

CONSTRUCTION PLANS FOR CREP PROJ. NO. GRU871810B

SITE GRADING, BERM CONSTRUCTION, SHEET PILE, RIP RAP AND ARMORING,
WETLAND SEEDING, DRAIN TILE, EROSION AND SEDIMENT CONTROL

GRUNDY COUNTY, IA

REVISED OCTOBER, 2016

SHEET INDEX

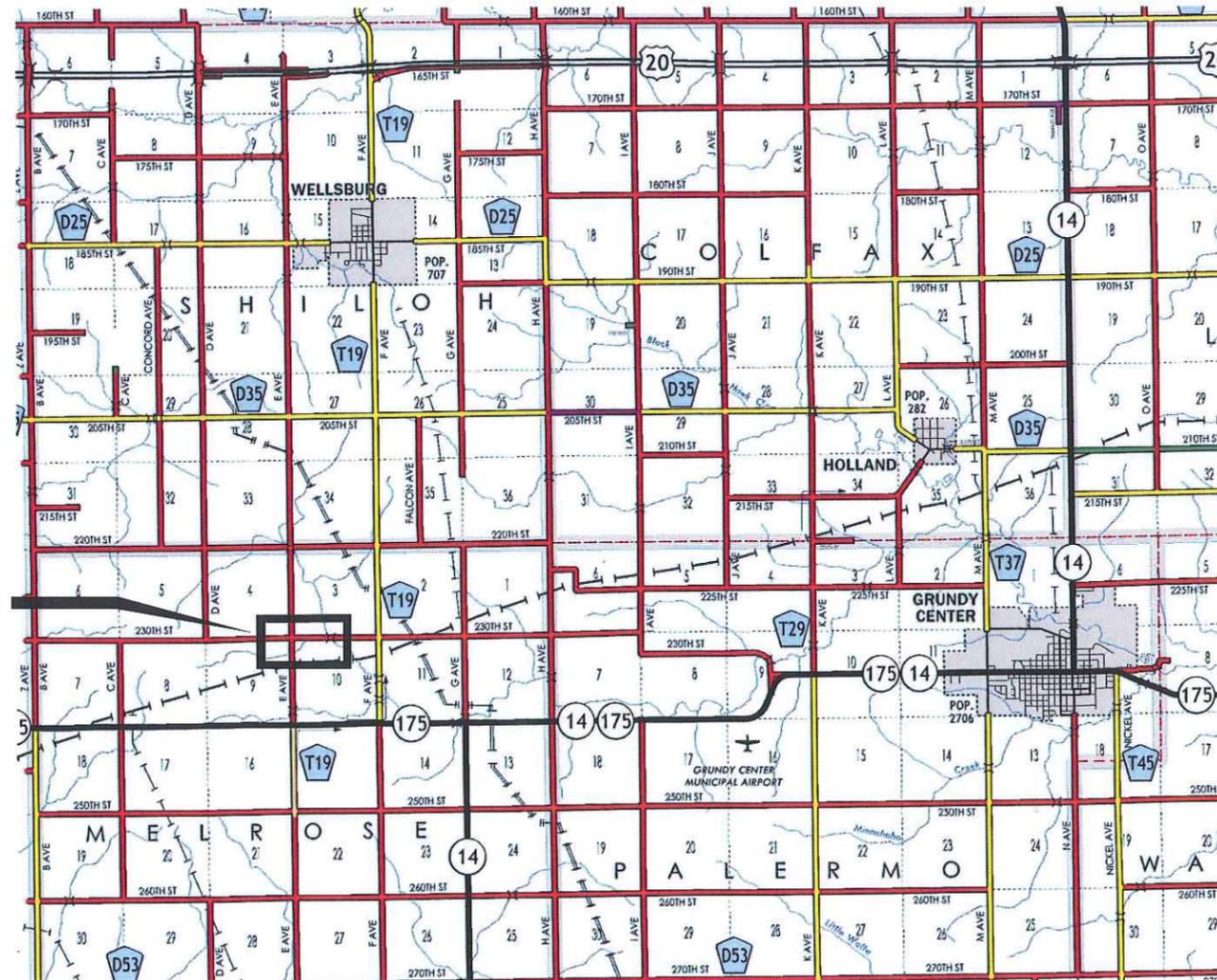
SHEET NO.	TITLE
1.0	TITLE SHEET
1.1	ESTIMATED QUANTITIES AND REFERENCE NOTES
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GOVERNING SPECIFICATIONS

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.

