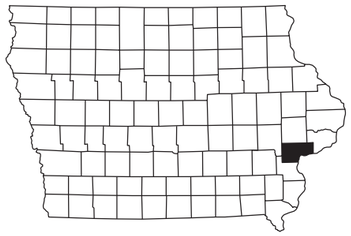
IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS FOR WIESE SLOUGH WMA ROAD MAINTENANCE

MUSCATINE COUNTY, IOWA

DOT PROJECT #SP-00SP(7)--7C-00
DNR PROJECT #23-06-70-01



LICENSED PROFESSIONAL ENGINEER
BRUCE L. FLIPPIN
19513
IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED UNDER MY SUPERVISION AND THAT ENGINEERING DECISIONS WITH REGARD TO THE DESIGN WERE MADE BY ME UNDER THE LAWS OF THE STATE OF IOWA.

Bruce L. Flippin
Digitally signed by Bruce L. Flippin
DN: cn=Bruce L. Flippin@dnr.iowa.gov, o=Iowa DNR, ou=Land Bureau, Engineering Bureau, cn=Bruce L. Flippin
Date: 2024.02.20 10:32:02-06'00'
SIGNATURE DATE

BRUCE L. FLIPPIN
PRINTED OR TYPED NAME

MY LICENCE RENEWAL DATE IS DECEMBER 31, 20 24
PAGES COVERED BY THIS SEAL: ALL

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

DIRECTORY

PROJECT MANAGER		CONSTRUCTION INSPECTOR	
COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES	COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES
ADDRESS	502 EAST 9TH STREET	ADDRESS	
CITY,STATE,ZIP	DES MOINES, IA, 50319	CITY,STATE,ZIP	
CONTACT	BRUCE L. FLIPPIN	CONTACT	MARK MOELLER
TELEPHONE	515-689-8009	TELEPHONE	515-214-9532
FAX	515-281-8685	FAX	
EMAIL	bruce.flippin@dnr.iowa.gov	EMAIL	mark.moller@dnr.iowa.gov

PROJECT DESCRIPTION

This project consists of granular roadway maintenance - blading/shaping, ditch cleaning, spreading new rock, and the replacement of 2 CMP culverts with RCP culverts.
Possible alternate bid items include a granular boat ramp (in water) installation.

AUTHORIZATION TO BID

Kelsey Fleming
Digitally signed by Kelsey Fleming
Date: 2024.02.20 10:35:41 -06'00'
AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

Travis Baker
Digitally signed by Travis Baker
Date: 2024.02.20 10:55:54 -06'00'
ENGINEERING BUREAU CHIEF DATE

SHEET INDEX

CONSULTANT:

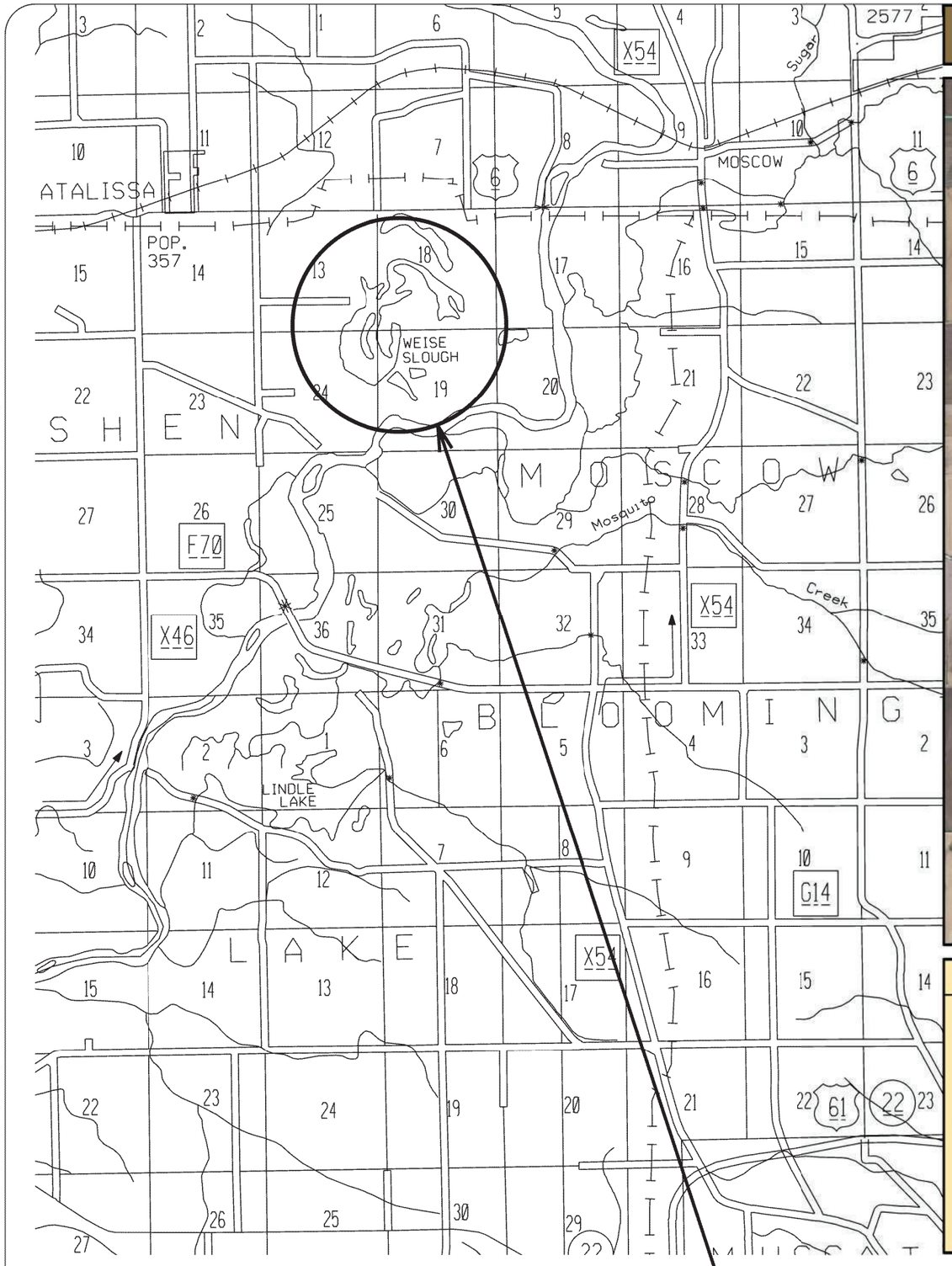
IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

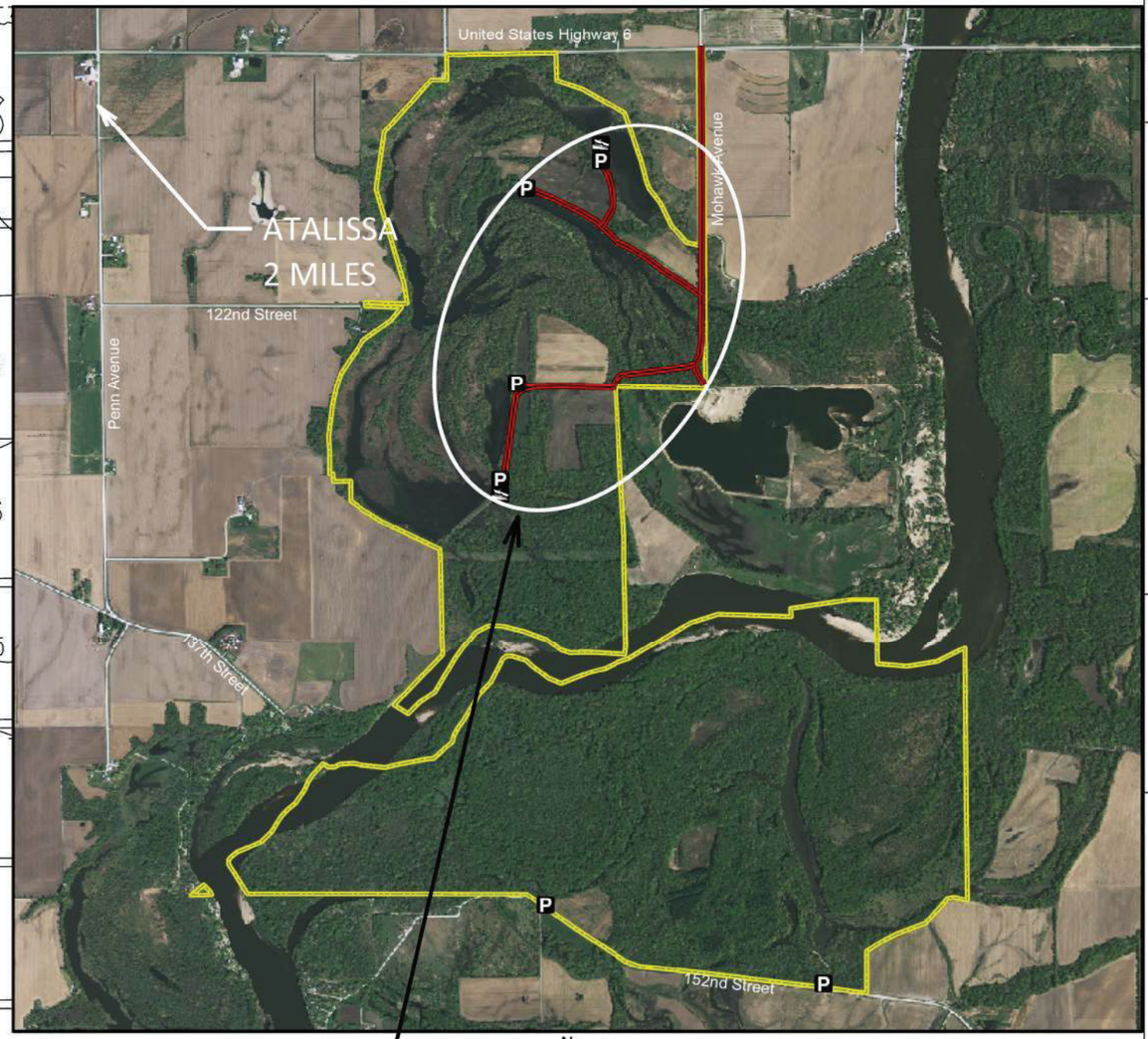
COVER SHEET
ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

