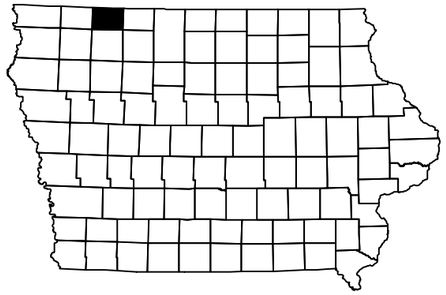
IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS FOR MINI WAKAN STATE PARK ROADWAY PROJECT DICKINSON COUNTY, IOWA

DNR PROJECT #12-01-30-15
IDOT PROJECT # SP-633-0(8)--7C-30

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



LICENSED PROFESSIONAL ENGINEER
BRETT A. JOHNSON
13653
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.

BRETT A. JOHNSON, IOWA REG. NO. 13653 DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2013

PAGES OR SHEETS COVERED BY THIS SEAL:
SHEETS 1-14

DIRECTORY

PROJECT MANAGER		CONSTRUCTION INSPECTOR	
COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES	COMPANY	IOWA DEPARTMENT OF NATURAL RESOURCES
ADDRESS	502 EAST 9TH STREET	ADDRESS	613 APPOLO RD
CITY,STATE,ZIP	DES MOINES, IA 50319	CITY,STATE,ZIP	HINTON, IA 51024
CONTACT	BRETT JOHNSON	CONTACT	JEFF FELTS
TELEPHONE	515-250-3711	TELEPHONE	515-250-3712
FAX	515-281-8685	FAX	712-947-4470
EMAIL	brett.johnson@dnr.iowa.gov	EMAIL	jeff.felts@dnr.iowa.gov

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF REMOVAL OF AN EXISTING ASPHALT ROADWAY AND THE CONSTRUCTION OF A NEW PORTLAND CEMENT CONCRETE ROADWAY IN ITS PLACE LOCATED AT MINI WAKAN STATE PARK IN DICKINSON COUNTY, IOWA.

AUTHORIZATION TO BID

AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

ENGINEERING BUREAU CHIEF DATE

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CONSULTANT:

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

DNR

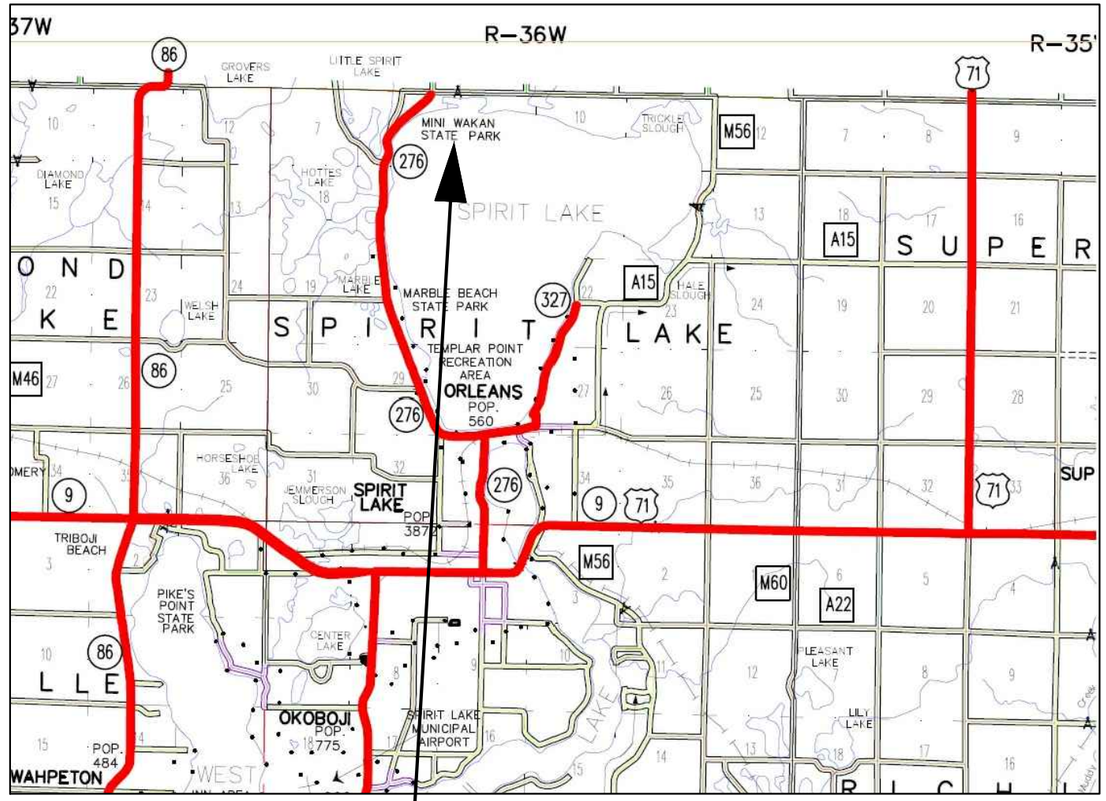
COVER SHEET

ROADWAY CONSTRUCTION PROJECT FOR:
MINI WAKAN STATE PARK
DICKINSON COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-01-30-15
CHK'D BY:
DATE: 10/30/2013

SHEET No: 1



PROJECT LOCATION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

VICINITY MAPS

ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-01-30-15

CHK'D BY:

DATE: 10/30/2013

SHEET No: 2

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM	UNIT	P&I	NON	TOTAL
1	CLEARING AND GRUBBING	LS	1		1
2	HMA/PAVEMENT REMOVAL	SY	2,896		2,896
3	REMOVAL OF EXISTING SIDEWALKS	SY		14	14
4	REMOVAL OF EXISTING GRAVEL PARKING AREAS	SY		445	445
5	FULL DEPTH SAW CUT	LF	139		139
6	GRADING	CY	522	161	683
7	SILT FENCE	LF	260		260
8	SPECIAL BACKFILL	TONS	810	97	907
9	GRANULAR SHOULDER	TONS	191		191
10	6-INCH NON-REINFORCED PCC	SY	2,945	383	3,328
11	5-INCH NON-REINFORCED PCC SIDEWALK	SY		99	99
12	SIDEWALK DETECTABLE WARNINGS	EA		4	4
13	15-INCH ARCH CMP	LF	40		40
14	15-INCH ARCH CMP FES	EA	2		2
15	PRECAST CONCRETE PARKING WHEEL STOPS	EA		5	5
16	PAINT STRIPING	LS		1	1
17	TRAFFIC CONTROL	LS	1		1
18	SEEDING, FERTILIZING AND MULCHING	LS	1		1
19	CONSTRUCTION SURVEY STAKING	LS	1		1
20	MOBILIZATION	LS	1		1

GENERAL NOTES

1. TWO WEEKS PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL NOTIFY:
   A. IOWA DNR PROJECT MANAGER: BRETT JOHNSON 515-250-3711
   B. DISTRICT INSPECTOR: JEFF FELTS 515-250-3712

2. THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY THE ABOVE MENTIONED CONTACTS OF ANY DISCREPANCIES.

3. THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING FACILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION WITHOUT UNCOVERING AND MEASURING. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL PUBLIC AND/OR PRIVATE UTILITIES SERVING THE AREA TO DETERMINE THE PRESENT EXTENT AND LOCATION OF THEIR FACILITIES BEFORE BEGINNING WORK.

4. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROPER UTILITY IMMEDIATELY UPON BREAKING OR DAMAGE TO ANY UTILITY LINE OR APPURTENANCE, OR THE INTERRUPTION OF THEIR SERVICE. HE SHALL NOTIFY THE PROPER UTILITY INVOLVED. IF EXISTING UTILITY LINES ARE ENCOUNTERED THAT CONFLICT IN LOCATION WITH NEW CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED.

5. CONTRACTOR TO PROTECT ALL UTILITY, PAVING, BUILDINGS, ETC. OUTSIDE OF LIMITS OF PROPOSED CONSTRUCTION.

6. PROTECT EXISTING TREES AND VEGETATION OUTSIDE OF CONSTRUCTION CORRIDOR.

7. ANY SPOIL MATERIAL THAT MAY BE GENERATED DURING THE CONSTRUCTION WILL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF-SITE AND DISPOSED OF BY THE CONTRACTOR APPROPRIATELY. SAID MATERIAL IS CONSIDERED INCIDENTAL TO THE CONTRACT.

8. THIS IS A SENSITIVE ARCHAEOLOGICAL SITE AREA. CONTRACTOR SHALL BE CAREFUL NOT TO DISTURB ANY AREAS OUTSIDE OF THE PROJECT AREA. THE LOCATION OF THE STAGING AREA SHALL BE COORDINATED WITH THE DNR INSPECTOR.

9. AN ARCHEOLOGICAL INSPECTOR WILL BE REQUIRED TO MONITOR GRADING ACTIVITIES BETWEEN STATIONS 5+25 AND 7+25. CONTRACTOR SHALL NOTIFY THE DNR 1 WEEK PRIOR TO GRADING DISTURBANCES IN THIS AREA SO THAT THE DNR CAN COORDINATE SCHEDULING THE INSPECTOR. THESE INSPECTION SERVICES WILL BE PAID AND COORDINATED BY THE DNR AND ARE NOT PART OF THE CONTRACTOR'S CONTRACT.

10. SUBSTANTIAL COMPLETION (PAVING OPEN FOR TRAFFIC) IS REQUIRED BY MAY 1, 2014, OTHERWISE, PAVEMENT REMOVAL CANNOT BEGIN UNTIL 9/1/14.