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

PLAN REVISIONS		
DATE	SHEET NUMBER	APPROVED BY
0	BID SET	6/7/16 - JDL
1	FINAL REVISIONS	10/6/16 - JDL



MAP OF PORTIONS OF
GRUNDY COUNTY, IOWA

MAP LEGEND

— PROJECT LIMITS

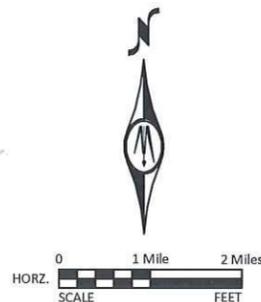


PROJECT LOCATION



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



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Email: Ames@bolton-menk.com
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PROJECT DATUM:
HORIZONTAL: IOWA STATE PLANE - NORTH ZONE
VERTICAL: NAVD 88

DESIGNED JPR	IOWA DEPARTMENT OF AGRICULTURE GRUNDY COUNTY CREP PROJECT NO. GRU871810B	SHEET 1.0
DRAWN JGS		
CHECKED JDL	TITLE SHEET	

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

James D. Leiding
JAMES D. LEIDING
REG. NO. 17000 DATE: 10-6-16

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2017
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

ESTIMATED PROJECT QUANTITIES					
ITEM NO.	WORK OR MATERIAL	SPEC. NO	UNIT	ESTIMATED QUANTITY	AS-BUILT QUANTITY
1	STRIPPING	IA-1	CY	7,150	
2	CLEARING AND GRUBBING	IA-1	LS	1	
3	STRUCTURE AND CHANNEL FERTILIZER AND SEEDING	IA-6	AC	2.25	
4	BUFFER SEEDING	IA-6	AC	5.30	
5	FIRE BREAK SEEDING	IA-6	AC	2.40	
6	MOBILIZATION/DEMOLITION	IA-8	LS	1	
7	DRAINAGE TILE INVESTIGATION AND REMOVAL	IA-9	LS	1	
8	STEEL SHEET PILE	IA-13	SF	998	
9	EXCAVATION, CORE TRENCH	IA-21	CY	1,830	
10	EXCAVATION, CHANNEL	IA-21	CY	6,640	
11	EXCAVATION, STILLING BASIN	IA-21	CY	410	
12	EARTHFILL, DIKE	IA-23	CY	9,565	
13	EARTHFILL, CLAY CORE	IA-23	CY	4,035	
14	DRAINFILL, FINE	IA-23	CY	125	
15	PERFORATED CORRUGATED POLYETHYLENE TUBING, 6" DIA.	IA-46	LF	1,100	
16	DUAL WALL HDPE, 24" DIAMETER	IA-46	LF	648	
17	DUAL WALL HDPE, 12" DIAMETER	IA-46	LF	636	
18	CMP PIPE, 24" DIAMETER	IA-51	LF	20	
19	CMP PIPE, 12" DIAMETER	IA-51	LF	40	
20	CMP PIPE, 6" DIAMETER	IA-51	LF	20	
21	HDPE PIPE TEE, DUAL WALL, 24" x 24"	IA-46	EA	1	
22	6" TILE STUB	IA-46	EA	1	
23	DRAWDOWN PIPE, CMP, 18" DIAMETER	IA-51	LF	90	
24	CMP PIPE BEND, 18", 45 DEGREE	IA-51	EA	2	
25	INLINE WATER CONTROL STRUCTURE, CMP, 48"	IA-51	EA	1	
26	RIP RAP, CLASS E	IA-61	TON	610	
27	CONCRETE GROUT	IA-62	CY	65	
28	TEMPORARY CONSTRUCTION ENTRANCE	IA-8	LS	1	
29	AGGREGATE SURFACING, ROADSTONE, CLASS A	IA-46	TON	50	
30	TRAFFIC CONTROL	IA-8	LS	1	

