CONSTRUCTION PLANS FOR

CREP PROJ. NO. WRI932534B

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

WRIGHT COUNTY, IA

OCTOBER, 2015

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
10/28/15	BID SET	JDL
03/18/16	ALL SHEETS - REV #1	

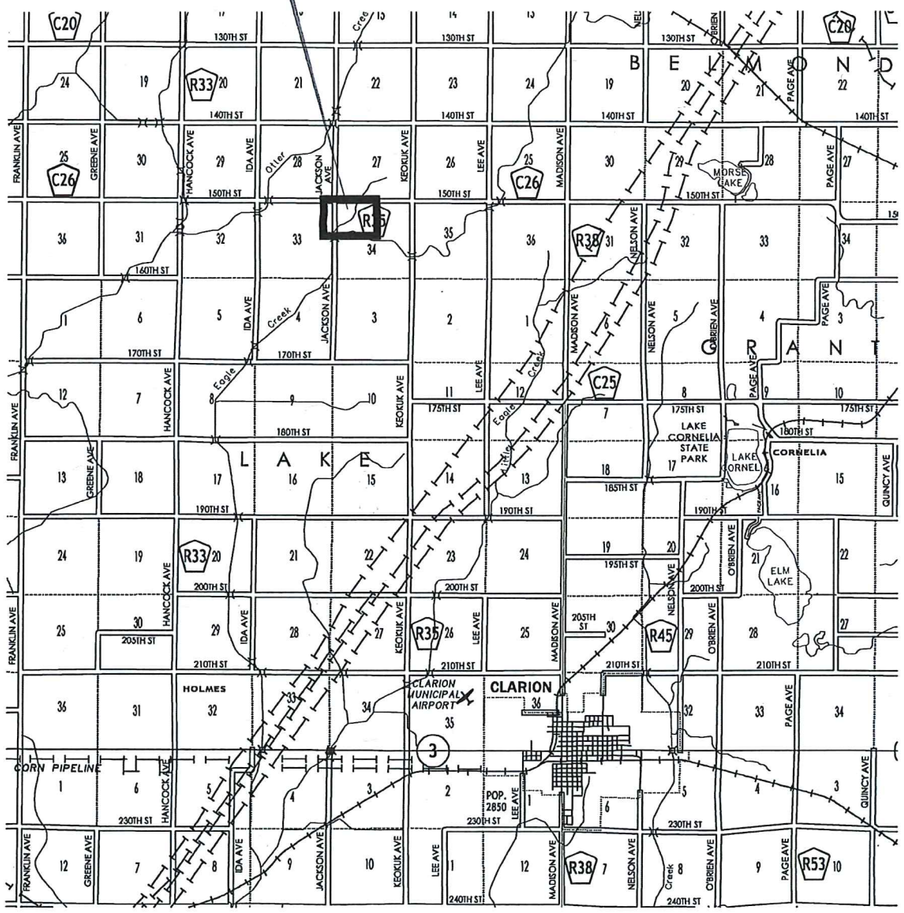
IOWA ONE CALL
1-800-292-8989 | 811
www.iowaonecall.com

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."

0 1000 2000
SCALE FEET

PROJECT LOCATION



MAP OF PORTIONS OF
WRIGHT COUNTY, IOWA

MAP LEGEND

PROJECT LIMITS

SHEET INDEX

PROJECT DATUM:
HORIZONTAL: IOWA STATE PLANE - NORTH ZONE
VERTICAL: NAVD 88

BOLTON & MENK, INC.
Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN BURNSVILLE, MN WILLMAR, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BAXTER, MN ROCHESTER, MN
AMES, IA SPENCER, IA DES MOINES, IA FARGO, ND

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: OCTOBER 28, 2015

LICENSED PROFESSIONAL ENGINEER
JAMES D. LEIDING
17000
IOWA

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2015

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

RECORD DRAWING INFORMATION	IOWA DEPARTMENT OF AGRICULTURE	SHEET
OBSERVER:	WRIGHT CREP PROJECT NO. WRI932534B	1.0
CONTRACTOR:	TITLE SHEET	
DATE:		