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
1	CLEARING AND GRUBBING A. CONTRACTOR TO CLEAR AND GRUB THE PROJECT SITE AND REMOVE EXISTING TREES AS SHOWN ON THE DEMOLITION PLAN (SHEET #6).
2	HMA REMOVAL A. CONTRACTOR SHALL REMOVE THE EXISTING HMA ENTRANCE ROAD AS SHOWN ON THE DEMOLITION PLANS (SHEET #6). THE HMA ENTRANCE ROAD IS COMPRISED OF A 2-INCH HMA LAYER (240 TONS) ON TOP OF A 5-INCH LAYER OF ASPHALT TREATED BASE (600 TONS). MAY USE CRUSHED HMA AS SPECIAL BACKFILL.
3	REMOVAL OF EXISTING SIDEWALKS A. CONTRACTOR SHALL REMOVE THOSE EXISTING SIDEWALKS ADJACENT TO THE LOOP DRIVE AS SHOWN ON THE DEMOLITION PLAN (SHEET #6).
4	REMOVAL OF EXISTING GRAVEL PARKING AREAS A. CONTRACTOR SHALL REMOVE THE EXISTING GRAVEL PARKING AREAS AS SHOWN ON THE DEMOLITION PLAN (SHEET #6).
5	FULL DEPTH SAW CUT A. CONTRACTOR SHALL SAW CUT EXISTING PCC PAVEMENTS FULL DEPTH IN THE LOCATIONS SHOWN ON THE DEMOLITION PLAN (SHEET #6).
6	GRADING A. CONTRACTOR SHALL GRADE THE SITE AS DETAILED IN THE PLANS. B. ANY SPOILS GENERATED SHALL BE HAULED OFF-SITE AND DISPOSED OF BY THE CONTRACTOR APPROPRIATELY. HAUL COSTS TO BE INCLUDED IN GRADING QUOTE.
7	SILT FENCE A. CONTRACTOR SHALL INSTALL SILT FENCE AS DETAILED IN THE PLANS. ADDITIONAL SILT FENCING MAY BE REQUIRED BY THE DNR INSPECTOR TO CONTROL EROSION.
8	SPECIAL BACKFILL A. CONTRACTOR SHALL INSTALL SPECIAL BACKFILL FOR THE ROADWAY BASE IN ACCORDANCE WITH IDOT SECTION 4132. SPECIAL BACKFILL CAN BE CRUSHED HMA IN ACCORDANCE WITH IDOT 4132.04.
9	GRANULAR SHOULDER A. CONTRACTOR SHALL INSTALL TYPE 'A' GRANULAR SHOULDER (3' WIDTH, 6-INCH DEPTH) AS DETAILED IN THE PLANS.
10	6-INCH NON-REINFORCED PCC A. CONTRACTOR SHALL INSTALL 6-INCH NON-REINFORCED PCC PAVEMENT AS DETAILED IN THE PLANS. ENTRANCE ROAD CONTAINS 2,945 SQUARE YARDS, PARKING AND ACCESS AREAS CONTAIN 383 SQUARE YARDS.
11	5-INCH NON-REINFORCED PCC SIDEWALK A. CONTRACTOR SHALL INSTALL 5-INCH NON-REINFORCED PCC SIDEWALK WITH 4-INCHES OF GRANULAR BASE IN LOCATIONS DETAILED IN THE PLANS. GRANULAR BASE (16.5 TONS) FOR SIDEWALK TO BE INCLUDED IN SIDEWALK BID AMOUNT.
12	SIDEWALK DETECTABLE WARNINGS A. CONTRACTOR SHALL INSTALL SIDEWALK DETECTABLE WARNINGS IN THE LOCATIONS SHOWN ON THE PLANS (SHEET#11).
13	15-INCH ARCH CMP A. CONTRACTOR SHALL INSTALL 15-INCH ARCH CMP AS DETAILED ON SHEET #8.
14	15-INCH ARCH CMP FES A. CONTRACTOR SHALL INSTALL 15-INCH ARCH CMP FES'S AS DETAILED ON SHEET #8.
15	PRECAST CONCRETE PARKING WHEEL STOPS A. CONTRACTOR SHALL INSTALL WHEEL STOPS AS DETAILED ON SHEET #11.
16	PAINT STRIPING A. CONTRACTOR SHALL INSTALL PAINT MARKINGS FOR THE PARKING AREAS AS DETAILED ON SHEETS #11 AND 14.
17	TRAFFIC CONTROL A. CONTRACTOR SHALL IMPLEMENT TRAFFIC CONTROL ALONG 700TH STREET FOR THE CONSTRUCTION OF THE ENTRANCE ROAD. SEE SHEET #14 FOR DETAIL.
18	SEEDING, FERTILIZING AND MULCHING A. THE CONTRACTOR SHALL SEED, FERTILIZE AND MULCH ALL DISTURBED AREAS. SEED WITH TYPE 'C' SEED MIXTURE.
19	CONSTRUCTION SURVEY STAKING A. CONTRACTOR IS RESPONSIBLE FOR THE CONSTRUCTION SURVEY STAKING FOR THE PROJECT.

CONSULTANT:

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

QUANTITIES & GENERAL NOTES

ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

NO.	BY	DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-01-30-15

CHK'D BY:

DATE: 10/30/2013

SHEET No:

3

NOTES
1. SURVEY CONTROL POINT COORDINATES ARE BASED ON AN INDEPENDENTLY ESTABLISHED COORDINATE SYSTEM FOR CONTROL.
2. SURVEY CONTROL POINTS ARE ALL CONTAINED WITHIN THE EXISTING ASPHALT DRIVE THAT IS TO DE DEMOLISHED. CONTRACTOR/SURVEYOR NEEDS TO ESTABLISH ADDITIONAL CONTROL POINTS OUTSIDE OF THE CONSTRUCTION CORRIDOR FOR CONSTRUCTION STAKING.

LEGEND

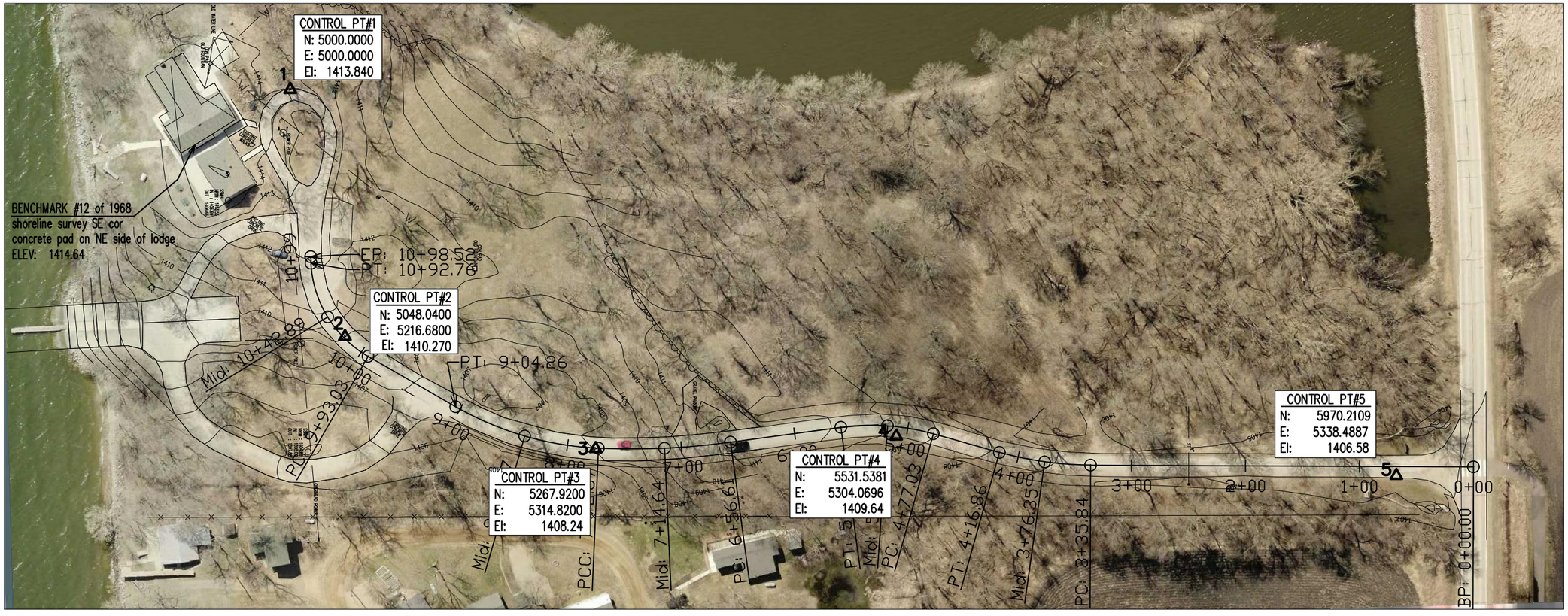
EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN

EXISTING/PROPOSED

- YARD HYDRANT
- 990 — ELEVATION

0 100 FEET



CONSULTANT:

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

SURVEY CONTROL

ROADWAY CONSTRUCTION PROJECT FOR:

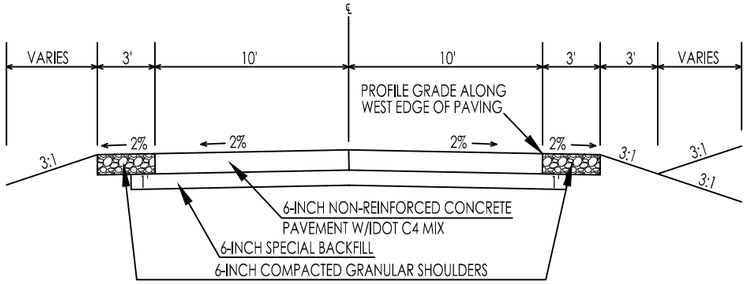
MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

NO.	BY	DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-01-30-15
CHK'D BY:
DATE: 10/30/2013
SHEET No: 4

