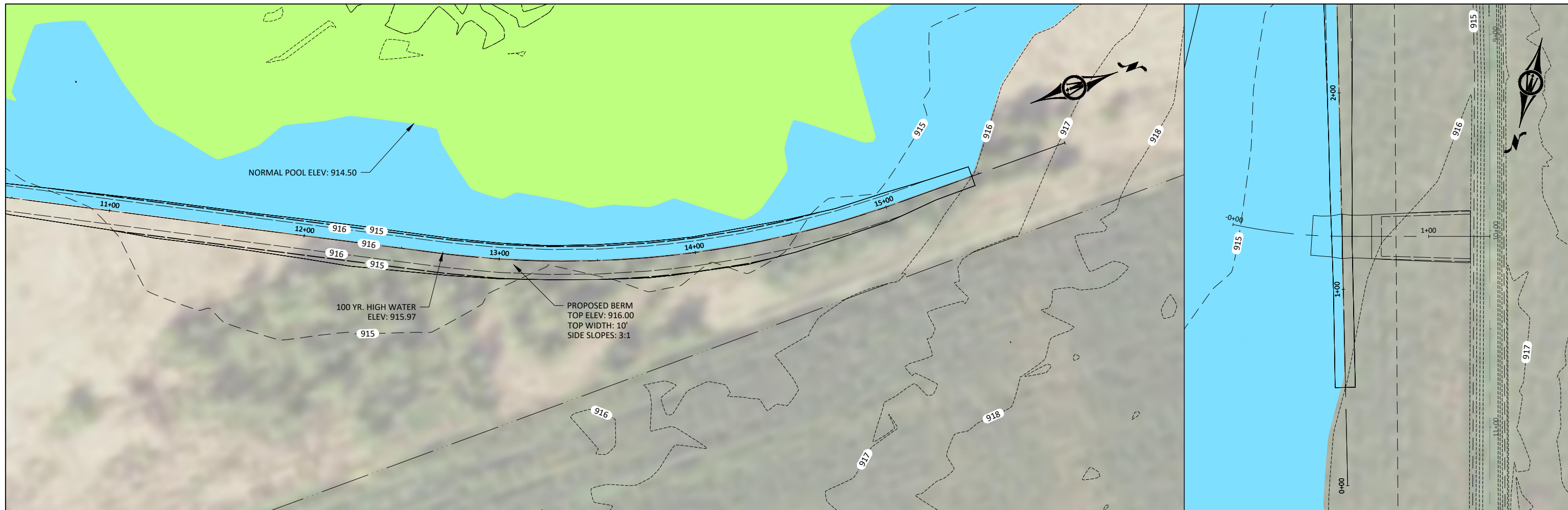
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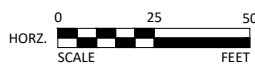
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