ESTIMATE REFERENCE INFORMATION	
ITEM NO.	DESCRIPTION
9	EXCAVATION, CORE TRENCH This is the excavation required to construct the core trench below the existing ground level as detailed along the centerline of the embankment berm.
10	EXCAVATION, CHANNEL This is the earthwork required to construct the settling basin on the downstream side of the weir wall and the channel structure to the existing waterway.
11	EXCAVATION, STILLING BASIN This is the excavation required to construct the stilling basin on the upstream side of the normal pool area.
12	EARTHFILL, DIKE This is the quantity of material necessary to construct the embankment berm outside of the clay core trench to the slopes and elevations detailed on the plans. The contractor shall provide for 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. Excess material from other excavations can be used or wasted here to build slopes outside the core.
13	EARTHFILL, CLAY CORE This is the quantity of material necessary to fill the clay core trench excavation and build the clay core trench to within 3 feet of the top of the berm as detailed. This quantity assumed a 30% shrinkage factor on the material.
14	DRAINFILL, FINE This is the quantity of material necessary to bed and cover the new tile, as well as the toe drain.
15	PERFORATED CORRUGATED POLYETHYLENE TUBING, 6" DIA. This item is for the trench drain running along the toe of the dike.
16	DUAL WALL HDPE, 24" DIAMETER This item includes the costs for installation, bedding and backfilling of the HDPE pipe.
17	DUAL WALL HDPE, 12" DIAMETER This item includes the costs for installation, bedding and backfilling of the HDPE pipe.
18	CMP PIPE, 24" DIAMETER
19	CMP PIPE, 12" DIAMETER These items are for the installation of the tile outlets for the new drain tiles.
20	CMP PIPE, 6" DIAMETER This item is for the installation of the trench drain on the toe of the dike.
21	HDPE PIPE TEE, DUAL WALL, 24" x 24" This item is for the installation of a 24" DIA by 24" DIA HDPE Dual wall Tee. Any fittings, hardware, backfill, bedding, etc. used for the installation of the tee shall be incidental to this item.
22	6" TILE STUB This item is for the installation of a 12" x 12" Tee, 12" x 6" Reducer and 10 LF of 6" PE Tile, Capped. Marking end of pipe with suitable post shall be considered incidental to this item.
23	DRAWDOWN PIPE, CMP, 18" DIAMETER This item includes the costs for installation, bedding and backfilling of the CMP pipe. Length is based from center to center of structure and through bends.
24	CMP PIPE BEND, 18", 45 DEGREE This item includes the costs for fabrication and installation of a 18" CMP bend.
25	INLINE WATER CONTROL STRUCTURE, CMP, 48" This item includes the main control structure, lid, locking mechanism, pvc or aluminum stop logs, steps, stop log removal tools, CMP pipe stubs, stop log storage tube, slab and grate, downstream CMP apron and animal guard and the upstream CMP perforated intake riser, grate and rip rap. The fabrication and installation of the two CMP anti-seep collars shall be included in this item. The 18" CMP pipe shall be paid for separately.
26	RIP RAP, CLASS E This item includes excavation, furnishing and installation of rip rap material at the outlet channel from the upstream side of the weir wall to the existing channel and at the outlet of the channel to the existing waterway. Furnishing and installation of geotextile fabric shall be considered incidental to this item. The plan calls for 100 tons total of erosion stone material divided as shown on the plans at the three drain tile outlets, this different material shall be considered rip rap for payment.
27	CONCRETE GROUT Grout mix shall be as specified and placed at 5.4 cubic feet of grout per square yard of rip rap area. The grout shall fully encase the bottom of the rip rap but not fill around the rip rap so as to reduce the energy dissipation capabilities of the rip rap. No grout shall be placed on the rip rap for the channel outlet to the existing waterway or the tile outlets. The grout on the first 4 feet on the upstream side of the weir shall be finished to a trowel smooth finish.
28	TEMPORARY CONSTRUCTION ENTRANCE This temporary driveway entrance shall be used for all construction access by the contractor for the duration of the project. Contractor shall choose the location in the field and verify with the property owner and Engineer. Contractor shall also be responsible for any and all permitting and fees required by the County. This item shall include: excavation, drainage culvert, erosion control, temporary surfacing, removal of items and surface restoration.
29	AGGREGATE SURFACING, ROADSTONE, CLASS A This item is for the reconstruction of the roadway surface on 230th Street after completion of the Drain Tile #3 outlet and extension. A minimum of 6" of Class A Roadstone in the excavated areas shall be installed, areas adjacent shall be top dressed with Class A Roadstone for a smooth transition area. Class A Roadstone shall be as specified in the Iowa Department of Transportation Standard Specifications, Section 4120.04 - Class A Crushed Stone.
30	TRAFFIC CONTROL The Contractor shall furnish and maintain all traffic control devices required for the duration of the road closure for the Drain Tile #3 extension. All traffic control devices shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) as adopted by the IDOT per 761 of the Iowa Administrative Code, Chapter 31: IDOT Standard Road Plans, and these plans. All traffic control devices shall be properly located, maintained, and kept clean and legible by the Contractor to provide for safe traffic flow at all times. Local traffic shall have access to their properties at all times.

