IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS FOR MAQUOKETA CAVES STATE PARK ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL

JACKSON COUNTY

PROJECT # 17-06-49-02
IA DOT PROJECT # SP-628-0(4)--7C-49

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MANDI LU ALDRICH PETERS 14439 LICENSED PROFESSIONAL ENGINEER IOWA

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.

Mandi Lu Aldrich Peters 10-24-17
Mandi Lu Aldrich Peters, Iowa Reg. No. 14439 Date

My license renewal date is December 31, 20 17

Pages or sheets covered by this seal: ALL

DIRECTORY

PROJECT MANAGER		CONSTRUCTION INSPECTOR	
COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES	COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES
ADDRESS	502 EAST 9TH STREET	ADDRESS	502 EAST 9TH STREET
CITY,STATE,ZIP	DES MOINES, IA 50319	CITY,STATE,ZIP	DES MOINES, IA 50319
CONTACT	MANDI ALDRICH PETERS	CONTACT	MICHAEL DUFOE
TELEPHONE	515-725-8468 (O)/515-205-1698 (C)	TELEPHONE	515-985-9196
FAX		FAX	
EMAIL	Mandi.Aldrich-Peters@dnr.iowa.gov	EMAIL	Michael.Dufoe@dnr.iowa.gov

PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REMOVAL AND RECONSTRUCTION OF THE EXISTING MAIN ROADWAY AND ONE PARKING LOT, MAINTENANCE ON THE SHELTER ROAD, CAMPGROUND ROADS, MUSEUM ROADS AND THE ASSOCIATE PARKING LOTS AND ELECTRICAL UPGRADES IN THE CAMPGROUND AND INCIDENTAL WORK AS REQUIRED BY THE DNR CONSTRUCTION INSPECTOR.

AUTHORIZATION TO BID

10-25-17
AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

10/26/17
ENGINEERING BUREAU CHIEF DATE

SHEET INDEX

CONSULTANT:

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

COVER SHEET

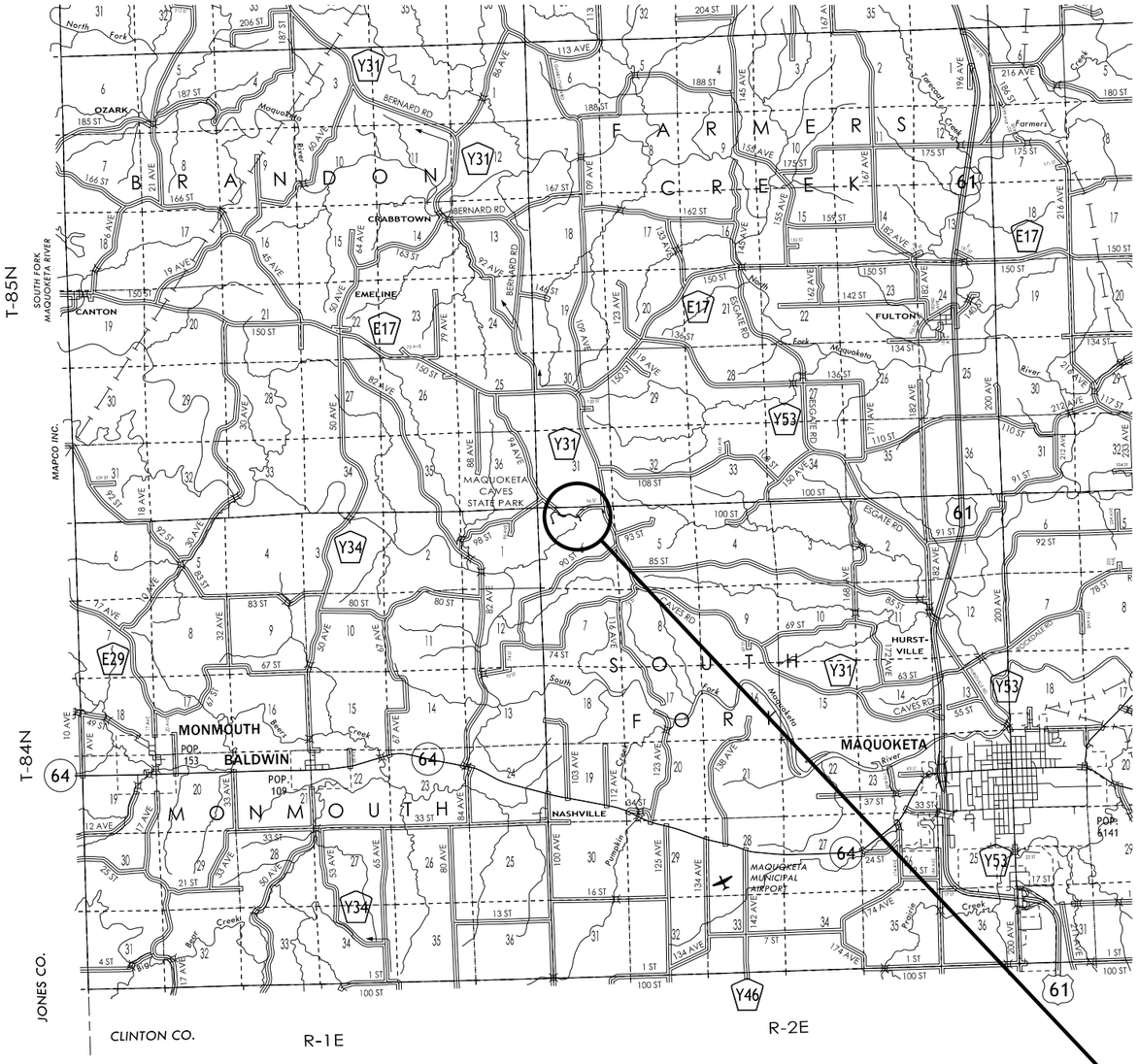
ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

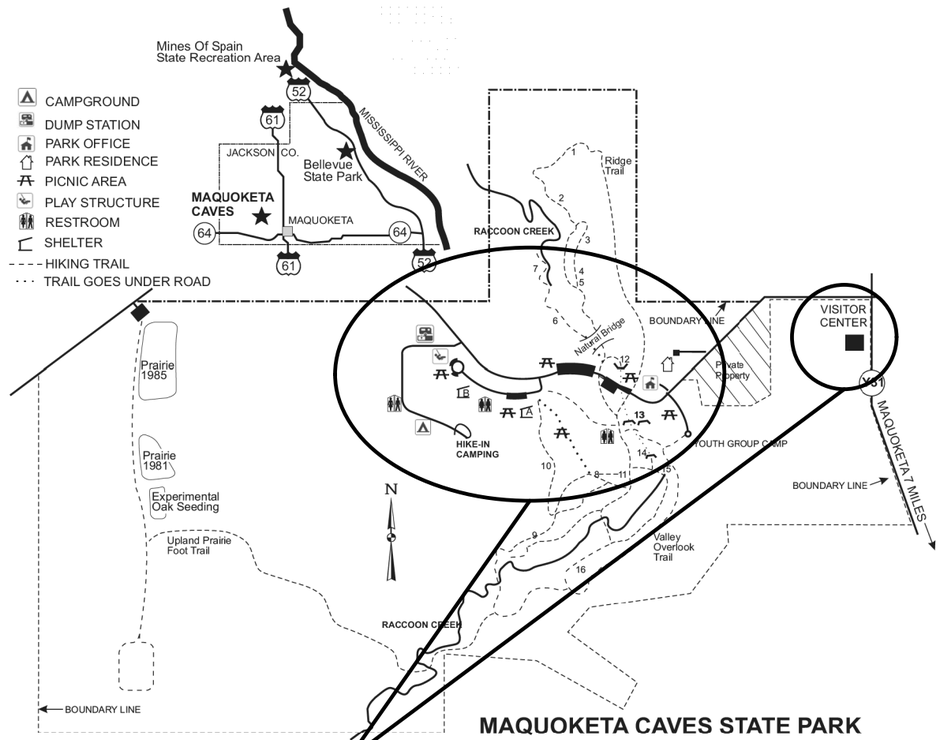
JACKSON COUNTY, IOWA

NO.	BY	DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 17-06-49-02
CHK'D BY:
DATE: October 2017
SHEET No: A.01



VICINITY MAP



LOCATION MAP

PROJECT LOCATION

CONSULTANT:

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PROJECT LOCATION MAP

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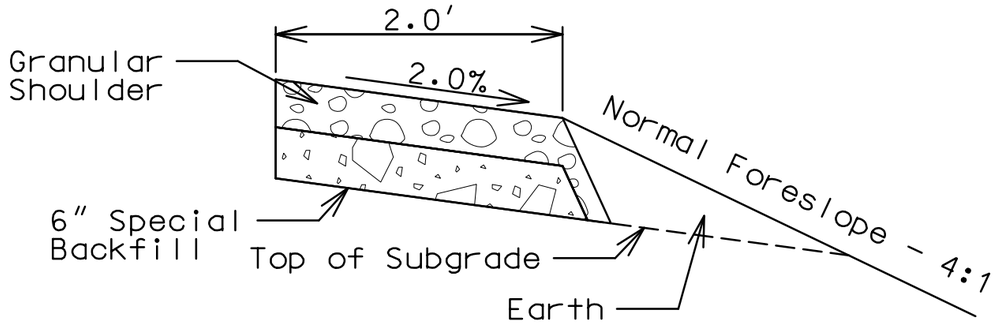
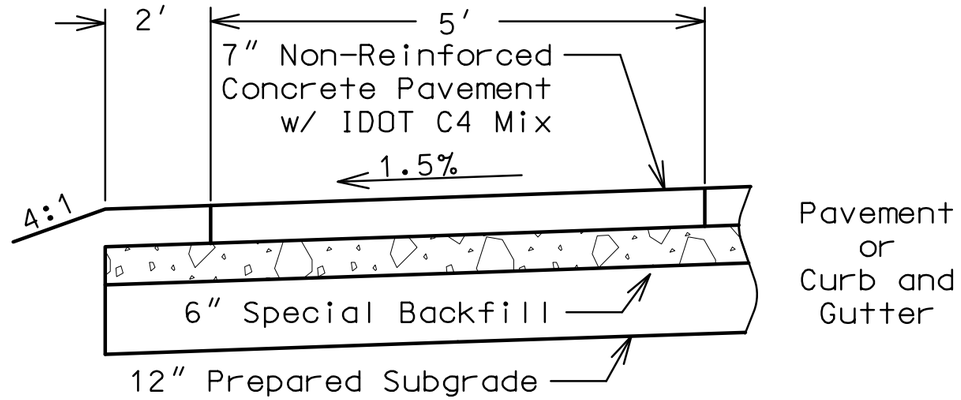
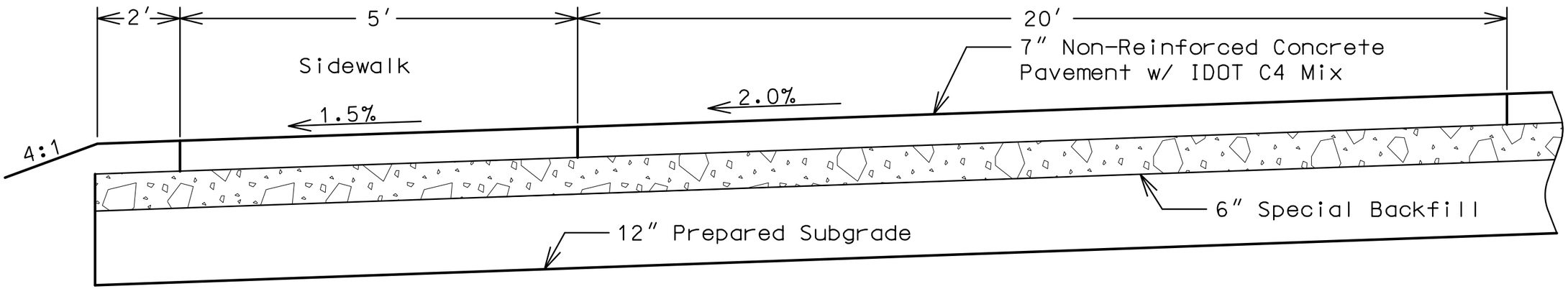


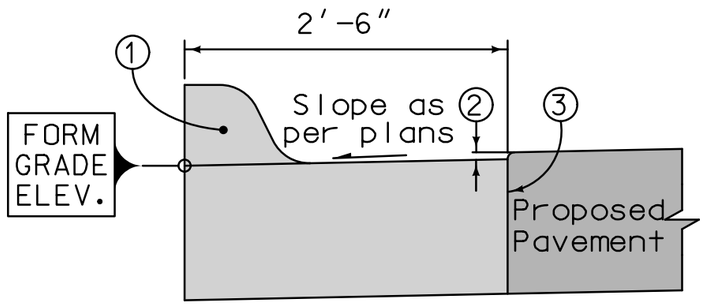
Typical Granular Shoulder



Typical Sidewalk Pavement



Typical Parking Lot Pavement



① 6" Standard Curb
② No elevation difference
③ 'BT' , 'KT', or 'L' joint

CURB AND GUTTER UNIT

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GENERAL DETAILS

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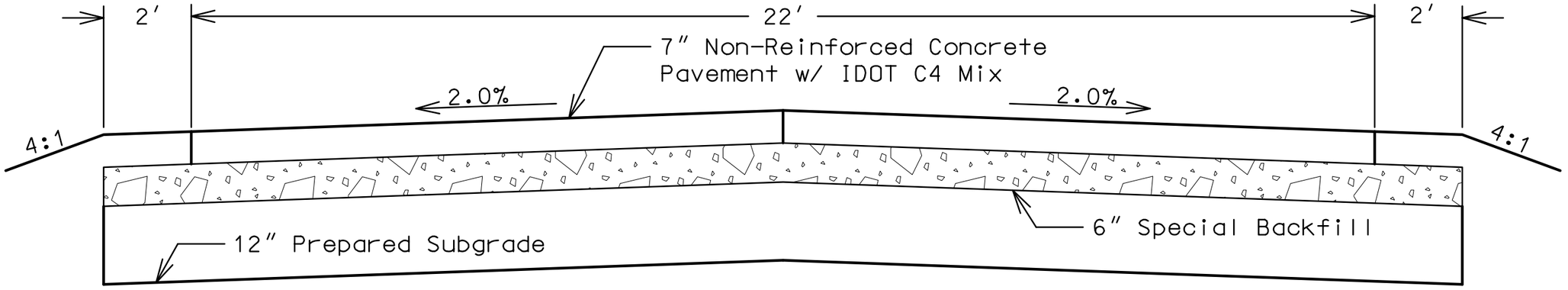
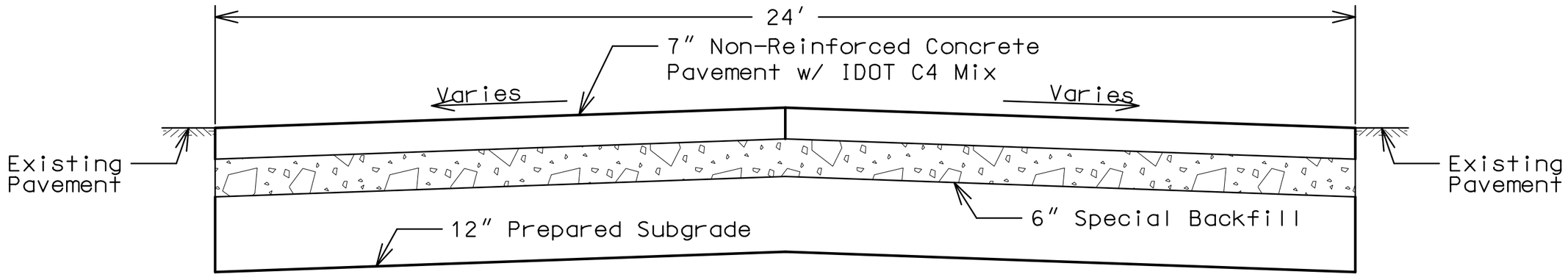


Typical 22' Roadway Pavement



Typical 24' Roadway Pavement

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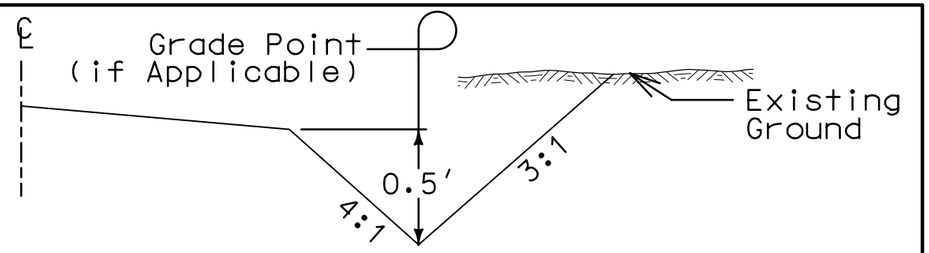
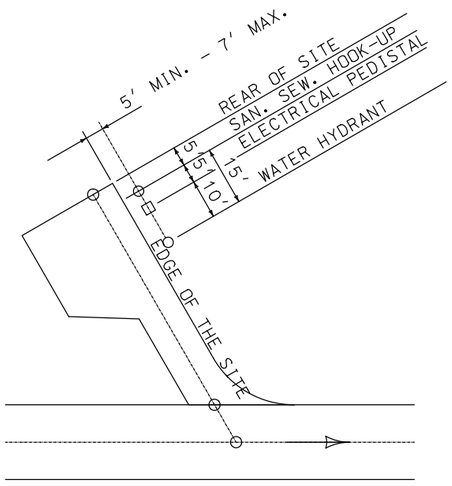
B.02



TYPICAL "V" DITCH

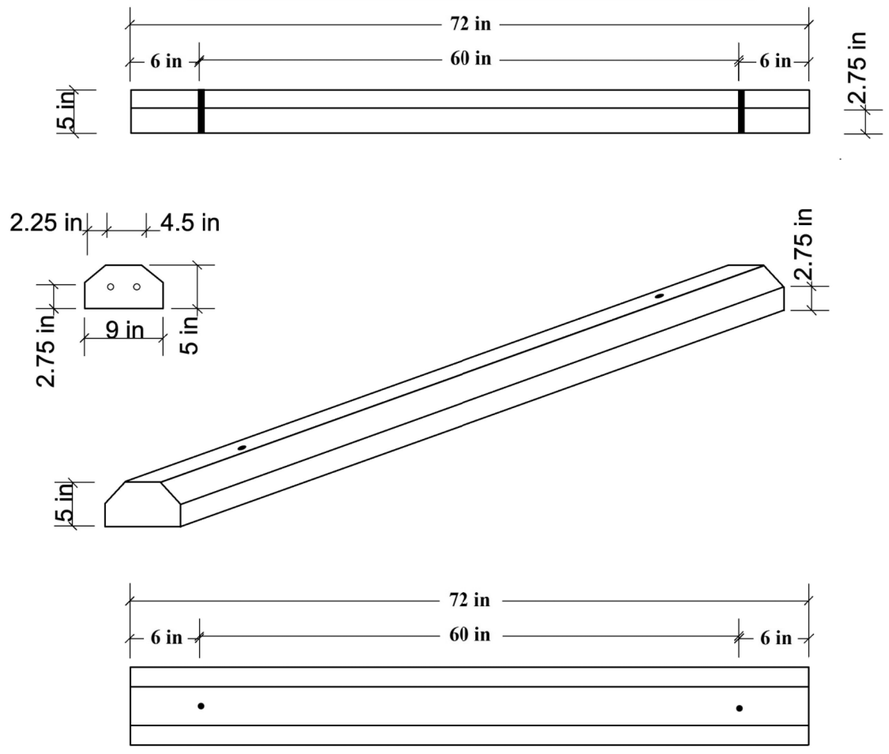


BACK-IN SITE

UTILITY LOCATIONS

NOTE:
A MINIMUM OF 10' MUST BE MAITAINED BETWEEN WATER AND SEWER SERVICES.

FLAT PARKING BUMPER



Air Entrained Concrete
4000 p.s.i. @ 28 days
Length: **6'0"**
Height: 5"
Width: 9"

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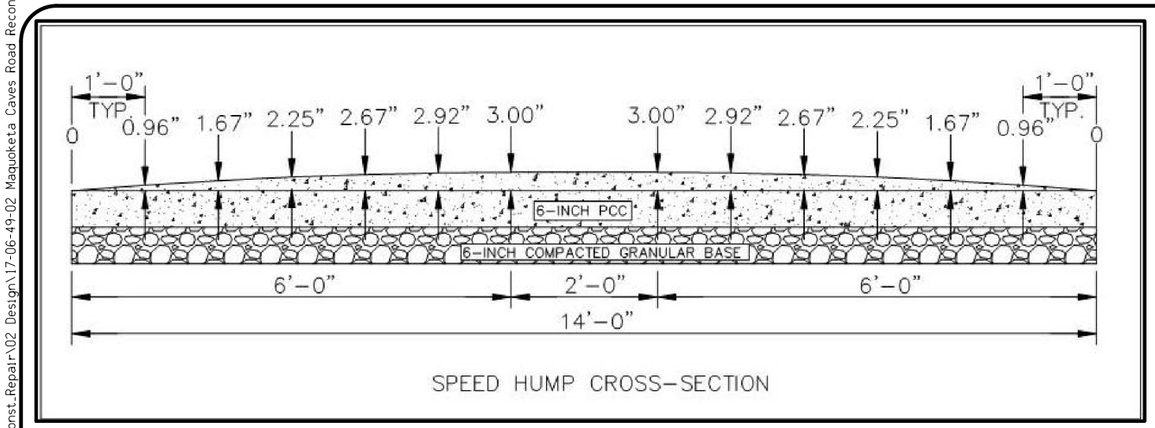
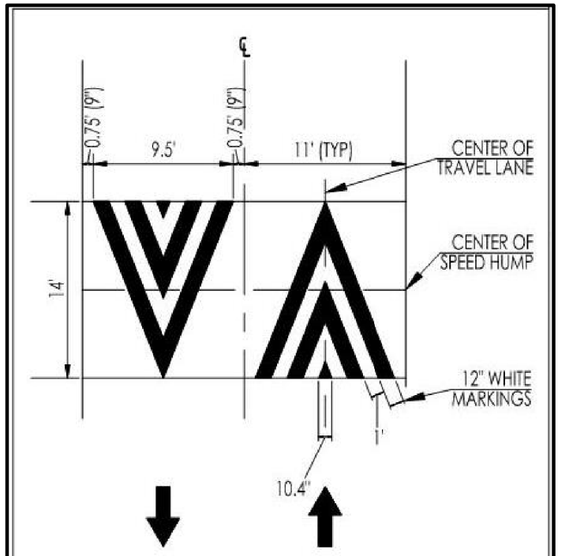


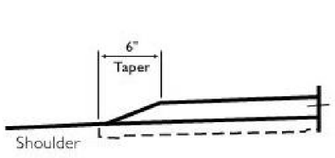
SPEED HUMP CROSS–SECTION

Note:
1) 24"x24"
2) See Iowa DOT Standard Road Plan for sign placement.
3) Mount sign on 4"x4" treated-wood post per Iowas DOT Section 4164.

