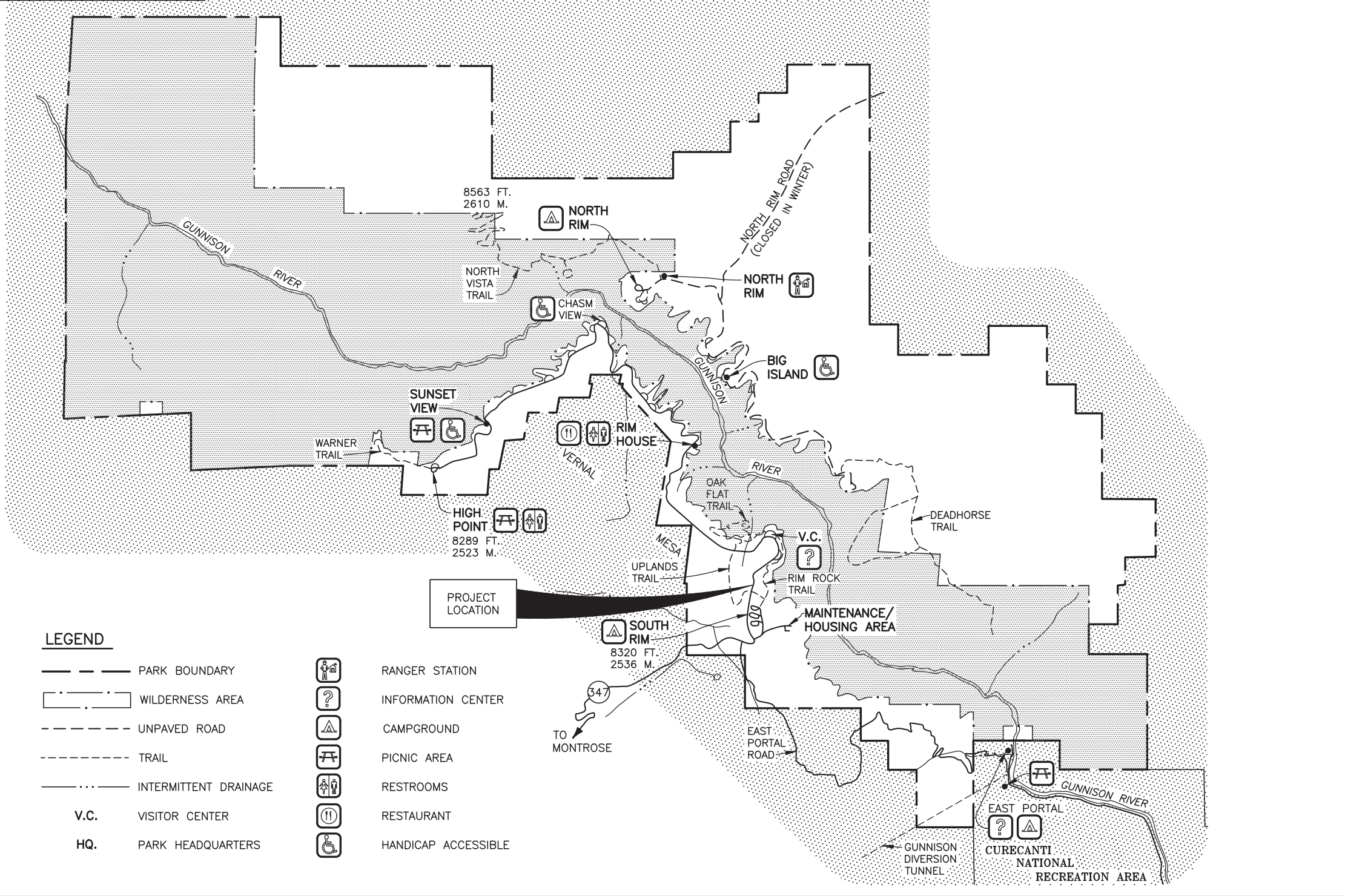
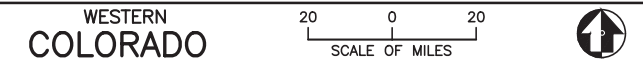
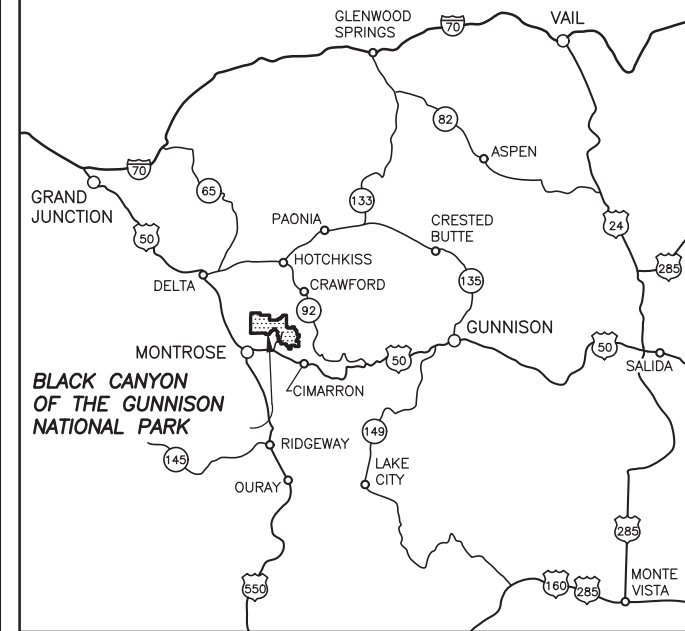
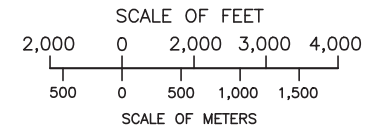


PRELIMINARY

RECOMMENDED _____ Project Manager _____ Date _____
 APPROVED _____ Superintendent _____ Date _____



LEGEND

- PARK BOUNDARY
- WILDERNESS AREA
- UNPAVED ROAD
- TRAIL
- INTERMITTENT DRAINAGE
- V.C. VISITOR CENTER
- HQ. PARK HEADQUARTERS
- RANGER STATION
- INFORMATION CENTER
- CAMPGROUND
- PICNIC AREA
- RESTROOMS
- RESTAURANT
- HANDICAP ACCESSIBLE

SHEET INDEX	
SHEET NO.	SHEET TITLE
G0	COVER SHEET
G1	LEGEND & GENERAL NOTES
G2	ABBREVIATIONS SHEET
G3	OVERALL SITE PLAN
G4	SURVEY CONTROL DIAGRAM
G5-G6	TYPICAL SECTIONS
C1-C4	ROADWAY PLAN - SOUTH RIM DRIVE
C5	ROADWAY PLAN - VISITOR CENTER
C6-C8	ROADWAY DETAILS - BYPASS LANE, TOMICHI OVERLOOK, & VISITOR CENTER
C9-C12	STRIPING & SIGNAGE PLAN - SOUTH RIM DRIVE
C13-C15	STRIPING & SIGNAGE PLAN - BYPASS LANE, TOMICHI OVERLOOK, & VISITOR CENTER
S1-S31	STANDARD DETAILS

BLACK CANYON OF THE GUNNISON NATIONAL PARK

BLCA 216374

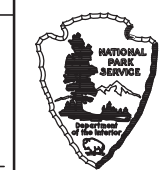


Know what's below.
Call before you dig.

BASIC DATA: BOUNDARY MAP 144/80,010 2/84; USGS TOPO MAP 1954; PARK MINI FOLDER 1993; COVER SHEET REVISED & REDRAWN 12/94. UPDATED 9/98. SGS.

A/E FIRM	Mark	Sheet	REVISION	Date	Initial
PRIME: JACOBS DENVER, CO.					
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.					

QUALITY DESIGN CERTIFICATION	
<input type="checkbox"/>	Prepared in Accordance with Design Development (Title I)
<input type="checkbox"/>	Variance from Design Development (Title I)
<input type="checkbox"/>	Approved by Superintendent on _____ Date _____
<input type="checkbox"/>	Construction Drawing Not Preceded by Design Development (Title I)
Project Manager	Date



DESIGN DRAWINGS
 UNITED STATES
 DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 DENVER SERVICE CENTER

TITLE OF DRAWING
COVER SHEET
 LOCATION WITHIN PARK
SOUTH RIM DRIVE
 NAME OF PARK
BLACK CANYON OF THE GUNNISON
 REGION COUNTY STATE
 6, 7, 8 MONTROSE COLORADO

DRAWING NO. #115
 177002
 PKG. NO. 1
 SHEET 1 OF 55

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LEGEND

<u>EXISTING</u>				<u>PROPOSED</u>	
	ASPHALT PAVEMENT		TRAFFIC BOX		LIMITS OF CONSTRUCTION
	FLOWLINE		TELEPHONE CABINET		ASPHALT
	CHAINLINK FENCE		TELEPHONE PEDESTAL		PAVED DITCH
	WIRE FENCE		ELECTRIC CABINET		TOE OF SLOPE / TOP OF CUT
	WOOD FENCE		ELECTRIC METER		SIGN
	CURB FLOW LINE		ELECTRIC TOWER		FLARED END SECTION
	STORM LINE QUALITY LEVEL "C"		ELECTRIC TRANSFORMER		HEADWALL
	STORM LINE QUALITY LEVEL "D"		SURVEY CONTROL POINT		DROP INLET
	ELECTRIC LINE QUALITY LEVEL "B"		TESTHOLE		CULVERT
	EXISTING MINOR CONTOUR		PAY BOX		CONCRETE
	EXISTING MAJOR CONTOUR		FLAG POLE		CATTLE GUARD
	ELECTRIC LINE		UNKNOWN UTILITY VALVE		
	WATER LINE		FAUCET		
			WATER VAULT		
			WATER WELL		
			FLARED END SECTION		
			STORM GRATE		
			STORM MANHOLE WITH GRATE		
			SIGN		
			TRASH CAN		
			ARROW STRAIGHT		
			ACCESSIBILITY SYMBOL		
			GATE		



A/E FIRM PRIME: JACOBS DENVER, CO.		DESIGNED: CM	SUB SHEET NO. G1	DRAWING NO. #115 177002	
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.		TECH. REVIEW: JM		SHEET 2 OF 55	
DATE: 3/28/22			TITLE OF DRAWING LEGEND & GENERAL NOTES BLACK CANYON OF THE GUNNISON NATIONAL PARK		

SITE WORK GENERAL ABBREVIATIONS

⊙	AT	CB	CATCH BASIN	EVC	END OF VERTICAL CURVATURE	MH	MANHOLE	RT	RIGHT
⊕	CENTER LINE	CC	CONTROL CABLE	EW	EACH WAY	MIN	MINIMUM	RW	RECLAIMED WATER
Δ	DELTA (ANGLE)	CF	CUBIC FEET	EXIST	EXISTING	MJ	MECHANICAL JOINT	S	SEWER
∅	DIAMETER	CI	CAST IRON	FDN	FOUNDATION	MO	MIDDLE ORDINATE	S	SLOPE
'	FEET	CIP	CAST IRON PIPR	FF	FINISHED FLOOR (ELEVATION)	MON	MONUMENT	S	SOUTH
ℓ	FLOW LINE	CJ	CONSTRUCTION JOINT	FH	FIRE HYDRANT	N	NORTH	SB	SELECT BACKFILL
"	INCHES	CLG	CEILING	FL	FLOW LINE	NIC	NOT IN CONTRACT	SCH	SCHEDULE
-	MINUS	CLR	CLEAR	FM	FORCE MAIN	NPS	NATIONAL PARK SERVICE	SHT	SHEET
#	NUMBER	CLR	CLEARANCE	FT	FOOT, FEET	NTE	NOT TO EXCEED	SP	SIGNAL POLE
%	PERCENT	CMP	CORRUGATED METAL PIPE	G	GAS	NTS	NOT TO SCALE	SQ	SQUARE
+	PLUS	CO	CLEANOUT	GA	GAGE	OC	ON CENTER	SS	STAINLESS STEEL
ℙ	PROPERTY LINE	CO	CONTRACTING OFFICER	GAL	GALLON	OD	OUTSIDE DIAMETER	ST	STORM SEWER
ℙ	P-LINE	CONC	CONCRETE	GALV	GALVANIZED	PB	POLYBUTYLENE (PIPE)	STA	STATION
A	AIR	CP	CORNER POINT	GLL	GRADING LIMIT LINE	PB	PULLBOX	STL	STEEL (PIPE)
AC, ACP	ASBESTOS CEMENT (PIPE)	CP	CATCH POINT	GPH	GALLONS PER HOUR	PC	POINT OF CURVATURE	STM	STEAM
AC	ASBESTOS CEMENT	CS	COMBINED SEWER	GPM	GALLONS PER MINUTE	PCC	POINT OF COMPOUND CURVATURE	T	TANGENT LENGTH
AC	ASPHALT CEMENT CONCRETE	CS	COMFORT STATION	GS	GALVANIZED STEEL	PE	PLAIN END PIPE	T	TELEPHONE
AE	AERIAL TELEPHONE	CSP	CORRUGATED STEEL PIPE	GSP	GALVANIZED STEEL PIPE	PE	POLYETHYLENE (PIPE)	TRANS	TRANSFORMER
AL	ALUMINUM	CU	COPPER	GV	GATE VALVE	PED	PEDESTAL	TC	TOP OF CURB
ARV	AIR RELIEF VALVE	CV	CURBSTOP VALVE	HB	HOSE BIBB	PG	PROFILE GRADE	TS	TOP OF SLOPE
ASPH	ASPHALT	CY	CUBIC YARDS	HH	HANDHOLE	PI	POINT OF INTERSECTION	TS	TOP OF STEP
AT	AERIAL TELEPHONE	D	DELTA (ANGLE)	HP	HIGH POINT	POC	POINT ON CURVE	TS	TRENCH SCAR
B&B	BALL AND BURLAP	DBH	DIAMETER BREST HEIGHT	HP	HINGE POINT	POL	POINT ON LINE	TW	TOP OF WALL
BC	BEGINNING OF CURVE	DC	DEGREE OF CURVE	HORIZ	HORIZONTAL	POT	POINT ON TANGENCY	TYP	TYPICAL
BC	BOTTOM OF CURB	DET	DETAIL	IN	INCH, INCHES	PP	POWER POLE	UE	UNDERGROUND ELECTRICAL
BC	BRASS CAP	DI	DROP INLET	ID	INSIDE DIAMETER	PRC	POINT OF REVERSE CURVATURE	UT	UNDERGROUND TELEPHONE
BD	BEDDING	DI	DUCTILE IRON	INV	INVERT	PRV	PRESSURE REGULATING VALVE	V	VALVE
BF	BACKFILL	DIA	DIAMETER	IE	INVERT ELEVATION	PSF	POUNDS PER SQUARE FOOT	VAR	VARIES
BLDG	BUILDING	DIP	DUCTILE IRON PIPE	JT	JOINT	PSI	POUNDS PER SQUARE INCH	VC	VERTICAL CURVE
BM	BENCHMARK	DR	DRAIN	L	LENGTH	PT	POINT OF TANGENCY	VC,VCP	VITRIFIED CLAY PIPE
BOL	BEGINNING OF LINE	E	EAST	L	LIGHTING	PVC	POLYVINYL CHLORIDE (PIPE)	VERT	VERTICAL
BOT	BOTTOM	E	ELECTRIC	LB	POUND	PVCC	POINT OF VERTICAL COMPOUND CURVATURE	VPC	VERTICAL POINT OF CURVATURE
BR	BRICK	EA	EACH	LC	LENGTH OF CURVE	PVI	POINT OF VERTICAL INTERSECTION	VPI	VERTICAL POINT OF INTERSECTION
BS	BOTTOM OF SLOPE	EC	END OF CURVE	LF	LINEAR FEET	PVRC	POINT OF VERTICAL REVERSE CURVATURE	VPT	VERTICAL POINT OF TANGENCY
BS	BOTTOM OF STEP	EJ	EXPANSION JOINT	LP	LOW POINT	R	RADIUS (LENGTH)	W	WATER
BVC	BEGINNING OF VERTICAL CURVATURE	EL	ELEVATION	LPG	LIQUID PROPANE GAS	RC	REINFORCED CONCRETE	W	WEST
BW	BOTTOM OF WALL	EOL	END OF LINE	LS	LIFT STATION	RCP	REINFORCED CONCRETE PIPE	W/	WITH
C	CHORD LENGTH	EP	EDGE OF PAVEMENT	LT	LEFT	REQ'D	REQUIRED	WLL	WORK LIMIT LINE
CAL	CALIPER	ER	EDGE OF ROAD	M	METER	RP	RADIUS POINT	W/O	WITHOUT
CATV	CABLE TELEVISION	ES	EDGE OF SHOULDER	MAX	MAXIMUM	ROW	RIGHT OF WAY	YH	YARD HYDRANT

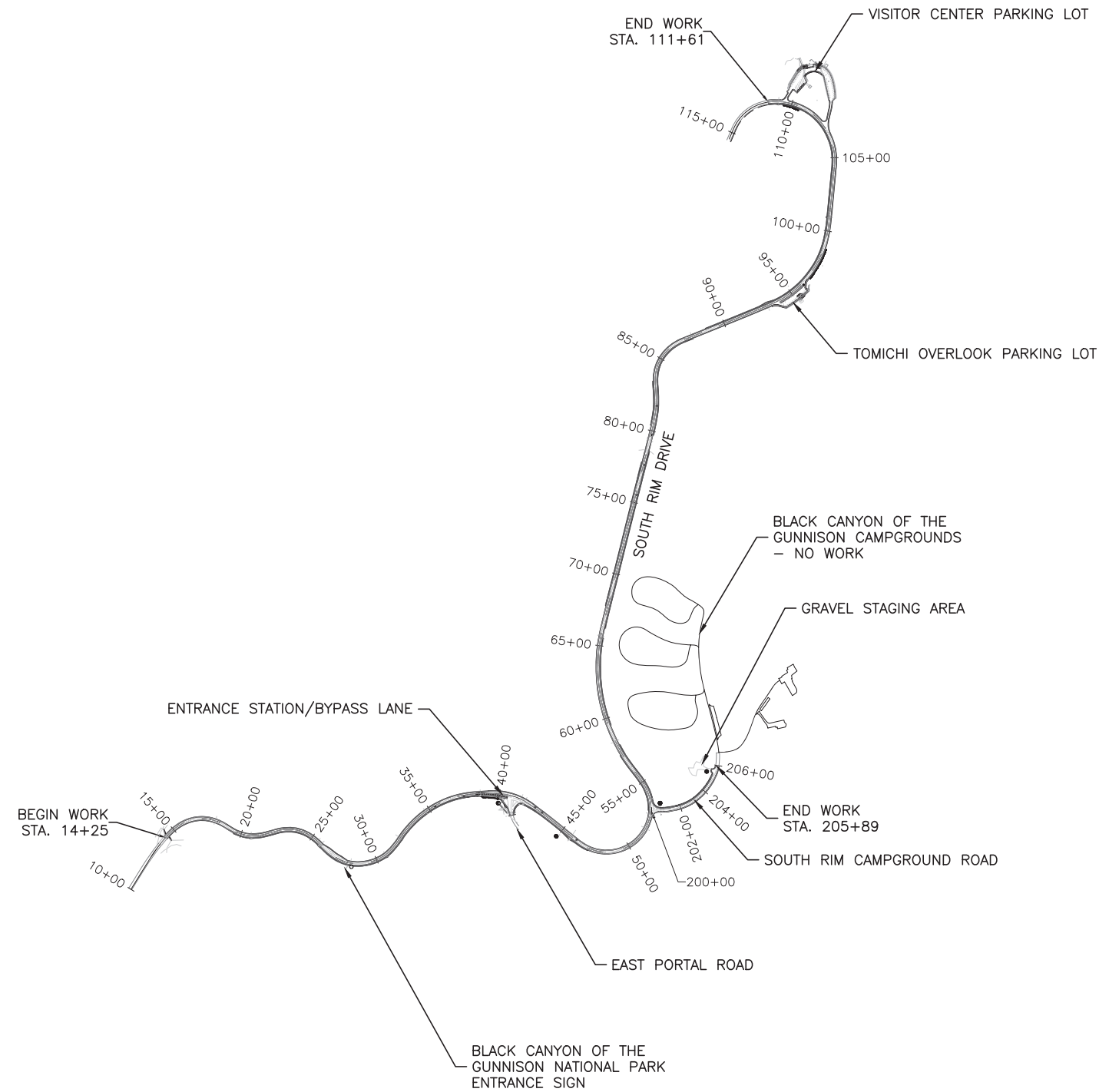
PROJECT SPECIFIC ABBREVIATIONS

RRFB RECTANGULAR RAPID FLASHING BEACON



A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM	SUB SHEET NO. G2	TITLE OF DRAWING ABBREVIATIONS SHEET	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM			
DATE: 3/28/22			BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1
				SHEET 3 OF 55

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A/E FIRM PRIME: JACOBS DENVER, CO. SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	DESIGNED: CM	SUB SHEET NO. <h1>G3</h1>	TITLE OF DRAWING <h2>OVERALL SITE PLAN</h2>		DRAWING NO. #115 177002
	TECH. REVIEW: JM		BLACK CANYON OF THE GUNNISON NATIONAL PARK		PKG. NO. 1
DATE: 3/28/22					

PROJECT CONTROL COORDINATE TABLE							
POINT	NORTH	EAST	ELEVATION	LATITUDE (N)	LONGITUDE (W)	HEIGHT	DESCRIPTION
601	1689645.19	2371429.22	8326.95	38°32'25.02067"	107°41'51.62621"	8275.47	2" ALUMINUM CAP #6 REBAR - JACOBS CP 601
602	1689795.44	2372691.73	8394.46	38°32'26.79871"	107°41'35.78565"	8343.04	2" ALUMINUM CAP #6 REBAR - JACOBS CP 602
603	1693390.90	2374605.49	8253.90	38°33'02.77207"	107°41'12.76574"	8202.50	2" ALUMINUM CAP #6 REBAR - JACOBS CP 603
604	1694652.00	2374800.30	8177.03	38°33'15.27914"	107°41'10.68580"	8125.62	2" BRASS CAP -USDI NPS B15 1959
605	1693529.46	2374837.00	8244.47	38°33'04.19486"	107°41'09.89330"	8193.07	2" ALUMINUM CAP #6 REBAR - JACOBS CP 605
606	1694843.72	2374662.12	8166.55	38°33'17.14170"	107°41'12.48123"	8115.14	2" ALUMINUM CAP #6 REBAR - JACOBS CP 606
607	1694738.92	2374607.86	8177.41	38°33'16.09353"	107°41'13.13312"	8126.00	2" ALUMINUM CAP #6 REBAR - JACOBS CP 607
608	1694877.86	2374781.66	8162.60	38°33'17.50672"	107°41'10.98684"	8111.20	PK NAIL IN ASPHALT

GENERAL NOTES:

1. DATE OF FIELD SURVEY: AUGUST 23, 2021 – AUGUST 29, 2021.
2. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECTS IN THIS SURVEY WITHIN THREE (3) YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN (10) YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
3. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY JACOBS ENGINEERING GROUP INC. OR THE SURVEYOR OF RECORD.
4. ALL UNITS ARE US SURVEY FEET.

