IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS FOR STEPHENS STATE FOREST LUCAS UNIT ROAD MAINTENANCE LUCAS COUNTY, IOWA

DOT PROJECT #SP-00SP(3)--7c-00 DNR PROJECT #21-05-59-01





PROJECT DESCRIPTION

This project consists of granular roadway maintenance - ditch cleaning, channel excavation, culvert removal/installation, blading/shaping of roadway, spreading new rock and the installation of revetment and erosion stone.



Nich. Dollar	211/12/2020
AUTHORIZATION BARKS WILDLIFE FISHERIES LAW EN	FORCEMENT FORESTRY DATE
Tiavis Bahn	11/12/2020
ENGINEERING BUREAU CHIEF	DATE

AUTHORIZATION TO BID

DIRECTORY

PROJECT MANAGER		CONSTRU	CTION 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	JASON KRUSE
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Note:

appropriately modified for areas specifically designated by the Engineer.

STATION TO) STATION	LOCATION	WIDTH
0+00	46+39	LAKE/CAMPGROUND	12′
100+00	115+06	HEADING WEST	12′
200+00	213+62	WEST LOOP	12′
300+00	304+80	CAMPGROUND	12′
400+00	411+77	SOUTH LOOP	12′
500+00	571+02	MAIN ROAD	18′

CONSULTANT:			
IOWA DEPARTMENT OF	NATURAL RESOURCES	ENGINEERING SERVICES - WALLACE BUILING	502 E. 9TH ST., DES MOINES, IA 50319-0034
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TYPICAL CROSS SECTIONS AND DETAILS	ROAD MAINTENANCE FOR:	STEPHENS STATE FOREST - LUCAS UNIT	LUCAS COUNTY
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DRAWN BY: BLF	PROJECT	NUMBER: 5-59-01	
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TYPICAL DITCH CROSS SECTION





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	ROSS SECTIONS AND DETAILS	ROAD MAINTENANCE FOR:	STATE FOREST - LUCAS UNIT	LUCAS COUNTY
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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 joirt connection and wrapping.

Refer to DR-101 for culvert ledding and backfill.

Refer to DR-104 for minimun and maximum allowable cov for the particular kind of culvert.

Camber is the dimension line between inlet and outlet elevation. Some settlement of the structure is usually anticipated, resulting in the cesign flow line between inlet a outlet. Camber is developed uniformly from inlet and outlet a point beneath the outside shoulder lines of the roadway is uniform between those ponts, as indicated. The Normal Camber indicated in the "Allowable Camber Tables" should be used unless specific camper 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 pip to be done as directed by the Engineer.

vrapping. II. Iowable cover	CONSULTANT:			
foutlet sually ween inlet and t and outlet to				
cing pipe variable	A DEPARTMENT OF	JRAL RESOURCES	RING SERVICES - WALLACE BUILING	IH SI., DES MUNES, IA 30319-0034
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REVISION New 04-21-15 DR-102	TYPICAL CROSS SECTIONS AND DETAILS	ROAD MAINTENANCE FOR:	STEPHENS STATE FOREST - LUCAS UNIT	LUCAS COUNTY
SHEET 1 of 1	NO. BY DATE	REVISIC	DN	
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PIPE CULVERT (COVER AND CAMBER)

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DIAMETER (H) MAXIMUM ALLOW			VABLE COVER	R IN FEET
OF PIPE 'D' Inches	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	10	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 "B" BEDDING

	CONC	RETE CULVER ASS "C" BEDD	RT PIPE			
DIAMETER	(H) MAX	(H) MAXIMUM ALLOWABLE COVER IN FEET				
OF PIPE '0' Inches	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 (ata 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. f.
Settlement Ratio	= rsd = +0.5
*	= ku = 0.13
Projection Ratio	= p = 0.9 (Class "C" bedding)
1.11.246.1900.1112.228	= 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 br 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 inder embankment conditions.

CONCRETE CUI VERT PIPE

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en unclassified pipe is specified, furnish and install ass of pipe meeting the requirements on the chart. Steel Round Pipe, the Contractor may choose the type of ugated pipe and installation to furnish as long as the ction conforms to the limits indicated for the type specified. en furnishing Steel Arch Fipe, furnish pipe with corrugations pecified in plans. mum allowable cover for concrete and metal pipe is at for roadway culverts ard 1 foot for entrance culverts. imum cover for all sizes and installations of concrete arch is 12 feet. all sizes and installations of polyethylene pipe: mimum cover = 2 feet ximum cover = 24 feet for 12 to 24 inch pipes 20 feet for 30 to 48 inch pipes are a pipe size not listed in the table is required, the 'H' cated for the next smallersize will apply.	RTMENT OF CONSULTANT:	ESOURCES 5- WALLACE BUILING ANES, IA 50319-2034
cial installations may be (esigned to exceed indicated imumallowable cover by specific modification of one or e of the following conditions: 1. Bedding Class 2. Pipe Strength (including special design pipe) 3. Twee of backfill or ower meterial	IOWA DEPA	NATURAL RI ENGINEERING SERVICES 502 E. 97H ST., DES MO
4. Compaction requirements for backfill or cover material 5. Controlled trench width are site conditions favor such modifications, significant formy may result from special design installations and these add be considered. Special designs will specify particular ification of construction requirements or design criteria as icable. Necessary modifications of normal requirements not ordinarily be paid for seperately but will be included in		DAIR
price bid for culvert pipe.	AL CROSS SECTIONS AND DETAILS	ROAD MAINTENANCE FOR: ENS STATE FOREST - LUCAS UNIT LUCAS COUNTY
COWADOT 1 04-19-16 DR-104 SHEET 1 of 3		
SIONS: Added general note regaring maximum cover on concrete arch pipes.		
Brien Smith		
DEPTH OF COVER TABLES	DRAWN BY: BLF CHK'D BY: SHEET No:	PROJECT NUMBER: 21-05-59-01 DATE: OCT 2020
OR CONCRETE AND CORRUGATED PIPE		B.06