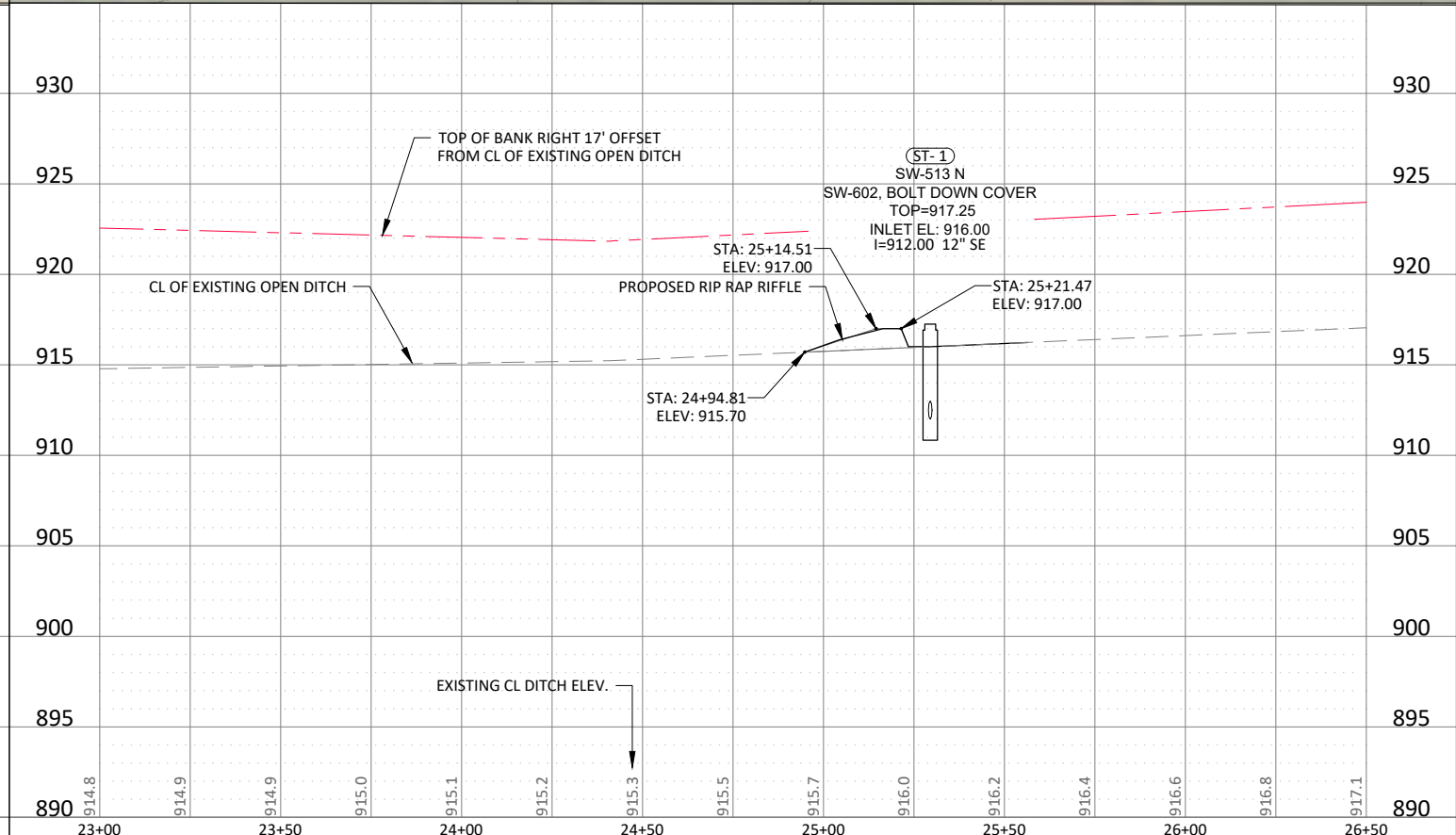
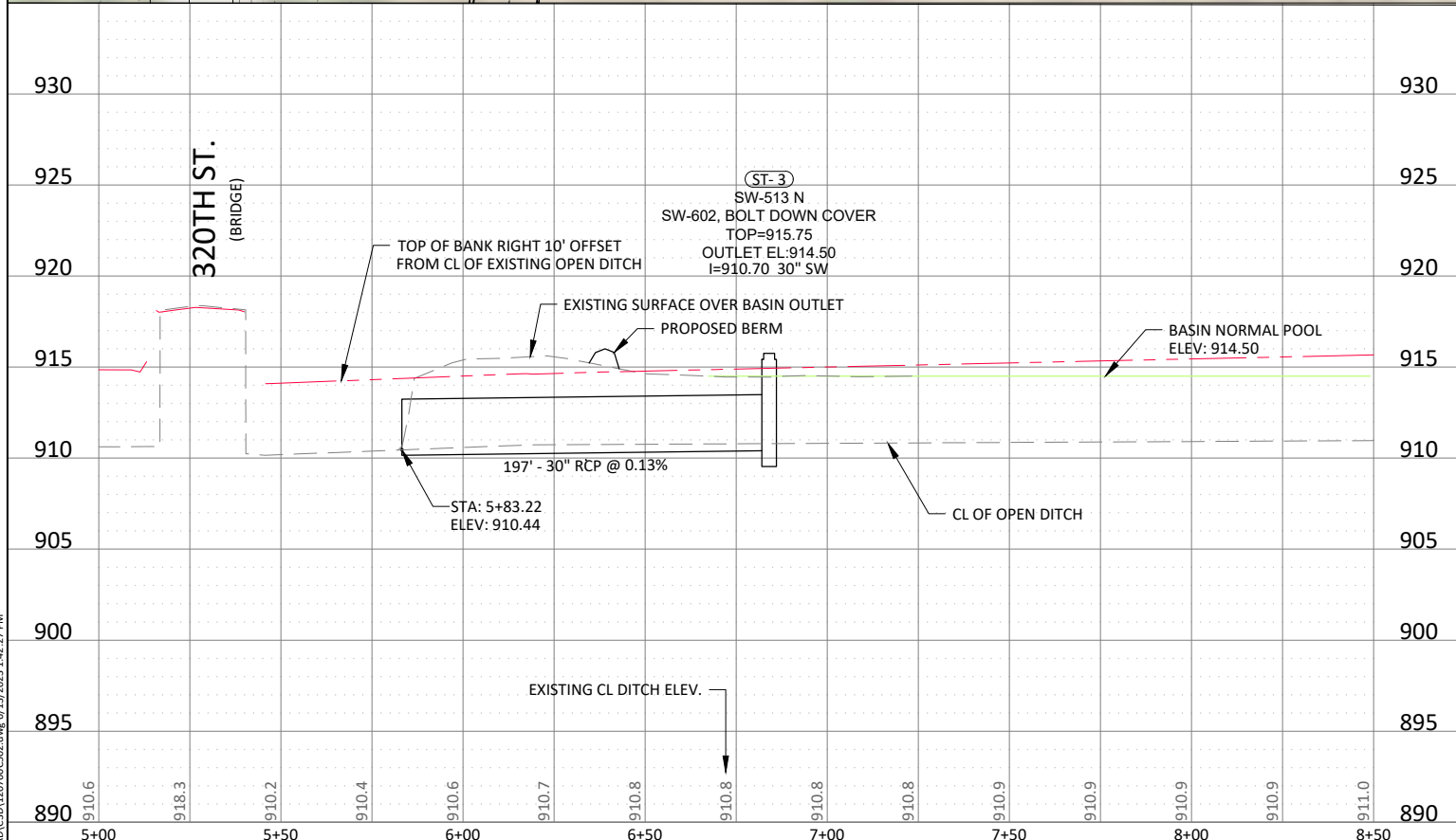
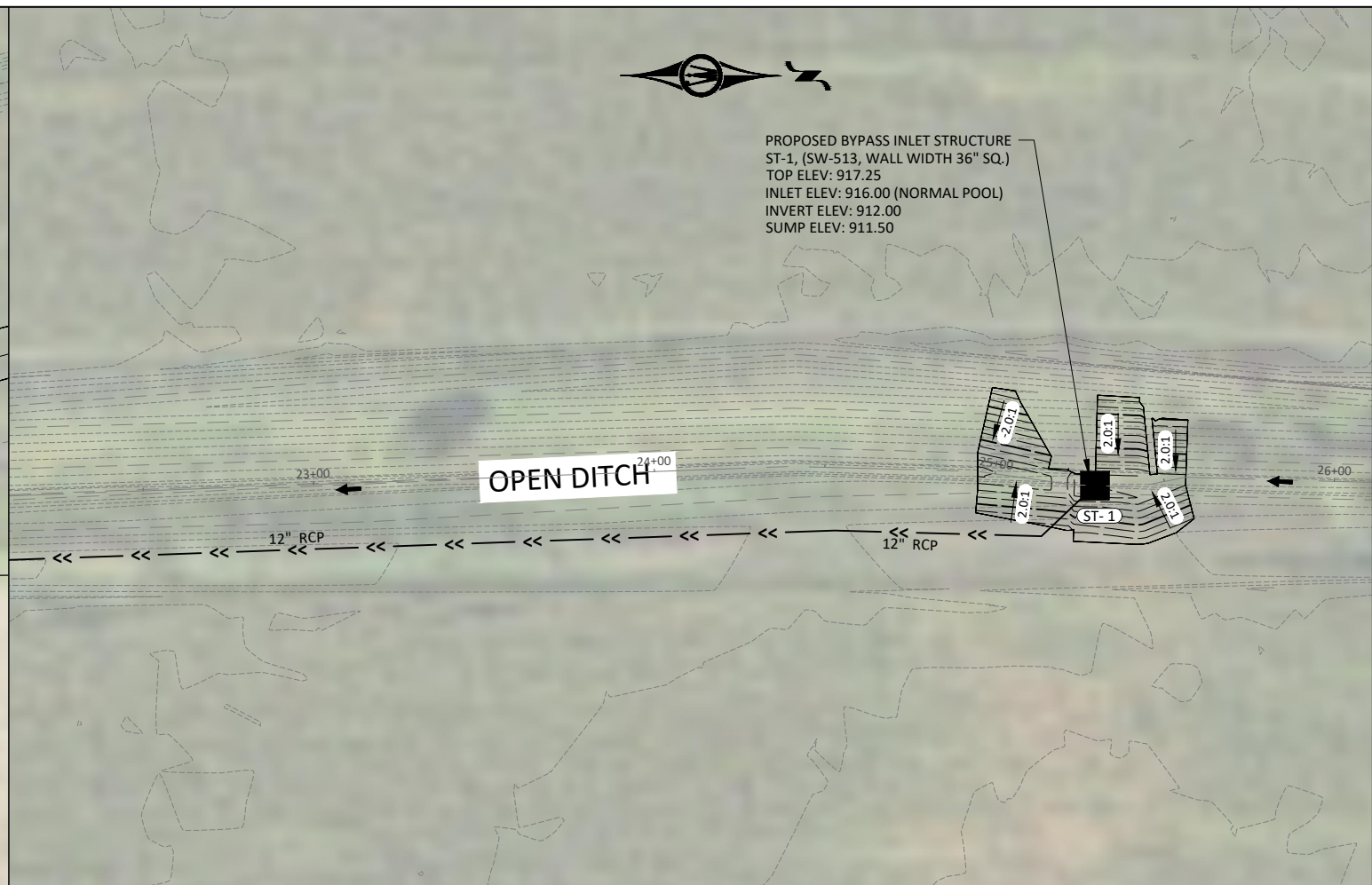
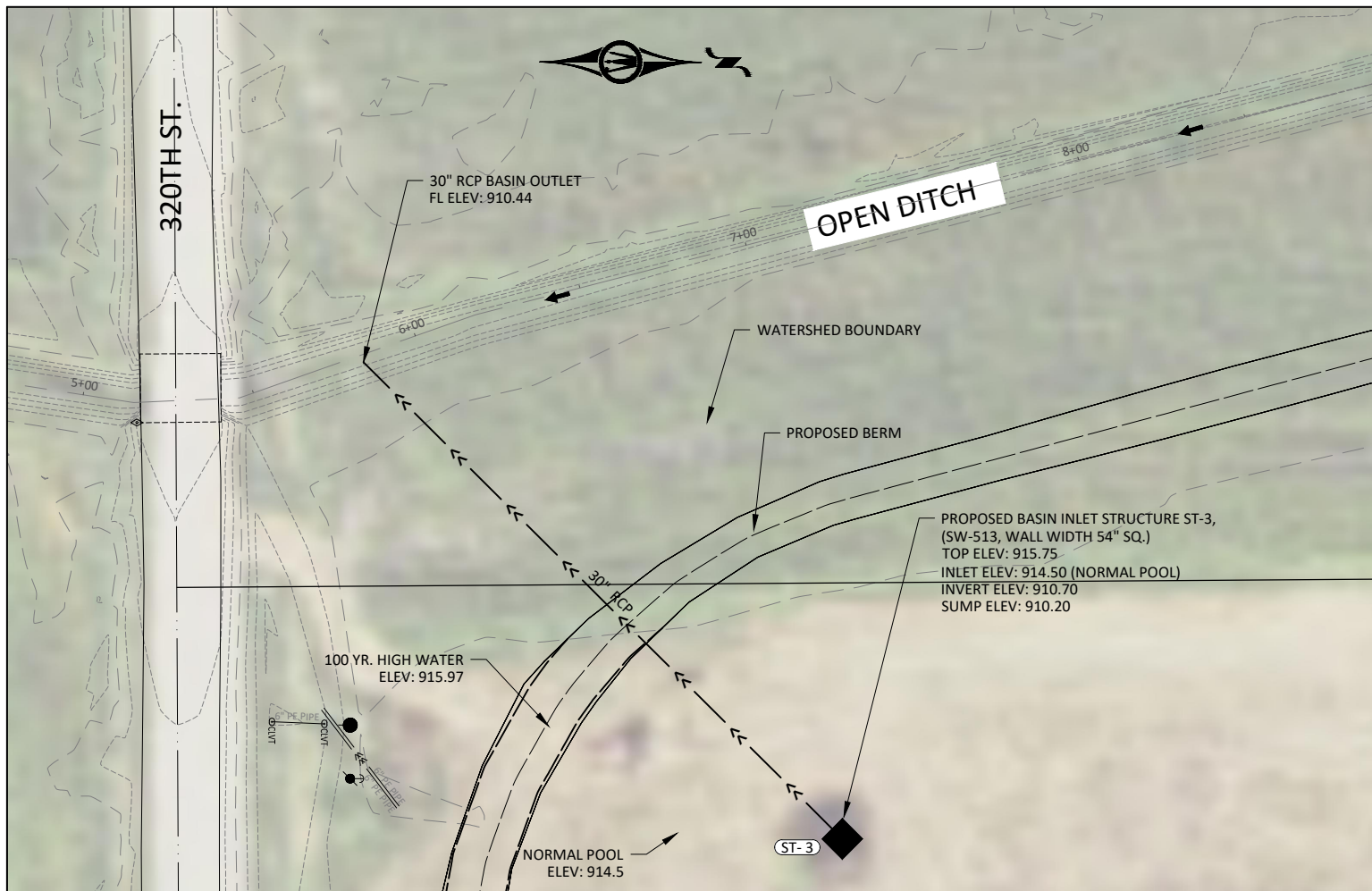


