IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTS FOR GREEN VALLEY STATE PARK RECREATIONAL TRAIL UNION COUNTY, IOWA

PROJECT # 12-04-88-03

IOWA ONE CALL
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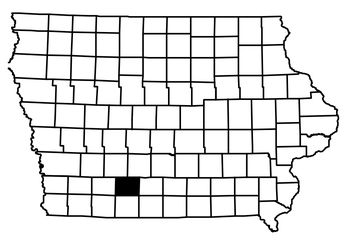


LICENSED PROFESSIONAL ENGINEER
GABRIEL S. LEE
12882
IOWA

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.

GABRIEL S. LEE, IOWA REG. NO. 12882 DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2013

PAGES OR SHEETS COVERED BY THIS SEAL:
SHEETS 1-29

SHEET INDEX

SHEET NO.	SHEET TITLE
1	COVER SHEET
2	VICINITY MAPS
3	QUANTITIES & NOTES
4	SURVEY CONTROL
5	HORIZONTAL SURVEY CONTROL
6	HORIZONTAL SURVEY CONTROL AND DEMOLITION PLAN
7	HIGHWAY SIGNAGE
8	OVERALL SITE PLAN
9	PLAN AND PROFILE
10	PLAN AND PROFILE
11	PLAN AND PROFILE
12	PLAN AND PROFILE
13	PLAN AND PROFILE
14	PLAN AND PROFILE
15	PLAN AND PROFILE
16	PLAN AND PROFILE
17	PLAN AND PROFILE
18	PLAN AND PROFILE
19	PLAN AND PROFILE
20	PLAN AND PROFILE
21	PLAN AND PROFILE
22	TYPICAL CROSS-SECTIONS
23	TYPICAL CROSS-SECTIONS
24	CULVERT CROSS-SECTIONS
25	CULVERT CROSS-SECTIONS
26	CULVERT CROSS-SECTIONS
27	DETAIL SHEET
28	ALTERNATE BID ALIGNMENT
29	ALTERNATE CONTROL/DETAIL SHEET

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	BRETT JOHNSON	CONTACT	MARK JOHNSON
TELEPHONE	515-250-3711	TELEPHONE	515-250-3713
FAX	515-281-8685	FAX	
EMAIL	brett.johnson@dnr.iowa.gov	EMAIL	mark.johnson@dnr.iowa.gov

PROJECT DESCRIPTION

TO INSTALL AN 8-FOOT WIDE 5-INCH THICK REINFORCED PCC RECREATIONAL TRAIL (3.48 MILES IN TOTAL LENGTH: 3.13 MILES OF ACTUAL CONSTRUCTION AND 0.35 MILES OF SHARED ROADWAY) FOR GREEN VALLEY STATE PARK, UNION COUNTY, IOWA. THIS PROJECT INCLUDES, BUT IS NOT LIMITED TO: CLEARING, DEMOLITION, GRADING, CULVERT PIPES, PCC TRAIL CONSTRUCTION, SEEDING/FERTILIZING/MULCHING DISTURBED AREAS, SIGNAGE.

AUTHORIZATION TO BID

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

ENGINEERING BUREAU CHIEF DATE

CONSULTANT:

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

COVER SHEET

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

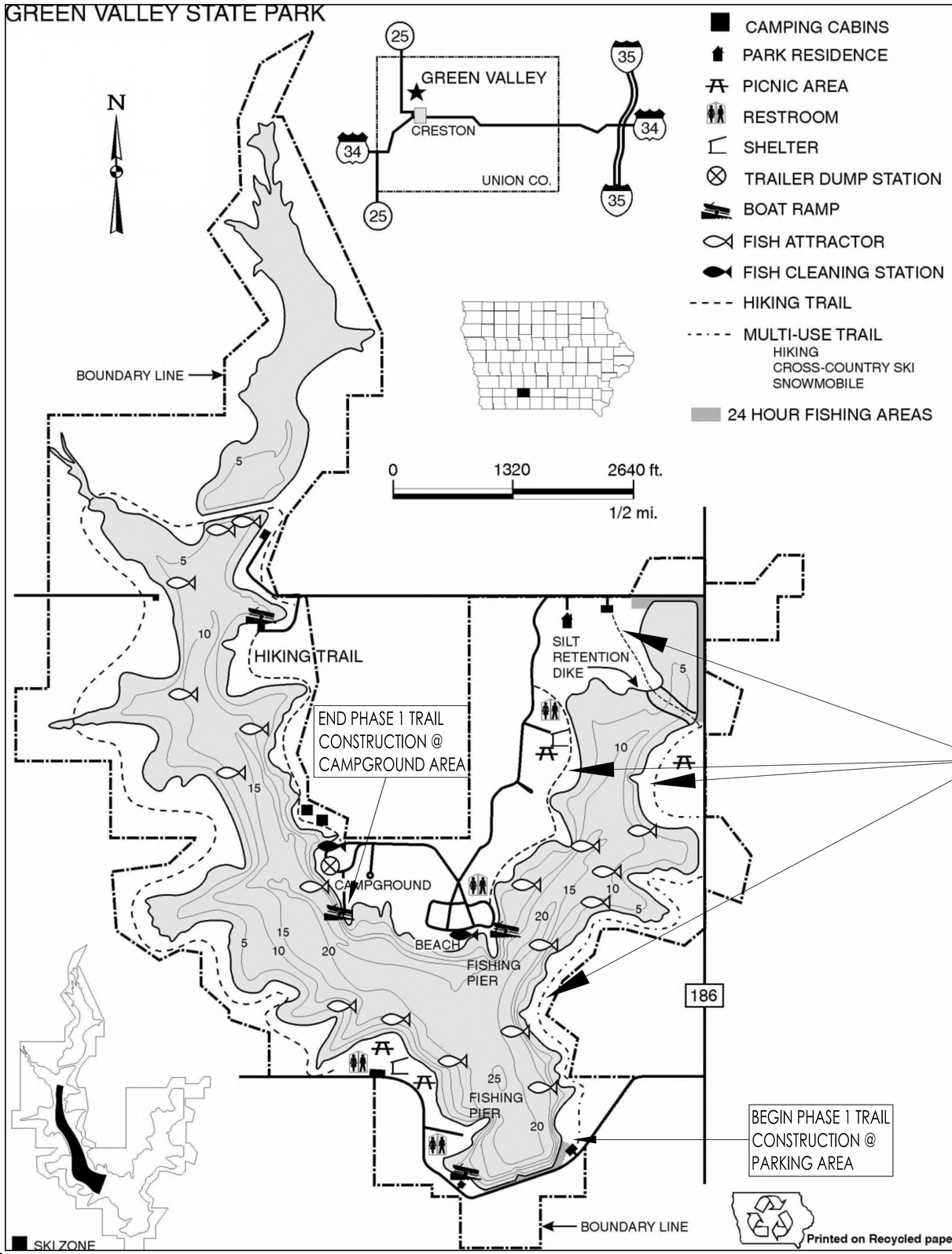
UNION COUNTY, IOWA

NO.	BY DATE	REVISION

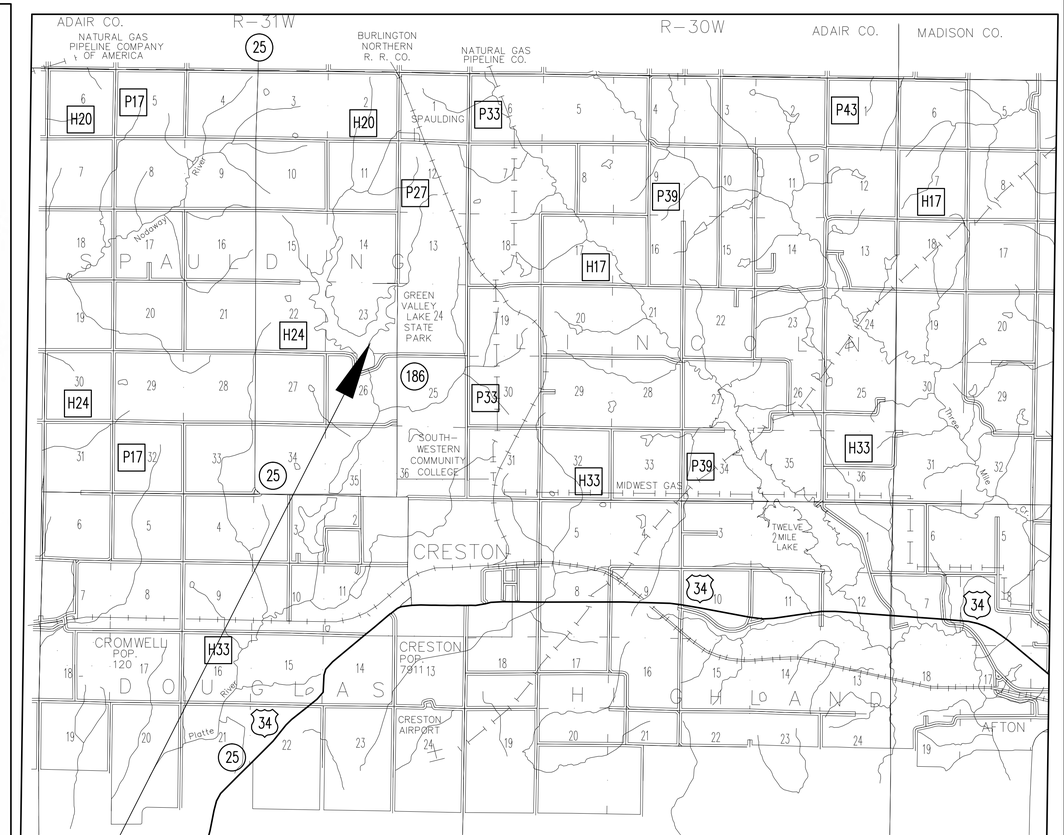
DRAWN BY: PROJECT NUMBER: 12-04-88-03

CHK'D BY: DATE: 6/17/2013

SHEET No: 1



LOCATION MAP



VICINITY MAP

PROJECT LOCATION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

VICINITY MAPS

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHK'D BY:
DATE: 6/17/2013
SHEET No: 2

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	CLEARING AND GRUBBING	LS	1
2	DEMOLITION	LS	1
3	GRADING	LS	1
4	SEEDING/FERTLIZING/MULCHING	LS	1
5	8-INCH FILTER SOCK	LF	720
6	GRANULAR BASE	CY	2,672
7	5" REINFORCED PCC PAVEMENT	SY	14,814
8	12-INCH CMP	LF	216
9	12-INCH CMP FES	EA	15
10	15-INCH CMP	LF	272
11	15-INCH CMP FES	EA	19
12	18-INCH CMP	LF	57
13	18-INCH CMP FES	EA	4
14	18-INCH 45 DEGREE CMP BEND	EA	1
15	21-INCH ARCH CMP	LF	224
16	21-INCH ARCH CMP FES	EA	16
17	24-INCH ARCH CMP	LF	84
18	24-INCH ARCH CMP FES	EA	6
19	48-INCH ARCH CMP	LF	128
20	48-INCH RCP CLASS III	LF	64
21	CLASS 'E' RIPRAP	TONS	775
22	PIPE BOLLARDS	EA	7
23	PRECAST CONCRETE PARKING WHEEL STOPS	EA	10
24	BICYCLE SIGNAGE	LS	1
25	TRAFFIC CONTROL	LS	1
26	CONSTRUCTION STAKING	LS	1
27	NPDES PERMIT & SWPPP	LS	1
28	MOBILIZATION	LS	1
	ESTIMATED PROJECT QUANTITIES FOR ALTERNATE BID		
29	CLEARING AND GRUBBING	LS	1
30	DEMOLITION	LS	1
31	GRADING	LS	1
32	SEEDING/FERTLIZING/MULCHING	LS	1
33	8-INCH FILTER SOCK	LF	770
34	GRANULAR BASE	CY	2,801
35	5" REINFORCED PCC PAVEMENT	SY	15,741
36	12-INCH CMP	LF	216
37	12-INCH CMP FES	EA	15
38	15-INCH CMP	LF	272
39	15-INCH CMP FES	EA	19
40	18-INCH CMP	LF	99
41	18-INCH CMP FES	EA	7
42	18-INCH 45 DEGREE CMP BEND	EA	1
43	21-INCH ARCH CMP	LF	224
44	21-INCH ARCH CMP FES	EA	16
45	24-INCH ARCH CMP	LF	84
46	24-INCH ARCH CMP FES	EA	6
47	48-INCH ARCH CMP	LF	128
48	48-INCH RCP CLASS III	LF	64
49	CLASS 'E' RIPRAP	TONS	775
50	PIPE BOLLARDS	EA	7
51	PRECAST CONCRETE PARKING WHEEL STOPS	EA	10
52	BICYCLE SIGNAGE	LS	1
53	TRAFFIC CONTROL	LS	1
54	CONSTRUCTION STAKING	LS	1
55	NPDES PERMIT & SWPPP	LS	1
56	MOBILIZATION	LS	1

ESTIMATE REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
1	CLEARING AND GRUBBING A. INCLUDES CLEARING AND GRUBBING THE PROJECT CORRIDOR (SEE PLAN/PROFILE FOR CLEARING LIMITS) WHICH INVOLVES THE REMOVAL OF SMALL BRUSH AND NUMEROUS LARGE CALIPER TREES. TOTAL AREA IS APPROXIMATELY 16 ACRES WITH APPROXIMATELY 4 ACRES OF DENSE TREES. B. DISPOSAL OF ALL MATERIAL IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR CAN CHIP THE REMOVED TREES AND STOCKPILE AT A LOCATION WITHIN THE PARK AS DESIGNATED BY THE DNR ON-SITE OR USE THEM AS MULCH FOR THE SEEDING/MULCHING OF DISTURBED AREAS.
2	DEMOLITION A. THE CONTRACTOR WILL REMOVE THE EXISTING STRUCTURE AND ADJOINING PAVEMENT LOCATED AT THE BEACH AREA AND USE THE CONCRETE FOOTINGS AND MASONRY AS BASE FOR THE TRAIL BETWEEN STATIONS 65+00 TO 68+00 BELOW AN ELEVATION OF 1266.00' (NORMAL POOL ELEVATION=1267.40'). SEE DEMOLITION PLAN ON SHEET #6. B. THE CONTRACTOR IS TO REMOVE AND DISPOSE OF THE EXISTING 24-INCH CMP CULVERT LOCATED AT STATION 42+95.09.
3	GRADING A. THE CONTRACTOR WILL GRADE THE SITE AS DETAILED IN THE PLANS.
4	SEEDING/MULCHING A. THE CONTRACTOR WILL SEED/FERTILIZE AND MULCH ALL DISTURBED AREAS. THE CONTRACTOR MAY USE THE CHIPPED TREES AS MULCH. DO NOT USE WALNUT TREES FOR MULCH.
5	8-INCH FILTER SOCK A. THE CONTRACTOR WILL INSTALL 8-INCH FILTER SOCK AS DETAILED ON PLANS. THE DNR INSPECTOR MAY REQUIRE ADDITIONAL EROSION CONTROL DURING CONSTRUCTION, IF WARRANTED.
6	GRANULAR BASE A. QUANTITY BREAKDOWN: MAIN TRAIL=1,974 CY, SPUR TRAIL=68 CY, BASE MATERIAL BETWEEN STATIONS 64+50 AND STATION 69+50=615 CY (SEE SHEET #26 FOR CROSS-SECTIONS), SIDEWALK=7 CY, CAMPGROUND ROAD EXTENSION=8 CY. B. THE CONTRACTOR SHALL INSTALL A 4-INCH COMPACTED GRANULAR BASE BENEATH THE PROPOSED PCC TRAIL EXTENDING 1 FOOT BEYOND THE PCC TRAIL EDGES (AS DETAILED IN THE CROSS-SECTIONS ON SHEETS 22 & 23). C. THE CONTRACTOR CAN USE A GRANULAR BASE STOCKPILE OF MATERIAL THAT EXISTS ON-SITE THAT CONTAINS APPROXIMATELY 4,000 CUBIC YARDS OF MATERIAL, MORE OR LESS. SEE SHEET #14 OF THE PLAN/PROFILE SHEETS FOR LOCATION.
7	5" REINFORCED PCC PAVEMENT A. QUANTITY BREAKDOWN: MAIN TRAIL= 14,211.5 SY, SPUR TRAIL= 492 SY, SIDEWALK= 49 SY, CAMPGROUND ROAD EXTENSION= 61.5 SY. B. CONTRACTOR TO INSTALL 8-FOOT WIDE PCC TRAIL WITH 8-FOOT TRANSVERSE JOINTING. C. CONTRACTOR TO INSTALL (4) LONGITUDINAL #4'S LOCATED 1' AND 3' OFFSET OF CENTERLINE ON THE TRAIL AND SIDEWALK AREAS AND 2' OC FOR THE CAMPGROUND ROAD EXTENSION.
8-9	12-INCH CMP AND FES A. CONTRACTOR SHALL INSTALL 12-INCH CMP AND FES AS DETAILED IN THE PLANS.
10-11	15-INCH CMP AND FES A. CONTRACTOR SHALL INSTALL 15-INCH CMP AND FES AS DETAILED IN THE PLANS.
12,13,14	18-INCH CMP, FES AND 45-DEGREE BEND A. CONTRACTOR SHALL INSTALL 18-INCH CMP, FES AND 45-DEGREE BEND AS DETAILED IN THE PLANS.
15-16	21-INCH ARCH CMP AND FES A. CONTRACTOR SHALL INSTALL 21-INCH ARCH CMP AND FES AS DETAILED IN THE PLANS.
17-18	24-INCH ARCH CMP AND FES A. CONTRACTOR SHALL INSTALL 24-INCH ARCH CMP AND FES AS DETAILED IN THE PLANS.
19	48-INCH ARCH CMP A. CONTRACTOR SHALL INSTALL 48-INCH ARCH CMP AS DETAILED IN THE PLANS.
20	48-INCH RCP CLASS III A. CONTRACTOR SHALL INSTALL 48-INCH RCP CLASS III AS DETAILED IN THE PLANS.
21	CLASS 'E' RIPRAP A. QUANTITY BREAKDOWN: TRAIL CONSTRUCTION BETWEEN STATIONS 64+50 AND 69+50= 550 TONS (SEE SHEET #26 FOR CROSS-SECTIONS), 48-INCH RCP OUTLET PROTECTION @ STATION 70+19.00= 50 TONS, 48-INCH ARCH PIPE @ WEIR LOCATION, STATION 91+92.50= 175 TONS. B. CONTRACTOR SHALL INSTALL RIPRAP AS DETAILED IN THE PLANS.
22	PIPE BOLLARDS A. CONTRACTOR TO INSTALL COLLAPSIBLE PIPE BOLLARDS IN LOCATIONS AS DETAILED IN THE PLANS AND IN ACCORDANCE WITH THE DETAIL ON SHEET #27. USE TRAFFICGUARD ROUND POST MODEL #HRP36 OR EQUIVALENT.
23	PRECAST CONCRETE PARKING WHEEL STOPS A. CONTRACTOR TO INSTALL NEW PRECAST CONCRETE PARKING WHEEL STOPS IN THE LOCATIONS AS DETAILED ON SHEET #20.
24	BICYCLE SIGNAGE A. CONTRACTOR SHALL INSTALL THE HIGHWAY TRAFFIC SIGNAGE AS DETAILED ON SHEET #7. B. CONTRACTOR SHALL INSTALL TRAIL SIGNAGE AS DETAILED IN PLAN/PROFILE AND ON SHEET #27.
25	TRAFFIC CONTROL A. CONTRACTOR SHALL IMPLEMENT TRAFFIC CONTROL IN ACCORDANCE WITH MUTCD FOR ALL WORK THAT ABUTS ROADWAYS. SEE DETAIL SHEET #27 FOR LANE CLOSURE DETAIL.
26	CONSTRUCTION STAKING A. CONTRACTOR IS RESPONSIBLE FOR THE SURVEY STAKING FOR THE CONSTRUCTION OF THE PROJECT.
27	NPDES PERMIT AND SWPPP A. CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE NECESSARY NPDES PERMIT AND SWPPP.

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: MARK JOHNSON 515-250-3713
2. THE PERMITS FOR THIS PROJECT SHOULD BE RETAINED BY LATE JULY OR EARLY AUGUST. CONSTRUCTION CAN COMMENCE ONCE ALL PERMITS ARE IN PLACE.
3. THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY THEABOVE MENTIONED CONTACTS OF ANY DISCREPANCIES.
4. 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.
5. 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.
6. CONTRACTOR TO PROTECT ALL UTILITY, PAVING, BUILDINGS, ETC. OUTSIDE OF LIMITS OF PROPOSED CONSTRUCTION.
7. IN THE EVENT THAT THERE IS A DISCREPANCY BETWEEN THE QUANTITIES AND THE PLANS, THE DETAILED PLANS SHALL GOVERN.
8. CONTRACTOR SHALL SEED/MULCH ALL DISTURBED AREAS. USE CLASS 'C' SEED MIX.
9. MAINTAIN ALL CUT AND FILL AREAS TO ACCOMMODATE SURFACE DRAINAGE.
10. FINISHED GRADE ON ALL NON-PAVED AREAS SHALL BE WITHIN 0.20 FOOT OF PLAN GRADE. PAVED AREAS SHALL BE WITHIN 0.10 FOOT.
11. TOPSOIL SHALL BE SPREAD TO A MINIMUM THICKNESS OF 6-INCHES ON ALL DISTURBED UNPAVED AREAS.
12. BACKFILL TO THE TOP OF ALL ROCK OR PAVED SURFACES.
13. ALL ELEVATIONS ARE TO THE GUTTER GRADE UNLESS NOTED OTHERWISE.
14. PROTECT ALL EXISTING TREES AND VEGETATION UNLESS OTHERWISE NOTED.
15. ANY SPOIL MATERIAL THAT MAY BE GENERATED DURING THE CONSTRUCTION, COORDINATE LOCATION FOR DISPOSITION WITH THE DNR INSPECTOR AND IS CONSIDERED INCIDENTAL TO THE PROJECT.

CONSULTANT:

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

QUANTITIES & GENERAL NOTES

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHKD BY:
DATE: 6/17/2013

SHEET No: 3

SURVEY CONTROL POINTS

SURVEY CONTROL POINT #203
N: 401548.3630
E: 1397425.9280
ELEV: 1279.217
NAIL WITH 5/8" HEAD.

SURVEY CONTROL POINT #204
N: 401902.5820
E: 1397474.4240
ELEV: 1272.123
NAIL WITH 5/8" HEAD.

SURVEY CONTROL POINT #205
N: 402048.8620
E: 1397574.4220
ELEV: 1286.476
NAIL WITH 5/8" HEAD.

SURVEY CONTROL POINT #260
N: 403970.4170
E: 1394996.4780
ELEV: 1273.164
NAIL

SURVEY CONTROL POINT #261
N: 404173.4400
E: 1395024.9240
ELEV: 1276.921
NAIL

SURVEY CONTROL POINT #262
N: 404005.7210
E: 1395285.5980
ELEV: 1274.710
NAIL WITH 5/8" HEAD.

SURVEY CONTROL POINT #263
N: 403927.7195
E: 1395489.7496
ELEV: 1270.228
NAIL WITH 5/8" HEAD.

