STAFF REPORT

Agenda Item: 6

Report To: Open Space Advisory Committee **Meeting Date:** February 22, 2021

Staff Contact: Lyndsey Boyer, Open Space Manager
Gregg Berggren, Trails Coordinator

Agenda Title: For Possible Action: Discussion and possible recommendation to staff regarding the use of approximately $33,275 from the Quality of Life (Open Space) fund to serve as an additional portion of the required 5% local match to a Federal Lands Access Program grant (total project cost approximately $5.3 million) for trailhead/roadway improvements in Kings Canyon; and review of the updated 95% conceptual design plans.

Staff Summary: Since 2017, the Carson City Public Works Department and the Parks, Recreation & Open Space Department have been working cooperatively to secure funding through the Federal Lands Access Program (FLAP) for much needed improvements to Kings Canyon Road and the Kings Canyon Trailhead. Since first proposed in 2018, the estimated project cost has increased from $3.7 million to $5.3 million. This grant program requires a 5% local match. In August 2018, the Open Space Advisory Committee (OSAC) voted to approve an allocation of approximately $35,000 as matching funds from the Open Space budget, with the remaining required match from Public Works, as authorized by the Regional Transportation Commission (RTC). Due to increased project costs, an additional $33,275 is requested as match for the trailhead portion of the project.

Agenda Action: Formal Action/Motion **Time Requested:** 20 minutes

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Proposed Motion

"I move to recommend that staff approve the use of approximately $33,275 from the Quality of Life (Open Space) fund to serve as a portion of the required 5% local match to a FLAP grant for trailhead/roadway improvements in Kings Canyon.

Board's Strategic Goal

Sustainable Infrastructure

Previous Action

August 6, 2018 OSAC approved 5-0 the use of approximately $35,000 from the Quality of Life (Open Space) fund to serve as a portion of the required 5% local match to a FLAP grant (total project cost approximately $3.7 million) for trailhead/roadway improvements in Kings Canyon.

July 25, 2018 - The RTC, the U.S. Forest Service (USFS) and the Federal Highway Administration (FHWA) signed a Memorandum of Agreement to move forward with a FLAP project to make improvements to the Kings Canyon Road.

November 27, 2017 – The RTC approved pursuit of this FLAP grant and accepted the fiscal impact associated with the 5% required local match.

Background/Issues & Analysis

Since 2017, the Carson City Public Works Department and the Parks, Recreation & Open Space Department have been working cooperatively to secure funding through the Federal Lands Access Program (FLAP) for much needed improvements to Kings Canyon Road and the Kings Canyon Trailhead. Project improvements include roadway reconstruction, storm water improvements, and trailhead improvements. The existing trailhead is significantly undersized for current levels of use, creating both roadway and private driveway obstruction and potential delays to emergency responders in the area. The designer, Central Federal Lands, has completed the 95% design plan set of the Kings Canyon Road and Trailhead Project, and they have submitted them to the City for review and comment. The bulk of the comments made as part of the 70% design plan submittal by the City have been incorporated into this 95% design plan set.

Highlights of the changes include:

- A reduction of the pavement width from 28 feet to 26 feet;
- Making the parking area a one-way loop with 25 parking spots, down from 30 spots at 70%;
- Including the proposed trail into the new slope on the western side of the parking lot to allow for more direct access to the existing waterfall trail;
- Adding curb and gutter as well as no parking signs to restrict parking outside of the parking area; and
- New driveway connections to adjacent properties.

The project will be presented to the RTC on February 10, 2021. Following presentation to the RTC, staff will provide any final comments to Central Federal Lands. Comments are anticipated to be limited to driveway approaches and utility coordination. Central Federal Lands will finalize the 100% plan set and prepare the project for bidding. The project is anticipated to be bid for construction later this spring. Through the project design process, costs for the trailhead and road improvements have increased significantly due to a variety of factors, including multiple design changes that incorporated comments from the public, staff, RTC, OSAC, and Parks and Recreation Commission. Originally, the project estimate was $3.7 million, the revised estimate for this project is projected at $5.3 million. The grantor will allocate additional funds for the difference in project costs but a 5% local match for the entire cost of the grant program is still required. In August 2018, OSAC voted to approve an allocation of approximately $35,000 (exact allocation of $35,350) from the Open Space budget, with the remaining required match from Public Works, as authorized by the RTC. Due to increased project costs, an additional $33,275 is being requested to contribute as matching funds for the trailhead portion of the project. This is based on an estimate of approximately $1.4 million dollars to fund the trailhead improvements associated with the project. The total match allocated for this project from the Open Space program will be approximately $68,625. Additional matching funds are being requested from the RTC as well to meet the 5% local match requirement.

Staff are working with Central Federal Lands to update the Memorandum of Agreement to account for updated right-of-way, engineering, and construction costs. A revised Memorandum of Agreement will be presented to the RTC for approval at a future meeting. The project will be put out to bid in the spring, and construction is anticipated for summer 2021.

ATTACHMENTS:

Exhibit A: 95% Kings Canyon Road Plans - Trailhead
Exhibit B: 95% Kings Canyon Road Plans - Trailhead (Aerial)
Exhibit C: Kings Canyon - Public Comments and Responses
Exhibit D: OSAC Staff Report, August 6, 2018
Exhibit E: OSAC Minutes, August 6, 2018

Applicable Statute, Code, Policy, Rule or Regulation

Carson City Grant Policy and Procedures

Carson City Municipal Code 13.06.140
Carson City Municipal Code 13.06.150

Financial Information

Is there a fiscal impact? ☒ Yes ☐ No

If yes, account name/number: Quality of Life – Open Space. Maintenance and Management / 2545047-507199

Is it currently budgeted? ☐ Yes ☒ No

Explanation of Fiscal Impact: Matching funds of $35,350 have been allocated and encumbered to the project in FY21. The additional $33,275 has been allocated in the Open Space budget for FY22 and will be encumbered in FY22. There is currently adequate funding available in the Open Space budget that is not encumbered or obligated to other grant projects.

Alternatives

Do not approve the item and provide additional direction to staff.

Committee Action Taken:

Motion: _____ 1) _____ Aye/Nay

2) _____ _____

_____

_____

_____

_____

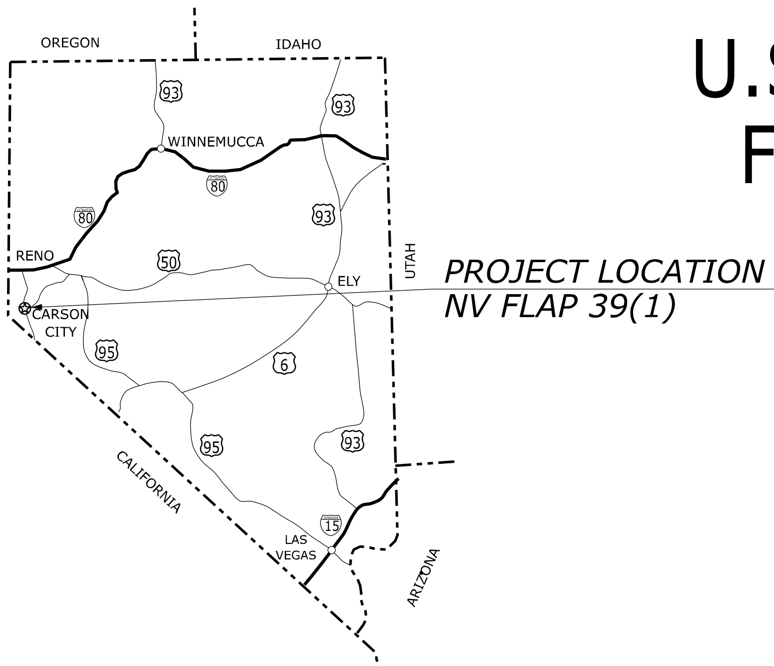
(Vote Recorded By)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PLANS FOR PROPOSED

NV FLAP 39(1)
KING'S CANYON ROAD

HUMBOLDT-TOIYABE NATIONAL FOREST
CARSON CITY, NV
LENGTH 0.81 miles



KEY MAP OF NEVADA

TYPE OF CONSTRUCTION:
Road reconstruction, drainage repairs, parking lot construction

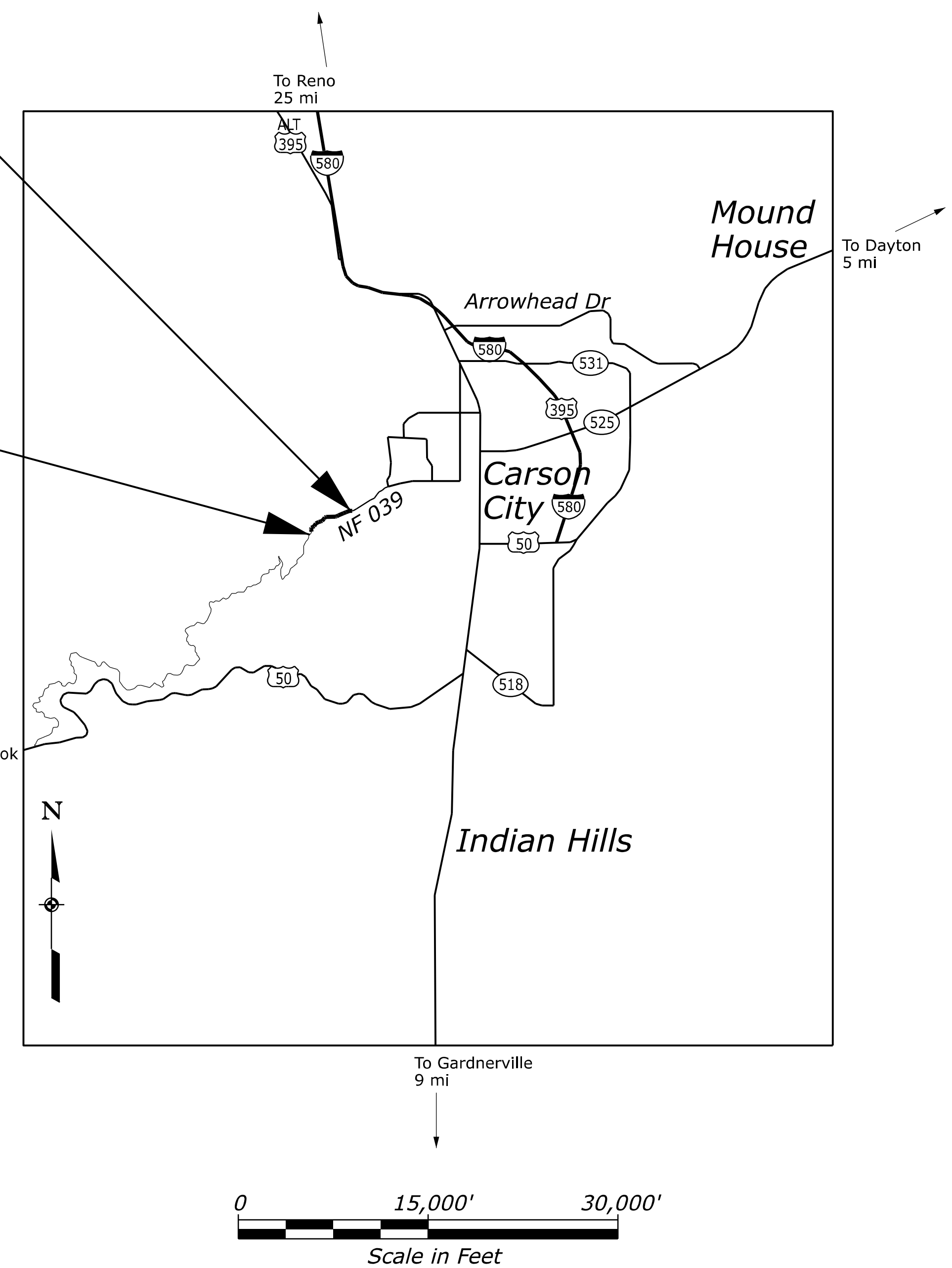
DESIGN DESIGNATIONS:
ADT (2021) ----------- 452
ADT (2041) ----------- 674
DHV ------------------ 75
D -------------------- 50%
T -------------------- 2%
V -------------------- 30 mph
e(max) --------------- 2%