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BERM AND EMERGENCY SPILLWAY PLAN AND PROFILE

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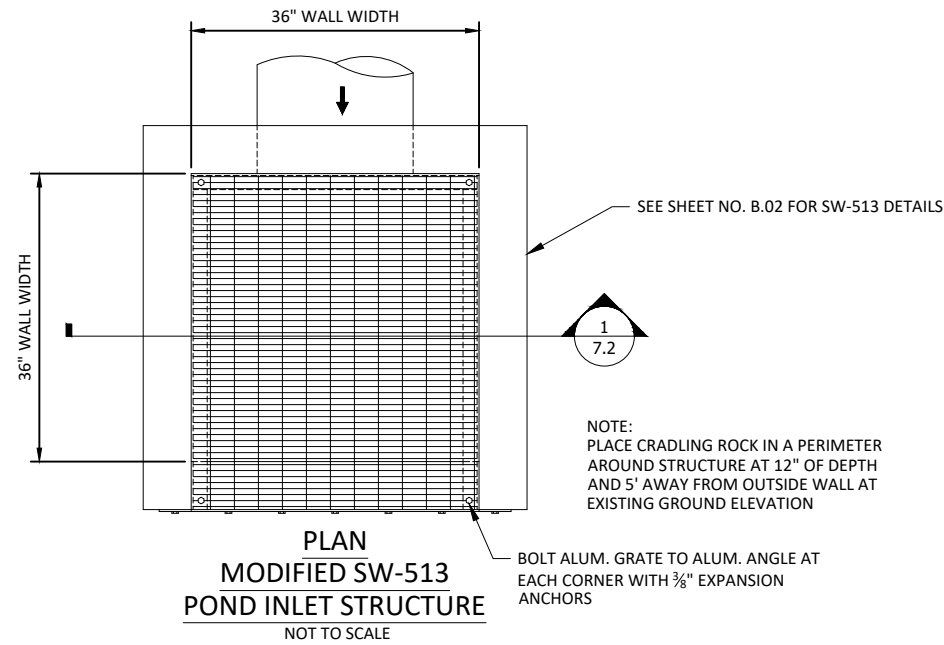