ESTIMATE REFERENCE INFORMATION	
ITEM NO.	DESCRIPTION
1	STRIPPING This is the quantity to remove, salvage and stockpile 12" of existing material from all areas to be excavated or disturbed. 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 permanent easement area.
3	STRUCTURE AND CHANNEL FERTILIZER AND SEEDING This seed is for the embankment and berm area, outlet channel area, tile outlet areas 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 This seed is for all other areas above the normal pool elevation and are not part of the fire break or structure & channel seeding. No mulch on this area. The preparation for this area shall include the grading to a uniform surface of the 10:1 safety bench around the perimeter of the pool area.
5	FIRE BREAK SEEDING This seed is for the 15 foot wide area around the perimeter of the permanent easement area, Mulching shall be included for this area.
6	MOBILIZATION/DEMOLITION This work shall include the mobilization and demobilization of the Contractor's forces and equipment for performing the work under the installation of the silt fence through the waterways shall be considered incidental to this item.
7	DRAINAGE TILE INVESTIGATION AND REMOVAL This item will consist of the exploratory excavations required to locate and abandon the tiles shown on the plans. This is full compensation for the excavation, abandonment and backfilling of the tile trenches within the permanent easement boundary.
8	STEEL SHEET PILE Sheet Piling shall be as detailed in the plans, bends and deflections shall be made by prefabricated pieces specifically made for a location. Any additional length necessary to meet angles, construction tolerances, etc. shall be incidental to the overall construction. Sheet pile loadings given are for the in-place loading. Contractor shall determine any additional strengths necessary for installation loadings.

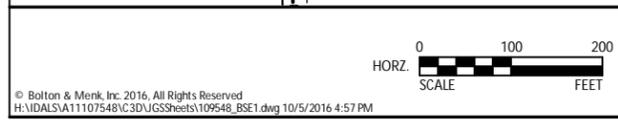
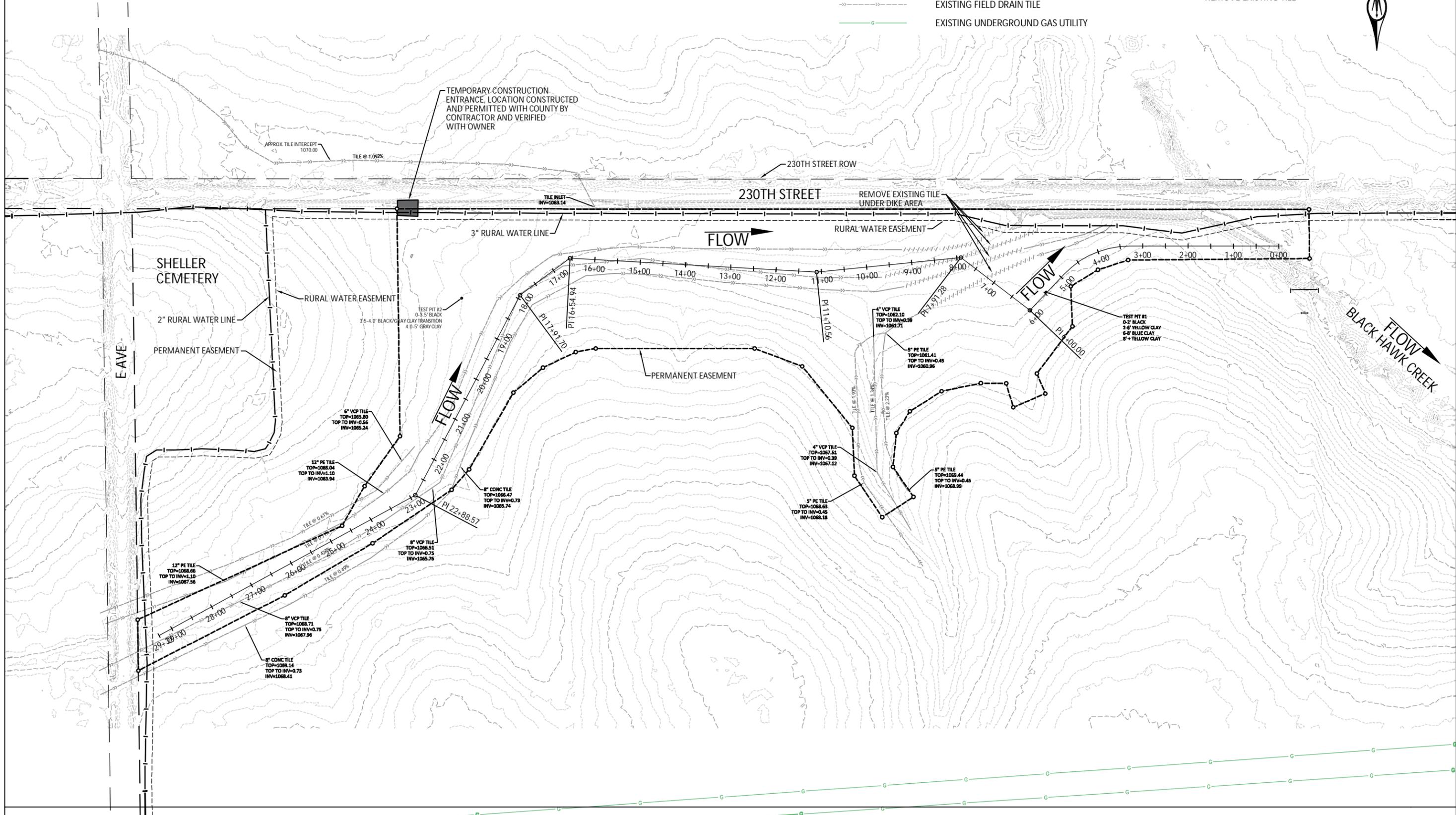