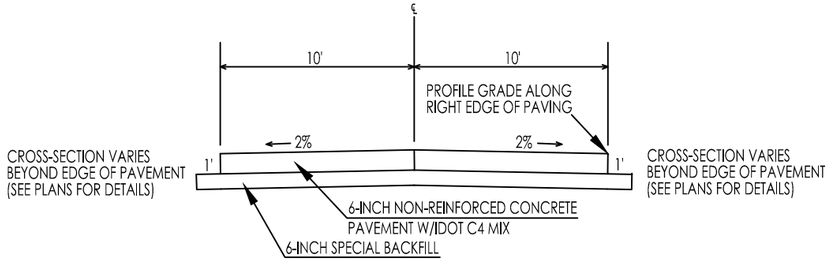
STATION 0+53.09 TO STATION 10+30.23



TYPICAL ROADWAY PAVEMENT CROSS-SECTION

NO SCALE

STATION 10+30.23 TO STATION 10+98.52

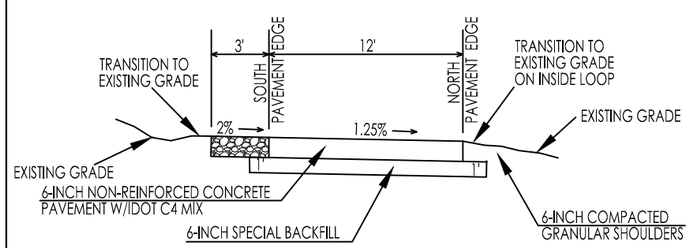


TYPICAL ROADWAY PAVEMENT CROSS-SECTION

NO SCALE

SOUTH 1/2 OF LOOP DRIVE

CROSS-SECTION LOOKING WEST

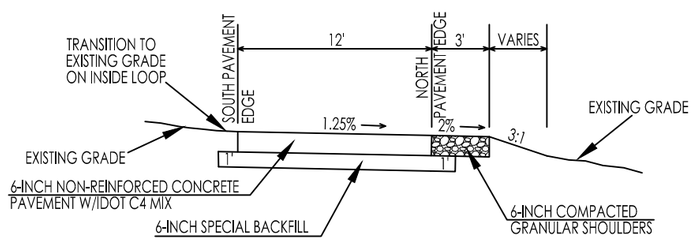


TYPICAL ROADWAY PAVEMENT CROSS-SECTION

NO SCALE

NORTH 1/2 OF LOOP DRIVE

CROSS-SECTION LOOKING WEST



TYPICAL ROADWAY PAVEMENT CROSS-SECTION

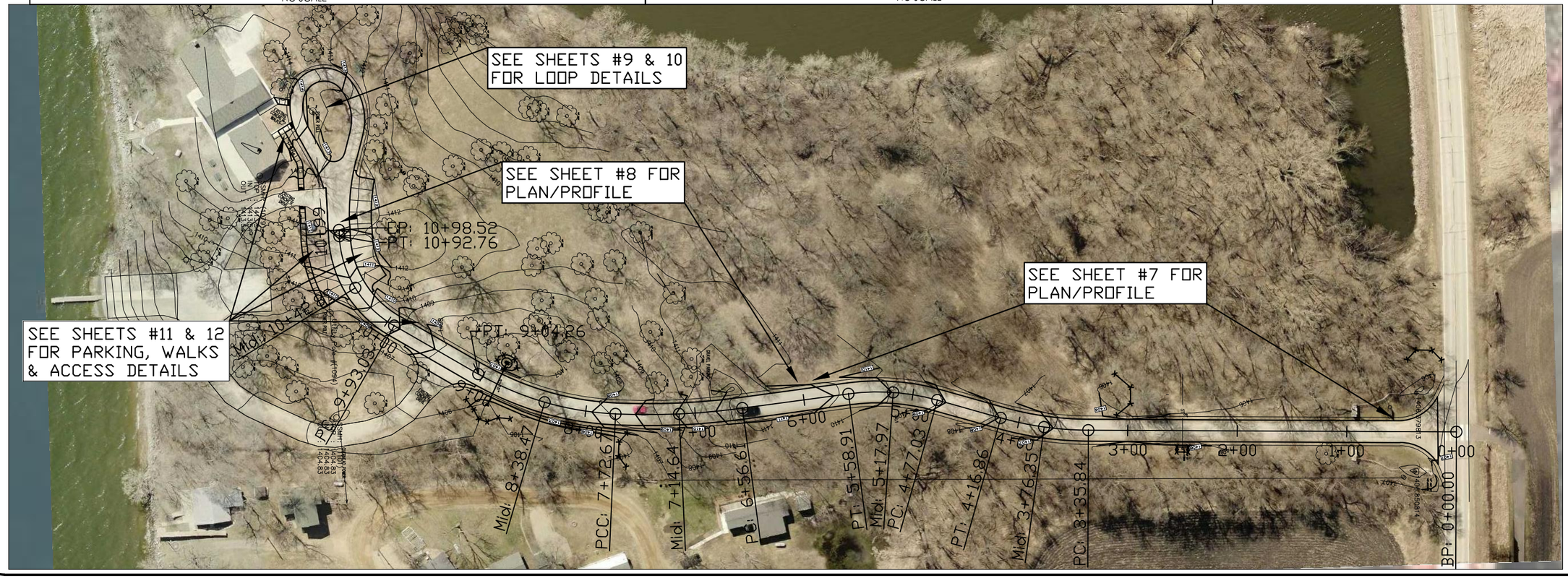
NO SCALE

LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- HYD — YARD HYDRANT
- 990 — ELEVATION
- SILT FENCE

0 100 FEET



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

OVERALL SITE PLAN

ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

NO.	BY	DATE	REVISION

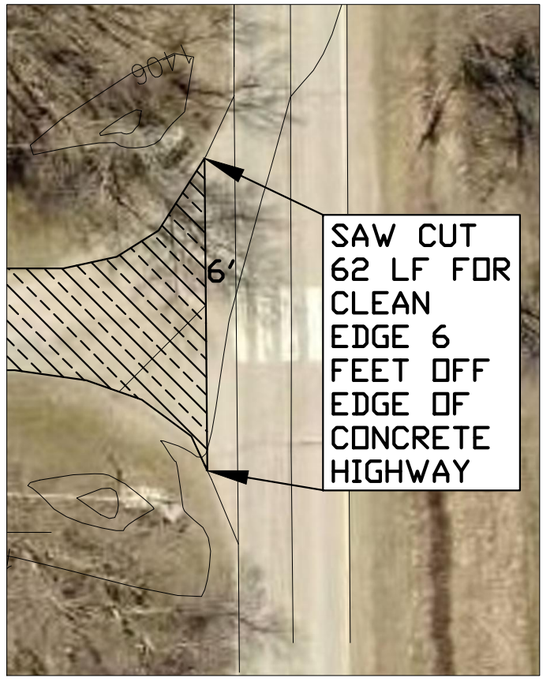
DRAWN BY:

PROJECT NUMBER: 12-01-30-15

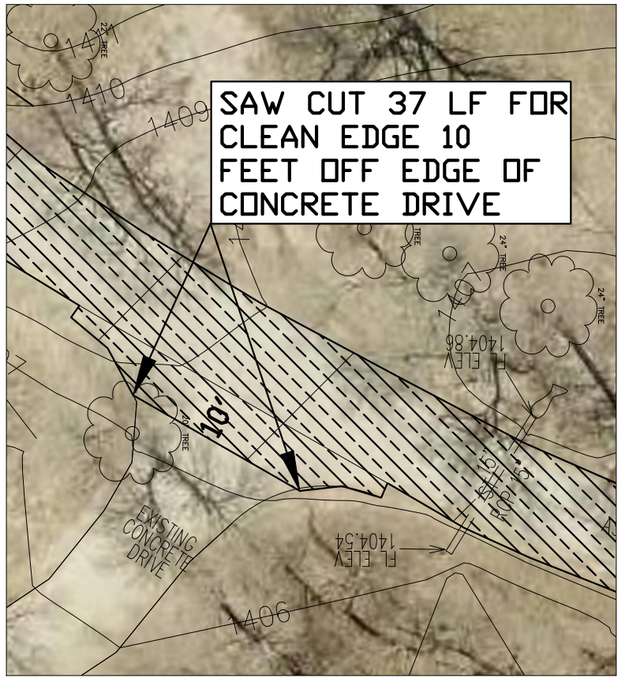
CHK'D BY:

DATE: 10/30/2013

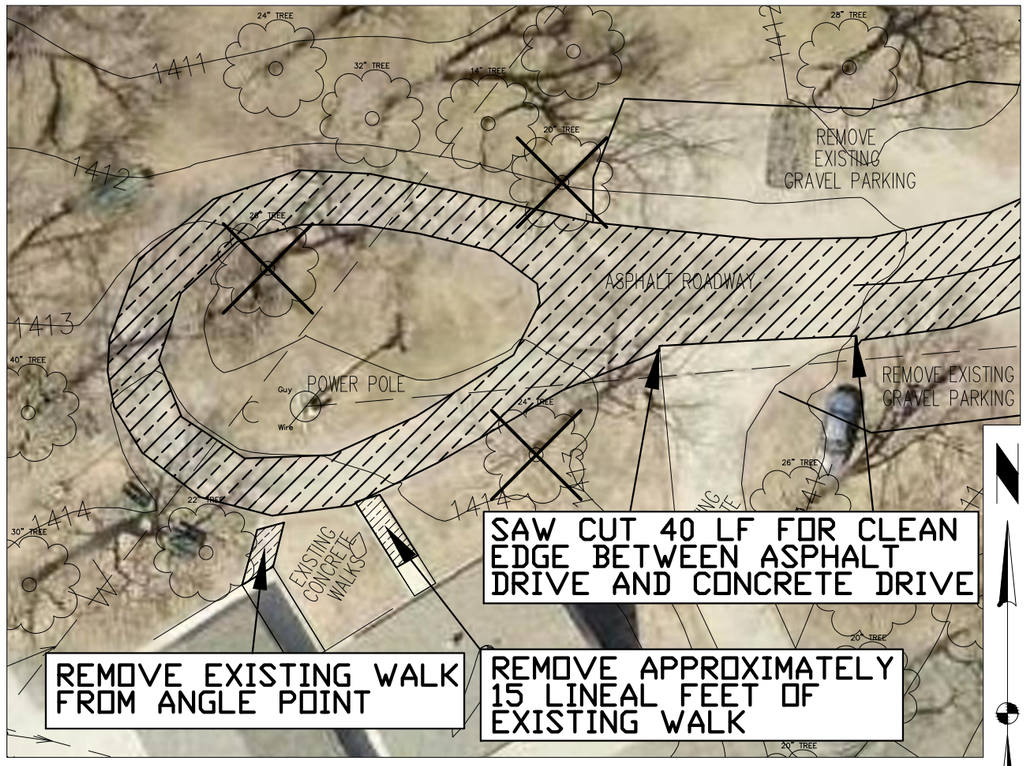
SHEET No: 5



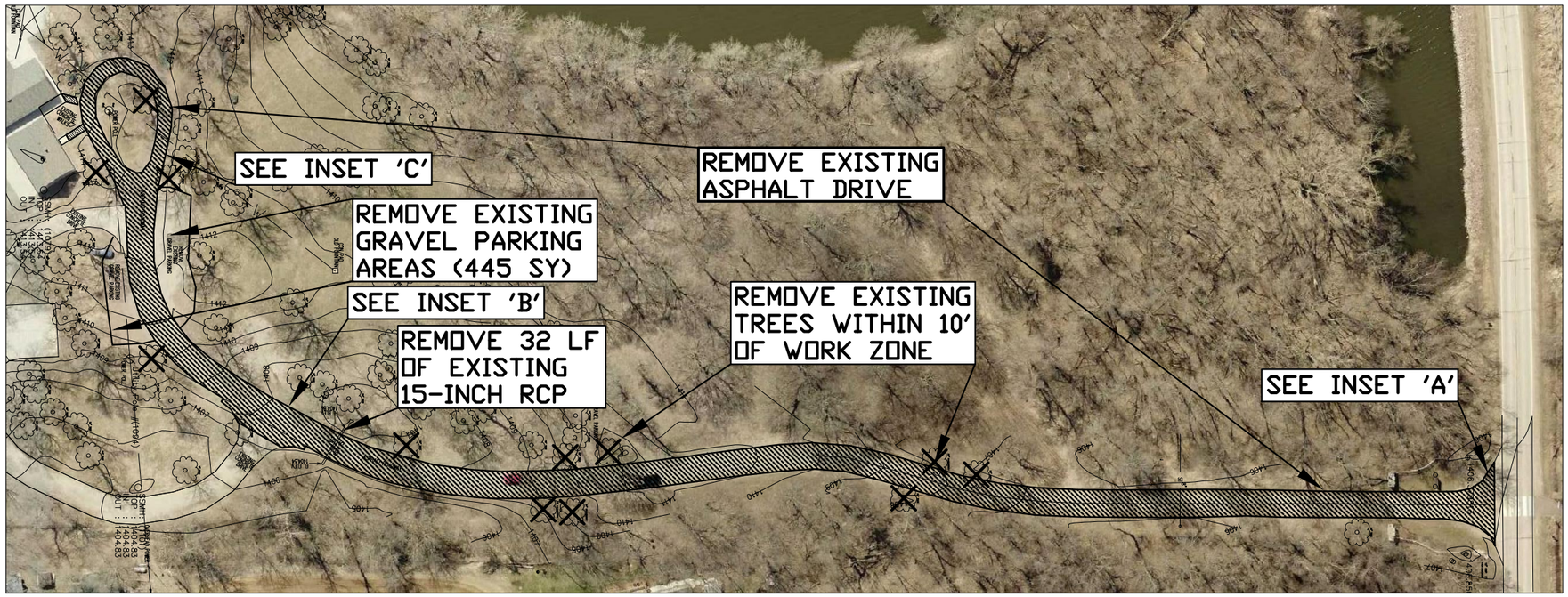
INSET 'A'
SCALE: 1"=30'



INSET 'B'
SCALE: 1"=30'



INSET 'C'
SCALE: 1"=30'



LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- YARD HYDRANT
- 990 — ELEVATION
- 20" HACKBERRY — TREE TO BE REMOVED
- ASPHALT DRIVE TO BE REMOVED

0 100
FEET

CONSULTANT:

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

DEMOLITION PLAN

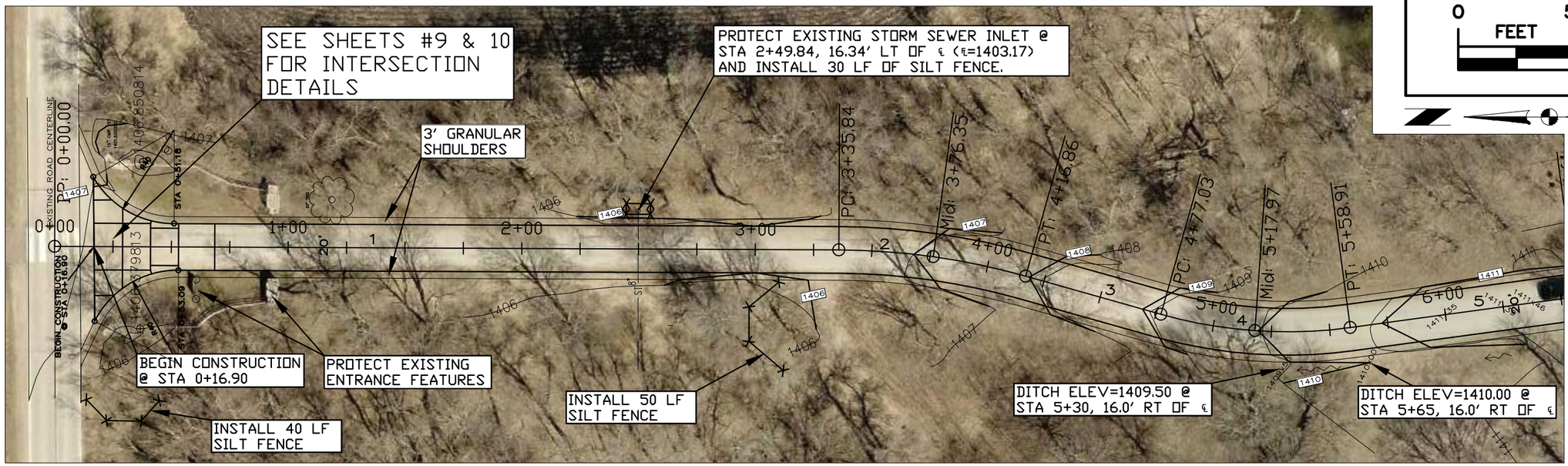
ROADWAY CONSTRUCTION PROJECT FOR:
MINI WAKAN STATE PARK
DICKINSON COUNTY, IOWA

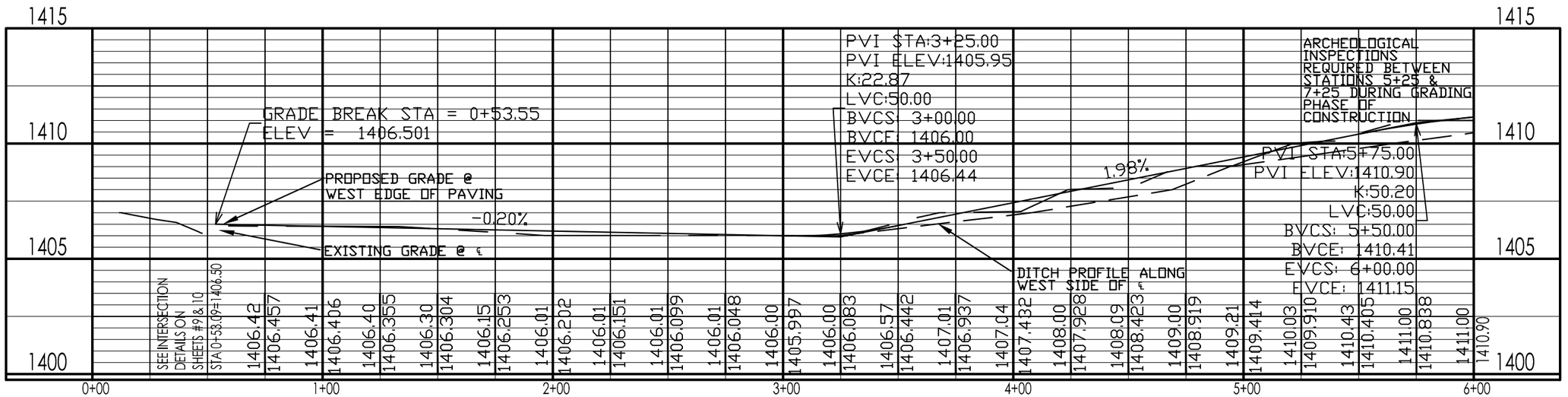
NO.	BY	DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-01-30-15
CHK'D BY:
DATE: 10/30/2013
SHEET No: 6

HORIZONTAL ROAD CENTERLINE CONTROL

No.	Type	Length	Radius	Direction	Start Station	End Station	Delta angle	Chord length	Chord Direction	Start Point	End Point	Center Point
1	Line	335.84'		S0° 15' 47"W	0+00.00'	3+35.84'				(5331.1080',6037.9524')	(5329.5666',5702.1142')	
2	Curve	81.02'	300.00'		3+35.84'	4+16.86'	15.4730 (d)	80.77'	S7° 59' 58"W	(5329.5666',5702.1142')	(5318.3262',5622.1296')	(5029.5697',5703.4912')
3	Line	60.17'		S15° 44' 10"W	4+16.86'	4+77.03'				(5318.3262',5622.1296')	(5302.0079',5564.2152')	
4	Curve	81.88'	200.00'		4+77.03'	5+58.91'	23.4580 (d)	81.31'	S4° 00' 25"W	(5302.0079',5564.2152')	(5296.3259',5483.1009')	(5494.5122',5509.9742')
5	Line	97.69'		S7° 43' 19"E	5+58.91'	6+56.61'				(5296.3259',5483.1009')	(5309.4528',5386.2920')	
6	Curve	116.07'	650.00'		6+56.61'	7+72.67'	10.2310 (d)	115.91'	S2° 36' 23"E	(5309.4528',5386.2920')	(5314.7240',5270.4985')	(4665.3472',5298.9539')
7	Curve	131.59'	275.00'		7+72.67'	9+04.26'	27.4155 (d)	130.33'	S16° 13' 01"W	(5314.7240',5270.4985')	(5278.3254',5145.3509')	(5039.9876',5282.5373')
8	Line	88.77'		S29° 55' 28"W	9+04.26'	9+93.03'				(5278.3254',5145.3509')	(5234.0432',5068.4182')	
9	Curve	99.74'	100.00'		9+93.03'	10+92.76'	57.1443 (d)	95.65'	S58° 29' 48"W	(5234.0432',5068.4182')	(5152.4885',5018.4350')	(5147.3750',5118.3042')
10	Line	5.76'		S87° 04' 08"W	10+92.76'	10+98.52'				(5152.4885',5018.4350')	(5146.7389',5018.1406')	





LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- YARD HYDRANT
- 990 / 990 — ELEVATION
- SILT FENCE

0 FEET 50

CONSULTANT:

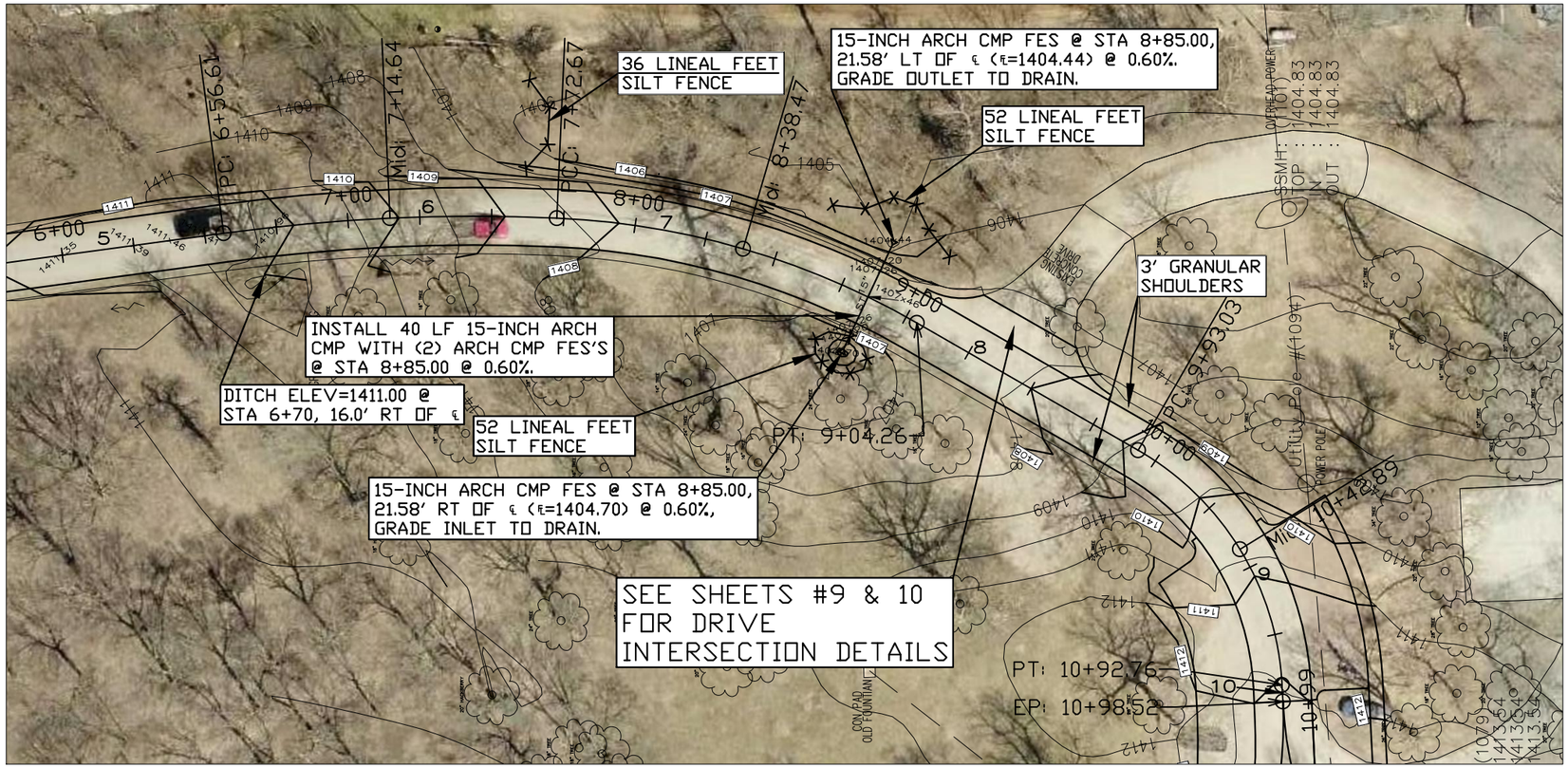
IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

PLAN/PROFILE
ROADWAY CONSTRUCTION PROJECT FOR:
MINI WAKAN STATE PARK
DICKINSON COUNTY, IOWA

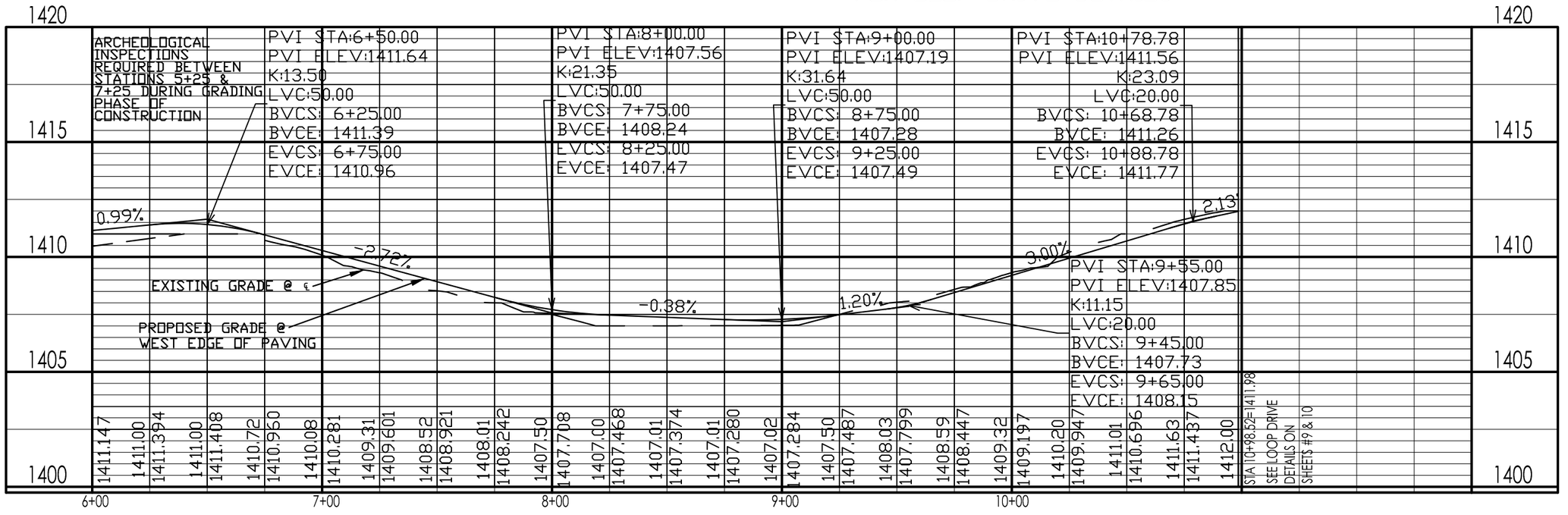
NO.	BY	DATE	REVISION

DRAWN BY: PROJECT NUMBER: 12-01-30-15
CHK'D BY: DATE: 10/30/2013
SHEET No: 7

SEE SHEET #7
FOR CONTINUATION



SEE SHEETS #9 & 10
FOR LOOP DRIVE DETAILS



LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- YARD HYDRANT
- 990 — ELEVATION
- SILT FENCE