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ESTIMATED PROJECT QUANTITIES

ITEM NO.	WORK OR MATERIAL	SPEC. NO	UNIT	ESTIMATED QUANTITY	AS-BUILT QUANTITY
1	STRUCTURE & CHANNEL SEEDING	IA-6	AC	3.71	
2	FIRE BREAK SEEDING	IA-6	AC	5.00	
3	BUFFER SEEDING	IA-6	AC	33.00	
4	MOBILIZATION & DEMOBILIZATION	IA-8	LS	1	
5	CLEARING AND GRUBBING	IA-1	LS	1	
6	STEEL SHEET PILE	IA-13	SF	1,600	
7	TILE INVESTIGATION & REMOVAL	IA-21	LS	1	
8	EXCAVATION, CHANNEL	IA-21	CY	875	
9	EXCAVATION, CORE TRENCH	IA-21	CY	935	
10	EARTHFILL, CLAY CORE	IA-23	CY	2,925	
11	EARTHFILL, BERM CONSTRUCTION	IA-23	CY	5,300	
12	EARTHFILL, POOL CONSTRUCTION	IA-23	CY	15,000	
13	TOPSOIL STRIP, SALVAGE & RESPREAD	IA-26	CY	12,500	
14	CORRUGATED POLY. TUBING, 5"	IA-46	LF	535	
15	CORRUGATED POLY. TUBING, 10"	IA-46	LF	1,705	
16	CORRUGATED POLY. TUBING, 12"	IA-46	LF	325	
17	CORRUGATED METAL PIPE, 6" DIA.	IA-51	LF	40	
18	CORRUGATED METAL PIPE, 12" DIA.	IA-51	LF	80	
19	CORRUGATED METAL PIPE, 18" DIA.	IA-51	LF	115	
20	WATER CONTROL STRUCTURE	IA-51	LS	1	
21	RIP RAP, CLASS E W/ GEOTEXTILE	IA-61	TONS	525	
22	PCC GROUT	IA-62	CY	85	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
1	STRUCTURE & CHANNEL SEEDING This seed is for the embankment and berm area, outlet channel area, drawdown channel, 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.
2	FIRE BREAK SEEDING This seed is for the 30 foot wide area around the perimeter of the permanent easement area, except for the southern side alorg the existing drainage ditch easement. Mulching shall be included for this area.
3	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 and around the perimeter of the pool area.
4	MOBILIZATION & DEMOBILIZATION This work shall include the mobilization and demobilization of the Contractor's forces and equipment for performing the work under the contract. Any installation of the silt fence through the waterways shall be considered incidental to this item.
5	CLEARING AND GRUBBING This shall be considered full compensation to remove all trees, stumps and brush from within the permanent easement area.