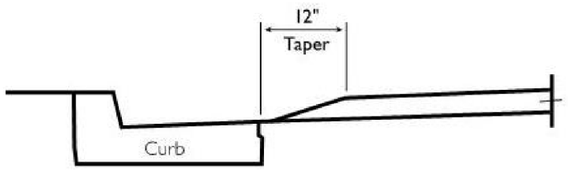


SPEED HUMP PAVEMENT MARKINGS

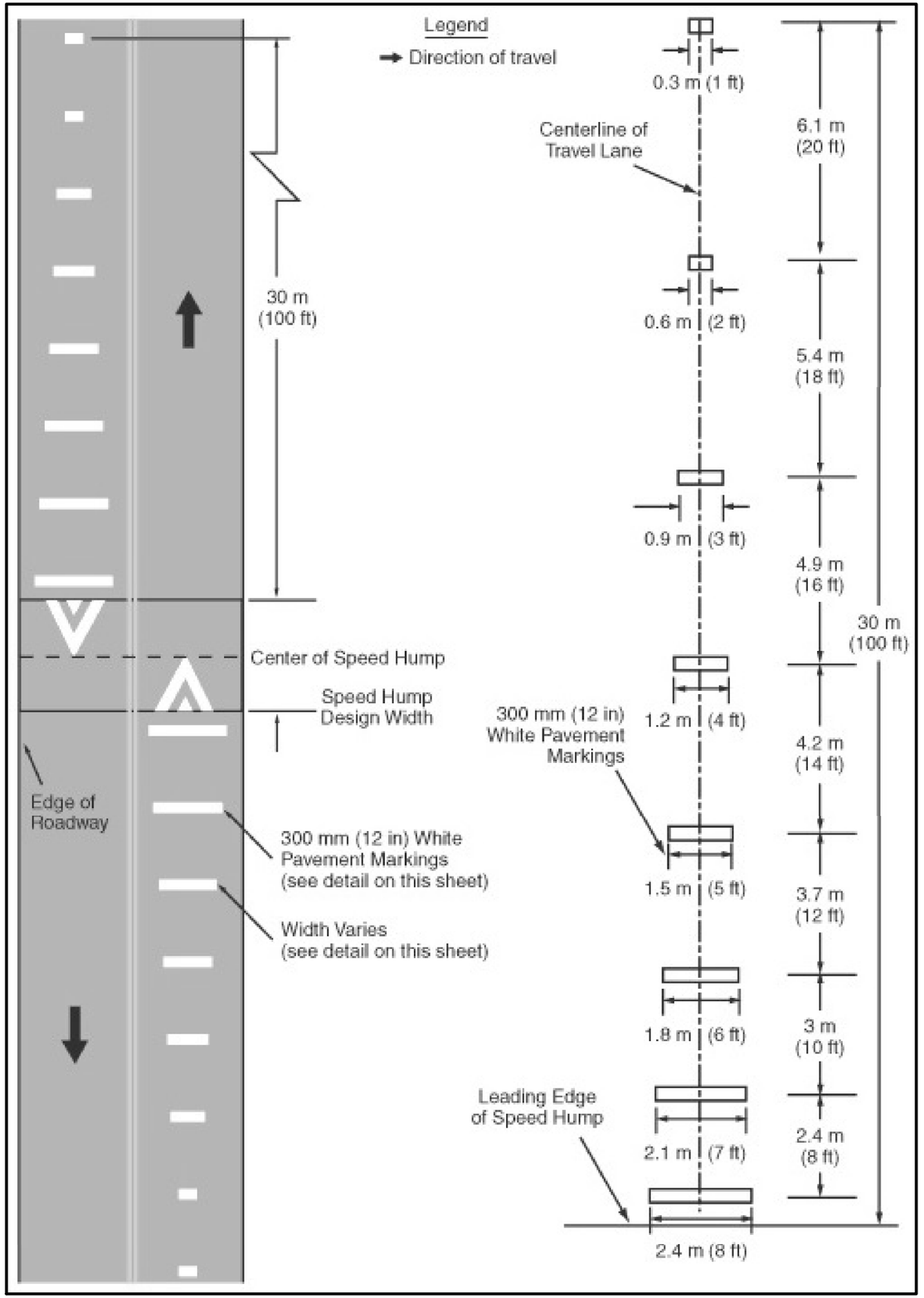
NO SCALE



Shoulder detail for streets without curbs



Shoulder detail for streets with curbs



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502 E. 9TH ST., DES MOINES, IA 50319-0034

GENERAL DETAILS

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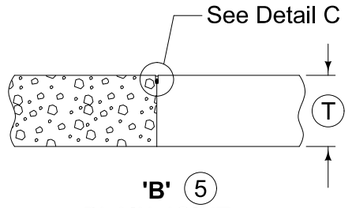
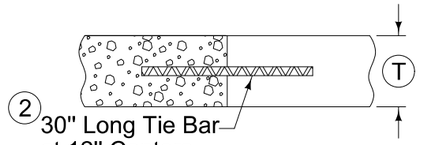
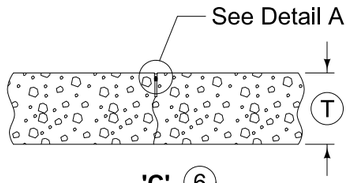


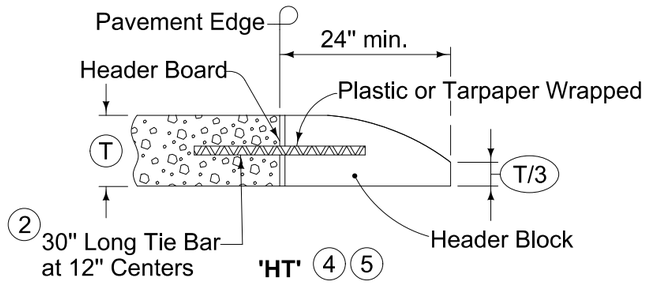
'B' (5)
PLAIN JOINT
(Abutting Pavement Slabs)



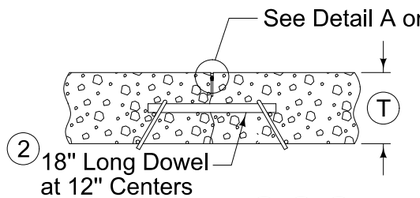
'DW' (3)(4)(7)
DAY'S WORK JOINT(Non-working)



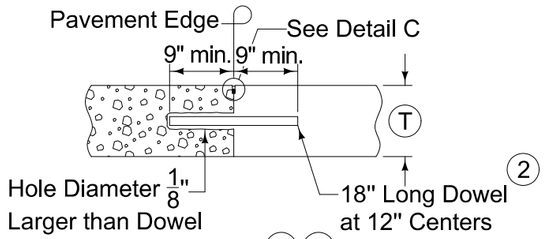
'C' (6)
CONTRACTION JOINT



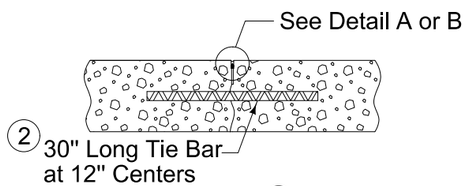
'HT' (4)(5)
HEADER JOINT
(End Rigid Pavement)



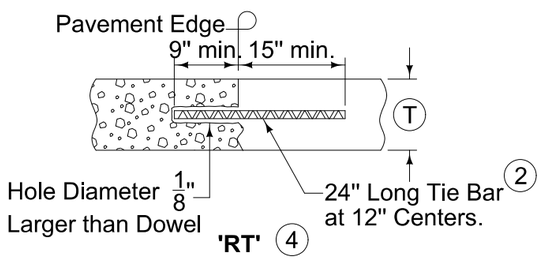
'CD' (1)(4)(6)
DOWELED CONTRACTION JOINT



'RD' (4)(5)
ABUTTING PAVEMENT JOINT

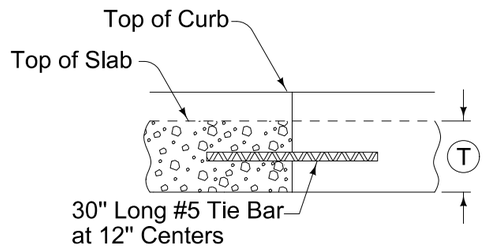


'CT' (4)
TIED CONTRACTION JOINT



'RT' (4)
ABUTTING PAVEMENT JOINT
RIGID TIE

1. See dowel assemblies for fabrication details.
2. See Bar Size Table.
3. Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.
4. Place bars within the limits shown under dowel assemblies.
5. Edge with 1/4 inch tool for length of joint indicated if formed; edging not required when cut with diamond blade saw. Remove header block and board when second slab is placed.
6. Unless otherwise specified, use 'CD' transverse contraction joints in mainline pavement when (T) is greater or equal to 8 inches. Use 'C' joints when (T) is less than 8 inches.
7. 'RT' joint may be used in lieu of 'DW' joint at the end of the days work. Remove any pavement damaged due to the drilling at no additional cost to the Contracting Authority.



'DW - CG' (3)(4)
DAY'S WORK JOINT
CURB AND GUTTER UNIT

TRANSVERSE CONTRACTION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
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MAQUOKETA CAVES STATE PARK
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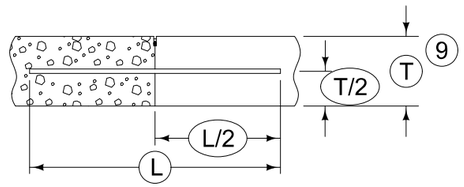
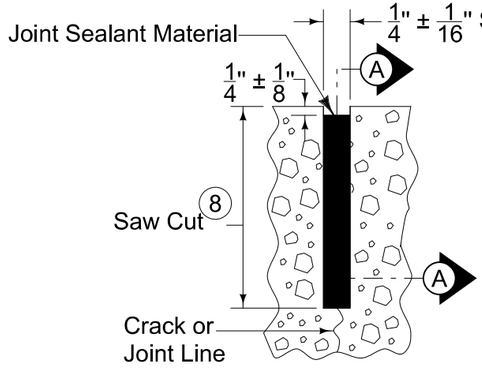
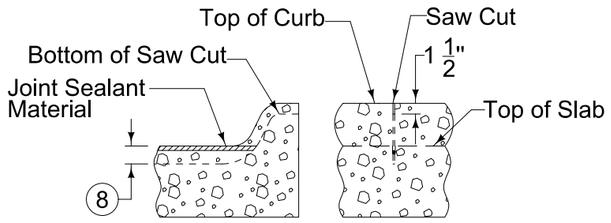


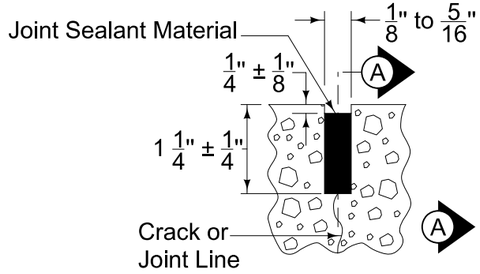
BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



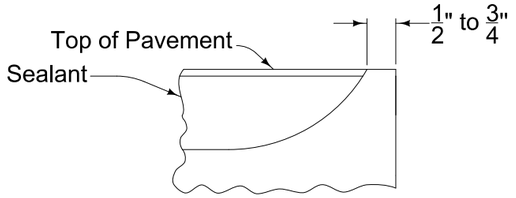
DETAIL A
(Saw cut formed by conventional concrete sawing equipment.)



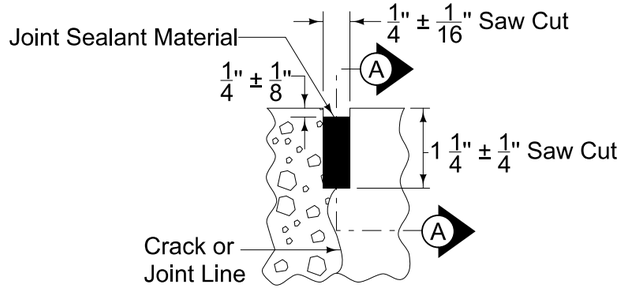
'C' JOINT IN CURB
(Match 'CT', 'CD', or 'C' joint in pavement.)



DETAIL B
(Saw cut formed by approved early concrete sawing equipment.)



SECTION A-A
(Detail at Edge of Pavement)



DETAIL C

TRANSVERSE CONTRACTION

8 Saw 'CD' joint to a depth of T/3 ± 1/4"; saw 'C' joint to a depth of T/4 ± 1/4".

9 When tying into old pavement, (T) represents the depth of sound PCC.

BAR SIZE TABLE		
(T)	Dowel Diameter	Tie Bar Size
< 8"	3/4"	#6
≥ 8" but < 10"	1 1/4"	#10
≥ 10"	1 1/2"	#11

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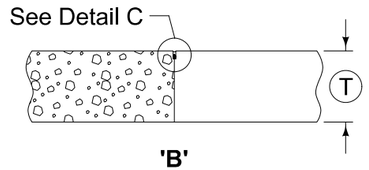
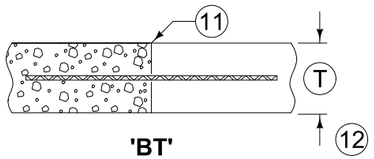
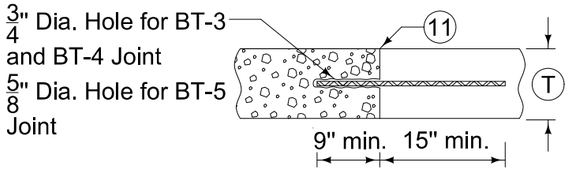


'B'
PLAIN JOINT
(Abutting Pavement Slabs)



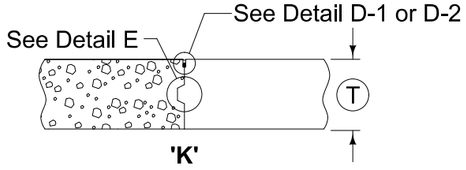
'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE

T	Joint	Bars	Bar Length and Spacing
< 8"	'BT-1'	#4	36" Long at 30" Centers
≥ 8"	'BT-2'	#5	36" Long at 30" Centers

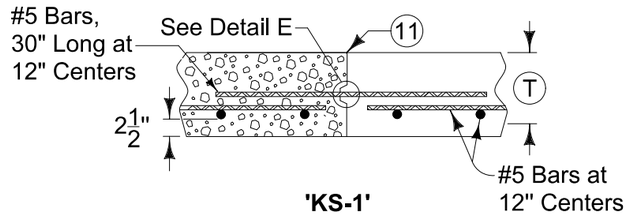


'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE (Drilled)

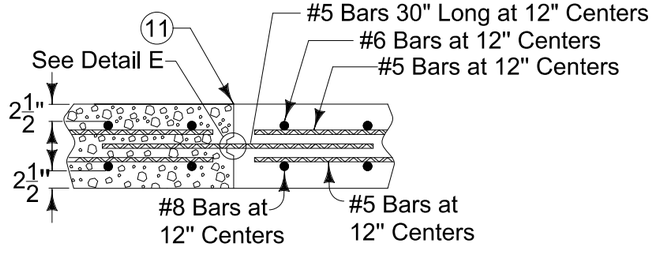
T	Joint	Bars	Bar Length and Spacing
< 8"	'BT-5'	#4	24" Long at 30" Centers
≥ 8"	'BT-3'	#5	24" Long at 30" Centers
	'BT-4'		24" Long at 15" Centers



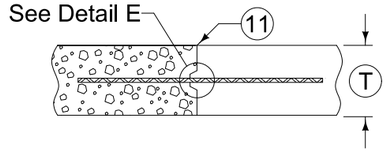
'K'
KEYED JOINT FOR ADJACENT SLABS
(Where T is 8" or more)



'KS-1'
[Single Reinforced Pavement (Bridge Approach)]



'KS-2'
[Double Reinforced Pavement (Bridge Approach)]



'KT'
ABUTTING PAVEMENT JOINT - KEYWAY TIE (10) (12)

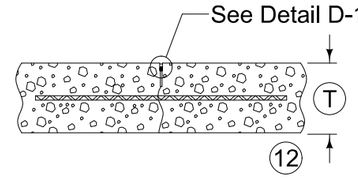
T	Joint	Bars	Bar Length and Spacing
< 8"	'KT-1'	#4	30" Long at 30" Centers
≥ 8"	'KT-2'	#5	30" Long at 30" Centers
	'KT-3'		30" Long at 15" Centers

LONGITUDINAL CONTRACTION

(10) Bar supports may be necessary for fixed form paving to ensure the bar remains in a horizontal position in the plastic concrete.

(11) Sawing or sealing of joint not required.

(12) The following joints are interchangeable, subject to the pouring sequence:
'BT-1', 'L-1', and 'KT-1'
'KT-2' and 'L-2'
'KT-3' and 'L-3'



'L'
CONTRACTION JOINT

T	Joint	Bars	Bar Length and Spacing
< 8"	'L-1'	#4	36" Long at 30" Centers
≥ 8"	'L-2'	#5	36" Long at 30" Centers
	'L-3'		36" Long at 15" Centers

CONSULTANT:

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:
MAQUOKETA CAVES STATE PARK
JACKSON COUNTY, IOWA

NO	BY DATE	REVISION

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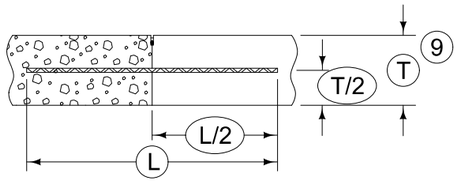
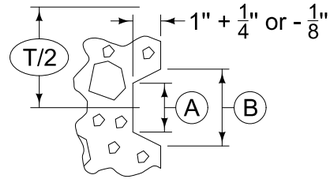
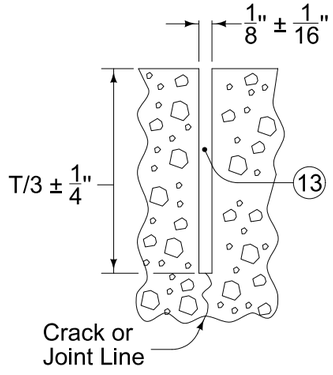


TIE BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)

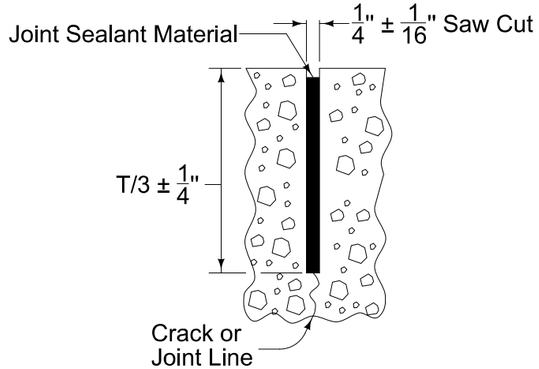


DETAIL E

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness (T)	(A)	(B)
Standard	8" or greater	$1\frac{3}{4}$"	$2\frac{3}{4}$"
Narrow	Less than 8"	1"	2"



DETAIL D-1
(Required when the Department of Transportation is the Contracting Authority, or when specified in the contract documents.)



DETAIL D-2
(Required when the Department of Transportation is not the Contracting Authority, or when specified in the contract documents)

(9) When tying into old pavement, (T) represents the depth of sound PCC.

(13) Sealant or cleaning not required.

LONGITUDINAL CONTRACTION

CONSULTANT:

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

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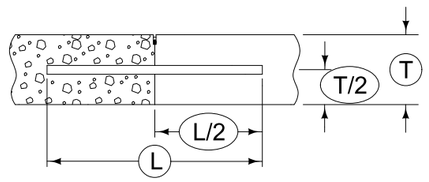
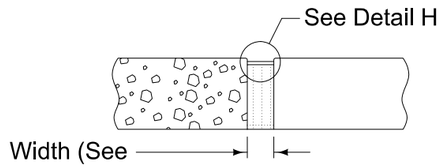
SHEET No: **B.08**

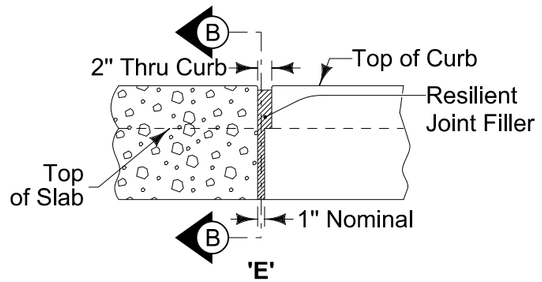


DOWEL PLACEMENT
(Applies to all joints unless otherwise detailed.)