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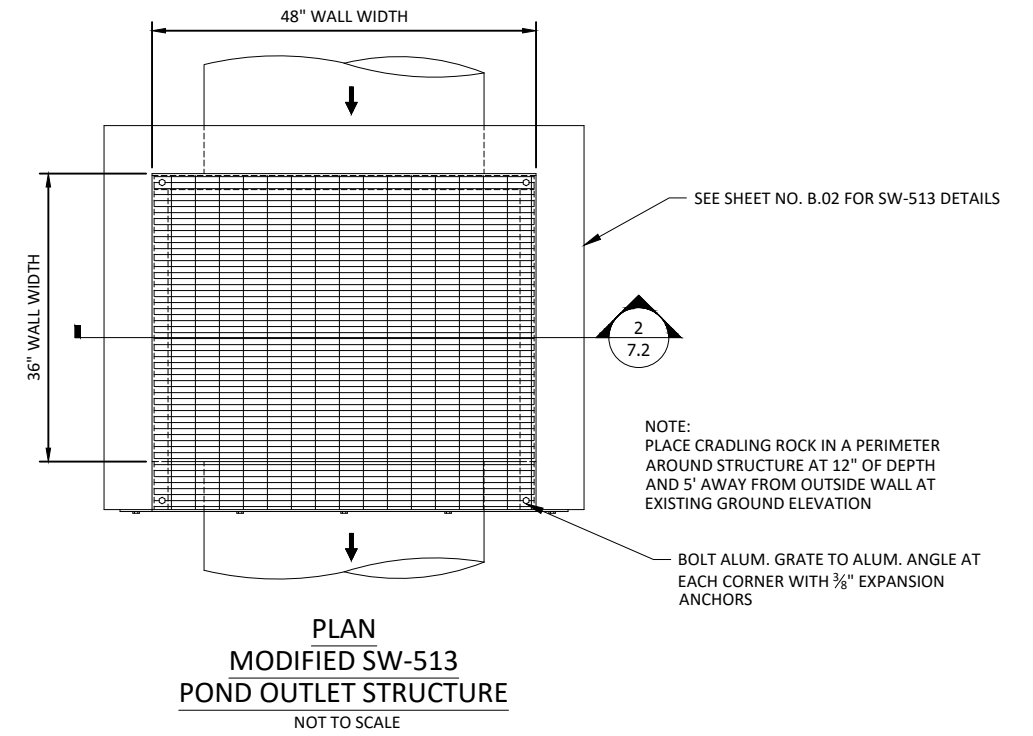
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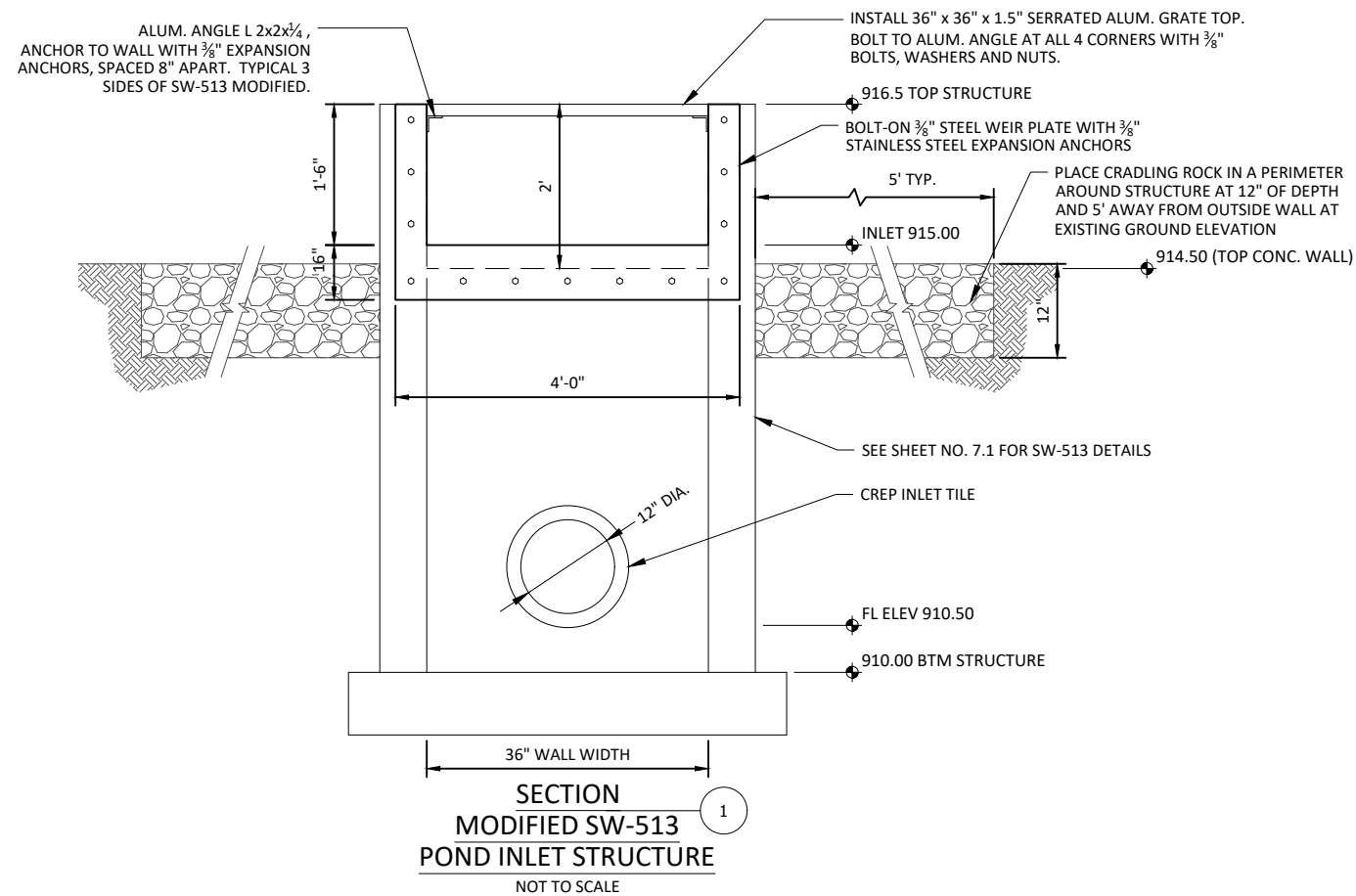
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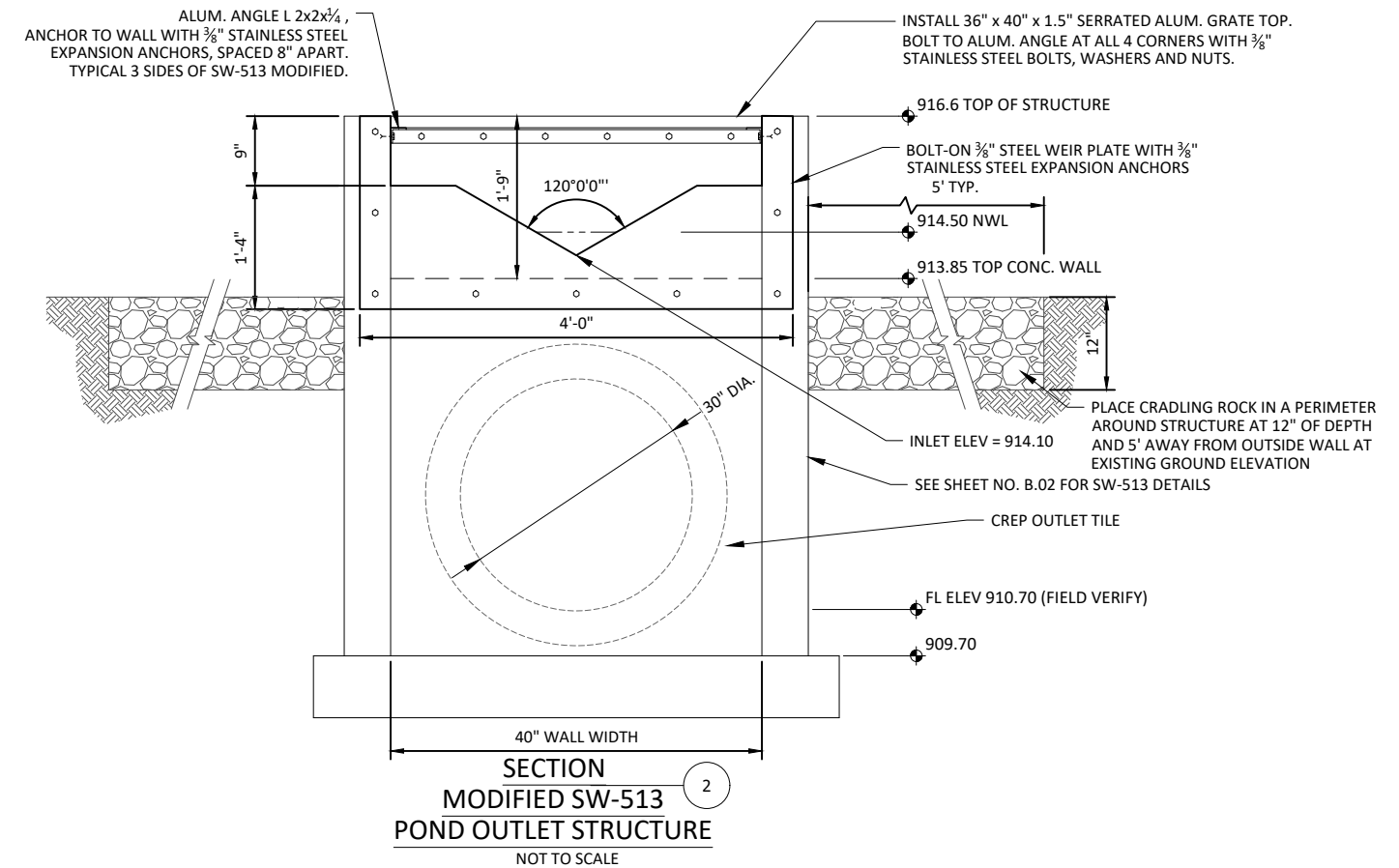
**PLAN
MODIFIED SW-513
POND INLET STRUCTURE**
NOT TO SCALE