CONSULTANT:

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

SURVEY CONTROL

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 4

No.	Type	Length	Radius	Direction	Start Station	End Station	Delta angle	Chord length	Chord Direction	Start Point	End Point	Center Point
1	Line	43.66'		N57° 59' 18"W	0+00.00'	0+43.66'				(1397542.4777',401387.7419',	(1397505.4535',401410.8877',0.0000')	
2	Curve	9.86'	75.00'		0+43.66'	0+53.53'	7.5343 (d)	9.86'	N54° 13' 16"W	(1397505.4535',401410.8877',	(1397497.4581',401416.6497',	(1397545.2105',401474.4832',
3	Line	117.27'		N50° 27' 14"W	0+53.53'	1+70.80'				(1397497.4581',401416.6497',	(1397407.0282',401491.3165',0.0000')	
4	Curve	117.82'	75.00'		1+70.80'	2+88.62'	90.0114 (d)	106.08'	N5° 26' 54"W	(1397407.0282',401491.3165',	(1397396.9567',401596.9139',	(1397454.7806',401549.1500',
5	Line	129.78'		N39° 33' 27"E	2+88.62'	4+18.40'				(1397396.9567',401596.9139',	(1397479.6063',401696.9712',0.0000')	
6	Curve	40.12'	150.00'		4+18.40'	4+58.52'	15.3252 (d)	40.00'	N31° 53' 42"E	(1397479.6063',401696.9712',	(1397500.7417',401730.9334',	(1397363.9584',401792.4990',
7	Line	107.01'		N24° 13' 56"E	4+58.52'	5+65.53'				(1397500.7417',401730.9334',	(1397544.6622',401828.5137',0.0000')	
8	Curve	103.41'	50.00'		5+65.53'	6+68.94'	118.4989 (d)	85.94'	N35° 01' 02"W	(1397544.6622',401828.5137',	(1397495.3479',401898.8970',	(1397499.0677',401849.0356',
9	Line	35.60'		S85° 44' 00"W	6+68.94'	7+04.54'				(1397495.3479',401898.8970',	(1397459.8466',401896.2485',0.0000')	
10	Curve	173.25'	100.00'		7+04.54'	8+77.79'	99.2626 (d)	152.38'	N44° 38' 07"W	(1397459.8466',401896.2485',	(1397352.7868',402004.6799',	(1397452.4069',401995.9713',
11	Line	13.58'		N4° 59' 45"E	8+77.79'	8+91.37'				(1397352.7868',402004.6799',	(1397353.9698',402018.2120',0.0000')	
12	Curve	39.53'	100.00'		8+91.37'	9+30.90'	22.6512 (d)	39.28'	N6° 19' 47"W	(1397353.9698',402018.2120',	(1397349.6396',402057.2495',	(1397254.3497',402026.9206',
13	Line	14.19'		N17° 39' 19"W	9+30.90'	9+45.10'				(1397349.6396',402057.2495',	(1397345.3344',402070.7758',0.0000')	
14	Curve	75.99'	100.00'		9+45.10'	10+21.09'	43.5400 (d)	74.18'	N4° 06' 53"E	(1397345.3344',402070.7758',	(1397350.6568',402144.7609',	(1397440.6243',402101.1047',
15	Line	4.85'		N25° 53' 05"E	10+21.09'	10+25.94'				(1397350.6568',402144.7609',	(1397352.7760',402149.1280',0.0000')	
16	Curve	121.13'	150.00'		10+25.94'	11+47.08'	46.2687 (d)	117.87'	N2° 45' 01"E	(1397352.7760',402149.1280',	(1397358.4317',402266.8587',	(1397217.8248',402214.6122',
17	Line	9.36'		N20° 23' 02"W	11+47.08'	11+56.44'				(1397358.4317',402266.8587',	(1397355.1716',402275.6325',0.0000')	
18	Curve	92.18'	80.00'		11+56.44'	12+48.62'	66.0225 (d)	87.17'	N53° 23' 43"W	(1397355.1716',402275.6325',	(1397285.1955',402327.6104',	(1397280.1812',402247.7677',
19	Line	47.34'		N86° 24' 23"W	12+48.62'	12+95.96'				(1397285.1955',402327.6104',	(1397237.9513',402330.5774',0.0000')	
20	Curve	114.82'	100.00'		12+95.96'	14+10.78'	65.7857 (d)	108.61'	N53° 30' 49"W	(1397237.9513',402330.5774',	(1397150.6259',402395.1627',	(1397244.2191',402430.3808',
21	Line	128.28'		N20° 37' 15"W	14+10.78'	15+39.05'				(1397150.6259',402395.1627',	(1397105.4494',402515.2208',0.0000')	
22	Curve	80.41'	200.00'		15+39.05'	16+19.46'	23.0350 (d)	79.87'	N32° 08' 18"W	(1397105.4494',402515.2208',	(1397062.9630',402582.8494',	(1396918.2630',402444.7846',
23	Line	71.31'		N43° 39' 21"W	16+19.46'	16+90.77'				(1397062.9630',402582.8494',	(1397013.7336',402634.4447',0.0000')	
24	Curve	61.63'	100.00'		16+90.77'	17+52.40'	35.3094 (d)	60.66'	N26° 00' 04"W	(1397013.7336',402634.4447',	(1396987.1427',402688.9614',	(1397086.0836',402703.4771',
25	Line	12.46'		N8° 20' 47"W	17+52.40'	17+64.86'				(1396987.1427',402688.9614',	(1396985.3334',402701.2937',0.0000')	
26	Curve	132.52'	100.00'		17+64.86'	18+97.38'	75.9276 (d)	123.03'	N29° 37' 03"E	(1396985.3334',402701.2937',	(1397046.1369',402808.2515',	(1397084.2743',402715.8094',
27	Line	5.89'		N67° 34' 52"E	18+97.38'	19+03.28'				(1397046.1369',402808.2515',	(1397051.5842',402810.4988',0.0000')	
28	Curve	140.87'	100.00'		19+03.28'	20+44.15'	80.7135 (d)	129.51'	N27° 13' 28"E	(1397051.5842',402810.4988',	(1397110.8316',402925.6609',	(1397013.4468',402902.9409',
29	Line	33.78'		N13° 07' 56"W	20+44.15'	20+77.92'				(1397110.8316',402925.6609',	(1397103.1577',402958.5535',0.0000')	
30	Curve	75.23'	150.00'		20+77.92'	21+53.15'	28.7354 (d)	74.44'	N1° 14' 07"E	(1397103.1577',402958.5535',	(1397104.7628',403032.9793',	(1397249.2350',402992.6335',
31	Line	25.15'		N15° 36' 11"E	21+53.15'	21+78.30'				(1397104.7628',403032.9793',	(1397111.5270',403057.2009',0.0000')	
32	Curve	91.97'	100.00'		21+78.30'	22+70.27'	52.6928 (d)	88.76'	N41° 56' 58"E	(1397111.5270',403057.2009',	(1397170.8603',403123.2143',	(1397207.8418',403030.3037',
33	Line	54.46'		N68° 17' 45"E	22+70.27'	23+24.73'				(1397170.8603',403123.2143',	(1397221.4634',403143.3560',0.0000')	
34	Curve	59.88'	50.00'		23+24.73'	23+84.61'	68.6129 (d)	56.36'	N33° 59' 22"E	(1397221.4634',403143.3560',	(1397252.9719',403190.0880',	(1397202.9727',403189.8112',
35	Line	73.70'		N0° 19' 02"W	23+84.61'	24+58.30'				(1397252.9719',403190.0880',	(1397252.5641',403263.7850',0.0000')	
36	Curve	92.19'	100.00'		24+58.30'	25+50.49'	52.8209 (d)	88.96'	N26° 05' 36"E	(1397252.5641',403263.7850',	(1397291.6916',403343.6778',	(1397352.5625',403264.3385',
37	Line	2.30'		N52° 30' 14"E	25+50.49'	25+52.79'				(1397291.6916',403343.6778',	(1397293.5159',403345.0774',0.0000')	
38	Curve	18.37'	100.00'		25+52.79'	25+71.16'	10.5239 (d)	18.34'	N47° 14' 30"E	(1397293.5159',403345.0774',	(1397306.9829',403357.5298',	(1397232.6449',403424.4168',
39	Line	92.26'		N41° 58' 47"E	25+71.16'	26+63.42'				(1397306.9829',403357.5298',	(1397368.6935',403426.1149',0.0000')	
40	Curve	61.20'	50.00'		26+63.42'	27+24.62'	70.1257 (d)	57.45'	N77° 02' 34"E	(1397368.6935',403426.1149',	(1397424.6782',403438.9960',	(1397405.8625',403392.6714',
41	Line	65.67'		S67° 53' 40"E	27+24.62'	27+90.29'				(1397424.6782',403438.9960',	(1397485.5224',403414.2829',0.0000')	
42	Curve	97.10'	50.00'		27+90.29'	28+87.39'	111.2705 (d)	82.55'	N56° 28' 13"E	(1397485.5224',403414.2829',	(1397554.3328',403459.8787',	(1397504.3381',403460.6075',
43	Line	29.68'		N0° 50' 06"E	28+87.39'	29+17.07'				(1397554.3328',403459.8787',	(1397554.7654',403489.5556',0.0000')	
44	Curve	7.49'	100.00'		29+17.07'	29+24.57'	4.2943 (d)	7.49'	N2° 58' 56"E	(1397554.7654',403489.5556',	(1397555.1552',403497.0386',	(1397654.7547',403488.0981',
45	Line	68.79'		N5° 07' 46"E	29+24.57'	29+93.35'				(1397555.1552',403497.0386',	(1397561.3050',403565.5488',0.0000')	
46	Curve	71.02'	50.00'		29+93.35'	30+64.38'	81.3867 (d)	65.20'	N45° 49' 22"E	(1397561.3050',403565.5488',	(1397608.0664',403610.9861',	(1397611.1048',403561.0785',
47	Line	102.48'		N86° 30' 58"E	30+64.38'	31+66.86'				(1397608.0664',403610.9861',	(1397710.3578',403617.2137',0.0000')	
48	Curve	82.02'	50.00'		31+66.86'	32+48.87'	93.9832 (d)	73.13'	N39° 31' 28"E	(1397710.3578',403617.2137',	(1397756.8954',403673.6191',	(1397707.3194',403667.1213',
49	Line	78.54'		N7° 28' 01"W	32+48.87'	33+27.41'				(1397756.8954',403673.6191',	(1397746.6893',403751.4881',0.0000')	
50	Curve	186.07'	125.00'		33+27.41'	35+13.47'	85.2864 (d)	169.36'	N35° 10' 34"E	(1397746.6893',403751.4881',	(1397844.2548',403889.9185',	(1397870.6293',403767.7326',
51	Line	39.53'		N77° 49' 09"E	35+13.47'	35+53.01'				(1397844.2548',403889.9185',	(1397882.8984',403898.2599',0.0000')	
52	Curve	78.07'	125.00'		35+53.01'	36+31.07'	35.7834 (d)	76.80'	S84° 17' 20"E	(1397882.8984',403898.2599',	(1397959.3219',403890.6170',	(1397909.2729',403776.0741',
53	Line	40.10'		S66° 23' 50"E	36+31.07'	36+71.17'				(1397959.3219',403890.6170',	(1397996.0643',403874.5626',0.0000')	
54	Curve	22.35'	100.00'		36+71.17'	36+93.52'	12.8038 (d)	22.30'	S59° 59' 43"E	(1397996.0643',403874.5626',	(1398015.3761',403863.4109',	(1397956.0251',403782.9282',
55	Line	50.70'		S53° 35' 37"E	36+93.52'	37+44.22'				(1398015.3761',403863.4109',	(1398056.1835',403833.3179',0.0000')	
56	Curve	24.85'	100.00'		37+44.22'	37+69.08'	14.2402 (d)	24.79'	S60° 42' 49"E	(1398056.1835',403833.3179',	(1398077.8049',403821.1913',	(1398115.5345',403913.8006',
57	Line	122.82'		S67° 50' 01"E	37+69.08'	38+91.90'				(1398077.8049',403821.1913',	(1398191.5514',403774.8503',0.0000')	
58	Curve	76.40'	300.00'		38+91.90'	39+68.30'	14.5912 (d)	76.19'	S60° 32' 17"E	(1398191.5514',403774.8503',	(1398257.8915',403737.3750',	(1398078.3626',403497.0225',
59	Line	44.61'		S53° 14' 33"E	39+68.30'	40+12.91'				(1398257.8915',403737.3750',	(1398293.6325',403710.6786',0.0000')	
60	Curve	41.39'	150.00'		40+12.91'	40+54.30'	15.8095 (d)	41.26'	S61° 08' 50"E	(1398293.6325',403710.6786',	(1398329.7689',403690.7691',	(1398383.3970',403830.8549',
61	Line	57.42'		S69° 03' 07"E	40+54.30'	41+11.71'				(1398329.7689',403690.7691',	(1398383.3892',403670.2420',0.0000')	
62	Curve	45.83'	100.00'		41+11.71'	41+57.54'	26.2560 (d)	45.43'	S55° 55' 26"E	(1398383.3892',403670.2420',	(1398421.0149',403644.7904',	(1398347.6372',403576.8515',
63	Line	92.27'		S42° 47' 46"E	41+57.54'	42+49.81'				(1398421.0149',403644.7904',	(1398483.7046',403577.0822',0.0000')	
64	Curve	49.62'	100.00'		42+49.81'	42+99.44'	28.4323 (d)	49.12'	S57° 00' 44"E	(1398483.7046',403577.0822',	(1398524.9026',403550.3403',	(1398557.0824',403645.0212',
65	Line	111.59'		S71° 13' 42"E	42+99.44'	44+11.02'				(1398524.9026',403550.3403',	(1398630.5552',403514.4315',0.0000')	
66	Curve	18.45'	200.00'		44+11.02'	44+29.47'	5.2855 (d)	18.44'	S73° 52' 16"E	(1398630.5552',403514.4315',	(1398648.2726',403509.3079',	(1398694.9148',403703.7932',
67	Line	112.87'		S76° 30' 50"E	44+29.47'	45+42.34'				(1398648.2726',403509.3079',	(1398758.0281',403482.9860',0.0000')	
68	Curve	97.91'	100.00'		45+42.34'	46+40.25'	56.0973 (d)	94.04'	N75° 26' 15"E	(1398758.0281',403482.9860',	(1398849.0511',403506.6321',	(1398781.3492',403580.2286',
69	Line	19.31'		N47° 23' 20"E	46+40.25'	46+59.57'				(1398849.0511',403506.6321',	(1398863.2658',403519.7082',0.0000')	
70	Curve	71.81'	50.00'		46+59.57'	47+31.38'	82.2931 (d)	65.80'	N6° 14' 32"E	(1398863.2658',403519.7082',	(1398870.4203',403585.1169',	(1398829.4148',403556.5065',
71	Line	169.94'		N34° 54' 15"W	47+31.38'	49+01.32'				(1398870.4203',403585.1169',	(1398773.1766',403724.4903',0.0000')	
72	Curve	32.59'	200.00'		49+01.32'	49+33.91'	9.3357 (d)	32.55'	N39° 34' 20"W	(1398773.1766',403724.4903',	(1398752.4396',403749.5819',	(1398609.1547',403610.0489',
73	Line	50.07'		N44° 14' 24"W	49+33.91'	49+83.98'				(1398752.4396',403749.5819',	(1398717.5068',403785.4540',0.0000')	
74	Curve	18.51'	200.00'		49+83.98'	50+02.49'	5.3024 (d)	18.50'	N41° 35' 20"W	(1398717.5068',403785.4540',	(1398705.2254',403799.2923',	(1398860.7916',403924.9870',
75	Line	87.83'		N38° 56' 15"W	50+02.49'	50+90.32'				(1398705.2254',403799.2923',	(1398650.0271',403867.6086',0.0000')	
76	Curve	62.87'	200.00'		50+90.32'	51+53.19'	18.0100 (d)	62.61'	N47° 56' 33"W	(1398650.0271',403867.6086',	(1398603.5420',403909.5484',	(1398494.4608',403741.9140',
77	Line	48.25'		N56° 56' 51"W	51+53.19'	52+01.44'				(1398603.5420',403909.5484',	(1398563.1021',403935.8630',0.0000')	
78	Curve	30.99'	200.00'		52+01.44'	52+32.43'	8.8783 (d)	30.96'	N52° 30' 30"W	(1398563.1021',403935.8630',	(1398538.5371',403954.7067',	(1398672.1833',404103.4974',
79	Line	110.42'		N48° 04' 10"W	52+32.43'	53+42.84'				(1398538.5371',403954.7067',	(1398456.3930',404028.4898',0.0000')	
80	Curve	28.19'	200.00'		53+42.84'	53+71.04'	8.0768 (d)	28.17'	N52° 06' 28"W	(1398456.3930',404028.4898',	(1398434.1622',404045.7912',	(1398322.7468',403879.6990',
81	Line	114.86'		N56° 08' 46"W	53+71.04'	54+85.89'				(1398434.1622',404045.7912',	(1398338.7793',404109.7745',0.0000')	
82	Curve	42.06'	200.00'		54+85.89'	55+27.96'	12.0505 (d)	41.99'	N50° 07' 15"W	(1398338.7793',404109.7745',	(1398306.5588',404136.6952',	(1398450.1948',404275.8666',
83	Line	55.04'		N44° 05' 44"W	55+27.96'	55+82.99'				(1398306.5588',404136.6952',	(1398268.2597',404176.2229',0.0000')	
84	Curve	115.37'	50.00'		55+82.99'	56+98.36'	132.2045 (d)	91.43'	N22° 00' 24"E	(1398268.2597',404176.2229',	(1398302.5188',404260.9886',	(1398304.1687',404211.0158',
85	Line	131.26'		N88° 06' 32"E	56+98.36'	58+29.63'				(1398302.5188',404260.9886',	(1398433.7087',404265.3200',0.0000')	
86	Curve	75.05'	100.00'		58+29.63'	59+04.68'	43.0005 (d)	73.30'	N66° 36' 32"E	(1398433.7087',404265.3200',	(1398500.9855',404294.4210',	(1398430.4089',404365.2655',
87	Line	71.15'		N45° 06' 31"E	59+04.68'	59+75.82'				(1398500.9855',404294.4210',	(1398551.3907',404344.6356',0.0000')	
88	Curve	92.23'	75.00'		59+75.82'	60+68.06'	70.4601 (d)	86.53'	N80° 20' 19"E	(1398551.3907',404344.6356',	(1398636.6925',404359.1575',	(1398604.3231',404291.5023',
89	Line	46.50'		S64° 25' 53"E	60+68.06'	61+14.56'				(1398636.6925',404359.1575',	(1398678.6419',404339.0869',0.0000')	
90	Curve	18.62'	100.00'		61+14.56'	61+33.18'	10.6676 (d)	18.59'	S69° 45' 55"E	(1398678.6419',404339.0869',	(1398696.0861',404332.6567',	(1398721.8011',404429.2938',
91	Line	25.05'		S75° 05' 56"E	61+33.18'	61+58.23'				(1398696.0861',404332.6567',	(1398720.2977',404326.2140',0.0000')	
92	Curve	42.32'	75.00'		61+58.23'	62+00.56'	32.3319 (d)	41.76'	S58° 55' 59"E	(1398720.2977',404326.2140',	(1398756.0704',404304.6626',	(1398701.0114',404253.7362',
93	Line	34.98'		S42° 46' 01"E	62+00.56'	62+35.53'				(1398756.0704',404304.6626',	(1398779.8194',404278.9865',0.0000')	
94	Curve	103.28'	200.00'		62+35.53'	63+38.81'	29.5880 (d)	102.14'	S57° 33' 40"E	(1398779.8194',404278.9865',	(1398866.0200',404224.1998',	(1398926.6434',404414.7904',
95	Line	42.27'		S72° 21' 18"E	63+38.81'	63+81.08'				(1398866.0200',404224.1998',	(1398906.3021',404211.3868',0.0000')	
96	Curve	93.47'	50.00'		63+81.08'	64+74.55'	107.1067 (d)	80.44'	N54° 05' 30"E	(1398906.3021',404211.3868',	(1398971.4557',404258.5648',	(1398921.4580',404259.0344',
97	Line	473.81'		N0° 32' 18"E	64+74.55'	69+48.36'				(1398971.4557',404258.5648',	(1398975.9067',404732.3575',0.0000')	
98	Curve	23.60'	50.00'		69+48.36'	69+71.96'	27.0413 (d)	23.38'	N14° 03' 32"E	(1398975.9067',404732.3575',	(1398981.5860',404755.0367',	(1399025.9044',404731.8878',
99	Line	0.06'		N27° 34' 46"E	69+71.96'	69+72.02'				(1398981.5860',404755.0367',	(1398981.6117',404755.0859',0.0000')	
100	Curve	23.49'	50.00'		69+72.02'	69+95.51'	26.9209 (d)	23.28'	N14° 07' 08"E	(1398981.6117',404755.0859',	(1398987.2899',404777.6602',	(1398937.2932',404778.2349',
101	Line	30.97'		N0° 39' 31"E	69+95.51'	70+26.48'				(1398987.2899',404777.6602',	(1398987.6458',404808.6240',0.0000')	
102	Curve	100.55'	50.00'		70+26.48'	71+27.03'	115.2262 (d)	84.45'	N56° 57' 16"W	(1398987.6458',404808.6240',	(1398916.8607',404854.6722',	(1398937.6491',404809.1987',
103	Line	153.51'		S65° 25' 56"W	71+27.03'	72+80.54'				(1398916.8607',404854.6722',	(1398777.2481',404790.8478',0.0000')	
104	Curve	183.12'	225.00'		72+80.54'	74+63.67'	46.6324 (d)	178.11'	S88° 44' 55"W	(1398777.2481',404790.8478',	(1398599.1783',404786.9576',	(1398683.7003',404995.4787',
105	Line	160.96'		N67° 56' 07"W	74+63.67'	76+24.62'				(1398599.1783',404786.9576',	(1398450.0088',404847.4221',0.0000')	
106	Curve	92.16'	100.00'		76+24.62'	77+16.78'	52.8030 (d)	88.93'	N41° 32' 02"W	(1398450.0088',404847.4221',	(1398391.0416',404913.9933',	(1398487.5741',404940.0981',
107	Line	66.27'		N15° 07' 56"W	77+16.78'	77+83.05'				(1398391.0416',404913.9933',	(1398373.7415',404977.9669',0.0000')	
108	Curve	18.76'	100.00'		77+83.05'	78+01.81'	10.7484 (d)	18.73'	N20° 30' 23"W	(1398373.7415',404977.9669',	(1398367.1794',404995.5119',	(1398277.2089',404951.8621',
109	Line	81.21'		N25° 52' 50"W	78+01.81'	78+83.02'				(1398367.1794',404995.5119',	(1398331.7322',405068.5753',0.0000')	
110	Curve	38.88'	100.00'		78+83.02'	79+21.90'	22.2777 (d)	38.64'	N14° 44' 30"W	(1398331.7322',405068.5753',	(1398321.9004',405105.9409',	(1398421.7028',405112.2251',
111	Line	95.67'		N3° 36' 11"W	79+21.90'	80+17.58'				(1398321.9004',405105.9409',	(1398315.8881',405201.4254',0.0000')	
112	Curve	4.96'	100.00'		80+17.58'	80+22.53'	2.8404 (d)	4.96'	N5° 01' 23"W	(1398315.8881',405201.4254',	(1398315.4541',405206.3633',	(1398216.0857',405195.1412',
113	Line	181.62'		N6° 26' 36"W	80+22.53'	82+04.16'				(1398315.4541',405206.3633',	(1398295.0722',405386.8379',0.0000')	
114	Curve	44.42'	100.00'		82+04.16'	82+48.57'	25.4481 (d)	44.05'	N6° 16' 50"E	(1398295.0722',405386.8379',	(1398299.8913',405430.6246',	(1398394.4405',405398.0601',
115	Line	75.72'		N19° 00' 17"E	82+48.57'	83+24.29'				(1398299.8913',405430.6246',	(1398324.5490',405502.2166',0.0000')	
116	Curve	100.90'	100.00'		83+24.29'	84+25.19'	57.8110 (d)	96.67'	N47° 54' 37"E	(1398324.5490',405502.2166',	(1398396.2897',405567.0162',	(1398419.0982',405469.6521',
117	Line	27.67'		N76° 48' 56"E	84+25.19'	84+52.86'				(1398396.2897',405567.0162',	(1398423.2257',405573.3262',0.0000')	
118	Curve	80.96'	75.00'		84+52.86'	85+33.82'	61.8494 (d)	77.09'	N45° 53' 27"E	(1398423.2257',405573.3262',	(1398478.5752',405626.9805',	(1398406.1194',405646.3493',
119	Line	3.28'		N14° 57' 59"E	85+33.82'	85+37.10'				(1398478.5752',405626.9805',	(1398479.4232',405630.1528',0.0000')	
120	Curve	91.96'	125.00'		85+37.10'	86+29.06'	42.1507 (d)	89.90'	N36° 02' 30"E	(1398479.4232',405630.1528',	(1398532.3172',405702.8440',	(1398600.1830',405597.8715',
121	Line	171.84'		N57° 07' 01"E	86+29.06'	88+00.90'				(1398532.3172',405702.8440',	(1398676.6262',405796.1413',0.0000')	
122	Curve	19.17'	100.00'		88+00.90'	88+20.07'	10.9834 (d)	19.14'	N62° 36' 31"E	(1398676.6262',405796.1413',	(1398693.6205',405804.9471',	(1398730.9188',405712.1632',
123	Line	56.83'		N68° 06' 01"E	88+20.07'	88+76.90'				(1398693.6205',405804.9471',	(1398746.3490',405826.1435',0.0000')	
124	Curve	82.56'	50.00'		88+76.90'	89+59.46'	94.6055 (d)	73.49'	N20° 47' 51"E	(1398746.3490',405826.1435',	(1398772.4446',405894.8493',	(1398727.6999',405872.5354',
125	Line	438.73'		N26° 30' 19"W	89+59.46'	93+98.19'				(1398772.4446',405894.8493',	(1398576.6491',406287.4653',0.0000')	
126	Curve	43.72'	50.00'		93+98.19'	94+41.91'	50.1008 (d)	42.34'	N1° 27' 17"W	(1398576.6491',406287.4653',	(1398575.5742',406329.7931',	(1398621.3938',406309.7792',
127	Line	18.66'		N23° 35' 44"E	94+41.91'	94+60.57'				(1398575.5742',406329.7931',	(1398583.0445',406346.8957',0.0000')	
128	Curve	44.00'	50.00'		94+60.57'	95+04.57'	50.4192 (d)	42.59'	N1° 36' 50"W	(1398583.0445',406346.8957',	(1398581.8449',406389.4719',	(1398537.2249',406366.9096',
129	Line	148.66'		N26° 49' 25"W	95+04.57'	96+53.23'				(1398581.8449',406389.4719',	(1398514.7648',406522.1322',0.0000')	
130	Curve	32.65'	100.00'		96+53.23'	96+85.87'	18.7061 (d)	32.50'	N36° 10' 36"W	(1398514.7648',406522.1322',	(1398495.5788',406548.3690',	(1398425.5248',406477.0077',
131	Line	110.22'		N45° 31' 47"W	96+85.87'	97+96.09'				(1398495.5788',406548.3690',	(1398416.9250',406625.5818',0.0000')	
132	Curve	83.05'	200.00'		97+96.09'	98+79.15'	23.7929 (d)	82.46'	N33° 38' 00"W	(1398416.9250',406625.5818',	(1398371.2540',406694.2357',	(1398557.0330',406768.3044',
133	Line	18.96'		N21° 44' 13"W	98+79.15'	98+98.11'				(1398371.2540',406694.2357',	(1398364.2305',406711.8520',0.0000')	
134	Curve	84.54'	200.00'		98+98.11'	99+82.65'	24.2182 (d)	83.91'	N9° 37' 40"W	(1398364.2305',406711.8520',	(1398350.1970',406794.5798',	(1398550.0095',406785.9207',
135	Line	25.37'		N2° 28' 53"E	99+82.65'	100+08.02'				(1398350.1970',406794.5798',	(1398351.2954',406819.9252',0.0000')	
136	Curve	48.03'	100.00'		100+08.02'	100+56.05'	27.5183 (d)	47.57'	N11° 16' 40"W	(1398351.2954',406819.9252',	(1398341.9927',406866.5749',	(1398251.3892',406824.2547',
137	Line	29.40'		N25° 02' 13"W	100+56.05'	100+85.45'				(1398341.9927',406866.5749',	(1398329.5500',406893.2136',0.0000')	
138	Curve	60.69'	100.00'		100+85.45'	101+46.13'	34.7705 (d)	59.76'	N7° 39' 06"W	(1398329.5500',406893.2136',	(1398321.5931',406952.4406',	(1398420.1535',406935.5338',
139	Line	73.08'		N9° 44' 01"E	101+46.13'	102+19.22'				(1398321.5931',406952.4406',	(1398333.9490',407024.4716',0.0000')	
140	Curve	16.88'	100.00'		102+19.22'	102+36.10'	9.6742 (d)	16.86'	N14° 34' 15"E	(1398333.9490',407024.4716',	(1398338.1917',407040.7938',	(1398432.5095',407007.5648',
141	Line	140.16'		N19° 24' 28"E	102+36.10'	103+76.26'				(1398338.1917',407040.7938',	(1398384.7649',407172.9878',0.0000')	
142	Curve	91.63'	50.00'		103+76.26'	104+67.89'	105.0047 (d)	79.34'	N33° 05' 40"W	(1398384.7649',407172.9878',	(1398341.4446',407239.4547',	(1398337.6060',407189.6023',
143	Line	12.32'		N85° 35' 49"W	104+67.89'	104+80.21'				(1398341.4446',407239.4547',	(1398329.1596',407240.4007',0.0000')	
144	Line	7.85'		N86° 05' 28"W	104+80.21'	104+88.07'				(1398329.1596',407240.4007',	(1398321.3248',407240.9360',0.0000')	
145	Line	44.44'		N0° 23' 44"E	104+88.07'	105+32.51'				(1398321.3248',407240.9360',	(1398321.6316',407285.3766',0.0000')	
146	Line	1168.70'		N88° 47' 51"W	105+32.51'	117+01.21'				(1398321.6316',407285.3766',	(1397153.1863',407309.9029',0.0000')	
147	Line	22.96'		S0° 32' 46"W	117+01.21'	117+24.17'				(1397153.1863',407309.9029',	(1397152.9674',407286.9447',0.0000')	
148	Line	43.15'		S33° 05' 47"W	117+24.17'	117+67.32'				(1397152.9674',407286.9447',	(1397129.4054',407250.7957',0.0000')	
149	Line	51.77'		S24° 33' 14"W	117+67.32'	118+19.10'				(1397129.4054',407250.7957',	(1397107.8904',407203.7027',0.0000')	
150	Line	34.23'		S3° 17' 14"W	118+19.10'	118+53.33'				(1397107.8904',407203.7027',	(1397105.9274',407169.5257',0.0000')	
151	Line	42.33'		S16° 51' 14"E	118+53.33'	118+95.66'				(1397105.9274',407169.5257',	(1397118.2014',407129.0097',0.0000')	
152	Line	75.02'		S23° 50' 04"E	118+95.66'	119+70.69'				(1397118.2014',407129.0097',	(1397148.5174',407060.3857',0.0000')	
153	Line	46.98'		S17° 09' 50"E	119+70.69'	120+17.67'				(1397148.5174',407060.3857',	(1397162.3824',407015.4947',0.0000')	
154	Line	50.84'		S7° 25' 25"E	120+17.67'	120+68.51'				(1397162.3824',407015.4947',	(1397168.9514',406965.0787',0.0000')	
155	Line	51.00'		S3° 28' 49"W	120+68.51'	121+19.51'				(1397168.9514',406965.0787',	(1397165.8554',406914.1707',0.0000')	
156	Line	239.51'		S19° 12' 50"W	121+19.51'	123+59.02'				(1397165.8554',406914.1707',	(1397087.0354',406688.0067',0.0000')	
157	Line	68.86'		S13° 07' 09"W	123+59.02'	124+27.88'				(1397087.0354',406688.0067',	(1397071.4054',406620.9427',0.0000')	
158	Line	70.54'		S5° 17' 22"W	124+27.88'	124+98.42'				(1397071.4054',406620.9427',	(1397064.9024',406550.7017',0.0000')	
159	Line	61.17'		S0° 11' 24"E	124+98.42'	125+59.59'				(1397064.9024',406550.7017',	(1397065.1054',406489.5277',0.0000')	
160	Line	219.71'		S2° 19' 54"E	125+59.59'	127+79.31'				(1397065.1054',406489.5277',	(1397074.0444',406269.9967',0.0000')	
161	Line	15.67'		S1° 24' 41"E	127+79.31'	127+94.98'				(1397074.0444',406269.9967',	(1397074.4304',406254.3295',0.0000')	
162	Line	9.97'		N88° 35' 29"E	127+94.98'	128+04.95'				(1397074.4304',406254.3295',	(1397084.3956',406254.5746',0.0000')	
163	Line	48.93'		N88° 35' 29"E	128+04.95'	128+53.88'				(1397084.3956',406254.5746',	(1397133.3139',406255.7774',0.0000')	
164	Curve	64.58'	100.00'		128+53.88'	129+18.47'	37.0043 (d)	63.47'	S72° 54' 23"E	(1397133.3139',406255.7774',	(1397193.9783',406237.1221',	(1397135.7721',406155.8077',
165	Line	2.92'		S54° 24' 16"E	129+18.47'	129+21.39'				(1397193.9783',406237.1221',	(1397196.3561',406235.4201',0.0000')	
166	Curve	26.16'	100.00'		129+21.39'	129+47.55'	14.9908 (d)	26.09'	S61° 53' 59"E	(1397196.3561',406235.4201',	(1397219.3701',406223.1316',	(1397254.5623',406316.7345',
167	Line	134.79'		S69° 23' 42"E	129+47.55'	130+82.34'				(1397219.3701',406223.1316',	(1397345.5347',406175.6971',0.0000')	
168	Curve	29.08'	100.00'		130+82.34'	131+11.42'	16.6602 (d)	28.98'	S61° 03' 54"E	(1397345.5347',406175.6971',	(1397370.8929',406161.6784',	(1397310.3425',406082.0941',
169	Line	100.67'		S52° 44' 06"E	131+11.42'	132+12.09'				(1397370.8929',406161.6784',	(1397451.0103',406100.7223',0.0000')	
170	Curve	42.19'	100.00'		132+12.09'	132+54.28'	24.1756 (d)	41.88'	S40° 38' 50"E	(1397451.0103',406100.7223',	(1397478.2922',406068.9450',	(1397390.4599',406021.1381',
171	Line	112.56'		S28° 33' 34"E	132+54.28'	133+66.84'				(1397478.2922',406068.9450',	(1397532.1012',405970.0852',0.0000')	
172	Curve	154.06'	500.00'		133+66.84'	135+20.90'	17.6544 (d)	153.46'	S19° 43' 56"E	(1397532.1012',405970.0852',	(1397583.9112',405825.6405',	(1397092.9399',405731.0510',
173	Line	75.23'		S10° 54' 18"E	135+20.90'	135+96.14'				(1397583.9112',405825.6405',	(1397598.1440',405751.7649',0.0000')	
174	Curve	76.66'	300.00'		135+96.14'	136+72.80'	14.6410 (d)	76.45'	S18° 13' 31"E	(1397598.1440',405751.7649',	(1397622.0547',405679.1485',	(1397892.7267',405808.5187',
175	Line	5.85'		S25° 32' 45"E	136+72.80'	136+78.64'				(1397622.0547',405679.1485',	(1397624.5763',405673.8727',0.0000')	
176	Curve	222.16'	500.00'		136+78.64'	139+00.81'	25.4580 (d)	220.34'	S12° 49' 01"E	(1397624.5763',405673.8727',	(1397673.4557',405459.0228',	(1397173.4563',405458.2557',
177	Line	48.66'		S0° 05' 16"E	139+00.81'	139+49.47'				(1397673.4557',405459.0228',	(1397673.5303',405410.3589',0.0000')	
178	Curve	158.81'	125.00'		139+49.47'	141+08.28'	72.7947 (d)	148.35'	S36° 18' 34"W	(1397673.5303',405410.3589',	(1397585.6882',405290.8176',	(1397548.5305',405410.1671',
179	Line	65.60'		S72° 42' 24"W	141+08.28'	141+73.88'				(1397585.6882',405290.8176',	(1397523.0537',405271.3173',0.0000')	
180	Curve	79.37'	300.00'		141+73.88'	142+53.25'	15.1587 (d)	79.14'	S65° 07' 39"W	(1397523.0537',405271.3173',	(1397451.2546',405238.0311',	(1397612.2322',404984.8785',
181	Line	57.33'		S57° 32' 53"W	142+53.25'	143+10.59'				(1397451.2546',405238.0311',	(1397402.8753',405207.2671',0.0000')	
182	Curve	190.27'	110.00'		143+10.59'	145+00.85'	99.1048 (d)	167.42'	S7° 59' 44"W	(1397402.8753',405207.2671',	(1397379.5875',405041.4747',	(1397461.9004',405114.4445',
183	Line	123.04'		S41° 33' 24"E	145+00.85'	146+23.90'				(1397379.5875',405041.4747',	(1397461.2107',404949.4004',0.0000')	
184	Curve	73.38'	200.00'		146+23.90'	146+97.28'	21.0213 (d)	72.97'	S31° 02' 46"E	(1397461.2107',404949.4004',	(1397498.8420',404886.8855',	(1397311.5509',404816.7281',
185	Line	19.79'		S20° 32' 08"E	146+97.28'	147+17.07'				(1397498.8420',404886.8855',	(1397505.7838',404868.3538',0.0000')	
186	Curve	33.45'	80.00'		147+17.07'	147+50.52'	23.9578 (d)	33.21'	S8° 33' 24"E	(1397505.7838',404868.3538',	(1397510.7247',404835.5153',	(1397430.8674',404840.2909',
187	Line	89.84'		S3° 25' 20"W	147+50.52'	148+40.36'				(1397510.7247',404835.5153',	(1397505.3618',404745.8363',0.0000')	
188	Curve	80.54'	55.00'		148+40.36'	149+20.89'	83.8972 (d)	73.53'	S45° 22' 15"W	(1397505.3618',404745.8363',	(1397453.0320',404694.1797',	(1397450.4599',404749.1195',
189	Line	32.19'		S87° 19' 10"W	149+20.89'	149+53.08'				(1397453.0320',404694.1797',	(1397420.8763',404692.6742',0.0000')	
190	Curve	58.70'	200.00'		149+53.08'	150+11.79'	16.8173 (d)	58.49'	N84° 16' 19"W	(1397420.8763',404692.6742',	(1397362.6755',404698.5123',	(1397411.5230',404892.4554',
191	Line	58.70'		N75° 51' 48"W	150+11.79'	150+70.48'				(1397362.6755',404698.5123',	(1397305.7570',404712.8480',0.0000')	
192	Curve	52.31'	50.00'		150+70.48'	151+22.80'	59.9478 (d)	49.96'	S74° 09' 46"W	(1397305.7570',404712.8480',	(1397257.6929',404699.2136',	(1397293.5452',404664.3623',
193	Line	24.14'		S44° 11' 20"W	151+22.80'	151+46.93'				(1397257.6929',404699.2136',	(1397240.8695',404681.9071',0.0000')	
194	Curve	30.34'	50.00'		151+46.93'	151+77.27'	34.7640 (d)	29.87'	S26° 48' 25"W	(1397240.8695',404681.9071',	(1397227.3967',404655.2436',	(1397276.7218',404647.0557',
195	Line	11.57'		S9° 25' 30"W	151+77.27'	151+88.84'				(1397227.3967',404655.2436',	(1397225.5027',404643.8336',0.0000')	
196	Curve	30.56'	50.00'		151+88.84'	152+19.40'	35.0183 (d)	30.09'	S26° 56' 03"W	(1397225.5027',404643.8336',	(1397211.8749',404617.0113',	(1397176.1777',404652.0214',
197	Line	122.86'		S44° 26' 36"W	152+19.40'	153+42.25'				(1397211.8749',404617.0113',	(1397125.8506',404529.2988',0.0000')	
198	Curve	157.41'	175.00'		153+42.25'	154+99.67'	51.5382 (d)	152.16'	S70° 12' 45"W	(1397125.8506',404529.2988',	(1396982.6741',404477.7871',	(1397000.9104',404651.8343',