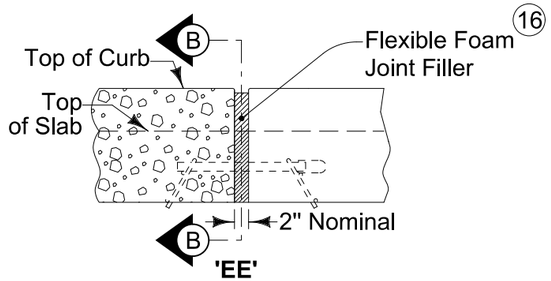


'CF' JOINT

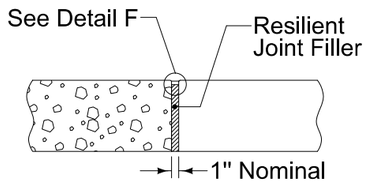
TYPE	WIDTH
CF-1	2"
CF-2	$2\frac{1}{2}$"
CF-3	3"
CF-4	$3\frac{1}{2}$"



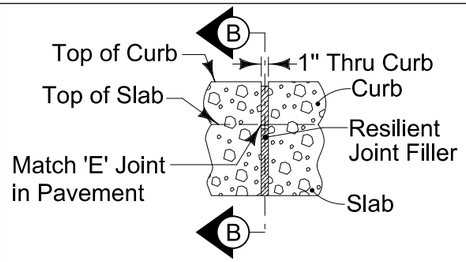
'E'
JOINT IN CURB
(View at Back of Curb)



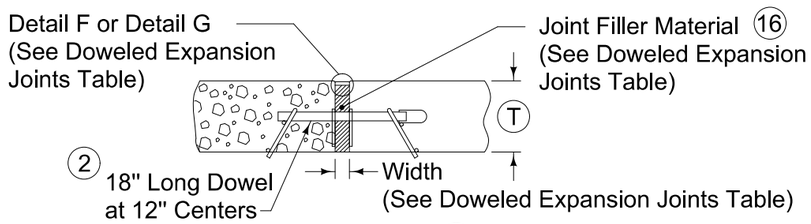
'EE'
JOINT IN CURB
(View at Back of Curb)



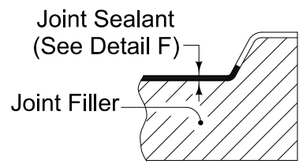
'E'
1" EXPANSION JOINT



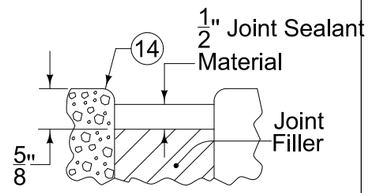
'ES'
JOINT IN CURB
(View at Back of Curb)



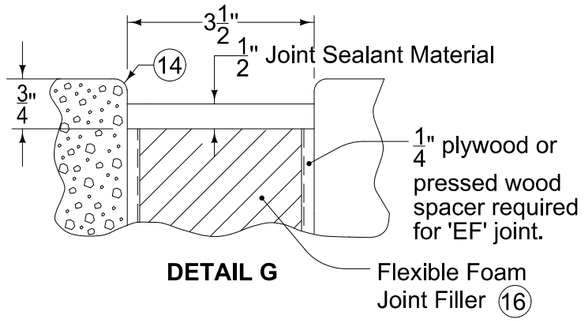
'ED', 'EE', 'EF' 15
DOWELED EXPANSION JOINT



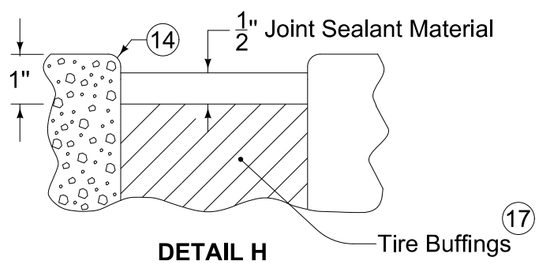
SECTION B-B



DETAIL F



DETAIL G



DETAIL H

EXPANSION

DOWELED EXPANSION JOINTS		
TYPE	WIDTH	FILLER MATERIAL 16
ED	1"	Resilient (Detail F)
EE	2"	Flexible Foam (Detail F)
EF	$3\frac{1}{2}$"	Flexible Foam (Detail G)

BAR SIZE TABLE			
T	< 8"	≥ 8" but < 10"	≥ 10"
Dowel Diameter	$\frac{3}{4}$"	$1\frac{1}{4}$"	$1\frac{1}{2}$"

2 See Bar Size Table.

14 Edge with 1/4 inch tool for length of joint indicated if formed; edging not required when cut with diamond blade saw.

15 See Dowel Assemblies for fabrication details and placement limits. Coat the free end of dowel bar to prevent bond with pavement. At intake locations, dowel bars may be cast-in-place.

16 Predrill or preform holes in joint material for appropriate dowel size.

17 Compact tire buffings by spading with a square-nose shovel.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
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JACKSON COUNTY, IOWA

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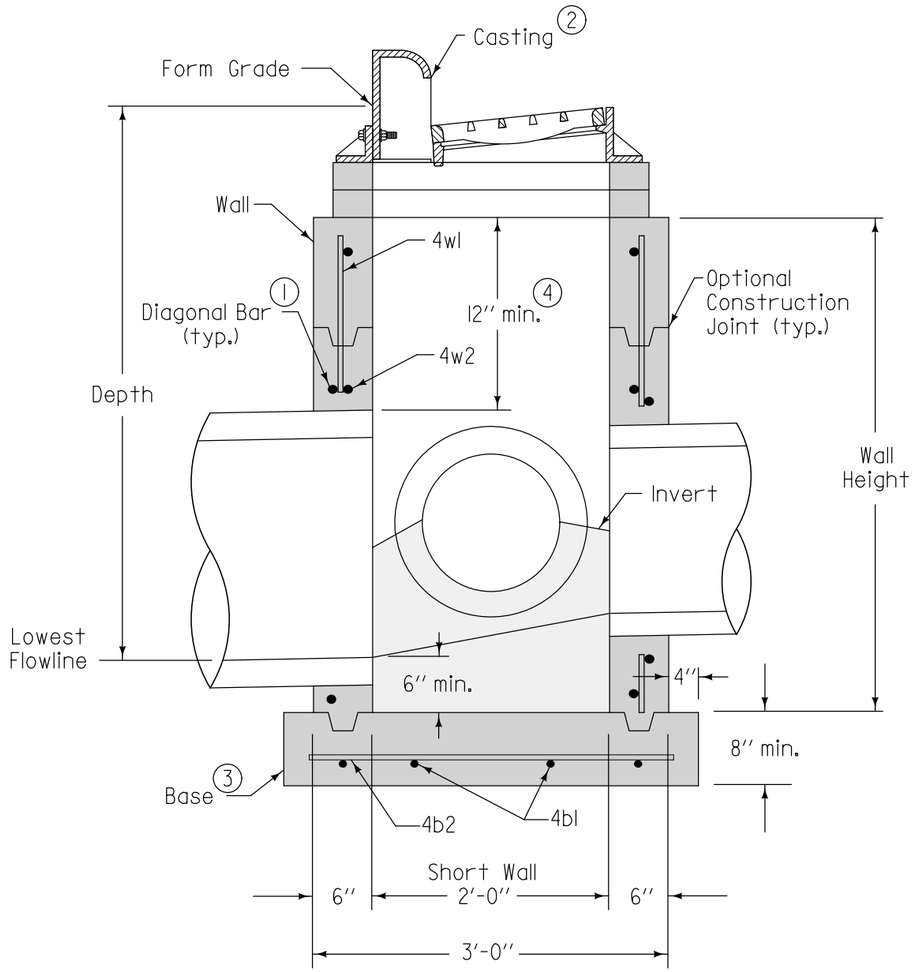
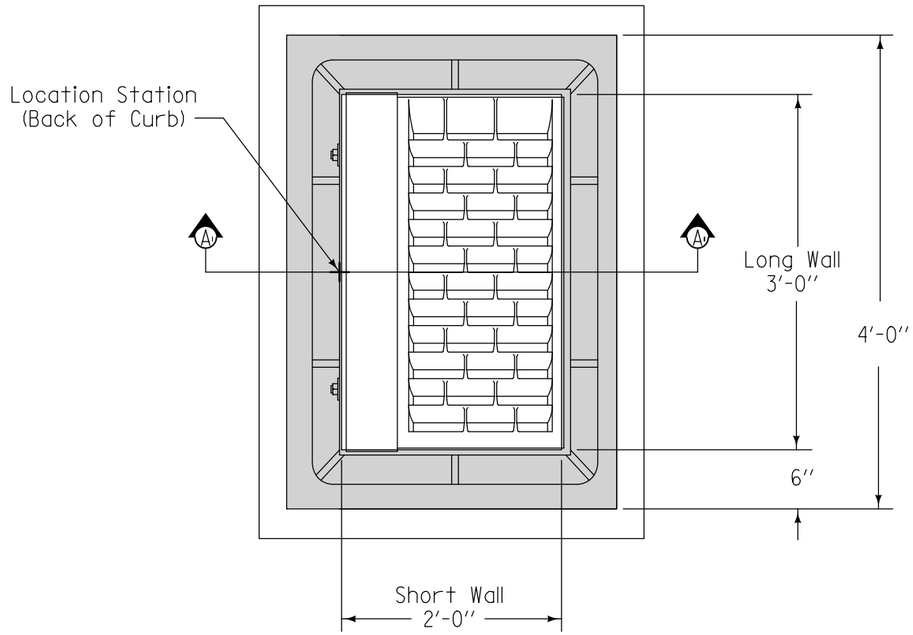
SHEET No: B.09



SECTION A-A

Refer to SW-514 for boxout details.

1. Install four #4 diagonal bars at all pipe openings.
2. SW-603 Type R unless Type Q is specified in the contract documents.
3. Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
4. 12 inch minimum wall height above all pipes.



PLAN

REINFORCING BAR LIST						
Mark	Size	Location	Shape	Length	Count	Spacing
4w1	4	Walls	———	Wall Height minus 4''	14	12''
4w2	4	Long Walls	———	3'-8''	Varies	12''
4w3	4	Short Walls	———	2'-8''	Varies	12''
4b1	4	Base	———	4'-2''	4	10''
4b2	4	Base	———	3'-2''	5	10''

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15''	18''
Long Wall	24''	30''

SINGLE GRATE INTAKE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY / DATE	REVISION

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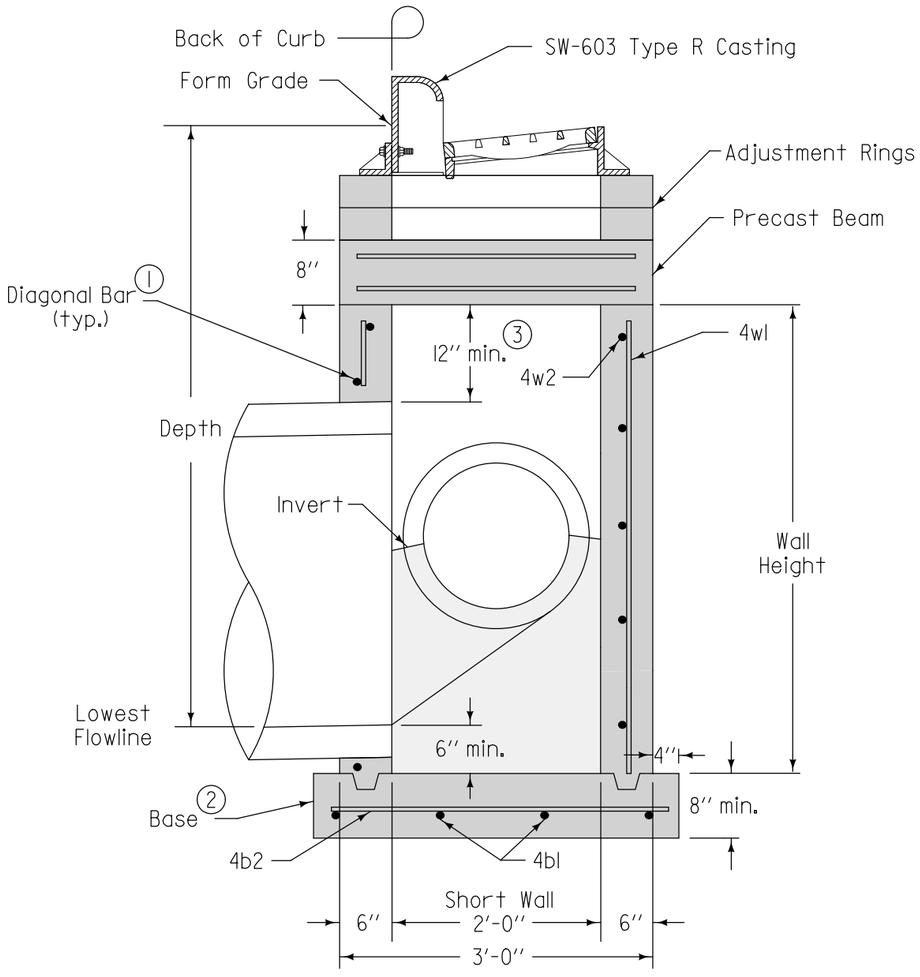
DATE: October 2017
SHEET No: **B.10**

Refer to SW-514 for boxout details.

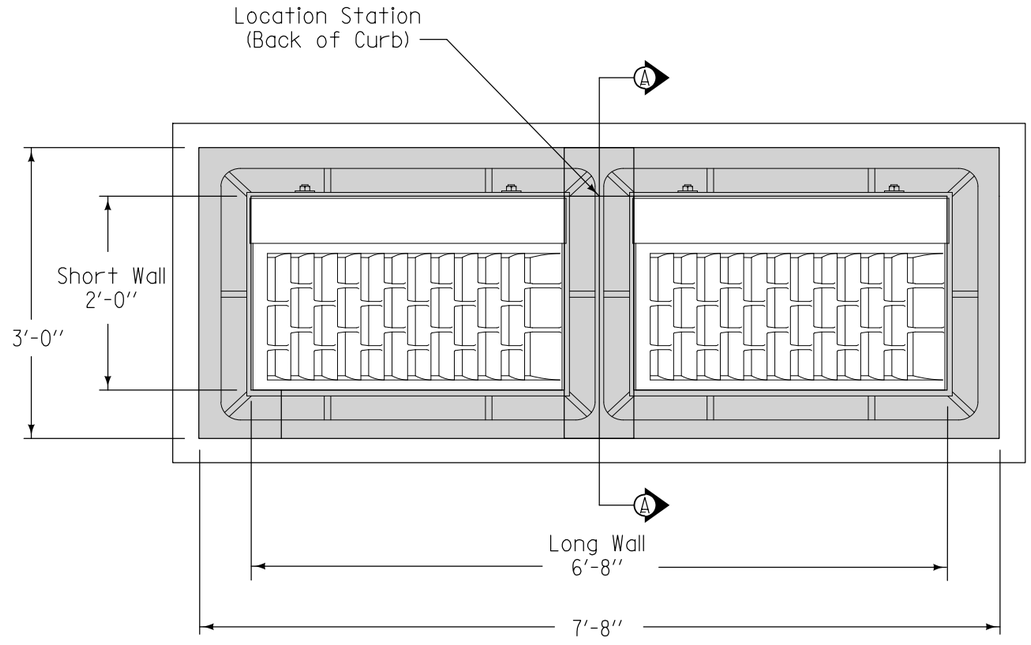
(1) Install four #4 diagonal bars at all pipe openings.

(2) Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.

(3) 12 inch minimum wall height above all pipes.



SECTION A-A



PLAN

DOUBLE GRATE INTAKE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY DATE	REVISION

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PROJECT NUMBER: 17-06-49-02

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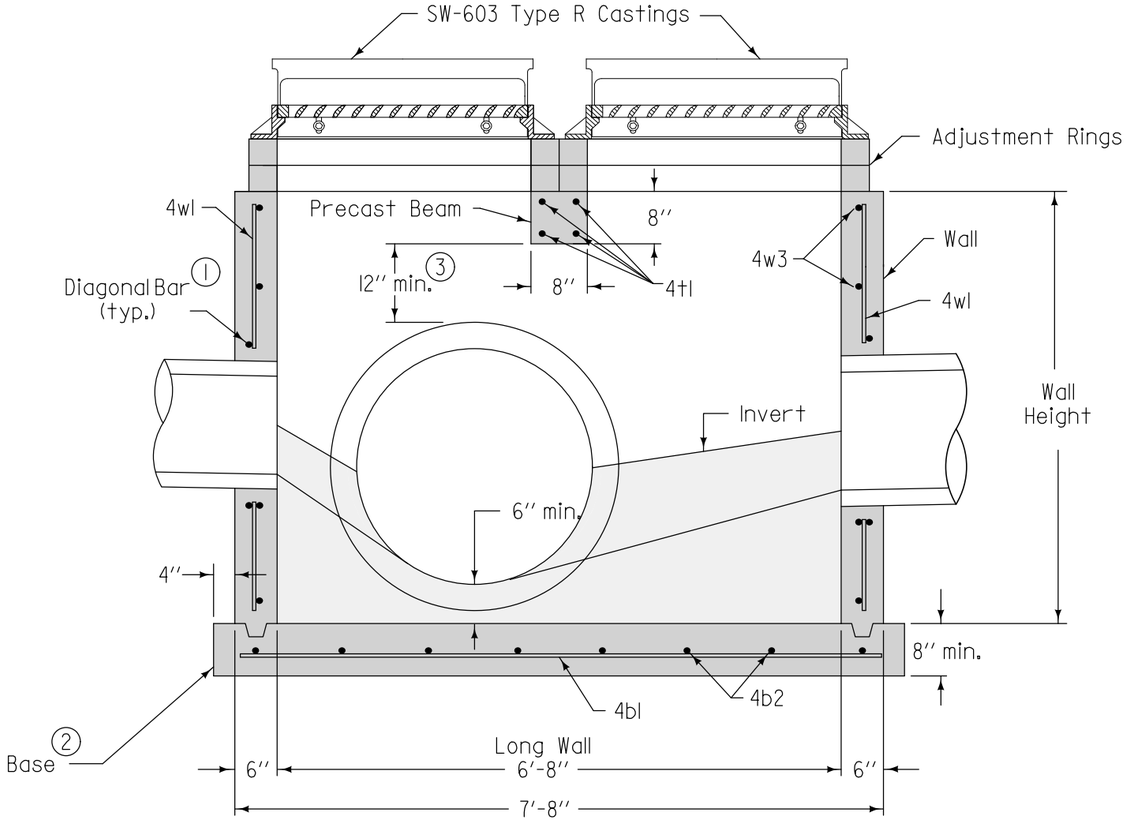
SHEET No: **B.11**



TYPICAL SECTION

1. Install four #4 diagonal bars at all pipe openings.
2. Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
3. 12 inch minimum wall height above all pipes.

REINFORCING BAR LIST						
Mark	Size	Location	Shape	Count	Length	Spacing
4t1	4	Beam	——	4	2'-8''	4''
4b1	4	Base	——	4	7'-10''	10''
4b2	4	Base	——	8	3'-2''	12''
4w1	4	Walls	——	20	Wall Height minus 4''	12''
4w2	4	Long Walls	——	Varies	7'-4''	12''
4w3	4	Short Walls	——	Varies	2'-8''	12''

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15''	18''
Long Wall	60''	66''

DOUBLE GRATE INTAKE

CONSULTANT:

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

GENERAL DETAILS

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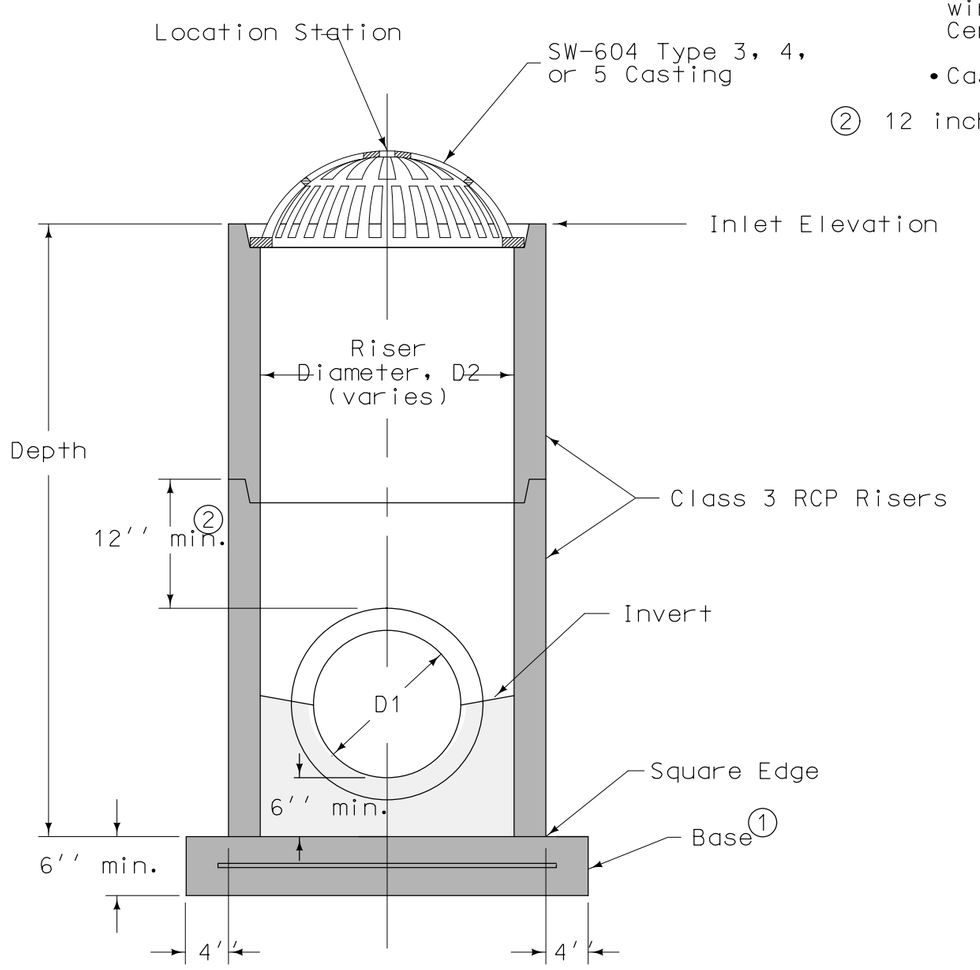

TYPICAL SECTION

CASE 1

① Precast (shown) or cast-in-place base:

- Precast: 6 inch thick concrete with #6 welded wire mesh on 4 inch centers (WWF 4'' x 4''). Center mesh vertically within base.
- Cast-in-place: 8 inch thick non-reinforced concrete.

② 12 inch minimum riser height above all pipes.