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
6	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. Sheets shown on the plan details are assumed width of 24 inches, actual width of pile used may vary, contractor will need to adjust number of sheets required accordingly.
7	TILE INVESTIGATION & 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, backfilling and abandonment of the tile trenches within the permanent easement boundary.
8	EXCAVATION, CHANNEL This is the earthwork required to construct the settling basin on the downstream side of the weir wall and the outlet channel to the existing waterway and includes the earthwork for the drawdown channel and stilling basin for the water control structure outlet.
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	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. It is anticipated that select clay material for the clay core construction will be borrowed from an area of suitable material from within the permanent easement, this price should include loading, hauling and placement of the material.
11	EARTHFILL, BERM CONSTRUCTION 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.
12	EARTHFILL, POOL CONSTRUCTION This is the amount of material excavated to cut and shape the pool as designed. Other areas will require filling with the excess material from that excavation to meet the proposed design. This quantity was based on the proposed finished grade compared to the 0.5' Strip surface. Excess material from this work shall be used for embankment berm construction outside of the clay core or stockpiled at a designated location.
13	TOPSOIL STRIP, SALVAGE & RESPREAD This is the quantity to remove, salvage and stockpile 6" 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.
14	CORRUGATED POLY. TUBING, 5" This quantity is for the two trench drains on the downstream side of the berm structure.
15	CORRUGATED POLY. TUBING, 10"
16	CORRUGATED POLY. TUBING, 12"
17	CORRUGATED METAL PIPE, 6" DIA. This quantity is for the two trench drains on the downstream side of the berm structure.
18	CORRUGATED METAL PIPE, 12" DIA.
19	CORRUGATED METAL PIPE, 18" DIA. The item includes the costs for installation, bedding and backfilling of the CMP pipe. Length is based from center of structure to center of structure and through bends for the water control structure outlet pipe and 20 LF for the TDD#3 tile outlet work. 2 - 45 degree bends will be incidental to this item and paid per LF.
20	WATER CONTROL STRUCTURE This item includes the main control structure, steps, 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 four CMP anti-seep collars shall be included in this item. The 18" RCP pipe shall be paid for seperately.
21	RIP RAP, CLASS E W/ GEOTEXTILE This item includes excavation, geotextile fabric placement and 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 overland flow bypass channel to the existing channel. The plan calls for 25 Tons of erosion stone material at each drain tile outlet, this different material shall be considered rip rap for payment, but geotextile fabric will not be required at the tile outlets.
22	PCC 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 drawdonw channel or the tile outlets.

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DESIGNED JPR
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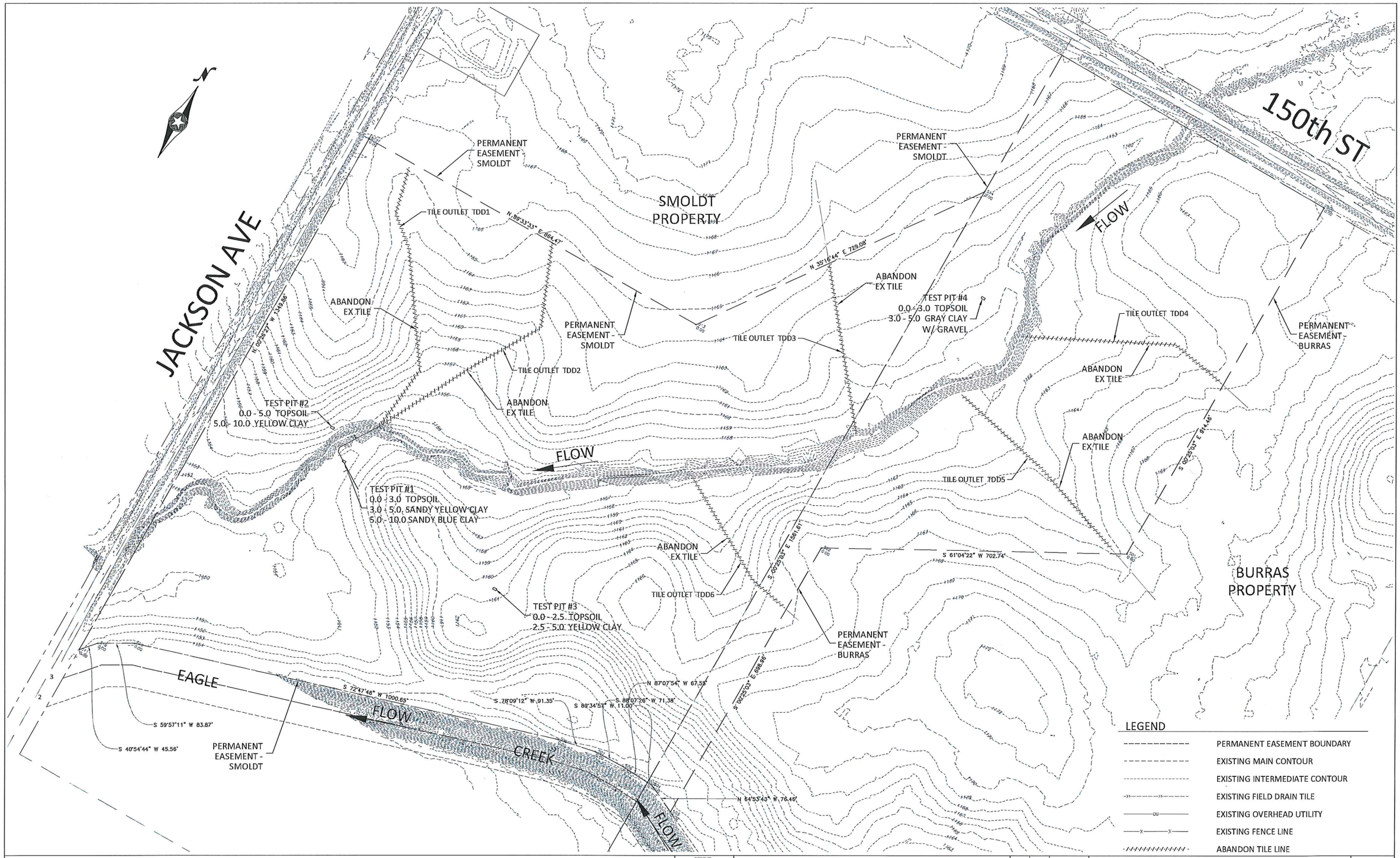
CHECKED NTG