SEE SHEET #6 FOR CONTINUATION

CONSULTANT:

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

HORIZONTAL TRAIL & CONTROL

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 5

No.	Type	Length	Radius	Direction	Start Station	End Station	Delta angle	Chord length	Chord Direction	Start Point	End Point	Center Point
199	Line	21.04'		N84° 01' 07"W	154+99.67'	155+20.70'				(1396982.6741',404477.7871',0.0000')	(1396961.7525',404479.9792',0.0000')	
200	Curve	104.10'	70.00'		155+20.70'	156+24.80'	85.2037 (d)	94.77'	S53° 22' 47"W	(1396961.7525',404479.9792',0.0000')	(1396885.6928',404423.4503',0.0000')	(1396954.4580',404410.3603',0.0000')
201	Line	1.36'		S10° 46' 40"W	156+24.80'	156+26.16'				(1396885.6928',404423.4503',0.0000')	(1396885.4377',404422.1102',0.0000')	
202	Curve	47.98'	100.00'		156+26.16'	156+74.15'	27.4931 (d)	47.53'	S2° 58' 08"E	(1396885.4377',404422.1102',0.0000')	(1396887.8991',404374.6486',0.0000')	(1396983.6737',404403.4102',0.0000')
203	Line	63.03'		S16° 42' 55"E	156+74.15'	157+37.18'				(1396887.8991',404374.6486',0.0000')	(1396906.0270',404314.2837',0.0000')	
204	Curve	102.31'	50.00'		157+37.18'	158+39.48'	117.2368 (d)	85.37'	S41° 54' 11"W	(1396906.0270',404314.2837',0.0000')	(1396849.0095',404250.7436',0.0000')	(1396858.1398',404299.9029',0.0000')
205	Line	46.10'		N79° 28' 43"W	158+39.48'	158+85.58'				(1396849.0095',404250.7436',0.0000')	(1396803.6863',404259.1613',0.0000')	
206	Curve	61.04'	150.00'		158+85.58'	159+46.62'	23.3150 (d)	60.62'	S88° 51' 50"W	(1396803.6863',404259.1613',0.0000')	(1396743.0800',404257.9595',0.0000')	(1396776.2957',404111.6834',0.0000')
207	Line	20.78'		S77° 12' 23"W	159+46.62'	159+67.40'				(1396743.0800',404257.9595',0.0000')	(1396722.8130',404253.3574',0.0000')	
208	Curve	102.87'	75.00'		159+67.40'	160+70.28'	78.5902 (d)	95.00'	S37° 54' 41"W	(1396722.8130',404253.3574',0.0000')	(1396664.4427',404178.4082',0.0000')	(1396739.4208',404180.2193',0.0000')
209	Line	22.72'		S1° 23' 01"E	160+70.28'	160+93.00'				(1396664.4427',404178.4082',0.0000')	(1396664.9913',404155.6959',0.0000')	
210	Curve	47.24'	100.00'		160+93.00'	161+40.24'	27.0676 (d)	46.80'	S14° 55' 03"E	(1396664.9913',404155.6959',0.0000')	(1396677.0400',404110.4695',0.0000')	(1396764.9622',404158.1108',0.0000')
211	Line	21.41'		S28° 27' 05"E	161+40.24'	161+61.65'				(1396677.0400',404110.4695',0.0000')	(1396687.2399',404091.6454',0.0000')	
212	Curve	64.15'	100.00'		161+61.65'	162+25.80'	36.7578 (d)	63.06'	S10° 04' 21"E	(1396687.2399',404091.6454',0.0000')	(1396698.2687',404029.5574',0.0000')	(1396599.3177',404044.0042',0.0000')
213	Line	77.07'		S8° 18' 23"W	162+25.80'	163+02.88'				(1396698.2687',404029.5574',0.0000')	(1396687.1343',403953.2939',0.0000')	
214	Curve	26.59'	100.00'		163+02.88'	163+29.47'	15.2365 (d)	26.51'	S0° 41' 18"W	(1396687.1343',403953.2939',0.0000')	(1396686.8158',403926.7815',0.0000')	(1396786.0852',403938.8471',0.0000')
215	Line	17.36'		S6° 55' 48"E	163+29.47'	163+46.83'				(1396686.8158',403926.7815',0.0000')	(1396688.9107',403909.5457',0.0000')	
216	Curve	41.05'	50.00'		163+46.83'	163+87.88'	47.0413 (d)	39.91'	S16° 35' 26"W	(1396688.9107',403909.5457',0.0000')	(1396677.5157',403871.2991',0.0000')	(1396639.2760',403903.5129',0.0000')
217	Line	1.62'		S40° 06' 41"W	163+87.88'	163+89.50'				(1396677.5157',403871.2991',0.0000')	(1396676.4749',403870.0636',0.0000')	
218	Line	24.01'		S40° 06' 45"W	163+89.50'	164+13.51'				(1396676.4749',403870.0636',0.0000')	(1396661.0062',403851.7021',0.0000')	
219	Line	6.39'		S44° 11' 26"W	164+13.51'	164+19.90'				(1396661.0062',403851.7021',0.0000')	(1396656.5513',403847.1196',0.0000')	
220	Line	21.24'		S41° 17' 54"W	164+19.90'	164+41.13'				(1396656.5513',403847.1196',0.0000')	(1396642.5363',403831.1657',0.0000')	
221	Line	29.92'		S44° 09' 41"W	164+41.13'	164+71.05'				(1396642.5363',403831.1657',0.0000')	(1396621.6950',403809.7051',0.0000')	
222	Line	30.16'		S43° 40' 19"W	164+71.05'	165+01.20'				(1396621.6950',403809.7051',0.0000')	(1396600.8713',403787.8929',0.0000')	
223	Line	29.81'		S44° 35' 14"W	165+01.20'	165+31.01'				(1396600.8713',403787.8929',0.0000')	(1396579.9464',403766.6644',0.0000')	
224	Line	30.38'		S44° 44' 27"W	165+31.01'	165+61.39'				(1396579.9464',403766.6644',0.0000')	(1396558.5617',403745.0853',0.0000')	
225	Line	9.46'		S47° 14' 56"W	165+61.39'	165+70.85'				(1396558.5617',403745.0853',0.0000')	(1396551.6132',403738.6619',0.0000')	
226	Line	30.06'		S62° 34' 39"W	165+70.85'	166+00.92'				(1396551.6132',403738.6619',0.0000')	(1396524.9280',403724.8163',0.0000')	
227	Line	18.00'		S62° 34' 38"W	166+00.92'	166+18.92'				(1396524.9280',403724.8163',0.0000')	(1396508.9487',403716.5253',0.0000')	
228	Curve	46.38'	75.00'		166+18.92'	166+65.30'	35.4313 (d)	45.64'	S44° 51' 41"W	(1396508.9487',403716.5253',0.0000')	(1396476.7516',403684.1722',0.0000')	(1396543.4902',403649.9529',0.0000')
229	Line	104.56'		S27° 08' 45"W	166+65.30'	167+69.86'				(1396476.7516',403684.1722',0.0000')	(1396429.0462',403591.1313',0.0000')	
230	Curve	84.11'	75.00'		167+69.86'	168+53.97'	64.2548 (d)	79.77'	S59° 16' 24"W	(1396429.0462',403591.1313',0.0000')	(1396360.4744',403550.3730',0.0000')	(1396362.3076',403625.3506',0.0000')
231	Line	139.96'		N88° 35' 58"W	168+53.97'	169+93.93'				(1396360.4744',403550.3730',0.0000')	(1396220.5520',403553.7941',0.0000')	
232	Curve	24.50'	250.00'		169+93.93'	170+18.43'	5.6147 (d)	24.49'	N85° 47' 31"W	(1396220.5520',403553.7941',0.0000')	(1396196.1290',403555.5911',0.0000')	(1396226.6627',403803.7195',0.0000')
233	Line	186.84'		N82° 59' 05"W	170+18.43'	172+05.27'				(1396196.1290',403555.5911',0.0000')	(1396010.6842',403578.4112',0.0000')	
234	Curve	70.30'	100.00'		172+05.27'	172+75.57'	40.2785 (d)	68.86'	N62° 50' 43"W	(1396010.6842',403578.4112',0.0000')	(1395949.4135',403609.8387',0.0000')	(1396022.8977',403677.6625',0.0000')
235	Line	160.59'		N42° 42' 22"W	172+75.57'	174+36.16'				(1395949.4135',403609.8387',0.0000')	(1395840.4979',403727.8440',0.0000')	
236	Curve	68.80'	200.00'		174+36.16'	175+04.95'	19.7084 (d)	68.46'	N52° 33' 37"W	(1395840.4979',403727.8440',0.0000')	(1395786.1436',403769.4606',0.0000')	(1395693.5295',403592.1963',0.0000')
237	Line	126.70'		N62° 24' 53"W	175+04.95'	176+31.65'				(1395786.1436',403769.4606',0.0000')	(1395673.8464',403828.1317',0.0000')	
238	Curve	29.49'	500.00'		176+31.65'	176+61.15'	3.3797 (d)	29.49'	N60° 43' 29"W	(1395673.8464',403828.1317',0.0000')	(1395648.1233',403842.5523',0.0000')	(1395905.3815',404271.2925',0.0000')
239	Line	187.42'		N59° 02' 05"W	176+61.15'	178+48.57'				(1395648.1233',403842.5523',0.0000')	(1395487.4107',403938.9851',0.0000')	
240	Curve	217.06'	375.00'		178+48.57'	180+65.64'	33.1650 (d)	214.05'	N75° 37' 02"W	(1395487.4107',403938.9851',0.0000')	(1395280.0726',403992.1535',0.0000')	(1395294.4670',403617.4299',0.0000')
241	Line	129.48'		S87° 48' 01"W	180+65.64'	181+95.12'				(1395280.0726',403992.1535',0.0000')	(1395150.6884',403987.1834',0.0000')	
242	Curve	70.19'	100.00'		181+95.12'	182+65.31'	40.2154 (d)	68.76'	S67° 41' 33"W	(1395150.6884',403987.1834',0.0000')	(1395087.0770',403961.0847',0.0000')	(1395154.5269',403887.2571',0.0000')
243	Line	24.94'		S47° 35' 05"W	182+65.31'	182+90.25'				(1395087.0770',403961.0847',0.0000')	(1395068.6618',403944.2604',0.0000')	
244	Curve	65.49'	75.00'		182+90.25'	183+55.74'	50.0334 (d)	63.43'	S72° 36' 05"W	(1395068.6618',403944.2604',0.0000')	(1395008.1316',403925.2930',0.0000')	(1395018.0744',403999.6310',0.0000')
245	Line	10.92'		N82° 22' 55"W	183+55.74'	183+66.66'				(1395008.1316',403925.2930',0.0000')	(1394997.3063',403926.7409',0.0000')	