INTAKE SIZE - CASE 1	
Outlet Pipe Diameter, D1	Minimum Riser Diameter, D2
12''	18''
15''	24''
18''	24''
21''	30''
24''	30''
27''	36''

CIRCULAR AREA INTAKE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILDING
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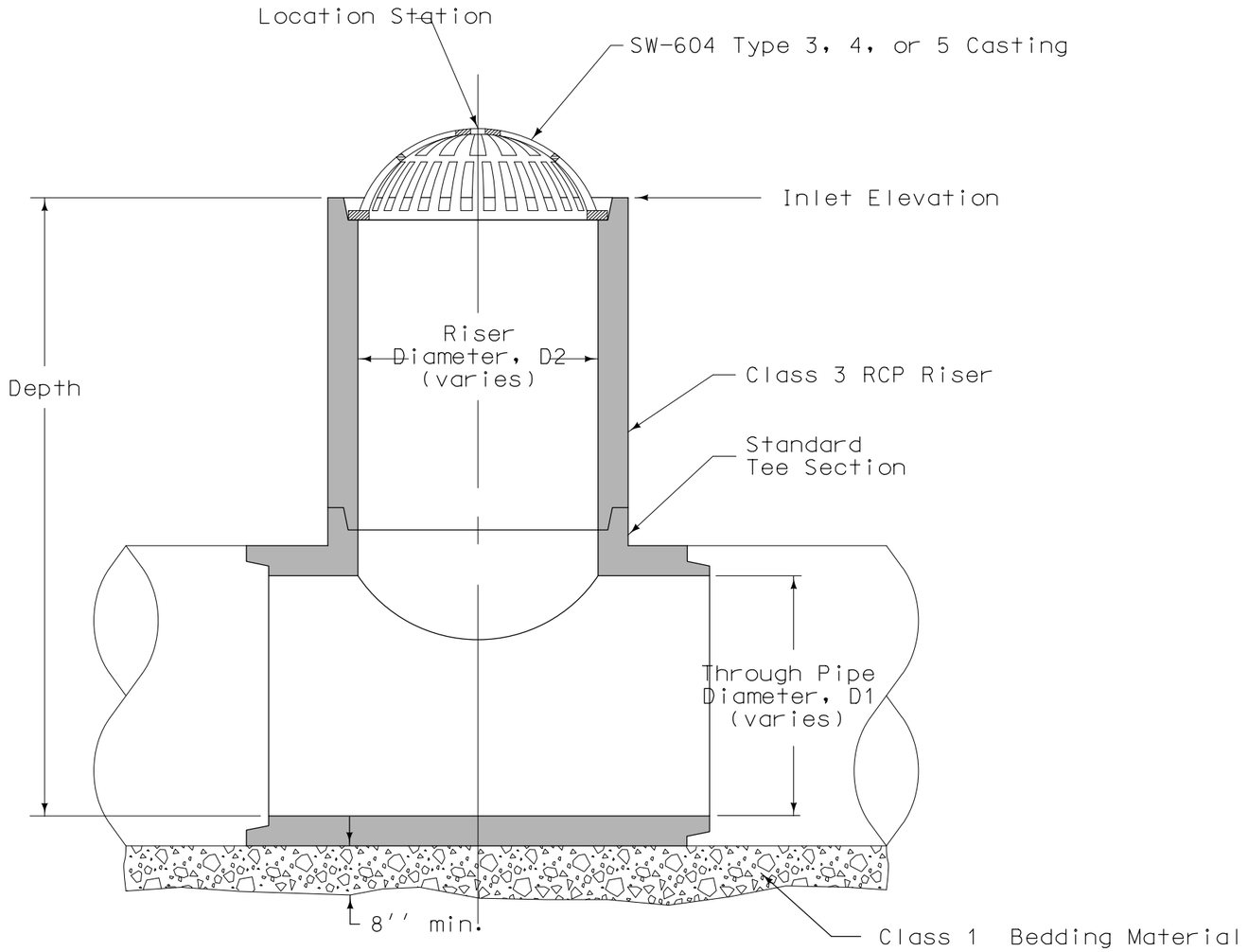
SHEET No: **B.13**

③ Minimum riser diameter is 18 inches.



TYPICAL SECTION

CASE 2

INTAKE SIZE - CASE 2	
Through Pipe Diameter, D1	Maximum ③ Riser Diameter, D2
18''	18''
21''	18''
24''	24''
27''	24''
30''	30''
36'' or more	36''

CIRCULAR AREA INTAKE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
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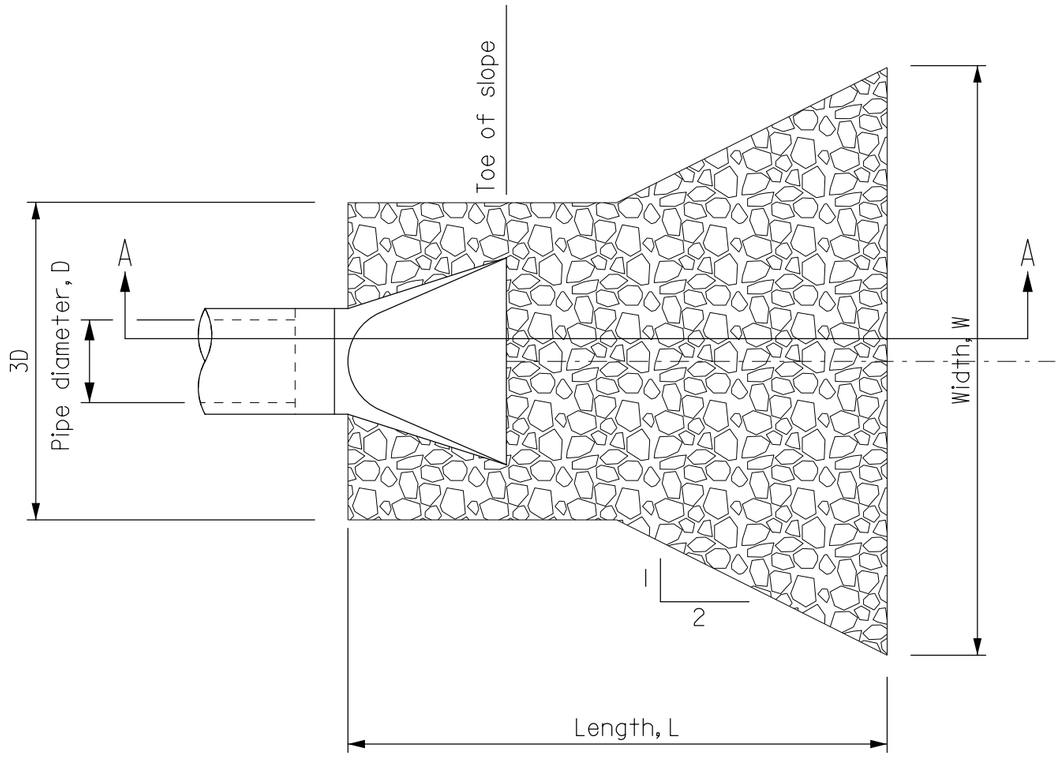
SHEET No: B.14

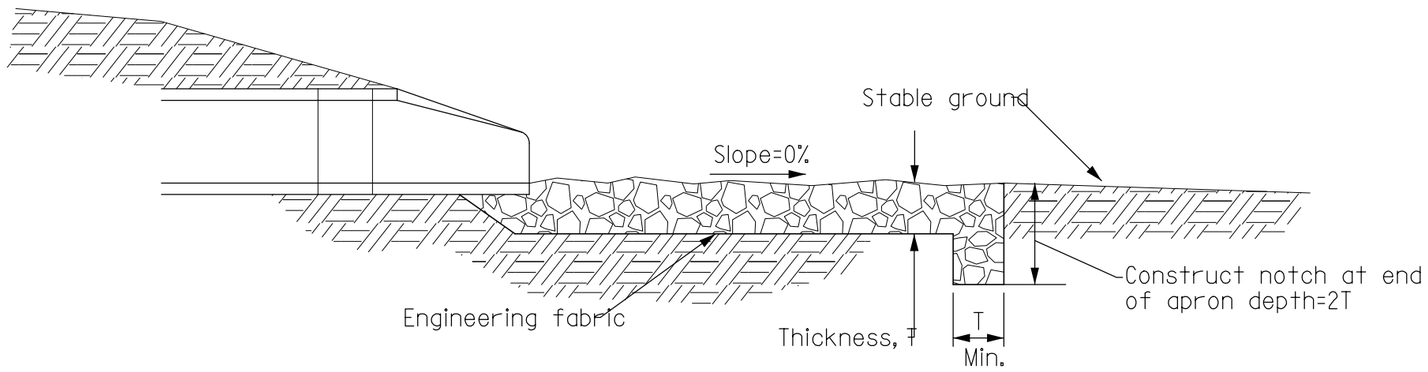
GENERAL NOTES:

Provide the rock gradation, thickness (T), width (W), and length (L) specified in the contract documents.

See Section 9040, 2.18 and 2.19 for engineering fabric and rock requirements.



PLAN



PROFILE
Section A-A

ROCK APRON FOR PIPE OUTLET ONTO FLAT GROUND

CONSULTANT:

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

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DATE: October 2017
SHEET No: B.15

CIRCUIT SCHEDULE

CIRCUIT OR CONDUCTOR	NO. OF CAMP SITES	FACILITY OR CAMPSITE NUMBERS SERVED	TRENCH LENGTH			LENGTH OF ROAD XING CONDUIT (FT.)	LENGTH OF WARNING TAPE (FT.)	C. B. OR FUSE SIZE (AMP)	SIZE (AWG) & LENGTH (FT.) OF GR. CONDUCTOR (TYPE THW OR USE)					SIZE (AWG) & LENGTH (FT.) OF CONDUCTOR						
														TYPE U.S.E.						
			SGL.	DBL.	TRPL.				#6	#4	#2	#1/0	#2/0	#1/0	#2/0	#3/0	#4/0	250 MCM	300 MCM	350 MCM
		DISTRIBUTION PANEL NO. 1																		
1A	6																			
		1	474				474	150/1P			162								162	
		2									180									
		3								366						366	180			
		4								438						438				
		5								228					228					
		6								246					246					
1B	0																			
		Light Pole	53				53	50/1P	234					234						
		DISTRIBUTION PANEL NO. 2																		
2A	4																			
		7	425				425	125/1P		702						702				
		8								237						237				
		9								249						249				
		10								222					222					
		DISTRIBUTION PANEL NO. 3																		
3A	8			32																
		23	498				530	200/1P			141								141	
		24									267								267	
		25									270							270		
		26									237							237		
		27									204							204		
		28									252							252		
		29									237							237		
		30									237							237		
TOTAL	18								234	2688	2187			234	696	1992	180	1437	570	
			1450				1482													
3B	6		395	32							399						399			
Alternate #1		11				30	524	150/1P			255						255			
		12									339						339			
		22				30					207						207			
		21									231						231			
		20									312						312			
		19																		
ALT 1 TOTAL	6		395	32		60	524				1743						1743			
3C	6		904	32			1033													
Alternate #2		13				30					1170							1170		
		14						75/1P			357							357		
		15									354							354		
		16									381							381		
		17									525							525		
		18									510						510			
ALT 2 TOTAL	6		904	32		30	1033				3297						510	2787		

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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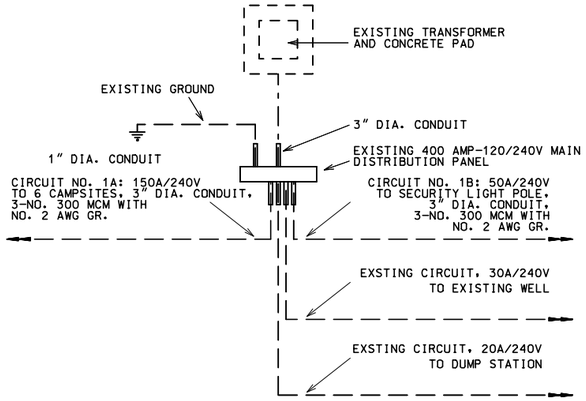
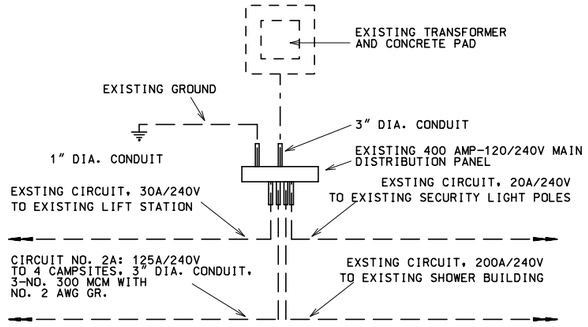
B.16



PLAN DETAIL
MAIN DISTRIBUTION PANEL NO. 1 (EXISTING)

NOT TO SCALE

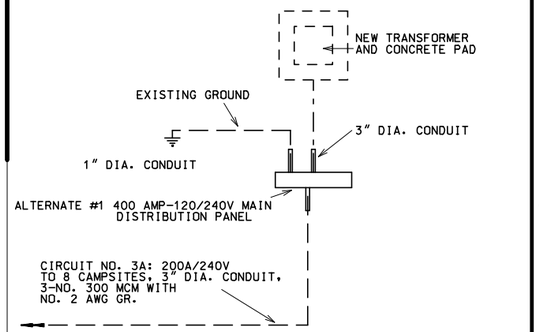


PLAN DETAIL
MAIN DISTRIBUTION PANEL NO. 2 (EXISTING)

NOT TO SCALE

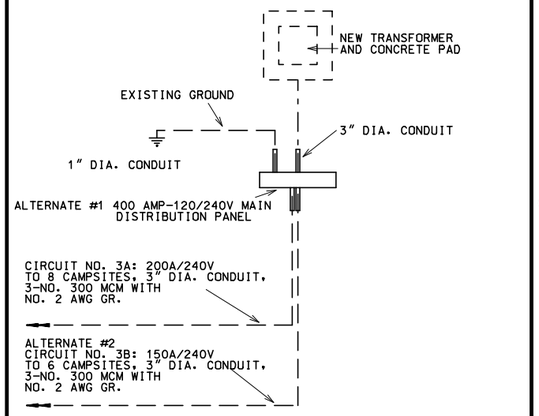
DISTRIBUTION PANEL SCHEDULE * = Existing

PANEL DESIG.	TYPE PANEL	MAINS		2-POLE MAIN BREAKER	BRANCH BREAKERS		BRANCH CIRCUITS
		AMPS	WIRE SIZE		1-POLE	2-POLE	
1	EXISTING	400	EXISTING	400	-	1 - 30* 1 - 200* 1 - 50 1 - 150	Existing Well*, Existing Dump Station* Security Light, Campsites 1-6
2	EXISTING	400	EXISTING	400	1 - 20*	1 - 200* 1 - 30* 1 - 125	Existing Shower Bld*, Exisitng Security Lights*, Existing Lift Station*, Campsites 7-10
3	CCB or I-Line HCM	400	By Maquoketa Valley Electric Coop	400	-	1 - 200	Campsites 23-30
3 ALT #1	CCB or I-Line HCM	400	By Maquoketa Valley Electric Coop	400	-	1 - 200 1 - 150	Campsites 23-30, 11-12, 19-22
3 ALT #2	CCB or I-Line HCM	400	By Maquoketa Valley Electric Coop	400	-	1 - 200 1 - 75	Campsites 23-30, 13-18
3 ALT #3	CCB or I-Line HCM	600	By Maquoketa Valley Electric Coop	600	-	1 - 200 1 - 150 1 - 75	Campsites 23-30, 11-12, 19-22, 13-18



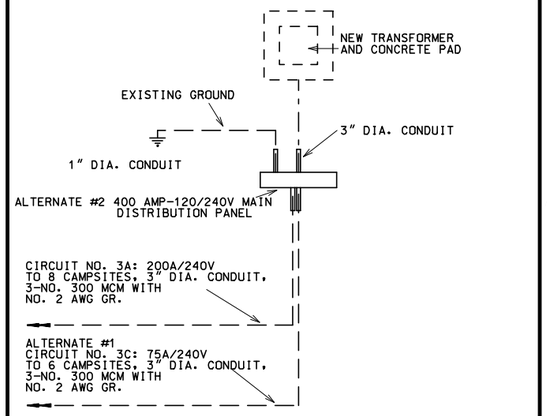
PLAN DETAIL
MAIN DISTRIBUTION PANEL NO. 3

NOT TO SCALE



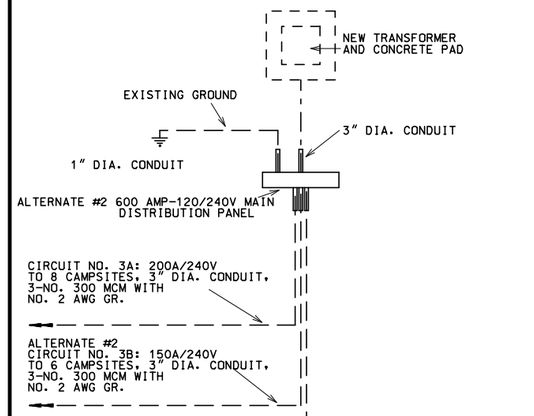
PLAN DETAIL
MAIN DISTRIBUTION PANEL NO. 3
ALTERNATE #1

NOT TO SCALE



PLAN DETAIL
MAIN DISTRIBUTION PANEL NO. 3
ALTERNATE #2

NOT TO SCALE



PLAN DETAIL
MAIN DISTRIBUTION PANEL NO. 3
ALTERNATE #3

NOT TO SCALE

GENERAL NOTES

1. Consistently throughout the project, the phase "A" conductor, the phase "B" conductor, and the neutral conductor shall be distinguished from each other by color coding, or by surface deformations or other markings in the conductor insulation. The ground conductors shall have green colored insulation.
2. The conductor sizes and the plan arrangement of the loads on each circuit were selected to limit the maximum circuit voltage drop, from the transformer to the furthest campsite outlet on the circuit, to 3% (3.6 volts on each 120V phase).
3. All conductors shall be copper.
4. Length of conductors in table are combined (total length) for phase "A" and "B" and neutral unless noted otherwise.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY / DATE	REVISION

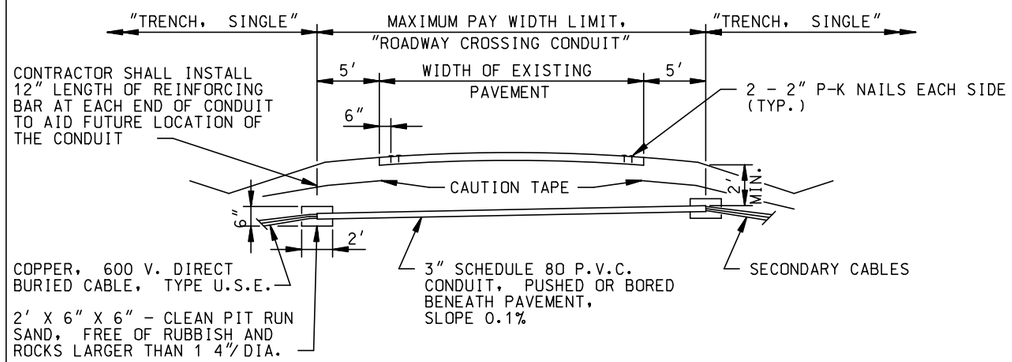
DRAWN BY:

PROJECT NUMBER: 17-06-49-02

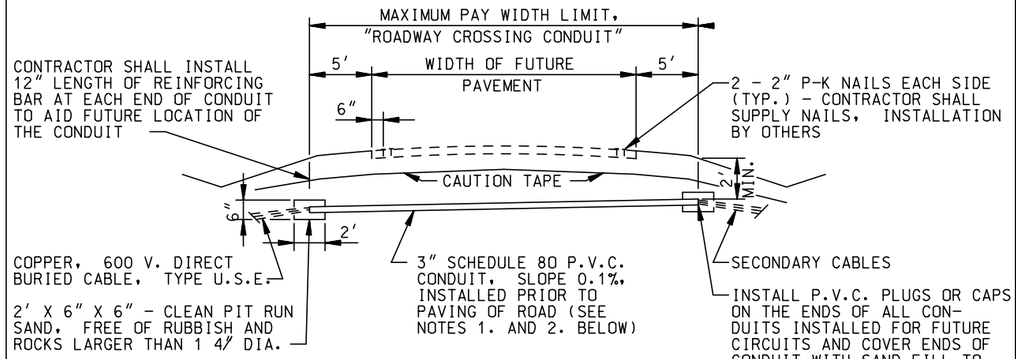
CHK'D BY:

DATE: October 2017

SHEET No: B.17



ROADWAY CROSSING CONDUIT BENEATH EXISTING PAVED ROAD



NOTE: THE LENGTH OF TRENCHING REQUIRED FOR THE PLACEMENT OF CONDUIT SHALL BE PAID FOR UNDER "TRENCH, SINGLE" ITEM

ROADWAY CROSSING CONDUIT BENEATH FUTURE PAVEMENT

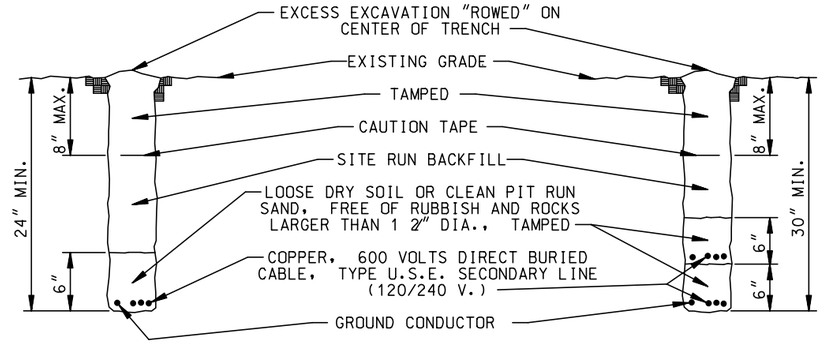
NOTES:

1. FOR ROADWAY CROSSING CONDUIT BENEATH FUTURE PAVEMENT, PLACE CONDUIT IN TRENCH THAT IS GRADED TRUE AND IS FREE FROM STONES OR SOFT SPOTS. IN ROCKY SOIL, PLACE SELECTED BACKFILL IN BOTTOM OF TRENCH AND AROUND CONDUIT.
2. TRENCH BACKFILL, PLACED AROUND ROADWAY CROSSING CONDUIT BENEATH FUTURE PAVEMENT, SHALL BE FREE FROM STONES AND BE FIRMLY TAMPED AROUND THE SIDES (NOT THE TOP) OF THE CONDUIT, TO DEVELOP MAXIMUM SUPPORTING STRENGTH. COMPACTION OF TOP 12" OF BACKFILL BENEATH FUTURE PAVEMENT WILL BE CONSIDERED SUITABLE IF THE RESULTING DENSITY WITH ADEQUATE MOISTURE, IS REASONABLY UNIFORM THROUGHOUT EACH COMPACTED LIFT AND IS AT LEAST 95 PERCENT OF MAXIMUM DENSITY, DETERMINED IN ACCORDANCE WITH STANDARD PROCTOR DENSITY TEST.