0 50 FEET

CONSULTANT:

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

PLAN/PROFILE

ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

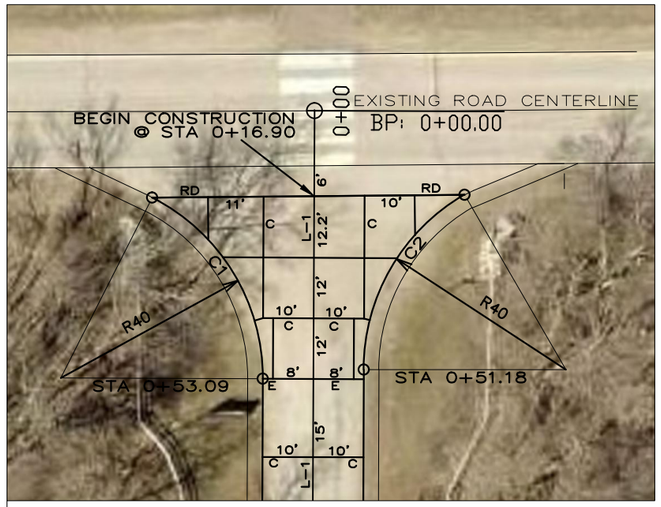
DICKINSON COUNTY, IOWA

NO.	BY	DATE	REVISION

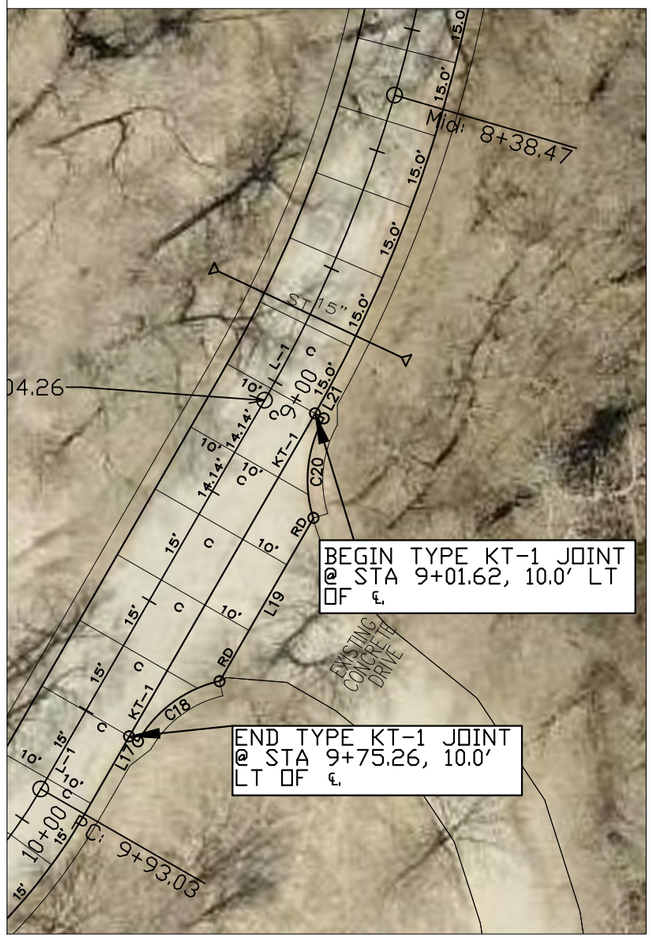
DRAWN BY:
PROJECT NUMBER: 12-01-30-15
CHK'D BY:
DATE: 10/30/2013
SHEET No: 8

HORIZONTAL ROAD CONTROL

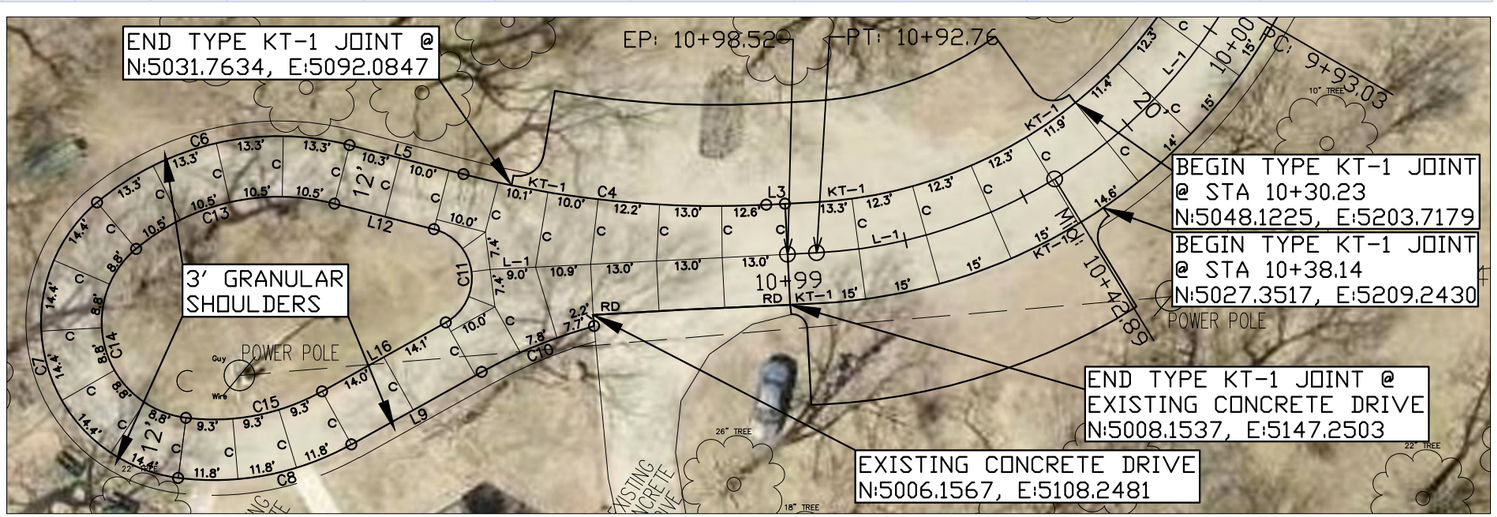
No.	Type	Length	Radius	Direction	Delta angle	Chord length	Chord Direction	Start Point	End Point	Center Point
C1	Curve	44.21	40'		63.3330 (d)	41.99'	S31°24'39"E	(5298.9780',6020.7485')	(5320.8644',5984.9081')	(5280.8648',5985.0846')
C2	Curve	41.82'	40'		59.9019 (d)	39.94'	N44°54'02"E	(5340.8621',5986.7227')	(5360.8028',6021.3294')	(5380.8621',5986.7227')
L3	Line	3.70'		S87°04'08"W				(5146.2276',5028.1275')	(5142.5352',5027.9385')	
C4	Curve	60.48'	200'		17.3247 (d)	60.25'	S84°16'07"E	(5142.5352',5027.9385')	(5082.5913',5033.9548')	(5132.3081',5227.6768')
L5	Line	23.29'		N75°36'23"W				(5082.5913',5033.9548')	(5060.0300',5039.7449')	
C6	Curve	53.23'	56'		54.4652 (d)	51.25'	S77°09'40"W	(5060.0300',5039.7449')	(5010.0597',5028.3563')	(5046.1093',4985.5027')
C7	Curve	71.80'	31'		132.7009 (d)	56.79'	S16°25'19"E	(5010.0597',5028.3563')	(5026.1156',4973.8801')	(5030.0158',5004.6338')
C8	Curve	35.52'	56'		36.3430 (d)	34.93'	N79°03'22"E	(5026.1156',4973.8801')	(5060.4089',4980.5112')	(5033.1610',5029.4351')
L9	Line	29.48'		N60°53'05"E				(5060.4089',4980.5112')	(5086.1606',4994.8534')	
C10	Curve	24.13'	100'		13.8280 (d)	24.08'	N67°47'55"E	(5086.1606',4994.8534')	(5108.4516',5003.9508')	(5134.8176',4907.4893')
C11	Curve	23.82'	10'		136.4909 (d)	18.58'	N07°21'39"W	(5079.0920',5004.6522')	(5076.7121',5023.0747')	(5074.2263',5013.3886')
L12	Line	20.30'		N75°36'23"W				(5076.7121',5023.0747')	(5057.0470',5028.1216')	
C13	Curve	41.83'	44'		54.4652 (d)	40.27'	S77°09'40"W	(5057.0470',5028.1216')	(5017.7846',5019.1734')	(5046.1093',4985.5027')
C14	Curve	44.01'	19'		132.7009 (d)	34.81'	S16°25'19"E	(5017.7846',5019.1734')	(5027.6253',4985.7847')	(5030.0158',5004.6338')
C15	Curve	27.91'	44'		36.3430 (d)	27.44'	N79°03'22"E	(5027.6253',4985.7847')	(5054.5701',4990.9949')	(5033.1610',5029.4351')
L16	Line	28.07'		N60°53'05"E				(5054.5701',4990.9949')	(5079.0920',5004.6522')	
L17	Line	2.00'		S60°04'32"E				(5251.5715',5078.8248')	(5253.3048',5077.8271')	
C18	Curve		25'		47.2814 (d)	20.05'	N53°33'55"E	(5253.3048',5077.8271')	(5269.4357',5089.7349')	(5274.9719',5065.3556')
L19	Line	37.28'		N29°52'51"E				(5269.4357',5089.7349')	(5288.0072',5122.0569')	
C20	Curve		25'		46.6872 (d)	19.81'	N06°01'51"E	(5288.0072',5122.0569')	(5290.0888',5141.7594')	(5311.8746',5129.4965')
L21	Line	2.00'		N60°37'32"W				(5290.0888',5141.7594')	(5288.3459',5142.7404')	



ENTRANCE INTERSECTION



DRIVE INTERSECTION



HORIZONTAL LOOP ROAD LAYOUT

NOTE: SEE SHEETS # 11 & 12 FOR PARKING AND SIDEWALK DETAILS

0 30 FEET

LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- YARD HYDRANT
- 990 — ELEVATION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