NO.	BY	DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHK'D BY:
DATE: FEB 2024
SHEET No: A.01

Wiese Slough Wildlife Management Area





Legend

State Areas open to hunting
- WMA Boundary
- Parking Lot
- Boat Ramp
- Access Road
- 2010 Aerial Photography

Map Creation Date: 3/2011

N
Miles
0 0.25 0.5

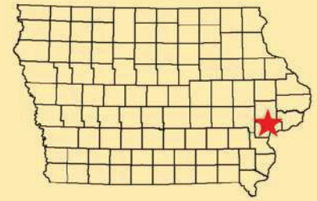
Acres: 1,871

Habitat: 4/5 Timber, 1/5 Marsh

Species: Deer, Squirrel, Turkey, Waterfowl, Dove

Contact: Andy Robbins
Odessa Wildlife Unit
319-551-8459

Muscatine County, Iowa
T-78N, R-02&03W,
Sections 13,18-20,24-25,29-30



Directions: 2.5 miles E of Atalissa on Hwy 6.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

PROJECT LOCATION MAP

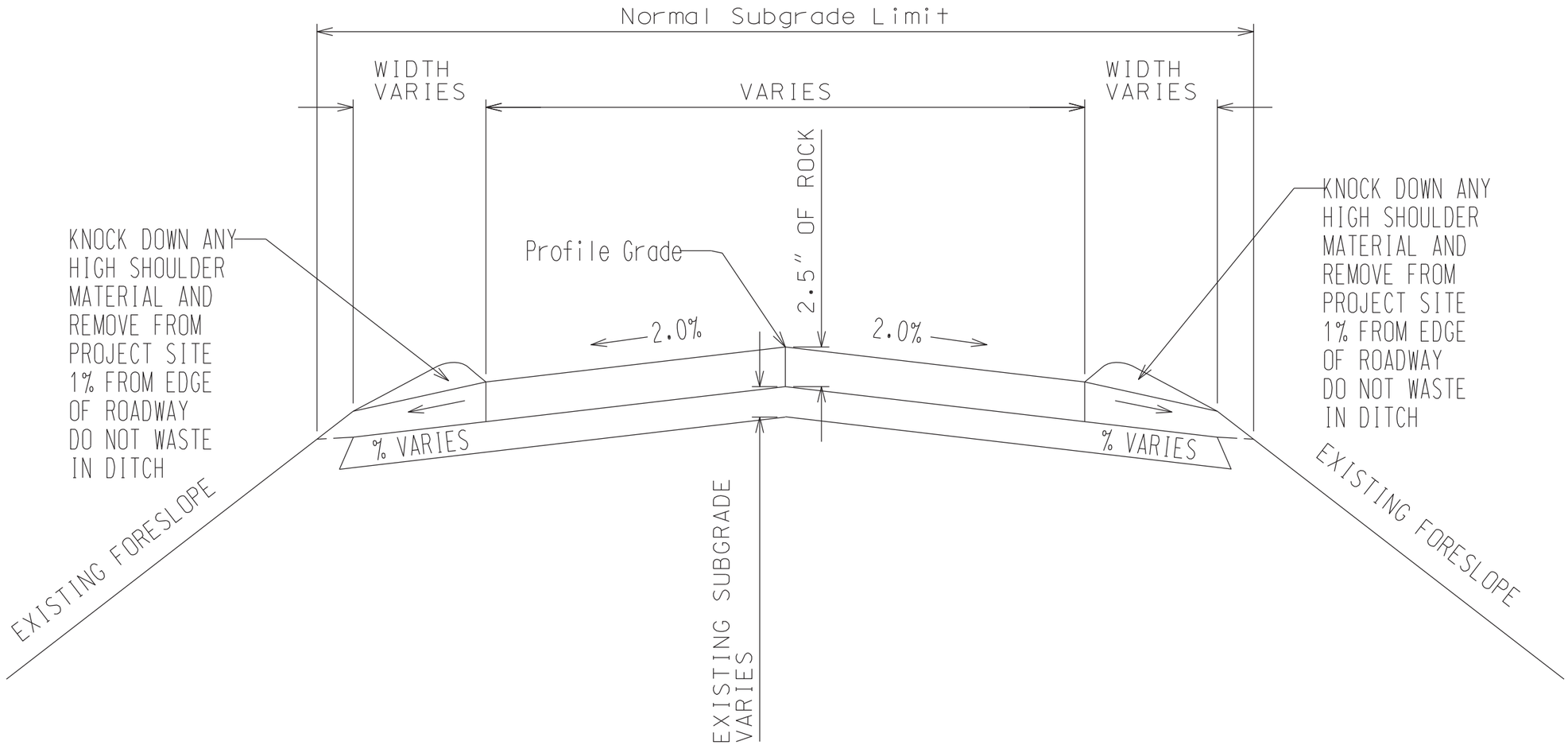
ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA

MUSCATINE COUNTY

NO.	BY / DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

SHEET No:
A.02



Typical Roadway Section - Center Crown

Note:

Normal sections shown may be appropriately modified for areas specifically designated by the Engineer.

STATION	TO STATION	LOCATION	WIDTH
0+00	45+01	TOP OF LEVEE	14'
100+00	103+5	HEADING WEST	14'
200+00	234+69	HEADING	14'
300+00	314+08	HEADING	14'