PROJECT CONTROL:

PROJECT COORDINATES AND ELEVATIONS ARE BASED ON NGS OPUS SOLUTIONS ON CONTROL POINTS 601 AND 604. CONTROL POINTS 601-604 WERE TIED TOGETHER USING STATIC GPS TECHNIQUES AND ADJUSTED USING LEAST SQUARES. ADDITIONAL CONTROL POINTS WERE ESTABLISHED USING RTK AND CONVENTIONAL SURVEYING METHODS.

HORIZONTAL POSITIONS:

HORIZONTAL POSITIONS ARE COLORADO SOUTH (ZONE 0503) STATE PLANE (NAD83/2011).

BASIS OF BEARINGS: BEARINGS ARE BASE ON A GRID BEARING OF N33°57'08"E FROM CONTROL POINT 601 (2" ALUM CAP #6 REBAR STAMPED "JACOBS CP 601") TO CONTROL POINT 604 (2" BRASS CAP STAMPED USDI NPS B15 1959").

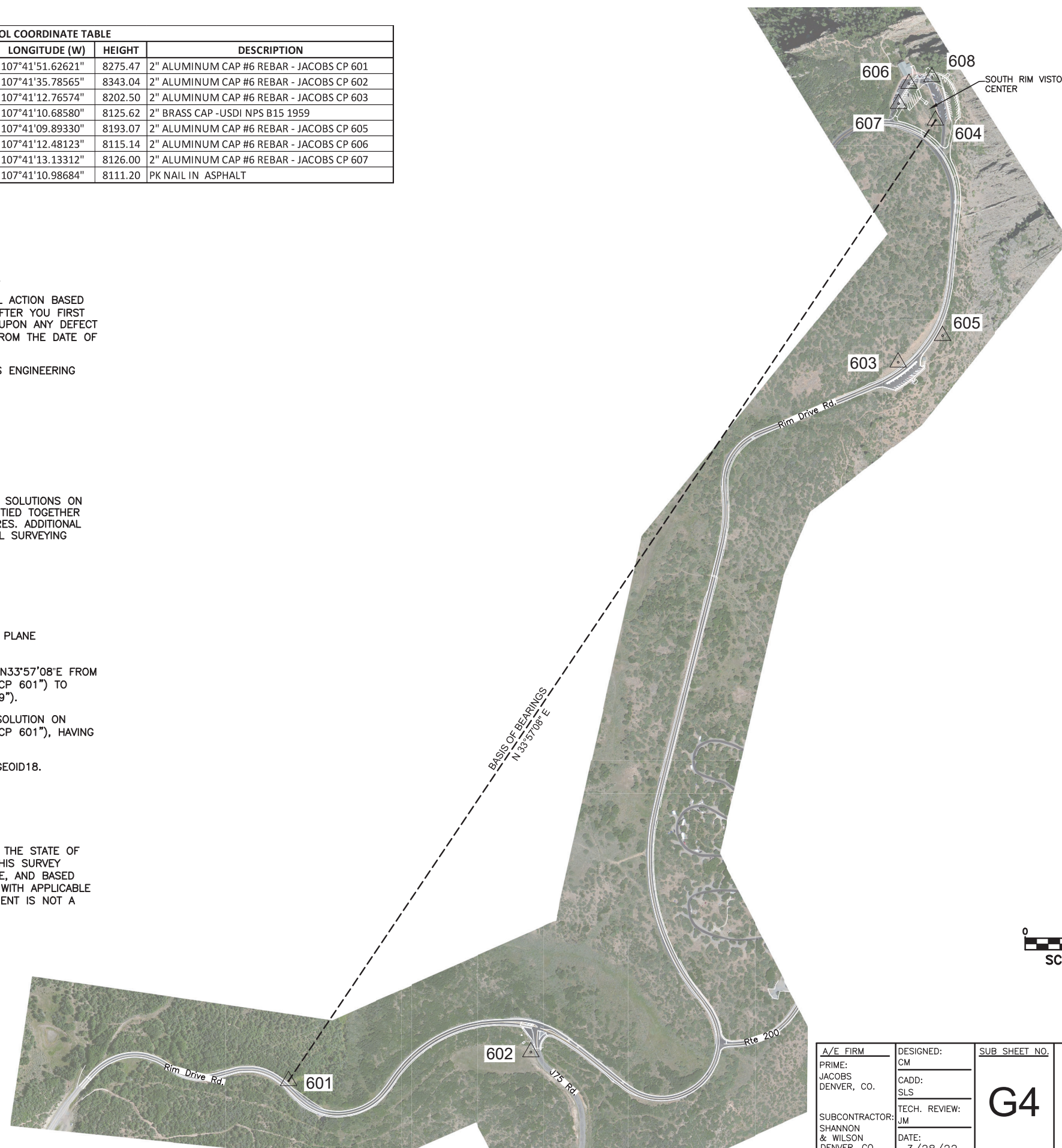
BASIS OF ELEVATIONS: ELEVATIONS ARE BASED ON AN NGS OPUS SOLUTION ON CONTROL POINT 601 (2" ALUM CAP #6 REBAR STAMPED "JACOBS CP 601"), HAVING AN OPUS DERIVED ELEVATION OF 8326.948 FEET (NAVD88).

NOTE: ELEVATIONS ESTABLISHED UTILIZING GPS TECHNIQUES USED GEOID18.

SURVEYOR'S CERTIFICATION:

I, ROBERT GUPTILL, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF COLORADO, DO HEREBY STATE TO NATIONAL PARK SERVICE, THAT THIS SURVEY CONTROL DIAGRAM WAS PREPARED UNDER MY RESPONSIBLE CHARGE, AND BASED UPON MY KNOWLEDGE, INFORMATION, AND BELIEF, IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE, EXCEPT AS NOTED HEREON. THIS STATEMENT IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

ROBERT GUPTILL, COLORADO PLS 38747
 FOR AND ON BEHALF OF JACOBS ENGINEERING GROUP INC.
 9191 JAMAICA STREET
 ENGLEWOOD, CO 80112
 Robert.Guptill@Jacobs.com

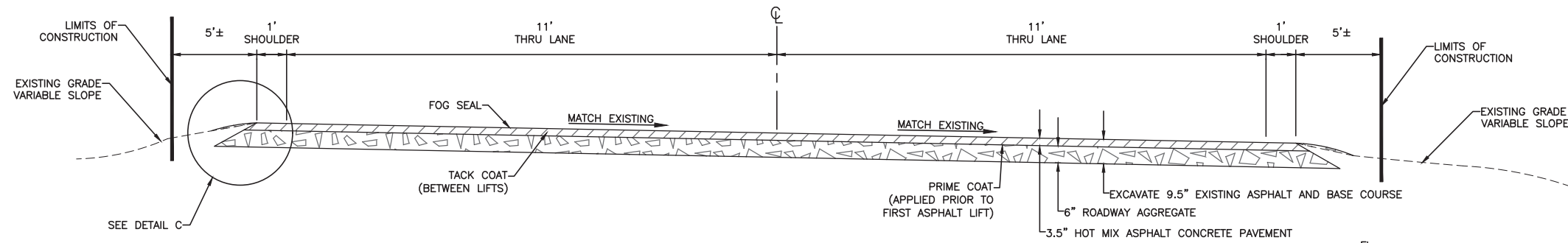


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SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM DATE: 3/28/22		BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1 SHEET 5 OF 52

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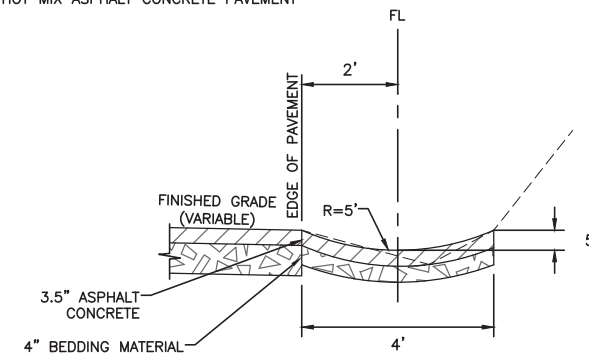
NOTES

1. PLACE ASPHALT CONCRETE PAVEMENT IN TWO LIFTS.
2. AT NEW ASPHALT DITCH LOCATIONS MATCH EXISTING SHAPE.
3. AT INLETS WIDEN AND SHAPE PAVED WATERWAY TO DRAIN AS APPROVED BY THE CO.
4. PLACE TACK COAT BETWEEN HOT MIX ASPHALT CONCRETE PAVEMENT LIFTS.
5. SEE DETAIL SHEET S14 THROUGH S16 FOR PAVEMENT MARKINGS.



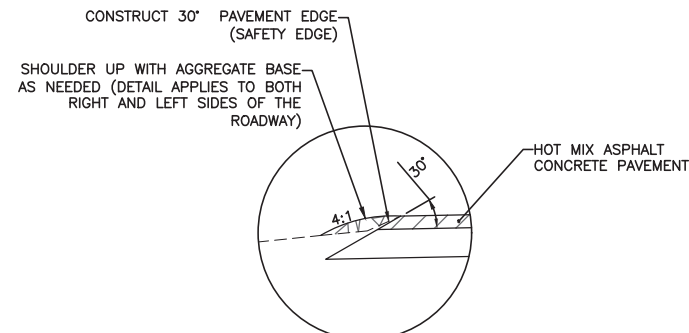
(A) TYPICAL SECTION - SOUTH RIM DRIVE

NO SCALE
 STA. 14+25 TO 38+41
 STA. 40+52 TO 111+61

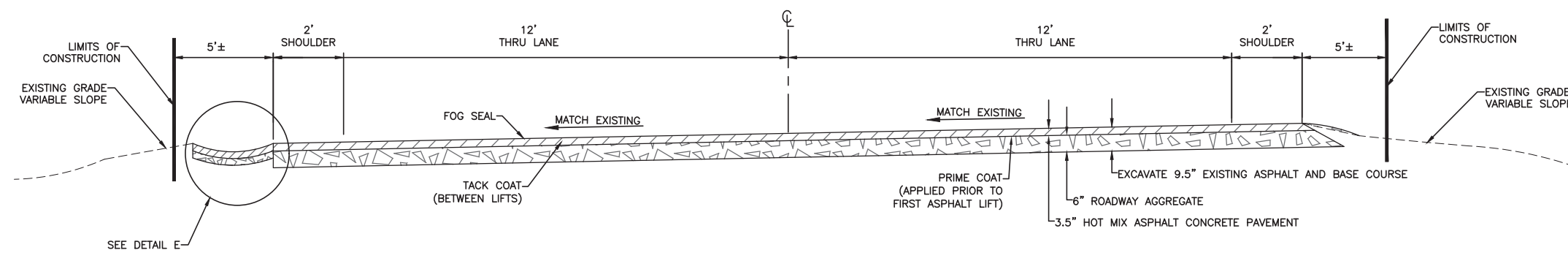


(E) ASPHALT DITCH TYPICAL SECTION

NO SCALE
 STA. 19+55 TO 40+61, RT
 STA. 41+46 TO 47+16, RT
 STA. 52+99 TO 57+31, LT
 STA. 53+85 TO 57+96, RT
 STA. 59+47 TO 65+54, RT
 STA. 66+24 TO 78+61, RT
 STA. 67+77 TO 77+78, LT
 STA. 79+75 TO 87+64, RT
 STA. 80+37 TO 83+40, LT
 STA. 88+71 TO 111+61, LT
 STA. 200+05 TO 205+29, RT

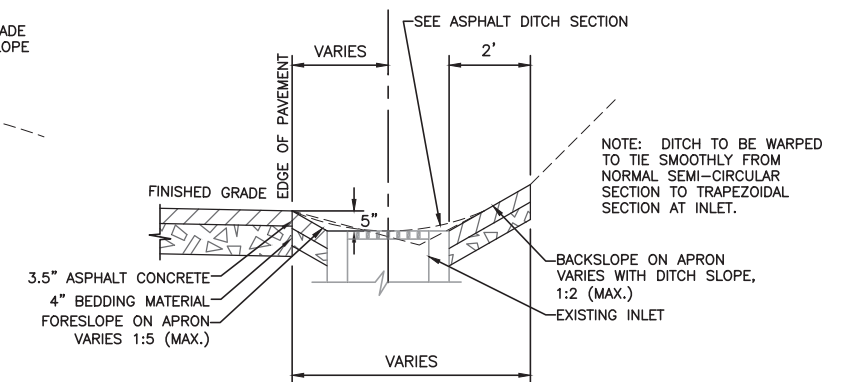


(C) PAVEMENT EDGE
 NO SCALE



(B) TYPICAL SECTION - SOUTH RIM CAMPGROUND ROAD

NO SCALE
 STA. 200+00 TO 205+89

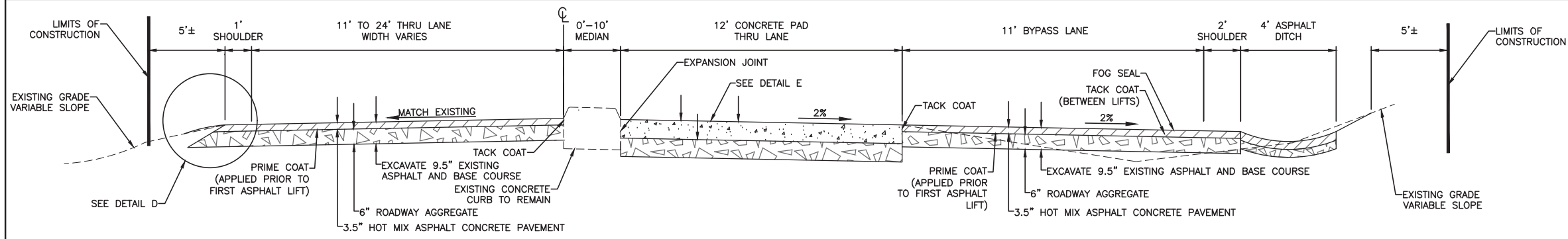


(D) ASPHALT DITCH TYPICAL SECTION AT EXISTING INLET
 NO SCALE

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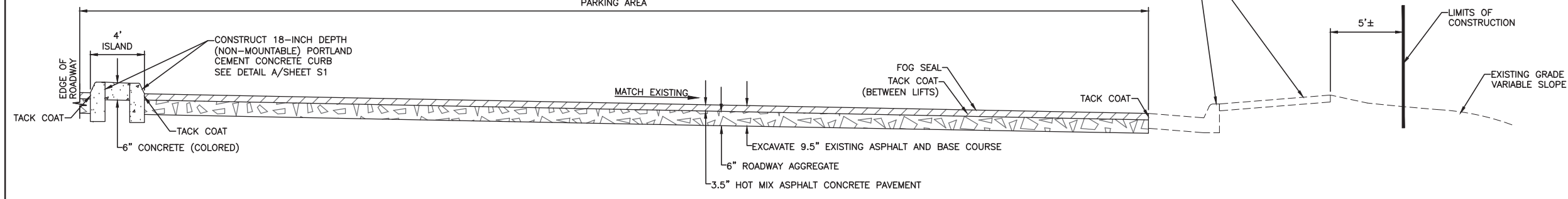
A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM CADD: CM TECH. REVIEW: JM DATE: 3/28/22	SUB SHEET NO. G5	TITLE OF DRAWING TYPICAL SECTIONS BLACK CANYON OF THE GUNNISON NATIONAL PARK	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.				PKG. NO. 1 SHEET 6 OF 55



A TYPICAL SECTION – SOUTH RIM DRIVE

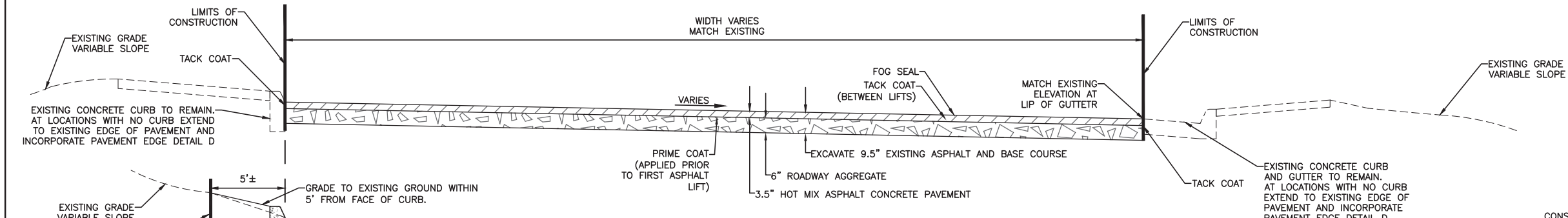
NO SCALE
STA. 38+41 TO 40+52

51'± TO CURB
PARKING AREA



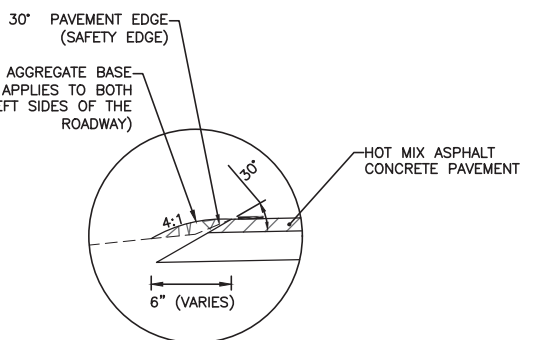
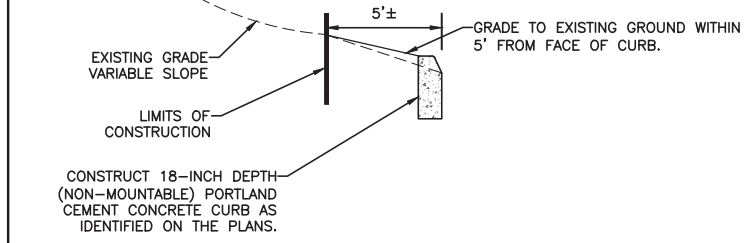
B TYPICAL SECTION – TOMICHI OVERLOOK