SPUR CONNECTION CENTERLINE HORIZONTAL CONTROL

No.	Type	Length	Radius	Direction	Start Station	End Station	Delta angle	Chord length	Chord Direction	Start Point	End Point	Center Point
S-1	Curve	102.42'	50.00'		0+00.00'	1+02.42'	117.3612 (d)	85.43'	N70° 49' 16"E	(1397297.4122',405628.2382')	(1397378.0990',405656.3030')	(1397346.2940',405617.7227')
S-2	Line	256.69'		S50° 29' 54"E	1+02.42'	3+59.11'				(1397378.0990',405656.3030')	(1397576.1625',405493.0223')	
S-3	Curve	42.37'	50.00'		3+59.11'	4+01.47'	48.5469 (d)	41.11'	S26° 13' 30"E	(1397576.1625',405493.0223')	(1397594.3285',405456.1447')	(1397544.3575',405454.4420')
S-4	Line	77.64'		S1° 57' 05"E	4+01.47'	4+79.11'				(1397594.3285',405456.1447')	(1397596.9721',405378.5534')	
S-5	Curve	36.70'	50.00'		4+79.11'	5+15.81'	42.0576 (d)	35.88'	S22° 58' 49"E	(1397596.9721',405378.5534')	(1397610.9816',405345.5175')	(1397646.9431',405380.2560')
S-6	Line	31.11'		S44° 00' 32"E	5+15.81'	5+46.92'				(1397610.9816',405345.5175')	(1397632.5981',405323.1399')	

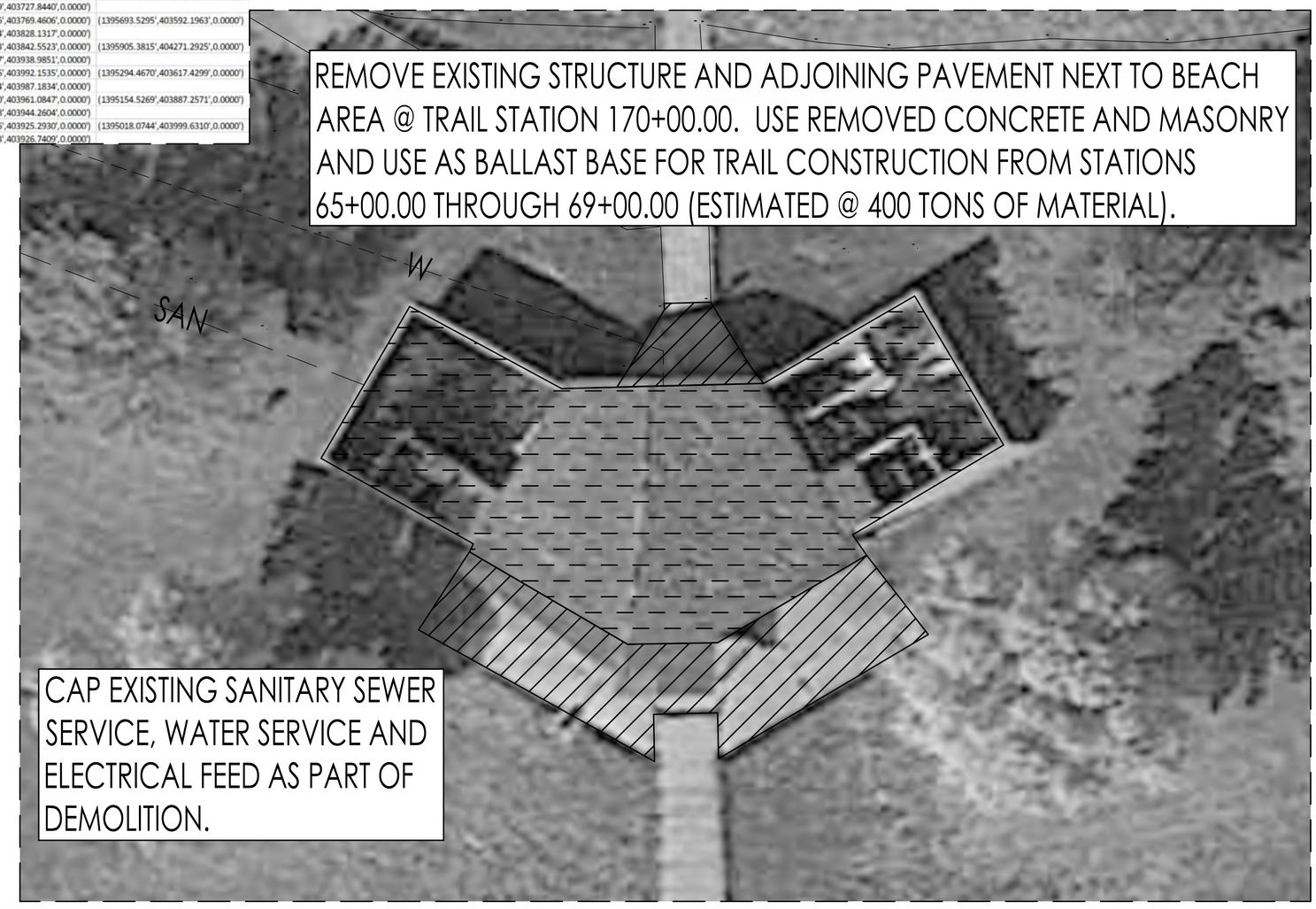
SIDEWALK AREAS TO BE REMOVED

BUILDING AREAS TO BE REMOVED

NORTH

Scale: 1"=10'

0' 10' 20'



REMOVE EXISTING STRUCTURE AND ADJOINING PAVEMENT NEXT TO BEACH AREA @ TRAIL STATION 170+00.00. USE REMOVED CONCRETE AND MASONRY AND USE AS BALLAST BASE FOR TRAIL CONSTRUCTION FROM STATIONS 65+00.00 THROUGH 69+00.00 (ESTIMATED @ 400 TONS OF MATERIAL).

CAP EXISTING SANITARY SEWER SERVICE, WATER SERVICE AND ELECTRICAL FEED AS PART OF DEMOLITION.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

HOR. CONTROL & DEMO PLAN

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

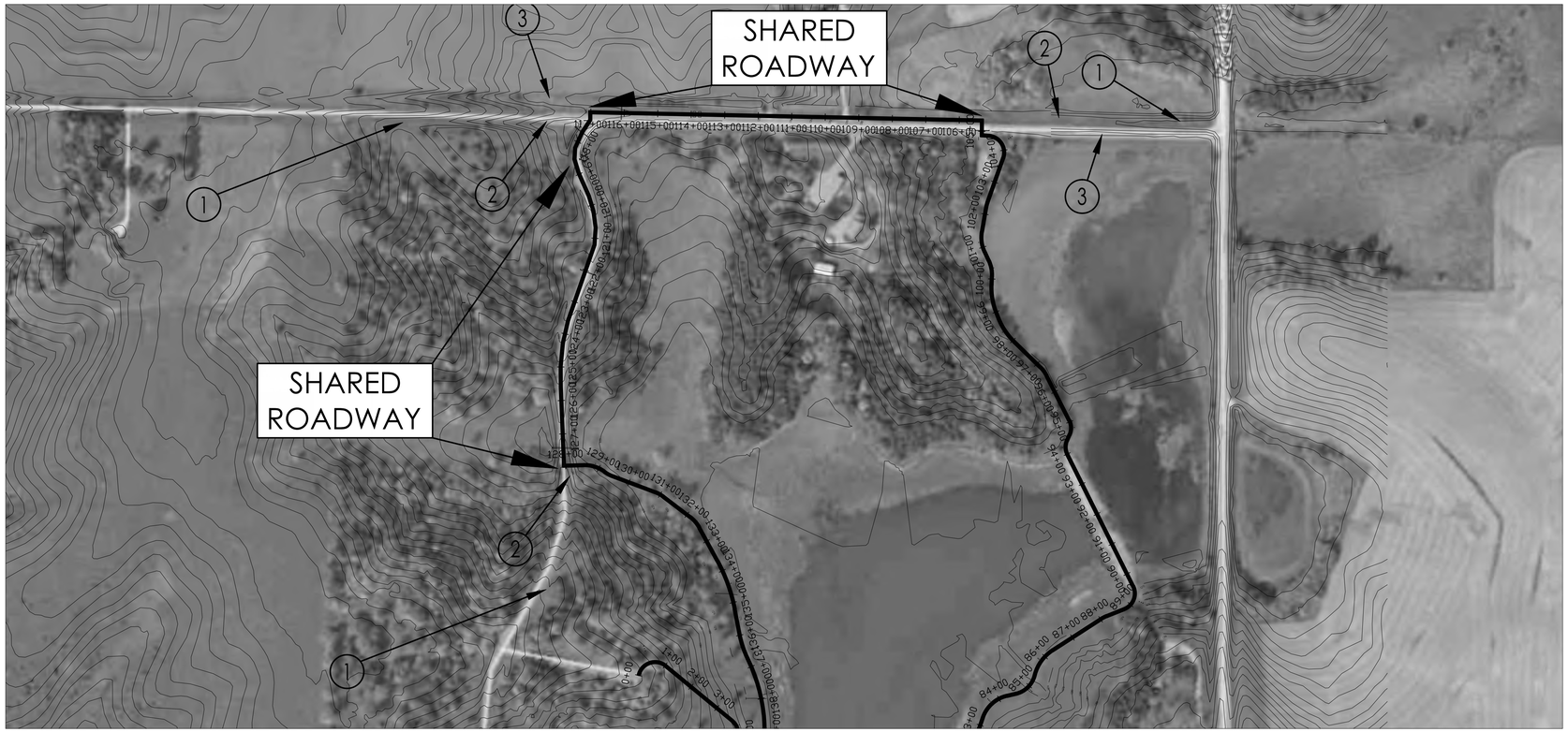
DRAWN BY:

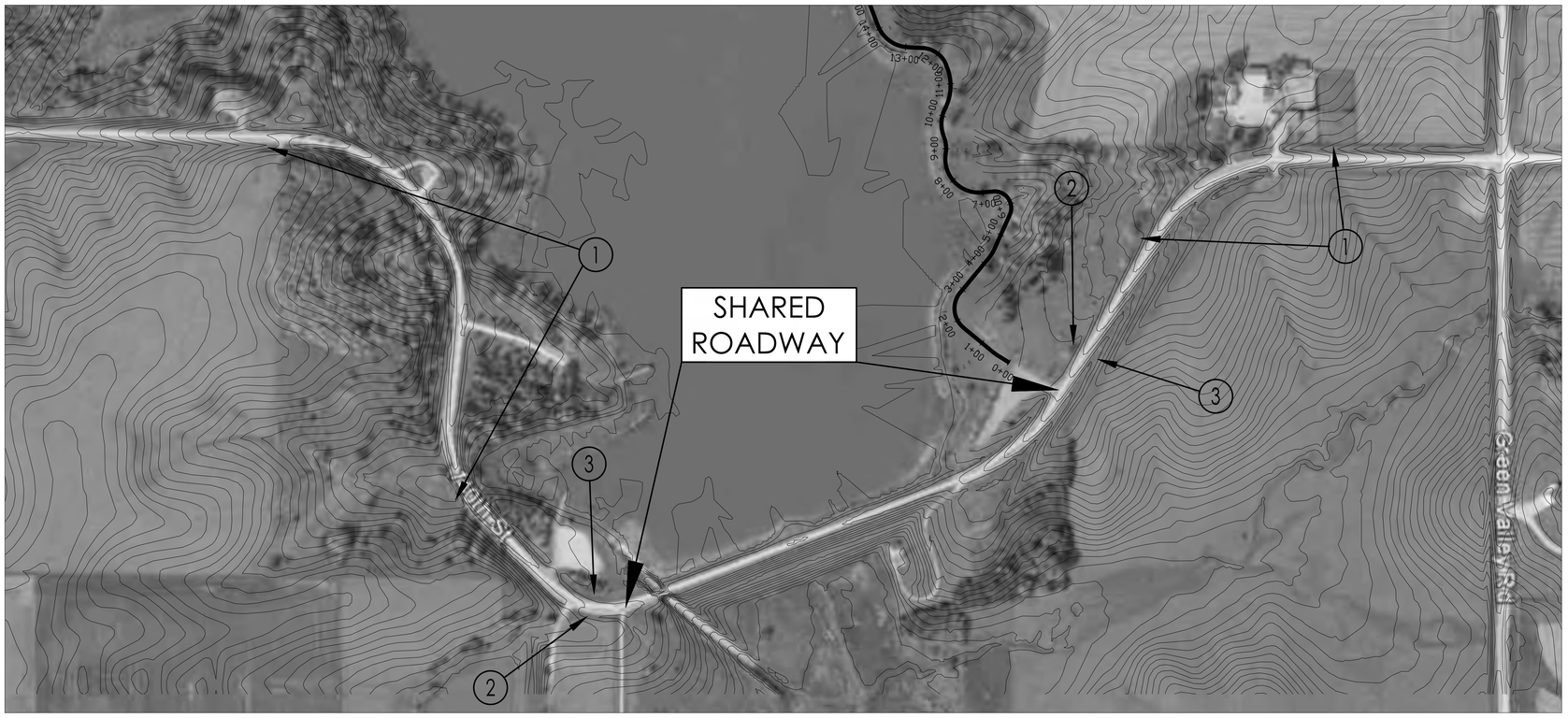
PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 6





HIGHWAY SIGNAGE

1. INSTALL MUTCD W11-1 BICYCLE TRAFFIC SIGN WITH W16-1 SIGN BELOW ON A BREAKAWAY SIGN POST 12' MINIMUM OFF EDGE OF ROADWAY WITH THE BOTTOM SIGN PLACED A MINIMUM OF 4 FEET ABOVE THE EDGE OF SLAB. SEE SHEET #27 FOR SIGN DETAILS.
2. INSTALL MUTCD D11-1 BICYCLE ROUTE SIGN WITH M4-11 'BEGIN' SIGN BELOW ON A BREAKAWAY SIGN POST 12' MINIMUM OFF EDGE OF ROADWAY WITH THE BOTTOM SIGN PLACED A MINIMUM OF 4 FEET ABOVE THE EDGE OF SLAB. SEE SHEET #27 FOR SIGN DETAILS.
3. INSTALL MUTCD D11-1 BICYCLE ROUTE SIGN WITH M4-12 'END' SIGN BELOW ON A BREAKAWAY SIGN POST 12' MINIMUM OFF EDGE OF ROADWAY WITH THE BOTTOM SIGN PLACED A MINIMUM OF 4 FEET ABOVE THE EDGE OF SLAB. SEE SHEET #27 FOR SIGN DETAILS.

NORTH

Scale: 1"=200'
0' 200' 400'

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

HIGHWAY SIGNAGE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

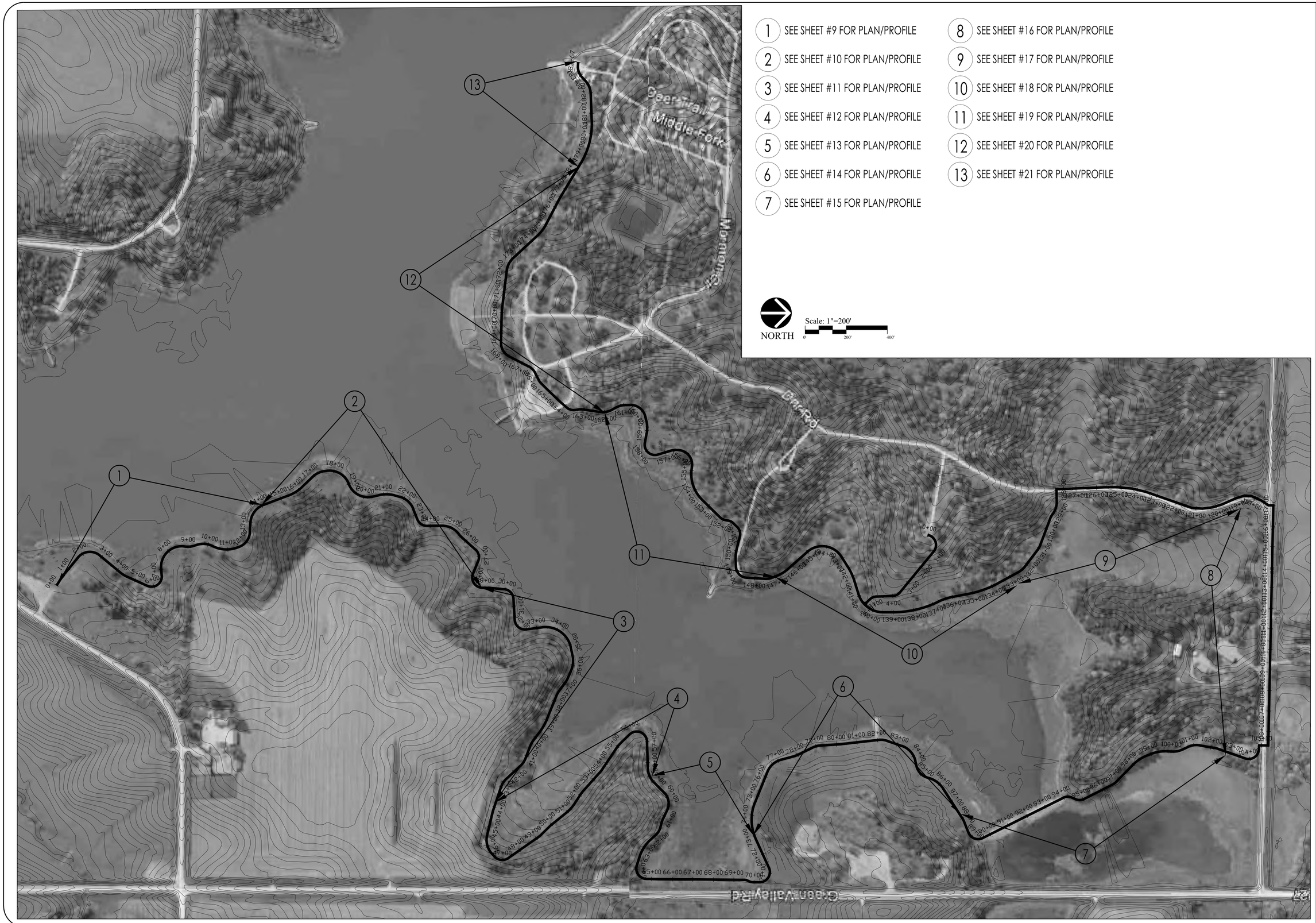
DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 7



1 SEE SHEET #9 FOR PLAN/PROFILE
2 SEE SHEET #10 FOR PLAN/PROFILE
3 SEE SHEET #11 FOR PLAN/PROFILE
4 SEE SHEET #12 FOR PLAN/PROFILE
5 SEE SHEET #13 FOR PLAN/PROFILE
6 SEE SHEET #14 FOR PLAN/PROFILE
7 SEE SHEET #15 FOR PLAN/PROFILE
8 SEE SHEET #16 FOR PLAN/PROFILE
9 SEE SHEET #17 FOR PLAN/PROFILE
10 SEE SHEET #18 FOR PLAN/PROFILE
11 SEE SHEET #19 FOR PLAN/PROFILE
12 SEE SHEET #20 FOR PLAN/PROFILE
13 SEE SHEET #21 FOR PLAN/PROFILE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