REV	ISSUED FOR	DATE	DESIGNED
0	BIDS	6/7/16	JPR
1	FINAL	10/6/16	JGS
			CHECKED
			JDL

TEMPORARY CONSTRUCTION ACCESS AREA WILL HAVE TO BE DEEP TILLED AFTER CONSTRUCTION IS COMPLETE TO REMOVE ALL COMPACTION IN THE FIELD. AREA UTILIZED SHALL BE KEPT TO THE MINIMUM. REQUIRED FOR EQUIPMENT.

LEGEND

- EXISTING MAIN CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- >---> EXISTING FIELD DRAIN TILE
- EXISTING UNDERGROUND GAS UTILITY
- EXISTING RURAL WATERLINE
- PERMANENT EASEMENT BOUNDARY
- REMOVE EXISTING TILE



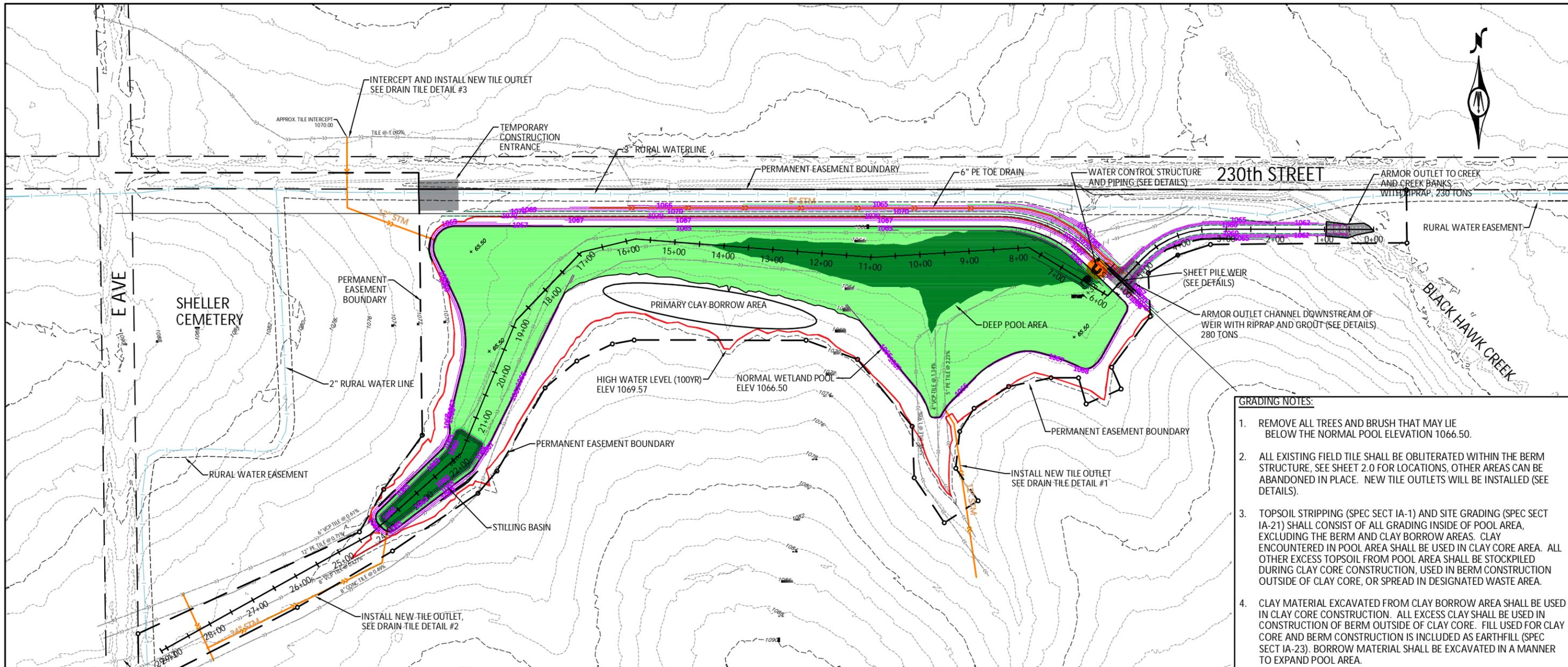
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1	FINAL	10/6/16	JGS
			CHECKED
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IOWA DEPARTMENT OF AGRICULTURE
 GRUNDY COUNTY CREP PROJECT NO. GRU871810B
 EXISTING SITE CONDITIONS