U.S. CUSTOMARY DIMENSIONS:
Slopes are expressed as RISE:RUN

SPECIFICATIONS:
"STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14"

End Project
STA 143+00
NV FLAP 39(1)
Schedule A

Begin Project
STA 100+00
NV FLAP 39(1)
Schedule A



95% SUBMITTAL
1/19/21
NOT FOR CONSTRUCTION

Know what's below.
Call before you dig.
www.call811.com

PROJECT MANAGER	LEAD DESIGNER
EMILIO BURGOS	THOMAS MCCRARY

PLANS PREPARED BY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION
DENVER, COLORADO

APPROVED:

DATE:

CHIEF OF ENGINEERING
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A2

ABBREVIATIONS

	℄	centerline
	Δ	curve delta
	Ø	diameter
A	abut.	abutment
	ADT	average daily traffic
	aggr.	aggregate
	AH	ahead
	alt.	alternate
	appr.	approach
	asph.	asphalt
B	b.f.	both faces
	beg.	beginning,begin
	BK	back
	BM	bench mark
	BP	balance point
	br.	bridge
	brg.	bearing
C	CBC	concrete box culvert
	c-c	center to center
	clr.	clear
	CMP	corrugated metal pipe
	Co.	county
	col.	column
	conc.	concrete
	constr.	construction
	constr. jt.	construction joint
	cont.	continuous
	corr.	corrugated
	cr.	creek
	CS	point of curve to spiral
	ctrs.	centers
	CTSM	contingent sum
	culv.	culvert
D	decr.	decrement
	DHV	design hour volume
	DI	drop inlet
	dia. or D	diameter
	diag.	diagonal
	diaph.	diaphragm
	dist.	distance
	Dist.	district
	DLC	donation land claim
	dwg(s).	drawing(s)
E	E	east
	e	superelevation rate
	El. 94.066	elevation with number
	elev.	elevation
	emb.	embankment
	engr(s).	Engineer(s)
	EOP	edge of pavement
	EQ or eq.	equation
	ER	edge of road
	et al	and others
	et ux	and wife
	EW	edge of water
	exc.	excavation
	exp. jt.	expansion joint
	ext.	exterior
F	f.f.	fill face
	Fed.	federal
	FES	flared end section
	fin.	finish
	ftg.	footing
G	ga.	gage (gauge)
	galv.	galvanized
	gdr.	girder
H	hdwl.	headwall
	HES	homestead entry survey
	hex.	hexagon
	horiz.	horizontal
	HW	high water
	hwy.	highway
I	ID	inside diameter
	incl.	inclusive,including
	incr.	increment
	int.	interior
J	jt.	joint
L	L	length of curve
	lam.	lamination
	lat.	latitude
	long.	longitudinal
	LPSM	lump sum
	Lt. or LT	left
	LW	low water
M	mag.	magnetic
	maint.	maintenance
	matl.	material
	max.	maximum
	min.	minimum
	mon.	monument
	mtn(s).	mountain(s)
N	N	north
	NC	normal crown
	neg.	negative
	no. or #	number
O	o.c.	on centers
	o.f.	other face
	OD	outside diameter
P	PC	point of curve
	PCC	point of compound curve
	perf.	perforate
	PI	point of intersection
	pl.	plate
	POC	point on curve
	POS	point on spiral
	POT	point on tangent
	proj.	project
	psi	pounds per square inch
	PT	point of tangent
	pvmt.	pavement
Q	quant., Qty	quantities
R	R	radius
	R.	range
	R/W	right-of-way
	rd.	road
	rdwy.	roadway
	reconst.	reconstruction
	reinf.	reinforcement
	reqd.	required
	res.	reservoir
	Res.	Reservation
	ret. wall	retaining wall
	RH	reference hub
	Rt. or RT	right
	rte.	route
S	S	south
	SADT	seasonal average daily traffic
	SC	point of spiral to curve
	sec.	section
	shldr.	shoulder
	spa.	spacing, Spaces or Spaced
	spec.	specification
	st.	street
	ST	point of spiral to tangent
	sta.	station
	std.	standard
	stiff.	stiffener
	str.	straight
	struc.	structural
	sym.	symmetrical
T	T	tangent length
	T.	township
	tan.	tangent
	TBM	temporary bench mark
	TCE	temporary construction easement
	transv.	transverse
	TS	point of tangent to spiral
	typ.	typical
V	V	design speed
	vert.	vertical
	vph	vehicles per hour
	VPI	vertical point of intersection
W	W	west

DRAINAGE SYMBOLS

Ditch (Existing, Proposed)

Flow Arrow

Drainage or Small Creek

Lake, Pond or Reservoir

Large Creek

Wetland

River

Spring

SPRING

Bridge (Existing, Proposed)

Box Culvert (Existing, Proposed)

Pipe Culvert (Existing, Proposed)

With End Sections (Existing, Proposed)

With Headwalls (Existing, Proposed)

With Drop Inlet (Existing, Proposed)

DI

Underdrain (Existing, Proposed)

Riprap Apron (Proposed)

EROSION & SEDIMENT CONTROL SYMBOLS

Bonded Fiber Matrix Mulching

Check Dam

Diversion Berm

Rolled Erosion Control Product

Riprap

Fiber Roll (Ditch and/or Cut Slope)

Silt Fence

Temporary Inlet Protection

Fiber Roll (Slope Protection)

FENCE & CATTLEGUARD SYMBOLS

Fence (Existing, Proposed)

Fence w/ Gate (Existing, Proposed)

Cattleguard (Existing, Proposed)

GEOLOGIC SYMBOLS

Boring Location (Existing, Proposed)

Material Source

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

CONVENTIONAL PLAN SYMBOLS AND ABBREVIATIONS

Sheet 1 of 2

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A3

LANDSCAPING & VEGETATION SYMBOLS

Tree

Treeline

MAPPING SYMBOLS

Building (Existing, Proposed)

Coordinate Grid Tick

North Arrow

Railroad
- Single Track
- Double Track

Spot Elevation — 999.9

Trail

Survey Control Point

RIGHT-OF-WAY SYMBOLS

Boundaries
- National
- State
- County
- City
- Township or Range Line
- Section
- ¼ Section
- 1/16 Section
- Bureau of Indian Affairs
- Bureau of Land Management
- National Forest
- National Park
- National Wildlife Refuge

Easements
- Permanent (Existing)
- Permanent (Proposed)
- Temporary (Proposed)

Monument (As described)

Parcel Number — 400

Property Line

Right-of-Way Line (Existing)

Right-of-Way Line (Proposed)

Section Corner (Found, Projected) — 36 31 1 6 / 36 31

¼ Section Corner (Found, Projected) — 15 22 / 15 22

1/16 Section Corner (Found) — 1/16

GUARDRAIL, BARRIER & WALL SYMBOLS

Guardrail (Existing, Proposed)

Guardwall (Existing, Proposed)

Median & Side Barrier (Existing, Proposed)

Retaining Wall (Existing, Proposed)

ROADWAY SYMBOLS

Clearing/Construction Limits

Slope Stake Limits
- Top of Cut
- Transition
- Toe of Fill

Edge of Roadway
- Existing
- Proposed

Roadway Centerline (With Station ticks)

Roadway Obliteration

SIGN SYMBOLS

Signs
- Commercial (Existing, Proposed)
- Delineator (Existing, Proposed)
- Portable (Proposed)
- Post Mounted (Existing, Proposed)

UTILITY SYMBOLS

Irrigation Ditch
- Underground (Existing, Proposed) — IRR
- Surface (Existing, Proposed) — IRR

Support Pole (Existing, Proposed)

Support Pole Anchor (Existing, Proposed)

Street Light (Existing, Proposed)

Telephone Booth (Existing, Proposed) — TB / TB

Telephone Pedestal (Existing, Proposed) — TP / TP

Underground Utility (Existing, Proposed)
- CATV — TV TV
- Fiber Optic — FO FO
- Gas
- Oil
- Power
- Sanitary Sewer
- Telephone
- Water

Overhead Utility Line (Existing, Proposed)
- CATV — TV TV
- Fiber Optic — FO FO
- Power
- Telephone