NO SCALE
STA. 93+47 TO 96+40

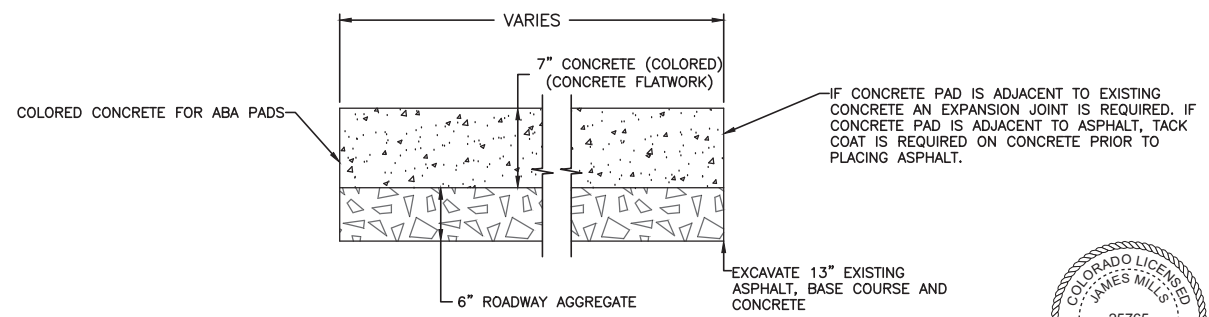


C TYPICAL SECTION – VISITOR CENTER

NO SCALE



D PAVEMENT EDGE
NO SCALE

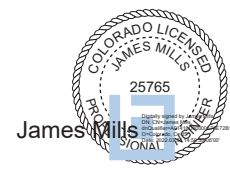


E CONCRETE PAD
NO SCALE

NOTES

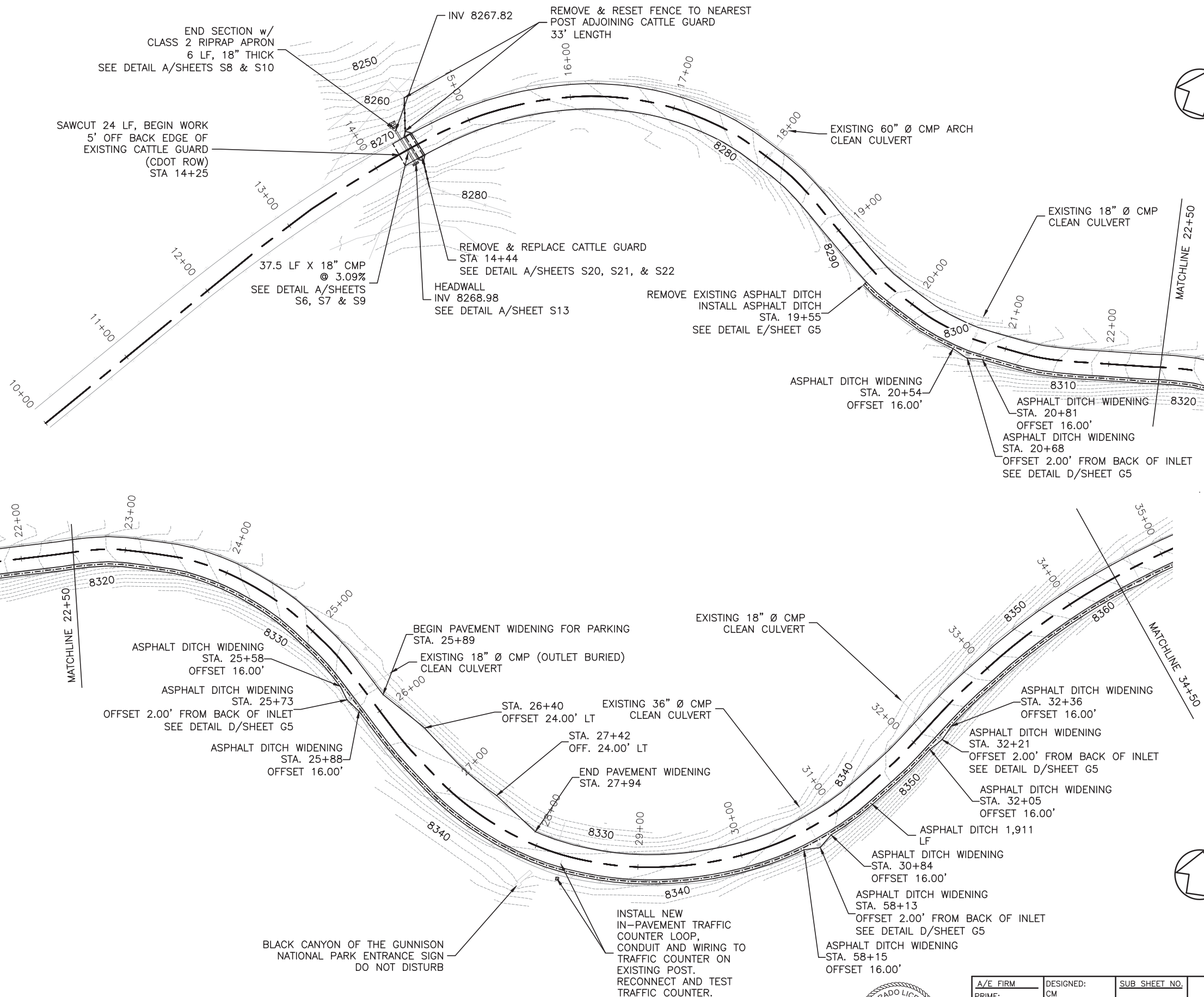
1. AT NEW ASPHALT DITCH LOCATIONS MATCH EXISTING SHAPE.
2. AT INLETS WIDEN AND SHAPE PAVED WATERWAY TO DRAIN AS APPROVED BY THE CO.
3. PLACE TACK COAT BETWEEN HOT MIX ASPHALT CONCRETE PAVEMENT LIFTS.
5. SEE DETAIL SHEET S14 THROUGH S16 FOR PAVEMENT MARKINGS.
6. PLACE ASPHALT CONCRETE PAVEMENT IN TWO LIFTS.

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A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM CADD: CM	SUB SHEET NO. G6	TITLE OF DRAWING TYPICAL SECTIONS	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM DATE: 3/28/22		BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1 SHEET 7 OF 55

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NOTES

1. CLEAN ALL CULVERTS UNLESS OTHERWISE NOTED.
2. CLEAN INLETS UNLESS OTHERWISE NOTED. REPLACE INLET GRATES WITH BIKE-SAFE GRATES UNLESS OTHERWISE NOTED.
3. ALL NEW AND REPLACEMENT CULVERTS TO BE CMP WITH POLYMER COATING INSIDE AND OUT.
4. ALL NEW AND REPLACEMENT PIPE END SECTIONS TO BE PAINTED OR POWDER COATED FOR CORROSION PROTECTION.
5. INSTALL OBJECT MARKERS AT ALL CULVERT INLETS AND OUTLETS PER DETAIL S29 UNLESS OTHERWISE NOTED.



Know what's below.
Call before you dig.

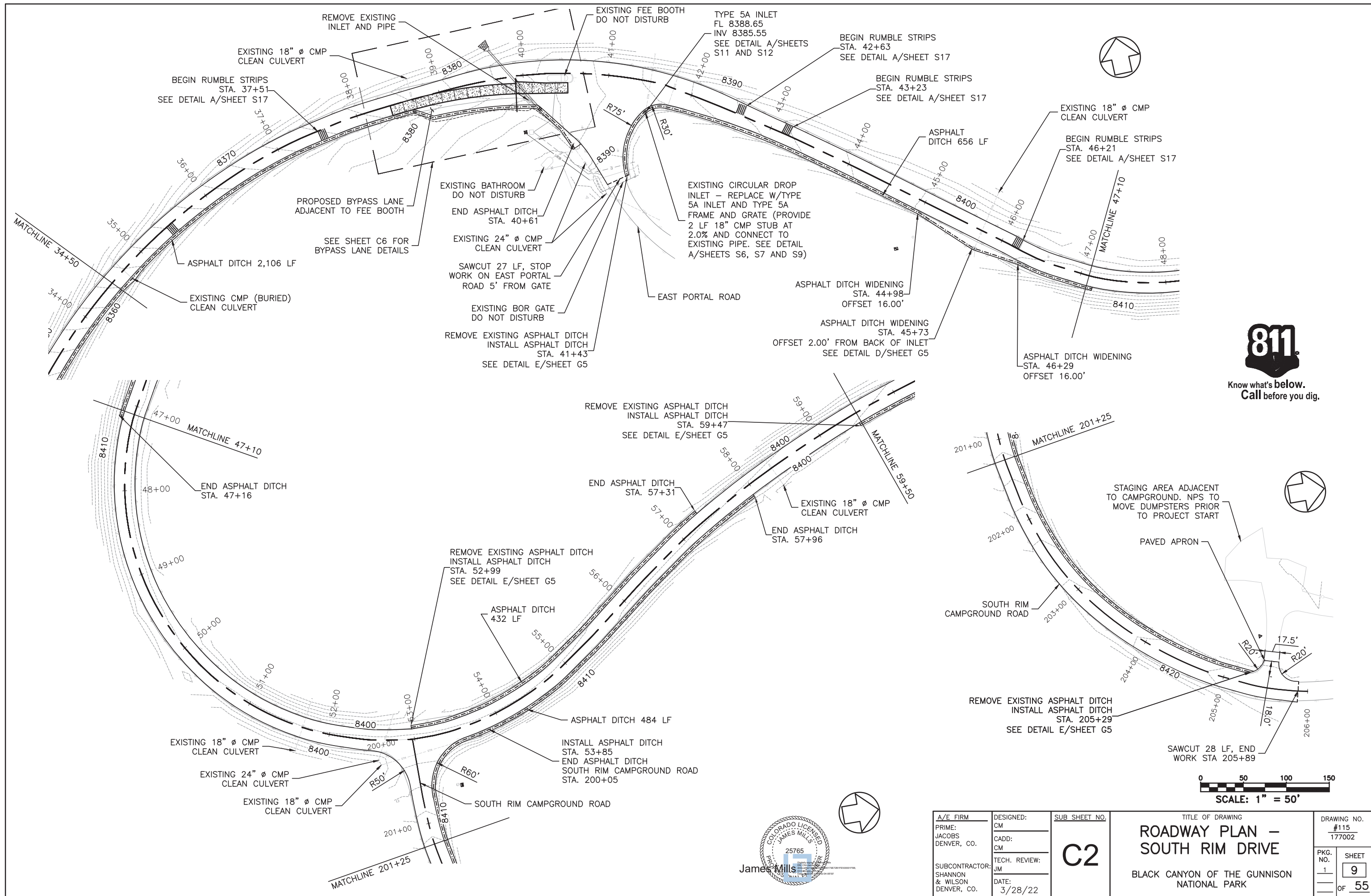


A/E FIRM	DESIGNED:	SUB SHEET NO.
PRIME: JACOBS DENVER, CO.	CM	C1
	CADD: CM	
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM	
	DATE: 3/28/22	

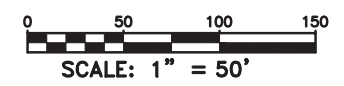
TITLE OF DRAWING	
ROADWAY PLAN - SOUTH RIM DRIVE	
BLACK CANYON OF THE GUNNISON NATIONAL PARK	

DRAWING NO.	#115 177002
PKG. NO.	1
SHEET	8
	OF 55

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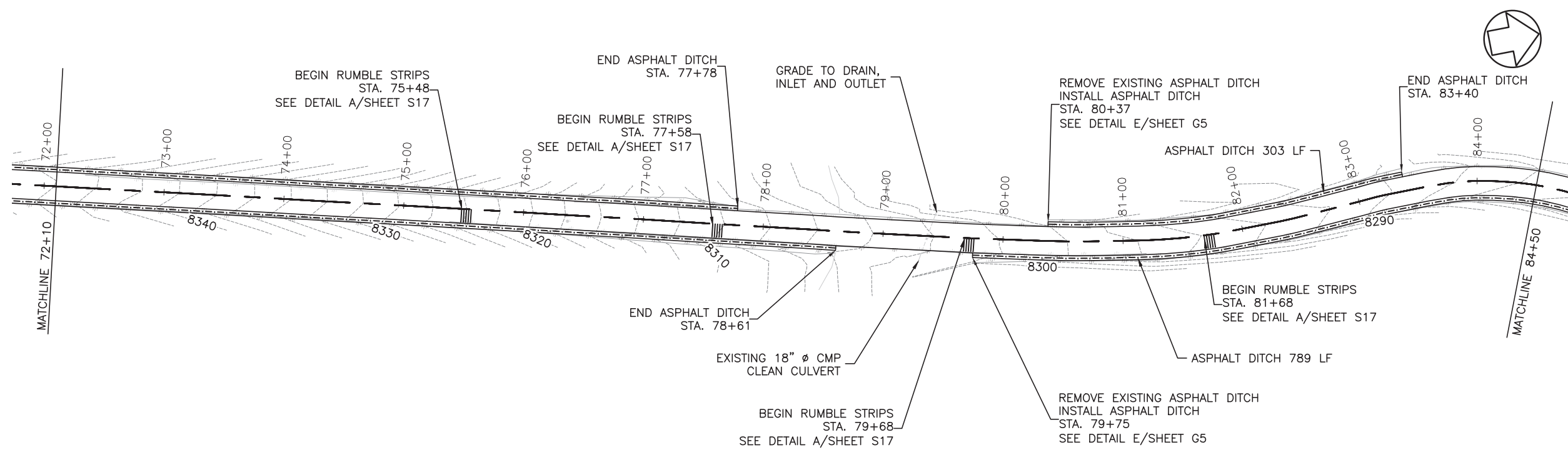
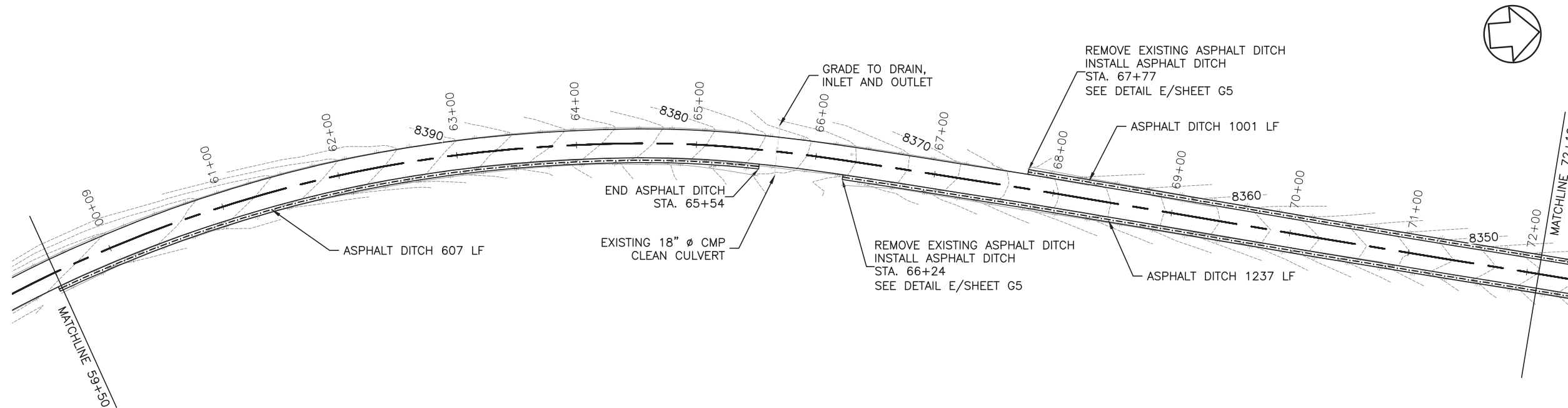


Know what's below.
Call before you dig.

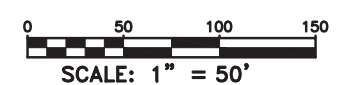


A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM CADD: CM TECH. REVIEW: JM DATE: 3/28/22	SUB SHEET NO. C2	TITLE OF DRAWING ROADWAY PLAN - SOUTH RIM DRIVE BLACK CANYON OF THE GUNNISON NATIONAL PARK	DRAWING NO. #115 177002	PKG. NO. 1	SHEET 9 OF 55
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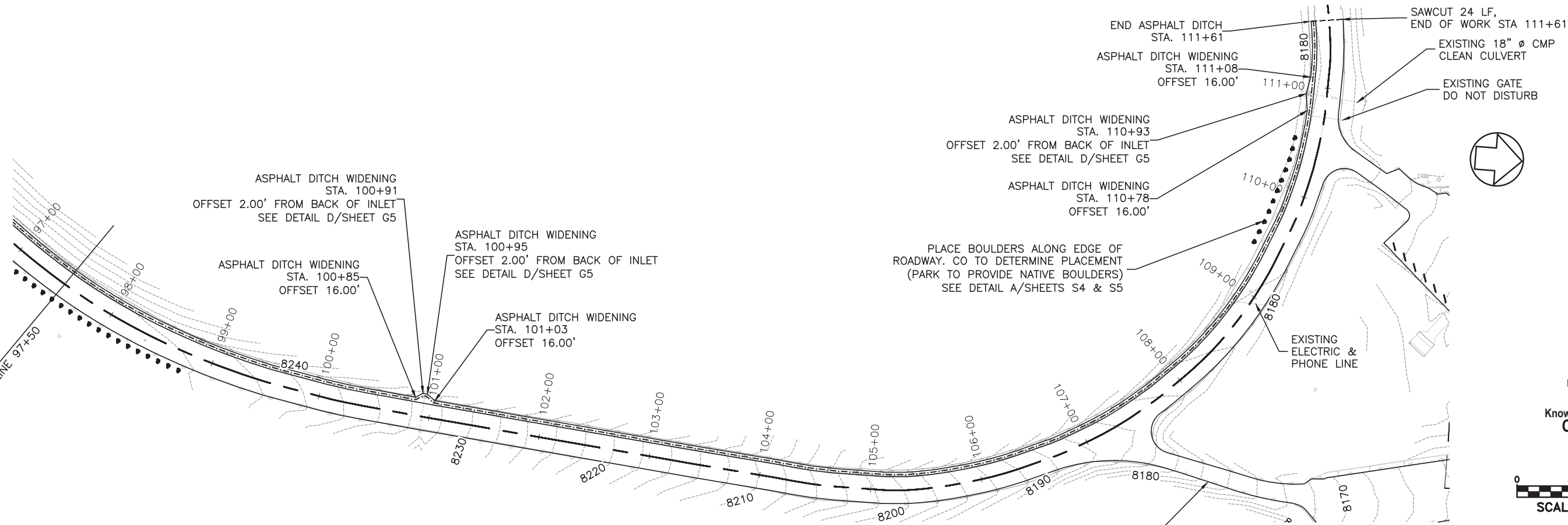
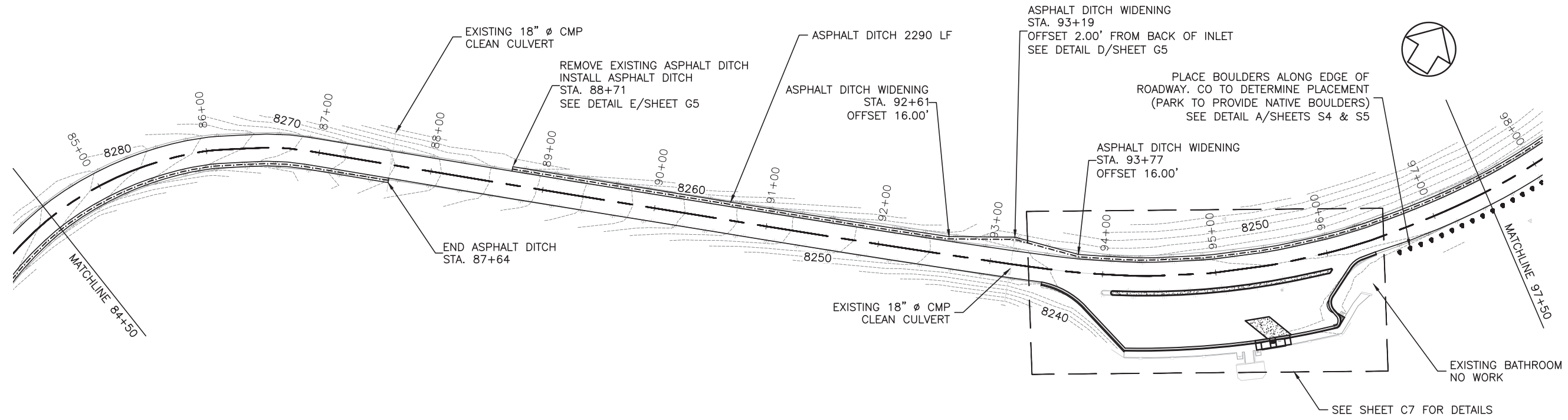


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Call before you dig.