CAMPGROUND ELECTRICAL SYSTEM
STANDARD DRAWING NO. RC-1

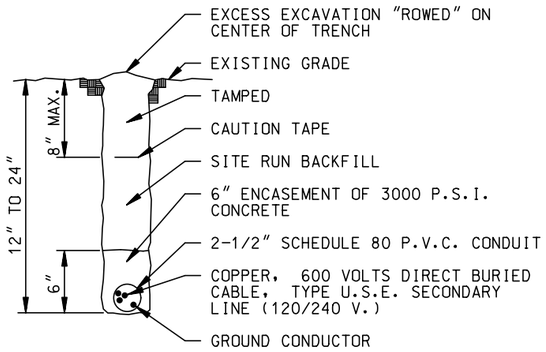
DETAILS OF ROADWAY CROSSING CONDUITS FOR SECONDARY CIRCUITS

REVISION DATE 1/25/95 | SHEET 3 OF 10

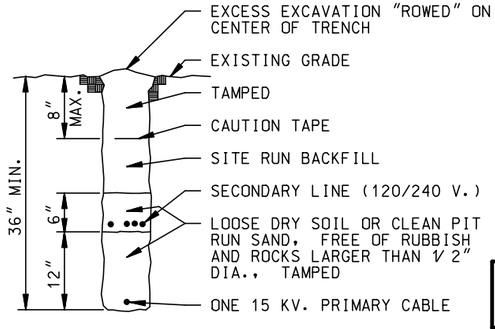


SINGLE TRENCH

DOUBLE TRENCH



SINGLE TRENCH WITH LESS THAN MINIMUM BURIAL DEPTH



COMBINED PRIMARY AND SECONDARY TRENCH

NOTES:

1. AFTER INSTALLATION OF THE ELECTRICAL CONDUCTORS, AND AT LOCATIONS WHERE THE TRENCHING OPERATIONS CROSS THE CAMPSITE VEHICLE PARKING PADS, THE CONTRACTOR SHALL PLACE AND COMPACT A MINIMUM OF 4" OF GRANULAR SURFACING ABOVE THE COMPACTED TRENCH BACKFILL.
2. THE CONTRACTOR SHALL SEED AREAS DISTURBED BY TRENCHING ACTIVITY WITH AN "URBAN" OR "RURAL" SEED MIXTURE, AS SPECIFIED ON THE PLAN DRAWINGS. THE COST OF SEEDING SHALL BE CONSIDERED AS INCIDENTAL TO OTHER ITEMS OF WORK.
3. TRENCHING AND BACKFILL SHALL CONFORM TO SECTION 02200, PART 3.05 OF THE TECHNICAL SPECIFICATIONS.

CAMPGROUND ELECTRICAL SYSTEM
STANDARD DRAWING NO TS-1

DETAILS OF TRENCHES FOR SECONDARY CIRCUITS

REVISION DATE 1/21/97 | SHEET 5 OF 10

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

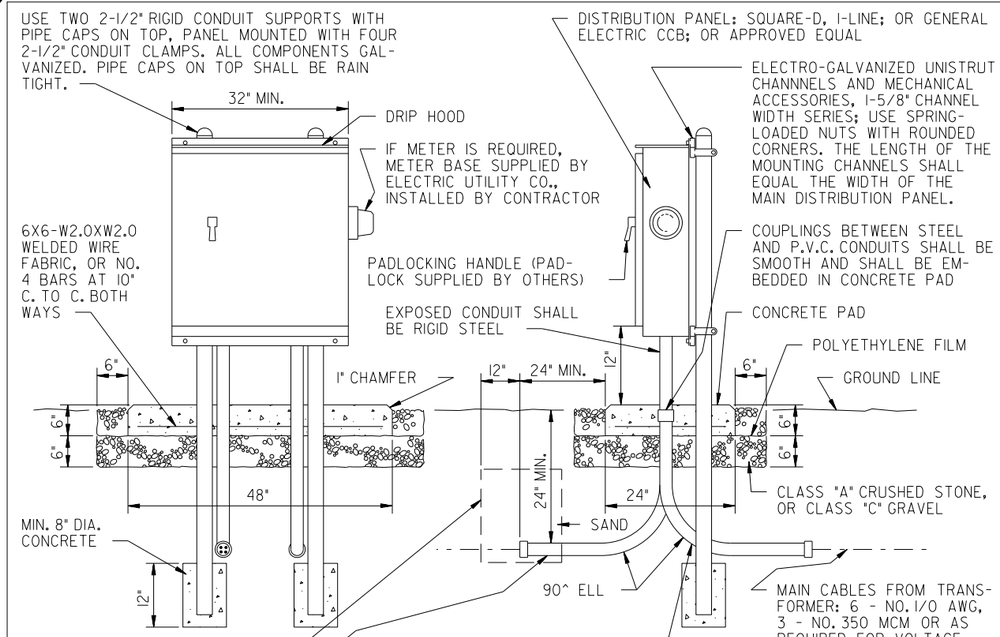
MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 17-06-49-02
CHK'D BY:
DATE: October 2017
SHEET No:

B.18



PAD-MOUNTED DISTRIBUTION PANEL DETAIL

NOTES:

1. IF THE PROJECT SITE DOES NOT HAVE PRIMARY METERING, A METER FOR SECONDARY CIRCUITS SHALL BE INSTALLED ON THE SIDE OF THE MAIN DISTRIBUTION PANEL. THE METER BASE INSTALLATION SHALL BE IN CONFORMANCE WITH THE ELECTRIC UTILITY COMPANY'S REQUIREMENTS AND BE SUBJECT TO THEIR APPROVAL.
2. THE COST FOR INSTALLING "MAIN CIRCUIT CABLES" SHALL BE INCLUDED IN THE COST FOR INSTALLING THE MAIN DISTRIBUTION PANEL. THE CONTRACTOR SHALL ARRANGE WITH THE ELECTRIC UTILITY COMPANY FOR CONNECTION OF THE MAIN CIRCUIT CABLES TO THE TRANSFORMER.
3. MAIN DISTRIBUTION PANELS SHALL BE MOUNTED TO RIGID STEEL CONDUIT POSTS USING CONDUIT CLAMPS AND A 1-5/8" X 3-1/4" X 12 GAUGE CHANNEL COMBINATION. MOUNTING CHANNELS AND ACCESSORIES SHALL BE CONSTRUCTED USING THE "UNISTRUT" SYSTEM MANUFACTURED BY GTE PRODUCTS CORP., THE "POWER-STRUT" SYSTEM MANUFACTURED BY ELCEN METAL PRODUCTS CO., OR AN APPROVED EQUAL. WITH THE "UNISTRUT" SYSTEM, CONDUIT CLAMPS SHALL BE NO. P1118, AND MOUNTING CHANNELS SHALL BE NO. P1001B. WITH THE "POWER-STRUT" SYSTEM, CONDUIT CLAMPS SHALL BE CAT. NO. PS-1100-2-1/2", AND MOUNTING CHANNELS SHALL BE CAT. NO. PS-200-2T2. END CAPS SHALL BE INSTALLED ON ENDS OF CHANNELS. SPRING LOADED NUTS AND BOLTS SHALL BE SIZED TO MATCH MOUNTING HOLES IN PANEL (MINIMUM DIA. OF BOLTS SHALL BE 1/2" AND 5 8"/ MOUNTING HOLES). ALL CHANNELS AND ACCESSORIES SHALL BE ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED.

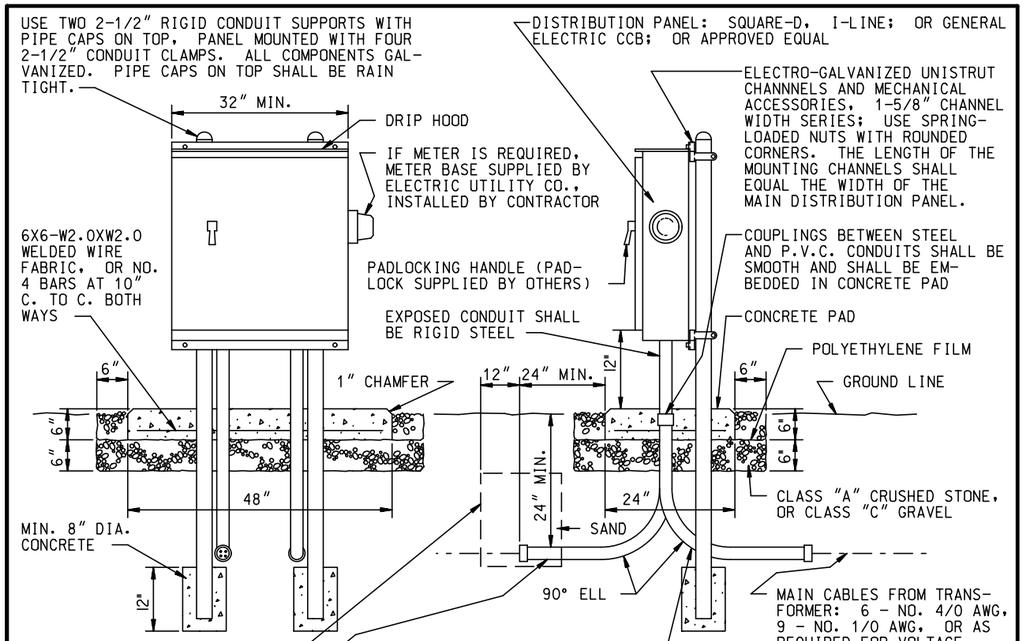
400 AMP/240 VOLT MAIN DISTRIBUTION PANEL FEATURES:

1. SYSTEM: 120/240 V., 3-WIRE CONTINUOUS GROUND, SINGLE PHASE.
2. SQUARE-D TYPE HCM I-LINE, OR GENERAL ELECTRIC TYPE CCB, PANELBOARD.
3. 400 AMP LA (SQUARE-D) OR TJD (G.E.) 2-POLE MAIN CIRCUIT BREAKER.
4. SOLID NEUTRAL.
5. EQUIPMENT GROUND BAR MOUNTED IN PANEL.
6. DEADFRONT, NEMA TYPE 3R ENCLOSURE.
7. GASKET SEALING AROUND DOOR OPENING.
8. CONCEALED DOOR HINGE.
9. THREE-POINT VAULT TYPE LOCKING MECHANISM WITH CHROME FINISH PAD-LOCKING HANDLE.
10. CABINET FINISH: RUST INHIBITING PRIMER AND FINISH COAT OF STANDARD GRAY BAKED ENAMEL.
11. BRANCH BREAKERS: TYPES FA & Q2 (SQUARE-D) OR TYPES TEB & TQD (G.E.) THERMAL MAGNETIC CIRCUIT BREAKERS.

CAMPGROUND ELECTRICAL SYSTEM
STANDARD DRAWING NO. MP-2

DETAILS OF PAD-MOUNTED
400 AMP / 240 VOLT
MAIN DISTRIBUTION PANEL

REVISION DATE 1/25/95 | SHEET 8 OF 10



PAD-MOUNTED DISTRIBUTION PANEL DETAIL

NOTES:

1. IF THE PROJECT SITE DOES NOT HAVE PRIMARY METERING, A METER FOR SECONDARY CIRCUITS SHALL BE INSTALLED ON THE SIDE OF THE MAIN DISTRIBUTION PANEL. THE METER BASE INSTALLATION SHALL BE IN CONFORMANCE WITH THE ELECTRIC UTILITY COMPANY'S REQUIREMENTS AND BE SUBJECT TO THEIR APPROVAL.
2. THE COST FOR INSTALLING "MAIN CIRCUIT CABLES" SHALL BE INCLUDED IN THE COST FOR INSTALLING THE MAIN DISTRIBUTION PANEL. THE CONTRACTOR SHALL ARRANGE WITH THE ELECTRIC UTILITY COMPANY FOR CONNECTION OF THE MAIN CIRCUIT CABLES TO THE TRANSFORMER.
3. MAIN DISTRIBUTION PANELS SHALL BE MOUNTED TO RIGID STEEL CONDUIT POSTS USING CONDUIT CLAMPS AND A 1-5/8" X 3-1/4" X 12 GAUGE CHANNEL COMBINATION. MOUNTING CHANNELS AND ACCESSORIES SHALL BE CONSTRUCTED USING THE "UNISTRUT" SYSTEM MANUFACTURED BY GTE PRODUCTS CORP., THE "POWER-STRUT" SYSTEM MANUFACTURED BY ELCEN METAL PRODUCTS CO., OR AN APPROVED EQUAL. WITH THE "UNISTRUT" SYSTEM, CONDUIT CLAMPS SHALL BE NO. P1118, AND MOUNTING CHANNELS SHALL BE NO. P1001B. WITH THE "POWER-STRUT" SYSTEM, CONDUIT CLAMPS SHALL BE CAT. NO. PS-1100-2-1/2", AND MOUNTING CHANNELS SHALL BE CAT. NO. PS-200-2T2. END CAPS SHALL BE INSTALLED ON ENDS OF CHANNELS. SPRING LOADED NUTS AND BOLTS SHALL BE SIZED TO MATCH MOUNTING HOLES IN PANEL (MINIMUM DIA. OF BOLTS SHALL BE 1/2" AND 5/8" MOUNTING HOLES). ALL CHANNELS AND ACCESSORIES SHALL BE ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED.

600 AMP/240 VOLT MAIN DISTRIBUTION PANEL FEATURES:

1. SYSTEM: 120/240 V., 3-WIRE CONTINUOUS GROUND, SINGLE PHASE.
2. SQUARE-D TYPE HCM I-LINE, OR GENERAL ELECTRIC TYPE CCB, PANELBOARD.
3. 600 AMP MA (SQUARE-D) OR TJK6 (G.E.) 2-POLE MAIN CIRCUIT BREAKER, EXCEPT WHEN PLAN DRAWINGS REQUIRE MAIN LUGS ONLY.
4. SOLID NEUTRAL.
5. EQUIPMENT GROUND BAR MOUNTED IN PANEL.
6. DEADFRONT, NEMA TYPE 3R ENCLOSURE.
7. GASKET SEALING AROUND DOOR OPENING.
8. CONCEALED DOOR HINGE.
9. THREE-POINT VAULT TYPE LOCKING MECHANISM WITH CHROME FINISH PAD-LOCKING HANDLE.
10. CABINET FINISH: RUST INHIBITING PRIMER AND FINISH COAT OF STANDARD GRAY BAKED ENAMEL.
11. BRANCH BREAKERS: TYPES FA & Q2 (SQUARE-D) OR TYPES TEB & TQD (G.E.) THERMAL MAGNETIC CIRCUIT BREAKERS.

CAMPGROUND ELECTRICAL SYSTEM
STANDARD DRAWING NO. MP-3

DETAILS OF PAD-MOUNTED
600 AMP / 240 VOLT
MAIN DISTRIBUTION PANEL

REVISION DATE 1/25/95 | SHEET 9 OF 10

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

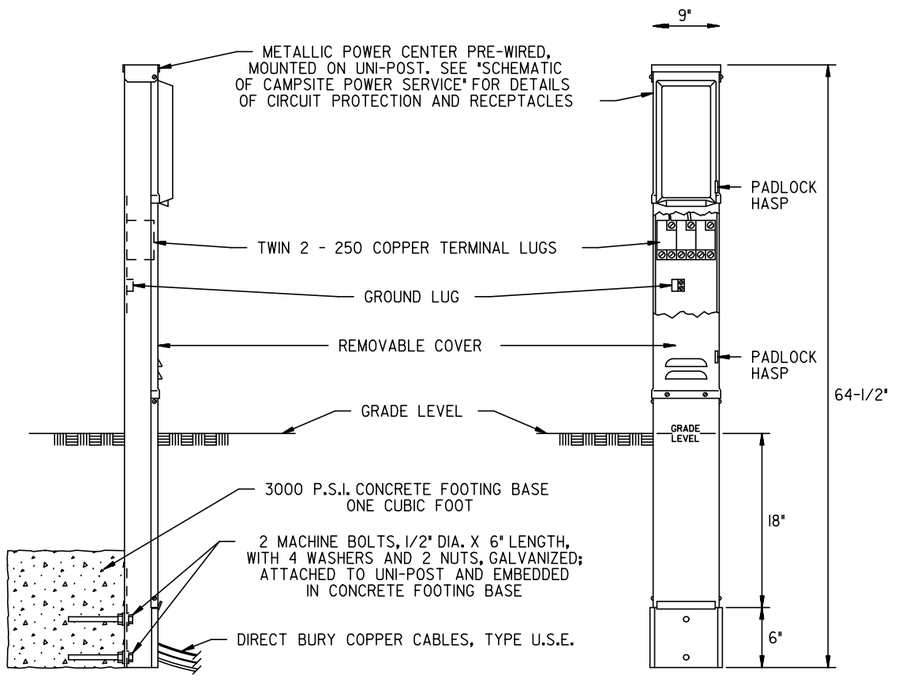
JACKSON COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY: | PROJECT NUMBER: 17-06-49-02
CHK'D BY: | DATE: October 2017

SHEET No:

B.19



SIDE VIEW

FRONT VIEW

NOTES:

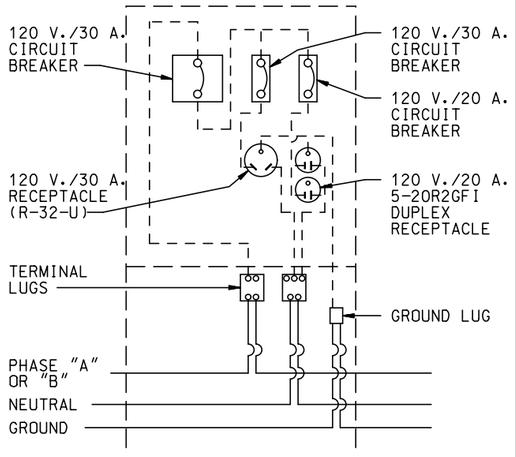
1. A "SINGLE CAMPSITE OUTLET POST-30 AMP" SHALL HAVE THE FOLLOWING CONFIGURATION: AN UNMETERED, POST MOUNTED CABINET WITH A 5-20R2GFI 20 AMP DUPLEX RECEPTACLE, A R32U 30 AMP RECEPTACLE, A SINGLE POLE 20 AMP CIRCUIT BREAKER, AND A SINGLE POLE 30 AMP CIRCUIT BREAKER; MIDWEST MODEL U075CP6010, MILLBANK U5200-XL-75, OR APPROVED EQUAL, SHALL BE USED FOR SINGLE CAMPSITE OUTLET POST WITH METALLIC POWER CENTER.

2. A "DOUBLE-HEAD CAMPSITE OUTLET POST-30 AMP" SHALL HAVE THE FOLLOWING CONFIGURATION: UNMETERED, POST MOUNTED CABINETS WITH RECEPTACLES AND BREAKERS AS ABOVE; MIDWEST MODEL U075CB6010, MILLBANK U5220-XL-75, OR APPROVED EQUAL, SHALL BE USED FOR DOUBLE CAMPSITE OUTLET POST WITH METALLIC POWER CENTER.

3. SEE TRENCH DETAILS, STANDARD DRAWING NO. TS-1, FOR DETAILS OF INSTALLATION OF DIRECT BURY COPPER CABLES TO CAMPSITE OUTLET POST.

4. THE CONDUCTOR SIZES AND THE PLAN ARRANGEMENT OF THE LOADS ON EACH CIRCUIT SHALL BE SELECTED TO LIMIT THE MAXIMUM CIRCUIT VOLTAGE DROP, FROM THE TRANS-FORMER TO THE FURTHEST CAMPSITE OUTLET ON THE CIRCUIT, TO 3% (3.6 VOLTS ON EACH 120 V. PHASE). ADJUST CONDUCTOR SIZE BASED ON ACTUAL ROUTING WITH NO ADDI-TIONAL COMPENSATION.

5. PROVIDE ONE EXTRA COMPLETE OUTLET POST OF EACH TYPE AND TURN OVER TO OWNER.

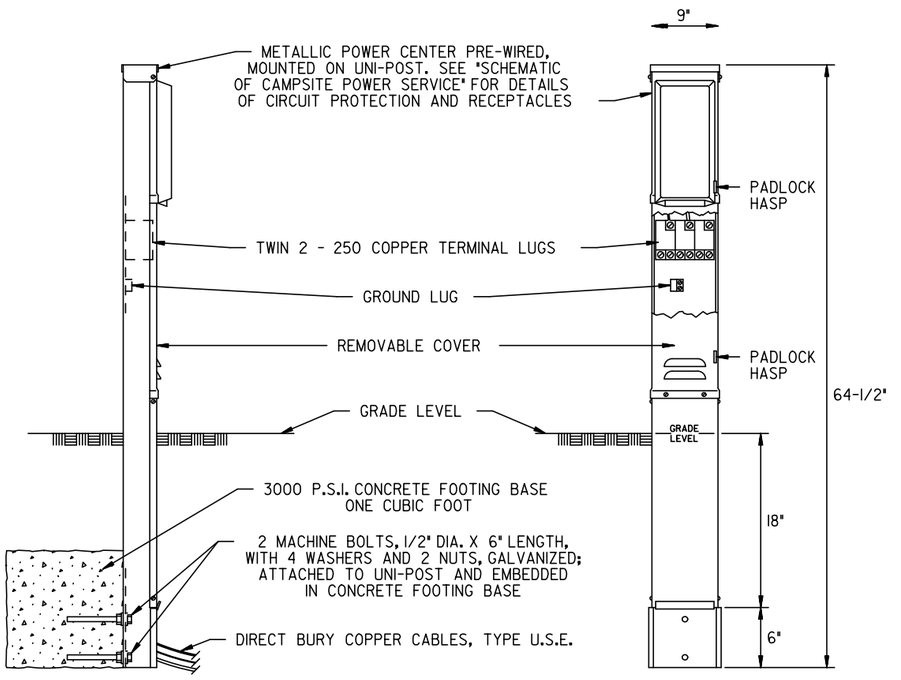


SCHEMATIC OF CAMPSITE 30 AMP POWER SERVICE

CAMPGROUND ELECTRICAL SYSTEM STANDARD DRAWING NO. SC-1

DETAILS OF CAMPSITE OUTLET POST

REVISION DATE | SHEET OF



SIDE VIEW

FRONT VIEW

NOTES:

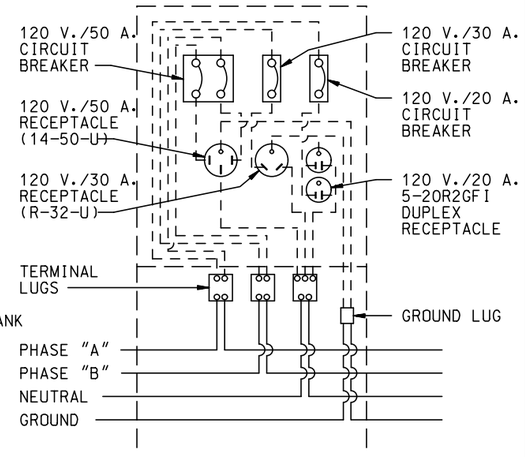
1. A "SINGLE CAMPSITE OUTLET POST-50 AMP" SHALL HAVE THE FOLLOWING CONFIGURATION: AN UNMETERED, POST MOUNTED CABINET WITH A 5-20R2GFI 20 AMP DUPLEX RECEPTACLE, A R32U 30 AMP RECEPTACLE, A 14-50R 50 AMP RECEPTACLE, A SINGLE POLE 20 AMP CIRCUIT BREAKER, A SINGLE POLE 30 AMP CIRCUIT BREAKER, AND A DOUBLE POLE 50 AMP CIRCUIT BREAKER; MIDWEST MODEL U075CP6010, MILLBANK U5200-XL-75, OR APPROVED EQUAL, SHALL BE USED FOR SINGLE CAMPSITE OUTLET POST WITH METALLIC POWER CENTER.