PROJECT SPECIFIC SYMBOLS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

CONVENTIONAL PLAN SYMBOLS AND ABBREVIATIONS

Sheet 2 of 2

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A4

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

SITE MAP

$USER$ $$$DGN$ $TIME$ $$$$DATE$$$$

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A5

Project : NV FLAP 39(1)

Review FP14, Section 152.02

Date Of Field Work : OCT 2018
Date Of Final Adjustment : OCT 2018

Project Units : US Survey Foot
Name: United States/State Plane 1983
Datum: NAD 1983 (Conus)
Zone: NV WEST 2703
Epoch: 2010.0000 (from OPUS)
Geoid: GEOID12B (Conus)
Vertical datum: NAVD88

Gpk File Dated:
Gpk File Name: Alignment:

POINT NUMBER	STATE PLANE COORDINATES			GEO COORDINATES			MAPPING ANGLE	COMBINED FACTOR	STATION	OFFSET	DESCRIPTION
	NORTH	EAST	ELEVATION	LATITUDE	LONGITUDE	ELLIPSOID HEIGHT					
2001	14730144.69	2278592.83	5064.59	39°09'25.88400"N	119°48'13.75200"W	4984.75	-0°46'16"	0.99979865	141+02.73	14.9	CARSON CITY CAP
2002	14728861.36	2275137.56	5434.07	39°09'12.74400"N	119°48'57.42000"W	5354.34	-0°46'41"	0.99978373	104+42.72	-232.6	USDA AC
						PROJECT AVERAGES =		0.99979119			

NOTE: TO PRECISELY CHECK DISTANCES BETWEEN POINTS AS MEASURED ON THE GROUND :
INVERSE THE STATE PLANE COORDINATES AND DIVIDE THE COMPUTED DISTANCE
BY A MEAN COMBINED FACTOR OF THE TWO POINTS.

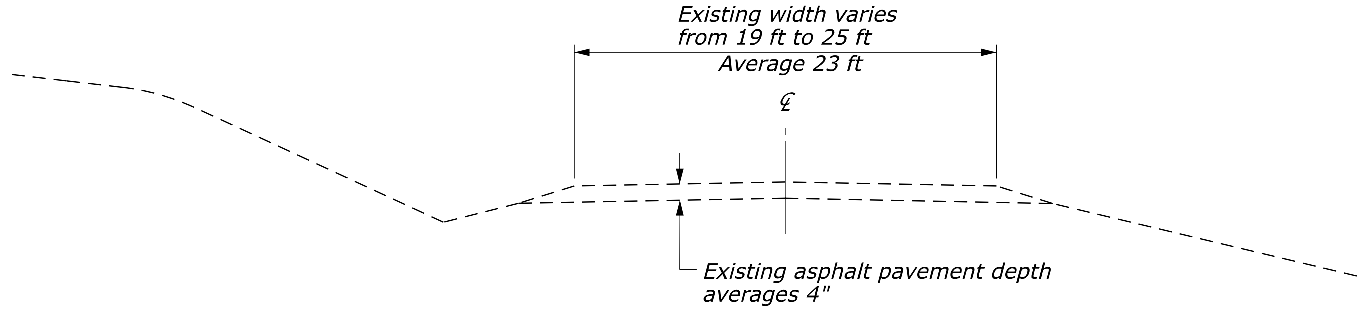
TO COMPUTE GEODETIC AZIMUTHS USE THE FOLLOWING FORMULA :
GEODETIC AZIMUTH = GRID AZIMUTH + MAPPING ANGLE

NO.	DESCRIPTION REVISIONS (OR CHANGE NOTICES)	DATE	INIT.
6			
5			
4			
3			
2			
1			

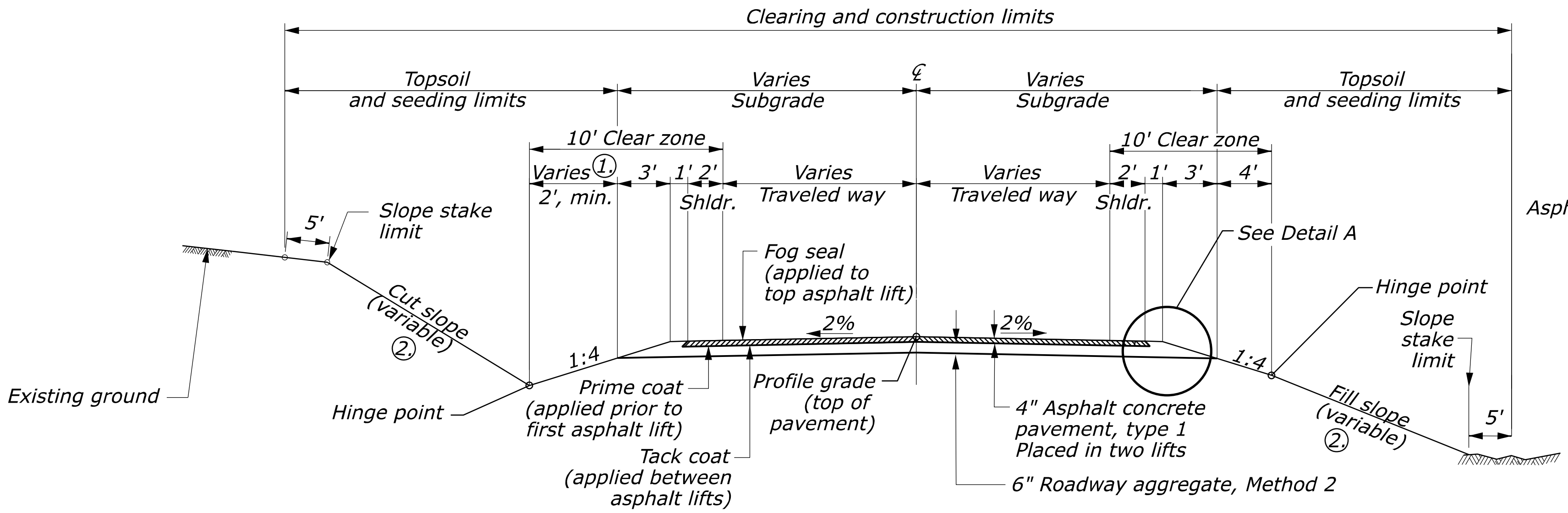
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

SURVEY CONTROL SHEET

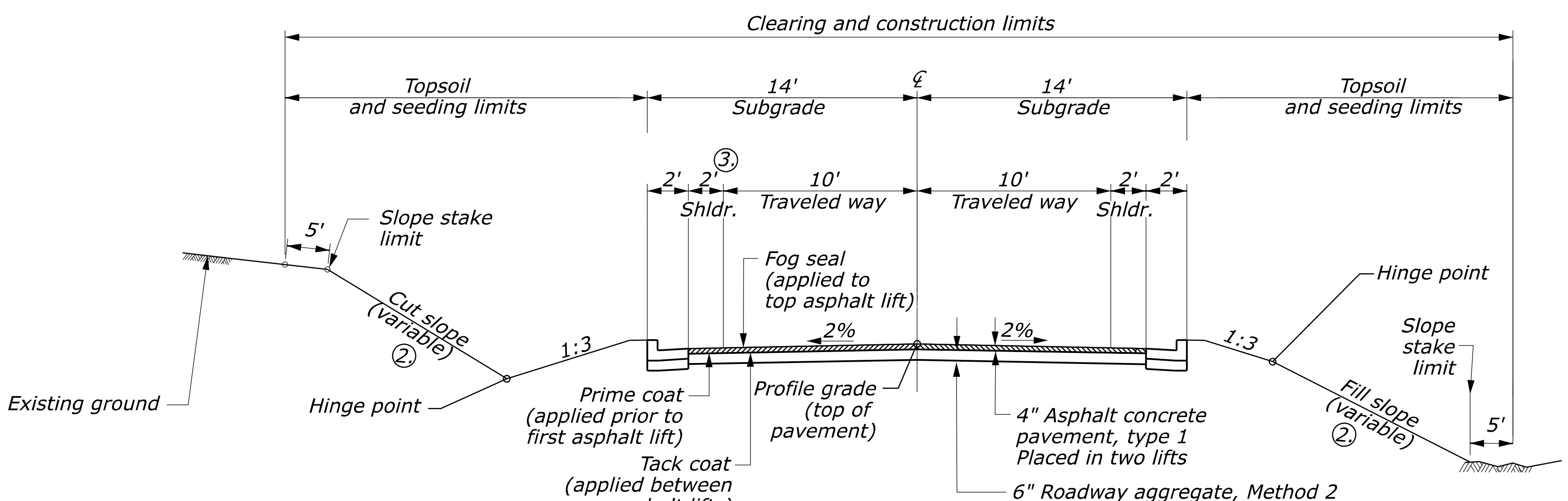
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A6



EXISTING TYPICAL SECTION
100+00 to 143+00



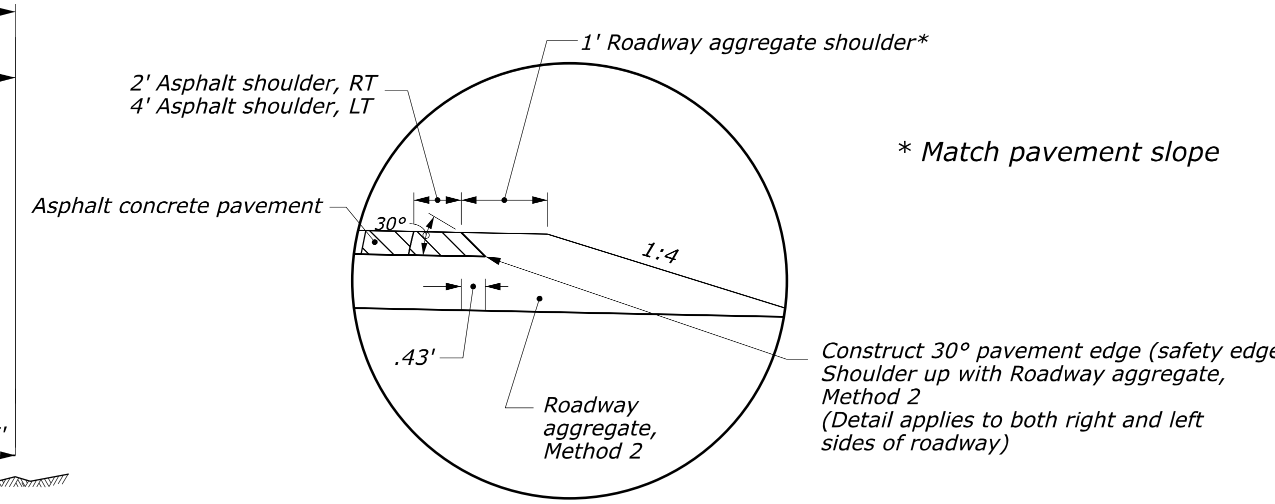
TYPICAL SECTION - NEW PAVEMENT
100+00 to 101+00