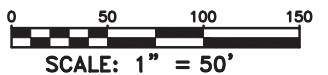


A/E FIRM PRIME: JACOBS DENVER, CO. SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	DESIGNED: CM	SUB SHEET NO. <div style="font-size: 2em; font-weight: bold; text-align: center;">C3</div>	TITLE OF DRAWING <div style="font-size: 1.2em; font-weight: bold;">ROADWAY PLAN – SOUTH RIM DRIVE</div>		DRAWING NO. #115 177002
	TECH. REVIEW: JM		BLACK CANYON OF THE GUNNISON NATIONAL PARK		PKG. NO. 1
DATE: 3/28/22					

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Know what's below.
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SEE SHEET C5 FOR VISITOR CENTER PARKING

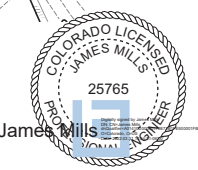
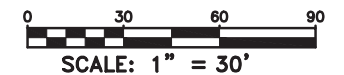
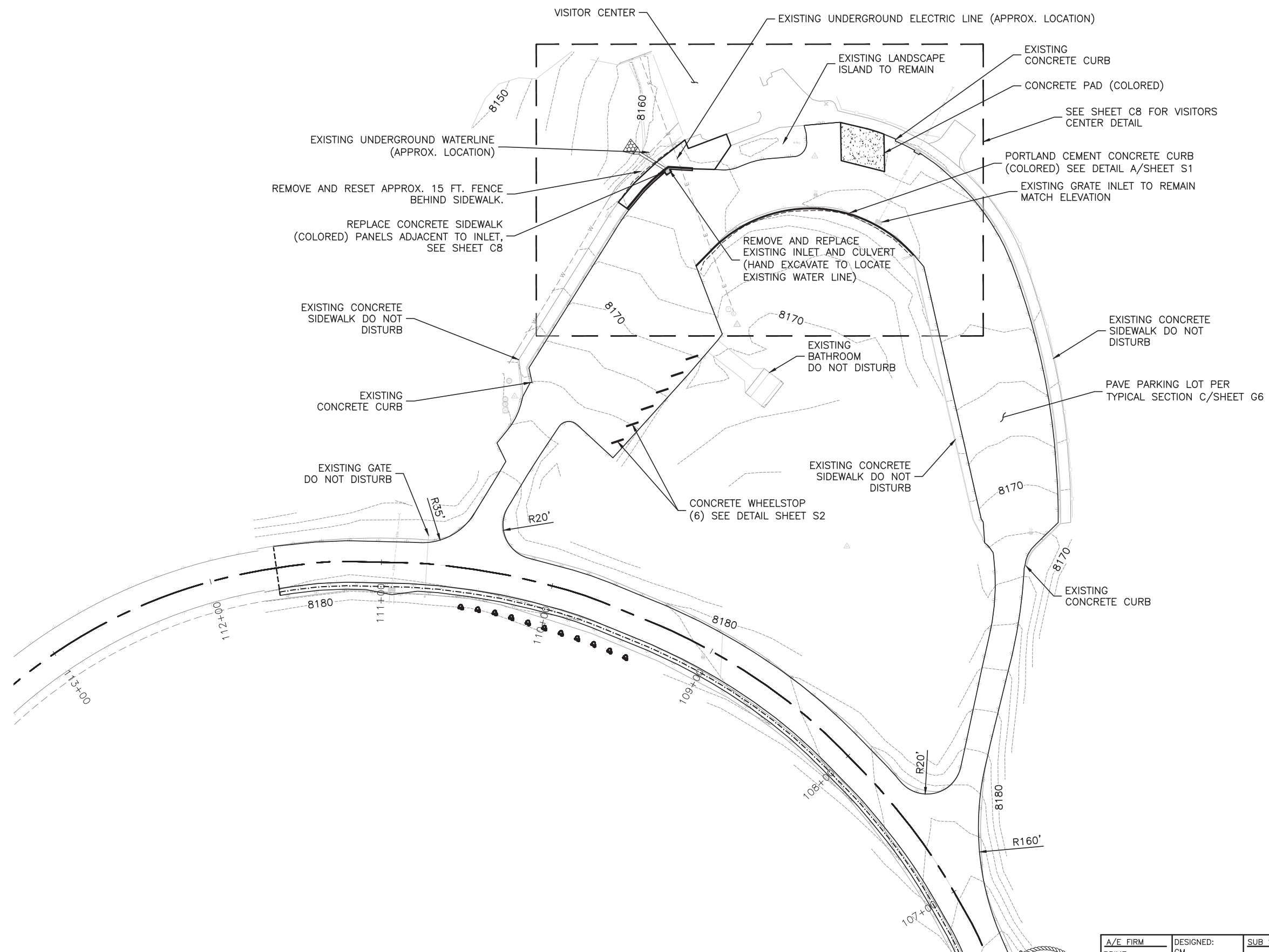


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PRIME: JACOBS DENVER, CO.	CM CADD: CM	C4
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM DATE: 3/28/22	

TITLE OF DRAWING
**ROADWAY PLAN -
SOUTH RIM DRIVE**
BLACK CANYON OF THE GUNNISON
NATIONAL PARK

DRAWING NO.	#115 177002
PKG. NO.	1
SHEET	11
OF	55

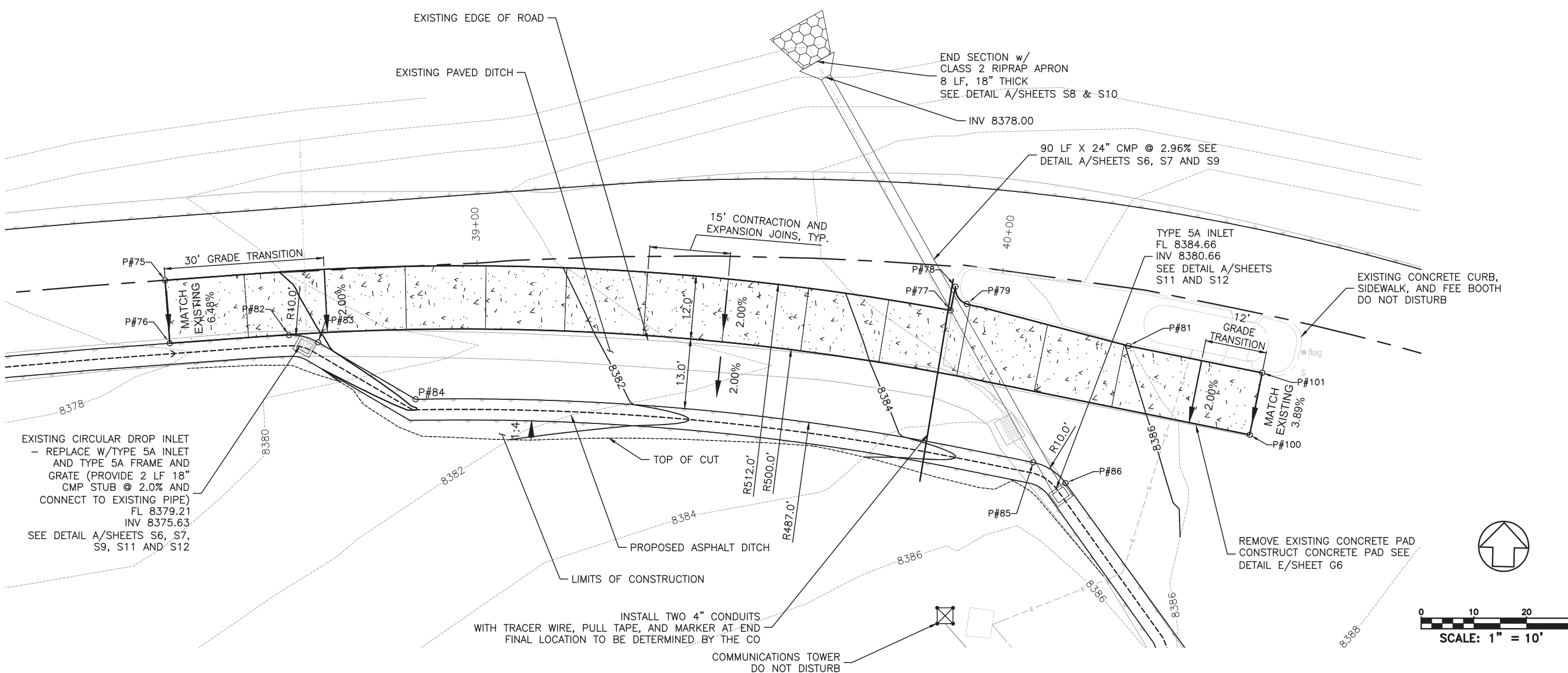
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A/E FIRM PRIME: JACOBS DENVER, CO. SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	DESIGNED: CM	SUB SHEET NO. C5	TITLE OF DRAWING ROADWAY PLAN – VISITOR CENTER	DRAWING NO. #115 177002
	TECH. REVIEW: JM	DATE: 3/28/22	BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1 SHEET 12 OF 55

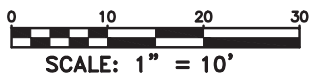
POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
75	1689948.70	2372489.78	8379.20	CONC CP
76	1689936.74	2372490.67	8378.42	CONC CP
77	1689942.98	2372638.85	8384.61	CONC CP
78	1689947.49	2372639.78	8384.84 MATCH EXIST	EXIST CURB FACE
79	1689944.19	2372641.94	8384.80 MATCH EXIST	EXIST CURB FACE
81	1689936.25	2372672.60	8386.02 MATCH EXIST	EXIST CURB FACE

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
82	1689938.27	2372513.30	8379.62	PC/ER
83	1689936.91	2372518.82	8379.89	PT/ER
84	1689926.10	2372537.30	8380.37	PC/ER
85	1689914.12	2372654.53	8384.98	PT/PC/ER
86	1689910.18	2372660.65	8385.18	PT/ER
100	1689919.36	2372695.62	8386.47	CONC CP
101	1689931.12	2372698.00	8386.93 MATCH EXIST	EXIST CURB FACE



EXISTING CIRCULAR DROP INLET
 - REPLACE W/TYPE 5A INLET
 AND TYPE 5A FRAME AND
 GRATE (PROVIDE 2 LF 18"
 CMP STUB @ 2.0% AND
 CONNECT TO EXISTING PIPE)
 FL 8379.21
 INV 8375.63
 SEE DETAIL A/SHEETS S6, S7,
 S9, S11 AND S12

REMOVE EXISTING CONCRETE PAD
 CONSTRUCT CONCRETE PAD SEE
 DETAIL E/SHEET G6



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A/E FIRM
 PRIME:
 JACOBS
 DENVER, CO.
 SUBCONTRACTOR:
 SHANNON
 & WILSON
 DENVER, CO.

DESIGNED:
 CM
 CADD:
 CM
 TECH. REVIEW:
 JM
 DATE:
 3/28/22

SUB SHEET NO.
C6

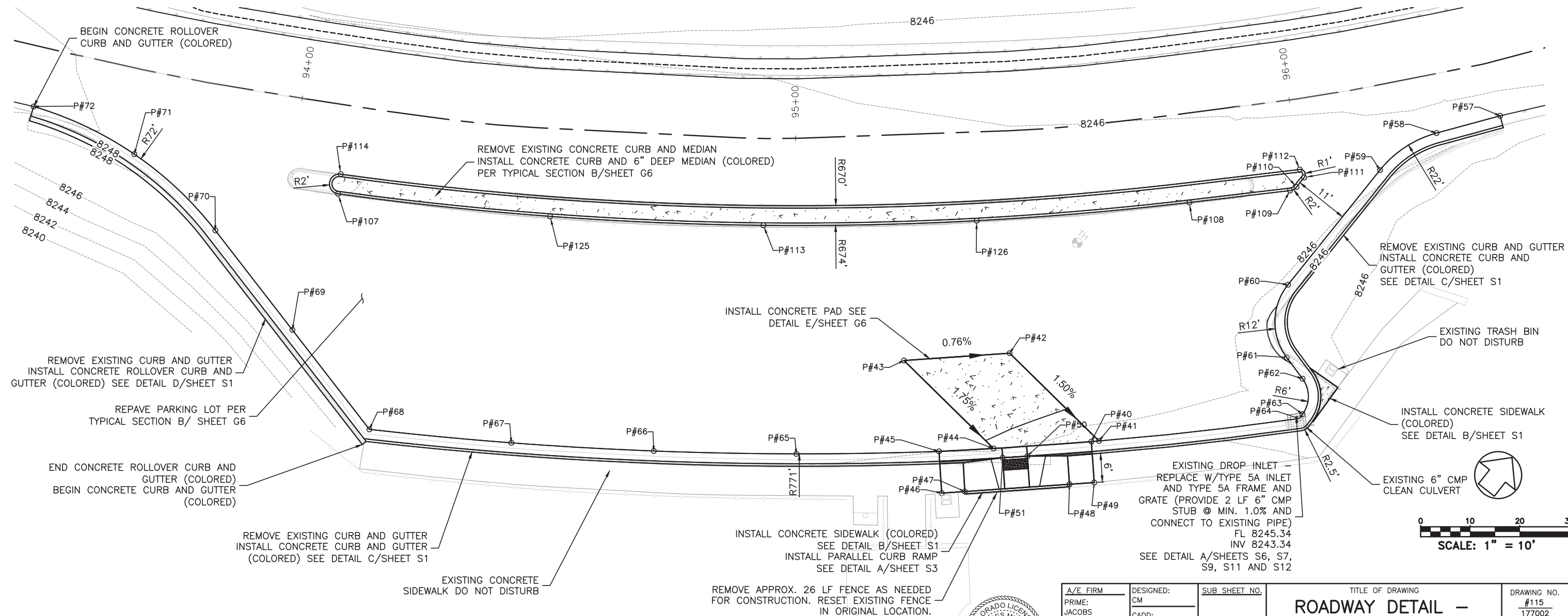
TITLE OF DRAWING
**ROADWAY DETAIL -
 BYPASS LANE**
 BLACK CANYON OF THE GUNNISON
 NATIONAL PARK

DRAWING NO.
 #115
 177002
 PKG. NO.
 1
 SHEET
13
 OF 55

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
40	1693333.06	2374707.79	8245.87	CONC CP/PAN EDGE
41	1693334.10	2374708.94	8245.86	PAN EDGE
42	1693337.49	2374683.89	8246.24	CONC CP
43	1693323.54	2374667.69	8246.40	CONC CP
44	1693320.13	2374692.81	8245.96	CONC CP/PAN EDGE
45	1693313.07	2374684.35	8246.01	PAN EDGE
46	1693306.66	2374689.84	8246.38 MATCH EXIST	BACK OF WALK
47	1693309.70	2374693.37	8246.55	BACK OF WALK
48	1693323.52	2374709.41	8246.34	BACK OF WALK
49	1693326.78	2374713.20	8245.91 MATCH EXIST	BACK OF WALK
50	1693322.98	2374699.20	8245.79	FL/RAMP
51	1693319.73	2374695.40	8245.82	FL/RAMP
57	1693435.12	2374734.43	8246.17 MATCH EXIST	PAN EDGE

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
58	1693424.64	2374726.24	8246.19 MATCH EXIST	PAN EDGE/PC
59	1693411.84	2374721.59	8246.11 MATCH EXIST	PAN EDGE/PT
60	1693382.18	2374720.59	8245.91 MATCH EXIST	PAN EDGE/PC
61	1693370.26	2374729.18	8245.54 MATCH EXIST	PAN EDGE/PT
62	1693368.74	2374734.29	8245.71 MATCH EXIST	PAN EDGE/PC
63	1693363.02	2374738.58	8245.53 MATCH EXIST	PAN EDGE/PT
64	1693361.91	2374738.59	8245.43 MATCH EXIST	PAN EDGE/PC
65	1693295.44	2374661.60	8246.18 MATCH EXIST	PAN EDGE
66	1693278.68	2374638.21	8246.32 MATCH EXIST	PAN EDGE
67	1693262.79	2374614.21	8246.41 MATCH EXIST	PAN EDGE
68	1693247.82	2374589.65	8246.49 MATCH EXIST	PAN EDGE/PT
69	1693254.59	2374565.18	8246.91 MATCH EXIST	PAN EDGE
70	1693261.37	2374540.71	8247.37 MATCH EXIST	PAN EDGE/PC

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
71	1693263.91	2374518.39	8247.76 MATCH EXIST	PAN EDGE
72	1693259.46	2374496.37	8248.17 MATCH EXIST	PAN EDGE/PT
107	1693282.12	2374556.09	8247.74 MATCH EXIST	FL/PT/PC
108	1693383.57	2374694.71	8246.78 MATCH EXIST	FL/PT
109	1693397.65	2374709.53	8246.44 MATCH EXIST	FL/PC
110	1693399.03	2374710.15	8246.42 MATCH EXIST	FL/PT
111	1693401.47	2374710.23	8246.40 MATCH EXIST	FL/PC
112	1693402.23	2374708.54	8246.42 MATCH EXIST	FL/PT
113	1693328.41	2374628.65	8247.20 MATCH EXIST	FL
114	1693285.62	2374554.16	8247.36 MATCH EXIST	FL/PT/PC
125	1693304.09	2374593.09	8247.49 MATCH EXIST	FL
126	1693354.92	2374662.54	8247.02 MATCH EXIST	FL



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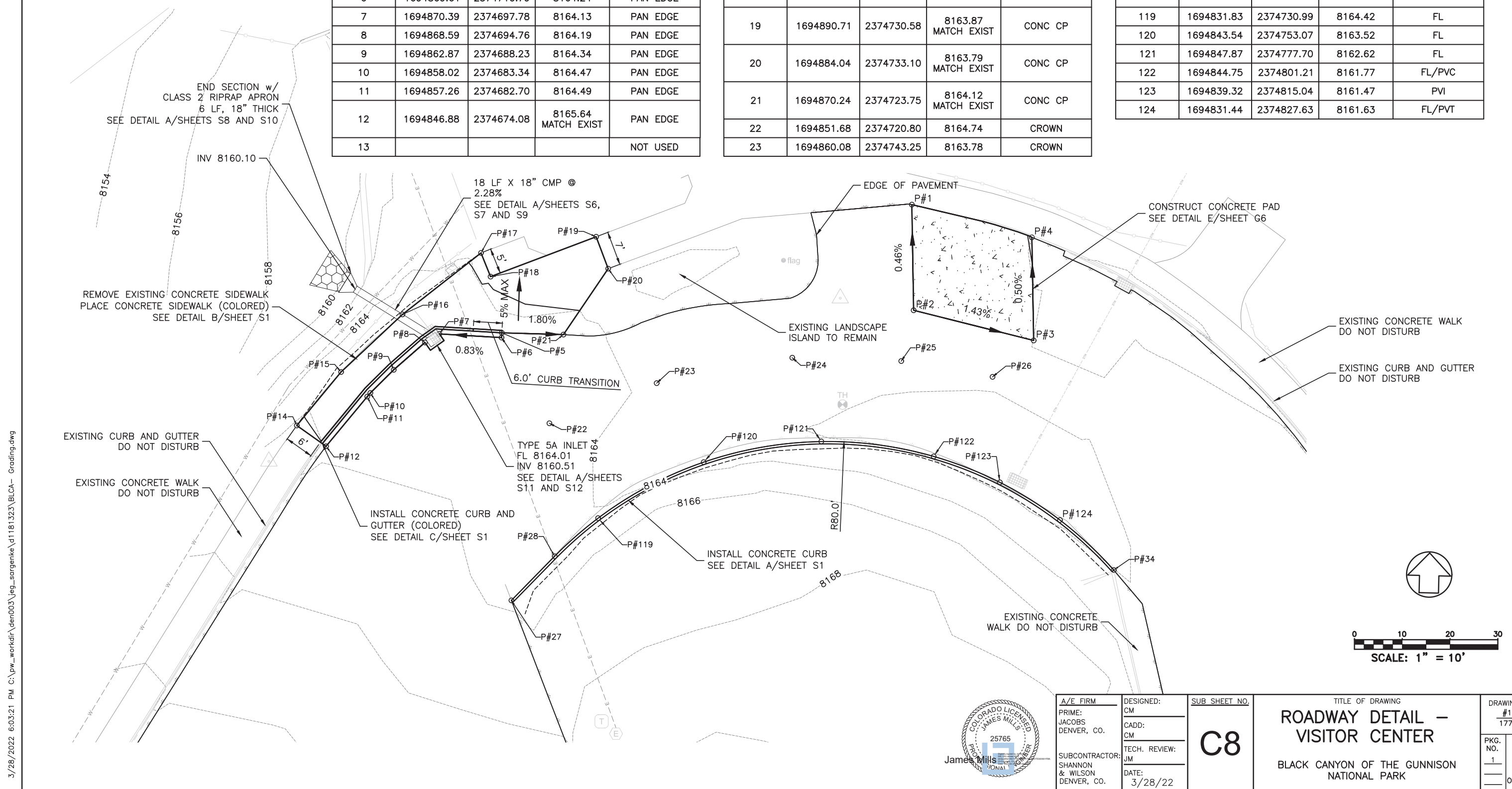


A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM	SUB SHEET NO. C7	TITLE OF DRAWING ROADWAY DETAIL - TOMICHI OVERLOOK	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM	DATE: 3/28/22	BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1
				SHEET 14 OF 55

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1694897.43	2374796.63	8162.35 MATCH EXIST	CONC CP
2	1694875.32	2374797.01	8162.45	CONC CP
3	1694869.02	2374822.12	8162.08	CONC CP
4	1694890.59	2374821.75	8161.97 MATCH EXIST	CONC CP
5	1694870.61	2374710.85	8164.35	CONC CP
6	1694869.61	2374710.79	8164.24	PAN EDGE
7	1694870.39	2374697.78	8164.13	PAN EDGE
8	1694868.59	2374694.76	8164.19	PAN EDGE
9	1694862.87	2374688.23	8164.34	PAN EDGE
10	1694858.02	2374683.34	8164.47	PAN EDGE
11	1694857.26	2374682.70	8164.49	PAN EDGE
12	1694846.88	2374674.08	8165.64 MATCH EXIST	PAN EDGE
13				NOT USED

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
14	1694851.22	2374667.95	8166.18 MATCH EXIST	BACK OF WALK
15	1694862.41	2374677.22	8165.08	BACK OF WALK
16	1694874.46	2374690.06	8164.78	BACK OF WALK
17	1694887.33	2374706.50	8163.86 MATCH EXIST	BACK OF WALK
18	1694882.37	2374708.50	8163.89 MATCH EXIST	CONC CP
19	1694890.71	2374730.58	8163.87 MATCH EXIST	CONC CP
20	1694884.04	2374733.10	8163.79 MATCH EXIST	CONC CP
21	1694870.24	2374723.75	8164.12 MATCH EXIST	CONC CP
22	1694851.68	2374720.80	8164.74	CROWN
23	1694860.08	2374743.25	8163.78	CROWN

POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
24	1694865.41	2374771.62	8162.73	CROWN
25	1694864.71	2374794.42	8162.26	CROWN
26	1694861.40	2374813.52	8162.11	CROWN
27	1694814.62	2374712.85	8165.81 MATCH EXIST	FL
28	1694823.86	2374721.90	8164.85	FL/PC
34	1694820.97	2374838.89	8162.05 MATCH EXIST	FL/PT
119	1694831.83	2374730.99	8164.42	FL
120	1694843.54	2374753.07	8163.52	FL
121	1694847.87	2374777.70	8162.62	FL
122	1694844.75	2374801.21	8161.77	FL/PVC
123	1694839.32	2374815.04	8161.47	PVI
124	1694831.44	2374827.63	8161.63	FL/PVT



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A/E FIRM
PRIME:
JACOBS
DENVER, CO.