SHEET
 2.0

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- GRADING NOTES:**
- REMOVE ALL TREES AND BRUSH THAT MAY LIE BELOW THE NORMAL POOL ELEVATION 1066.50.
 - ALL EXISTING FIELD TILE SHALL BE OBLITERATED WITHIN THE BERM STRUCTURE, SEE SHEET 2.0 FOR LOCATIONS. OTHER AREAS CAN BE ABANDONED IN PLACE. NEW TILE OUTLETS WILL BE INSTALLED (SEE DETAILS).
 - TOPSOIL STRIPPING (SPEC SECT IA-1) AND SITE GRADING (SPEC SECT IA-21) SHALL CONSIST OF ALL GRADING INSIDE OF POOL AREA, EXCLUDING THE BERM AND CLAY BORROW AREAS. CLAY ENCOUNTERED IN POOL AREA SHALL BE USED IN CLAY CORE AREA. ALL OTHER EXCESS TOPSOIL FROM POOL AREA SHALL BE STOCKPILED DURING CLAY CORE CONSTRUCTION, USED IN BERM CONSTRUCTION OUTSIDE OF CLAY CORE, OR SPREAD IN DESIGNATED WASTE AREA.
 - CLAY MATERIAL EXCAVATED FROM CLAY BORROW AREA SHALL BE USED IN CLAY CORE CONSTRUCTION. ALL EXCESS CLAY SHALL BE USED IN CONSTRUCTION OF BERM OUTSIDE OF CLAY CORE. FILL USED FOR CLAY CORE AND BERM CONSTRUCTION IS INCLUDED AS EARTHFILL (SPEC SECT IA-23). BORROW MATERIAL SHALL BE EXCAVATED IN A MANNER TO EXPAND POOL AREA.
 - SPREAD 6" OF TOPSOIL IN PRIMARY CLAY BORROW AREA AND BERM AREA AFTER CONSTRUCTION ACCORDING TO SPEC SECT IA-26. TOPSOIL IS NOT REQUIRED ON ANY PORTIONS OF SITE 3' BELOW NORMAL POOL ELEVATION 1063.50
 - STRIP AND SALVAGE 12" OF TOPSOIL FROM BORROW AREAS. AFTER BORROW OPERATIONS ARE COMPLETED SPREAD TOPSOIL UNIFORMLY OVER THE BORROW AREA (INCLUDING AREAS BELOW THE WETLAND CREST BUT NOT SLOPES OF DEEP POOL AREA BELOW 1063.50).
 - 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.
 - CONTRACTOR SHALL CONTACT IOWA ONE CALL @ 1-800-292-8989 FOR LOCATION OF ALL UTILITIES AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION AS REQUIRED BY STATE LAW.
 - CONTRACTOR SHALL LOCATE AND PROTECT ALL RURAL WATER LINES IN PROJECT AREA.