TYPICAL SECTION - NEW PAVEMENT
101+00 to 105+92

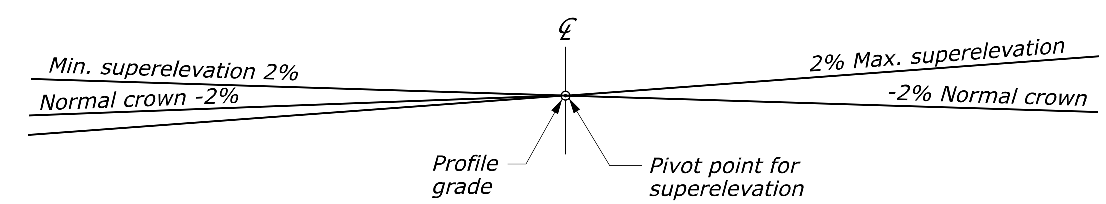
NOTE:

1. The gradient and width of roadway ditches and the excavation and embankment slope ratios may be adjusted by the CO to assure adequate drainage and stability.
2. See the cross sections for cut and fill slope ratios.
3. Transition the left shoulder from 2' to 4' from station 104+47.93 to station 105+07.87.



* Match pavement slope

DETAIL A



METHOD OF SUPERELEVATION ON CURVES

See plans for locations of curves and superelevations

LENGTH OF PROJECT	
Station to Station	Roadway (ft)
100+00 to 105+92.00	592
TOTALS (ft)	592
TOTAL (mi)	0.11

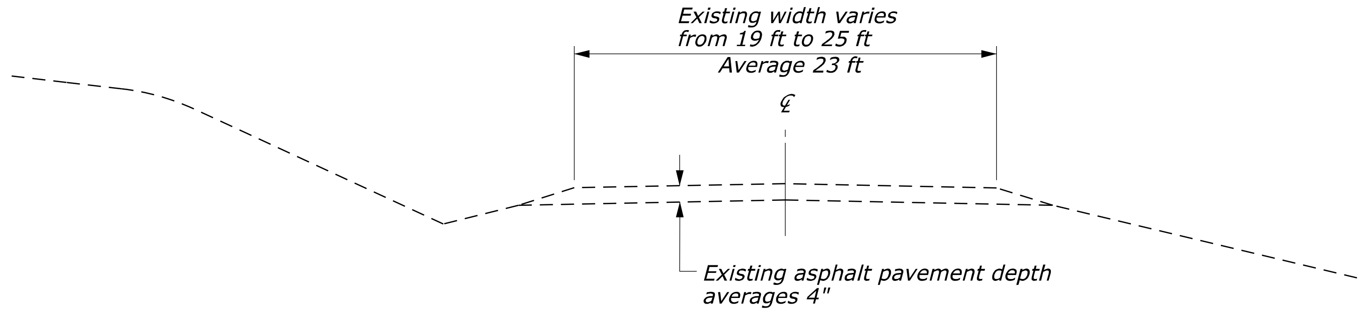
NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

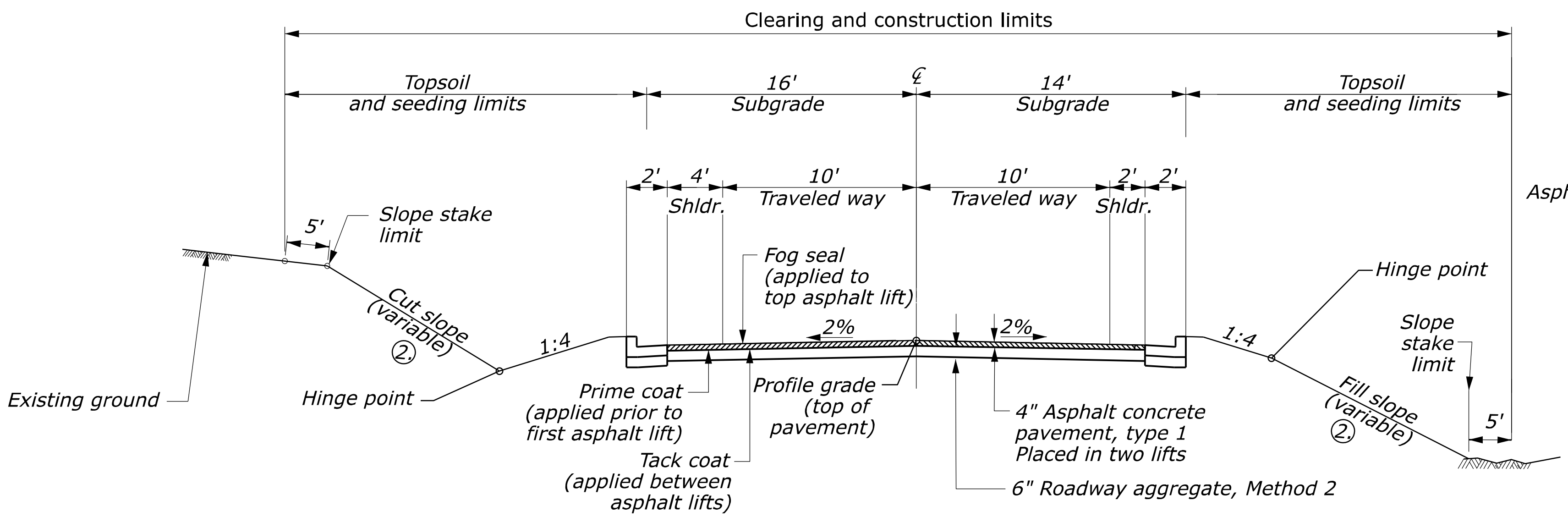
TYPICAL SECTIONS MAINLINE

$USER$ $$$$DGN$$$$ $TIME$ $$$$DATE$$$$

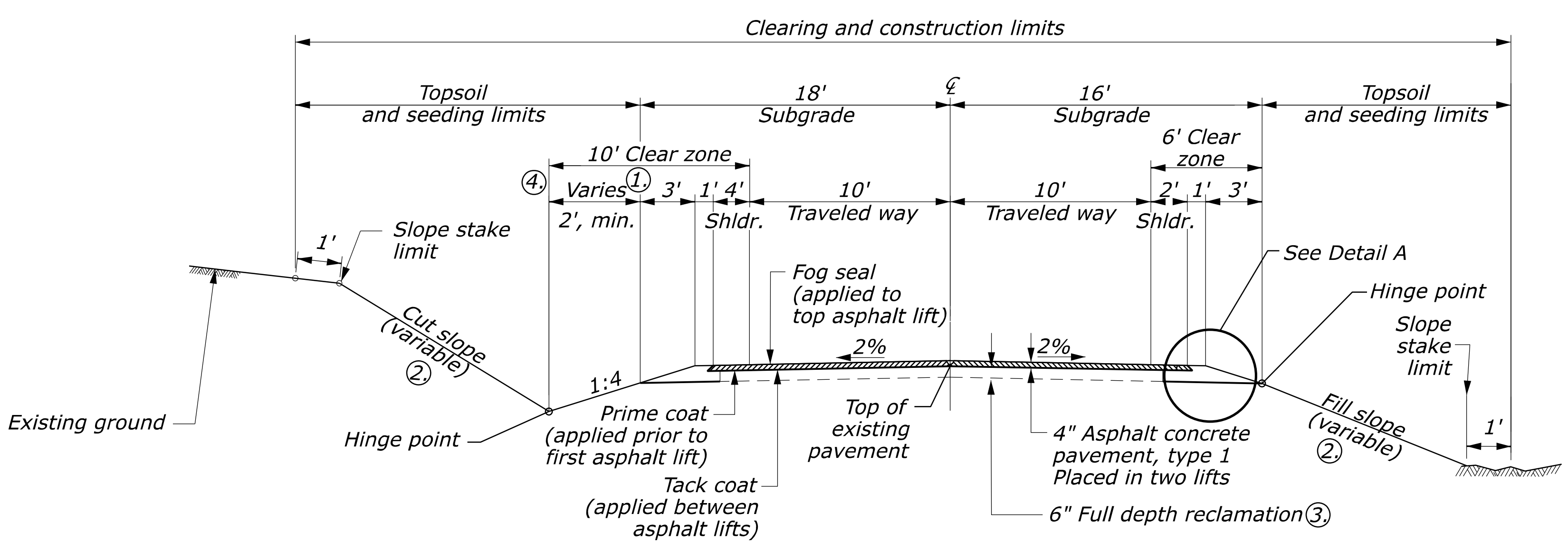
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A7



EXISTING TYPICAL SECTION
100+00 to 143+00



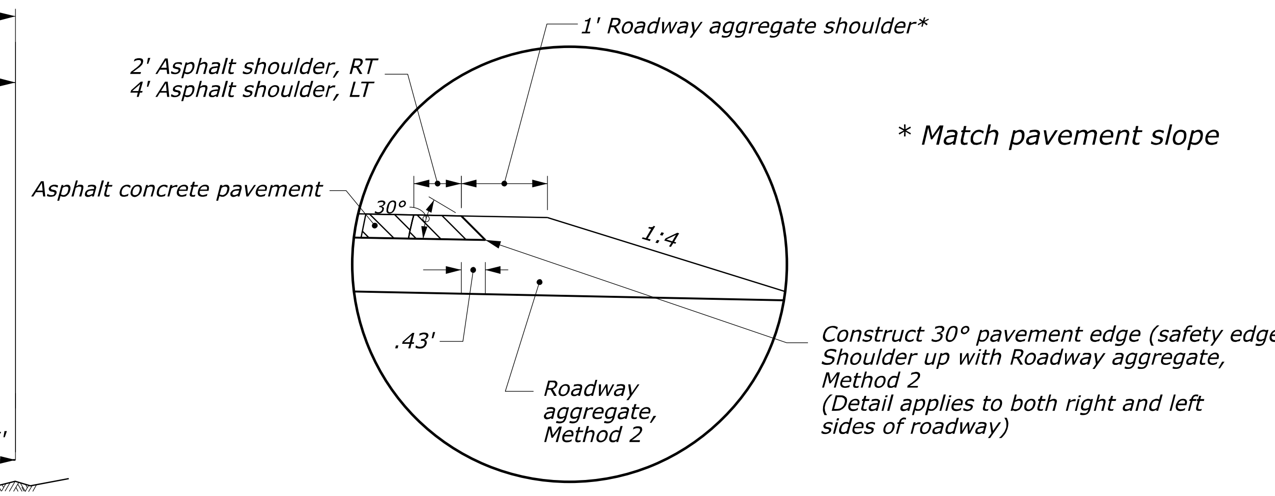
TYPICAL SECTION - NEW PAVEMENT
105+92 to 106+07.16