OVERALL SITE PLAN

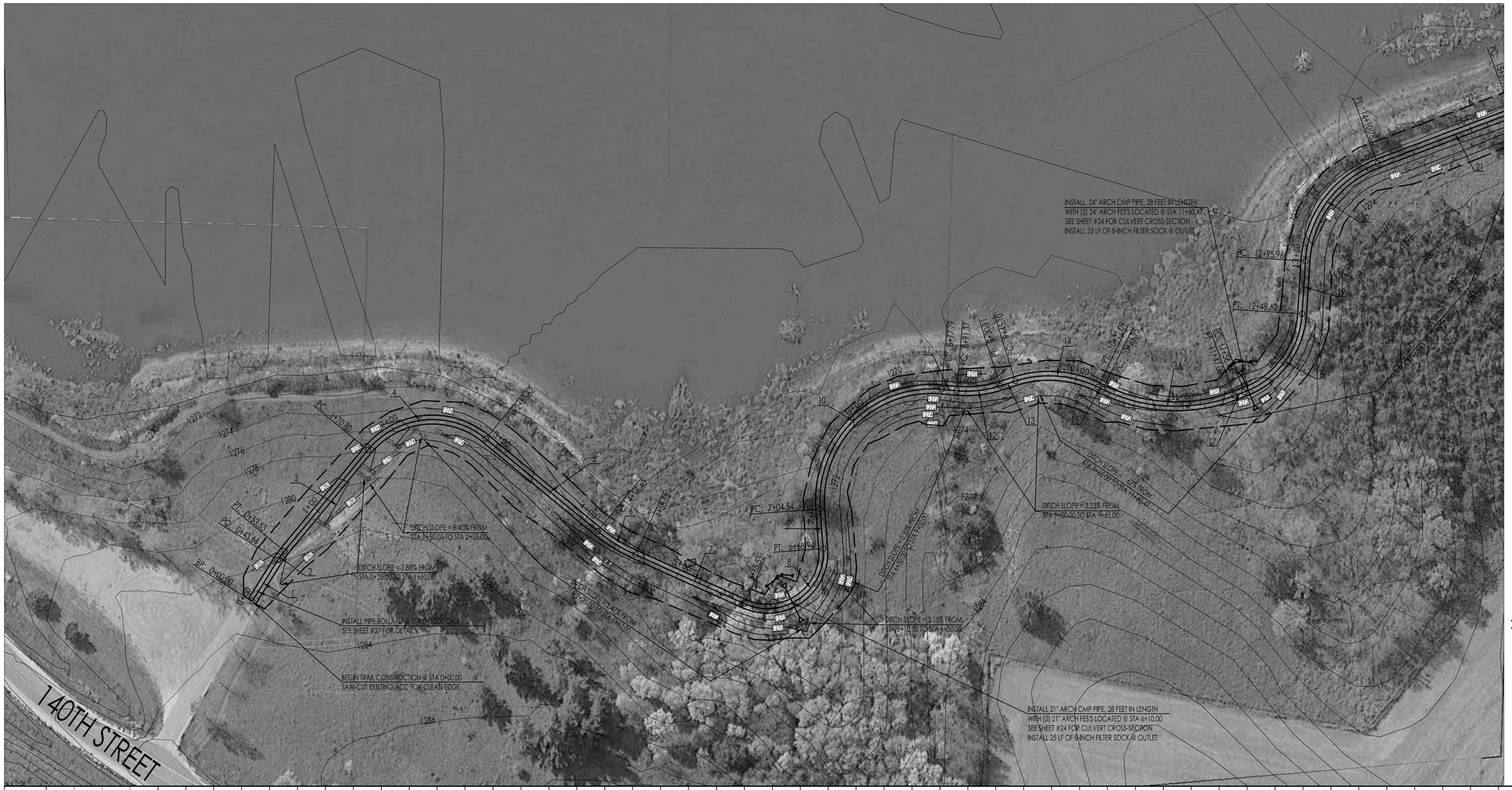
RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHK'D BY:
DATE: 6/17/2013
SHEET No: 8



SEE SHEET #10 FOR CONTINUATION

LEGEND

EXISTING/PROPOSED

ST 15" — STORM SEWER

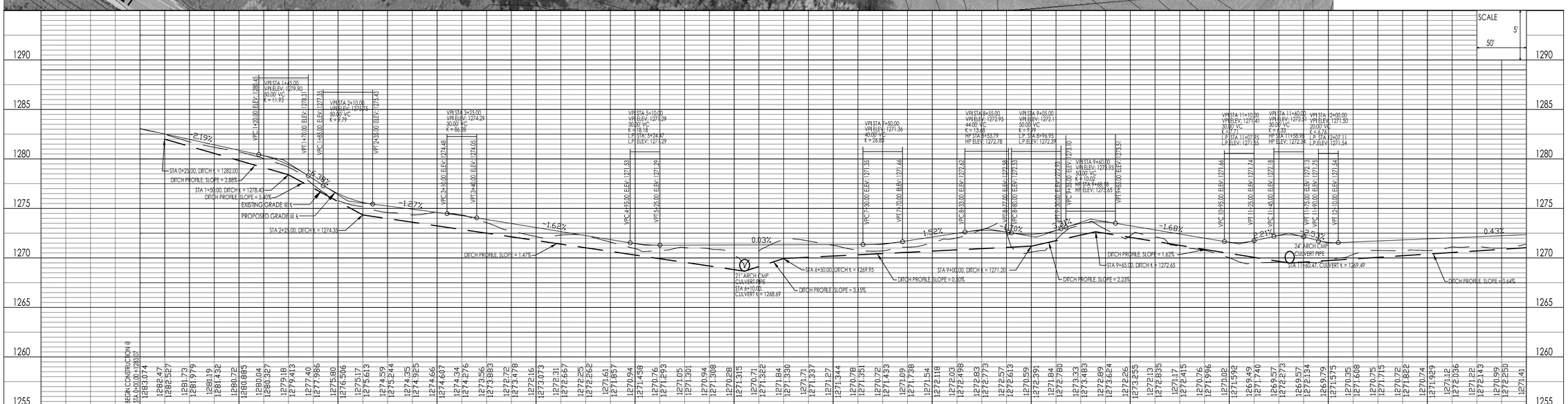
990 — TREES

8" FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHKD BY:

DATE: 6/17/2013

SHEET No: 9

SEE SHEET #9 FOR CONTINUATION

SEE SHEET #11 FOR CONTINUATION

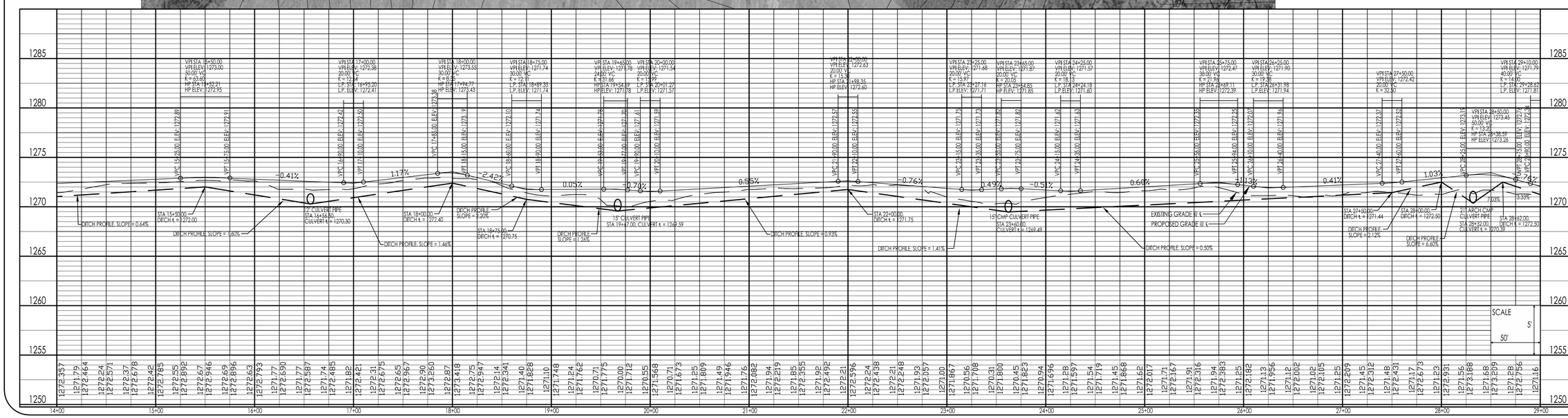
LEGEND

EXISTING/PROPOSED

- ST 15" — STORM SEWER
- 990 — TREES
- 8" FILTER SOCK
- CLEARING LIMITS

NORTH

Scale: 1"=50'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHKD BY:

DATE: 6/17/2013

SHEET No: 10

SEE SHEET #10 FOR CONTINUATION

SEE SHEET #12 FOR CONTINUATION

LEGEND

EXISTING/PROPOSED

ST 15" STORM SEWER

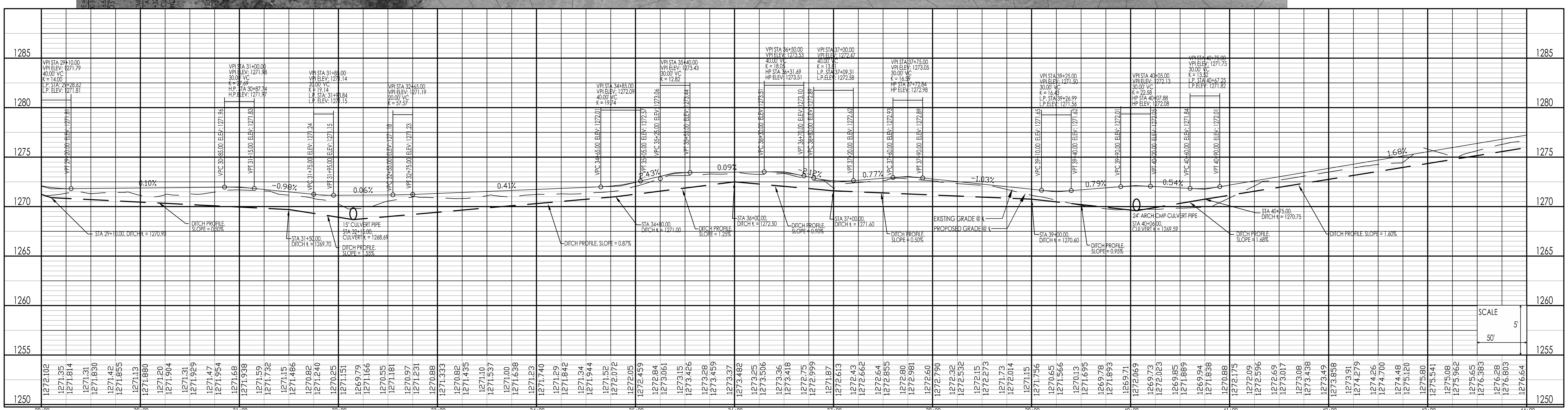
TREES

8' FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

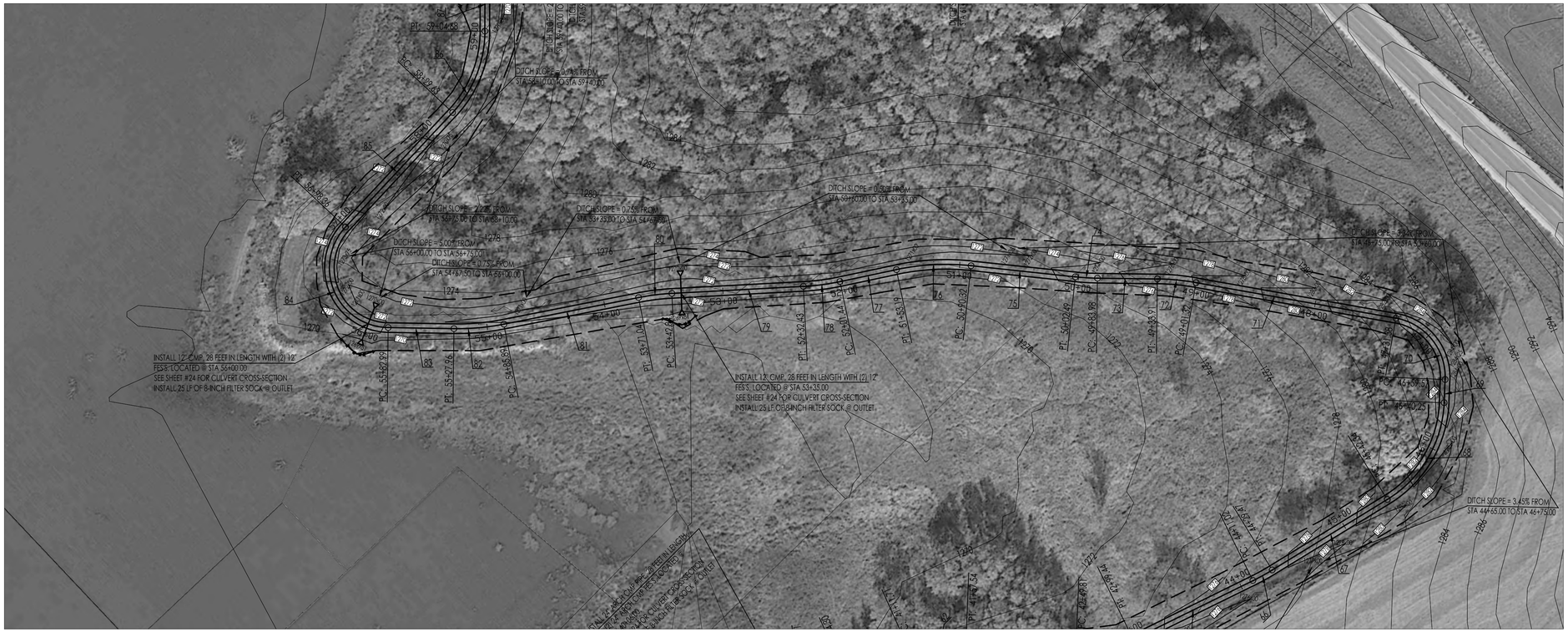
PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 11

SEE SHEET #13 FOR CONTINUATION



SEE SHEET #11 FOR CONTINUATION

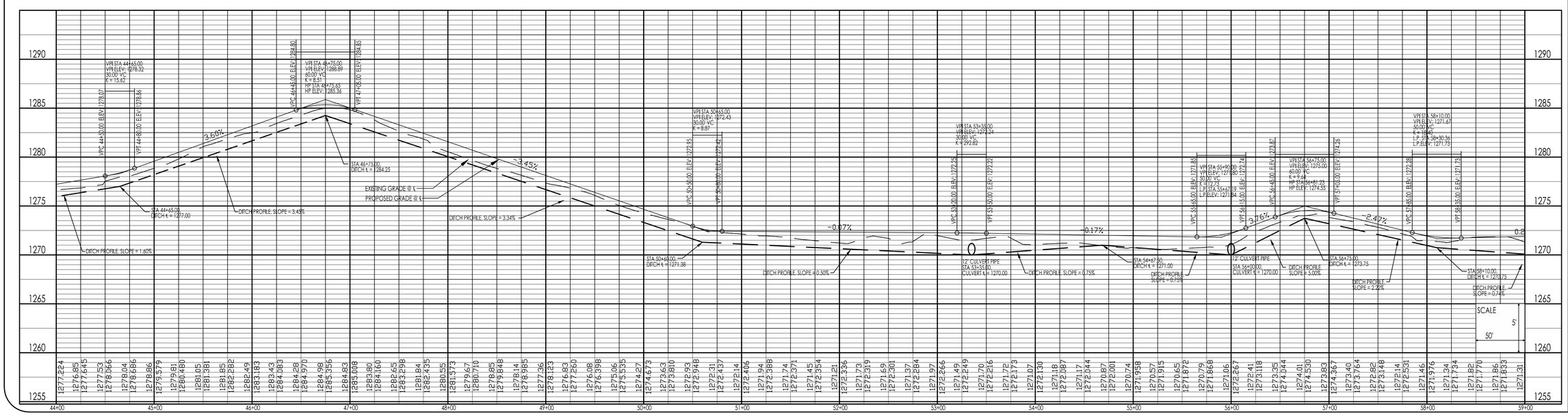
LEGEND

EXISTING/PROPOSED

- ST 15" — STORM SEWER
- 990 — TREES
- 8" FILTER SOCK
- CLEARING LIMITS

NORTH

Scale: 1"=50'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

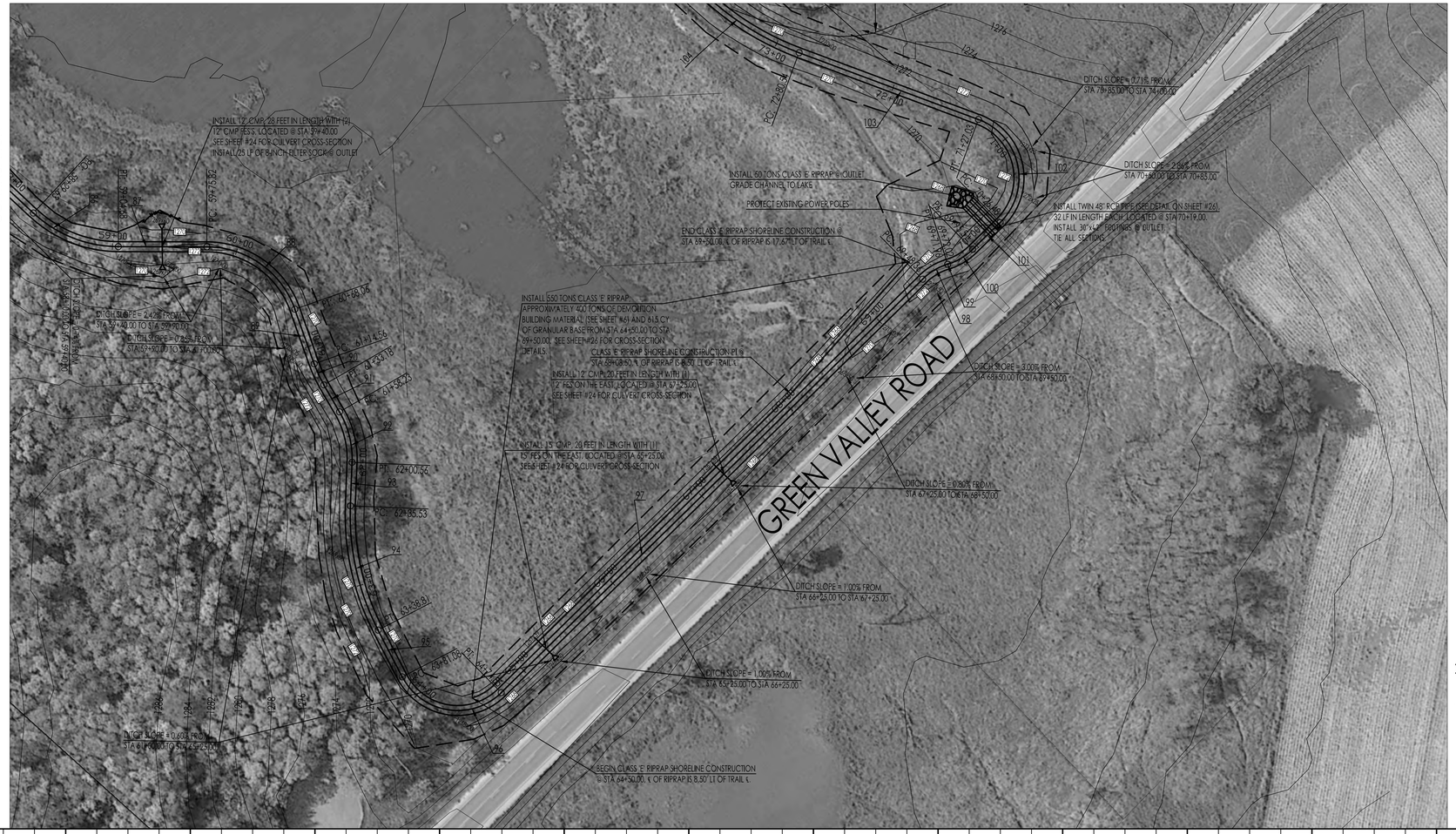
CHK'D BY:

DATE: 6/17/2013

SHEET No: 12

SEE SHEET #14 FOR CONTINUATION

SEE SHEET #12 FOR CONTINUATION



LEGEND

EXISTING/PROPOSED

ST 15" — STORM SEWER

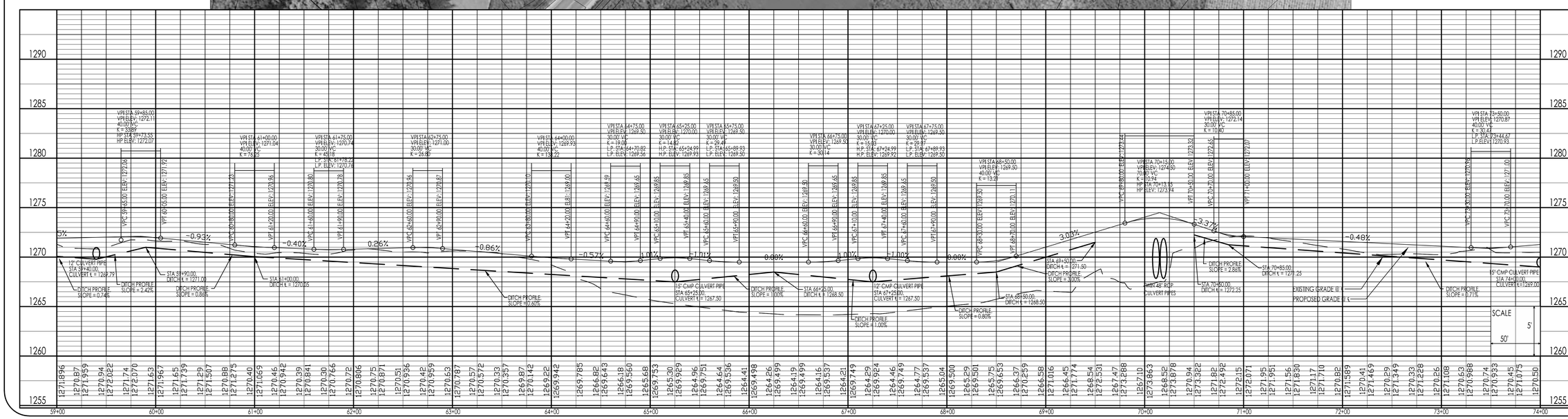
990 — TREES

8" FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHKD BY:

DATE: 6/17/2013

SHEET No: 13

SEE SHEET #13 FOR CONTINUATION

LEGEND

EXISTING/PROPOSED

— — ST 15" — STORM SEWER

990 990 TREES

8" FILTER SOCK

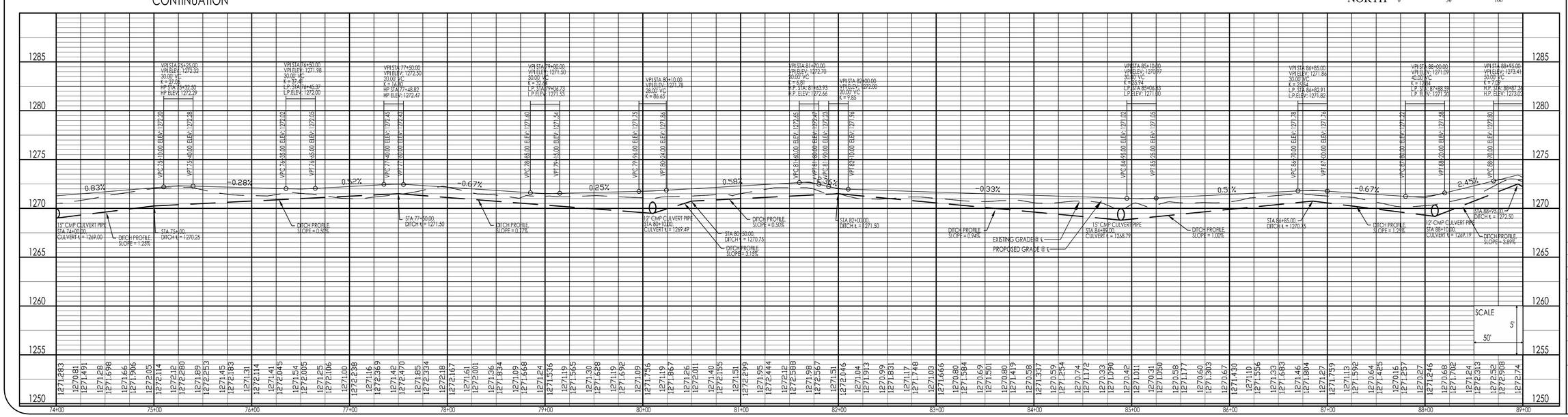
CLEARING LIMITS

SEE SHEET #15 FOR CONTINUATION

NORTH

Scale: 1"=50'