BOLTON & MENK, INC.
Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN BURNSVILLE, MN WILLMAR, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BAXTER, MN ROCHESTER, MN
AMES, IA SPENCER, IA DES MOINES, IA FARGO, ND

REV.	BY	DATE
1	JDL	03/18/16

IOWA DEPARTMENT OF AGRICULTURE
WRIGHT CREP PROJECT NO. WRI932534B
ESTIMATED QUANTITIES AND REFERENCE NOTES

SHEET 1.1



LEGEND

- PERMANENT EASEMENT BOUNDARY
- EXISTING MAIN CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING FIELD DRAIN TILE
- EXISTING OVERHEAD UTILITY
- EXISTING FENCE LINE
- ABANDON TILE LINE

HORIZ. SCALE 0 100 200 FEET

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DESIGNED	DRAWN	CHECKED
JPR	JDL	NTG

BOLTON & MENK, INC.
Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN BURNSVILLE, MN WILLMAR, MN
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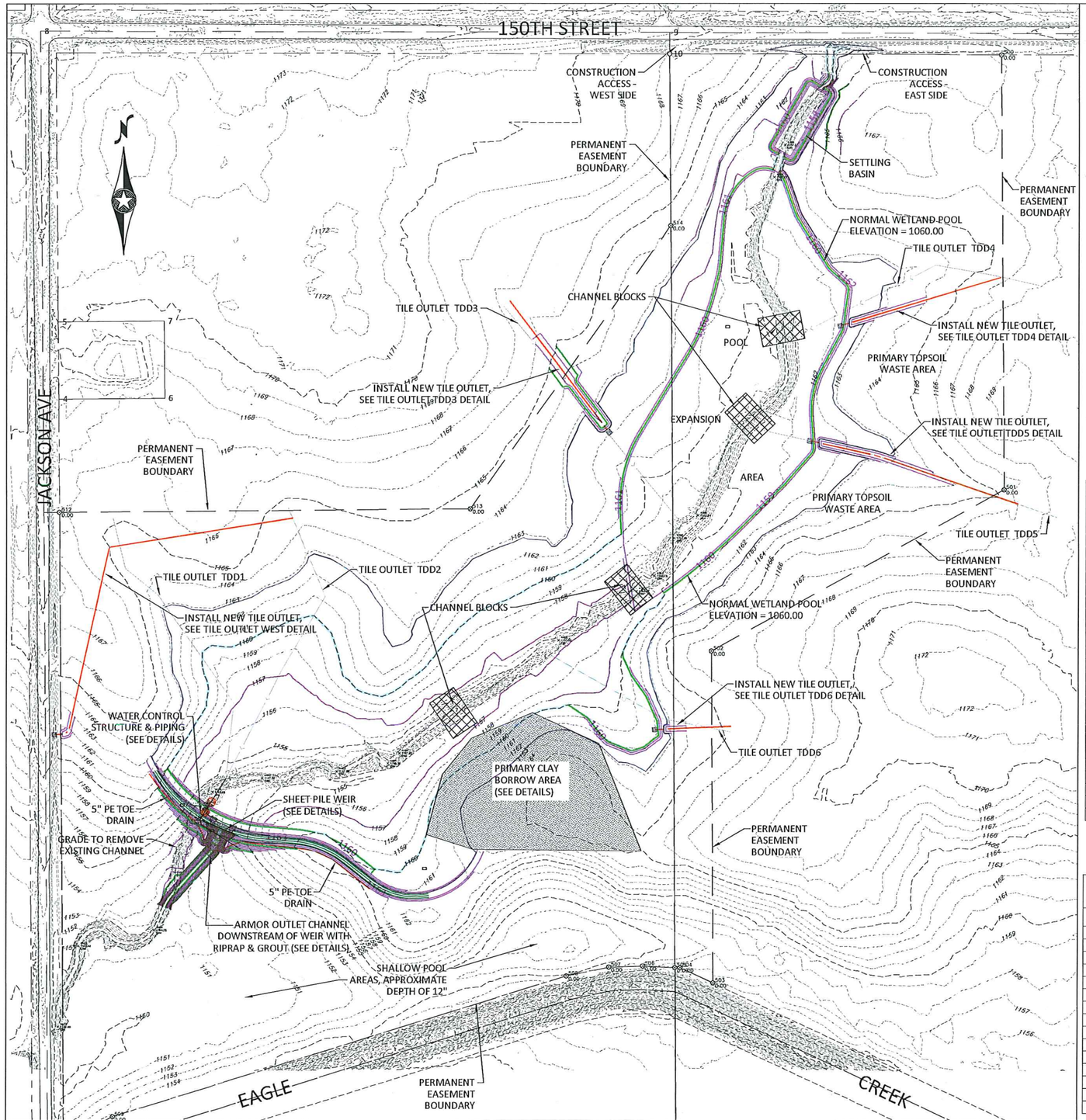
REV.	BY	DATE
1	JDL	03/18/16

IOWA DEPARTMENT OF AGRICULTURE
WRIGHT CREP PROJECT NO. WRI932534B
EXISTING SITE CONDITIONS

SHEET 2.0



GRADING NOTES:

1. REMOVE ALL TREES AND BRUSH THAT MAY LIE BELOW THE NORMAL POOL ELEVATION 1060.00.