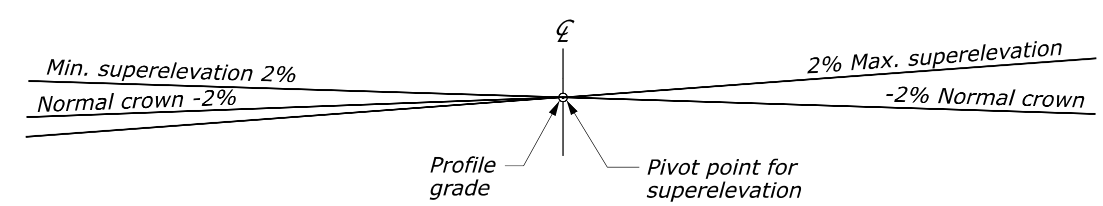
TYPICAL SECTION - FULL DEPTH RECLAMATION
106+07.16 to 140+44.24

NOTE:

1. The gradient and width of roadway ditches and the excavation and embankment slope ratios may be adjusted by the CO to assure adequate drainage and stability.
2. See the cross sections for cut and fill slope ratios.
3. Add Roadway aggregate, Method 2, as needed, for additional widening beyond existing pavement width.
4. From Sta 119+75.09 to 132+74.31 LT, transition from a 0.5' ditch depth to 1.5' ditch depth. From Sta 132+74.31 to 137+02.34 LT, maintain a 1.5' ditch depth. From Sta 137+96.46 to 142+00 LT, use a 0.5' ditch depth. From Sta 134+73.59 to 136+99.83 RT, transition from a 0.5' ditch depth to 1.5' ditch depth. From Sta 136+99.83 to 142+00 RT, maintain a 1.5' ditch depth.



DETAIL A



METHOD OF SUPERELEVATION ON CURVES
See plans for locations of curves and superelevations

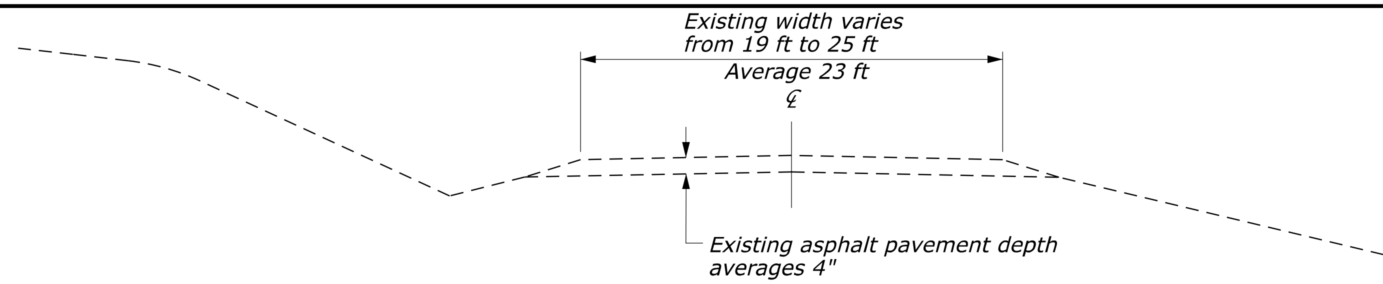
LENGTH OF PROJECT	
Station to Station	Roadway (ft)
105+92.00 to 140+44.24	3452
TOTALS (ft)	3452
TOTAL (mi)	0.65

NO SCALE

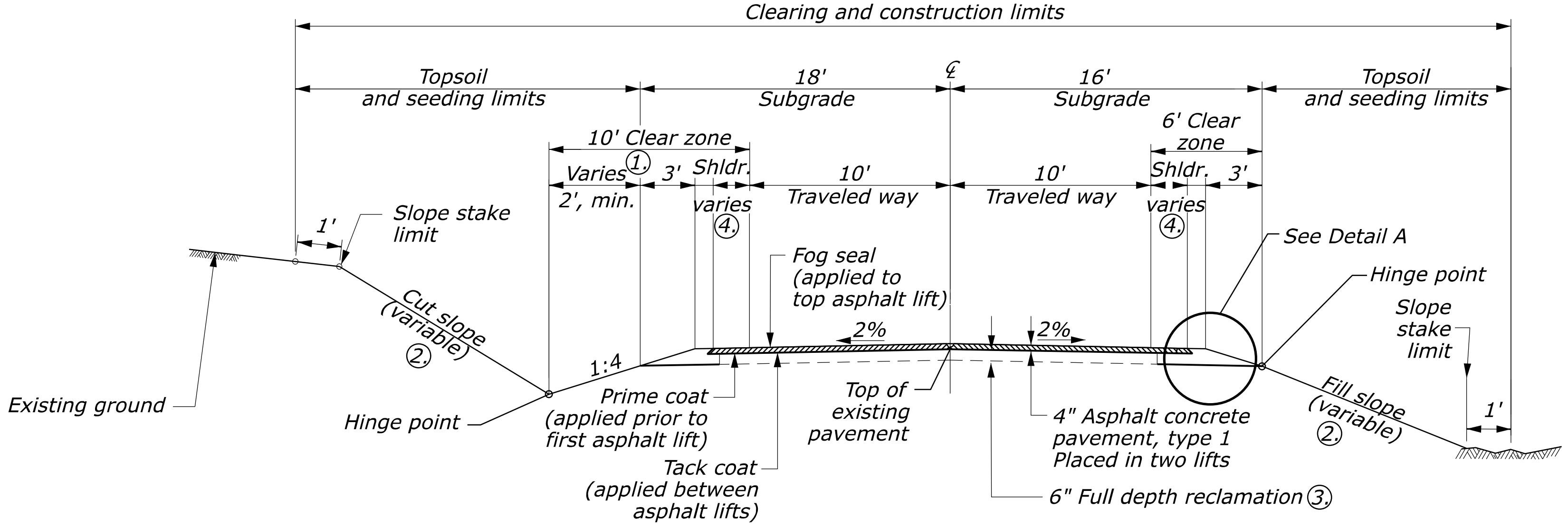
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

TYPICAL SECTIONS
MAINLINE

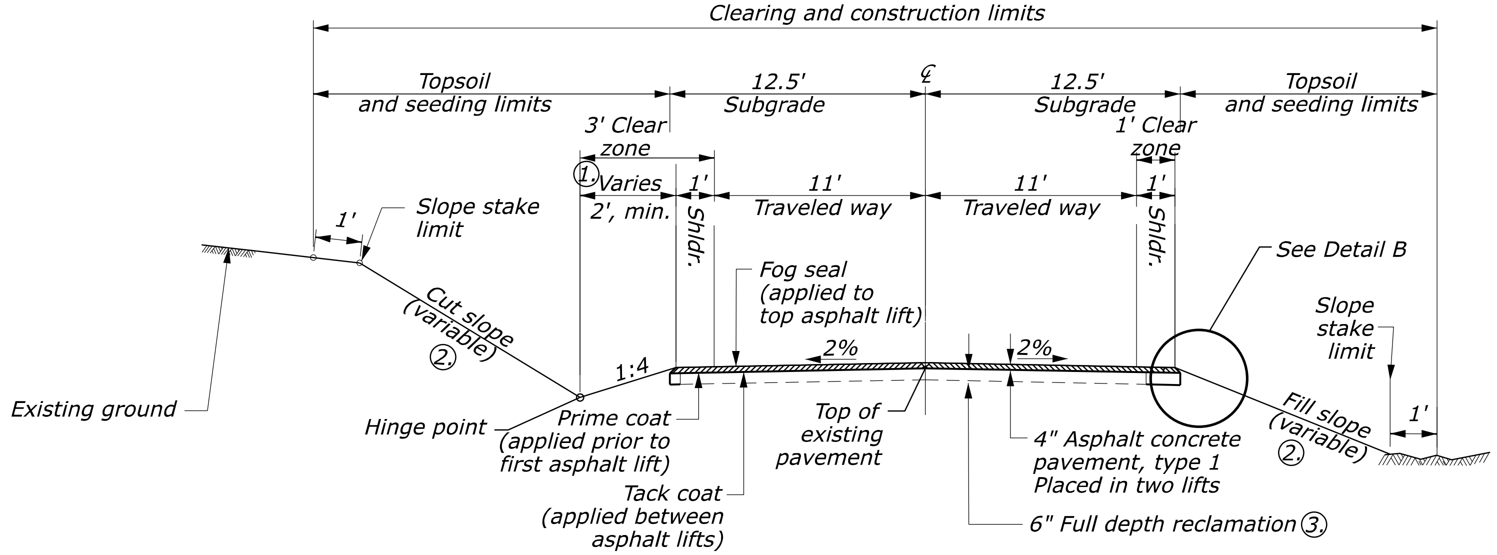
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A8



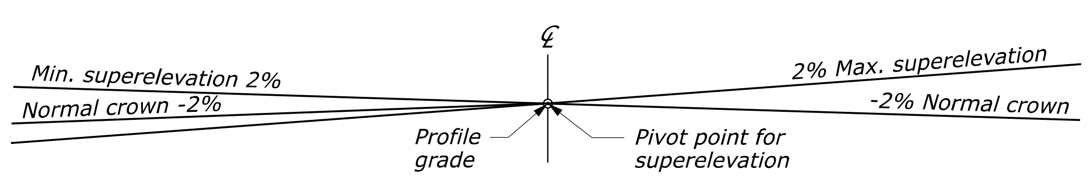
EXISTING TYPICAL SECTION
100+00 to 143+00