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA

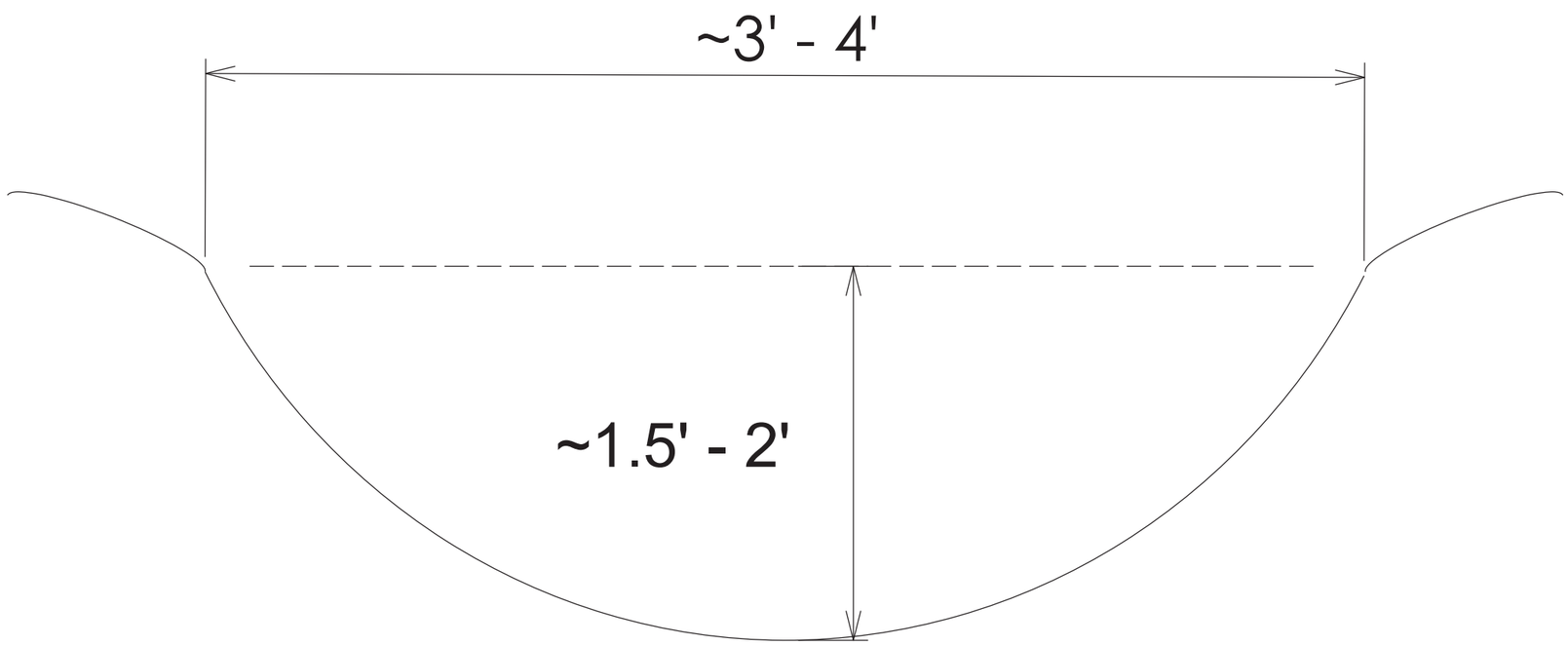
MUSCATINE COUNTY

NO.	BY / DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHK'D BY:
DATE: FEB 2024

SHEET No:
B.01

Typical Ditch Profile



STATION	TO	STATION	OFFSET
14+50		15+50	LEFT
35+00		36+00	LEFT
37+75		38+75	LEFT
202+00		203+00	LEFT
205+00		206+00	LEFT

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

NO.	BY / DATE	REVISION

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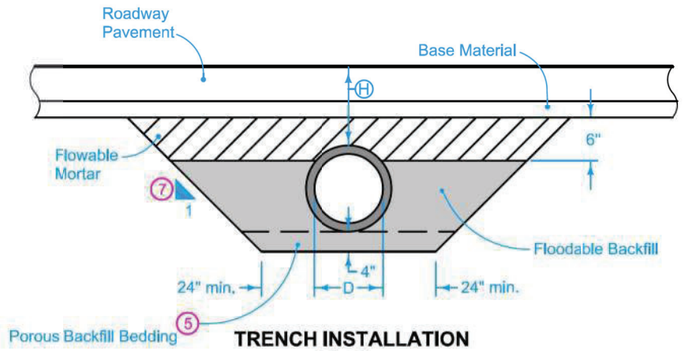
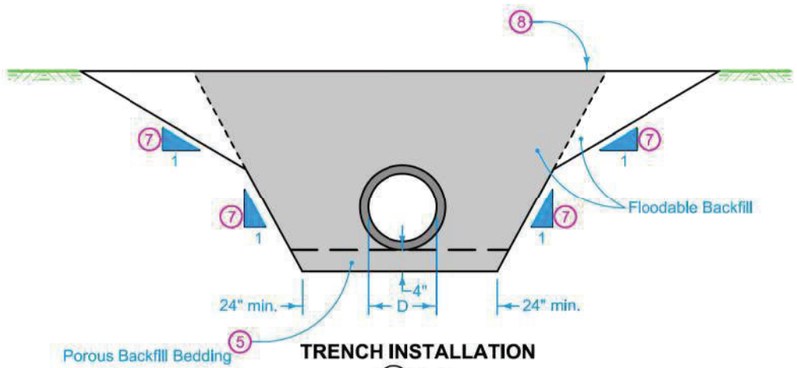
CHK'D BY:
DATE: FEB 2024

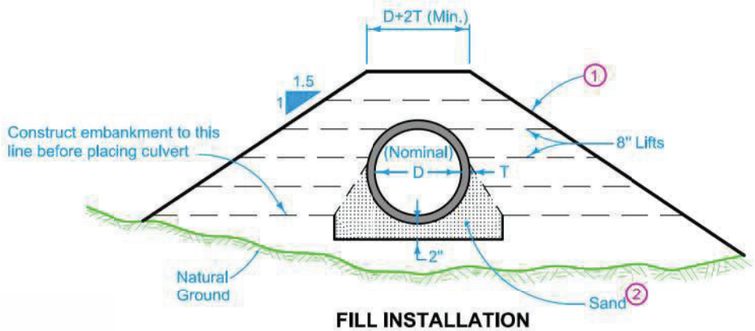
SHEET No:
B.02



TRENCH INSTALLATION
(H)≤4'



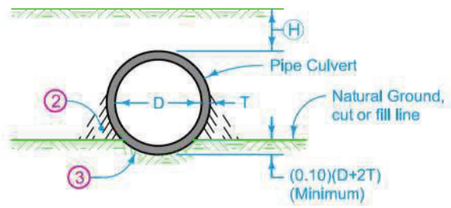
TRENCH INSTALLATION
(H)>4'



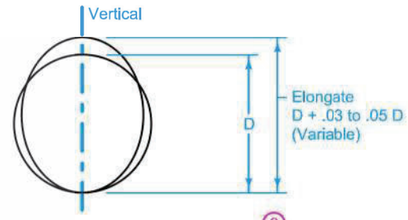
FILL INSTALLATION
(FOR RIGID PIPES ONLY)

CLASS 'B' BEDDING & BACKFILL (4)

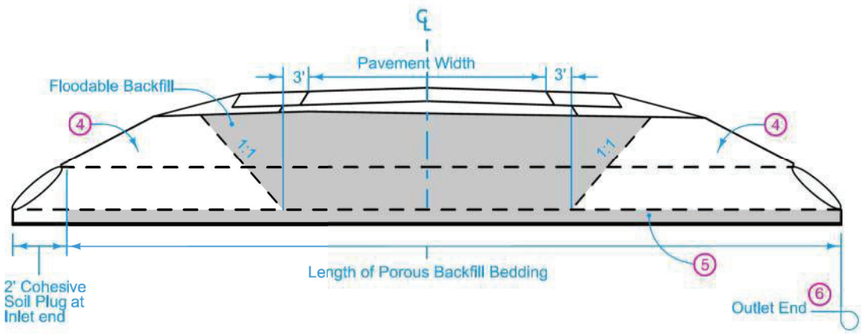
Denotes pay limits for flooded backfill



CLASS 'C' BEDDING & BACKFILL



ELONGATED PIPE (9)



TYPICAL SECTION - SOIL PLUG

Refer to DR-104 for minimum and maximum allowable cover (H) for the particular kind of pipe culvert.

1. The backfill adjacent to and above the pipe culvert may be placed in conjunction with normal embankment construction. Thoroughly tamp the embankment within the limits shown.
2. Take extra care to ensure complete and satisfactory tamping of backfill material in the area immediately adjacent to the lower portion of pipe.
3. Carefully shape excavation below groundline either using a template conforming to actual dimension and shape of the pipe or using other means. If using other means, check with a template conforming to the actual dimension and shape of the pipe.
4. For culverts backfilled by flooding, place a cohesive soil plug at the inlet, outlet, and, when necessary, sides, prior to flooding.
5. 4-inch Porous Backfill bedding. 2-inch Floodable Backfill bedding may be used under unsealed rigid pipe.
6. Extend Porous Backfill through the outlet end soil plug when used for bedding.
7. Quantity calculations are based upon a 1:1 slope and minimum trench dimension. Actual slope of trench may vary based upon Contractor's operations.
8. Ground Line at time of pipe installation. When existing ground exceeds 5 feet depth over pipe, backfill and compaction by flooding is not required more than 5 feet above the pipe.
9. Where a corrugated metal pipe culvert requiring elongation is to be installed (to counteract deformation caused by backfill), complete elongation using a means approved by the Engineer. Elongation may be developed either as part of shop fabrication or field installation. Install with elongated axis vertical.