2. A "DOUBLE-HEAD CAMPSITE OUTLET POST-50 AMP" SHALL HAVE THE FOLLOWING CONFIGURATION: UNMETERED, POST MOUNTED CABINETS WITH RECEPTACLES AND BREAKERS AS ABOVE; MIDWEST MODEL U075CB6010, MILLBANK U5220-XL-75, OR APPROVED EQUAL, SHALL BE USED FOR DOUBLE CAMPSITE OUTLET POST WITH METALLIC POWER CENTER.

3. SEE TRENCH DETAILS, STANDARD DRAWING NO. TS-1, FOR DETAILS OF INSTALLATION OF DIRECT BURY COPPER CABLES TO CAMPSITE OUTLET POST.

4. THE CONDUCTOR SIZES AND THE PLAN ARRANGEMENT OF THE LOADS ON EACH CIRCUIT SHALL BE SELECTED TO LIMIT THE MAXIMUM CIRCUIT VOLTAGE DROP, FROM THE TRANS-FORMER TO THE FURTHEST CAMPSITE OUTLET ON THE CIRCUIT, TO 3% (3.6 VOLTS ON EACH 120 V. PHASE). ADJUST CONDUCTOR SIZE BASED ON ACTUAL ROUTING WITH NO ADDI-TIONAL COMPENSATION.

5. PROVIDE ONE EXTRA COMPLETE OUTLET POST OF EACH TYPE AND TURN OVER TO OWNER.



SCHEMATIC OF CAMPSITE 50 AMP POWER SERVICE

CAMPGROUND ELECTRICAL SYSTEM STANDARD DRAWING NO. SC-1

DETAILS OF CAMPSITE OUTLET POST

REVISION DATE 10/02/03 | SHEET 10 OF 10

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL DETAILS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 17-06-49-02
CHK'D BY:
DATE: October 2017
SHEET No:

B.20

ESTIMATED PROJECT QUANTITIES

DIVISION 1= P&I FUNDS
DIVISION 2= INFRASTRUCTURE

ITEM NO.	ITEM	UNIT	DIVISION 1	DIVISION 2	TOTAL
1	Clearing and Grubbing	LS	0.9	0.1	1
2	Remove Existing Roadway Pavement	SY	4,272	0	4,272
3	Remove Existing Paved Parking	SY	0	761	761
4	Roadway Pavement, PCC, 7"	SY	4,915	0	4,915
5	Parking Lot, PCC, 7"	SY	0	587	587
6	Sidewalk, PCC, 5"	SY	0	469	469
7	Curb and Gutter, P.C. Concrete, 2.5 Ft., 6 Inch Standard Curb	LF	747.8	0	747.8
8	Special Backfill	CY	962	203	1,165
9	Class "A" Crushed Stone	TON	201.9	0	201.9
10	Painted Pavement Markings, Waterborne/Solvent - White	STA	29.3	0	29.3
11	Painted Pavement Markings, Waterborne/Solvent - Double Yellow Centerline	STA	1.9	0	1.9
12	Excavation, Class 10, Roadway and Borrow	CY	1,717.1	0	1,717.1
13	Excavation, Class 10, Waste	CY	1,544.4	0	1,544.4
14	Erosion Control	LF	3,810	3,245	7,055
15	Culvert, Concrete Roadway Pipe, 24 IN. DIA.	LF	144	0	144
16	Revetment, Class E	TON	49	0	49
17	Intake, SW-512, 24 IN.	EACH	1	0	1
18	Intake, SW-501	EACH	1	0	1
19	Intake, SW-505	EACH	1	0	1
20	Aggregate, Cover - Sand	TON	104	44	148
21	Binder Bitumen, CRS-2P	GAL	1,377	577	1,954
22	Patches, Full-Depth Finish, By Area	SY	0	7	7
23	Patches, Full-Depth Finish, By Count, 6-Inch PCC	EACH	0	1	1
24	Crack And Joint Cleaning And Filling (PCC Pavement)	MILE	0	0.1	0.1
25	Sealer Material (PCC Pavement)	LB	0	100	100
26	Transverse Joint Repair	TON	4.4	2.2	6.6
27	Cleaning And Filling Cracks (Pavement Maintenance)	MILE	0.7	0.3	1
28	Hot Mix Asphalt For Crack Filling (Maintenance))	TON	1	0	1
29	Filler Material (Maintenance)	GAL	350	150	500
30	Speed Hump, PCC	EACH	4	0	4
31	Rural Seeding, Fertilizing and Mulching	ACRE	1.5	0.6	2.1
32	Precast Concrete Parking Wheel Stops	EACH	0	40	40
33	Furnish and Install Light Fixture	EACH	0	1	1
34	Light Pole and Base, Complete	EACH	0	1	1
35	#6. AWG Grounding Conductor Cable, Type THW or USE	LF	0	234	234
36	#4. AWG Grounding Conductor Cable, Type THW or USE	LF	0	2,688	2,688
37	#2. AWG Grounding Conductor Cable, Type THW or USE	LF	0	2,187	2,187
38	#1/0. AWG Single Conductor Cable, Type USE	LF	0	234	234
39	#2/0. AWG Single Conductor Cable, Type USE	LF	0	696	696
40	#3/0. AWG Single Conductor Cable, Type USE	LF	0	1,992	1,992
41	#4/0. AWG Single Conductor Cable, Type USE	LF	0	180	180
42	250. AWG Single Conductor Cable, Type USE	LF	0	1,437	1,437
43	300. AWG Single Conductor Cable, Type USE	LF	0	570	570
44	Pad-Mounted 400 AMP Distribution Panel & Connections, Complete	LS	0	1	1
45	Single Campsite Outlet Post (Metallic Power Center) 50 AMP	EACH	0	18	18
46	Removal of Existing Roadway Pipe	LF	108	0	108
47	Removal of Light Pole	EACH	0	1	1
48	Traffic Control	LS	1	0	1
49	Mobilization	LS	1	0	1
	ALTERNATE 1				6
50	Single Campsite Outlet Post (Metallic Power Center) 50 AMP	EACH	0	6	60
51	Bore, Single Circuit Secondary	LF	0	60	1743
52	#2. AWG Grounding Conductor Cable, Type THW or USE	LF	0	1743	1743
53	#4/0. AWG Single Conductor Cable, Type USE	LF	0	1743	
	ALTERNATE 2				
54	Single Campsite Outlet Post (Metallic Power Center) 30 AMP	EACH	0	6	6
55	Bore, Single Circuit Secondary	LF	0	30	30
56	#2. AWG Grounding Conductor Cable, Type THW or USE	LF	0	3297	3297
57	#4/0. AWG Single Conductor Cable, Type USE	LF	0	510	510
58	250. AWG Single Conductor Cable, Type USE	LF	0	2787	2787

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

QUANTITIES & NOTES

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 17-06-49-02
CHK'D BY:
DATE: October 2017
SHEET No: C.01

ESTIMATED PROJECT QUANTITIES

DIVISION 1= P&I FUNDS
DIVISION 2= INFRASTRUCTURE

ITEM NO.	ITEM	UNIT	DIVISION 1	DIVISION 2	TOTAL
	ALTERNATE 3				
59	Upgrade Pad-Mounted 400 AMP To 600 AMP Distribution Panel & Connections, Complete	LS	0	1	1
60	Single Campsite Outlet Post (Metallic Power Center) 30 AMP	EACH	0	6	6
61	Single Campsite Outlet Post (Metallic Power Center) 50 AMP	EACH	0	6	6
62	Bore, Single Circuit Secondary	LF	0	60	60
63	#2. AWG Grounding Conductor Cable, Type THW or USE	LF	0	5040	5040
64	#4/0. AWG Single Conductor Cable, Type USE	LF	0	2253	2253
65	250. AWG Single Conductor Cable, Type USE	LF	0	2787	2787

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
1	CLEARING AND GRUBBING A. Off site disposal is the responsibility of the contractor. No burning or burying allowed in the park.
2	REMOVE EXISTING ROADWAY PAVEMENT A. The contractor shall remove the existing pavement and base as indicated in the plan sheets. B. All saw cuts shall be incidental. C. Off site disposal is the responsibility of the contractor. D. No payment for overhaul will be allowed.
3	REMOVE EXISTING PAVED PARKING A. The contractor shall remove the existing pavement and base as indicated in the plan sheets. B. Removal of existing parking wheel stops shall be incidental. C. All saw cuts shall be incidental. D. Off site disposal is the responsibility of the contractor. E. No payment for overhaul will be allowed.
4	ROADWAY PAVEMENT, PCC, 7" A. Non-reinforced concrete pavement with IDOT C4 mix B. Joints shall be sawcut at 15' maximum spacing.
5	PARKING LOT, PCC, 7" A. Non-reinforced concrete pavement with IDOT C4 mix. B. Joints shall be sawcut at 15' maximum spacing.
6	SIDEWALK, PCC, 5" A. Reinforced concrete pavement with IDOT C4 mix. B. Contraction joints shall be sawcut at 5' maximum spacing.
8	SPECIAL BACKFILL A. Existing ACC from pavement removal shall be used on the project as a special backfill. B. The contractor may crush ACC from the pavement removal and use as recycled material provided it meets the gradation requirements.
12	EXCAVATION, CLASS 10, ROADWAY AND BORROW A. Remove existing topsoil to an average depth of 6 inch. B. Material to be used as fill where needed. C. Sod to be stripped in areas where fill is placed. D. Place top soil in those areas outside of the new construction. Seed, fertilizer and mulch on all disturbed areas as directed by the DNR Inspector. E. No shrink factor is applied. F. No payment for overhaul will be allowed.
13	Excavation, Class 10, Waste A. A suitable waste site shall be obtained by the contractor. No payment for overhaul will be allowed. B. No shrink factor is applied.
14	EROSION CONTROL A. Filter sock shall be installed as detailed to prevent sediment from exiting the project site and shall remain in place and be maintained during construction. DNR Park staff will remove once the site is stabilized.
20	AGGREGATE, COVER - SAND
21	BINDER BITUMEN, CRS-2P A. Follow IA DOT Specification 2307. Apply sand at the rate of 30LB/SY. Apply bitumen at the rate of 0.2 GAL/SY.
22	PATCHES, FULL-DEPTH FINISH, BY AREA
23	PATCHES, FULL-DEPTH FINISH, BY COUNT, 6-INCH PCC A. Follow IA DOT Specification 2307. Use C4 mix.

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
24	CRACK AND JOINT CLEANING AND FILLING (PCC PAVEMENT)
25	SEALER MATERIAL (PCC PAVEMENT) A. Follow IA DOT Specification 2542.
26	TRANSVERSE JOINT REPAIR A. Follow IA DOT Specification 2543. Joints to be 1.5-feet wide X 6-inches deep, unless directed otherwise by the DNR Field Engineer.
27	CLEANING AND FILLING CRACKS (PAVEMENT MAINTENANCE)
28	HOT MIX ASPHALT FOR CRACK FILLING (MAINTENANCE))
29	FILLER MATERIAL (MAINTENANCE) A. Follow IA DOT Specification 2544.
30	SPEED HUMP, PCC A. Speed humps shall poured monolithically with the PCC pavement. B. Speed humps shall be constructed at the stations shown in the plans. C. Two signs shall be required for each speed hump and shall be placed 20'before the center of the speed hump in the direction of the oncoming traffic. D. Paint markings and signs shall be incidental to the bid item. E. Method of Measurement and Basis of Payment shall be for each speed hump constructed.
31	RURAL SEEDING, FERTILIZING AND MULCHING A. All rural seeding shall be completed using DOT Urban or Class "C" seed mixture.
32	PRECAST CONCRETE PARKING WHEEL STOPS A. Wheel stops shall be tied to the paved surface via metal pins.
33	FURNISH AND INSTALL LIGHT FIXTURE A. Light Fixtures are to be Lithonia Lighting model DSX1LED-30C-700-50K-T4M-120-SPA-PIRH-_-DDBXB or approved equal.
34	LIGHT POLE AND BASE, COMPLETE A. Light poles are to be Lithonia Lighting model SSS-20-4G_-_-DDB or approved equal.
35	#6. AWG Grounding Conductor Cable, Type THW or USE
36	#4. AWG Grounding Conductor Cable, Type THW or USE
37	#2. AWG Grounding Conductor Cable, Type THW or USE
38	#1/0. AWG Single Conductor Cable, Type USE
39	#2/0. AWG Single Conductor Cable, Type USE
40	#3/0. AWG Single Conductor Cable, Type USE
41	#4/0. AWG Single Conductor Cable, Type USE
42	250. AWG Single Conductor Cable, Type USE
43	300. AWG Single Conductor Cable, Type USE A. Detectable warning tape shall be incidental. B. Camp pad repair and wooden timber replacement shall be incidental. Contractor has the option to bore the line under the camp pads.
46	REMOVAL OF EXISTING PIPE A. The contractor shall remove the existing pipes as indicated in the plan sheets. B. Off site disposal is the responsibility of the contractor. C. No payment for overhaul will be allowed.
	ALTERNATE 1
52	#2. AWG Grounding Conductor Cable, Type THW or USE
53	#4/0. AWG Single Conductor Cable, Type USE A. Detectable warning tape shall be incidental. B. Camp pad repair and wooden timber replacement shall be incidental. Contractor has the option to bore the line under the camp pads.

CONSULTANT:

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

QUANTITIES & NOTES

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 17-06-49-02
CHK'D BY:
DATE: October 2017
SHEET No: C.02

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
	ALTERNATE 2
56	#2. AWG Grounding Conductor Cable, Type THW or USE
57	4/0. AWG Single Conductor Cable, Type USE
58	250. AWG Single Conductor Cable, Type USE
	A. Detectable warning tape shall be incidental.
	B. Camp pad repair and wooden timber replacement shall be incidental. Contractor has the option to bore the line under the camp pads.
	ALTERNATE 3
63	#2. AWG Grounding Conductor Cable, Type THW or USE
64	#4/0. AWG Single Conductor Cable, Type USE
65	250. AWG Single Conductor Cable, Type USE
	A. Detectable warning tape shall be incidental.
	B. Camp pad repair and wooden timber replacement shall be incidental. Contractor has the option to bore the line under the camp pads.

NOTE:

The wooded habitat impacted by this project may provide summer habitat for Indiana bats, and summer and swarming habitat for Northern long-eared bats. All tree clearing will occur between October 1st and March 31st so as to occur when Indiana bats and Northern long-eared bats are not occupying their summer habitat. These dates are in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as ameded; 16 U.S.C. 1531 et seq).

GENERAL NOTES

A. The contractor shall notify the following two weeks prior to demolition and/ or construction:
   a. District Inspector: Mike Dufoe (515) 985-9196

B. 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.

C. 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.

D. The contractor shall be responsible for any damage to existing facilities resulting from their negligence, or that of a subcontractor, and said repairs shall be approved by the owner.

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

F. 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.

G. All holes resulting from operations of the contractor, including removal of guardrail posts, fence posts, utility poles or piers, shall be filled and consolidated to finish grade as directed by the Engineer to prevent future settlement. The voids shall be filled as soon as practical - preferably the day created and not later than the following day. Any portion of the right of way or project limits (including borrow areas and operation sites) disturbed by any such operations shall be restored to an applicable condition. This operation shall be considered incidental to other bid items in the project.

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

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

J. Topsoil shall be spread to a minimum thickness of 6 inches on all disturbed unpaved areas.

K. The contractor shall seed, fertilize and mulch all disturbed areas. Use Class "C" seed mixture.

L. Backfill to the top of all rock or paved surfaces.

M. 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.

N. 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.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

GENERAL NOTES

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

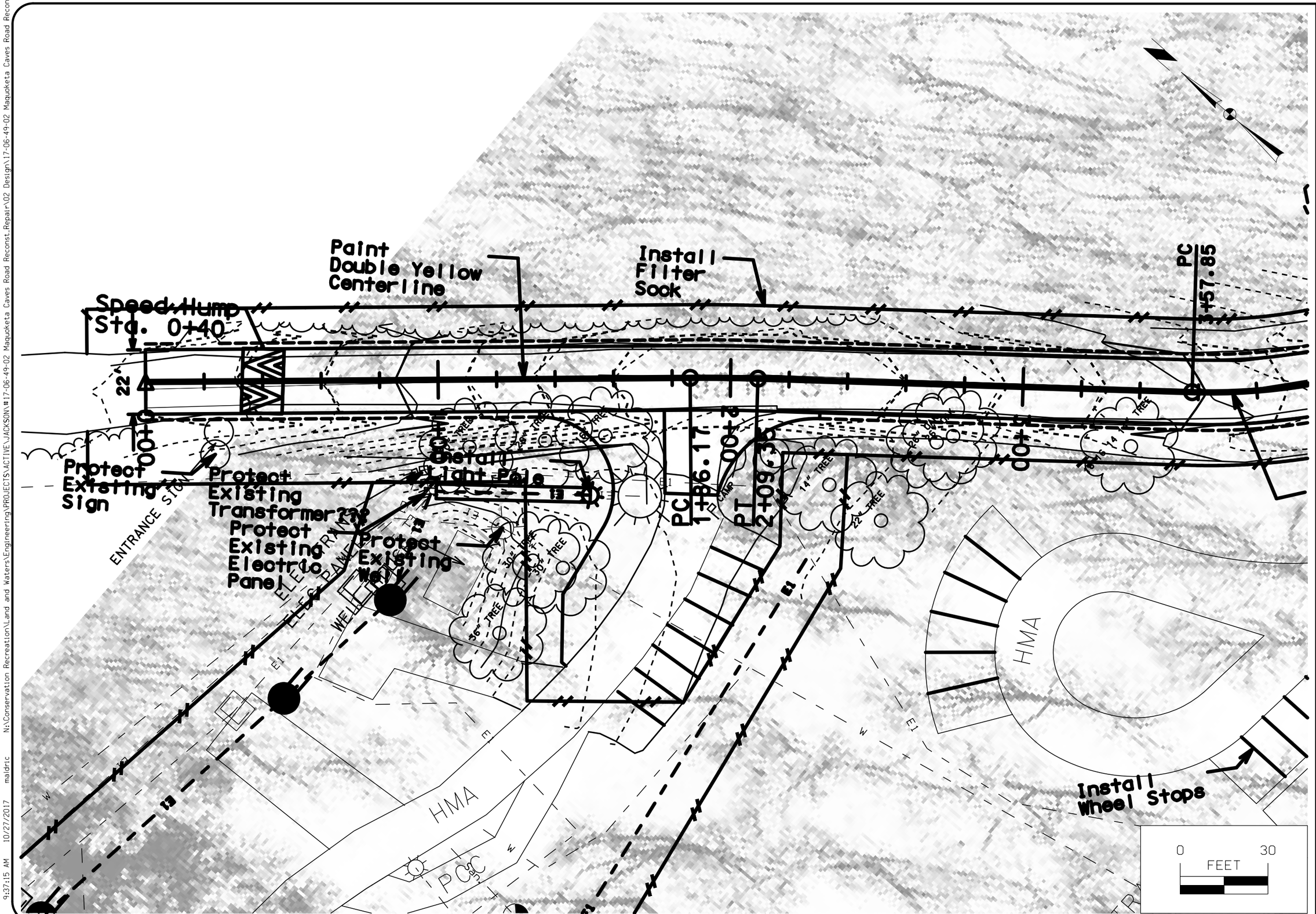
PROJECT NUMBER: 17-06-49-02

CHK'D BY:

DATE: October 2017

SHEET No:

C.03



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

ROAD PLAN SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

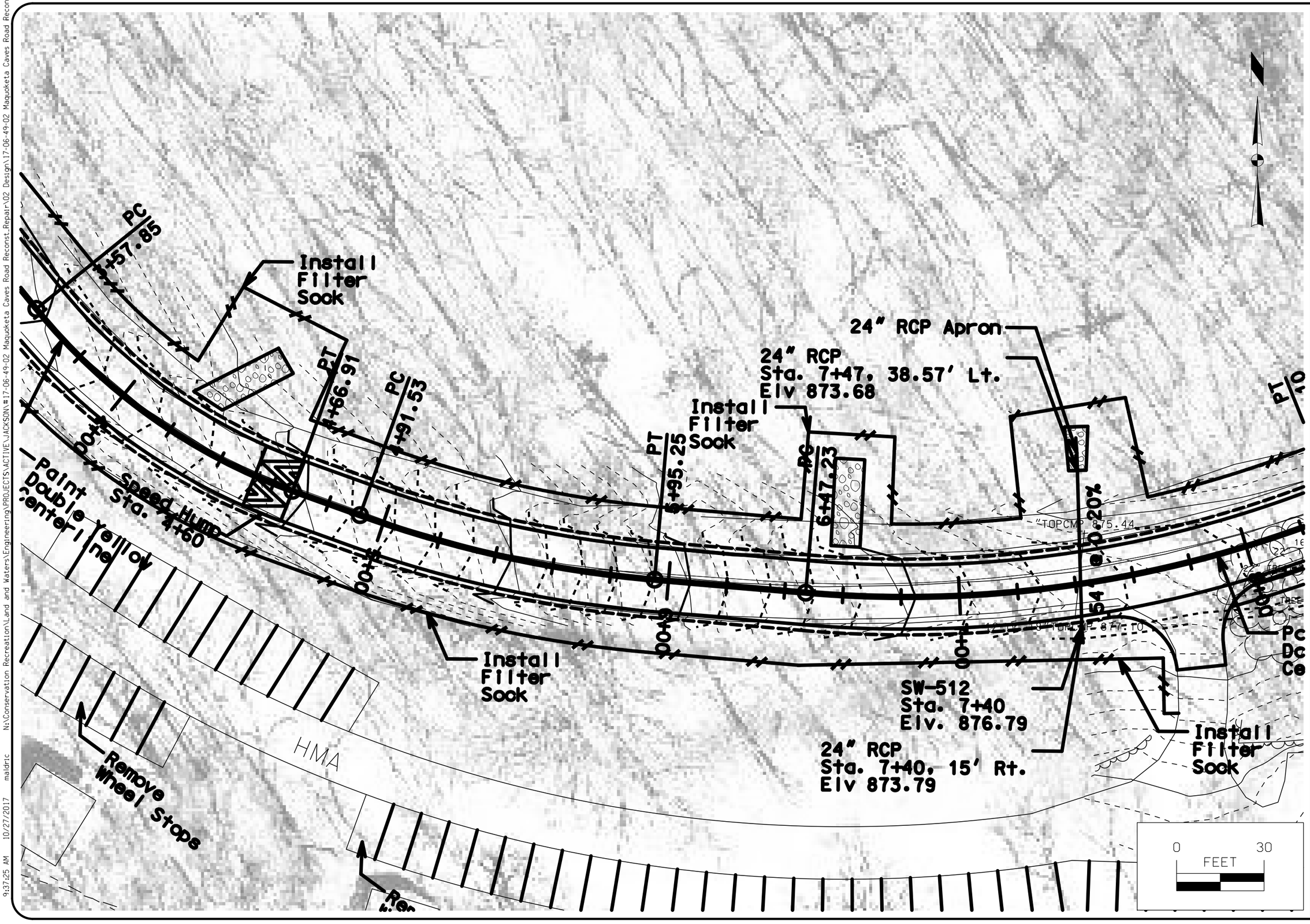
PROJECT NUMBER: 17-06-49-02

CHK'D BY:

DATE: October 2017

D.01

9:37:15 AM 10/27/2017 maldric N:\Conservation Recreation\Land and Waters\Engineering\PROJECTS\ACTIVE\JACKSON\#17-06-49-02 Maquoketa Caves Road Reconst.Repair\02 Design\17-06-49-02 Maquoketa Caves Road Reconst.Re



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

DNR

ROAD PLAN SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY	DATE	REVISION

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PROJECT NUMBER: 17-06-49-02

CHK'D BY:

DATE: October 2017

D.02

Install Filter Sock

Install Wheel Stops

24" RCP Sta. 11+40.56, 84.44' Lt. Elv 844.66

Install Filter Sock

24" RCP Apron

24" CMP

PT 10+34.10

PC 9+87.18

Speed Hump Sta. 8+80

Paint Double Yellow Centerline

PT 9+93.56

SW-505 Sta. 10+89.65, 13' Rt. FG 857.16

TOP 24" RCP Sta. 10+91.48, 11' Rt. Elv 848.44

POT 9+98.60

Remove Wheel Stops

Install Filter Sock

HMA

Remove Wheel Stops

W

San.