**PLAN
MODIFIED SW-513
POND OUTLET STRUCTURE**
NOT TO SCALE



**SECTION
MODIFIED SW-513
POND INLET STRUCTURE**
NOT TO SCALE



**SECTION
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BUTLER COUNTY CREP SITE PROJECT NO. BUT901622D

MODIFIED STRUCTURE DETAILS

SHEET
K.02

**PIPE HAUNCH FILL AND COMPACTION METHOD
PLAN REQUIREMENTS COMPLIANCE VERIFICATION**

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE INSTALLATION OF ALL PIPE ACCORDING TO PLAN REQUIREMENTS. THE CONTRACTOR'S PARTICIPATION IN AND COMPLIANCE WITH THE FOLLOWING PROCEDURE IS REQUIRED AND WILL ALLOW FOR FEWER SOIL DENSITY TESTS TO ENSURE PROPER PIPE INSTALLATION.

STEP 1
BEFORE COMMENCING PIPE INSTALLATION, STANDARD SOIL PROCTOR DENSITY TEST RESULTS OF REPRESENTATIVE SAMPLE(S) OF PIPE HAUNCH FILL SHALL BE PROVIDED BY AN INDEPENDENT QUALIFIED SOILS TESTING LAB. THE SELECTION OF THE SAMPLE(S) WILL BE MADE BY THE ENGINEER AND CONTRACTOR (WHEN SPECIFIED).

STEP 2
CONTRACTOR MAY BEGIN EXCAVATING THE MODIFIED TYPE 4 TRENCH WITH THE REQUIRED SHAPED BOTTOM GROOVE AND PLACE SEVERAL PIPE SECTIONS ONLY WHEN BOTH ENGINEER AND TESTING LAB TECHNICIAN ARE PRESENT

CONTRACTOR SHALL DEMONSTRATE THE INTENDED METHODS FOR COMPACTING THE FILL FOR THE PIPE HAUNCH AREAS. SOIL DENSITY TESTS SHALL BE TAKEN AT LOCATIONS DESIGNATED BY THE ENGINEER TO CONFIRM THAT THE INTENDED METHODS FOR FILL AND COMPACTION OF THE PIPE HAUNCH AREAS SATISFIES THE PLAN REQUIREMENTS. CONTRACTOR SHALL MODIFY THE INSTALLATION METHODS AND REPEAT STEP 2 UNTIL ACCEPTABLE TESTS RESULTS ARE ACHIEVED.