Possible Contract Items:
- Flowable Mortar
- Flooded Backfill
- Excavation, Class 20

Possible Tabulations:
- 104-3
- 104-4

IOWA DOT

STANDARD ROAD PLAN

REVISION	
2	04-18-17

DR-101

SHEET 1 of 1

REVISIONS: Changed "Porous Backfill" to "Porous Backfill Bedding" for clarity. Modified trench installation detail for H>4' to clarify pay limits.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

PIPE CULVERT
(BEDDING AND BACKFILL)

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

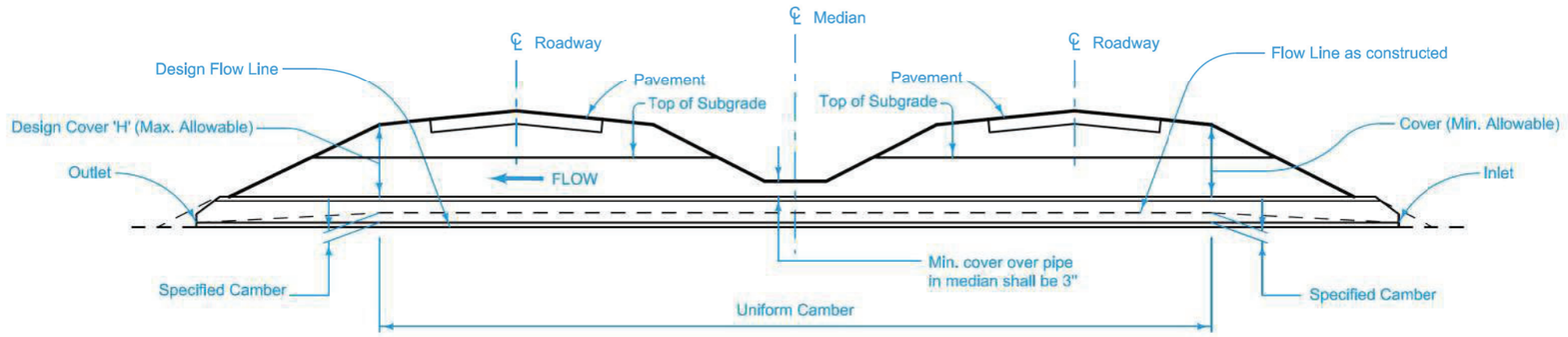
TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

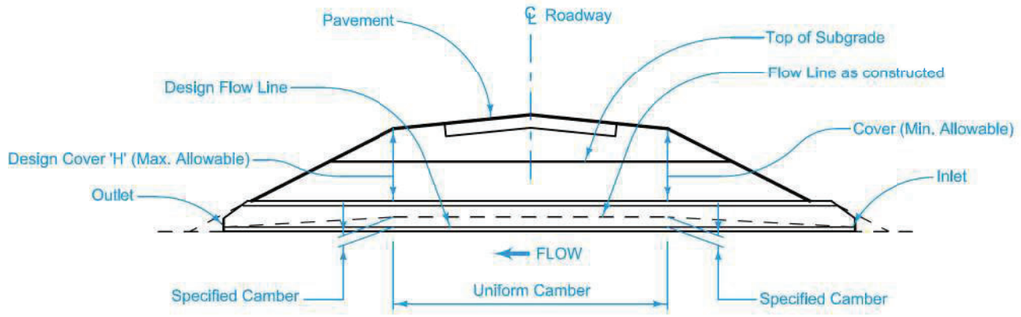
NO.	BY / DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

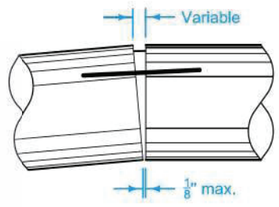
SHEET No:
B.03



TYPICAL INSTALLATION DUAL ROADWAY



TYPICAL INSTALLATION SINGLE ROADWAY



TYPICAL JOINT IN CAMBERED PIPE (1)

Design Cover 'H' (feet)	Normal Camber (feet)
5	0.08
10	0.17
15	0.25
20	0.33
25	0.42
30	0.50
35	0.58

Pipe Size 'D'	Maximum Camber (feet)
24"	1.1
30"	1.2
36"	1.3
42"	1.4
48"	1.5
60"	1.6
84"	1.7

ALLOWABLE CAMBER TABLES

Refer to DR-121 for pipe joint connection and wrapping.

Refer to DR-101 for culvert bedding and backfill.

COVER

Refer to DR-104 for minimum and maximum allowable cover for the particular kind of culvert.

CAMBER

Camber is the dimension line between inlet and outlet elevation. Some settlement of the structure is usually anticipated, resulting in the design flow line between inlet and outlet. Camber is developed uniformly from inlet and outlet to a point beneath the outside shoulder lines of the roadway and is uniform between those points, as indicated. The Normal Camber indicated in the "Allowable Camber Tables" should be used unless specific camber values are indicated elsewhere in the plans.

(1) Camber for concrete pipe is created by placing pipe sections tight at the bottom of the joint with variable opening at top of joint. Camber for corrugated metal pipe to be done as directed by the Engineer.

IOWA DOT

STANDARD ROAD PLAN

REVISION: New 04-21-15

DR-102

SHEET 1 of 1

REVISIONS: New. Replaces RF-30B.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

PIPE CULVERT (COVER AND CAMBER)

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

DNR

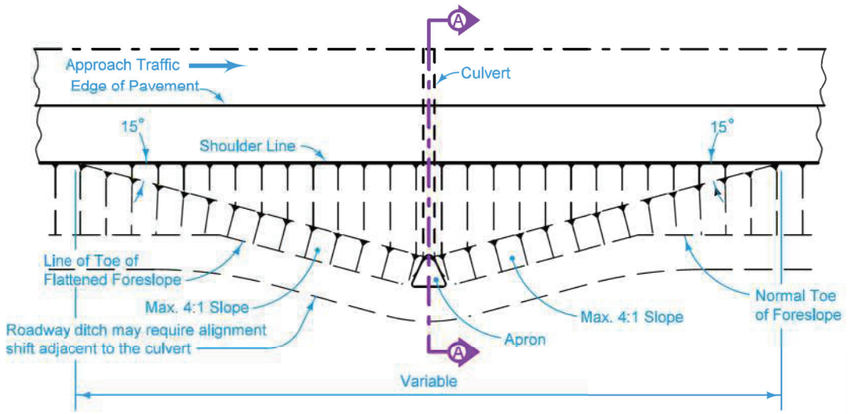
TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

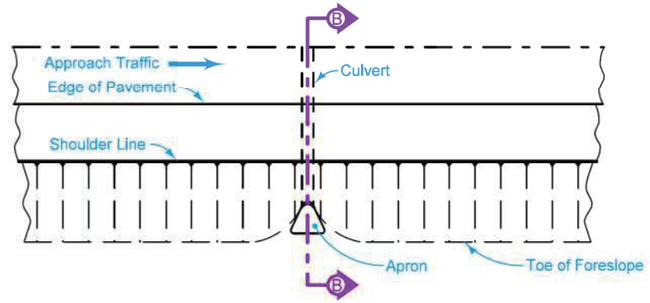
NO.	BY DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

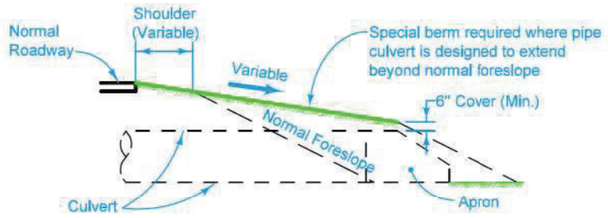
SHEET No: **B.04**



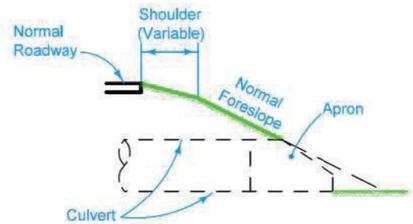
TYPICAL INSTALLATION PLAN
WHERE SPECIAL BERM IS REQUIRED



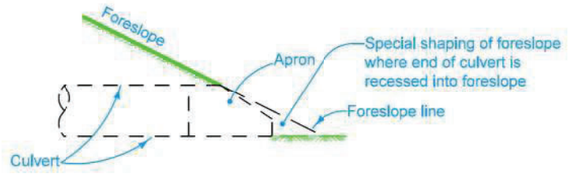
TYPICAL INSTALLATION PLAN
WHERE CULVERT MATCHES NORMAL FORESLOPE



SECTION A-A



SECTION B-B



DETAIL OF SHAPING EARTH FORESLOPE
AT CULVERT END

IOWA DOT

STANDARD ROAD PLAN

REVISION	
New	04-21-15

DR-103

SHEET 1 of 1

REVISIONS: New. Replaces RF-30C.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