TYPICAL SECTION - FULL DEPTH RECLAMATION
140+44.24 to 140+94.24



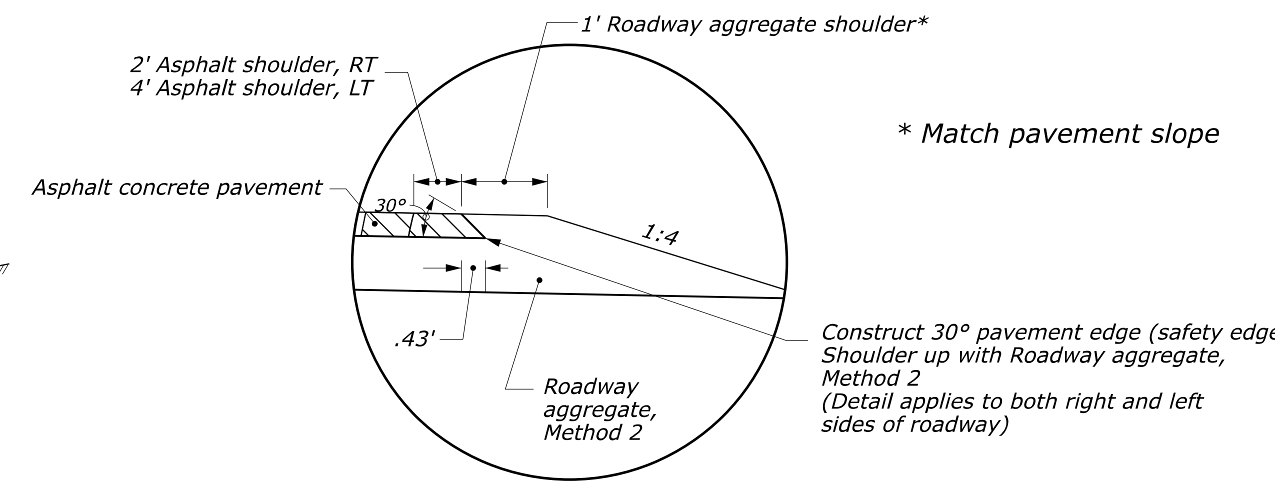
TYPICAL SECTION - FULL DEPTH RECLAMATION
140+94.94 to 143+00.00



METHOD OF SUPERELEVATION ON CURVES
See plans for locations of curves and superelevations

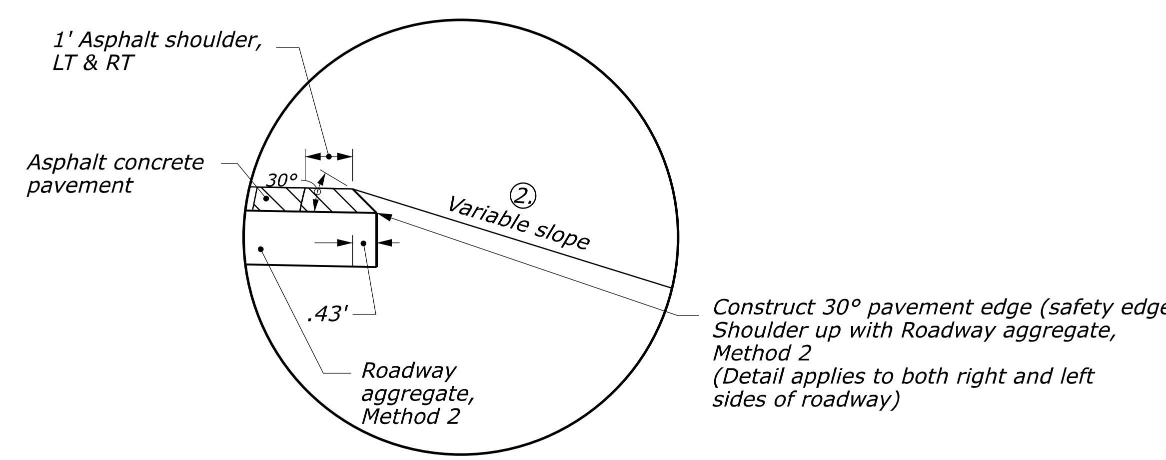
NOTE:

1. The gradient and width of roadway ditches and the excavation and embankment slope ratios may be adjusted by the CO to assure adequate drainage and stability.
2. See the cross sections for cut and fill slope ratios.
3. Add Roadway aggregate, Method 2, as needed, for additional widening beyond existing pavement width.
4. From Sta. 140+44.24 to 140+94.24, transition from a 4' paved shoulder to a 1' paved shoulder, Lt. Tranisition from a 1' aggregate shoulder to no aggregate shoulder, Lt. Transition from a 2' paved shoulder to a 1' paved shoulder, Rt. Transition from a 1' aggregate shoulder to no aggregate shoulder, Rt.



* Match pavement slope

DETAIL A



DETAIL B

LENGTH OF PROJECT

Station to Station	Roadway (ft)
140+44.24 to 143+00	255
TOTALS (ft)	255
TOTAL (mi)	0.05

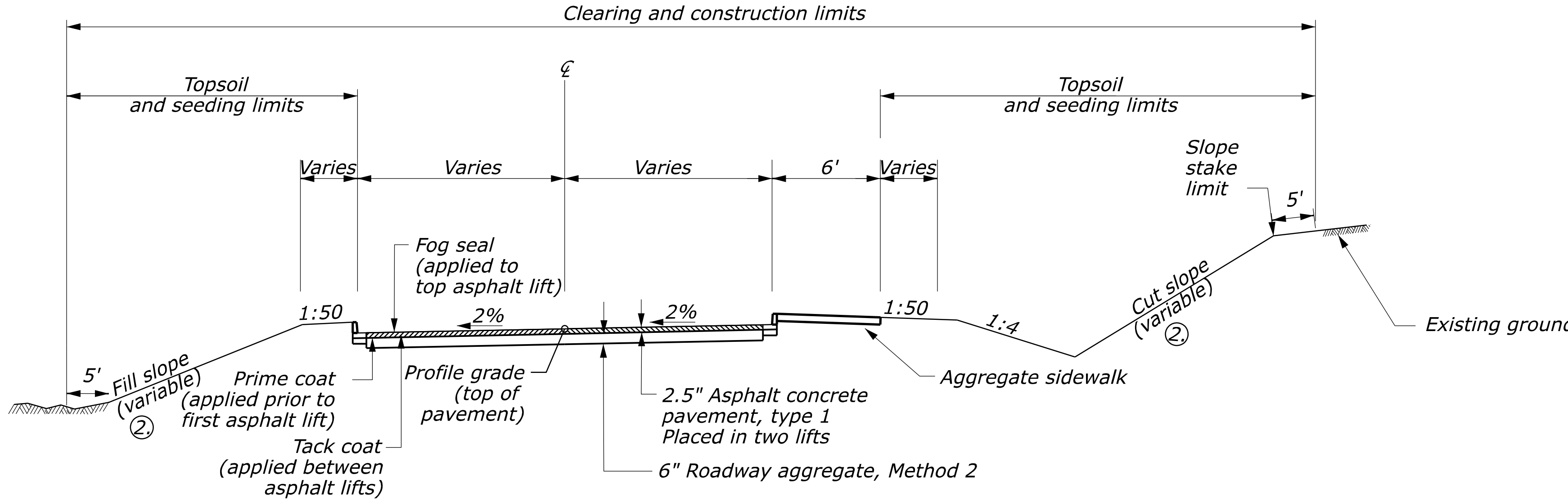
NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

TYPICAL SECTIONS MAINLINE

$USER$ $$DGN$$$$ $TIME$ $$$$DATE$$$$

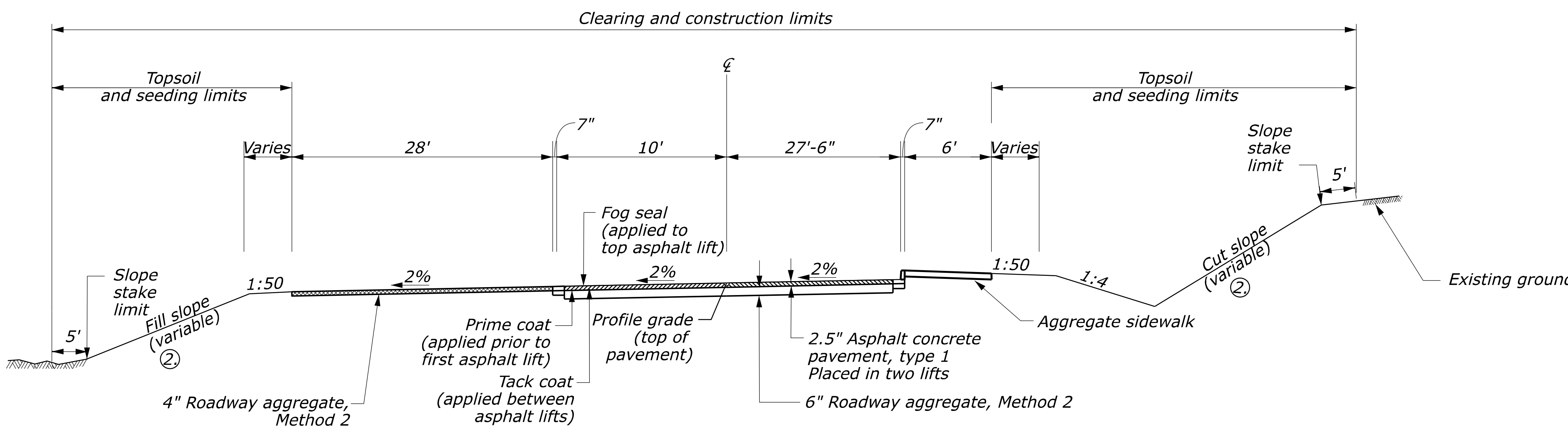
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A9



TYPICAL SECTION - PARKING LOT
500+12.00 to 501+53.67
502+78.58 to 504+19.26

NOTE:

1. The gradient and width of roadway ditches and the excavation and embankment slope ratios may be adjusted by the CO to assure adequate drainage and stability.
2. See the cross sections for cut and fill slope ratios.