0' 50' 100'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

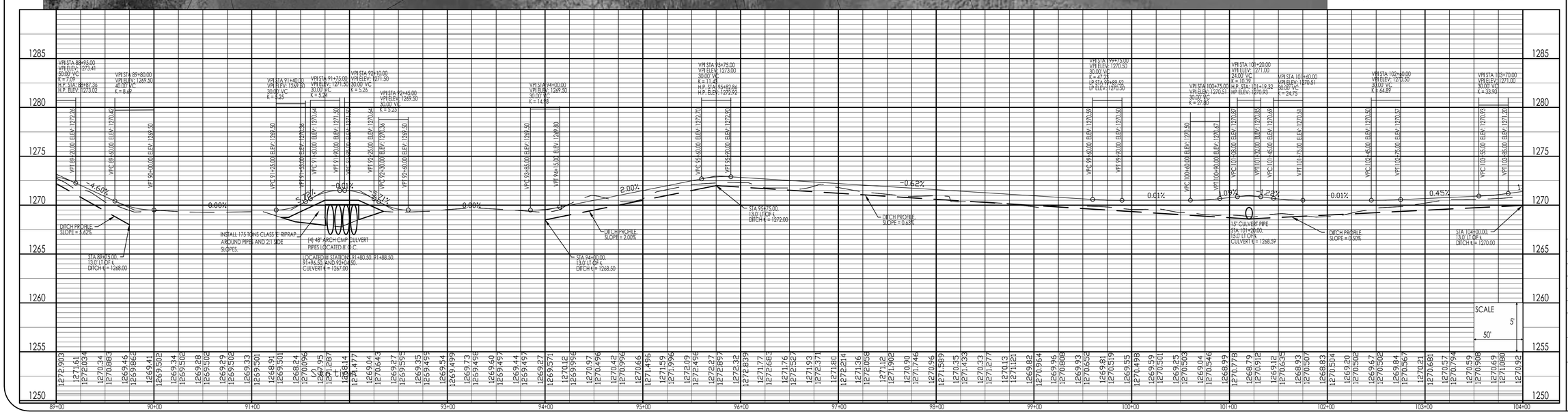
DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 14



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHKD BY:
DATE: 6/17/2013
SHEET No: 15

LEGEND

EXISTING/PROPOSED

ST 15" — STORM SEWER

990 990 — TREES

SILT FENCE OR FILTER SOCK

CLEARING LIMITS

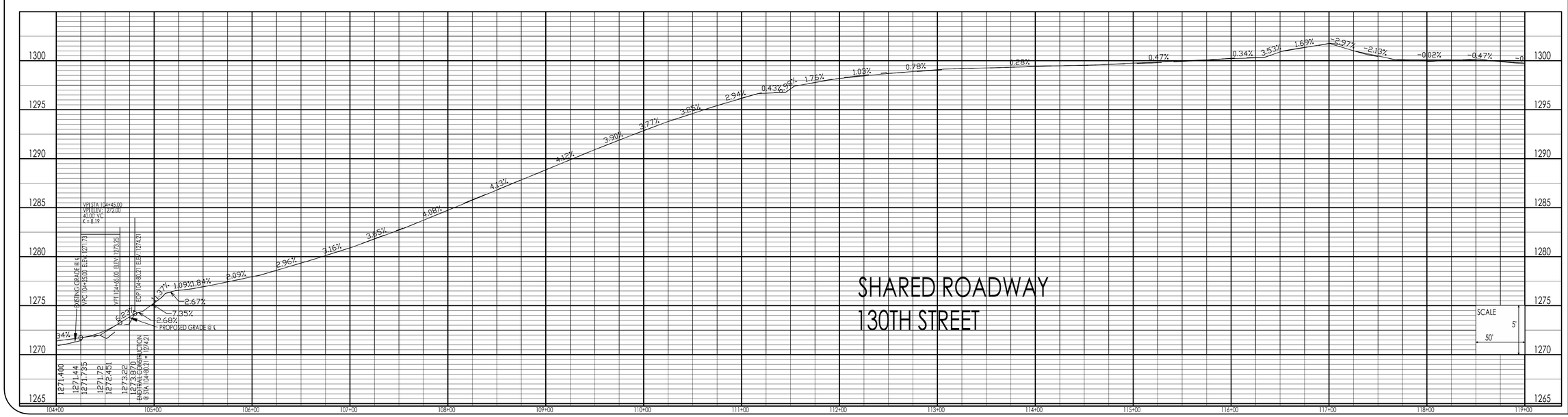
NORTH

Scale: 1"=50'

0' 50' 100'

SEE SHEET #17 FOR CONTINUATION

SEE SHEET #15 FOR CONTINUATION



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

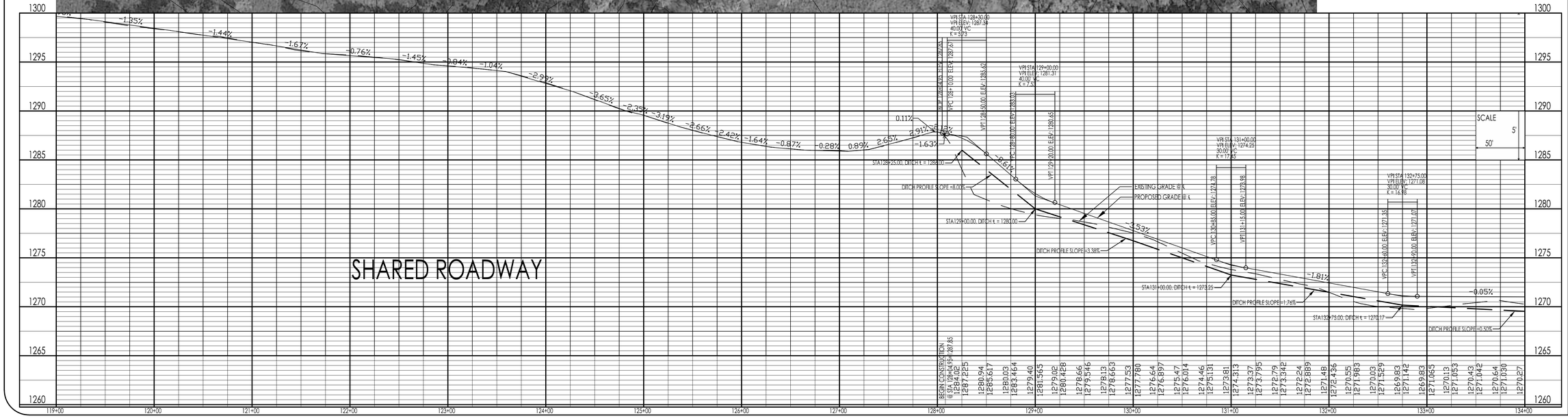
DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 16



LEGEND

EXISTING/PROPOSED

- ST 15" — STORM SEWER
- 990 — TREES
- 8" FILTER SOCK
- CLEARING LIMITS

NORTH

Scale: 1"=50'

0' 50' 100'

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

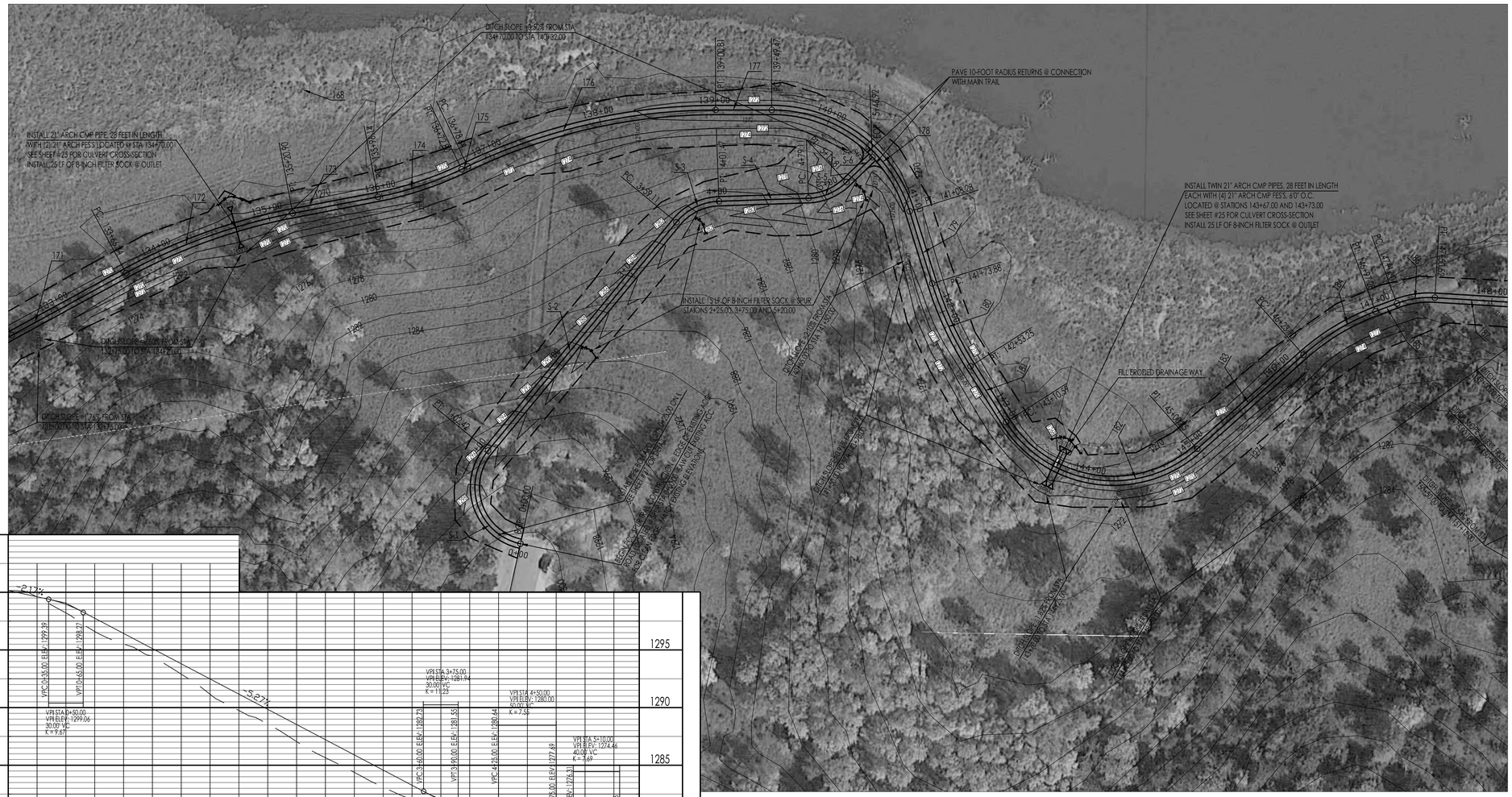
DRAWN BY:

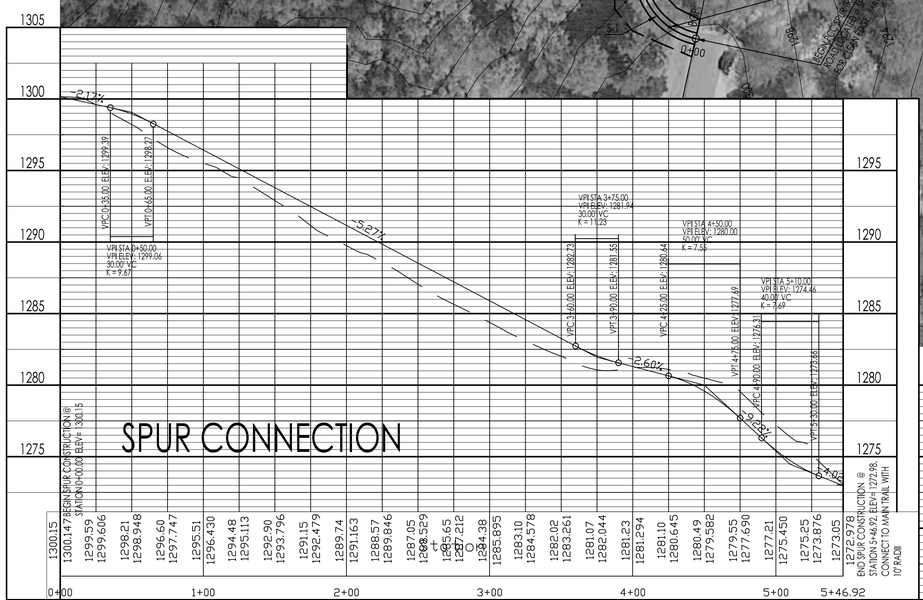
PROJECT NUMBER: 12-04-88-03

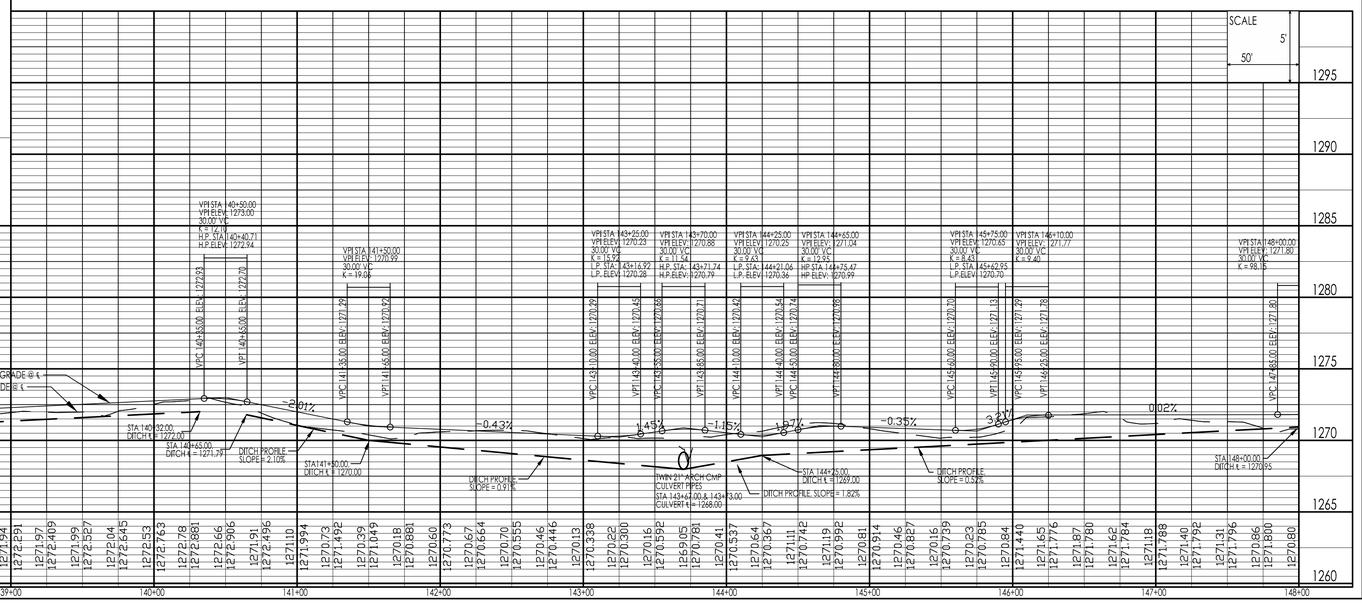
CHK'D BY:

DATE: 6/17/2013

SHEET No: 17







LEGEND

EXISTING/PROPOSED

— — ST 15" — STORM SEWER

990 990 TREES

8" FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'

0' 50' 100'

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

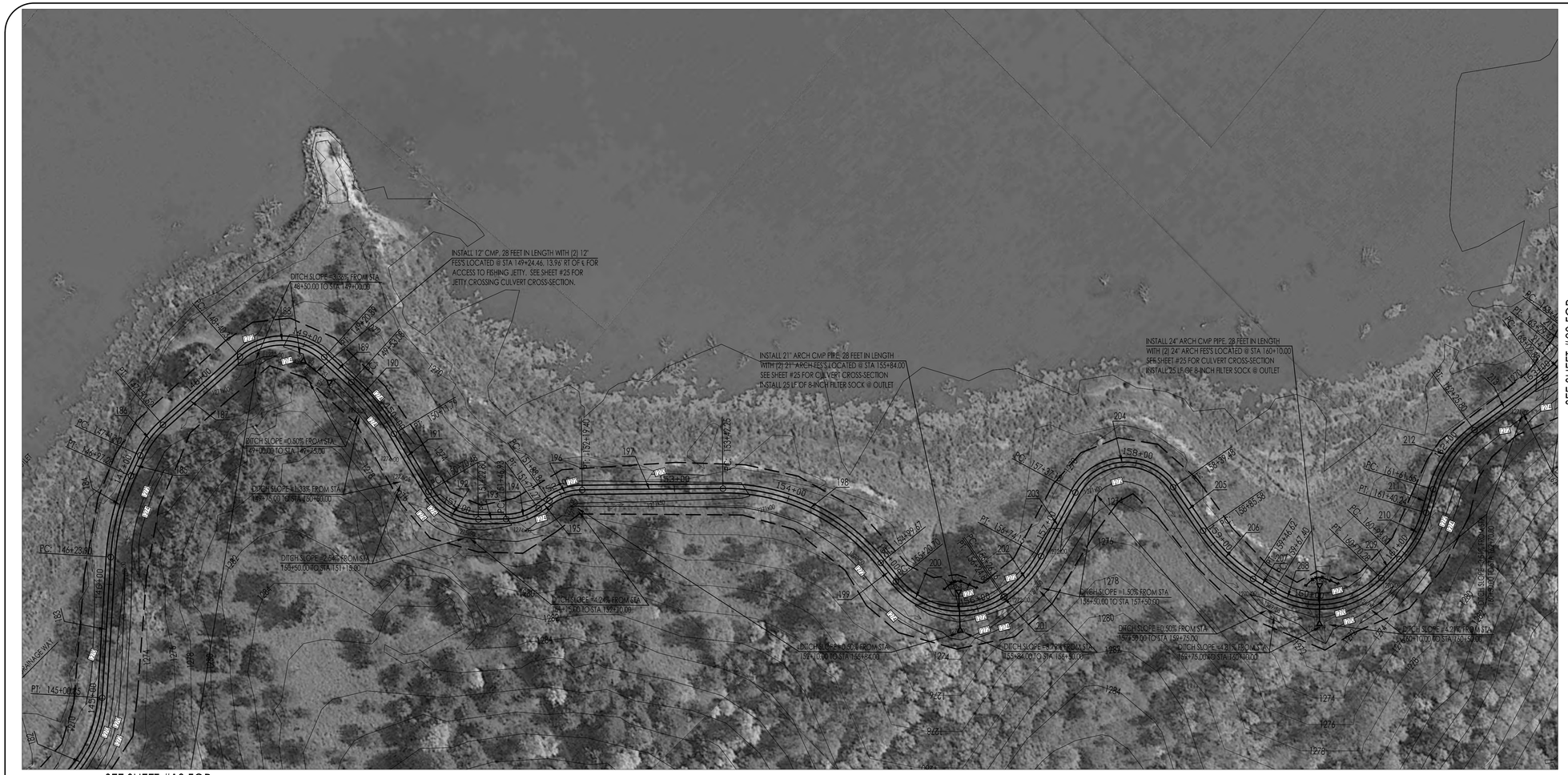
DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHKD BY:

DATE: 6/17/2013

SHEET No: 18



SEE SHEET #18 FOR CONTINUATION

SEE SHEET #20 FOR CONTINUATION

LEGEND

EXISTING/PROPOSED

ST 15" — STORM SEWER

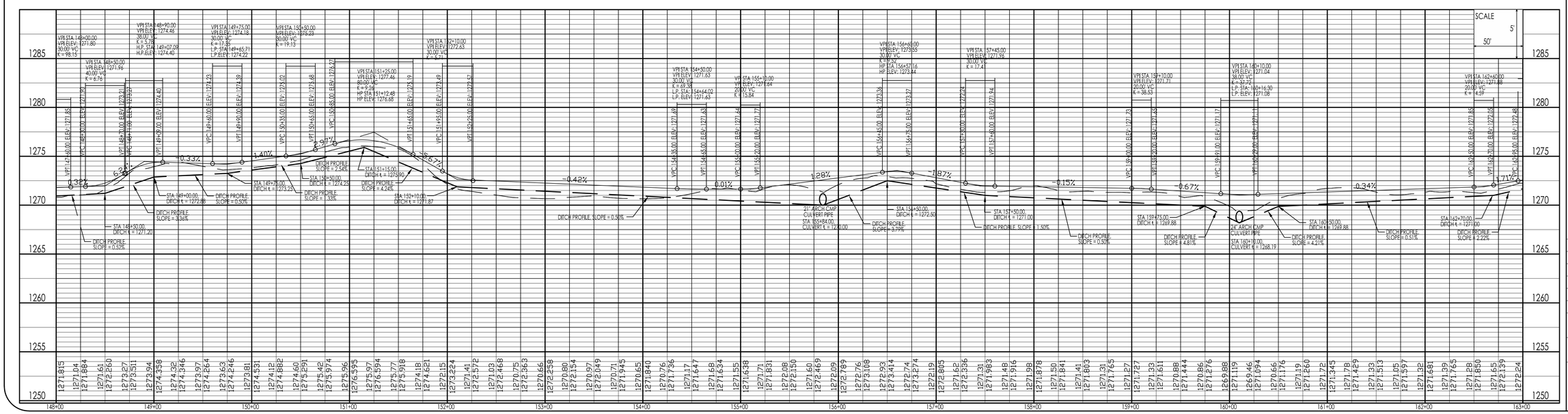
990 — TREES

8' FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'



CONSULTANT:

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

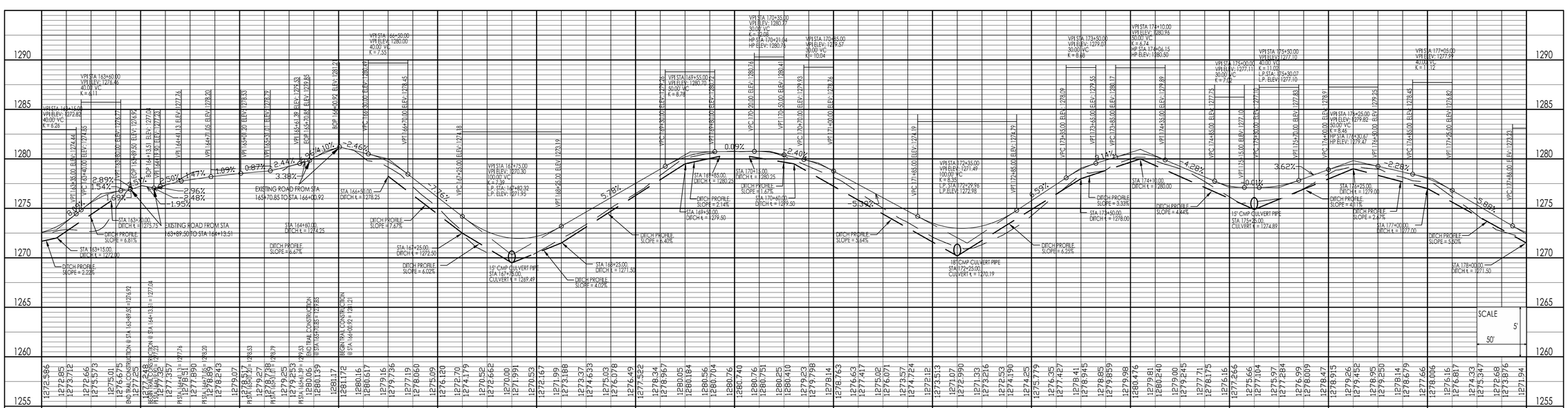
DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHKD BY:

DATE: 6/17/2013

SHEET No: 19



LEGEND

EXISTING/PROPOSED

ST 15" — STORM SEWER

990 — TREES

8' FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 20

SEE SHEET #20 FOR CONTINUATION

LEGEND

EXISTING/PROPOSED

ST 15" — STORM SEWER

990 — TREES

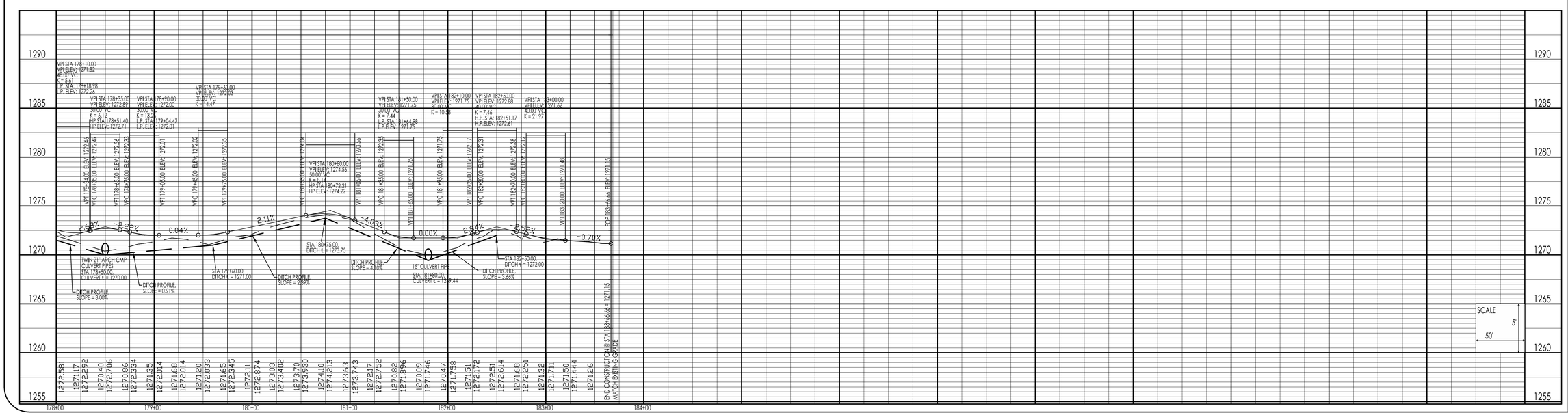
8" FILTER SOCK

CLEARING LIMITS

NORTH

Scale: 1"=50'

0' 50' 100'



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

PLAN AND PROFILE

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

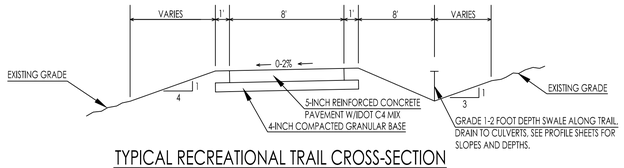
CHK'D BY:

DATE: 6/17/2013

SHEET No: 21

STATION 0+00.00 TO STATION 1+50.00

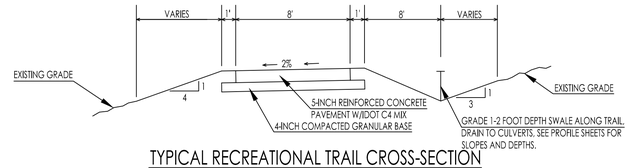
TRANSITION CROSS-SLOPE FROM 0% @ STA 0+00.00 TO 2% @ STA 1+50.00



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 1+50.00 TO STATION 64+50.00

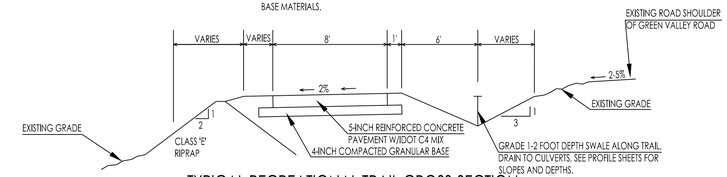


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 64+50.00 TO STATION 70+19.00

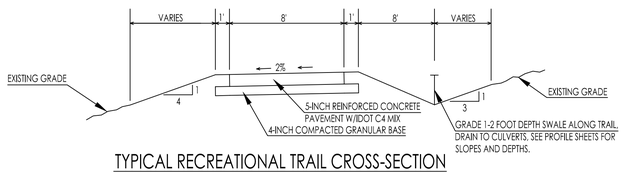
RECREATIONAL TRAIL ALONGSIDE GREEN VALLEY ROAD
SEE MORE DETAILED CROSS-SECTIONS ON SHEET #26 FOR
BASE MATERIALS.