PIPE CULVERT
(INSTALLATION DETAILS)

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

DNR

TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

NO.	BY / DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

SHEET No:
B.05

CONCRETE CULVERT PIPE CLASS "B" BEDDING				
DIAMETER OF PIPE 'D' Inches	(H) MAXIMUM ALLOWABLE COVER IN FEET			
	1500D (Class II)	2000D (Class III)	3000D (Class IV)	3750D (Class V)
18	11	13	20	25
24	12	14	21	26
36	13	16	23	28
48	14	16	24	29
60	14	17	24	29
72	14	17	24	30
84	15	17	25	30
96	15	18	25	31
108	15	18	26	32

CONCRETE CULVERT PIPE CLASS "C" BEDDING				
DIAMETER OF PIPE 'D' Inches	(H) MAXIMUM ALLOWABLE COVER IN FEET			
	1500D (Class II)	2000D (Class III)	3000D (Class IV)	3750D (Class V)
18	9	12	18	22
24	10	13	19	23
36	11	14	20	24
48	11	15	21	25
60	12	15	21	26
72	12	16	22	26
84	13	16	22	27
96	13	16	23	27
108	13	17	23	28

DESIGN CRITERIA FOR CONCRETE PIPE

The height of cover tables have been prepared from data in the "Concrete Pipe Design Manual" published by the American Concrete Pipe Association using the values listed below.

FOR EMBANKMENT CONDITIONS

Fill Material Density	= w = 120 lbs. per cu. ft.
Settlement Ratio	= rsd = +0.5
*	= ku = 0.13
Projection Ratio	= p = 0.9 (Class "C" bedding)
	= p = 0.7 (Class "B" bedding)
Factor of Safety	= F.S. = 1.33 on Ultimate Strength

* Using a ratio of lateral to vertical earth pressure (k) of 0.37 (saturated yellow clay) and a coefficient of internal friction (u) of 0.34.

The values shown for concrete pipe were calculated for concrete pipe placed under embankment conditions. These values do not apply to to design and installation of sanitary sewer except where sanitary sewer would be placed under embankment conditions.

When unclassified pipe is specified, furnish and install a class of pipe meeting the requirements on the chart.

For Steel Round Pipe, the Contractor may choose the type of corrugated pipe and installation to furnish as long as the selection conforms to the limits indicated for the type specified.

When furnishing Steel Arch Pipe, furnish pipe with corrugations as specified in plans.

Minimum allowable cover for concrete and metal pipe is 2 feet for roadway culverts and 1 foot for entrance culverts.

Maximum cover for all sizes and installations of concrete arch pipe is 12 feet.

For all sizes and installations of polyethylene pipe:
minimum cover = 2 feet
maximum cover = 24 feet for 12 to 24 inch pipes
20 feet for 30 to 48 inch pipes

Where a pipe size not listed in the table is required, the 'H' indicated for the next smaller size will apply.

Special installations may be designed to exceed indicated maximumallowable cover by specific modification of one or more of the following conditions:

1. Bedding Class
2. Pipe Strength (including special design pipe)
3. Type of backfill or cover material
4. Compaction requirements for backfill or cover material
5. Controlled trench width

Where site conditions favor such modifications, significant economy may result from special design installations and these should be considered. Special designs will specify particular modification of construction requirements or design criteria as applicable. Necessary modifications of normal requirements will not ordinarily be paid for seperately but will be included in the price bid for culvert pipe.

CONCRETE CULVERT PIPE

IOWA DOT

STANDARD ROAD PLAN

REVISION 1 04-19-16

DR-104

SHEET 1 of 3

REVISIONS: Added general note regarding maximum cover on concrete arch pipes.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

DEPTH OF COVER TABLES FOR CONCRETE AND CORRUGATED PIPE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
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MUSCATINE COUNTY

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CHKD BY:
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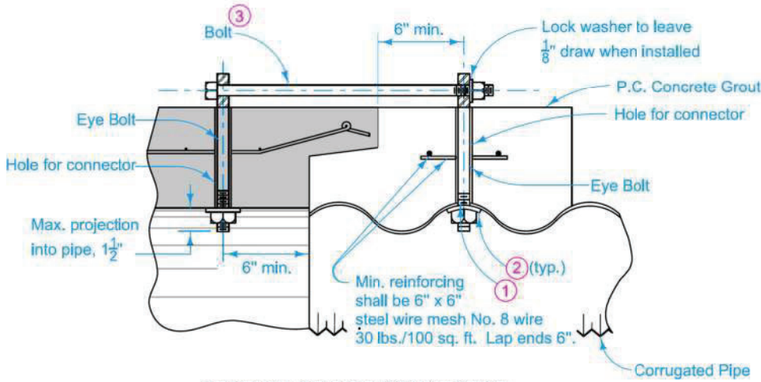
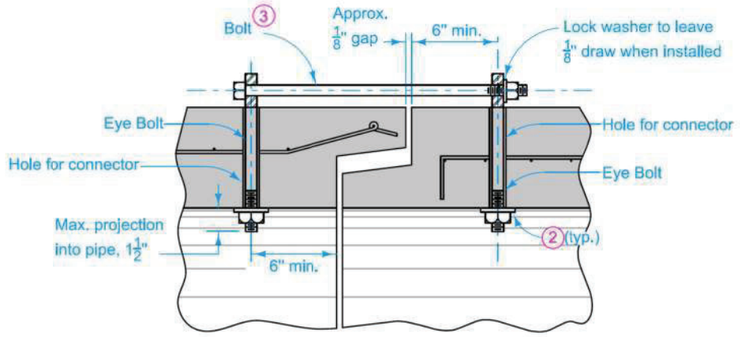
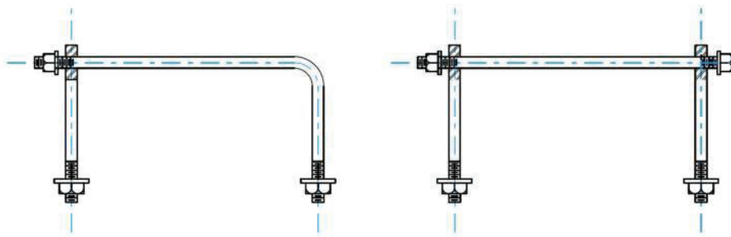
SHEET No:
B.06



SECTION OF PIPE CONNECTOR
(Concrete Pipe to Corrugated Pipe)

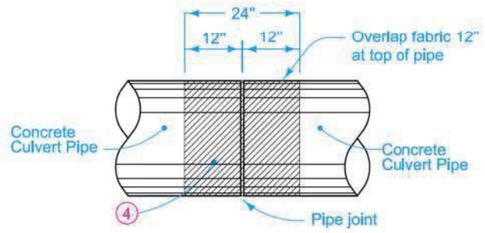


SECTION OF PIPE CONNECTOR
(Concrete Pipe to Concrete Pipe)



ONE BEND END **THREADED AT BOTH ENDS**

OPTIONAL BOLTS/CONNECTORS



PIPE JOINT WRAPPING

PIPE SIZE (in)	CONNECTOR AND BOLT SIZE (in.)	HOLE FOR CONNECTOR (in.)
12 to 27	5/8	7/8
30 to 60	3/4	1.0
66 to 132	1.0	1 1/4

Wrap all joints on concrete roadway pipe culverts.

Use Type 3 Connections on all culvert pipes, unless specified otherwise. Refer to Materials I.M. 445.01 for Connector requirements.

Minimum 2 threads showing at all threaded ends.

Connections not required on pipe sections installed by trenchless methods.

For belled concrete pipe joints, connectors may be installed on the inside of the pipe.

TYPE 1

One connector at the top of the pipe section.

TYPE 2 (Sealed Joint)

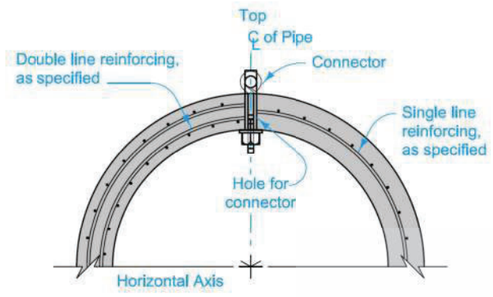
Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required. Refer to Materials I.M. 491.09 for seal requirements.