INTERSECTION/LOOP LAYOUT

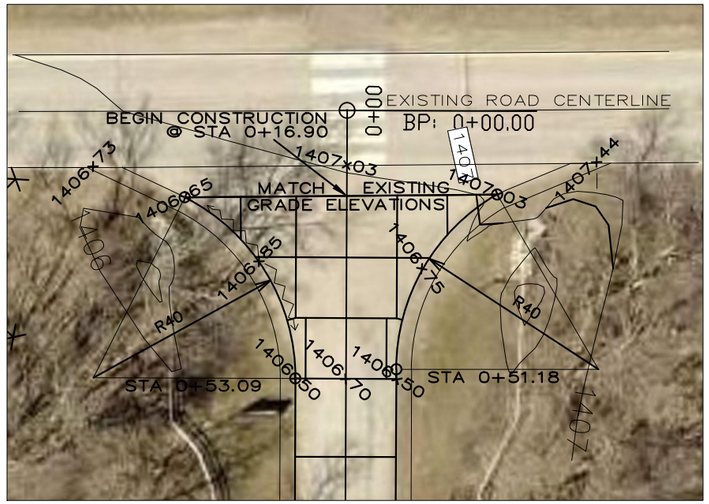
ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-01-30-15
CHK'D BY:
DATE: 10/30/2013
SHEET No: 9



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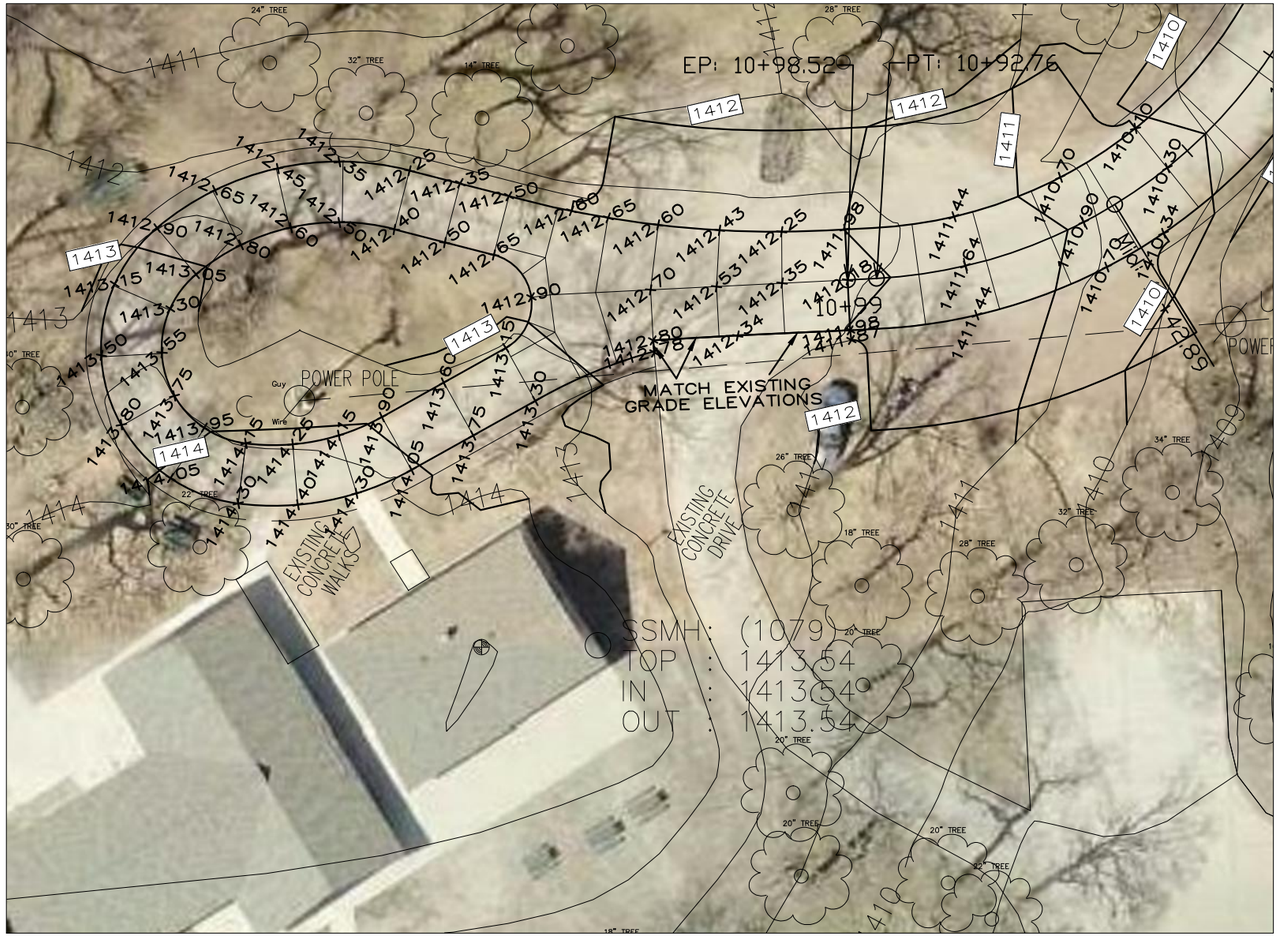
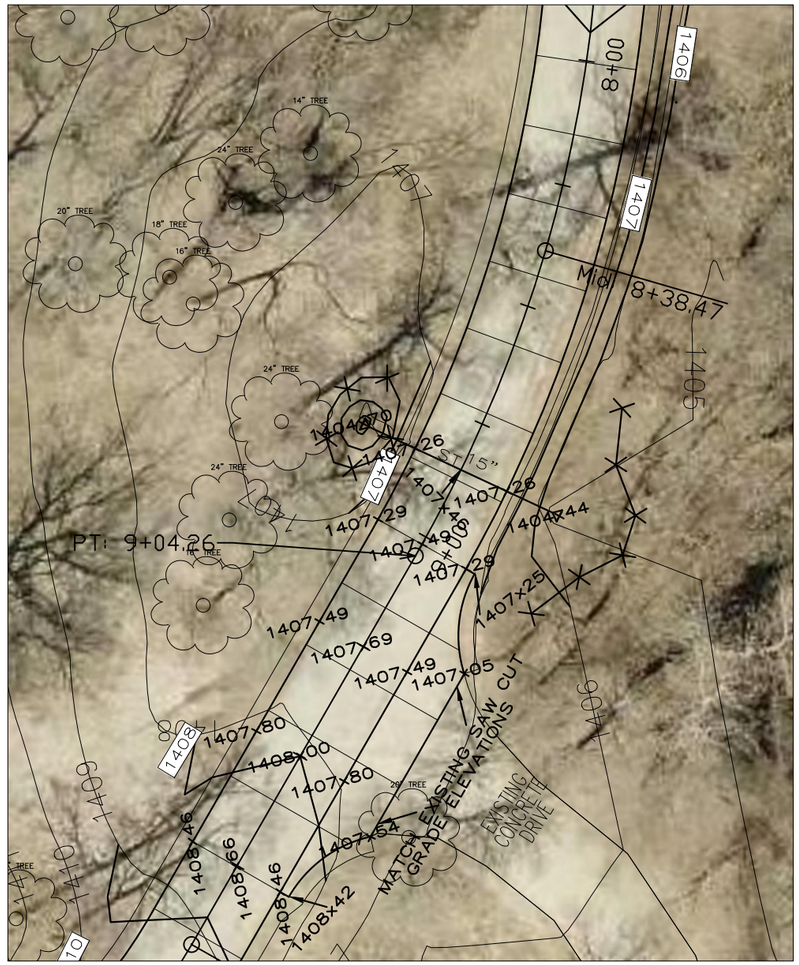


HORIZONTAL LOOP ROAD ELEVATIONS



DRIVE INTERSECTION

NOTE: SEE SHEETS #11 & 12 FOR PARKING AND SIDEWALK DETAILS

0 30
FEET

LEGEND

EXISTING/PROPOSED

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- 990 — ELEVATION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

INTERSECTION/LOOP ELEVATIONS

ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

NO.	BY	DATE	REVISION

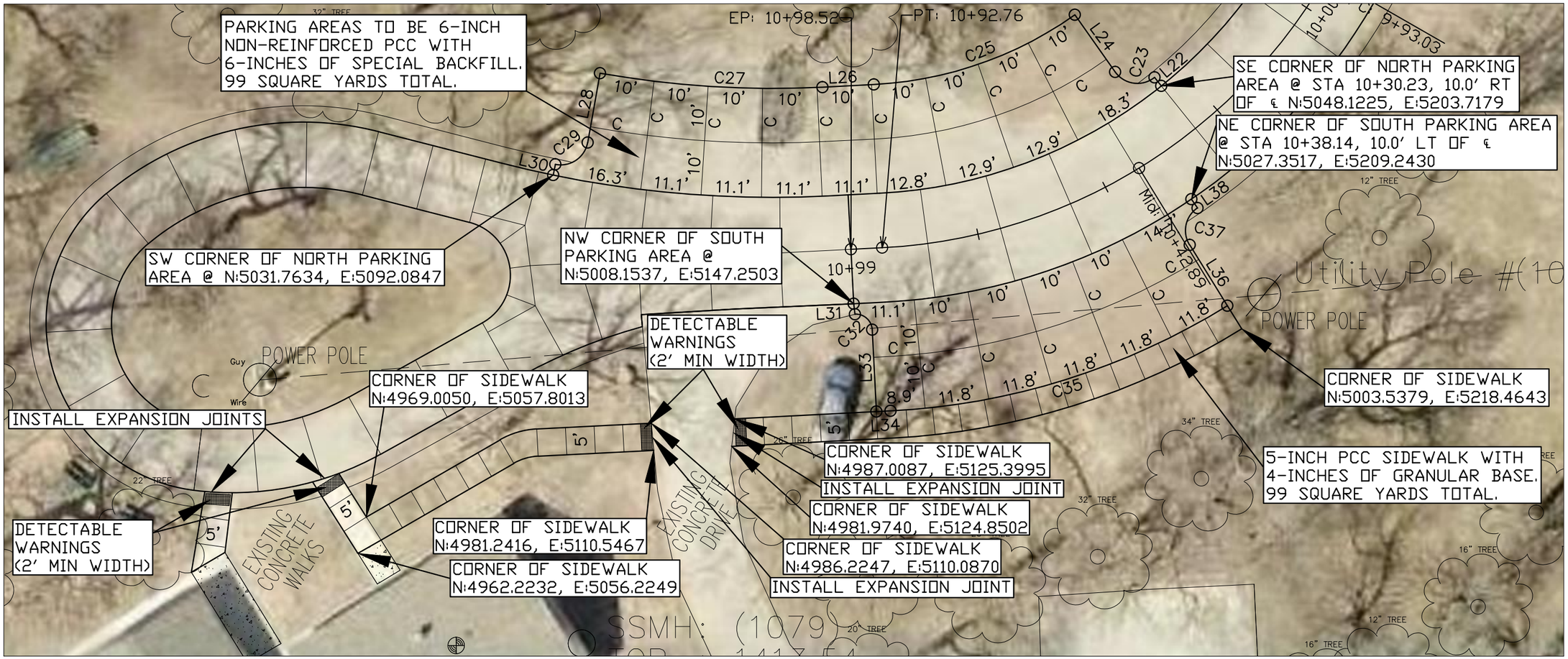
DRAWN BY:

PROJECT NUMBER: 12-01-30-15

CHK'D BY:

DATE: 10/30/2013

SHEET No: 10



PARKING AREA CONTROL

No.	Type	Length	Radius	Direction	Delta angle	Chord length	Chord Direction	Start Point	End Point	Center Point
L22	Line	2.00'		N38°45'29"W				(5203.7179',5048.1225')	(5202.4658',5049.6821')	
C23	Curve	8.16'	5'		93.4536 (d)	7.28'	N82°01'52"W	(5202.4658',5049.6821')	(5195.2552',5050.6914')	(5199.3357',5053.5810')
L24	Line	12.85'		N35°18'16"W				(5195.2552',5050.6914')	(5187.8294',5061.1776')	
C25	Curve	39.55'	70'		32.3733 (d)	39.03'	S70°52'56"W	(5187.8294',5061.1776')	(5150.9544',5048.3958')	(5147.3750',5118.3042')
L26	Line	9.45'		S87°04'08"W				(5150.9544',5048.3958')	(5141.5125',5047.9123')	
C27	Curve	40.99'	180'		13.0489 (d)	40.91'	N86°24'24"W	(5141.5125',5047.9123')	(5100.6871',5050.4761')	(5132.3081',5227.6768')
L28	Line	12.94'		S10°07'04"W				(5100.6871',5050.4761')	(5098.4148',5037.7420')	
C29	Curve	7.98'	5'		91.4845 (d)	7.16'	S55°51'36"W	(5098.4148',5037.7420')	(5092.4870',5033.7225')	(5093.4925',5038.6204')
L30	Line	2.00'		S11°36'08"W				(5092.4870',5033.7225')	(5092.0847',5031.7634')	
L31	Line	1.94'		S06°52'54"E				(5147.2503',5008.1537')	(5147.4829',5006.2264')	
C32	Curve	4.71'	3'		90.0000 (d)	4.24'	S47°55'52"E	(5147.4829',5006.2264')	(5150.6324',5003.3837')	(5147.6363',5003.2303')
L33	Line	15.06'		S02°55'52"E				(5150.6324',5003.3837')	(5151.4026',4988.3401')	
L34	Line	2.62'		N87°04'08"E				(5151.4026',4988.3401')	(5154.0225',4988.4743')	
C35	Curve	65.45'	130'		28.8441 (d)	64.76'	N72°38'49"E	(5154.0225',4988.4743')	(5215.8313',5007.7885')	(5147.3750',5118.3042')
L36	Line	13.11'		N31°46'31"W				(5215.8313',5007.7885')	(5208.9294',5018.9303')	
C37	Curve	7.64'	5'		87.5507 (d)	6.92'	N12°00'01"E	(5208.9294',5018.9303')	(5210.3678',5025.6980')	(5213.1800',5021.5638')
L38	Line	2.00'		N34°13'28"W				(5210.3678',5025.6980')	(5209.2430',5027.3517')	

LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- YARD HYDRANT
- 990 — ELEVATION

0 20 FEET

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PARKING/SIDEWALK CONTROL

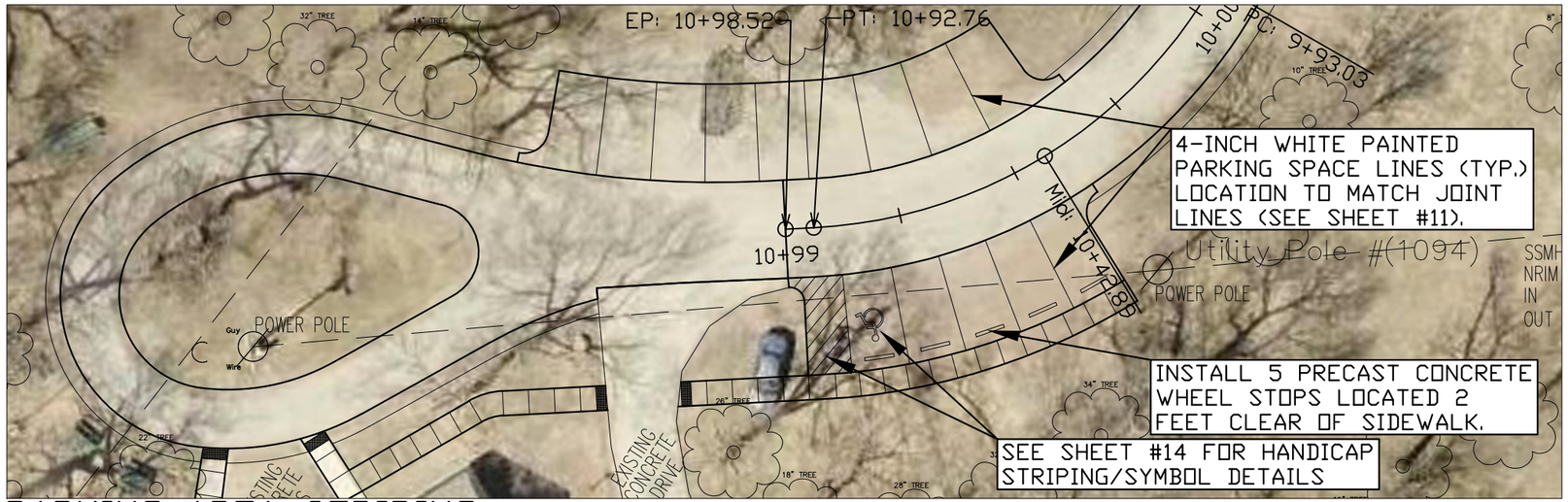
ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

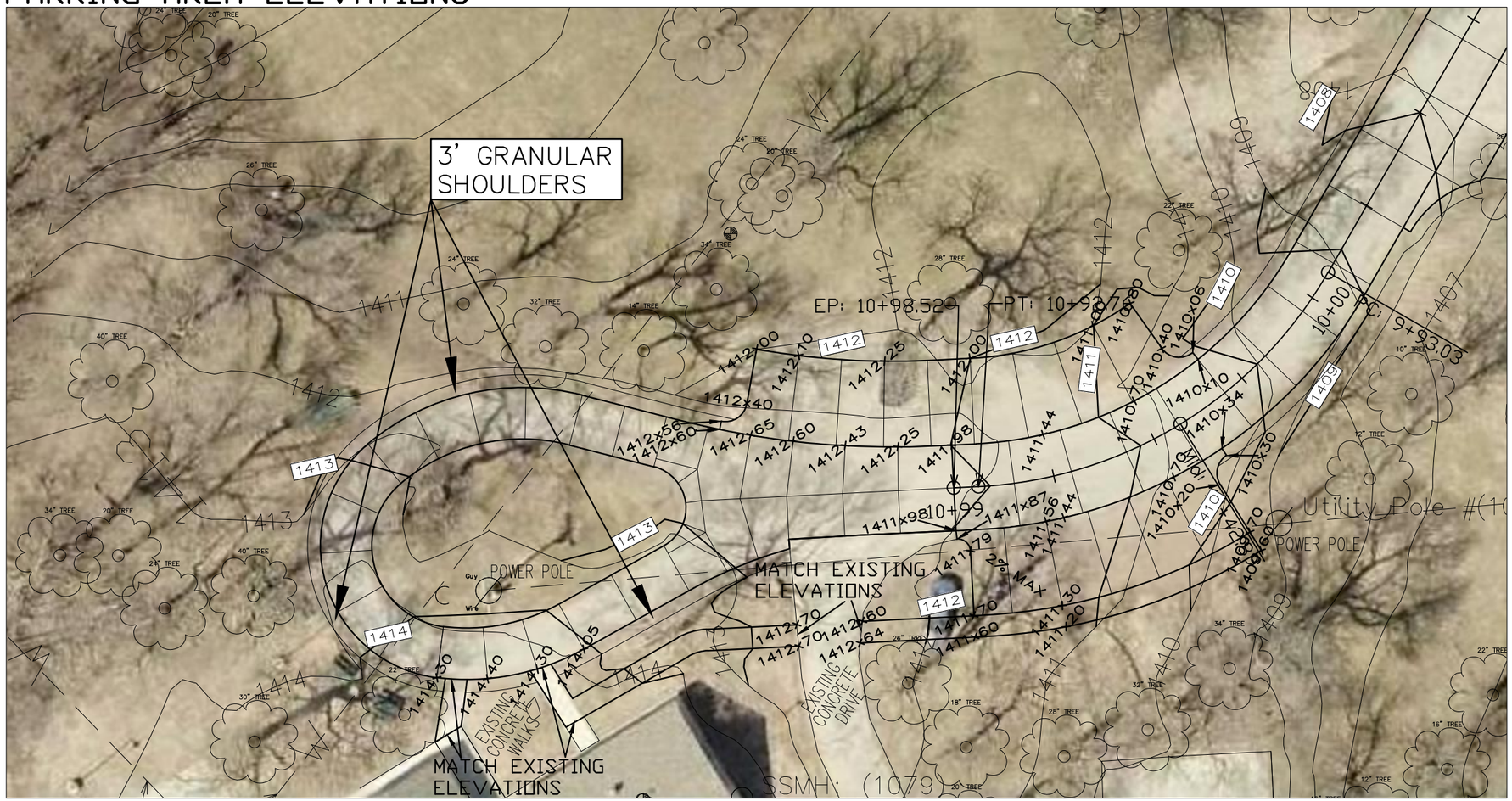
NO.	BY	DATE	REVISION

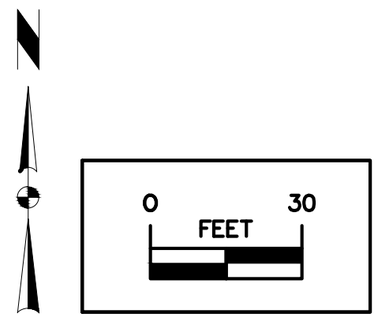
DRAWN BY:
PROJECT NUMBER: 12-01-30-15
CHK'D BY:
DATE: 10/30/2013
SHEET No: 11



PARKING AREA STRIPING

PARKING AREA ELEVATIONS





LEGEND

EXISTING/PROPOSED

- ST 8" — STORM SEWER
- E — ELECTRIC LINE
- W 2" — WATER MAIN
- YARD HYDRANT
- 990 — ELEVATION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PARKING/SIDEWALK ELEVATIONS

ROADWAY CONSTRUCTION PROJECT FOR:

MINI WAKAN STATE PARK

DICKINSON COUNTY, IOWA

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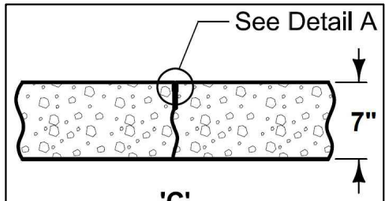
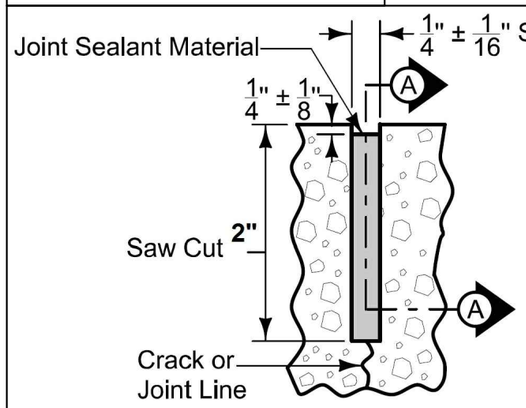
CHK'D BY:

DATE: 10/30/2013

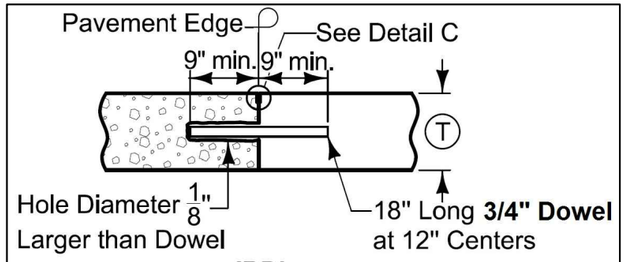
SHEET No: 12



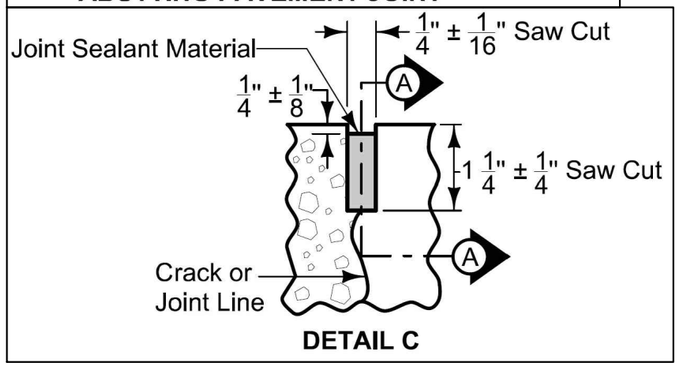
'C'
CONTRACTION JOINT



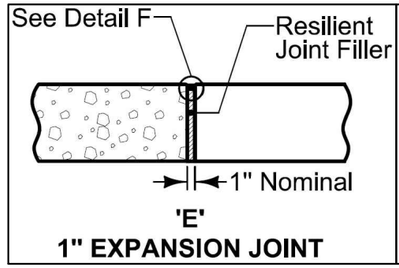
DETAIL A
(Saw cut formed by conventional concrete sawing equipment.)