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 70+19.00 TO STATION 89+25.00

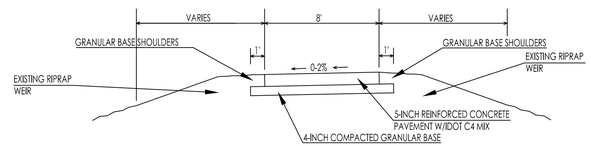


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 89+25.00 TO STATION 90+75.00

TRANSITION CROSS-SLOPE FROM 2% @ STA 89+25.00 TO 0% @ STA 90+75.00

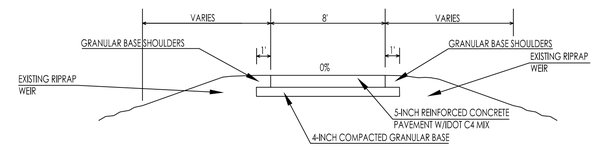


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 90+75.00 TO STATION 92+50.00

RECREATIONAL TRAIL IS CROSSING OVER THE EXISTING RIPRAP WEIR

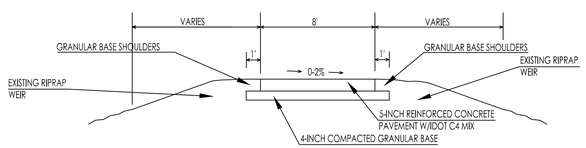


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 92+50.00 TO STATION 94+00.00

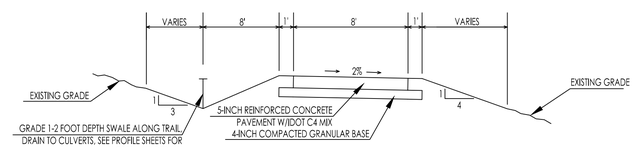
TRANSITION CROSS-SLOPE FROM 0% @ STA 92+50.00 TO 2% @ STA 94+00.00
RIPRAP WEIR ENDS @ STA 94+00.00±



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 94+00.00 TO STATION 103+30.21

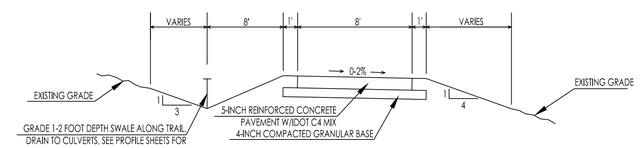


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 103+30.21 TO STATION 104+80.21

TRANSITION CROSS-SLOPE FROM 2% @ STA 103+30.21 TO MATCH EXISTING ACC @ STA 104+80.21
@ STA 104+80.21, THE RECREATIONAL TRAIL JOINS THE EXISTING ACC PARKING ACCESS & THEN SHARES
THE 130TH STREET ROADWAY TO STA 128+04.95.

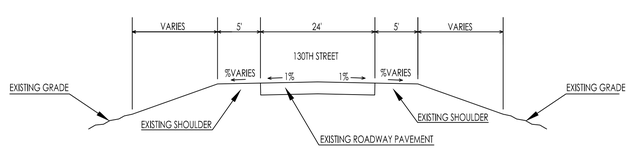


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 104+80.21 TO STATION 128+04.95

@ STA 104+80.21, THE RECREATIONAL TRAIL JOINS THE EXISTING PARKING ACCESS ROAD, THEN JOINS
130TH ST THEN JOINS THE EXISTING PARK ROAD & SHARES THESE ROADWAYS TO STA 128+04.95

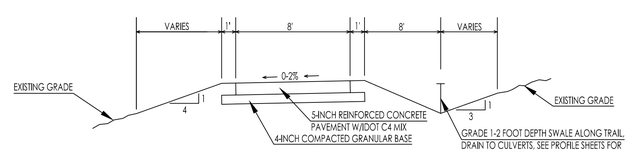


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 128+04.95 TO STATION 129+54.95

TRANSITION CROSS-SLOPE FROM 0% @ STA 128+04.95 TO 2% @ STA 129+54.95
@ STA 128+04.95, THE RECREATIONAL TRAIL LEAVES THE SHARED PARK ROADWAY

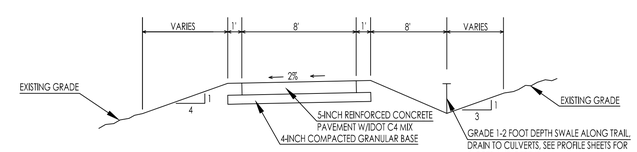


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 129+54.95 TO STATION 163+89.50

END CONSTRUCTION @ STA 163+89.50 WHERE THE RECREATIONAL TRAIL CROSSES THE PARK'S NORTH
ASPHALT LOOP DRIVE OF THE BOAT RAMP. MATCH EXISTING ELEVATIONS OF LOOP DRIVE.



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

TYPICAL CROSS-SECTIONS

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 22

STATION 163+89.50 TO STATION 164+13.51

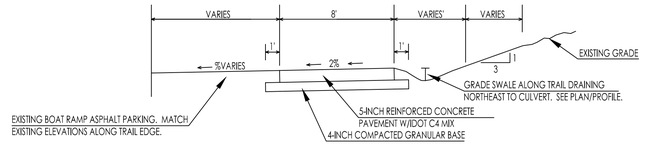
@ STA 163+89.50, THE RECREATIONAL TRAIL STARTS CROSSING THE PARK'S NORTH ASPHALT LOOP DRIVE OF THE BOAT RAMP AND LEAVES THE LOOP DRIVE @ STA 164+13.51. ANY DAMAGE DONE TO THE EXISTING LOOP DRIVE DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR @ CONTRACTORS EXPENSE.

TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 164+13.51 TO STATION 165+70.85

BEGIN CONSTRUCTION @ STA 164+13.51, END CONSTRUCTION @ STA 165+70.85 WHERE THE TRAIL CROSSES THE PARK'S SOUTH ASPHALT LOOP DRIVE OF THE BOAT RAMP. MATCH EXISTING ELEVATIONS OF THE EXISTING ASPHALT WHERE THE TRAIL ADJOINS.



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 165+70.85 TO STATION 166+00.92

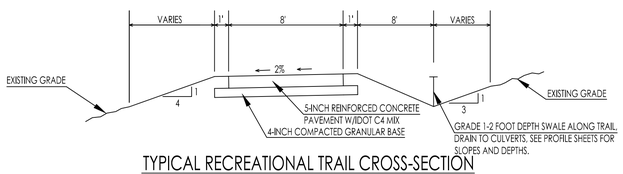
@ STA 165+70.85, THE RECREATIONAL TRAIL STARTS CROSSING THE PARK'S SOUTH ASPHALT LOOP DRIVE OF THE BOAT RAMP AND LEAVES THE LOOP DRIVE @ STA 166+00.92. ANY DAMAGE DONE TO THE EXISTING LOOP DRIVE DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR @ CONTRACTORS EXPENSE.

TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 166+00.92 TO STATION 183+66.66

BEGIN CONSTRUCTION @ STA 166+00.92 WHERE THE RECREATIONAL TRAIL CROSSES THE PARK'S SOUTH ASPHALT LOOP DRIVE OF THE BOAT RAMP. MATCH EXISTING ELEVATIONS OF LOOP DRIVE.



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

TYPICAL CROSS-SECTIONS

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

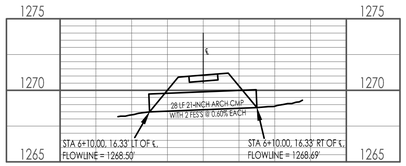
PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

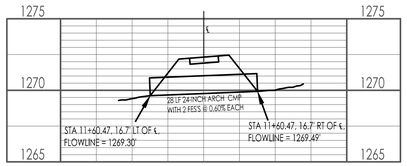
SHEET No: **23**

CULVERT @ STATION 6+10.00



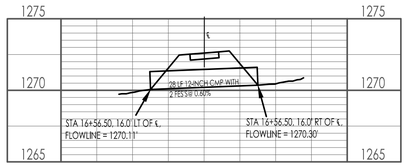
CULVERT CROSS-SECTION

CULVERT @ STATION 11+60.47



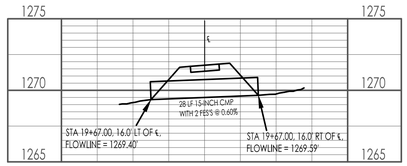
CULVERT CROSS-SECTION

CULVERT @ STATION 16+56.50



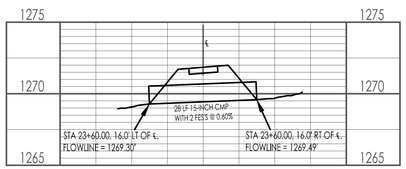
CULVERT CROSS-SECTION

CULVERT @ STATION 19+67.00



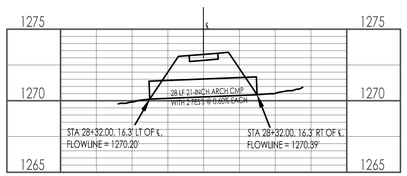
CULVERT CROSS-SECTION

CULVERT @ STATION 23+60.00



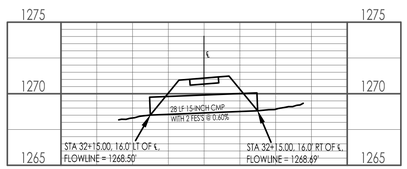
CULVERT CROSS-SECTION

CULVERT @ STATION 28+32.00



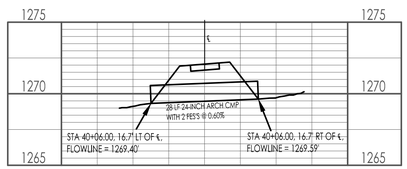
CULVERT CROSS-SECTION

CULVERT @ STATION 32+15.00



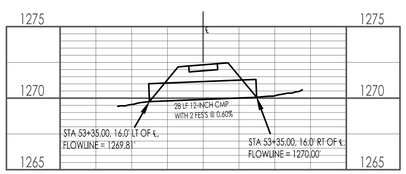
CULVERT CROSS-SECTION

CULVERT @ STATION 40+06.00



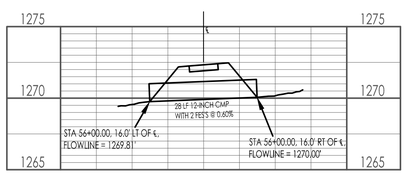
CULVERT CROSS-SECTION

CULVERT @ STATION 53+35.00



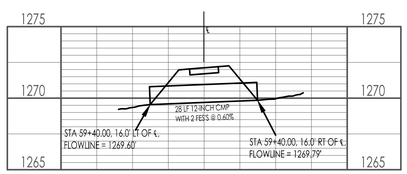
CULVERT CROSS-SECTION

CULVERT @ STATION 56+00.00



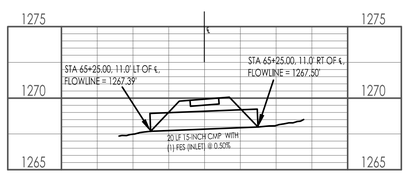
CULVERT CROSS-SECTION

CULVERT @ STATION 59+40.00



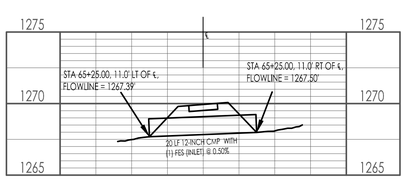
CULVERT CROSS-SECTION

CULVERT @ STATION 65+25.00



CULVERT CROSS-SECTION

CULVERT @ STATION 67+25.00



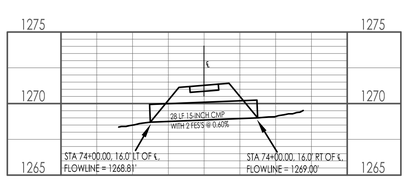
CULVERT CROSS-SECTION

CULVERT @ STATION 70+19.00

SEE SHEET #26 FOR 48-INCH RCP DETAILS

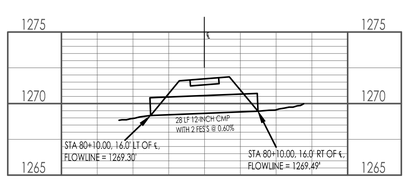
CULVERT CROSS-SECTION

CULVERT @ STATION 74+00.00



CULVERT CROSS-SECTION

CULVERT @ STATION 80+10.00



CULVERT CROSS-SECTION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

CULVERT CROSS-SECTIONS

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

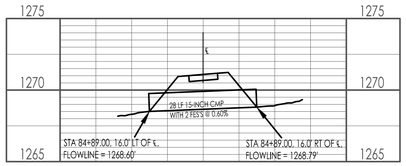
PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

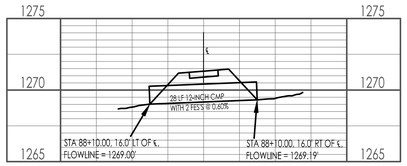
SHEET No: 24

CULVERT @ STATION 84+89.00



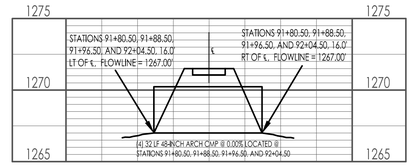
CULVERT CROSS-SECTION

CULVERT @ STATION 88+10.00



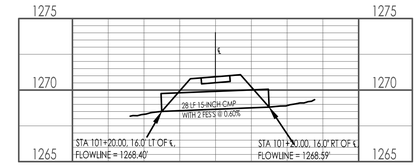
CULVERT CROSS-SECTION

CULVERT @ STATION 91+92.50



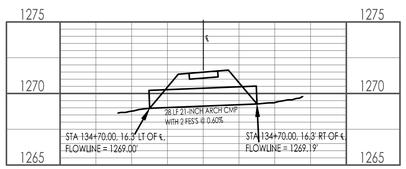
CULVERT CROSS-SECTION

CULVERT @ STATION 101+20.00



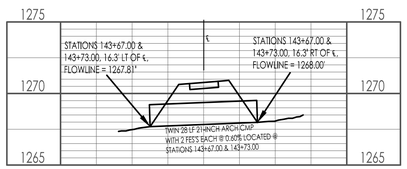
CULVERT CROSS-SECTION

CULVERT @ STATION 134+70 .00



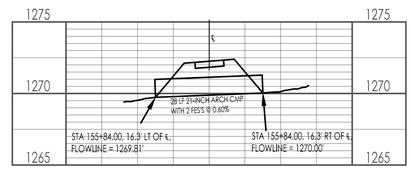
CULVERT CROSS-SECTION

CULVERT @ STATION 143+70 .00



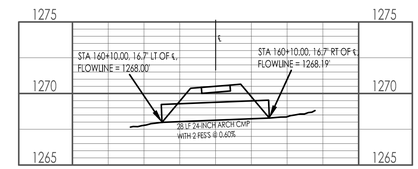
CULVERT CROSS-SECTION

CULVERT @ STATION 155+84 .00



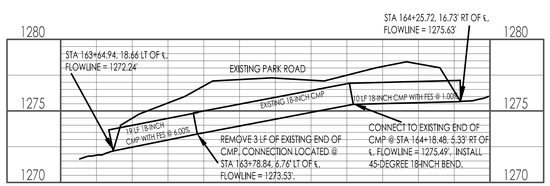
CULVERT CROSS-SECTION

CULVERT @ STATION 160+10 .00



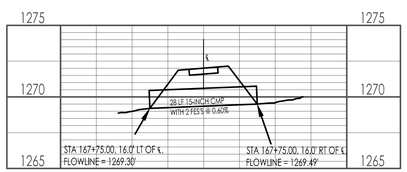
CULVERT CROSS-SECTION

CULVERT @ STATION 164+00.00±



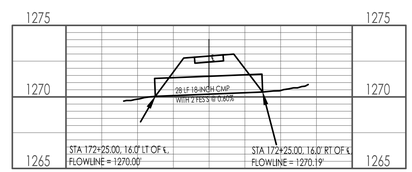
CULVERT CROSS-SECTION

CULVERT @ STATION 167+75.00



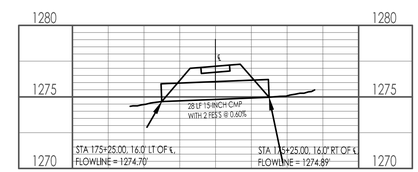
CULVERT CROSS-SECTION

CULVERT @ STATION 172+25.00



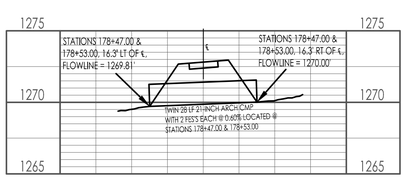
CULVERT CROSS-SECTION

CULVERT @ STATION 175+25.00



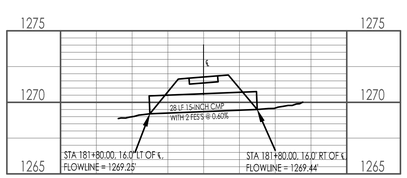
CULVERT CROSS-SECTION

CULVERT @ STATION 178+50 .00



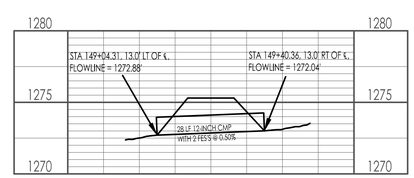
CULVERT CROSS-SECTION

CULVERT @ STATION 181+80.00



CULVERT CROSS-SECTION

JETTY CROSSING CULVERT @ STATION 149+24.46



CULVERT CROSS-SECTION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

CULVERT CROSS-SECTIONS

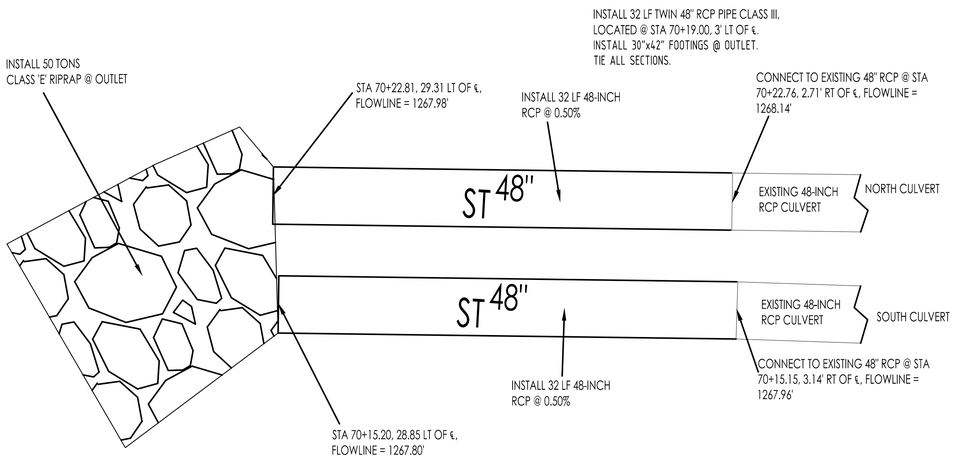
RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

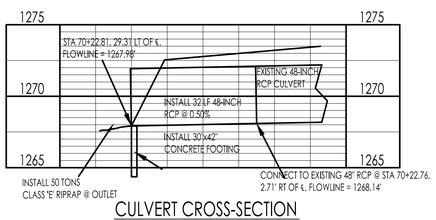
UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHK'D BY:
DATE: 6/17/2013
SHEET No: 25