TYPE 3 (Non - Sealed Joint)

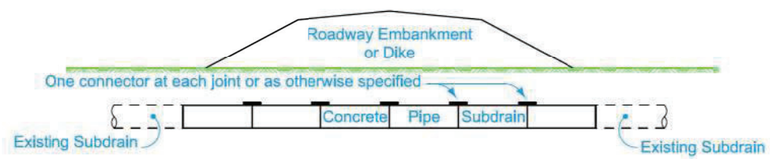
Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required.

1. If holes are field drilled, place a ribbon of butyl sealant around bolts before placing 3 in. x 3 in. x 1/4 in. plate on bolts through corrugated metal pipe and tightening nuts.
2. 1 3/4 inch round x 9/64 inch thick washer or 3 in. x 3 in. x 1/4 in. square plate (shaped to pipe radius).
3. Connectors with One Bend End and Bell End spacers allowed per Materials I.M. 451. Refer to Optional Bolts detail.
4. Engineering fabric for embankment erosion control.

Possible Tabulations:
104-3
104-5B



TYPICAL SECTION
(Non-Sealed Joint)



TYPICAL INSTALLATION

TYPE 1 CONNECTION

IOWA DOT
STANDARD ROAD PLAN

REVISION
4 04-18-23

DR-121
SHEET 1 of 2

REVISIONS: Corrected title.

APPROVED BY DESIGN METHODS ENGINEER

CONNECTED PIPE JOINTS

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

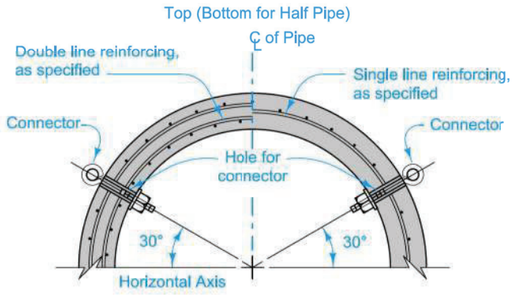
TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

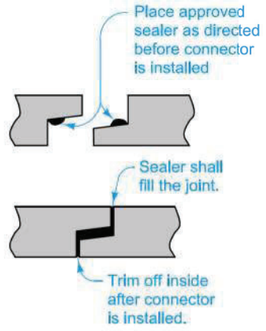
NO.	BY DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

SHEET No: B.07

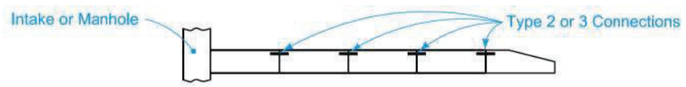


TYPICAL SECTION
TYPE 2 CONNECTION
TYPE 3 CONNECTION

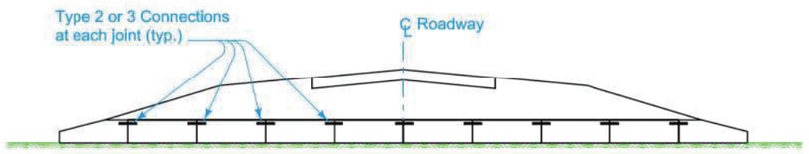


SEALED JOINT
TYPE 2 CONNECTION

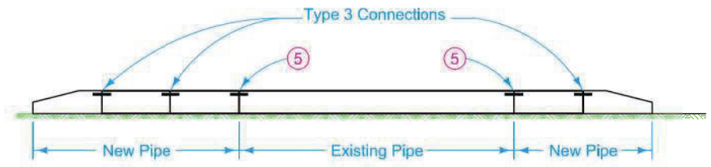
(5) On culvert extensions, connect all new joints including the joint between the old and new culvert pipe. Holes may need to be drilled into existing pipes.



TYPICAL INSTALLATION
STORM SEWER OUTLET - TYPE 2 OR TYPE 3 CONNECTION



TYPICAL INSTALLATION
NEW CONSTRUCTION - TYPE 2 or 3 CONNECTION



TYPICAL INSTALLATION
PIPE EXTENSION - TYPE 3 CONNECTION

TYPE 2 AND TYPE 3 CONNECTIONS

IOWA DOT
STANDARD ROAD PLAN

REVISION	
4	04-18-23

DR-121
SHEET 2 of 2

REVISIONS: Corrected title.

APPROVED BY DESIGN METHODS ENGINEER

CONNECTED PIPE JOINTS

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

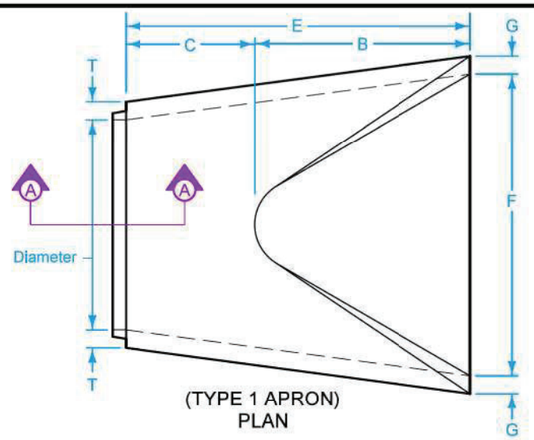
TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

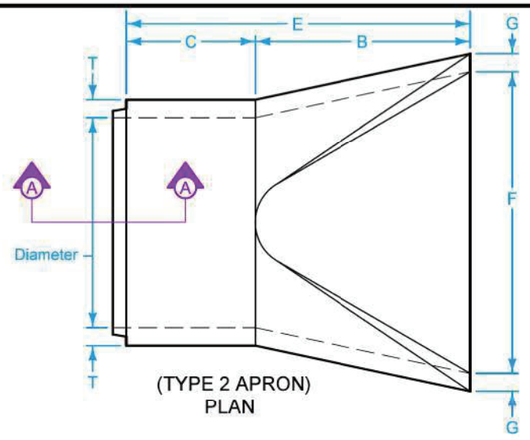
NO.	BY	DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

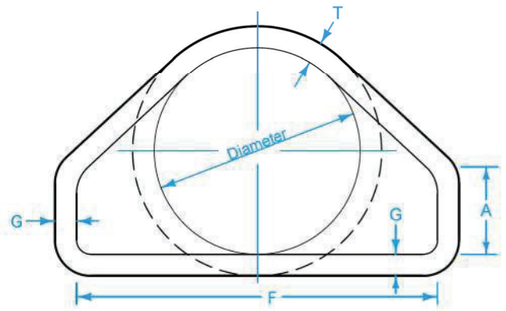
SHEET No:
B.08



(TYPE 1 APRON)
PLAN



(TYPE 2 APRON)
PLAN



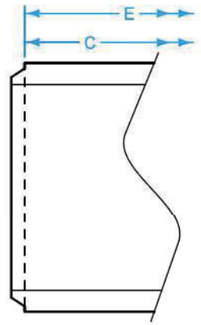
(TYPE 1 AND TYPE 2 APRONS)
END VIEW

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 hereon within the length of concrete culvert pipe furnished.

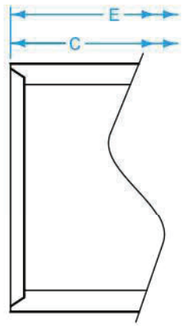
Install connected pipe joints as shown on DR-121.

When specified in the contract documents, install pipe apron guards as shown on DR-213. Pipe apron guards are incidental to "Concrete Aprons".

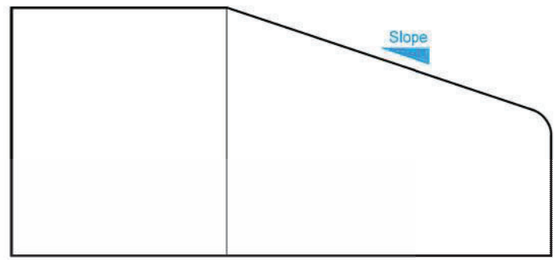
Slight variations in both shape and dimensions from those shown may be accepted if approved by the engineer.