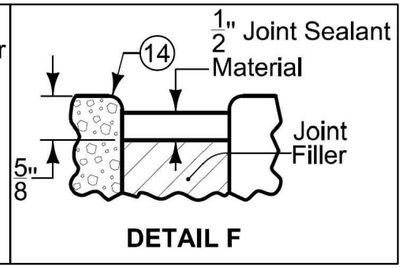
'RD'
ABUTTING PAVEMENT JOINT



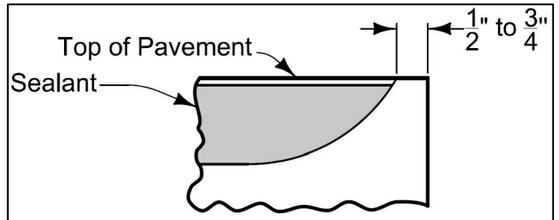
DETAIL C



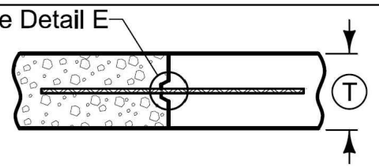
'E'
1" EXPANSION JOINT



DETAIL F



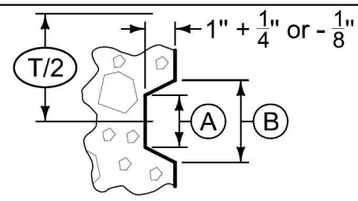
SECTION A-A
(Detail at Edge of Pavement)



'KT'
ABUTTING PAVEMENT JOINT - KEYWAY TIE

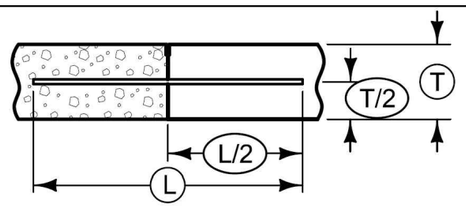
T	Joint	Bars	Bar Length and Spacing
< 8"	'KT-1'	#4	30" Long at 30" Centers

Sawing or sealing of joint not required.

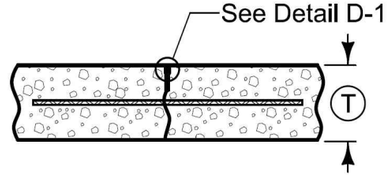


DETAIL E

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness T	A	B
Narrow	Less than 8"	1"	2"

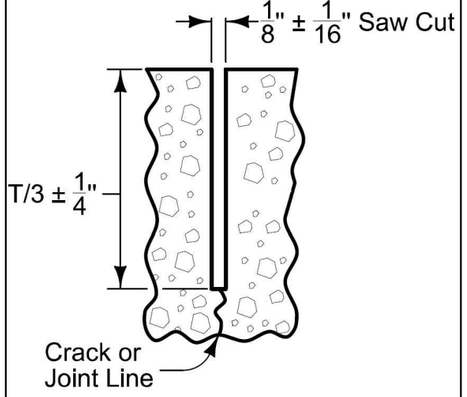


BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)
When tying into old pavement, T represents the depth of sound PCC.



'L'
CONTRACTION JOINT

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



DETAIL D-1
Sealant or cleaning not required.

CONSULTANT:

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

JOINT DETAIL SHEET

ROADWAY CONSTRUCTION PROJECT FOR:
MINI WAKAN STATE PARK
DICKINSON COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
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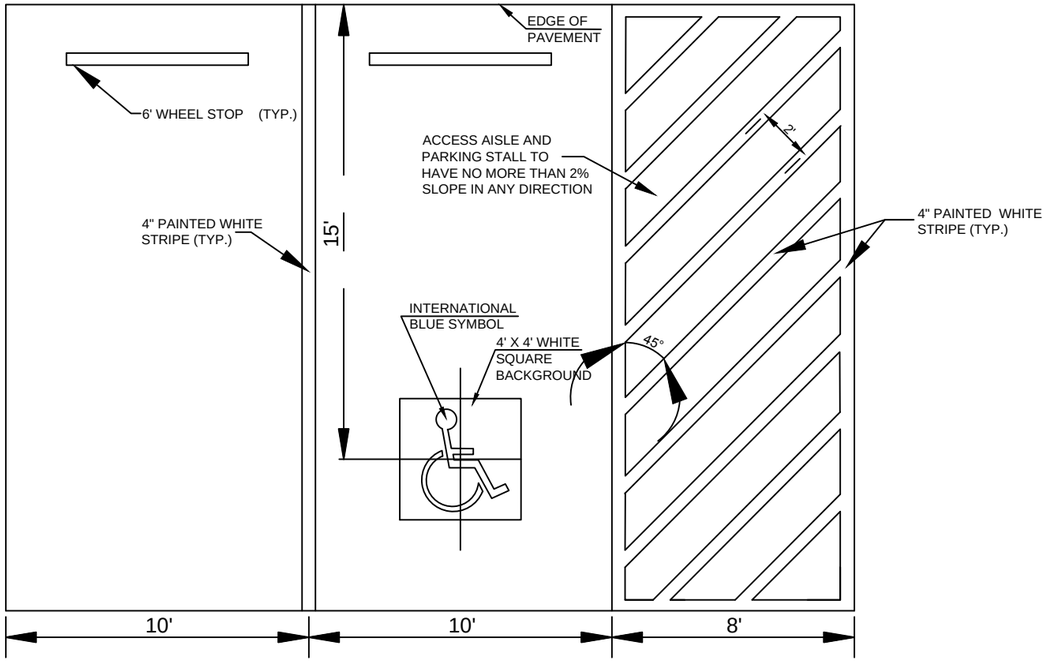
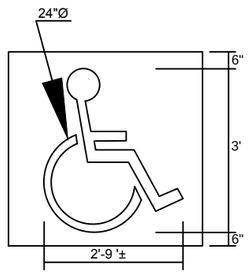
SHEET No: 13



PAVEMENT MARKINGS FOR PARKING STALLS DETAIL

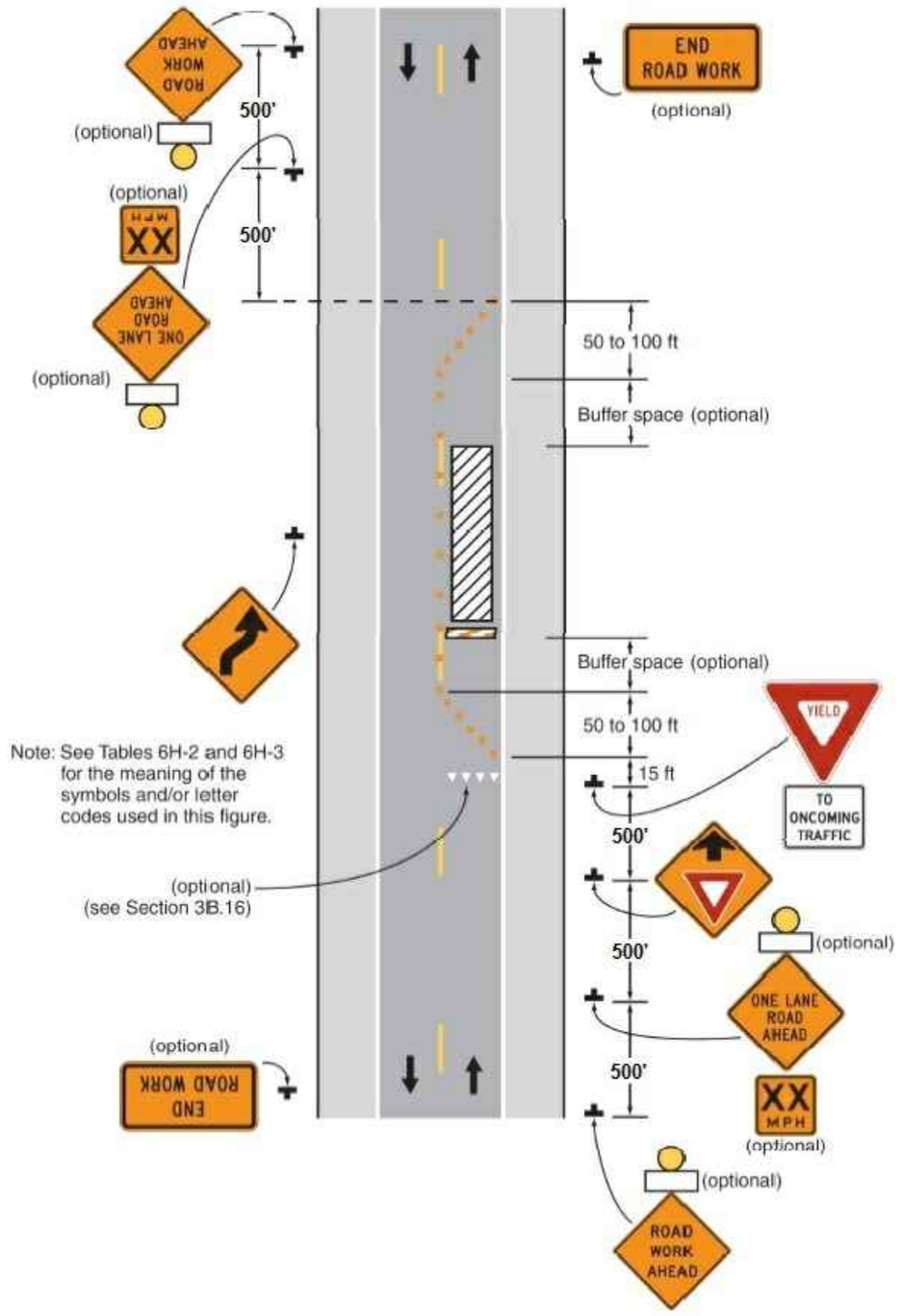
NOT TO SCALE



HANDICAP PARKING
PAVEMENT MARKING DETAIL

NOT TO SCALE

Figure 6H-11. Lane Closure on a Two-Lane Road with Low Traffic Volumes (TA-11)



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

DETAIL SHEET

ROADWAY CONSTRUCTION PROJECT FOR:

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SHEET No: 14