DESIGN CRITERIA					VALUE	UNIT	REQUIREMENT
WATERSHED AREA					604	ACRES	500+ acres
POOL NORMAL WATER LEVEL (NWL) ELEV					1066.50	FT	
DESIGNED WETLAND POOL AREA (@ NWL)					7.1	ACRES	
PERCENT POOL AREA TO WATERSHED AREA					1.2	%	Range: 0.5% to 2% of watershed area
MAXIMUM POOL DEPTH					6.5	FT	
AVERAGE POOL DEPTH					1.9	FT	
DEEP WATER AREA (DEPTH > 3 FT)					1.7	ACRES	
PERCENT DEEP WATER TO POOL AREA					24.2	%	Less than 25%
POOL STORAGE VOLUME AT NWL					13.9	ACRE-FT	
BERM ELEVATION					1070.50	FT	
POOL STORAGE VOLUME AT TOP OF DIKE					51.4	ACRE-FT	
MAXIMUM BERM HEIGHT					10.5	FT	
AVERAGE BERM HEIGHT					4.9	FT	
BERM LENGTH					1570	FT	
PRIMARY WEIR ELEVATION					1066.50	FT	
PRIMARY WEIR WIDTH					30	FT	
AUXILIARY SPILLWAY ELEVATION					-	FT	
AUXILIARY SPILLWAY WIDTH					-	FT	
AREA OF BUFFER					9.7	ACRES	*Easement Area less Pool Area
RATIO BUFFER AREA TO NWL POOL AREA					1.4		Less than 4
25-YEAR STORM HWL IN POOL					1069.08	FT	
25-YEAR PEAK INFLOW					471	CFS	
25-YEAR PEAK OUTFLOW					425	CFS	
100-YEAR STORM HWL IN POOL					1069.62	FT	
100-YEAR PEAK INFLOW					625	CFS	
100-YEAR PEAK OUTFLOW					569	CFS	

WETLAND POOL DEPTH (FT)	ELEV (FT)	INCREMENTAL AREA (FT ²)	INCREMENTAL VOLUME (FT ³)	CUMULATIVE VOLUME (AC-FT)
0	1060.00	6167	0	0.00
0.5	1060.50	6950	3475	0.08
1	1061.00	7904	7427	0.17
1.5	1061.50	13645	14249	0.33
2	1062.00	23187	25843	0.59
2.5	1062.50	36511	44098	1.01
3	1063.00	53770	70983	1.63
3.5	1063.50	74882	108424	2.49
4	1064.00	98570	157709	3.62
4.5	1064.50	123463	219440	5.04
5	1065.00	145583	292232	6.71
5.5	1065.50	168903	376683	8.65
6	1066.00	296179	524772	12.05
6.5	1066.50	309763	679654	15.60
7	1067.00	335749	847528	19.46
7.5	1067.50	353127	1024092	23.51
8	1068.00	374624	1211404	27.81
8.5	1068.50	398249	1410528	32.38
9	1069.00	423138	1622097	37.24
9.5	1069.50	455820	1850007	42.47
10	1070.00	498827	2099420	48.20
10.5	1070.50	546764	2372802	54.47

LEGEND

--- (dashed)	EXISTING MAIN CONTOUR	[Pattern]	PROPOSED GROUDED RIPRAP
--- (dotted)	EXISTING INTERMEDIATE CONTOUR	[Green]	NORMAL WETLAND POOL AREA
->->- (dashed)	EXISTING FIELD DRAIN TILE	[Dark Green]	DEEP WATER POOL AREA
-G- (dashed)	EXISTING UNDERGROUND GAS UTILITY	[Black]	PROPOSED SHEET PILE WEIR
(dashed)	REMOVE EXISTING TILE	[Blue]	EXISTING RURAL WATERLINE
--- (solid)	PROPOSED MAIN CONTOUR	[Orange]	PROPOSED OUTLET PIPE
--- (dashed)	PROPOSED INTERMEDIATE CONTOUR		
--- (dashed)	PERMANENT EASEMENT BOUNDARY		



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IOWA DEPARTMENT OF AGRICULTURE
GRUNDY COUNTY CREP PROJECT NO. GRU871810B
PROPOSED SITE CONDITIONS

SHEET
3.0