SECTION A-A
TONGUE END DETAIL (1)



SECTION A-A
GROOVE END DETAIL (1)



SIDE VIEW

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

TYPE 1 APRONS								* Maximum
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F	G	T
12"	2.4:1	4"	2'-0"	4'-7/8"	6'-7/8"	2'-0"	2"	2"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"	2 1/4"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0" *	2 1/2"	2 1/2"
21"	2.4:1	9"	3'-0 "	3'-1 1/2"	6'-1 1/2"	3'-5"	3"	3"
24"	2.5:1	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"	3"
27"	2.5:1	10 1/2"	4'-1 "	2'-0"	6'-1 1/2"	4'-4"	3 1/2"	3 1/2"
30"	2.5:1	12"	4'-6"	1'-7 3/4"	6'-1 1/2"	5'-0"	3 1/2"	3 1/2"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"	4"	4"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"	4 1/2"	4 1/2"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"	5"	5"
54"	1.8:1	27"	5'-0"	3'-0"	8'-0"	7'-6"	5 1/2"	5 1/2"
60"	1.6:1	29 1/2"	5'-0"	3'-0"	8'-0"	8'-0"	5 1/2"	6"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"	5 1/2"	6"
72"	1.6:1	30"	6'-6"	1'-9"	8'-3"	9'-0"	6"	7"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"	6 1/2"	7 1/2"
84"	1.3:1	29 1/2"	6'-9"	2'-6 1/2"	9'-3 1/2"	10'-0"	6 1/2"	8"

TYPE 2 APRONS								* Maximum
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F	G	T
12"	2.4:1	4"	2'-0"	4'-7/8"	6'-7/8"	2'-0"	2"	2"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"	2 1/4"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0" *	2 1/2"	2 1/2"
21"	2.4:1	9"	3'-0"	3'-1 1/2"	6'-1 1/2"	3'-5"	3"	3"
24"	2.5:1	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"	3"
27"	2.5:1	10 1/2"	4'-1 "	2'-0"	6'-1 1/2"	4'-4"	3 1/2"	3 1/2"
30"	2.5:1	12"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"	3 1/2"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"	4"	4"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"	4 1/2"	4 1/2"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"	5"	5"
54"	1.9:1	24 1/2"	5'-5"	2'-7"	8'-0"	7'-6"	5 1/2"	5 1/2"
60"	1.4:1	24 1/2"	5'-0"	3'-0"	8'-0"	8'-0"	5 1/2"	6"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"	5 1/2"	6"
72"	1.4:1	24"	6'-6"	1'-9"	8'-3"	9'-0"	6"	7"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"	6 1/2"	7 1/2"
84"	1.5:1	23 1/2"	7'-6 1/2"	1'-9"	9'-3 1/2"	10'-0"	6 1/2"	8"

Contract Item:
Apron, Concrete

Tabulations:
104-3
104-5C

IOWA DOT

REVISION 3 10-17-23

STANDARD ROAD PLAN

DR-201

SHEET 1 of 1

REVISIONS: Added note about shape and dimensions.

APPROVED BY DESIGN METHODS ENGINEER

CONCRETE APRONS

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR: WIESE SLOUGH WMA

MUSCATINE COUNTY

NO.	BY DATE	REVISION

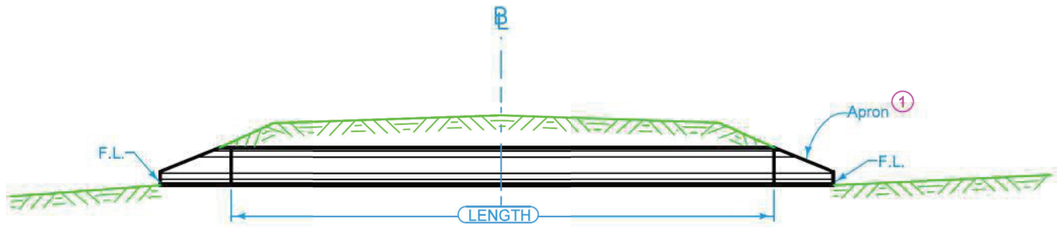
DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024

SHEET No: B.09

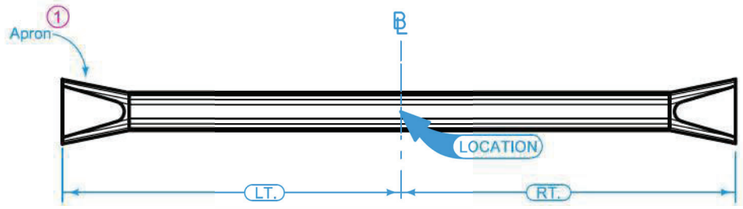
℄ is ℄ of roadway, dike, survey, or other as detailed on plans.

Skew angle is the angle which one end of the pipe is ahead (by stationing) of line perpendicular to the ℄.
(Example: skew Rt. ahead 30 degrees)

① Refer to the following:
DR-201 for circular concrete.
DR-202 for low clearance concrete.
DR-203 for circular metal.
DR-205 for circular concrete with end wall.
DR-206 for low clearance concrete with end wall.



SECTION



PLAN

Possible Tabulation:
104-3

IOWA DOT
STANDARD ROAD PLAN

REVISION
2 04-18-17

DR-601
SHEET 1 of 1

REVISIONS: Modified note 1 to include references to additional apron types.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

REINFORCED CONCRETE PIPE CULVERT

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

DNR

TYPICAL CROSS SECTIONS AND DETAILS

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

NO	BY	DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024
SHEET No: B.10

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	2101 - CLEARING	LS	1
2	2104 - EXCAVATION, CL 10, CHANNEL	CY	148
3	2125 - RESHAPING/CLEANING DITCHES	STA	5
4	2127 - RECONSTRUCTION OF ROADBED - BLADING/SHAPING	STA	97.11
5	2312 - GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	1941
6	2402 - GRANULAR BACKFILL	TON	52
7	2416 - APRON, CONC, 30"	EACH	2
8	2416 - APRON, CONC, 36"	EACH	2
9	2416 - CULV, CONC RDWY PIPE, 30"	LF	24
10	2416 - CULV, CONC RDWY PIPE, 36"	LF	24
11	2507 - REVETMENT, CLASS E	TON	36
12	2507 - EROSION STONE	TON	36
13	2518 - SAFETY CLOSURE	EACH	2
14	2528 - TRAFFIC CONTROL	LS	1
15	2533 - MOBILIZATION	LS	1
	Alternate 1 - Boat Ramp		
16	2104 - EXCAVATION, CL 10, CHANNEL	CY	76
17	2402 - GRANULAR BACKFILL	TON	32
18	2507 - EROSION STONE	TON	81
19	2499 - 6-INCH GEOWEB	SF	900

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
1	A. This item for removing any brush at/near the inlet/outlet of 2 new RCP installations. B. Remove brush from project site.
2	A. Remove approximately 18 CY of existing material at each new RCP inlet/outlet. B. Remove spoil from project site.
3	A. Clean ditches as shown on typical sheet B.02. B. Limits of cleaning will be marked by DNR Field Engineer. C. Remove spoil from project site.
4	A. Repair potholes by scarifying surrounding area to depth of pothole and recompacting. B. Remove any high shoulder areas, before spreading new rock. Blade onto roadway and scoop up, scoop up excess shoulder material directly with bucket, or similar process. C. Remove high shoulder spoil from project site. D. Re-establish roadway crown - 2% positive drainage each way from centerline; 2% across the width in banked sections.
5	A. A final leveling/spreading of the aggregate after being dumped, is required. B. Roll rock after spreading. C. DOT approved source. D. Quantity based upon an approximate 2.5 - inch depth.
6	A. Use for RCP bedding. B. Bed pipe up to haunch (halfway). C. DOT approved source.
7-10	A. Install new RCP's level, and at existing CMP invert elevations. B. Remove old CMP from project site. C. Bed bottom of pipe as shown in details - Sheet B.02, and bed to haunch with rock. D. Wrap and pin(type 3) connections as shown in details - Sheets B.06 and B.07. E. DOT approved source.
11-12	A. Place at the direction of the DNR Field Engineer. B. Approximately 9 Ton each inlet/outlet. C. DOT approved source.
13	A. Follow current Iowa DOT Standard Specifications section 2518 for safety closure requirements. B. Set-up must be complete for payment.

ESTIMATE REFERENCE INFORMATION (Continued)

ITEM NO.	
16	A. Remove approximately 2-foot of silt from boat ramp launch area (30' X 34' - 30' from edge of water) B. Remove spoil from project site.
17	A. This item for filling geoweb.
18	A. Place in cleaned out area approximately 1.5 - feet in depth.
19	A. Stake out to cover a 30' X 30' area.

GENERAL NOTES

Verify actual locations and elevations with DNR Engineer.

All work shall conform to and be performed in accordance with all applicable codes and ordinances.

The contractor shall visit the site and inspect the project area and thoroughly familiarize themselves with the actual job conditions prior to bidding and the start of work. Failure to visit the project site shall not relieve the contractor from performing the work in accordance to the plans, specification, special provisions and contract.

The contractor shall verify, at the site, all dimensions and conditions shown on the plans and shall notify the DNR Engineer of any discrepancies, omissions, and/or conflicts prior to proceeding with the work.