TOP • 891.25

0 30 FEET

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

ROAD PLAN SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

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CHK'D BY:

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D.03

Install Filter Sock

Protect Stairs

Protect Pipe

Paint Double Yellow Centerline

24" RCP
Sta. 12+99.19, 12.59' Lt.
Elv 836.00

Protect Intake

Paint Parking Lines

Protect Existing Pavement

Protect Existing Columns

Protect Existing Pavement

Paint Parking Lines

Install Wheel Stops

24" RCP
Sta. 12+59.02, 12.64' Lt.
Elv 836.65

SW-501
Sta. 12+57.47, 13' Rt.
FG 839.95

Install Filter Sock

Paint Double Yellow Centerline

Protect Existing Columns

0 30
FEET

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

ROAD PLAN SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

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DATE: October 2017

D.04

HMA

Paint Parking Lines

Protect Existing Columns

PT 16+29.13

PC 16+53.34

PT 16+95.13

Protect Existing Columns

18+00

Paint Double Yellow Centerline

Protect Existing Columns

00+00

Speed Hump 16+20

HMA

0 30

FEET

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

DNR

ROAD PLAN SHEET

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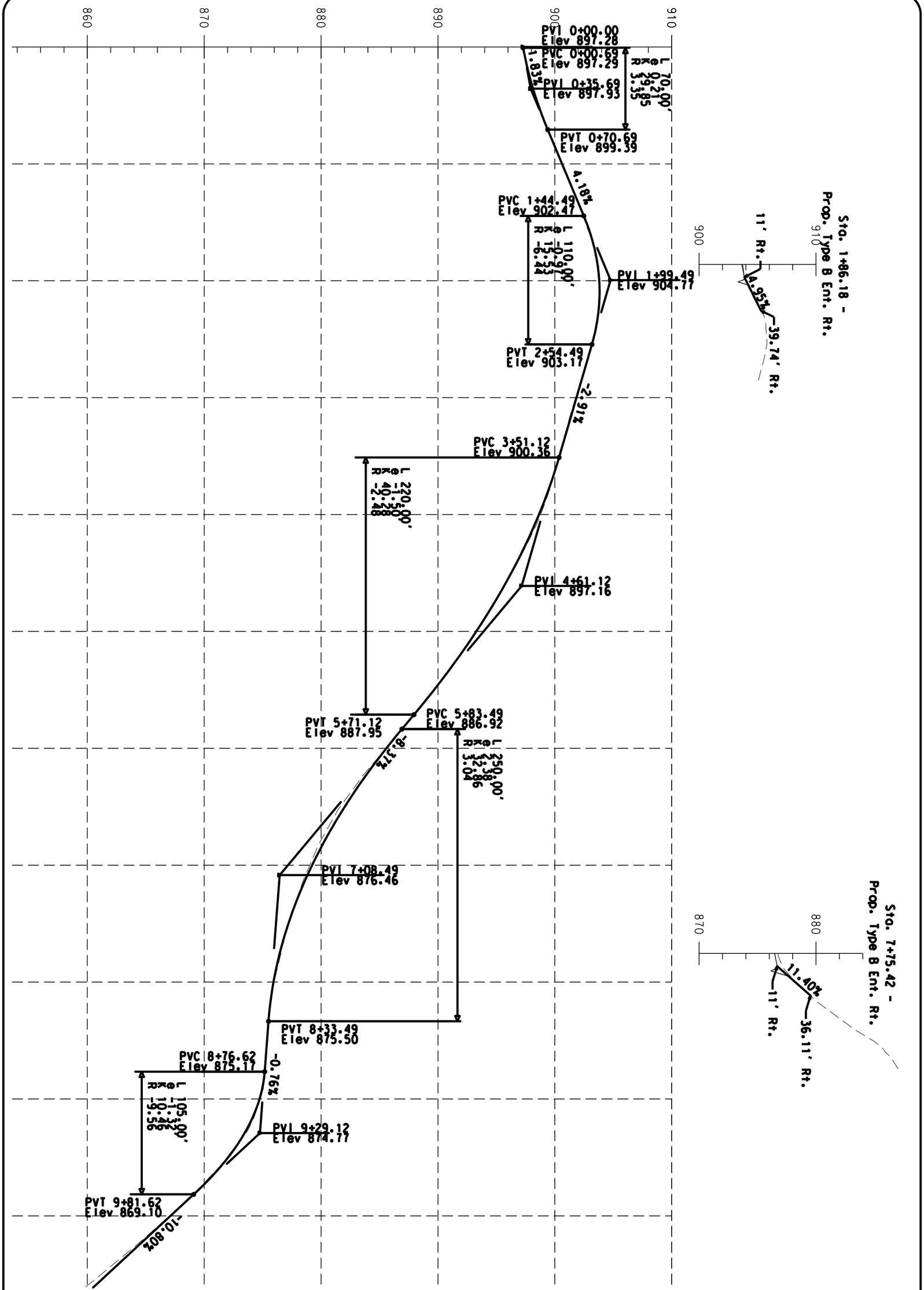
D.05



D.06

CHKD BY:
DRAWN BY:
DATE: October 2017
PROJECT NUMBER: 17-06-49-02
NO. DATE REVISION

ROAD PROFILE SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

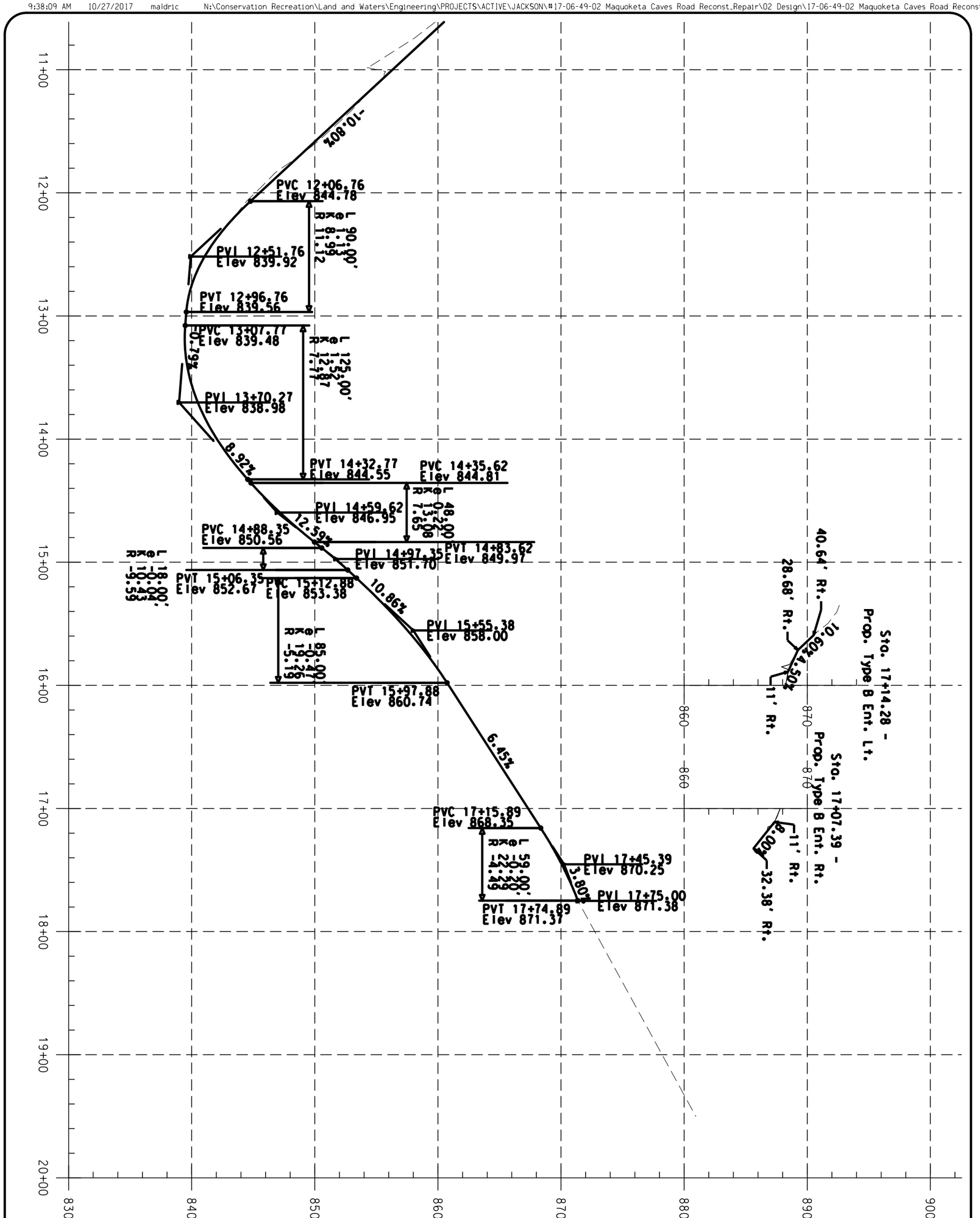
MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

IOWA DEPARTMENT OF NATURAL RESOURCES

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

CONSULTANT:



D.07

CHKD BY:
DRAWN BY:
DATE: October 2017
PROJECT NUMBER: 17-06-49-02
NO. DATE REVISION

ROAD PROFILE SHEET

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MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

IOWA DEPARTMENT OF NATURAL RESOURCES

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

CONSULTANT:

HMA Parking Lot – 250 sy

HMA

HMA

HMA Road – 0.27 miles, 20' Wide Including Loop, 3168 sy

ELEC TRANS

ELEC TRANS

PCC – 0.02 miles, 14' Wide 5'x12' PCC Patch

HMA

HMA Parking Lot – 175 sy

ELEC TRANS

ELEC TRANS

HMA

HMA Patch 144 sy (0.012 mi)

HMA Patch 156 sy (0.013 mi)

HMA

HMA

0 100 FEET

N

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

MAINTENANCE PLANS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

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E.01

HMA Road –
0.15 miles, 20' Wide
Including Loop, 1789 sy

HMA Parking Lot –
167 sy (0.014 miles)

HMA Parking Lot –
256 sy (0.022 miles)

HMA Parking Lot –
189 sy (0.016 miles)

HMA Parking Lot –
156 sy (0.013 miles)

HMA Parking Lot –
911 sy (0.078 miles)

HMA Parking Lot –
144 sy (0.012 miles)

HMA

TRANS PANEL

TOPCMP 875.44

12" on 18" TOPCMP 877.10

14" TREE

22" TREE

26" OAK

25" OAK

15 14 14" TREE

8" TREE

10" CHERRY

16" TREE

20" TREE

South Fork

San.

W

E1

0 50
FEET

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

MAINTENANCE SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

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E.02

HMA Parking Lot –
220 sy (0.031 miles)

HMA Road –
0.061 miles, 12' Wide
432 sy

HMA

HMA

ROCK

HMA

0 30
FEET

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

MAINTENANCE SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

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JACKSON COUNTY, IOWA

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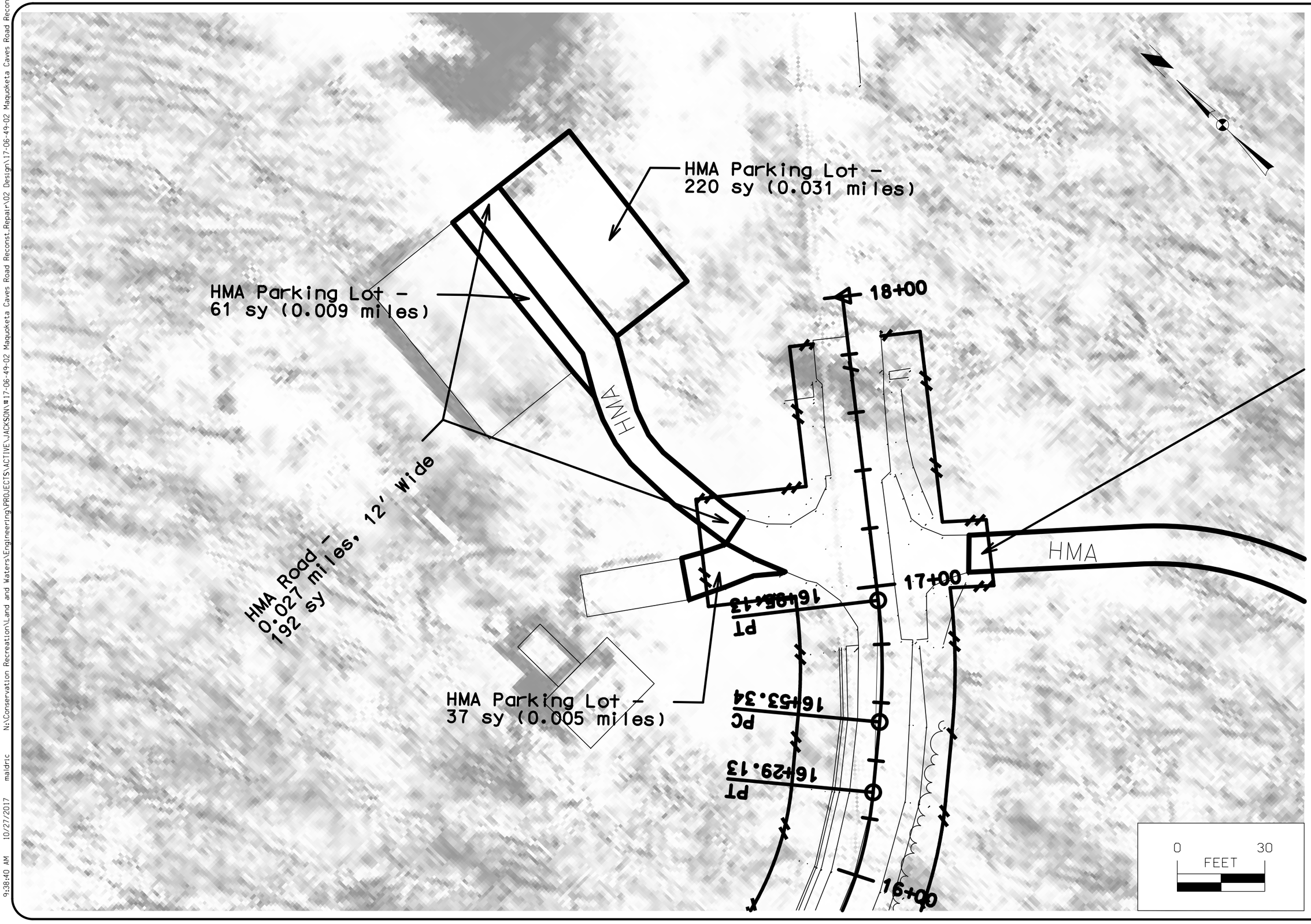
E.04



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

DNR

MAINTENANCE SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

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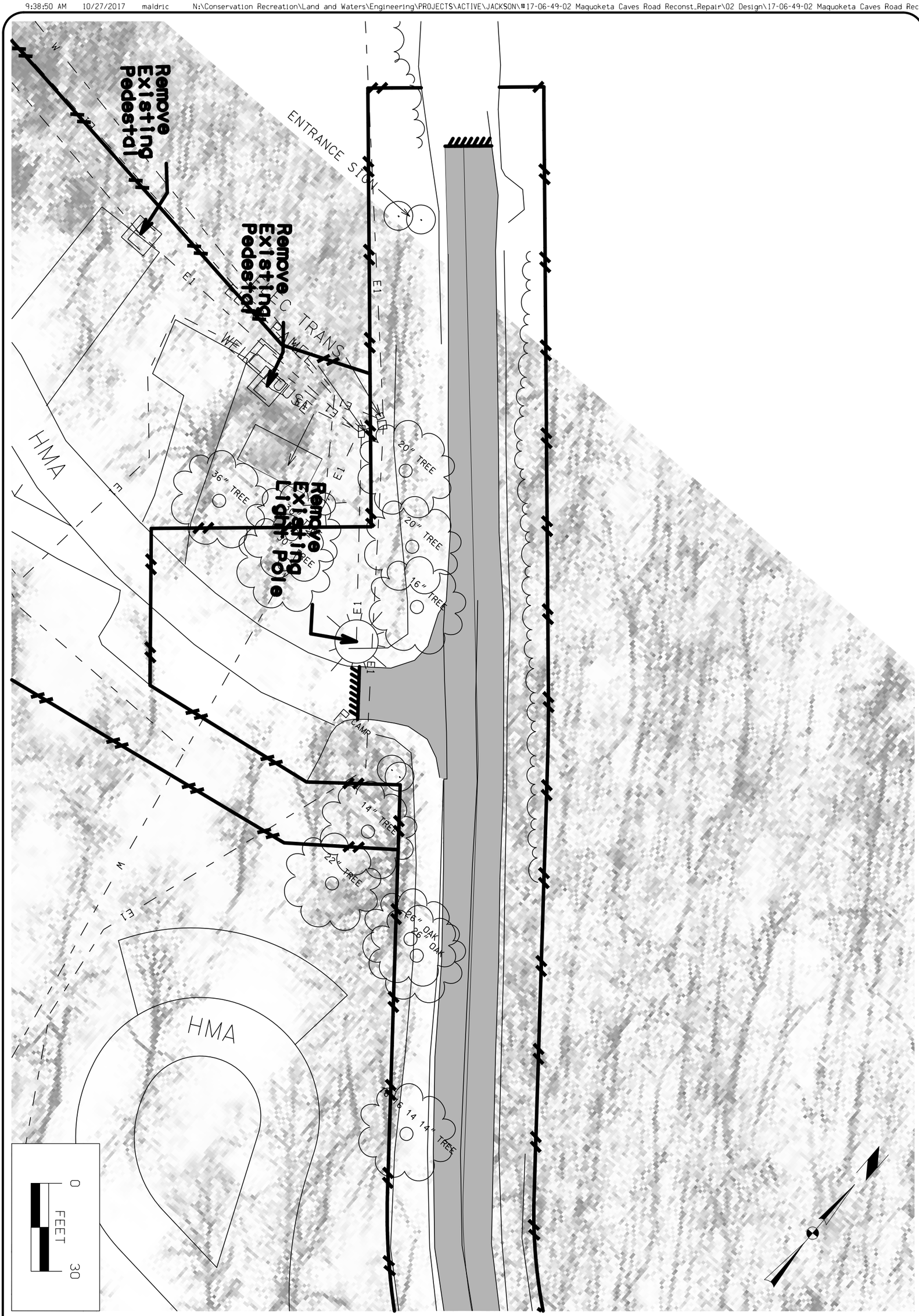
E.05



DEMOLITION SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

F.01

CHKD BY:

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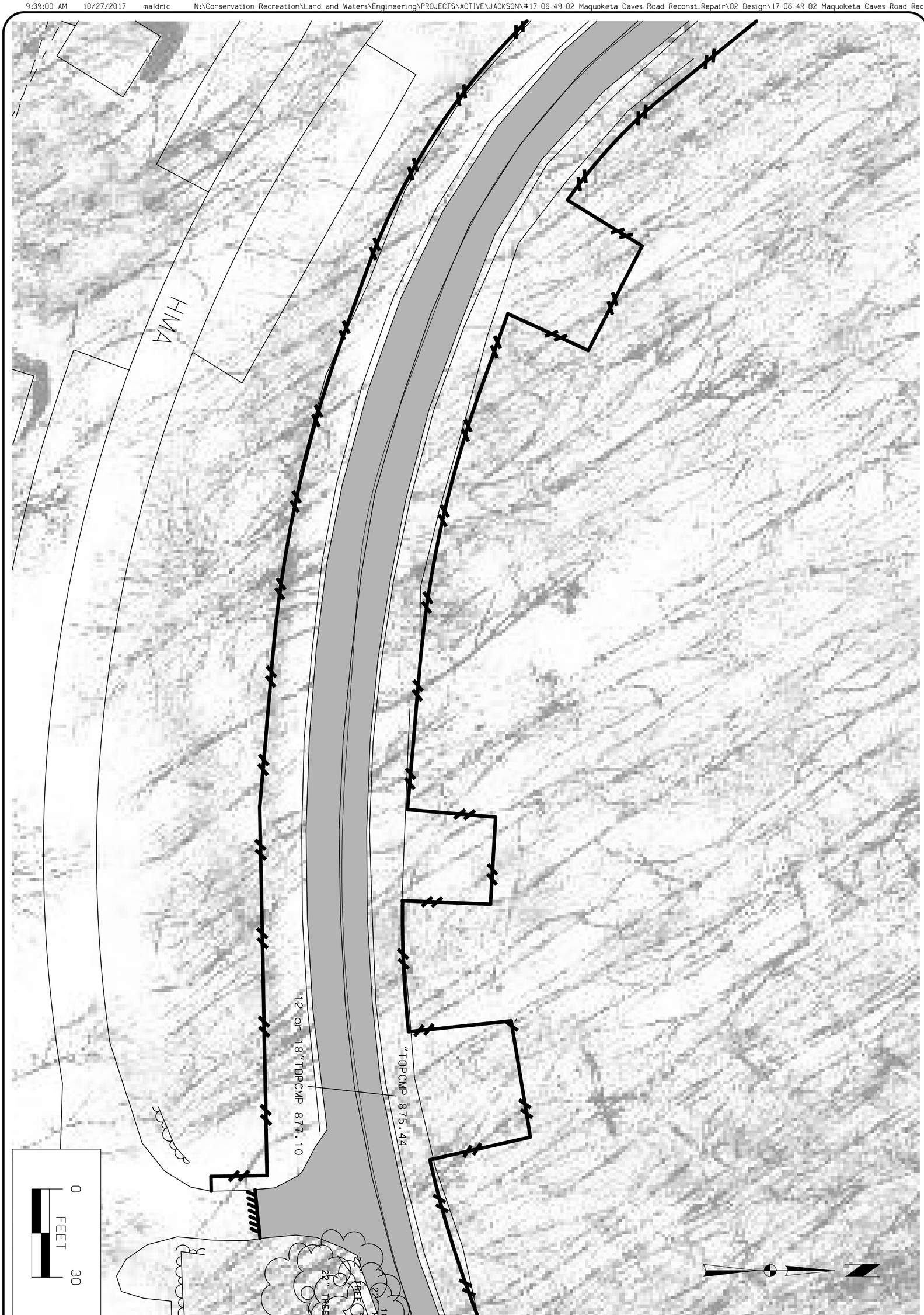
IOWA DEPARTMENT OF NATURAL RESOURCES