STEP 3
CONTRACTOR MAY INSTALL THE NEXT SEVERAL HUNDRED FEET OF PIPE. ENGINEER SHALL DESIGNATE SEVERAL LOCATIONS (APPROXIMATELY 10% OF THE INSTALLED LENGTH) WHERE CONTRACTOR SHALL LEAVE THE PIPE UNBLINDED FOR FURTHER DENSITY TESTS OF THE HAUNCH FILL AREA. ALL DENSITY TESTS MUST MEET PLAN REQUIREMENTS BEFORE WORK MAY PROCEED FURTHER.

IF DENSITY TESTING DATA CONFIRMS TO THE SATISFACTION OF THE ENGINEER THAT THE CONTRACTOR'S INSTALLATION METHOD WILL PRODUCE CONSISTENT COMPLIANCE WITH PLAN REQUIREMENTS, CONTRACTOR MAY CONTINUE INSTALLATION OF THE PIPE WITH NO ADDITIONAL TESTING REQUIRED. IF NOT, STEPS 2 AND 3 SHALL BE REPEATED UNTIL A RELIABLE, SUCCESSFUL METHOD OF PIPE INSTALLATION THAT PRODUCES SATISFACTORY RESULTS IS ESTABLISHED.

CONTRACTOR IS REQUIRED TO PROPERLY AND ADEQUATELY INSTRUCT SUBCONTRACTORS AND/OR SUBSEQUENT PIPE INSTALLATION WORKERS ON THE PROPER INSTALLATION METHOD.

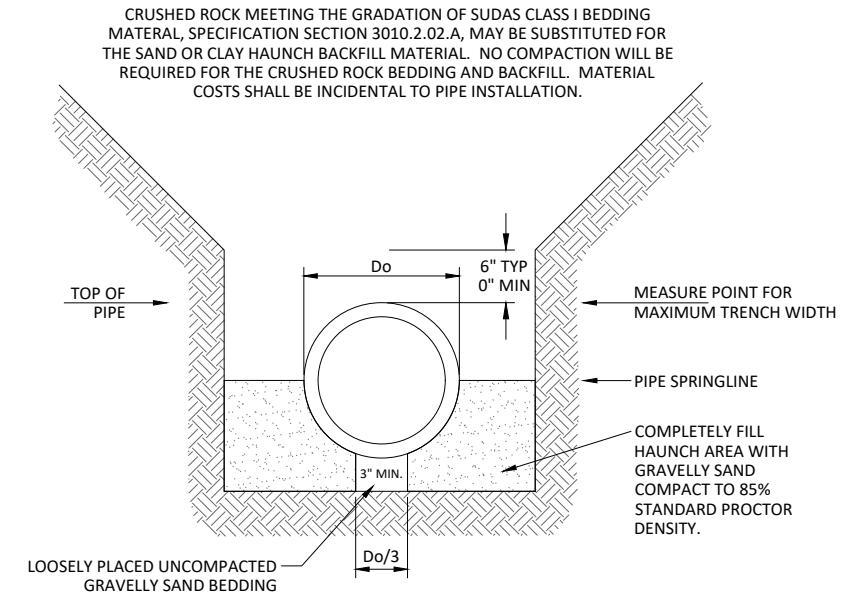
STEP 4A
SOIL OR TRENCH CONDITION CHANGES

TO VERIFY CONTRACTOR'S COMPLIANCE WITH PLAN REQUIREMENTS UNDER THE CHANGED CONDITIONS, ENGINEER MAY STOP WORK AND REQUIRE ADDITIONAL SOIL PROCTOR TESTS AND/OR SOIL DENSITY TESTS SIMILAR TO STEPS 1 THROUGH 3. THE WORK AND COSTS OF THE FIRST TWO REVERIFICATIONS IS SUBSIDIARY TO THE PIPE INSTALLATION. SUBSEQUENT VERIFICATIONS WILL BE CONSIDERED EXTRA WORK.

STEP 4B
CONTRACTOR FAILS TO CONSISTENTLY PERFORM INSTALLATION METHOD OR INSTRUCT OTHER INSTALLERS

IF CONTRACTOR FAILS TO CONSISTENTLY PERFORM OR ADEQUATELY INSTRUCT SUBCONTRACTORS AND/OR SUBSEQUENT PIPE INSTALLATION WORKERS ON THE APPROVED INSTALLATION METHOD, ENGINEER MAY STOP WORK AND REQUIRE ADDITIONAL SOIL PROCTOR TESTS AND/OR SOIL DENSITY TESTS SIMILAR TO STEPS 1 THROUGH 3 TO VERIFY CONTRACTOR'S COMPLIANCE WITH PLAN REQUIREMENTS. THE WORK AND COSTS OF ALL VERIFICATIONS UNDER SUCH CONDITIONS IS SUBSIDIARY TO THE PIPE INSTALLATION.

EXCEPTION
IF CONTRACTOR ELECTS TO SHAPE THE TRENCH BOTTOM SUCH THAT A MINIMUM OF 45% OF THE OUTER CIRCUMFERENCE OF THE PIPE IS FIRMLY BEDDED IN AND CONSISTENTLY SUPPORTED BY UNDISTURBED SOIL, PIPE HAUNCH FILL COMPACTION TESTING WILL NOT BE REQUIRED. THE CONTRACTOR IS REQUIRED TO COMPLY WITH A PROPER INSTALLATION METHOD AND TO FULLY COMPLY WITH THE REQUIREMENTS OF THE VERIFICATION OUTLINED ABOVE FOR ALL SITUATIONS WHERE THIS EXCEPTION IS NOT MET.