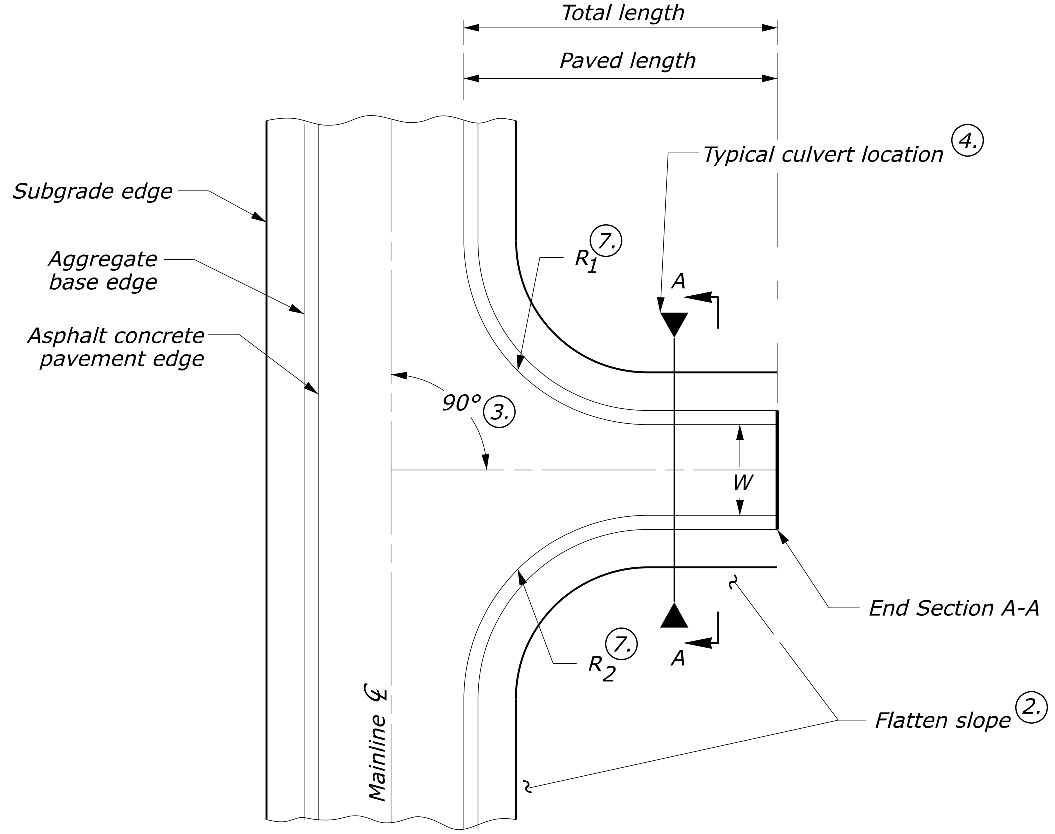
TYPICAL SECTION - PARKING LOT
501+53.68 to 502+78.57

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

TYPICAL SECTIONS
PARKING LOT

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A10



APPROACH ROAD TYPICAL PLAN

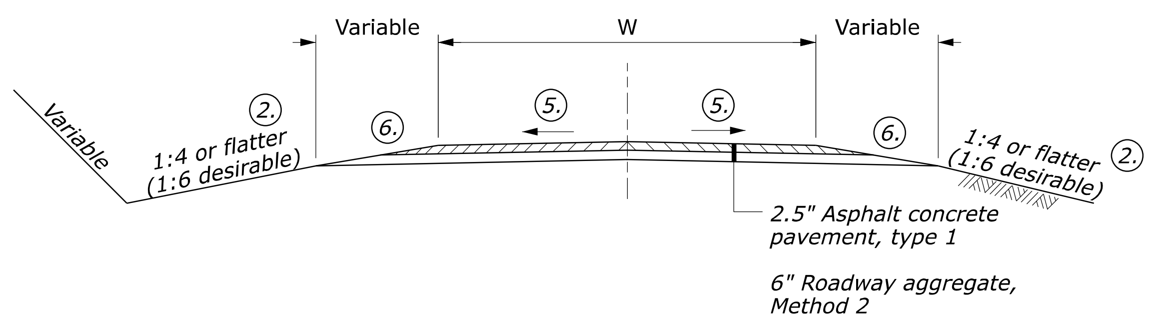
APPROACH ROAD SUMMARY

STATION (1.)	PAVED LENGTH (ft)	TOTAL LENGTH (ft)	W (ft)	R_1 (ft)	R_2 (ft)	REMARKS
106+37.53 Rt.	36	36	*	10	15	
108+31.27 Lt.	238	238	12	5	25	
108+45.61 Rt.	20	20	*	15	3	
109+11.26 Lt.	46	46	*	*	17.5	
110+80.96 Rt.	36	36	*	5	10	
111+54.78 Lt.	12	12	20	10	8	
111+77.00 Rt.	27	27	*	5	5	
113+26.25 Rt.	33	33	*	*	5	
113+62.46 Rt.	40	40	*	10	*	
115+23.00 Rt.	30	30	*	10	5	
115+66.87 Lt.	18	18	*	5	7	
115+95.12 Lt.	18	18	*	7	5	
116+51.60 Rt.	5	23	*	10	5	
117+38.75 Lt.	78	78	*	10	10	
118+46.10 Lt.	88	88	*	5	300	
119+05.07 Rt.	21	21	*	5	5	
119+61.57 Lt.	15	15	*	10	10	
121+76.04 Rt.	25	25	*	5	5	
123+57.41 Rt.	31	31	*	24	18	
126+25.33 Rt.	14	14	*	5	5	Concrete driveway
130+43.77 Rt.	15	15	*	15	7	
132+64.87 Rt.	15	15	*	14	10	
132+85.56 Lt.	12	12	*	5	5	
134+49.33 Lt.	14	14	*	8	15	
134+53.15 Rt.	13.5	13.5	*	5	5	Concrete driveway
134+91.65 Rt.	5	21	*	5	5	
135+50.82 Rt.	5	14	*	5	5	
136+81.88 Rt.	5	18	*	5	5	
137+47.10 Lt.	36	36	*	30	30	
138+73.22 Lt.	20	20	*	5	10	
141+53.57 Rt.	22	22	*	65	9	

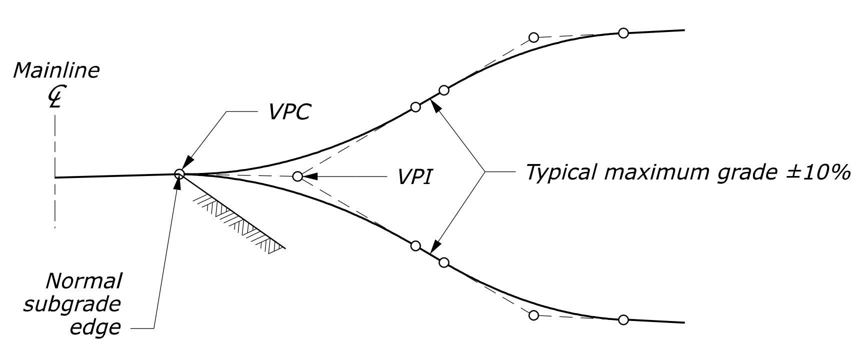
* Match existing

NOTE:

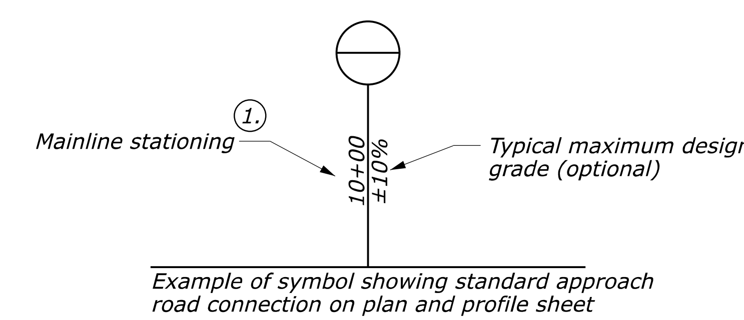
1. Stations shown are approximate locations. Actual locations to be field verified.
2. Construct cut and fill slopes for approach roads to match with mainline roadway construction.
3. Under special conditions, the approach road angle shown may be varied ±20°.
4. Place culverts at the end of the approach road radius to provide a flatter foreslope and increased mainline recovery area. When a culvert must be placed within the clear zone of the mainline roadway, use safety end sections (see Standard Drawing 602-9).
5. Match existing approach road cross slope.
6. Refer to mainline typical sections for structural section thicknesses and foreslopes.
7. Vary radii to fit unusual field conditions. Do not reduce existing radii or widths. R_1 is on the left side of the approach road centerline.