DESIGNED:
CM

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CM

TECH. REVIEW:
JM

DATE:
3/28/22

SUB SHEET NO.
C8

TITLE OF DRAWING
ROADWAY DETAIL - VISITOR CENTER

BLACK CANYON OF THE GUNNISON NATIONAL PARK

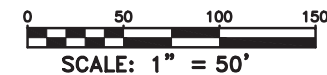
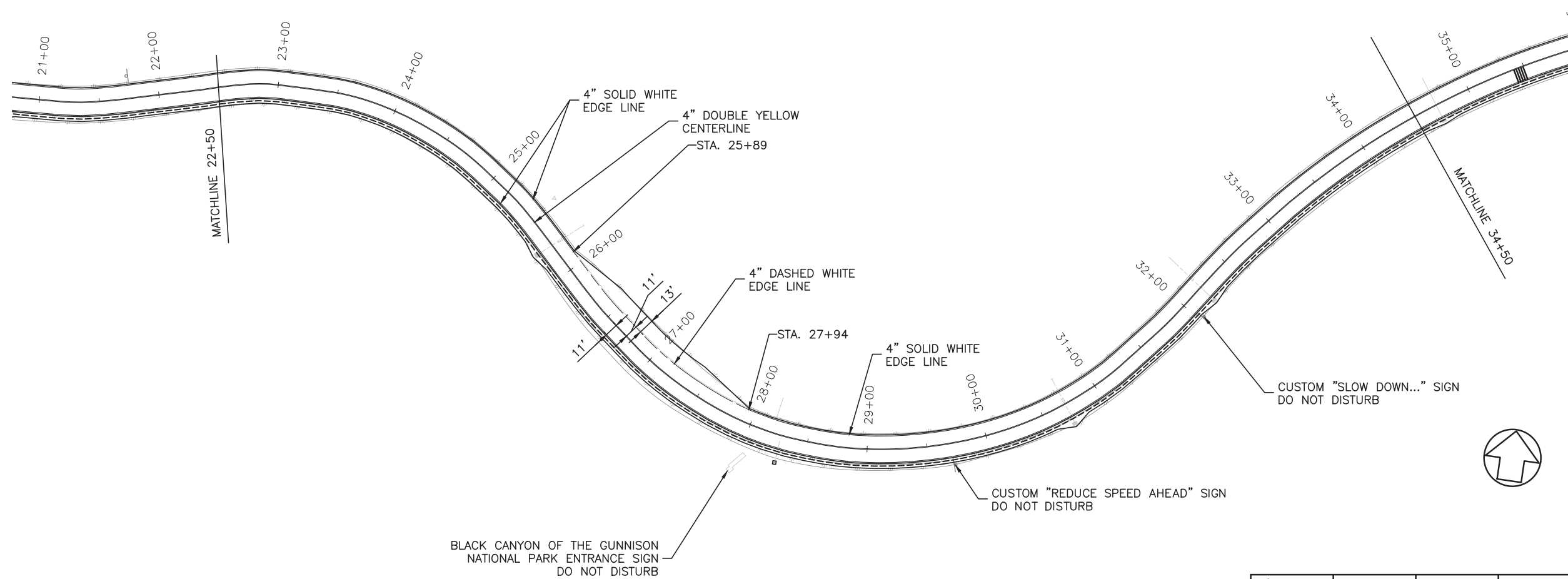
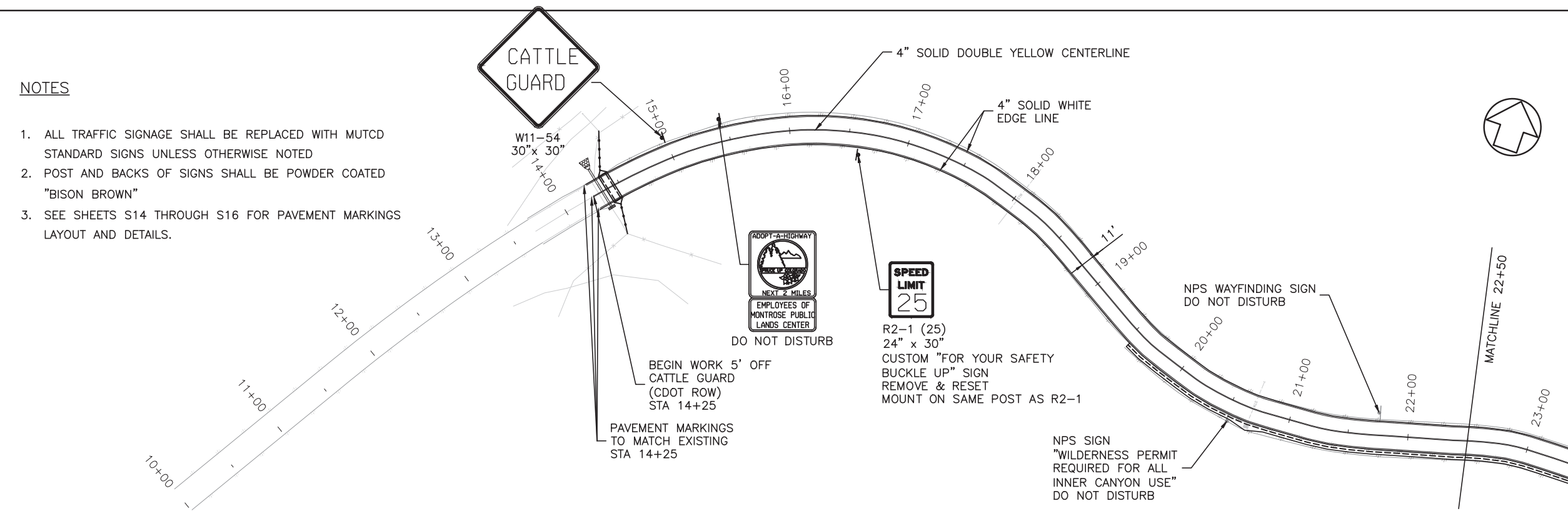
DRAWING NO.
#115
177002

PKG. NO. 1

SHEET **15** OF 55

NOTES

1. ALL TRAFFIC SIGNAGE SHALL BE REPLACED WITH MUTCD STANDARD SIGNS UNLESS OTHERWISE NOTED
2. POST AND BACKS OF SIGNS SHALL BE POWDER COATED "BISON BROWN"
3. SEE SHEETS S14 THROUGH S16 FOR PAVEMENT MARKINGS LAYOUT AND DETAILS.



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A/E FIRM	DESIGNED:	SUB SHEET NO.
PRIME: JACOBS DENVER, CO.	CM	C9
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	CADD: CM	
	TECH. REVIEW: JM	
	DATE: 3/28/22	

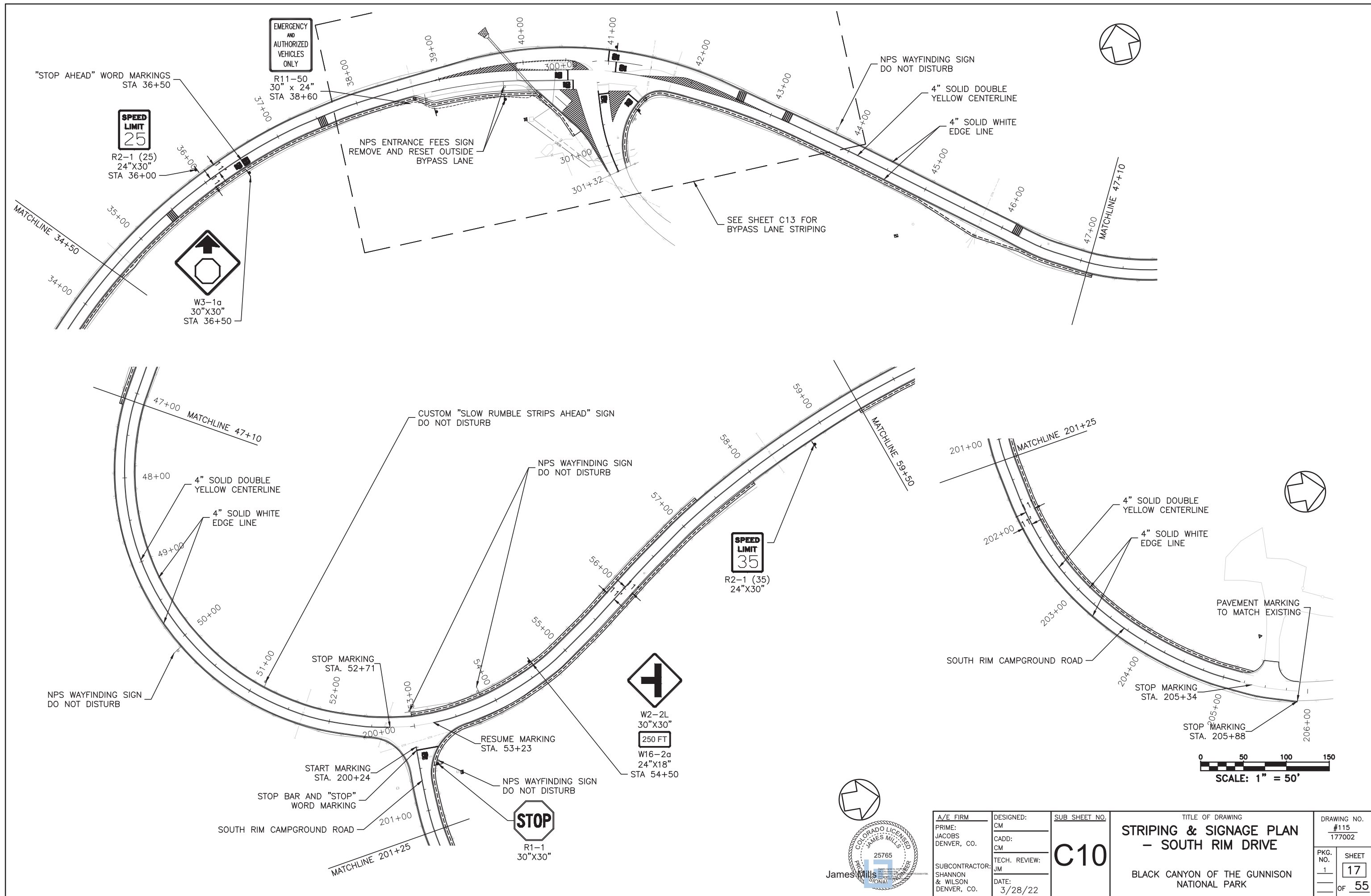
TITLE OF DRAWING

**STRIPING & SIGNAGE PLAN
- SOUTH RIM DRIVE**

BLACK CANYON OF THE GUNNISON
NATIONAL PARK

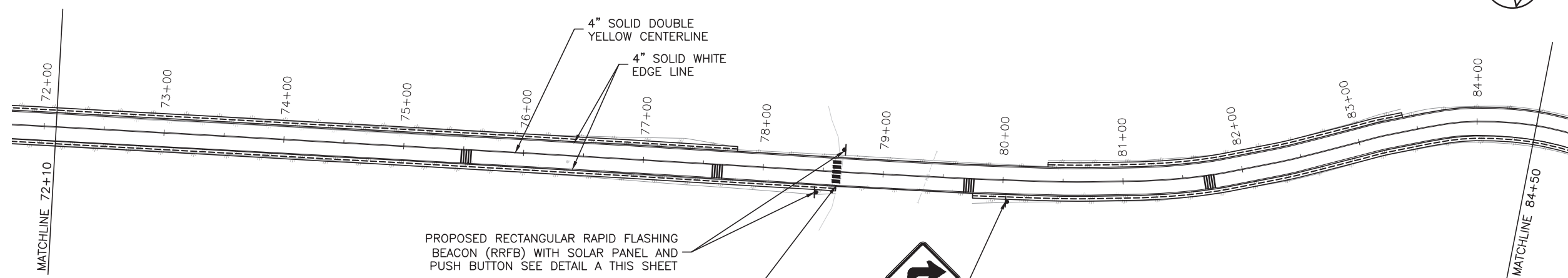
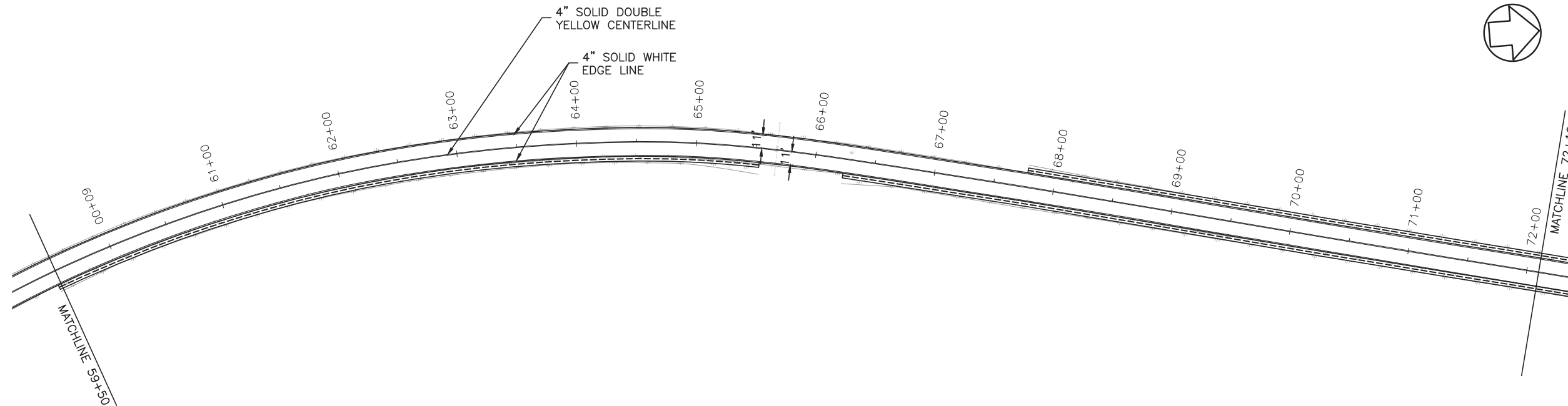
DRAWING NO.	#115 177002
PKG. NO.	1
SHEET	16
OF	55

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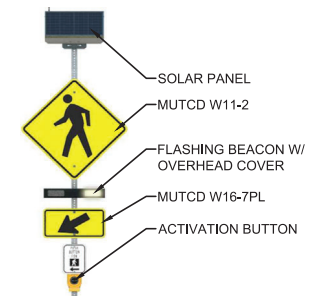
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	TECH. REVIEW: JM		BLACK CANYON OF THE GUNNISON NATIONAL PARK		PKG. NO. 1
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	DATE: 3/28/22			SHEET 17	OF 55

3/28/2022 6:05:50 PM C:\pw_workdir\den003\veg_sergentke\1181323\BLCA- Striping & Signage.dwg

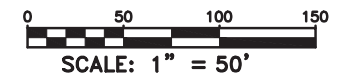


PROPOSED RECTANGULAR RAPID FLASHING BEACON (RRFB) WITH SOLAR PANEL AND PUSH BUTTON SEE DETAIL A THIS SHEET

CROSSWALK STRIPING SEE DETAIL B/SHEET S17



A RRFB SIGN DETAIL
NO SCALE



A/E FIRM
PRIME:
JACOBS
DENVER, CO.
SUBCONTRACTOR:
SHANNON
& WILSON
DENVER, CO.

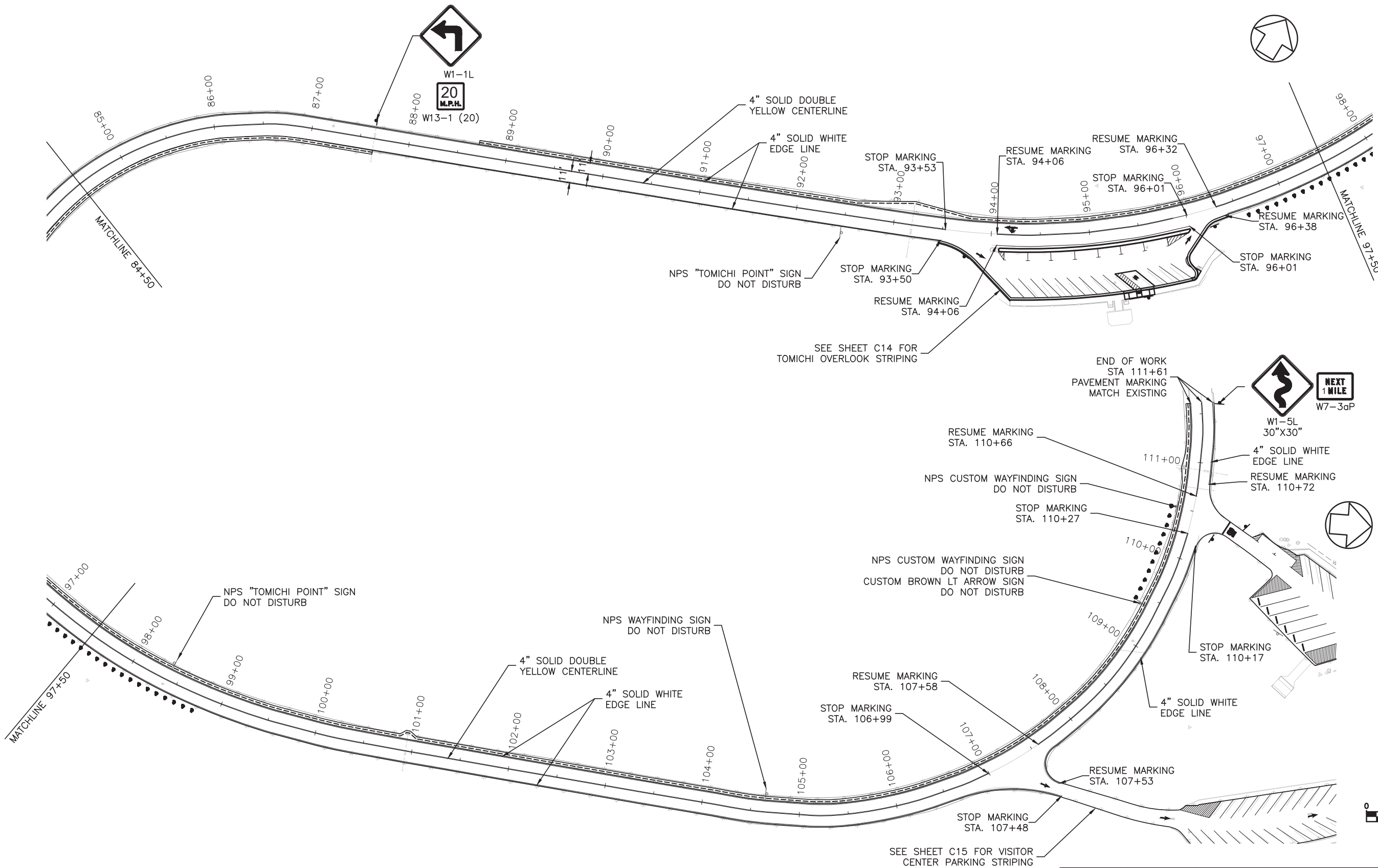
DESIGNED:
CM
CADD:
CM
TECH. REVIEW:
JM
DATE:
3/28/22

SUB SHEET NO.
C11

TITLE OF DRAWING
**STRIPING & SIGNAGE PLAN
- SOUTH RIM DRIVE**
BLACK CANYON OF THE GUNNISON
NATIONAL PARK

DRAWING NO.
#115
177002
PKG. NO. 1
SHEET 18 OF 55

3/28/2022 6:06:37 PM C:\pw_workdir\den003\veg_sergentke\1181323\BLCA- Striping & Signage.dwg



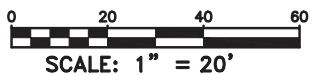
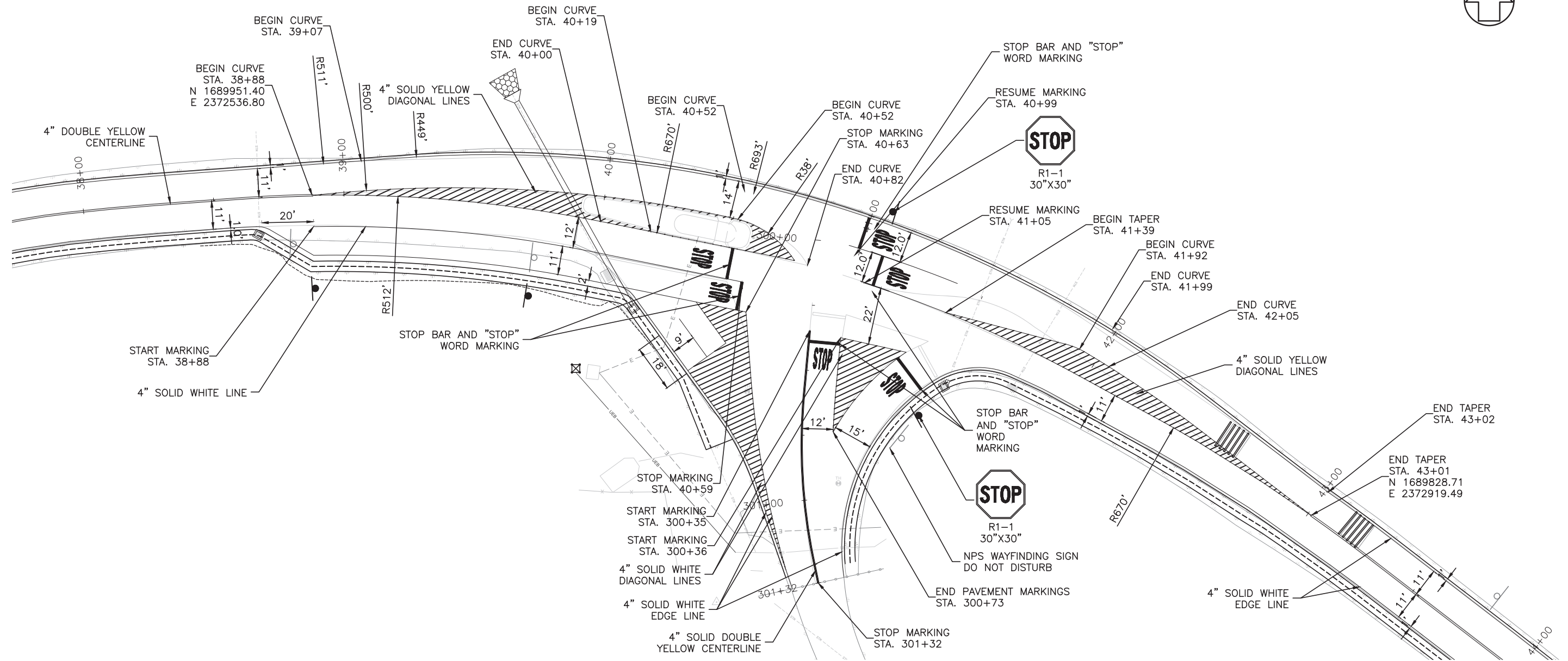
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 PRIME:
 JACOBS
 DENVER, CO.
 SUBCONTRACTOR:
 SHANNON
 & WILSON
 DENVER, CO.