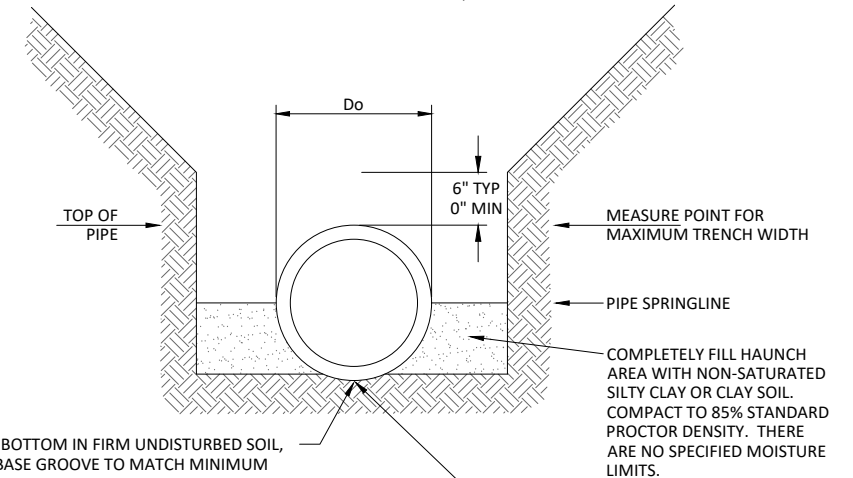


GRAVELLY SAND BEDDING SHALL BE CONSISTENT WITH THE GRADATION AND OTHER CHARACTERISTICS OF STANDARD AASHTO A1 OR A3 SOIL. A REPRESENTATIVE SAMPLE OF THE MATERIAL AND A GRADATION REPORT OR SUPPLIER'S CERTIFICATION OF COMPLIANCE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO DELIVERY TO SITE. SEE SOIL DATA IN APPENDIX OF SPECIFICATIONS BOOKLET.

TRENCH INSTALLATION TYPE 3

NOT TO SCALE
SOURCE: AMERICAN CONCRETE PIPE ASSOCIATION
CONCRETE PIPE DESIGN MANUAL

MINIMUM TRENCH WIDTH SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 12" OR THAT WIDTH WHICH IS REQUIRED FOR COMPACTION, WHICHEVER IS GREATER

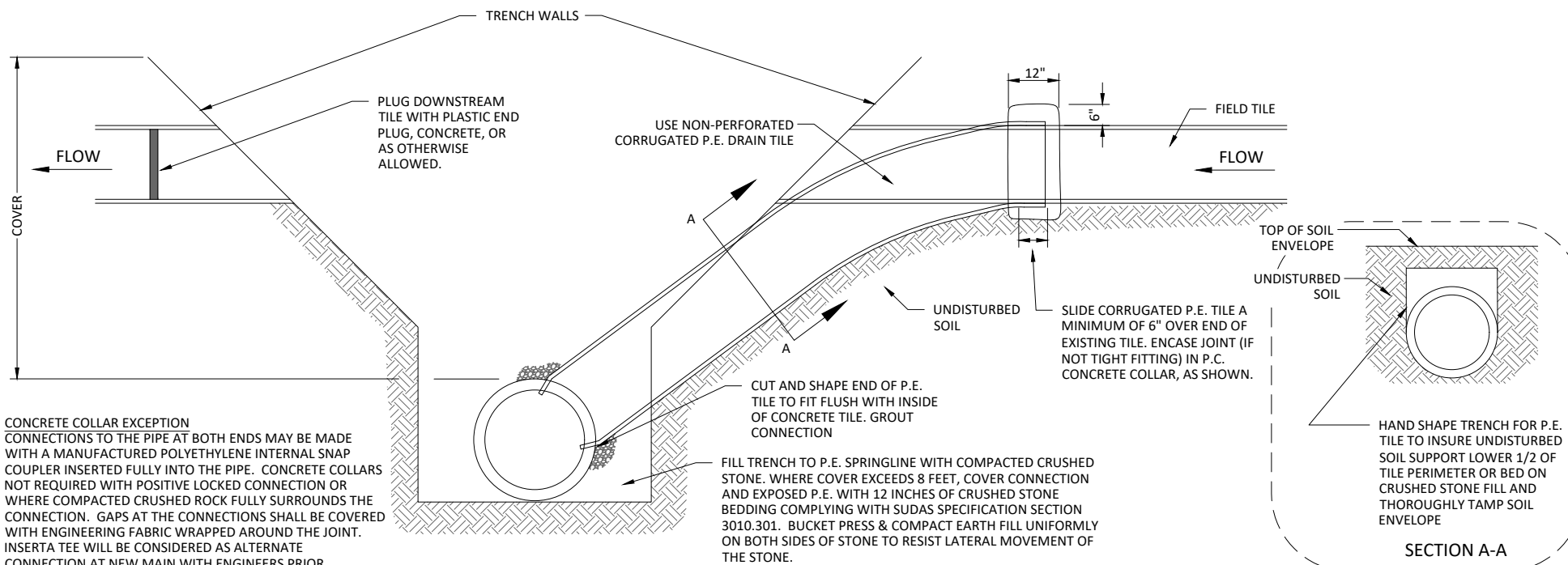


WHERE TRENCH BOTTOM IN FIRM UNDISTURBED SOIL, SHAPE TRENCH BASE GROOVE TO MATCH MINIMUM 1/6 OF THE OUTER CIRCUMFERENCE OF THE PIPE. WHERE THE SHAPED GROOVE CANNOT BE CONSTRUCTED INTO UNDISTURBED GROUND OR WHERE EXCESS CUT OCCURS OVER EXCAVATE AND PLACE MINIMUM 3-INCH THICK COMPACTED GRAVELLY SAND BEDDING TO RESTORE GRADE SUCH THAT 1/6 OR MORE OF THE OUTER CIRCUMFERENCE OF THE PIPE IS BEDDED. THIS MATERIAL AND WORK IS SUBSIDIARY TO THE INSTALLATION OF THE PIPE. CONTRACTOR MAY SUBSTITUTE PIPE BEDDING ROCK AS THE BEDDING MATERIAL. IT ALSO IS SUBSIDIARY.

WHERE FIRM BASE IS NOT ENCOUNTERED. OVER EXCAVATE AS DIRECTED BY ENGINEER. PLACE CRADLING ROCK AND BED PIPE IN IT SUCH THAT 1/6 OR MORE OF THE OUTER CIRCUMFERENCE OF THE PIPE IS SUPPORTED. THIS ROCK IS PAID FOR UNDER A SEPARATE BID ITEM.

MODIFIED TRENCH INSTALLATION TYPE 4

NOT TO SCALE
SOURCE: AMERICAN CONCRETE PIPE ASSOCIATION
CONCRETE PIPE DESIGN MANUAL



TYPICAL FIELD TILE CONNECTION
FOR FIELD TILE UP TO 10" DIAMETER

CONCRETE COLLAR EXCEPTION
CONNECTIONS TO THE PIPE AT BOTH ENDS MAY BE MADE WITH A MANUFACTURED POLYETHYLENE INTERNAL SNAP COUPLER INSERTED FULLY INTO THE PIPE. CONCRETE COLLARS NOT REQUIRED WITH POSITIVE LOCKED CONNECTION OR WHERE COMPACTED CRUSHED ROCK FULLY SURROUNDS THE CONNECTION. GAPS AT THE CONNECTIONS SHALL BE COVERED WITH ENGINEERING FABRIC WRAPPED AROUND THE JOINT. INSERTA TEE WILL BE CONSIDERED AS ALTERNATE CONNECTION AT NEW MAIN WITH ENGINEERS PRIOR APPROVAL AND INSTALLATION PER MANUFACTURERS RECOMMENDATION.