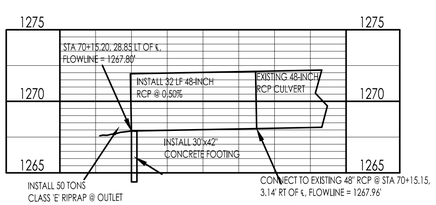


NORTH CULVERT @ STATION 70+22.76



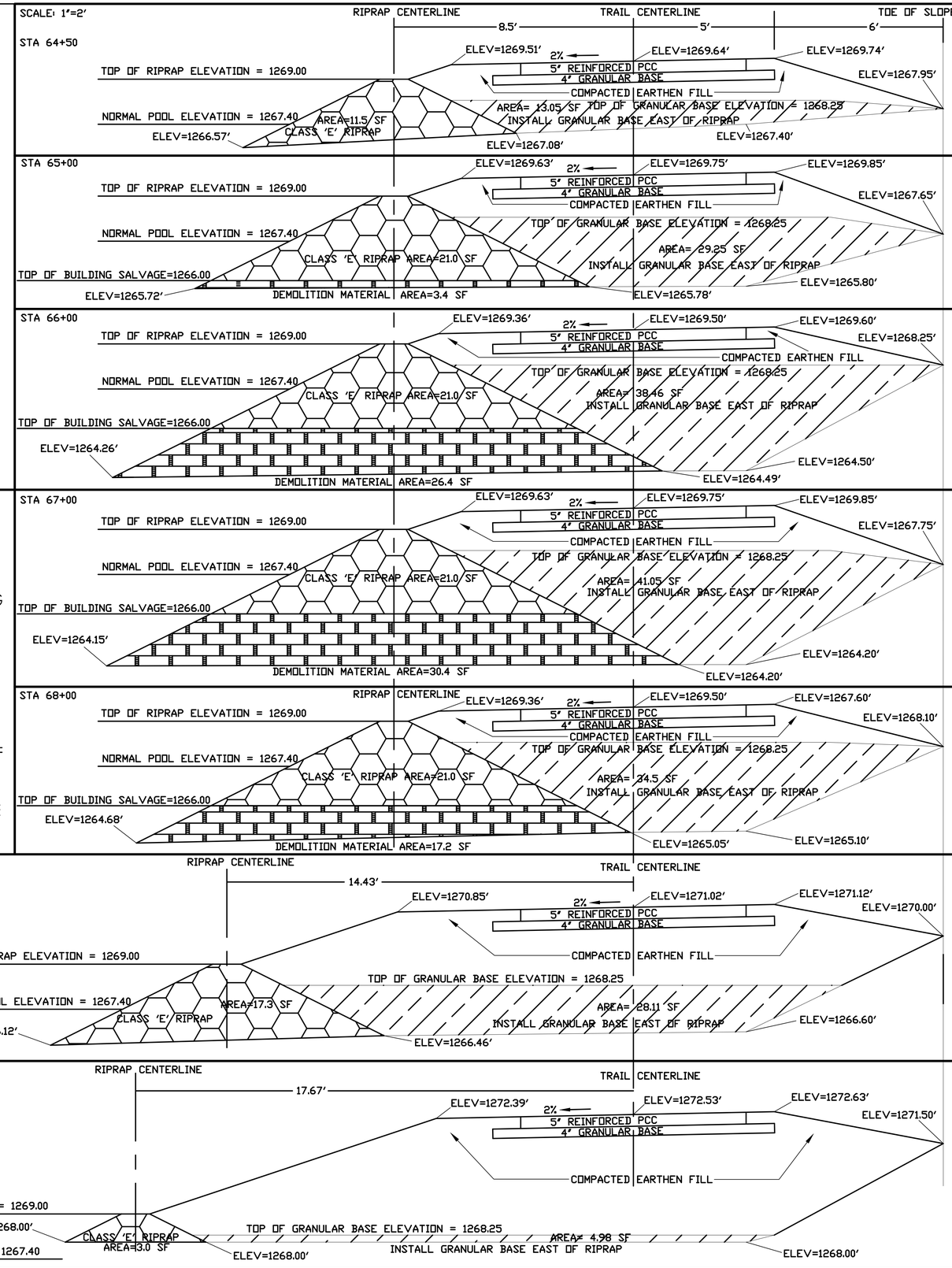
CULVERT CROSS-SECTION

SOUTH CULVERT @ STATION 70+15.15



CULVERT CROSS-SECTION

CROSS-SECTIONS FOR TRAIL CONSTRUCTION BETWEEN STATIONS 64+50 AND 69+50. INSTALL 550 TONS CLASS 'E' RIPRAP WITH A TOP WIDTH OF 1-FOOT AND SIDESLOPES OF 2:1. APPROXIMATELY 400 TONS OF BUILDING DEMOLITION MATERIALS SHALL BE PLACED BELOW ELEVATION = 1266.00'. 615 CY OF GRANULAR BASE SHALL BE INSTALLED EAST OF RIPRAP WITH A TOP OF BASE ELEVATION = 1268.25' TERMINATING @ THE TOE OF SLOPE. COMPACTED EARTHEN FILL WILL HAVE 3:1 SIDE SLOPE TO RIPRAP (WEST SIDE OF TRAIL) AND VARYING SIDE SLOPES ON THE EAST SIDE OF THE TRAIL TO THE TOE OF SLOPE OF GREEN VALLEY ROAD, SEE PLAN/PROFILE FOR MORE ELEVATIONS.



CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

CULVERT CROSS-SECTIONS

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

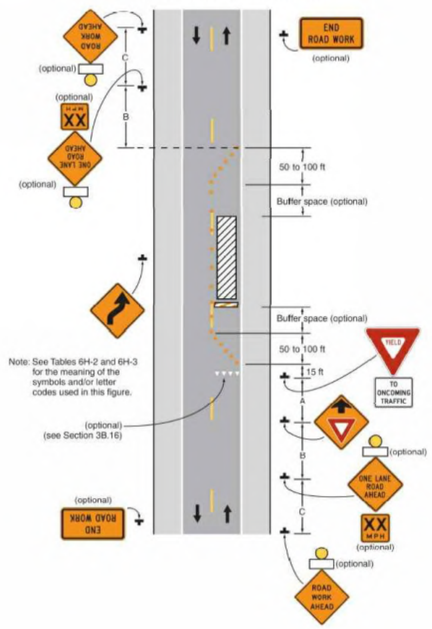
UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHK'D BY:
DATE: 6/17/2013

SHEET No: 26

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



W11-1
BICYCLE TRAFFIC

*See page 67 for symbol design.

	A	B	C	D	E	F
	18	.375	.625	5	.594	1.5
G	24	.375	.625	6.688	.813	1.5
	30	.5	.75	8.5	1	1.875
	36	.625	.875	10	1.188	2.25
	48	.75	1.25	13.375	1.625	3

COLORS: SYMBOL – BLACK
BACKGROUND – YELLOW (RETROREFLECTIVE)

2-91

W16-1

Note: For use with Warning Signs for slower forms of transportation such as the Bicycle, Golf Cart, Farm Machinery, Horse Drawn Vehicle and ATV Warning Signs.

	A	B	C	D	E	F	G	H	J	K	L
G	18	24	.375	.625	3.5	4 C	2.5	6.865	3.862	5.505	1.5
	24	30	.375	.625	4.25	5 C	3.25	8.586	4.823	6.885	1.5

COLORS: LEGEND BLACK
BACKGROUND YELLOW (RETROREFLECTIVE)

2-121

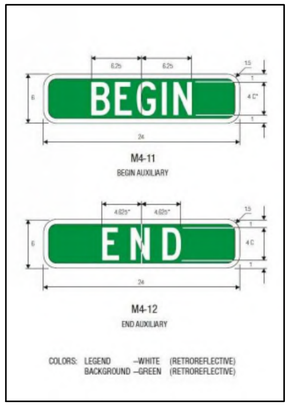
D11-1
BICYCLE ROUTE

*See page 67 for symbol design.

A	B	C	D	E	F	G	H	J	K
24	18	.5	1.5	7	3.5	5 C	5.5	8.5	1.5
30	24	.625	1.875	8.75	4.375	4 C	6.875	10.5	1.5

COLORS: LEGEND WHITE (RETROREFLECTIVE)
SYMBOL WHITE (RETROREFLECTIVE)
BACKGROUND GREEN (RETROREFLECTIVE)

3-84



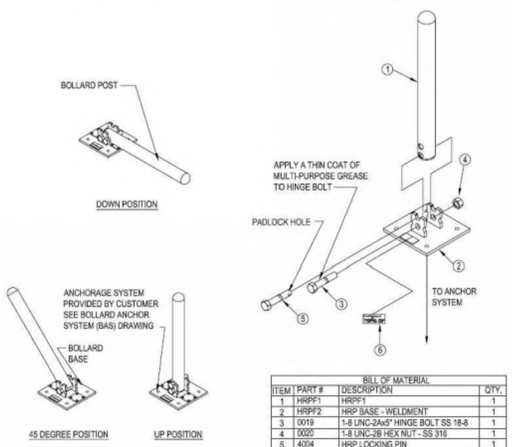
M4-11
BEGIN AUXILIARY

M4-12
END AUXILIARY

COLORS: LEGEND –WHITE (RETROREFLECTIVE)
BACKGROUND –GREEN (RETROREFLECTIVE)

TRAFFICGUARD® DIRECT
manufactured in the USA

TRAFFICGUARD DIRECT, INC.
P.O. BOX 201
GENEVA, IL 60134
TOLL FREE: 1-877-727-7347
FAX: (800) 814-7194
www.trafficguard.com



ITEM	PART #	BILL OF MATERIAL DESCRIPTION	QTY.
1	HRPF1	HRPF1	1
2	HRPF2	HRP BASE - WELDMENT	1
3	0019	1-8 UNC-2A x5" HINGE BOLT SS 18-8	1
4	0020	1-8 UNC-2B HEX NUT - SS 316	1
5	4004	HRP LOCKING PIN	1
6	0105	LABEL	1

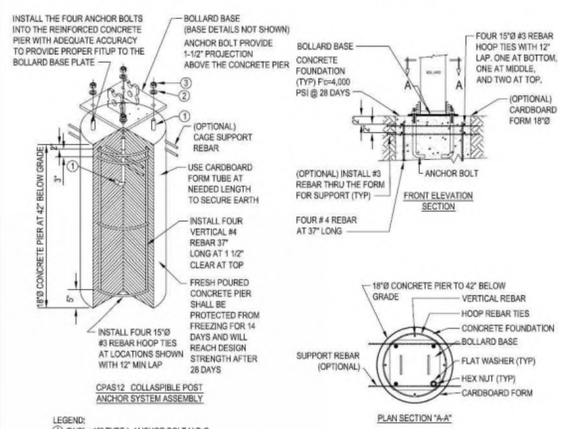
NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.
3. DO NOT SCALE DRAWING.
4. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info REFERENCE NUMBER 4209-005.

ROUND POST
MODEL HRP36 - TRAFFICGUARD® ROUND POST, ASSEMBLY DETAILS

4209-005 REVISION DATE 15/06/2011

TRAFFICGUARD® DIRECT
manufactured in the USA

TRAFFICGUARD DIRECT, INC.
P.O. BOX 201
GENEVA, IL 60134
TOLL FREE: 1-877-727-7347
FAX: (800) 814-7194
www.trafficguard.com



LEGEND:
① Ø1/2" x 12" TYPE L ANCHOR BOLT-H.D.G.
② Ø1/2" TYPE A FLAT NARROW WASHER GALVANIZED STEEL
③ Ø1/2" HEX NUT GALVANIZED STEEL

NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.
3. DO NOT SCALE DRAWING.
4. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info REFERENCE NUMBER 4209-005A.

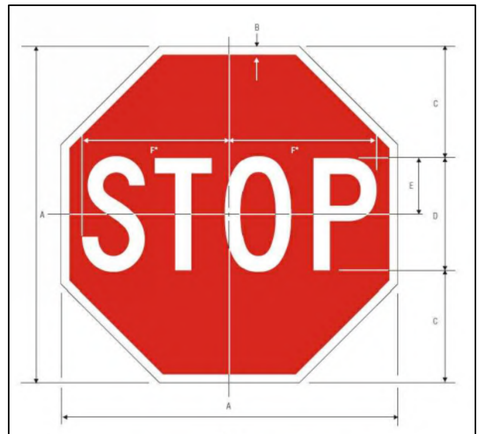
ROUND POST
MODEL HRP36 - TRAFFICGUARD® ROUND POST, FOOTING / ANCHOR SYSTEM DETAILS

4209-005A

NOTE: MOUNT 24"x24" DIAMOND "IMPASSABLE DURING HIGH WATER" SIGN ON 8' HEAVY DUTY U-CHANNEL POST. BOTTOM OF SIGN TO BE 4' ABOVE FINISH GRADE ELEVATION. SIGN LOCATIONS @ STATION 89+00.00, 8.0' RT OF ℄ AND @ STATION 94+40.00, 8.0' LT OF ℄.

24"x24" DIAMOND
BLACK ON YELLOW

NOTE: MOUNT 18"x18" STOP SIGN ON 8' HEAVY DUTY U-CHANNEL POST. BOTTOM OF SIGN TO BE 4' ABOVE FINISH GRADE ELEVATION. SIGN LOCATIONS @ STATION 105+07.00, 8.0' RT OF ℄, STATION 128+10.00, 8.0' LT OF ℄, STATION 163+78.00, 8.0' RT OF ℄, STATION 166+10.00, 8.0' LT OF ℄, AND @ STATION 183+40.00, 8.0' RT OF ℄.



R1-1
STOP

*Reduce spacing 40%

A	B	C	D	E	F
18	.375	6	6 C	3	.775

COLORS: LEGEND – WHITE (RETROREFLECTIVE)
BACKGROUND – RED (RETROREFLECTIVE)

CONSULTANT:

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

STANDARD DETAILS
RECREATIONAL TRAIL FOR:
GREEN VALLEY STATE PARK
UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY:
PROJECT NUMBER: 12-04-88-03
CHK'D BY:
DATE: 6/17/2013
SHEET No: 27

NOTE

THIS ALTERNATE ADDS ADDITIONAL TRAIL ALONG THE PARK ROAD WHICH RESULTS IN THE ELIMINATION OF THE SHARED PARK ROAD FOR THIS PART OF THE PROJECT. SHARED ROADWAY SIGNAGE IS NOT REQUIRED ALONGSIDE THE PARK ROAD ADJACENT TO THIS ALTERNATE ROUTE.

NORTH

Scale: 1"=50'

0' 50' 100'

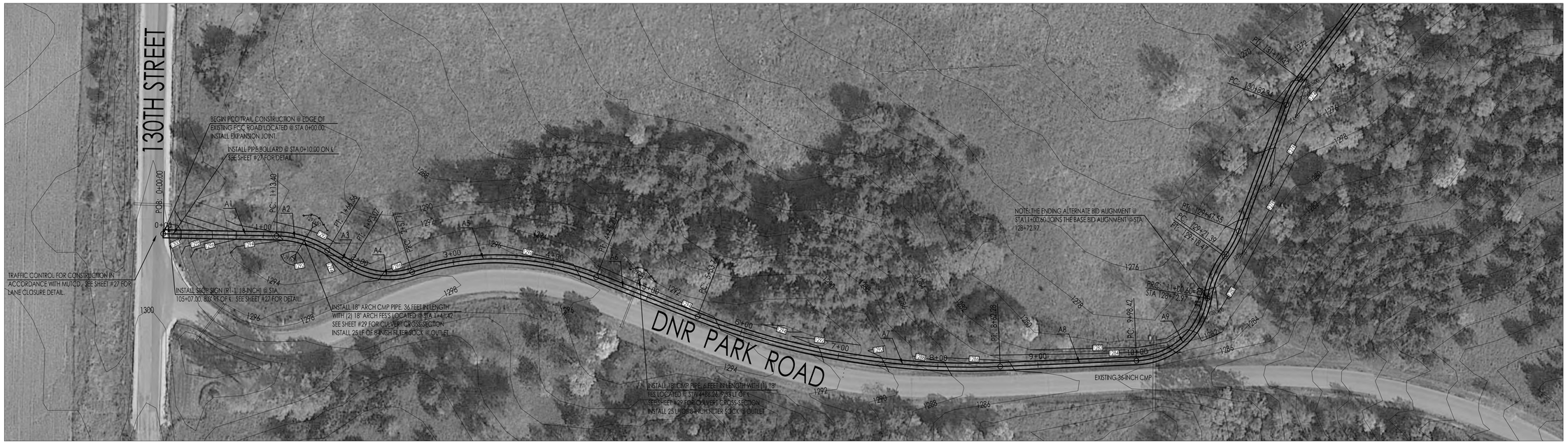
LEGEND

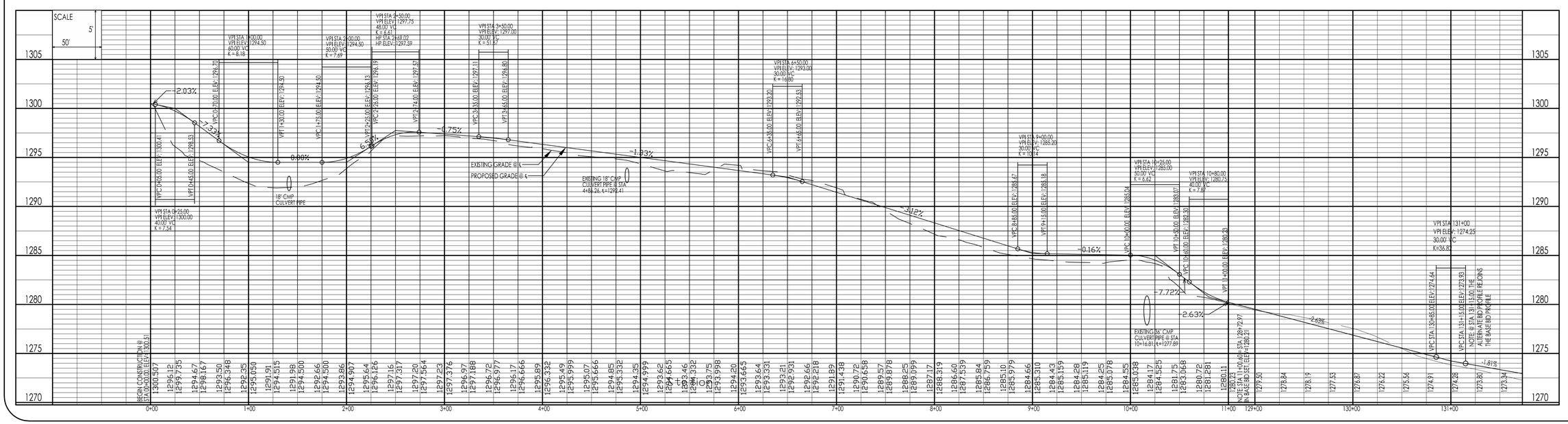
EXISTING/PROPOSED

ST 15" — STORM SEWER

990 — TREES

8" FILTER SOCK





CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

ALTERNATE BID-ALIGNMENT

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY DATE	REVISION

DRAWN BY: PROJECT NUMBER: 12-04-88-03

CHKD BY: DATE: 6/17/2013

SHEET No: 28

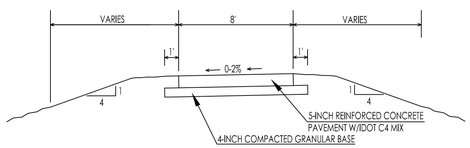
HORIZONTAL CONTROL OF ALTERNATE CENTERLINE ALIGNMENT

No.	Type	Length	Radius	Delta angle	Chord length	Chord Direction	Start Station	End Station	Start Point	End Point	Center Point
A1	Line	113.40'					0+00.00'	1+13.40'	(1397216.6731',407297.1678')	(1397214.5243',407183.7911')	
A2	Curve	53.16'	100.00'	30.4575 (d)	52.53'	S16° 18' 52"W	1+13.40'	1+66.56'	(1397214.5243',407183.7911')	(1397199.7668',407133.3719')	(1397114.5423',407185.6861')
A3	Line	26.51'					1+66.56'	1+93.07'	(1397199.7668',407133.3719')	(1397185.8983',407110.7787')	
A4	Curve	64.71'	75.00'	49.4313 (d)	62.72'	S6° 49' 39"W	1+93.07'	2+57.77'	(1397185.8983',407110.7787')	(1397178.4423',407048.5062')	(1397249.8167',407071.5431')
A5	Curve	187.43'	275.00'	39.0497 (d)	183.82'	S1° 38' 12"W	2+57.77'	4+45.20'	(1397178.4423',407048.5062')	(1397173.1918',406864.7625')	(1396916.7362',406964.0377')
A6	Line	108.55'					4+45.20'	5+53.74'	(1397173.1918',406864.7625')	(1397134.0069',406763.5369')	
A7	Curve	308.54'	750.00'	23.5710 (d)	306.37'	S9° 22' 34"W	5+53.74'	8+62.28'	(1397134.0069',406763.5369')	(1397084.0940',406461.2581')	(1397833.4311',406492.7865')
A8	Line	136.14'					8+62.28'	9+98.42'	(1397084.0940',406461.2581')	(1397089.8171',406325.2386')	
A9	Curve	102.18'	75.00'	78.0587 (d)	94.46'	S41° 26' 19"E	9+98.42'	11+00.60'	(1397089.8171',406325.2386')	(1397152.3309',406254.4270')	(1397164.7508',406328.3915')

TYPICAL CROSS-SECTIONS OF ALTERNATE ALIGNMENT

STATION 00+00.00 TO STATION 1+50.00

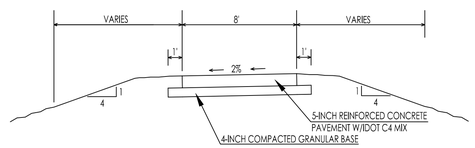
TRANSITION CROSS-SLOPE FROM 0% @ STA 00+00.00 TO 2% @ STA 1+50.00



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

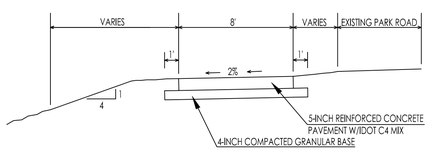
STATION 1+50.00 TO STATION 2+50.00



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

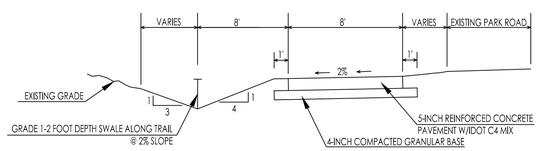
STATION 2+50.00 TO STATION 6+00.00



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

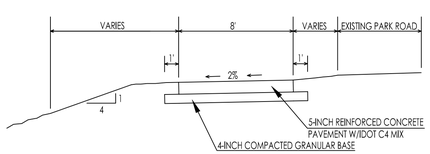
STATION 6+00.00 TO STATION 7+75.00



TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 7+75.00 TO STATION 10+25.00

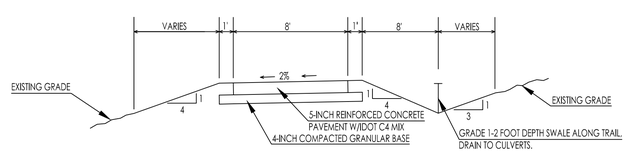


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

STATION 10+25.00 TO STATION 11+00.60

THE ALTERNATE ALIGNMENT ENDS @ STA 11+00.60 WHICH IS EQUAL TO STA 128+72.97 IN THE BASE BID.
THE ALIGNMENT OF THE TRAIL THEN FOLLOWS THE ORIGINAL BASE BID ALIGNMENT BEYOND THIS POINT.

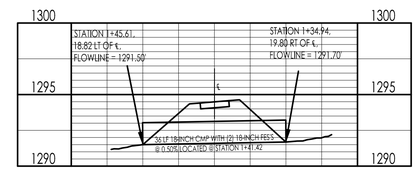


TYPICAL RECREATIONAL TRAIL CROSS-SECTION

NO SCALE

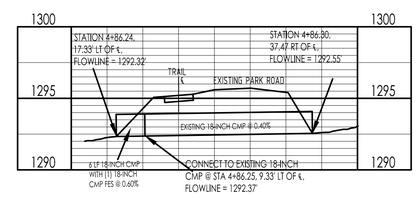
TYPICAL CROSS-SECTIONS OF ALTERNATE CULVERTS

CULVERT @ STATION 1+41.42



CULVERT CROSS-SECTION

CULVERT @ STATION 4+86.25



CULVERT CROSS-SECTION

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

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

ALTERNATE CONTROL/ DETAILS

RECREATIONAL TRAIL FOR:

GREEN VALLEY STATE PARK

UNION COUNTY, IOWA

NO.	BY / DATE	REVISION

DRAWN BY:

PROJECT NUMBER: 12-04-88-03

CHK'D BY:

DATE: 6/17/2013

SHEET No: 29