It shall be the contractor's responsibility to provide waste areas or disposal sites for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project. No payment for overhaul will be allowed for material hauled to these sites. No material shall be placed within the right-of-way, unless specifically stated in the plans or approved by the DNR Engineer.

The contractor shall not disturb desirable grass areas and desirable trees outside the construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service areas will be subject to the approval of the DNR Engineer.

Where utilities and fixtures are shown as Existing on the plans or encountered within the construction area, it shall be the responsibility of the contractor to notify the DNR Engineer of those utilities prior to the beginning of any construction. The contractor shall be afforded access to these facilities for necessary modification of services. Underground facilities, structures and utilities have been plotted from available surveys and records and therefore their locations must be considered approximate only. It is possible there may be others, the existence of which is presently not known or shown. It is the contractor's responsibility to determine their existence and exact location and to avoid damage thereto. No claims for additional compensation will be allowed to the contractor for any interference or delay caused by such work.

The contractor shall shape graded area to maintain surface drainage. All elevations are to finish grade.

The contractor is expected to have materials, equipment, and labor available on a daily basis to install and maintain erosion control features on the project. This may involve seeding, silt fence, rock ditch checks, silt basins or silt dikes.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

QUANTITIES AND GENERAL INFORMATION

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA
MUSCATINE COUNTY

NO.	BY DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHK'D BY:
DATE: FEB 2024
SHEET No: C.01

PROJECT OVERVIEW

MOHAWK AVE

ATALISSA
2 MILES

234+69
230+00
225+00
220+00
314+08
310+00
305+00
300+00
215+00
210+00
205+00
200+00

103+33
100+00
30+00
25+00
20+00
15+00
10+00
5+00
0+00
35+00
40+00
45+01

0 FEET 600

N

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

SITE PLAN

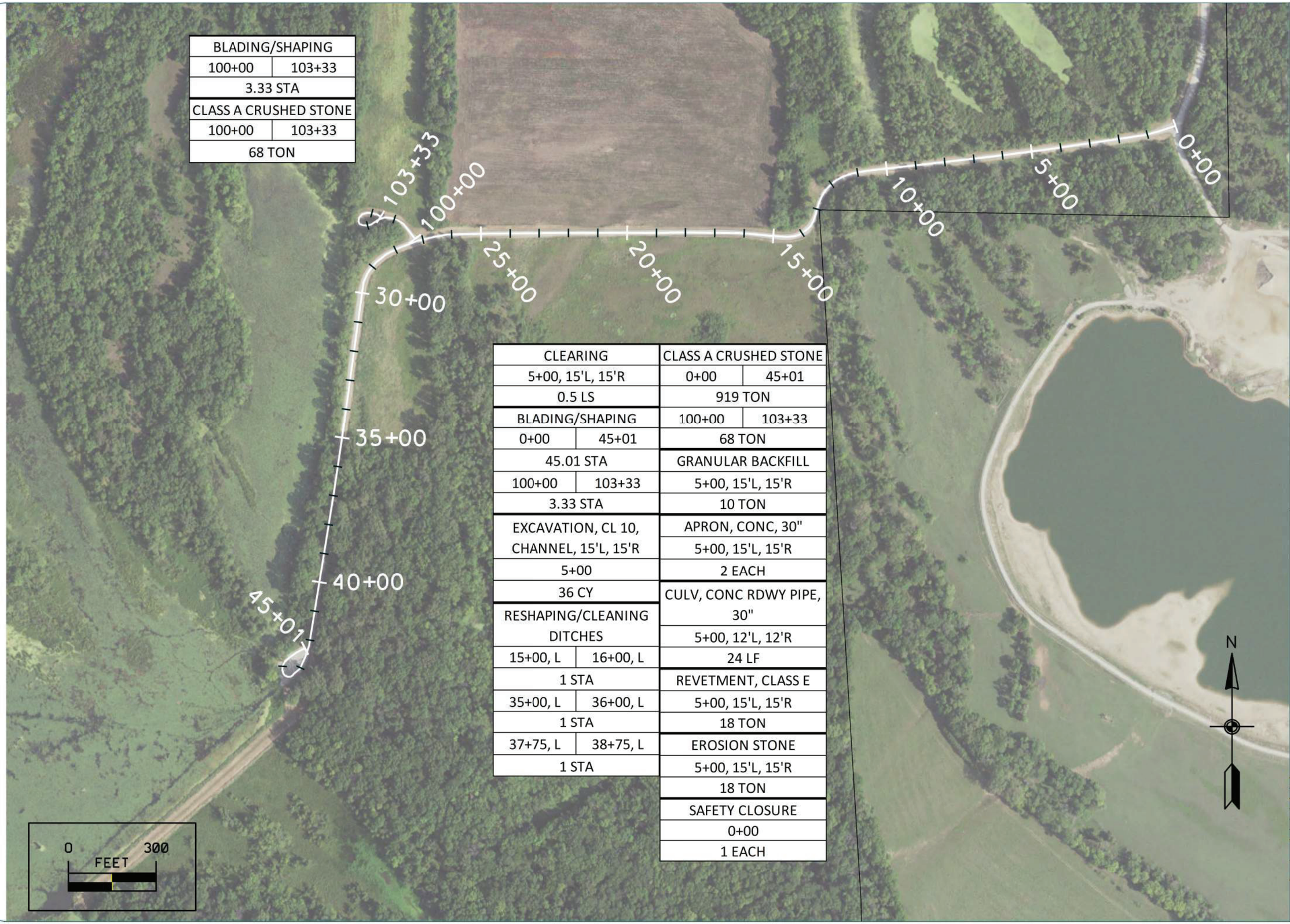
ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA

MUSCATINE COUNTY

NO.	BY / DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024
SHEET No:

D.01



BLADING/SHAPING	
100+00	103+33
3.33 STA	

CLASS A CRUSHED STONE	
100+00	103+33
68 TON	

CLEARING	
5+00, 15'L, 15'R	
0.5 LS	

BLADING/SHAPING	
0+00	45+01
45.01 STA	

100+00	103+33
3.33 STA	

EXCAVATION, CL 10, CHANNEL, 15'L, 15'R
5+00
36 CY

RESHAPING/CLEANING DITCHES	
15+00, L	16+00, L
1 STA	
35+00, L	36+00, L
1 STA	
37+75, L	38+75, L
1 STA	

CLASS A CRUSHED STONE	
0+00	45+01
919 TON	
100+00	103+33
68 TON	

GRANULAR BACKFILL
5+00, 15'L, 15'R
10 TON

APRON, CONC, 30"
5+00, 15'L, 15'R
2 EACH

CULV, CONC RDWY PIPE, 30"
5+00, 12'L, 12'R
24 LF

REVETMENT, CLASS E
5+00, 15'L, 15'R
18 TON

EROSION STONE
5+00, 15'L, 15'R
18 TON

SAFETY CLOSURE
0+00
1 EACH

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

SITE PLAN

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA

MUSCATINE COUNTY

NO.	BY	DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024
SHEET No:

D.02

CLEARING	
215+10, 15'L, 15'R	
0.5 LS	
BLADING/SHAPING	
200+00	234+69
34.69 STA	
EXCAVATION, CL 10, CHANNEL	
215+10, 15'L, 15'R	
36 CY	
RESHAPING/CLEANING DITCHES	
202+00, L	203+00, L
1 STA	
205+00, L	206+00, L
1 STA	
CLASS A CRUSHED STONE	
200+00	234+69
708 TON	

GRANULAR BACKFILL
215+10, 15'L, 15'R
10 TON
APRON, CONC, 36"
215+10, 15'L, 15'R
2 EACH
CULV, CONC RDWY PIPE, 36"
215+10
24 LF
REVETMENT, CLASS E
215+10, 15'L, 15'R
18 TON
EROSION STONE
215+10, 15'L, 15'R
18 TON
SAFETY CLOSURE
200+00
1 EACH

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

SITE PLAN

ROAD MAINTENANCE FOR:
WIESE SLOUGH WMA

MUSCATINE COUNTY

NO.	BY	DATE	REVISION

DRAWN BY: BLF
PROJECT NUMBER: 23-06-70-01
CHKD BY:
DATE: FEB 2024
SHEET No:
D.03

CONSULTANT:

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SHEET No:
D.04

ALTERNATE BID ITEMS

40+00

45+01

EXCAVATION, CL 10, CHANNEL, 15'L, 15'R
76 CY
GRANULAR BACKFILL
32 TON
EROSION STONE
81 TON
6-INCH GEOWEB
900 sf

BOAT RAMP AREA
APPROX. 30' x 34'
(NTS)

0 100
FEET

N

CONSULTANT:

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