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

CONSULTANT:



DEMOLITION SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

F.02

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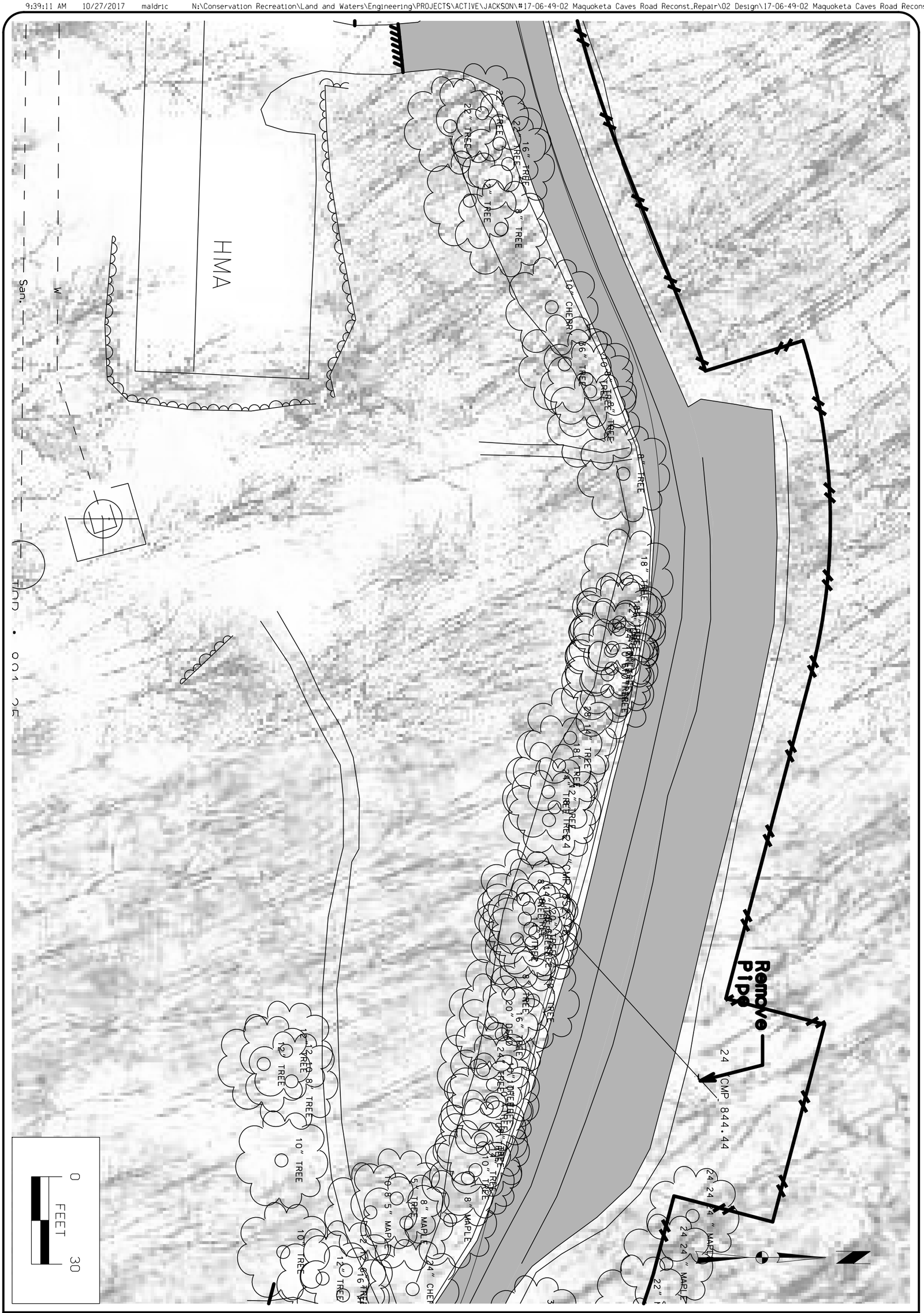
502 E. 9TH ST., DES MOINES, IA 50319-0034

CONSULTANT:



DEMOLITION SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

IOWA DEPARTMENT OF NATURAL RESOURCES

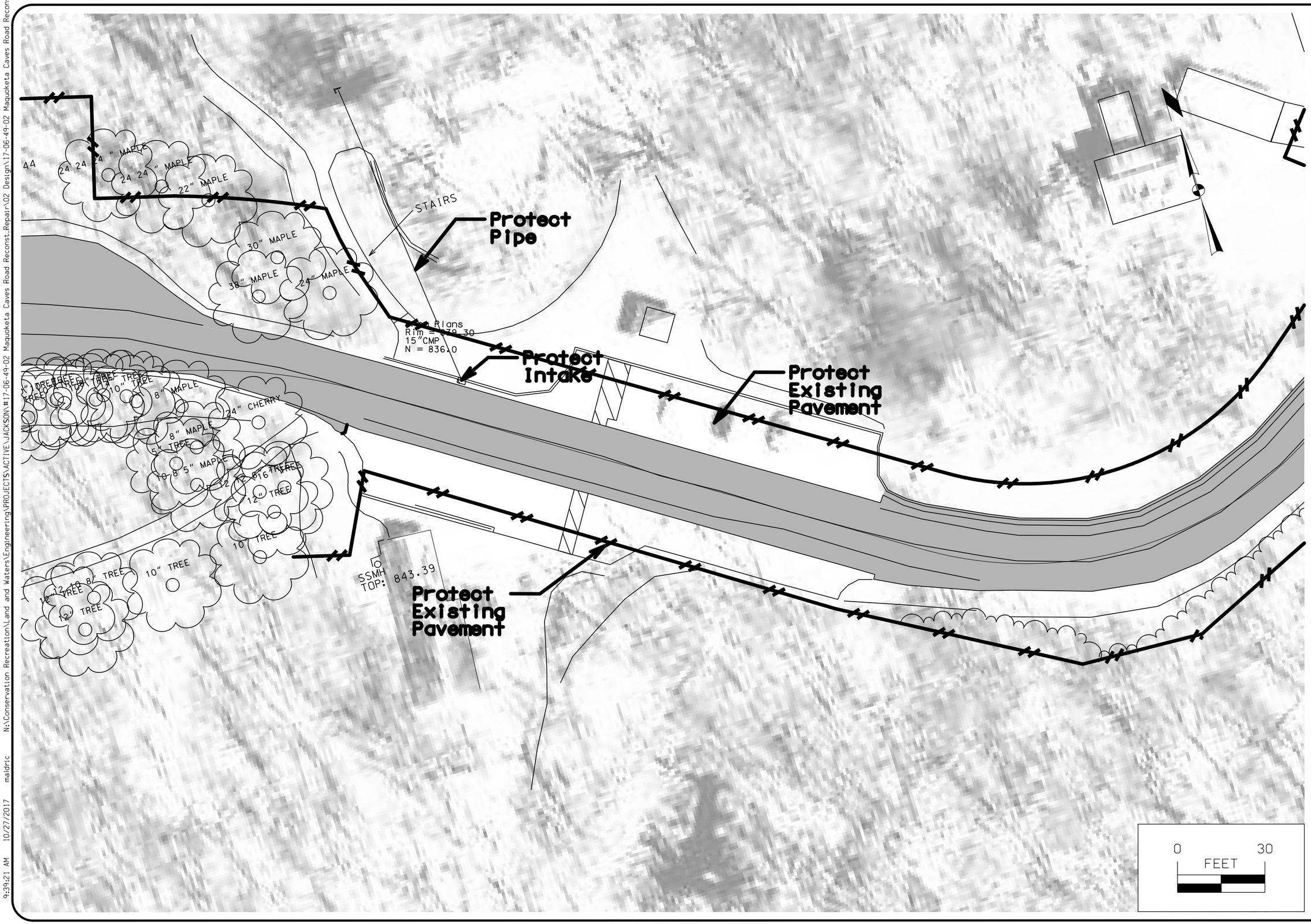
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

CONSULTANT:

F.03

DRAWN BY:
CHKD BY:
DATE: October 2017
PROJECT NUMBER: 17-06-49-02

NO. | DATE | REVISION



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILDING
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DNR

DEMOLITION SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY DATE	REVISION

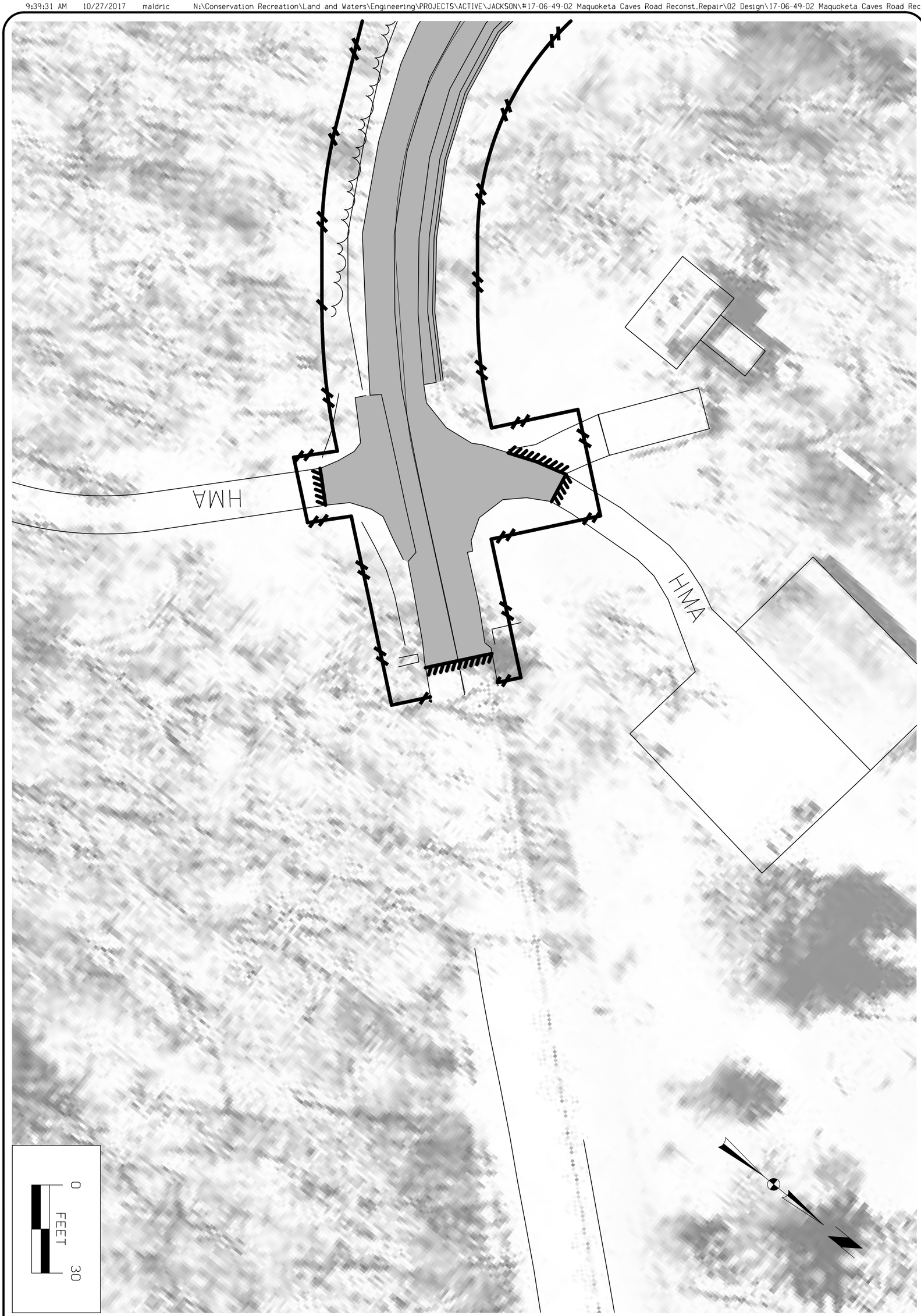
DRAWN BY:

PROJECT NUMBER: 17-06-49-02

CHK'D BY:

DATE: October 2017

F.04



F.05

DRAWN BY:
CHK'D BY:
DATE: October 2017
PROJECT NUMBER: 17-06-49-02

NO.	DATE	REVISION

DEMOLITION SHEET

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

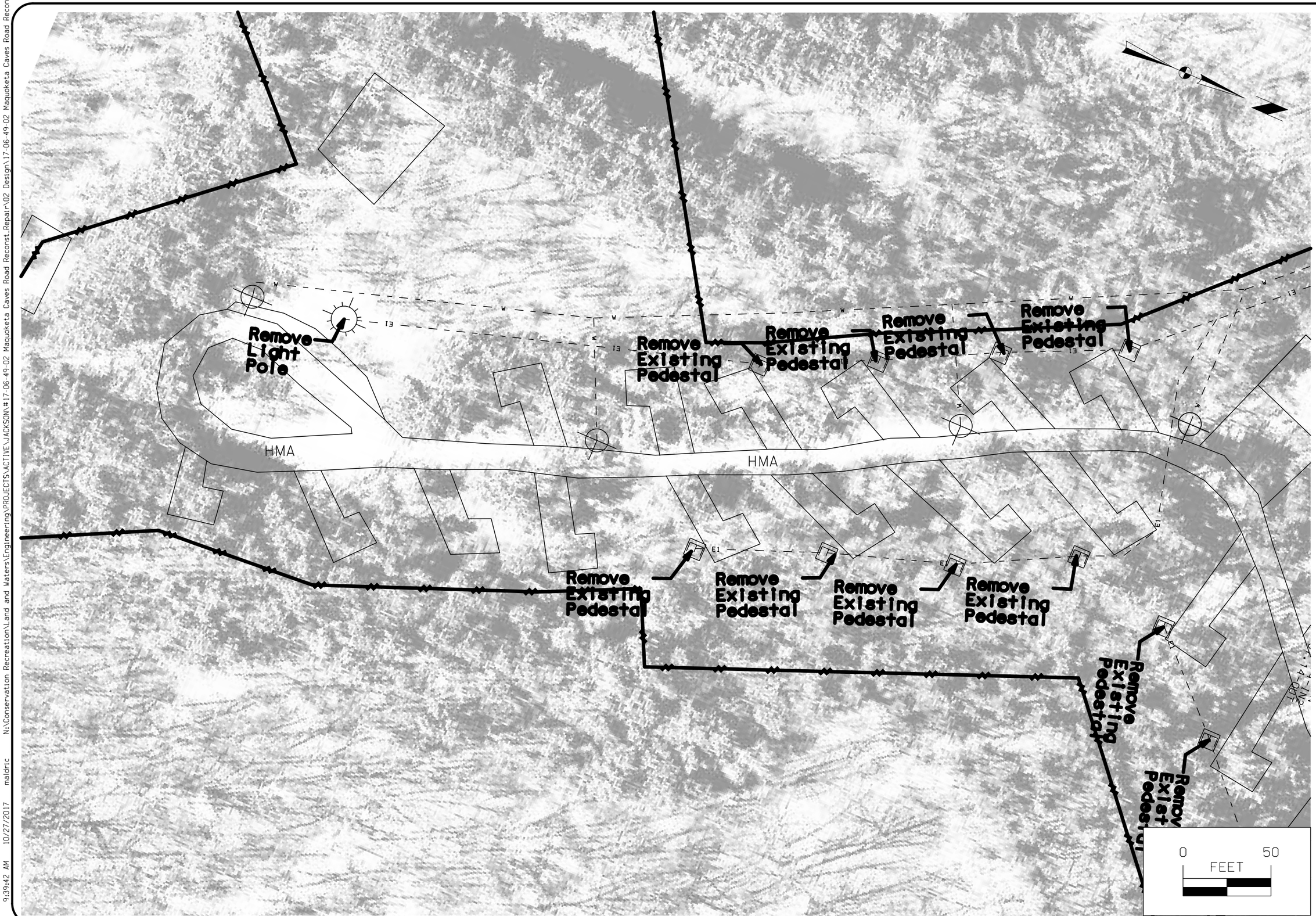
MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

IOWA DEPARTMENT OF NATURAL RESOURCES

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

CONSULTANT:



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

ELECTRICAL PLANS

ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR:

MAQUOKETA CAVES STATE PARK

JACKSON COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

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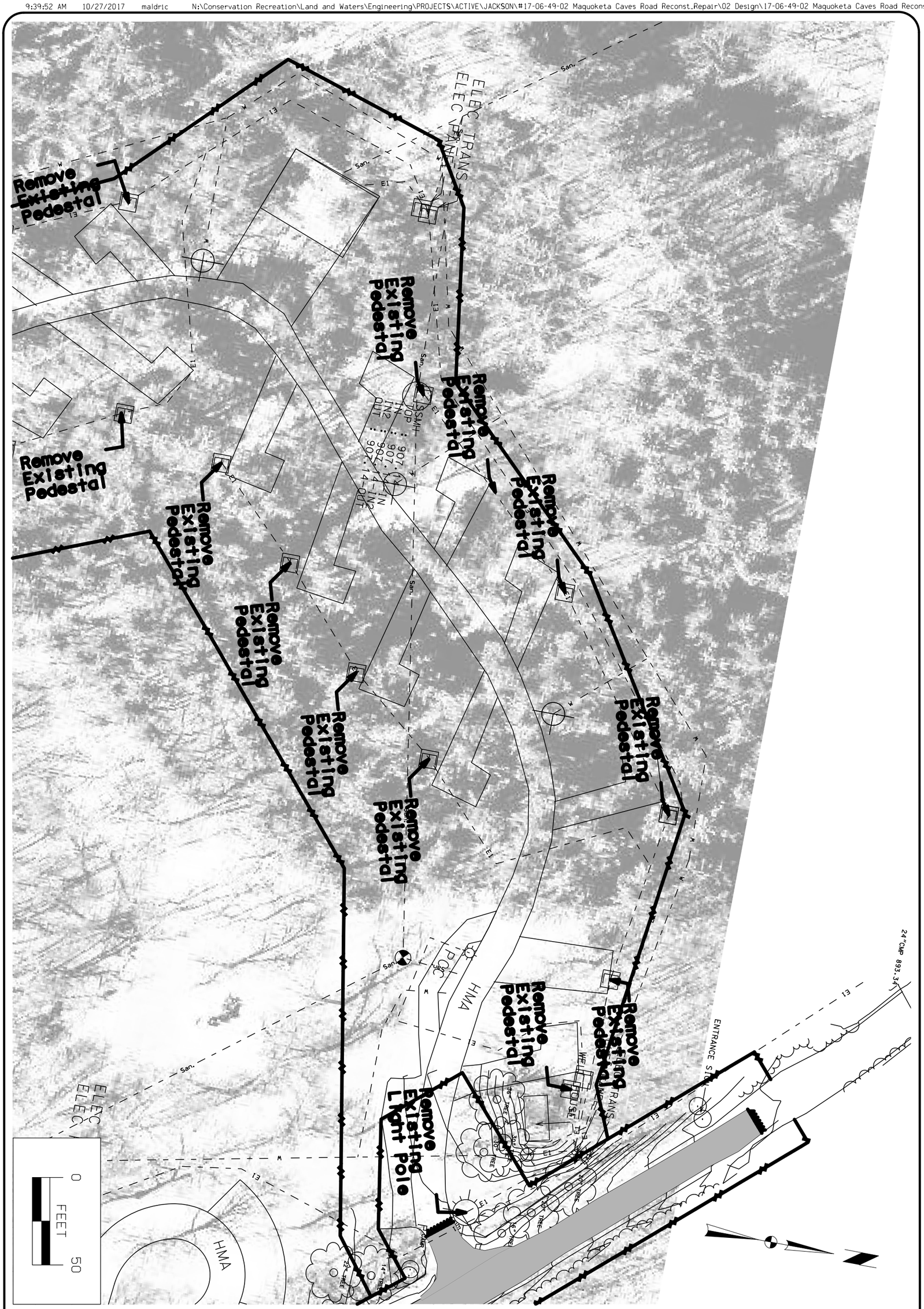
CHK'D BY:

DATE: October 2017

F.06

9:39:42 AM 10/27/2017 maldric N:\Conservation Recreation\Land and Waters\Engineering\PROJECTS\ACTIVE\JACKSON\#17-06-49-02 Maquoketa Caves Road Reconst_Repair\02 Design\17-06-49-02 Maquoketa Caves Road Reconst_Re



F.07	ELECTRICAL PLAN ROADWAY RECONSTRUCTION, MAINTENANCE & CAMPGROUND ELECTRICAL FOR: MAQUOKETA CAVES STATE PARK JACKSON COUNTY, IOWA	DNR	IOWA DEPARTMENT OF NATURAL RESOURCES ENGINEERING SERVICES - WALLACE BUILING 502 E. 9TH ST., DES MOINES, IA 50319-0034	CONSULTANT:

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