DESIGNED:
 CM
 CADD:
 CM
 TECH. REVIEW:
 JM
 DATE:
 3/28/22

SUB SHEET NO.
C12

TITLE OF DRAWING
**STRIPING & SIGNAGE PLAN
 - SOUTH RIM DRIVE**
 BLACK CANYON OF THE GUNNISON
 NATIONAL PARK

DRAWING NO.
 #115
 177002
 PKG. NO.
 1
 SHEET
19
 OF 55



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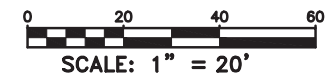
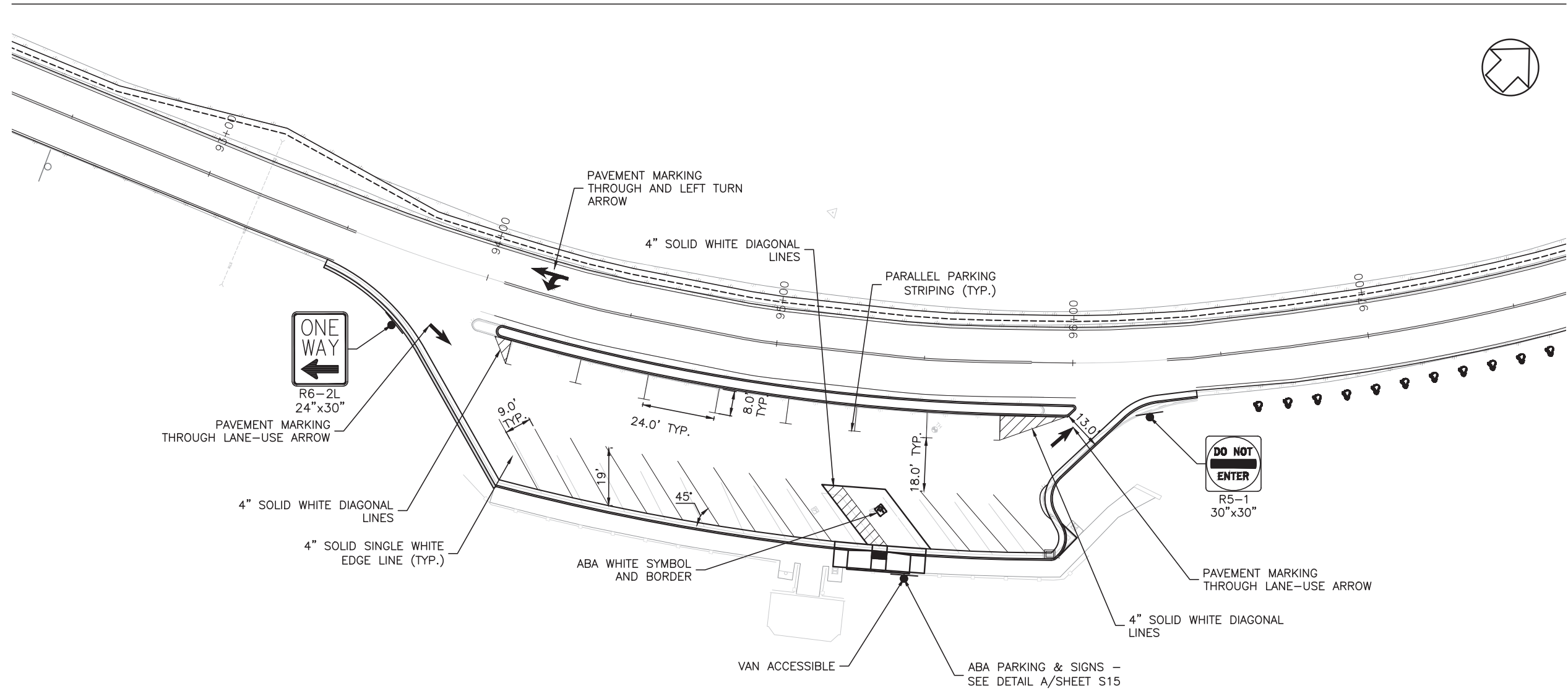
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	CADD: CM	
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM	TITLE OF DRAWING
	DATE: 3/28/22	STRIPING & SIGNAGE PLAN - BYPASS LANE

C13

TITLE OF DRAWING
**STRIPING & SIGNAGE PLAN
- BYPASS LANE**
BLACK CANYON OF THE GUNNISON
NATIONAL PARK

DRAWING NO.	#115
	177002
PKG. NO.	1
SHEET	20
	OF 55

3/28/2022 6:07:17 PM C:\pw_workdir\den003\veg_sergentke\1181323\BLCA- Striping & Signage.dwg

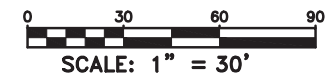
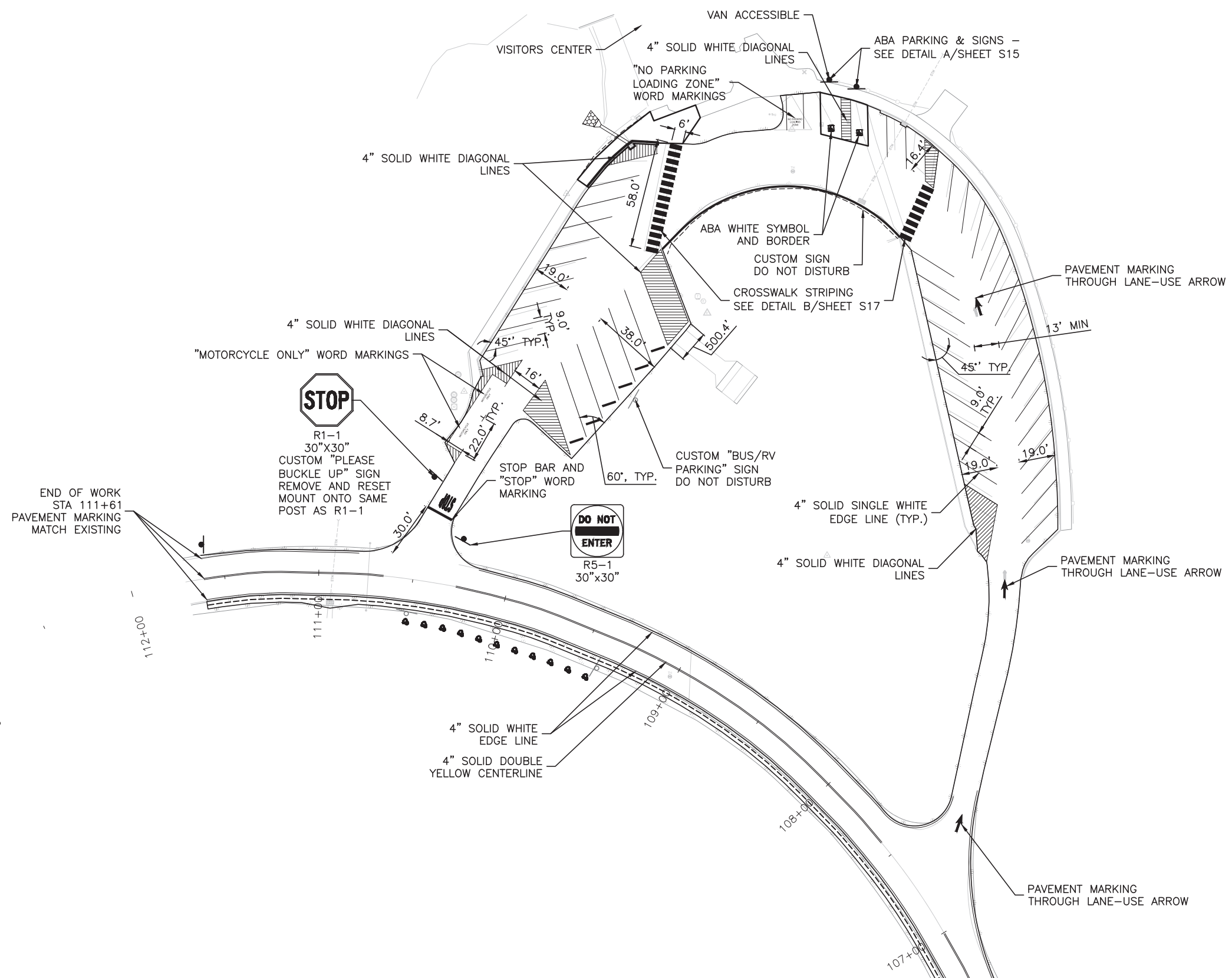


A/E FIRM
 PRIME: JACOBS DENVER, CO.
 SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.
 DESIGNED: CM
 CADD: CM
 TECH. REVIEW: JM
 DATE: 3/28/22

SUB SHEET NO.
C14

TITLE OF DRAWING
STRIPING & SIGNAGE PLAN - TOMICHI OVERLOOK
 BLACK CANYON OF THE GUNNISON NATIONAL PARK

DRAWING NO. #115 177002
 PKG. NO. 1
 SHEET **21** OF 55



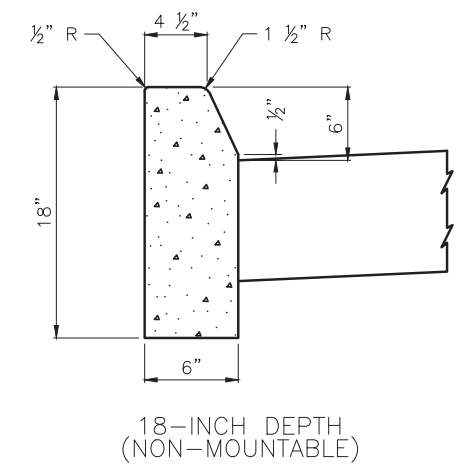
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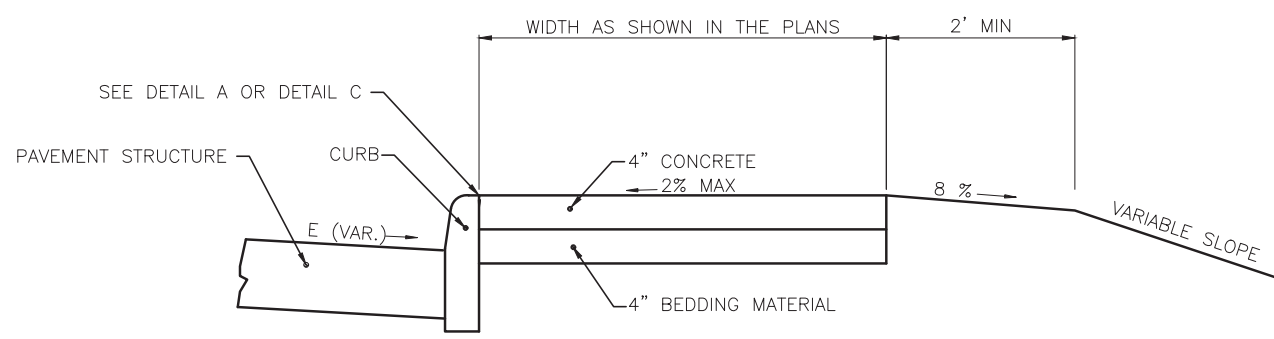
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	TECH. REVIEW: JM DATE: 3/28/22	PKG. NO. 1	SHEET 22	OF 55

DETAIL D NOTES:

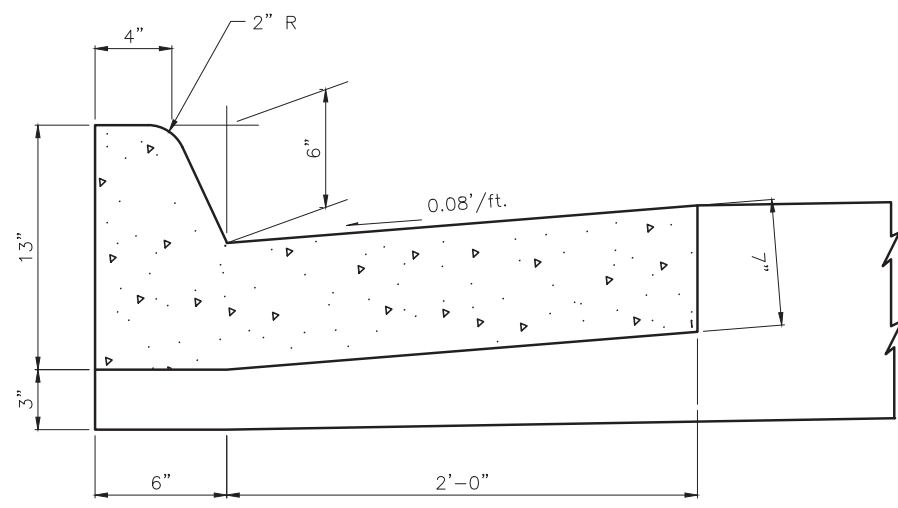
1. PLACE $\frac{3}{4}$ -INCH TRANSVERSE EXPANSION JOINTS AT INTERVALS OF NOT MORE THAN 20 FEET TO MATCH ADJACENT CURB EXPANSION JOINTS.
2. PLACE CONTRACTION JOINTS AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK AS SHOWN IN THE PLANS.
3. INSTALL $\frac{1}{2}$ -INCH PREFORMED EXPANSION JOINT FILLER CONFORMING TO SUBSECTION 712.01(B)(1).



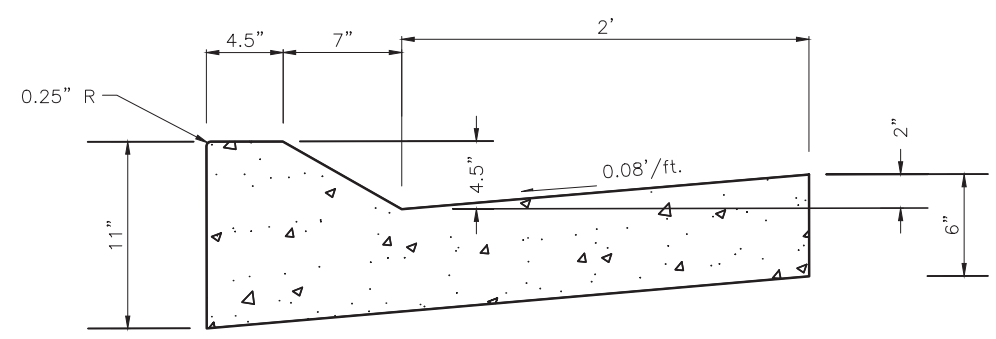
A PORTLAND CEMENT CONCRETE CURB
NO SCALE



B SIDEWALK WITH CURB
NO SCALE



C CONCRETE CURB AND GUTTER
NO SCALE

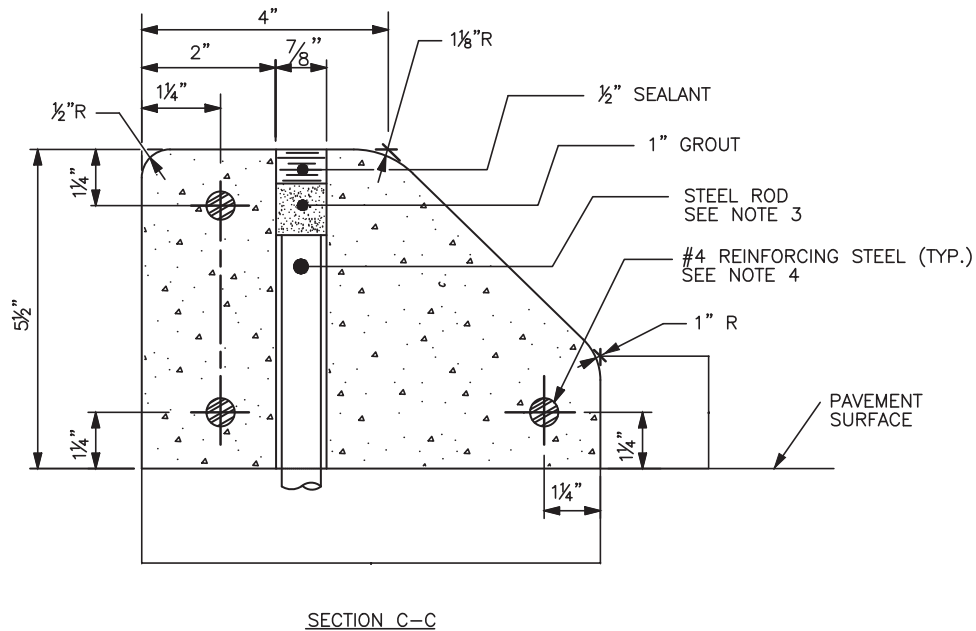
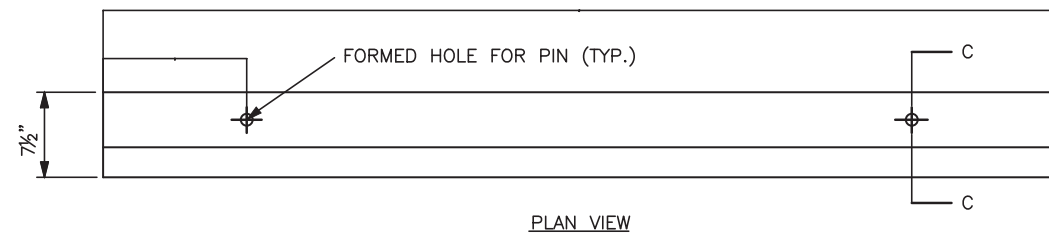


D CONCRETE ROLLOVER CURB AND GUTTER
NO SCALE

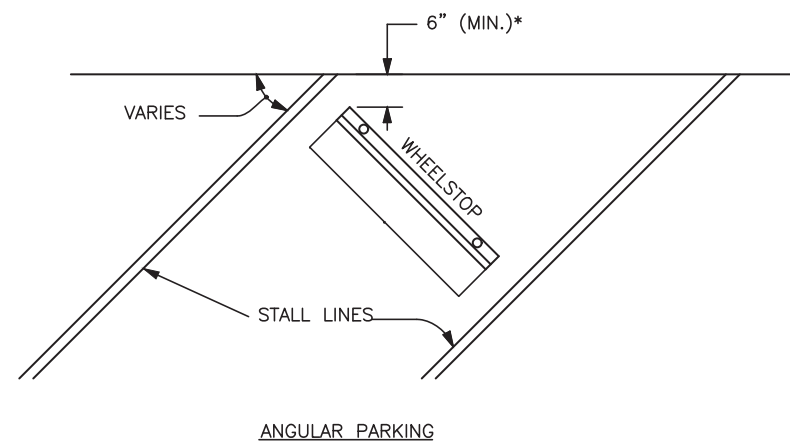
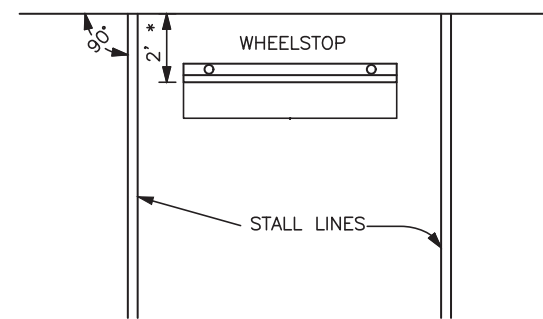
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A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM	SUB SHEET NO. S1	TITLE OF DRAWING ROADWAY DETAILS	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM	DATE: 3/28/22	BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1 SHEET 23 OF 55



A CONCRETE WHEELSTOP
NO SCALE



* INCREASE DISTANCE FOR WALL OR OTHER OBSTRUCTIONS AS DIRECTED BY THE CO.

B WHEELSTOP LAYOUT
NO SCALE

NOTES:

1. CENTER WHEELSTOPS BETWEEN AND PERPENDICULAR TO STALL LINES.
2. VARIATIONS IN WHEELSTOPS WILL BE ALLOWED TO MEET MANUFACTURER'S STANDARDS WITH THE APPROVAL OF THE CO.
3. PIN THE WHEELSTOPS WITH NO. 6 REINFORCING STEEL OR 3/4-INCH STEEL RODS ACCORDING TO SUBSECTION 609.08.
4. EXTEND THE REINFORCING STEEL TO WITHIN 1 INCH OF ENDS OF WHEELSTOP.