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RCP INSTALLATION DETAILS

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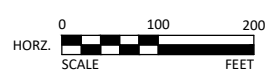
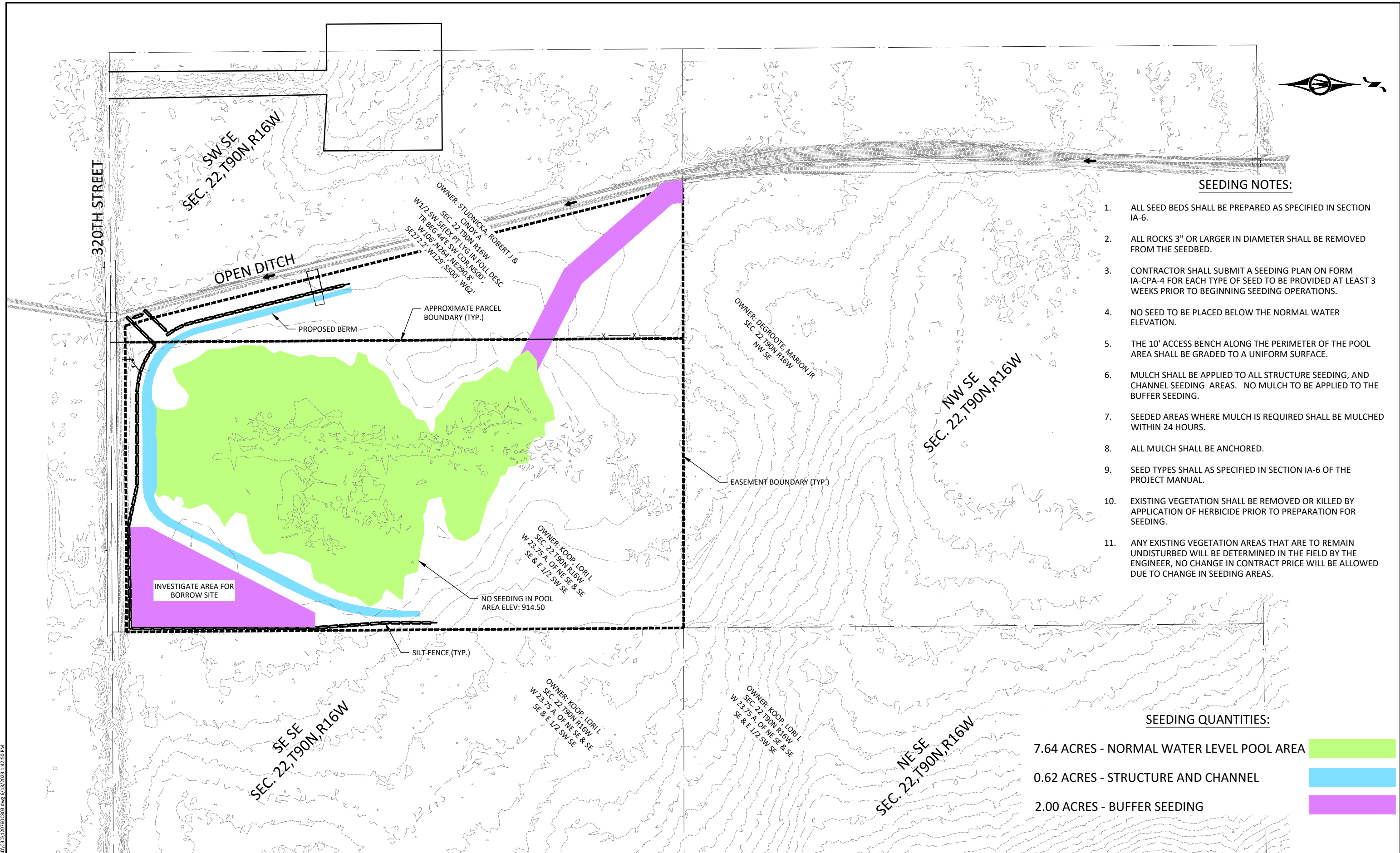


SEEDING NOTES:

1. ALL SEED BEDS SHALL BE PREPARED AS SPECIFIED IN SECTION IA-6.
2. ALL ROCKS 3" OR LARGER IN DIAMETER SHALL BE REMOVED FROM THE SEEDBED.
3. CONTRACTOR SHALL SUBMIT A SEEDING PLAN ON FORM IA-CPA-4 FOR EACH TYPE OF SEED TO BE PROVIDED AT LEAST 3 WEEKS PRIOR TO BEGINNING SEEDING OPERATIONS.
4. NO SEED TO BE PLACED BELOW THE NORMAL WATER ELEVATION.
5. THE 10' ACCESS BENCH ALONG THE PERIMETER OF THE POOL AREA SHALL BE GRADED TO A UNIFORM SURFACE.
6. MULCH SHALL BE APPLIED TO ALL STRUCTURE SEEDING, AND CHANNEL SEEDING AREAS. NO MULCH TO BE APPLIED TO THE BUFFER SEEDING.
7. SEEDED AREAS WHERE MULCH IS REQUIRED SHALL BE MULCHED WITHIN 24 HOURS.
8. ALL MULCH SHALL BE ANCHORED.
9. SEED TYPES SHALL AS SPECIFIED IN SECTION IA-6 OF THE PROJECT MANUAL.
10. EXISTING VEGETATION SHALL BE REMOVED OR KILLED BY APPLICATION OF HERBICIDE PRIOR TO PREPARATION FOR SEEDING.
11. ANY EXISTING VEGETATION AREAS THAT ARE TO REMAIN UNDISTURBED WILL BE DETERMINED IN THE FIELD BY THE ENGINEER, NO CHANGE IN CONTRACT PRICE WILL BE ALLOWED DUE TO CHANGE IN SEEDING AREAS.

SEEDING QUANTITIES:

- 7.64 ACRES - NORMAL WATER LEVEL POOL AREA
- 0.62 ACRES - STRUCTURE AND CHANNEL
- 2.00 ACRES - BUFFER SEEDING



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SEEDING AREAS

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