2. ALL EXISTING FIELD TILE SHALL BE OBLITERATED WITHIN THE BERM STRUCUTRE, SEE SHEET 2.0 FOR LOCATIONS, OTHER AREAS CAN BE ABANDONED IN PLACE. NEW TILE OUTLETS WILL BE INSTALLED (SEE DETAILS).
3. SITE GRADING (SPEC SECT IA-1) 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.
4. 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 ONSTRUCTION IS INCLUDED AS EARTHFILL (SPEC SECT IA-23).
5. 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 BELOW ELEVATION 1057.00.
6. STRIP AND SALVAGE 6" 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 AREAS BELOW 1057.00).
7. STRIPPED AND REMOVED UNSUITABLE MATERIALS, IF ANY, ARE TO BE DISPOSED OF IN DESIGNATED AREAS AS DIRECTED BY ENGINEER AND PRIOR TO TOPSOIL PLACEMENT.
8. IN TOPSOIL WASTE AREAS, FEATHER TOPSOIL INTO SLOPE SO THAT OVERLAND FLOW IS NOT IMPEDED.
9. EXCESS MATERIAL CAN BE WASTED BY FILLING THE EXISTING DEEP CHANNEL AREAS INTERMITTENTLY.
10. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS, CODES, AND OSHA STANDARDS.
11. 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.