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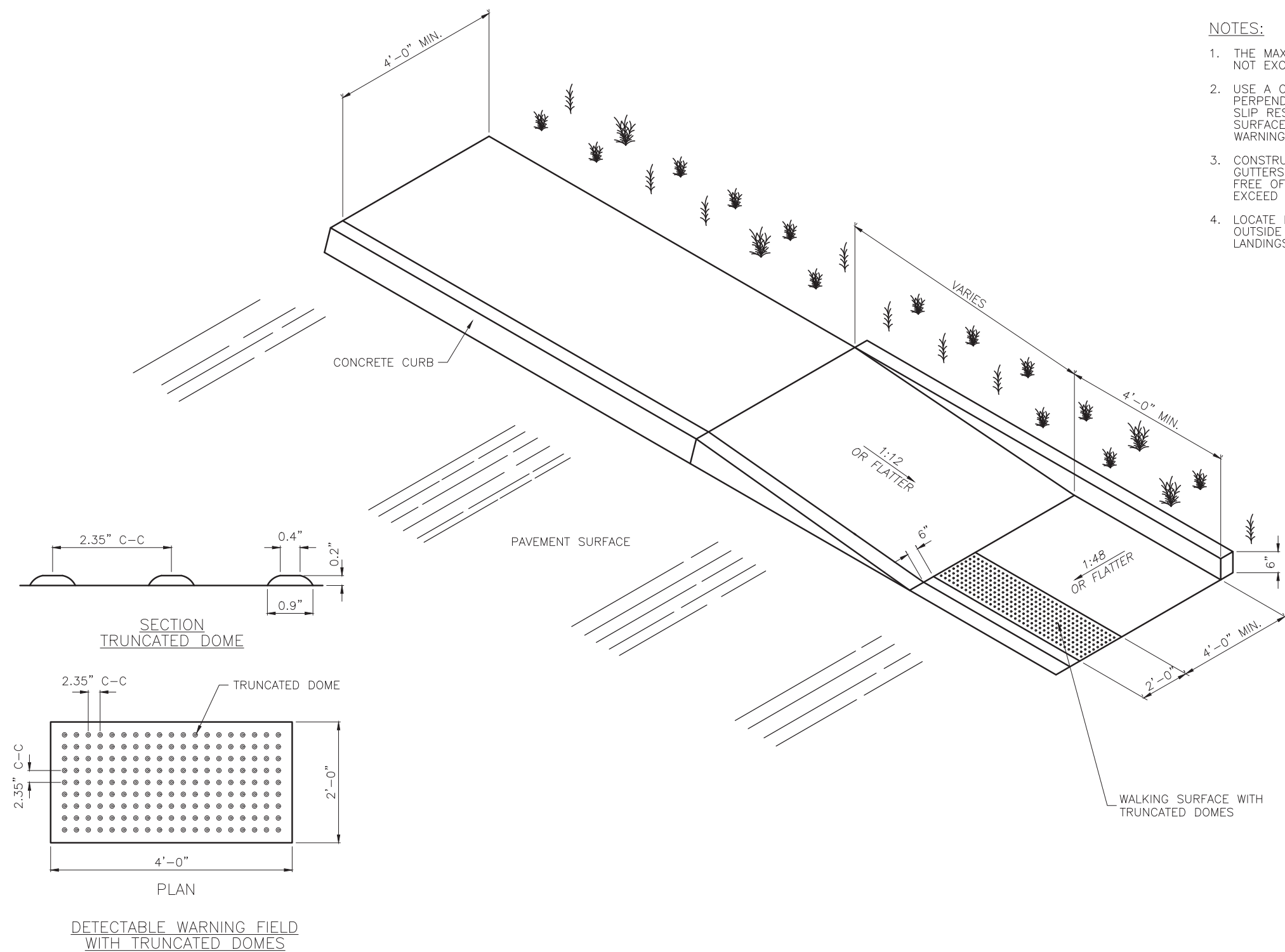


A/E FIRM	DESIGNED:	SUB SHEET NO.
PRIME: JACOBS DENVER, CO.	CM	S2
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	CADD: CM	
	TECH. REVIEW: JM	
	DATE: 3/28/22	

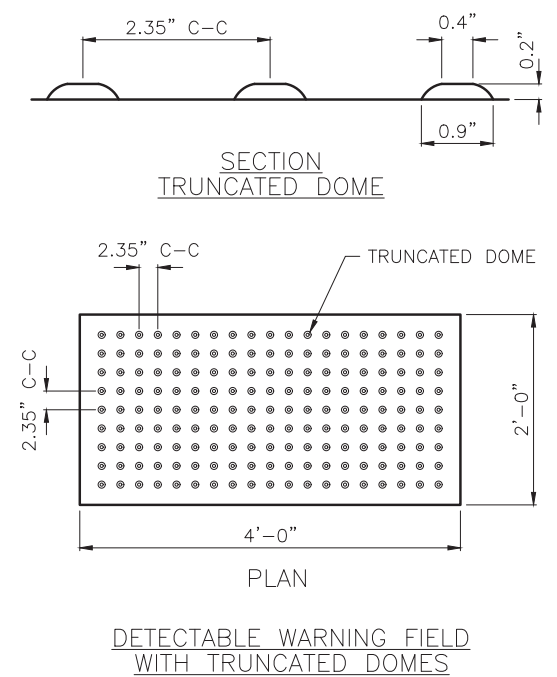
TITLE OF DRAWING
CONCRETE WHEELSTOP DETAIL
BLACK CANYON OF THE GUNNISON NATIONAL PARK

DRAWING NO.	#115 177002
PKG. NO.	1
SHEET	24
	OF 55

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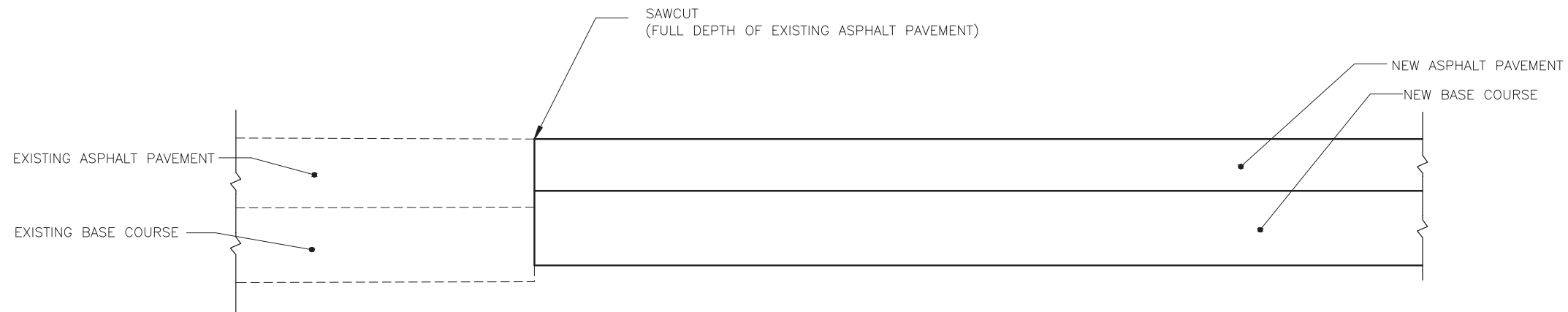
- NOTES:**
1. THE MAXIMUM CROSS SLOPES OF RAMPS MUST NOT EXCEED 2% IN ANY DIRECTION.
 2. USE A COARSE BROOM FINISH RUNNING PERPENDICULAR TO THE SLOPE TO CREATE A SLIP RESISTANT SURFACE ON CONCRETE RAMP SURFACES, EXCLUSIVE OF THE DETECTABLE WARNING FIELDS.
 3. CONSTRUCT RAMP TRANSITIONS BETWEEN WALKS, GUTTERS, OR STREETS THAT ARE FLUSH AND FREE OF ABRUPT VERTICAL CHANGES NOT TO EXCEED 0.25 INCHES.
 4. LOCATE DRAINAGE INLETS AND MANHOLES OUTSIDE OF RAMP WALKING SURFACES OR LANDINGS.



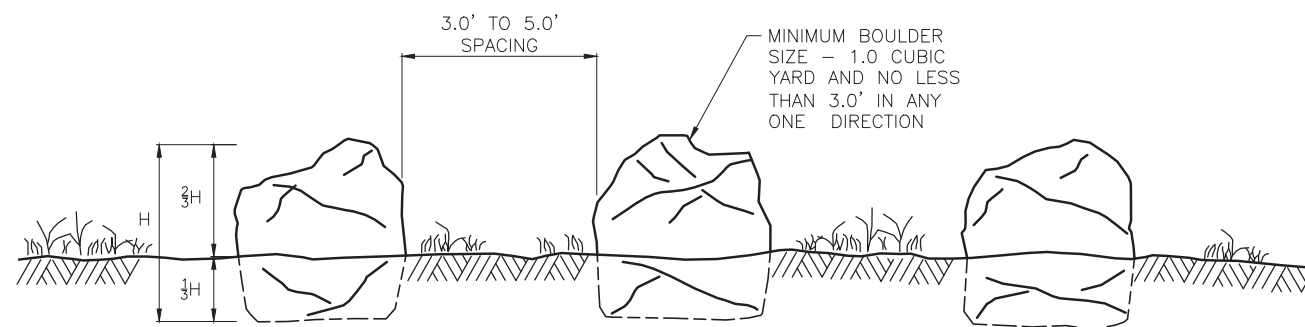
(A) PARALLEL CURB RAMP
NO SCALE



A/E FIRM PRIME: JACOBS DENVER, CO. SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	DESIGNED: CM	SUB SHEET NO. <h1>S3</h1>	TITLE OF DRAWING <h2>PARALLEL CURB RAMP</h2> BLACK CANYON OF THE GUNNISON NATIONAL PARK	DRAWING NO. #115 177002
	TECH. REVIEW: JM			PKG. NO. 1
DATE: 3/28/22				



A NEW PAVEMENT
NO SCALE



B BOULDER BARRIER PLACEMENT
NO SCALE

DETAIL B NOTES:

1. PLACE BOULDERS IN CLUSTERS, IN SELECTED AREAS, AS DIRECTED BY CO.

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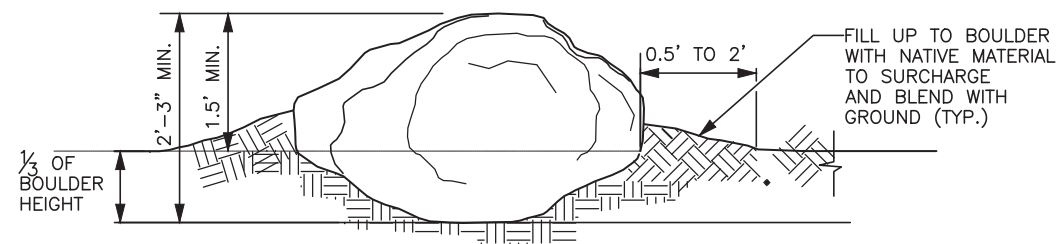


A/E FIRM	DESIGNED:
PRIME: JACOBS DENVER, CO.	CM
	CADD: CM
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM
	DATE: 3/28/22

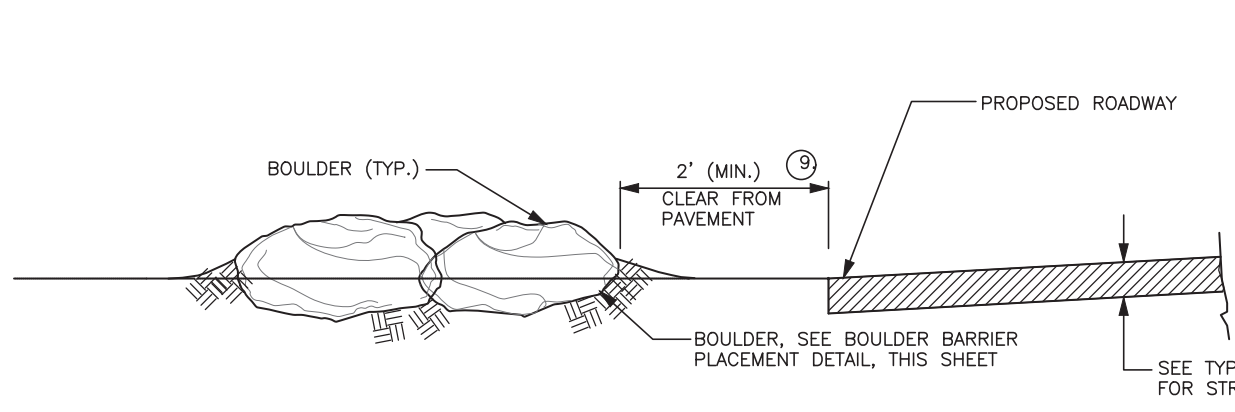
SUB SHEET NO.
S4

TITLE OF DRAWING	
PAVEMENT TRANSITION AND BOULDER BARRIER PLACEMENT	
BLACK CANYON OF THE GUNNISON NATIONAL PARK	

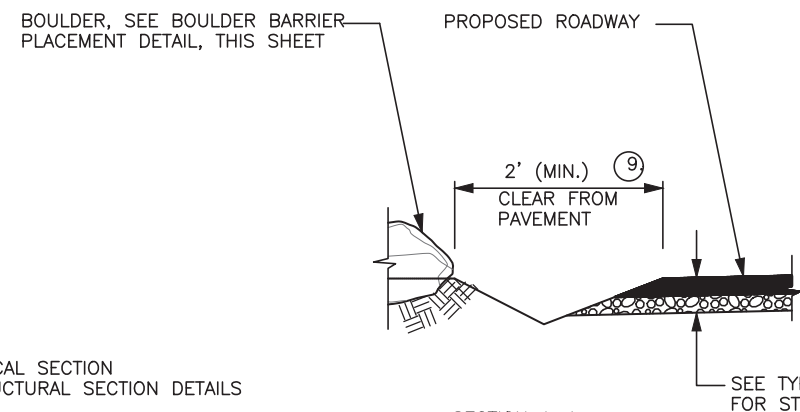
DRAWING NO.	#115 177002
PKG. NO.	1
SHEET	26
OF	55



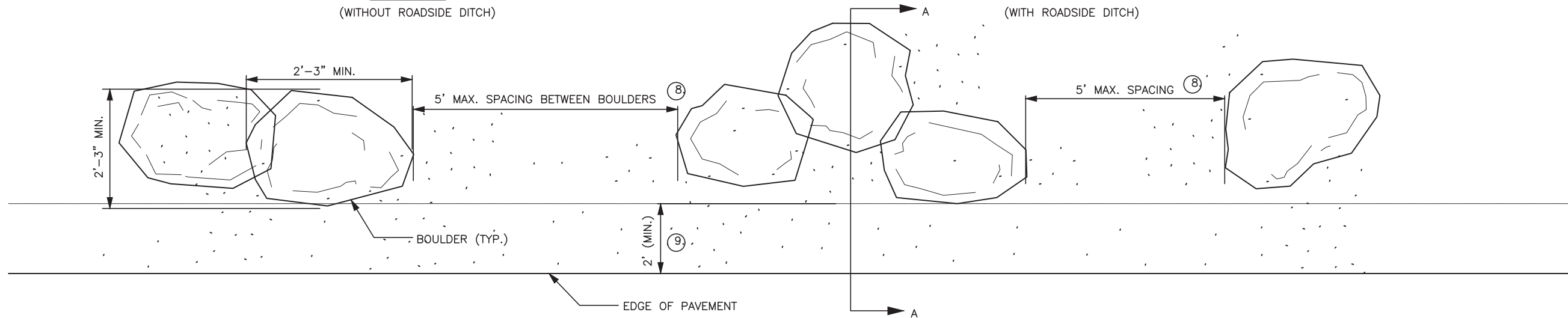
BARRIER BOULDER PLACEMENT DETAIL



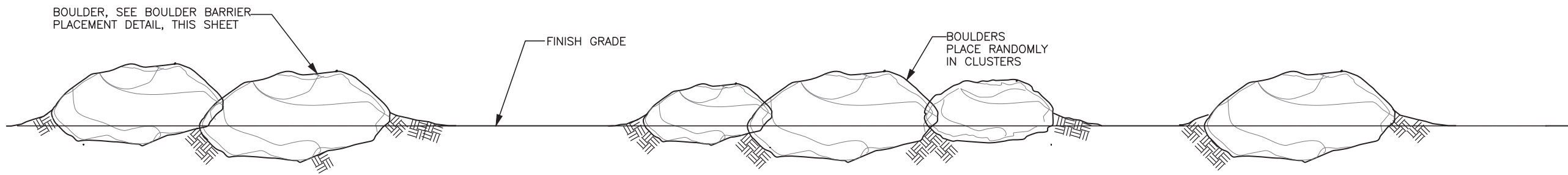
SECTION A-A
(WITHOUT ROADSIDE DITCH)



SECTION A-A
(WITH ROADSIDE DITCH)



PLAN



ELEVATION

NOTES:

1. BOULDER LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. PLACE AS DIRECTED BY THE CO IN COORDINATION WITH THE NPS.
2. PLACE BOULDERS WEATHERED SIDE UP.
3. PLACE BOULDERS RANDOMLY WITHIN THE MAXIMUM SPACING. VARY NUMBER OF BOULDERS AS DIRECTED BY CO.
4. BURY BOULDER TO 1/3 OF BOULDER HEIGHT.
5. BOULDERS TO BE PROVIDED FROM LOCAL SOURCE AND SHALL MATCH THE CHARACTERISTICS OF BOULDERS INDIGENOUS TO CAPITOL REEF NATIONAL PARK.
6. PAYMENT FOR BOULDER INSTALLATION WILL BE MADE UNDER ITEM 25125-0000, BOULDER. PAYMENT WILL BE FULL COMPENSATION FOR THE WORK AS SHOWN IN THE PLANS, AND THIS DETAIL.
7. THE BARRIER BOULDER PLACEMENT PLAN, WHILE SHOWN ON ONE SIDE OF THE ROADWAY, APPLY TO EITHER SIDE AS CALLED OUT ON THE PLANS.
8. AFTER EMBANKMENT, EXCAVATION, AND BOULDER PLACEMENT IS COMPLETE, RIP OR OTHERWISE ROUGHEN ALL SURFACES BETWEEN THE BOULDERS AND SCENIC DRIVE TO DETER VEHICULAR TRAFFIC USE.
9. DISTANCE FROM EDGE OF SHOULDER TO FACE OF BOULDERS WILL BE 2' (MIN.) OR AS DETERMINED BY CO.

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A BARRIER BOULDER PLACEMENT
NO SCALE



A/E FIRM	DESIGNED:	SUB SHEET NO.
PRIME: JACOBS DENVER, CO.	CM	S5
	CADD: CM	
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM	
	DATE: 3/28/22	

TITLE OF DRAWING		DRAWING NO.
BARRIER BOULDER PLACEMENT DETAILS		#115 177002
BLACK CANYON OF THE GUNNISON NATIONAL PARK		
PKG. NO.	SHEET	
1	27	
	OF	55

COUPLING BANDS FOR METAL PIPE CULVERT ^[1]					
CORRUGATION SIZE ^[2] INCHES	ROUND PIPE DIAMETER INCHES	ELLIPTICAL PIPE SPAN × RISE INCHES	MINIMUM BAND WIDTH (INCHES)		
			ANNULAR CORRUGATED BANDS ^[3]	HELICALLY CORRUGATED BANDS ^[4]	SEMI-CORRUGATED BANDS ^[5]
1½ × ¼	UNDERDRAIN ^[6]	—	10.5	7	10.5
	12 to 36	17 × 13 to 42 × 29	7	12	
2⅔ × ½	42 to 72	49 × 33 to 83 × 57	10.5	12	
	78 to 84	—	10.5	12	10.5
3 × 1	36 to 72	60 × 46 to 81 × 59	12	14	10.5
	78 to 144	87 × 64 to 142 × 91	12	14	10.5
5 × 1	36 to 72	60 × 46 to 81 × 59	20	22	
	78 to 144	87 × 64 to 142 × 91	20	22	

[1] FABRICATE ANNULAR, HELICAL AND SEMI-CORRUGATED TYPE COUPLING BANDS FROM THE SAME METAL AS THE CONNECTING PIPE. PROVIDE COUPLING BANDS NOT MORE THAN 3 NOMINAL SHEET THICKNESSES THINNER THAN THE THICKNESS OF THE PIPE TO BE CONNECTED, AND NO THINNER THAN 0.052 INCH FOR STEEL OR 0.048 INCH FOR ALUMINUM. FASTEN COUPLING BANDS WITH THE FOLLOWING DIAMETER OF BOLT:
 3/8" FOR 18" ROUND CULVERT (21" × 15" ELLIPTICAL PIPE) OR LESS
 1/2" FOR 21" ROUND CULVERT (24" × 18" ELLIPTICAL PIPE) OR MORE ²

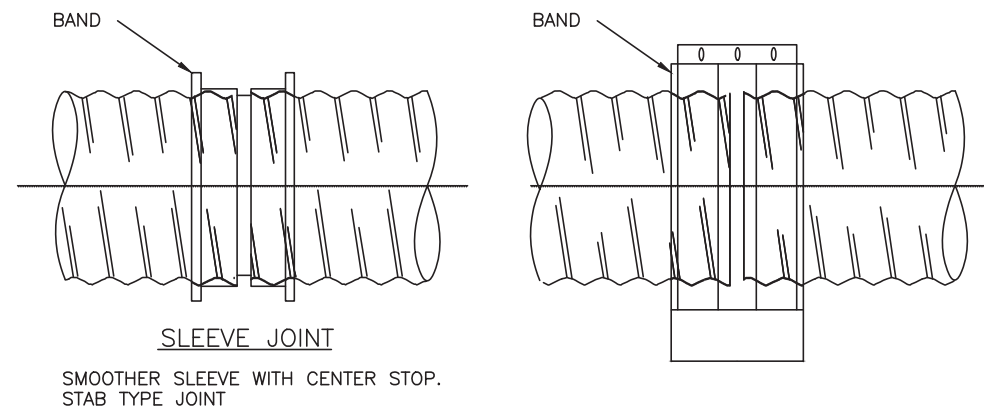
[2] FOR HELICALLY CORRUGATED PIPE WITH REROLLED ENDS, THE NOMINAL CORRUGATIONS SIZE REFERS TO THE DIMENSION OF THE END CORRUGATION IN THE PIPE.