ESTIMATED PROJECT QUANTITIES

ITEM N	D. ITEM	UNIT	TOTAL			
1	2102 - EMBANKMENT-IN-PLACE, CONTRACTOR FURNISH	CY	50			
2	2125 - RESHAPING/CLEANING DITCHES	STA	11			
3	2127 - RECONSTRUCTION OF ROADBED - BLADING/SHAPING	STA	91.7			
4	2312 - GRANULAR SURFACING ON ROAD, CRUSHED STONE, CLASS A	TON	750			
5	2312 - GRANULAR SURFACING ON ROAD, CRUSHED STONE, 1.5-INCH	TON	1609			
6	2312 - GRANULAR SURFACING ON ROAD, CRUSHED STONE, 3-INCH MINUS	TON	422			
7	2417 - CULV, CMP RDWY, 18"	LF	140			
8	2417 - CULV, CMP RDWY, 24"	LF	100			
9	2417 - CULV, CMP RDWY, 36"	LF	120			
10	2417 - CULV, BAND, CMP RDWY, 36"	EACH SY	4			
11	2507 - ENGINEERING FABRIC		100			
12	2507 - REVETMENT, CLASS E	TON	80			
13	2507 - EROSION STONE	TON	20			
14	2518 - SAFETY CLOSURE	EACH	3			
15	2528 - TRAFFIC CONTROL	LS	1			
10	2533 - MOBILIZATION		1			
			2			
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	ESTIMATE REFERENCE INFORMATION					
NO.	DESCRIPTION					
'	A. FOR CUIVERT EXTENSION DOCKTIII.					
	A See twiced ditch detail sheet P.00					
	A. See typical aircn defail sheet BU2					
	 Dirk field Engineer will definity defour infinits. Waste spail on site at the direction of DNP Field Engineer. 					
3	A Repair all patholes by scarifying surrounding area to depth of pathole and recompacting					
Ŭ	 Repeat of periods by searching solice intering area to depine of periods and recompacting. Re-establish roadway crown - 4% positive drainage each way from centerline: 4% across the width in banke 	d sections				
	C. Remove any high shoulder greas, before spreading new rock.					
4-6	A. A final leveling of the aggregate after being dumped, is required.					
	B. From DOT approved source.	From DOT approved source.				
	C. Approximate 4-inch depth for 3-inch minus, 3-inch depth for Class A and 1.5-inch.					
7-10	A. DNR Field Engineer will identify inlet locations when needed.					
	B. Remove existing culverts and dispose of off project site.					
	C. From DOT approved source.					
11-13	A. DNR Field Engineer will identify limits of placement.					
	B. From DOT approved source.					
14	A. Follow current lowa DOT Standard Specifications section 2518 for closure requirements.					

GENERAL NOTES

Verify actual locations and elevations with DNR Engineer.

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

The contractor shall visit the site and inspect the project area and t themselves with the actual job conditions prior to bidding and the visit the project site shall not relieve the contractor from performin to the plans, specification, special provisions and contract.

The contractor shall verify, at the site, all dimensions and condition shall notify the DNR Engineer of any discrepancies, omissions, and, proceeding with the work.

It shall be the contractor's responsibility to provide waste areas or material (excavated material or broken concrete) which is not desi into the work involved on this project. No payment for overhaul w hauled to these sites. No material shall be placed within the rightstated in the plans or approved by the DNR Engineer.

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

Where utilities and fixtures are shown as Existing on the plans or er construction area, it shall be the responsibility of the contractor to of those utilities prior to the beginning of any construction. The con access to these facilities for necessary modification of services. Und structures and utilities have been plotted from available surveys an their locations must be considered approximate only. It is possible existence of which is presently not known or shown. It is the contra determine their existence and exact location and to avoid damage t additional compensation will be allowed to the contractor for any in caused by such work.

The contractor shall shape graded area to maintain surface draina, finish grade.

The contractor is expected to have materials, equipment, and labor to install and maintain erosion control features on the project. Th fence, rock ditch checks, silt basins or silt dikes.

	1			
	-	IANT:		
applicable codes and		CONSUL		
thoroughly familiarize start of work. Failure to ing the work in accordance				
ns shown on the plans and I/or conflicts prior to				
r disposal sites for excess irable to be incorporated will be allowed for material -of-way, unless specifically e trees outside the or service vehicles and arking and service areas		NA DEPARTMENT OF ATURAL RESOURCES	INEERING SERVICES - WALLACE BUILING 2 E. 9TH ST., DES MOINES, IA 50319-0034	
encountered within the o notify the DNR Engineer ontractor shall be afforded nderground facilities, and records and therefore e there may be others, the gractor's responsibility to thereto. No claims for interference or delay		<u>o</u> z		
ge. All elevations are to		ATION	UNIT	COUNTY
or available on a daily basis is may involve seeding, silt		ROAD MAINTENANCE FOR: ROAD MAINTENANCE FOR:	STEPHENS STATE FOREST - LUCAS	
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	Blading/Shaping 400+00 411+77 11.77 STA 1.5" Rock 400+00 411+77 247 TON Safety Closure 400+00	
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