DESIGN CRITERIA	VALUE	UNIT	REQUIREMENT
WATERSHED AREA	1023	ACRES	Greater than 500 acres
POOL NORMAL WATER LEVEL (NWL) ELEV	1160.00	FT	
DESIGNED WETLAND POOL AREA (@ NWL)	13.1	ACRES	
PERCENT POOL AREA TO WATERSHED AREA	1.3	%	Range 0.5% to 2% of watershed area
MAXIMUM POOL DEPTH	13	FT	
AVERAGE POOL DEPTH	2.1	FT	
DEEP WATER AREA (DEPTH > 3 FT)	1.6	ACRES	
PERCENT DEEP WATER TO POOL AREA	11.8	%	Less than 25%
POOL STORAGE VOLUME AT NWL	27.1	ACRE-FT	
BERM ELEVATION	1163.50	FT	
POOL STORAGE VOLUME AT TOP OF DIKE	87.9	ACRE-FT	
MAXIMUM BERM HEIGHT	16.5	FT	
AVERAGE BERM HEIGHT	3.7	FT	
BERM LENGTH	880	FT	
PRIMARY WEIR ELEVATION	1160.00	FT	
PRIMARY WEIR WIDTH	30	FT	
AUXILIARY SPILLWAY ELEVATION	-	FT	
AUXILIARY SPILLWAY WIDTH	-	FT	
AREA OF BUFFER	40.2	ACRES	
RATIO BUFFER AREA TO NWL POOL AREA	3.1		Less than 4
25-YEAR STORM HWL IN POOL	1162.29	FT	
25-YEAR PEAK INFLOW	431.6	CFS	
25-YEAR PEAK OUTFLOW	402.6	CFS	
100-YEAR STORM HWL IN POOL	1162.85	FT	
100-YEAR PEAK INFLOW	596.9	CFS	
100-YEAR PEAK OUTFLOW	559.2	CFS	

WETLAND POOL DEPTH (FT)	ELEV (FT)	INCREMENTAL AREA (FT2)	CUMULATIVE VOLUME (FT3)	CUMULATIVE VOLUME (AC-FT)
Elevation < 1157.00 (Volume not filled)				
3.0	1157.00		202500	4.65
3.5	1157.50	181940	247985	5.69
4.0	1158.00	213773	346913	7.96
4.5	1158.50	242878	461076	10.58
5.0	1159.00	490569	644438	14.79
5.3	1159.50	540782	902275	20.71
5.5	1160.00	571878	1180440	27.10
6.0	1160.50	608685	1475581	33.87
6.5	1161.00	643139	1788537	41.06
7.0	1161.50	689156	2121611	48.71
7.5	1162.00	756046	2482911	57.00
8.0	1162.50	839651	2881835	66.16
8.5	1163.00	944564	3327889	76.40
9.0	1163.50	1054591	3827678	87.87

LEGEND

- EXISTING MAIN CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING FIELD DRAIN TILE
- OU EXISTING OVERHEAD UTILITY
- PROPOSED MAIN CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- PERMANENT EASEMENT BOUNDARY
- PROPOSED GROUTED RIPRAP
- PROPOSED SHEET PILE WEIR
- PROPOSED OUTLET PIPE
- 966.5 × PROPOSED SPOT ELEVATION
- BERM CLAY BORROW AREA

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DESIGNED JPR
DRAWN JDL
CHECKED NTG

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REV.	BY	DATE
1	JDL	03/18/16

IOWA DEPARTMENT OF AGRICULTURE
WRIGHT CREP PROJECT NO. WRI932534B
PROPOSED SITE CONDITIONS

SHEET 3.0