[3] USE ANNULAR CORRUGATED BANDS WITH PIPES HAVING ANNULAR CORRUGATIONS OR WITH HELICAL PIPE HAVING REROLLED END TO FORM ANNULAR CORRUGATIONS. A 10.5 INCH BAND IS ACCEPTABLE ON 2 × 1 PIPE ENDS REROLLED WITH 2 2/3" × 1/2" CORRUGATIONS. A 12 INCH BAND IS ACCEPTABLE ON PIPE ENDS 3 × 2 REROLLED WITH 3" × 1" PIPE CORRUGATIONS.

[4] USE HELICAL CORRUGATED BANDS WITH PIPES HAVING HELICALLY CORRUGATED ENDS.

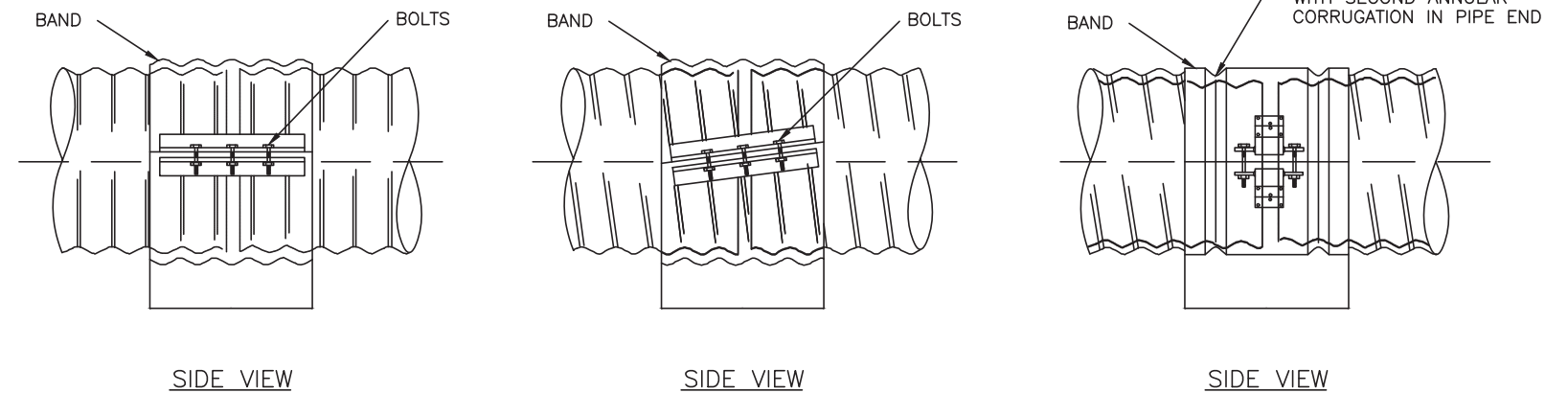
[5] THE MINIMUM BAND WIDTHS SHOWN FOR 3" × 1" AND 5" × 1" CORRUGATED SIZES APPLY TO 2 2/3" × 1/2" CORRUGATIONS ON REROLLED PIPE ENDS.

[6] SMOOTH SLEEVE-TYPE COUPLERS AND FLAT BANDS MAY BE USED FOR PIPE DIAMETERS OF 12" OR LESS. USE A MATCHING METAL HAVING A NOMINAL THICKNESS OF NOT LESS THAN 0.040 INCH FOR STEEL, OR 0.036 INCH FOR ALUMINUM, OR A PLASTIC WITH AN EQUIVALENT STRENGTH TO METAL.



SMOOTH SLEEVE BAND

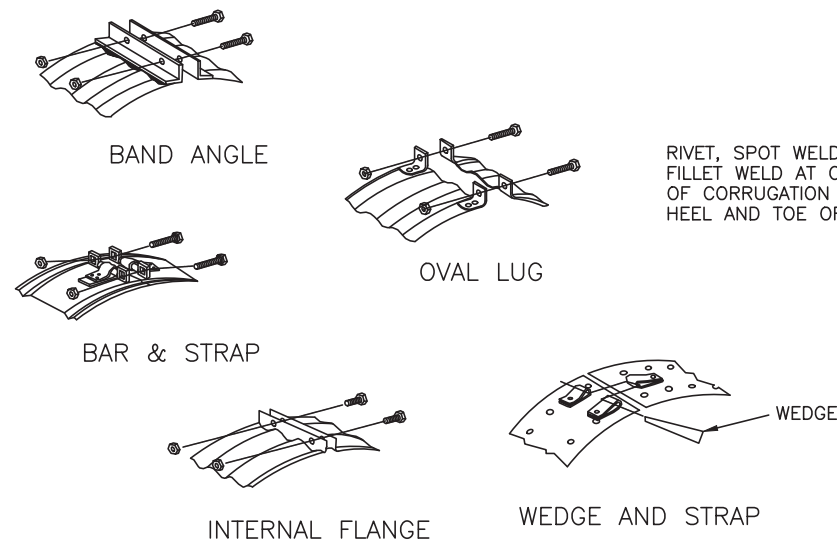
FLAT BAND



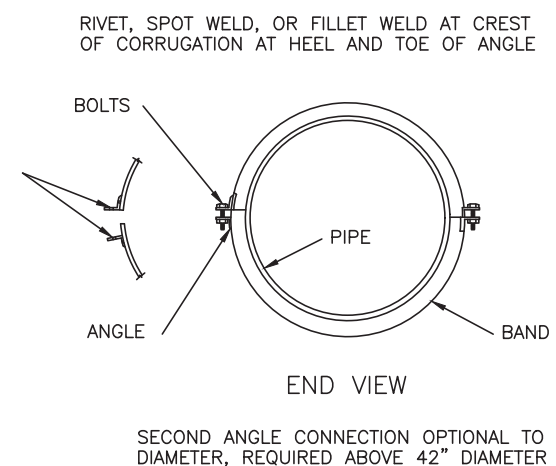
SIDE VIEW

SIDE VIEW

SIDE VIEW

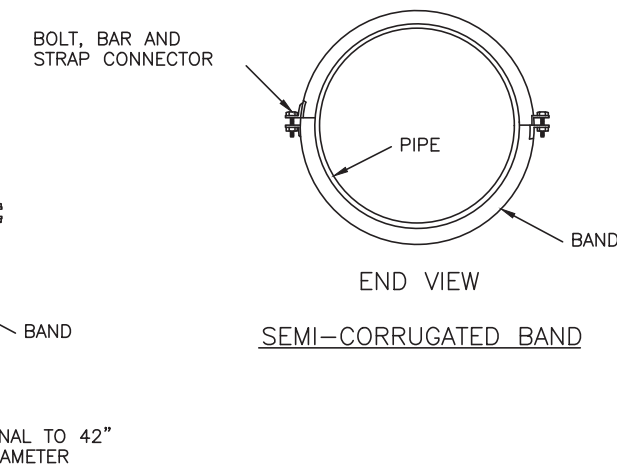


STANDARD BAND CONNECTIONS



ANNULAR BAND

HELICAL BAND



SEMI-CORRUGATED BAND

NOTES:

1. WATERTIGHT PIPE JOINTS ARE NOT REQUIRED UNLESS SPECIFIED IN THE SPECIAL CONTRACT REQUIREMENTS.
2. OTHER TYPES OF COUPLING BANDS OR FASTENING DEVICES THAT COMPLY WITH THE JOINT PERFORMANCE CRITERIA OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
3. ALL NEW AND REPLACEMENT CULVERTS TO BE CMP WITH POLYMER COATING INSIDE AND OUT.

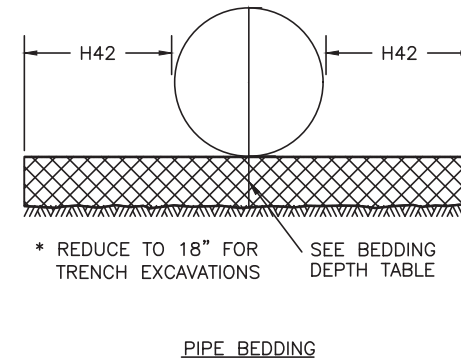
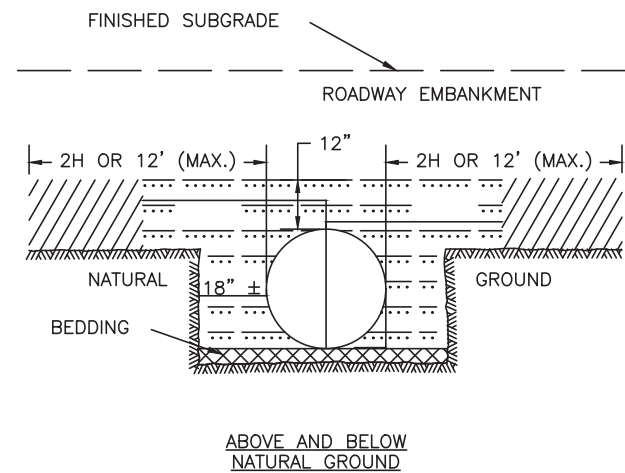
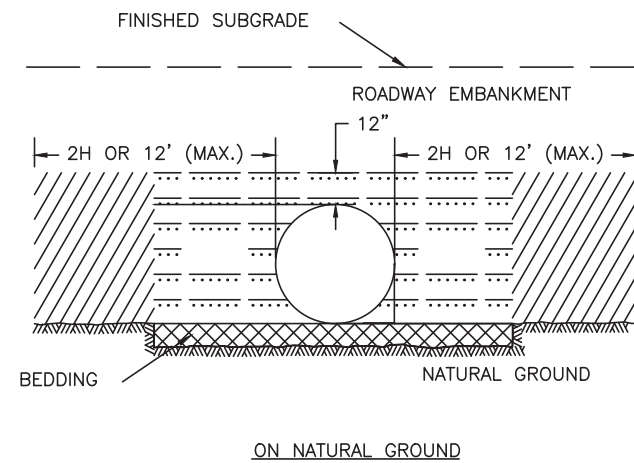
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A METAL CULVERT PIPE COUPLING DETAILS
NO SCALE



A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM CADD: CM	SUB SHEET NO. S6	TITLE OF DRAWING METAL CULVERT PIPE COUPLING DETAILS	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM DATE: 3/28/22		BLACK CANYON OF THE GUNNISON NATIONAL PARK	PKG. NO. 1 SHEET 28 OF 55

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

MINIMUM SPACING	
DIAMETER OR SPAN	SPACING
UP TO 48"	24"
48" AND UP	HALF DIAMETER OR SPAN OR 36" WHICHEVER IS LESS

BEDDING DEPTH	
PIPE SIZE (H)	DEPTH
12" TO 54"	4"
> 54"	6"

NOTES:

1. WHEN DIRECTED, CAMBER PIPE CULVERTS UPWARD FROM A CHORD THROUGH THE INLET AND OUTLET INVERTS AN ORDINATE AMOUNT EQUAL TO 1% OF THE PIPE LENGTH. DEVELOP CAMBER ON A PARABOLIC CURVE. IF THE MIDPOINT ELEVATION ON THE PARABOLIC CURVE AS DESIGNED EXCEEDS THE ELEVATION OF THE INLET INVERT, REDUCE THE AMOUNT OF CAMBER OR INCREASE THE PIPE CULVERT GRADIENT.
2. H EQUALS THE DIAMETER OF ALL ROUND PIPE CULVERTS OR THE RISE DIMENSION OF ALL ELLIPTICAL PIPE CULVERTS.

LEGEND:

-  BEDDING MATERIAL (UNCOMPACTED)
-  EMBANKMENT MATERIAL PLACED IN LAYERS NOT EXCEEDING 6" COMPACTED DEPTH.
-  COMPACTED BACKFILL MATERIAL PLACED IN LAYERS NOT EXCEEDING 6" COMPACTED DEPTH; OR LEAN CONCRETE
-  IMPERMEABLE BACKFILL MATERIAL.

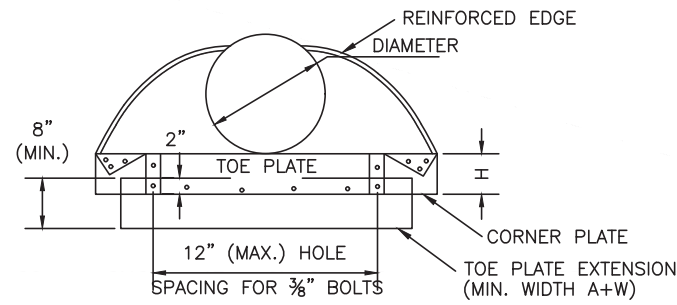
A CULVERT BACKFILL DETAILS
NO SCALE



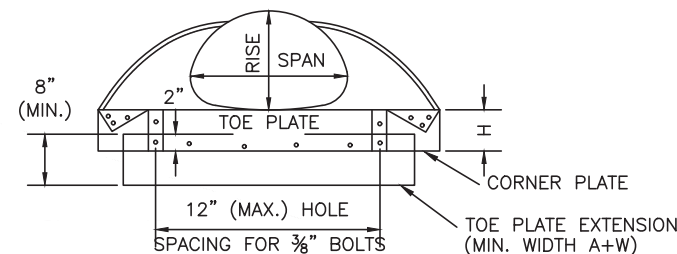
A/E FIRM PRIME: JACOBS DENVER, CO.	DESIGNED: CM	SUB SHEET NO. S7	TITLE OF DRAWING CULVERT BACKFILL DETAILS	DRAWING NO. #115 177002
SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	TECH. REVIEW: JM			DATE: 3/28/22

END SECTIONS FOR ROUND PIPE CULVERT											
PIPE SIZE DIAMETER INCHES	METAL THICKNESS				DIMENSIONS INCHES						SLOPE APPROX.
	STEEL		ALUMINUM		A (MIN)	B (MAX)	H (MIN)	L (±2")	W (MAX)		
	INCHES	GAGE	INCHES	GAGE							
12	0.064	16	0.060	16	5	7	6	21	44	2¼	
15	0.064	16	0.060	16	6	8	6	26	52	2¼	
18	0.064	16	0.060	16	7	10	6	31	58	2½	
21	0.064	16	0.060	16	8	12	6	36	66	2½	
24	0.064	16	0.060	16	9	13	6	41	72	2½	

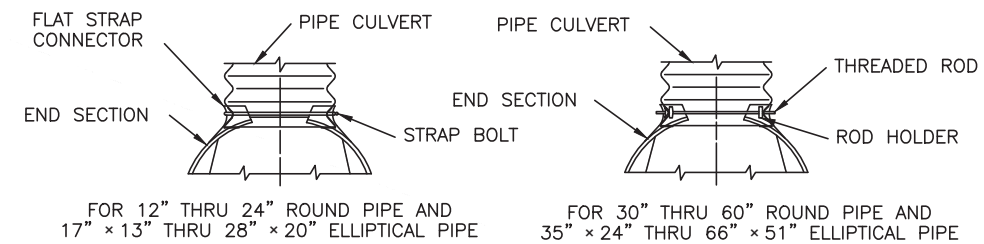
END SECTIONS FOR ELLIPTICAL PIPE CULVERT											
PIPE SIZE SPAN × RISE INCHES	EQUIVALENT DIAM. (INCHES)	METAL THICKNESS				DIMENSIONS INCHES					SLOPE APPROX.
		STEEL		ALUMINUM		A (MIN)	B (MAX)	H (MIN)	L (±2")	W (MAX)	
		INCHES	GAGE	INCHES	GAGE						
17 × 13	15	0.064	16	0.060	16	7	9	6	19	30	2½
21 × 15	18	0.064	16	0.060	16	7	10	6	23	36	2½
24 × 18	21	0.064	16	0.060	16	8	12	6	28	42	2½
28 × 20	24	0.064	16	0.060	16	9	14	6	32	48	2½



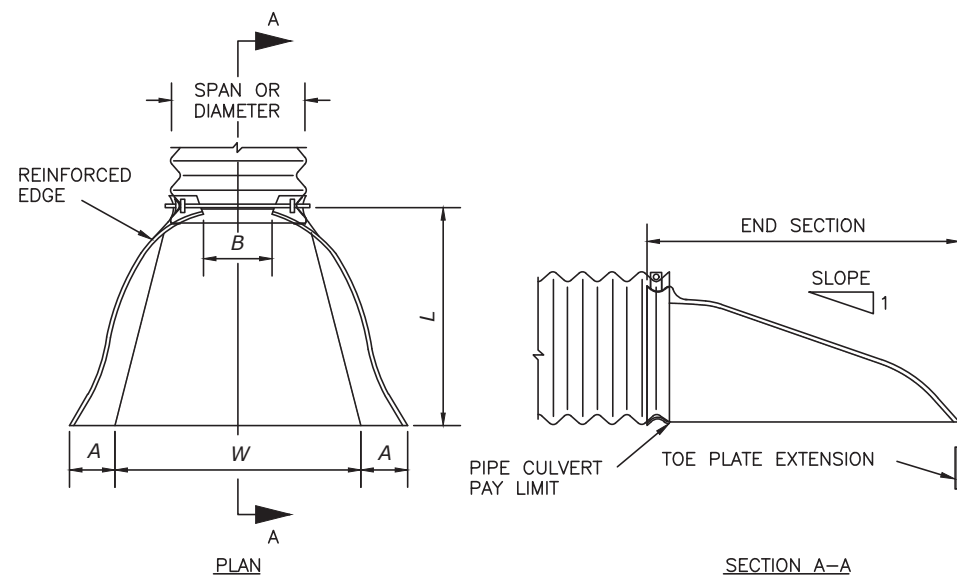
ELEVATION
ROUND PIPE CULVERT



ELEVATION
ELLIPTICAL PIPE CULVERT



DESIGN A
CONNECTION TO ANNULAR
CORRUGATED METAL PIPE



PLAN
SECTION A-A
ROUND OR ELLIPTICAL PIPE CULVERT

A CULVERT END SECTION DETAILS
NO SCALE

NOTES:

- VARIATIONS IN DESIGN AND DIMENSIONS ARE PERMITTED TO ALLOW FOR MANUFACTURER'S STANDARDS.
- FABRICATE THE DIAMETER OF THE END SECTION OF DESIGN B TO MATCH THE INSIDE DIAMETER OF THE CONCRETE PIPE CULVERT.
- DESIGN C MAY BE USED IN LIEU OF DESIGN A FOR ALL METAL PIPE CULVERT SIZES. COUPLING BANDS MAY BE ANY ACCEPTABLE TYPE FOR THE PIPE CULVERT SPECIFIED.
- FABRICATE MULTIPLE PIECE BODIES WITH LAP SEAMS TIGHTLY JOINED BY RIVETS OR BOLTS. FABRICATE END SECTION CENTER PANELS 8 FOR 60" AND LARGER DIAMETER PIPE AND EQUIVALENT ELLIPTICAL PIPE FROM 0.138 INCH STEEL OR 0.135 INCH ALUMINUM.
- ON END SECTION CENTER PANELS FOR 66" AND LARGER EQUIVALENT ELLIPTICAL PIPE PROVIDE 2 ½" × 2 ½" × ¼" ANGLE REINFORCEMENT BOLTED OR RIVETED UNDER THE CENTER PANEL SEAM.
- SUPPLEMENT THE REINFORCED EDGES OF END SECTIONS FOR 60" AND LARGER DIAMETER PIPE AND 66" AND LARGER EQUIVALENT ELLIPTICAL PIPE WITH 2 ½" × 2 ½" × ¼" STIFFENER ANGLES ATTACHED WITH BOLTS OR RIVETS.
- FABRICATE CONNECTOR SECTION, CORNER PLATE AND TOE PLATE EXTENSIONS FROM THE SAME METAL THICKNESS AS THE PANEL BODY. USE TOE PLATE EXTENSION WHERE SHOWN ON THE PLANS.
- WARP EMBANKMENT SLOPES TO MATCH THE SLOPE OF THE FLARED END SECTIONS.
- ALL NEW AND REPLACEMENT PIPE END SECTIONS TO BE PAINTED OR POWDER COATED FOR CORROSION PROTECTION.

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A/E FIRM PRIME: JACOBS DENVER, CO. SUBCONTRACTOR: SHANNON & WILSON DENVER, CO.	DESIGNED: CM CADD: CM TECH. REVIEW: JM DATE: 3/28/22	SUB SHEET NO. S8	TITLE OF DRAWING CULVERT END SECTION DETAILS BLACK CANYON OF THE GUNNISON NATIONAL PARK	DRAWING NO. #115 177002 PKG. NO. 1 SHEET 30 OF 55
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