SECTION A-A



TYPICAL PROFILE



Example of symbol showing standard approach road connection on plan and profile sheet

TYPICAL SYMBOL

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

TYPICAL SECTIONS APPROACH ROADS

SUMMARY OF QUANTITIES - Schedule A

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	B1

AMEND	Line Item No.	Pay Item Number	Pay Item Description	Unit	Sheet and Description						Estimated Quantities	Remarks and/or Determination of Estimated Quantity
					B4	B5	B6	B7				
					DRAINAGE SUMMARY	GRADING AND SURFACING SUMMARIES	SIGNAGE SUMMARY	MISCELLANEOUS SUMMARIES		ALLOWANCE	Bid Schedule	
	A0020	15101-0000	MOBILIZATION	LPSM							ALL	
	A0040	15215-3000	SURVEY AND STAKING, DRAINAGE STRUCTURE	EACH	2						2	
	A0060	15215-7000	SURVEY AND STAKING, PARKING AREA	EACH							1	
	A0080	15225-0000	SLOPE, REFERENCE, AND CLEARING AND GRUBBING CONTROL	MILE							0.810	
	A0100	15236-2000	SURVEY CONTROL, GRADE FINISHING	MILE							1.620	
	A0120	15301-0000	CONTRACTOR QUALITY CONTROL	LPSM							ALL	
	A0140	15401-0000	CONTRACTOR TESTING	LPSM							ALL	
	A0160	15501-0000	CONSTRUCTION SCHEDULE	LPSM							ALL	
	A0180	15701-0000	SOIL EROSION CONTROL (SEDIMENT CONTROL)	LPSM							ALL	
	A0200	15701-0000	SOIL EROSION CONTROL (EROSION CONTROL)	LPSM							ALL	
	A0220	15701-0000	SOIL EROSION CONTROL (NON-STORMWATER CONTROL)	LPSM							ALL	
	A0240	15720-0000	STORM WATER POLLUTION PREVENTION PLAN	LPSM							ALL	
	A0260	15802-0000	WATERING FOR DUST CONTROL	LPSM							ALL	
	A0280	20101-0000	CLEARING AND GRUBBING	ACRE					5.5	0.1	5.6	
	A0300	20304-1000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LPSM							ALL	
	A0320	20401-0000	ROADWAY EXCAVATION	CUYD		20,520				1,080	21,600	
	A0340	20402-0000	SUBEXCAVATION	CUYD							500	As directed by CO
	A0360	20441-0000	WASTE	CUYD		2,246				154	2,400	
	A0380	21101-1000	ROADWAY OBLITERATION, METHOD 1	SQYD					65	5	70	
	A0400	25101-0200	PLACED RIPRAP, METHOD A, CLASS 2	CUYD	32					3	35	
	A0420	25101-0400	PLACED RIPRAP, METHOD A, CLASS 4	CUYD	45					5	50	
	A0440	25126-0000	REMOVE AND RESET BOULDER	EACH					1		1	
	A0460	30202-2000	ROADWAY AGGREGATE, METHOD 2	TON		3,743				187	3,930	
	A0480	30401-5300	FULL DEPTH RECLAMATION, METHOD 2, 6-INCH DEPTH	MILE		0.810				0.190	1.000	
	A0500	40301-0100	ASPHALT CONCRETE PAVEMENT, TYPE 1	TON		3,430				170	3,600	
	A0520	40601-0000	FOG SEAL	TON		5				1	6	
	A0540	41102-0000	PRIME COAT	SQYD		12,422				378	12,800	
	A0560	41201-0000	TACK COAT	TON		5				1	6	
	A0580	50101-0600	MINOR CONCRETE PAVEMENT, REINFORCED, 6-INCH DEPTH	SQYD		119				6	125	
	A0600	60103-0000	CONCRETE, HEADWALL (INCLUDES WINGWALLS)	EACH	2						2	
	A0620	60103-0000	CONCRETE, HEADWALL (CUSTOM WINGWALL)	EACH	1						1	
	A0640	60103-1960	CONCRETE, HEADWALL FOR 36-INCH EQUIVALENT DIAMETER PIPE CULVERT	EACH	1						1	
	A0660	60201-0600	18-INCH PIPE CULVERT	LNFT	40					2	42	
	A0680	60201-0800	24-INCH PIPE CULVERT	LNFT	194					8	202	
	A0700	60201-0900	30-INCH PIPE CULVERT	LNFT	68					2	70	
	A0720	60201-1000	36-INCH PIPE CULVERT	LNFT	37					3	40	
	A0740	60201-1100	42-INCH PIPE CULVERT	LNFT	249					13	262	
	A0760	60202-0200	18-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	LNFT	964					44	1,008	
	A0780	60202-0500	30-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	LNFT	34					6	40	
	A0800	60202-0600	36-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	LNFT	49					6	55	

MileStone: 95%
Date Completed: 01/19/21
Report Date: 01/19/21

SUMMARY OF QUANTITIES - Schedule A

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	B2

AMEND	Line Item No.	Pay Item Number	Pay Item Description	Unit	Sheet and Description						Estimated Quantities	Remarks and/or Determination of Estimated Quantity
					B4	B5	B6	B7				
					DRAINAGE SUMMARY	GRADING AND SURFACING SUMMARIES	SIGNAGE SUMMARY	MISCELLANEOUS SUMMARIES		ALLOWANCE	Bid Schedule	
	A0820	60210-0600	END SECTION FOR 18-INCH PIPE CULVERT	EACH	1						1	
	A0840	60210-0800	END SECTION FOR 24-INCH PIPE CULVERT	EACH	5						5	
	A0860	60210-0900	END SECTION FOR 30-INCH PIPE CULVERT	EACH	1						1	
	A0880	60210-1000	END SECTION FOR 36-INCH PIPE CULVERT	EACH	1						1	
	A0900	60210-1100	END SECTION FOR 42-INCH PIPE CULVERT	EACH	1						1	
	A0920	60211-0600	END SECTION FOR 18-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	EACH	46						46	
	A0940	60211-0900	END SECTION FOR 30-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	EACH	2						2	
	A0960	60211-1000	END SECTION FOR 36-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	EACH	1						1	
	A0980	60220-1200	6 FEET SPAN, 4 FEET RISE PRECAST REINFORCED CONCRETE BOX CULVERT	LNFT	44					4	48	
	A1000	60401-0000	MANHOLE	EACH	2						2	
	A1020	60901-2300	CURB, ASPHALT, 6-INCH DEPTH	LNFT					178	7	185	
	A1040	60902-1000	CURB AND GUTTER, CONCRETE, 12-INCH DEPTH	LNFT		1,780				80	1,860	
	A1060	61101-0000	WATER SYSTEM	LPSM					All		ALL	
	A1080	61108-1000	ADJUST WATER VALVE	EACH					2		2	
	A1100	61501-0100	SIDEWALK, CONCRETE	SQYD		146				9	155	
	A1120	61501-0800	SIDEWALK, AGGREGATE	SQYD		568				12	580	
	A1140	61504-1000	ACCESSIBILITY RAMP, CONCRETE	SQYD					8		8	
	A1160	61901-2400	FENCE, SPLIT RAIL, 2 RAIL	LNFT					474	26	500	
	A1180	61902-0900	GATE, METAL	EACH							2	
	A1200	61921-1000	REMOVE AND RESET FENCE	LNFT					819		819	
	A1220	62201-0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	HOUR							40	
	A1240	62201-1000	WHEEL LOADER, 4 CUBIC YARD MINIMUM RATED CAPACITY	HOUR							40	
	A1260	62201-2750	MOTOR GRADER	HOUR							40	
	A1280	62201-3300	HYDRAULIC EXCAVATOR, 3/4 CUBIC YARD MINIMUM CAPACITY	HOUR							40	
	A1300	62301-0000	GENERAL LABOR	HOUR							40	
	A1320	62302-1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	HOUR							40	
	A1340	62302-1100	SPECIAL LABOR, HIRED SURVEY SERVICES	HOUR							40	
	A1360	62407-0000	PLACING CONSERVED TOPSOIL	CUYD					1,931	69	2,000	
	A1380	62510-2000	SEEDING, HYDRAULIC METHOD	ACRE					4.7	0.3	5.0	
	A1400	62515-2000	MULCHING, HYDRAULIC METHOD	ACRE					4.7	0.3	5.0	
	A1420	62901-0000	ROLLED EROSION CONTROL PRODUCT	SQYD				6,539		261	6,800	
	A1440	63301-0000	SIGN SYSTEM	EACH			36				36	
	A1460	63308-0000	OBJECT MARKER	EACH			4				4	
	A1480	63309-0000	DELINEATOR	EACH							120	
	A1500	63401-0300	PAVEMENT MARKINGS, TYPE B, SOLID	LNFT			33,734			1,466	35,200	
	A1520	63405-0050	PAVEMENT MARKINGS, SYMBOLS	EACH			4				4	

MileStone: 95%
Date Completed: 01/19/21
Report Date: 01/19/21

SUMMARY OF QUANTITIES - Schedule A

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	B3

AMEND	Line Item No.	Pay Item Number	Pay Item Description	Unit	Sheet and Description						Estimated Quantities	Remarks and/or Determination of Estimated Quantity
					B4	B5	B6	B7				
					DRAINAGE SUMMARY	GRADING AND SURFACING SUMMARIES	SIGNAGE SUMMARY	MISCELLANEOUS SUMMARIES		ALLOWANCE	Bid Schedule	
	A1540	63502-1300	TEMPORARY TRAFFIC CONTROL, DRUM	EACH				30			30	
	A1560	63502-2100	TEMPORARY TRAFFIC CONTROL, CRASH CUSHION	EACH				2			2	
	A1580	63503-0400	TEMPORARY TRAFFIC CONTROL, CONCRETE BARRIER	LNFT				50			50	
	A1600	63503-1000	TEMPORARY TRAFFIC CONTROL, PLASTIC FENCE	LNFT				500			500	
	A1620	63504-1000	TEMPORARY TRAFFIC CONTROL, CONSTRUCTION SIGN	SQFT				90			90	
	A1640	63505-1000	TEMPORARY TRAFFIC CONTROL, PAVEMENT MARKINGS	MILE				4.0			4.0	
	A1660	63506-0500	TEMPORARY TRAFFIC CONTROL, FLAGGER	HOUR				1,440			1,440	
	A1680	64603-1000	FIXTURE, VAULT TOILET	EACH							1	
	A1700	64604-3000	FIXTURE, PEDESTRIAN RAILING	LNFT							82	
	A1720	64620-0000	REMOVE AND RESET (INFORMATION SIGNS)	EACH							1	Information kiosk at parking lot
	A1740	64620-0400	REMOVE AND RESET MAILBOX	EACH							17	
	A1760	64620-1000	REMOVE AND RESET HISTORIC MARKER	EACH							1	Historic monument at parking lot

MileStone: 95%
Date Completed: 01/19/21
Report Date: 01/19/21

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	B4

DRAINAGE SUMMARY

Item Number			15215-3000	25101-0200	25101-0400	60103-0000	60103-0000	60103-1960	60201-0600	60201-0800	60201-0900	60201-1000	60201-1100	60202-0200	60202-0500	60202-0600	60210-0600	60210-0800	60210-0900	60210-1000	60210-1100	60211-0600	60211-0900	60211-1000
Station	Side	Skew (deg)	SURVEY AND STAKING, DRAINAGE STRUCTURE	PLACED RIPRAP, METHOD CLASS 2	PLACED RIPRAP, METHOD CLASS 4	CONCRETE, HEADWALL (INCLUDES WINGWALLS)	CONCRETE, HEADWALL (CUSTOM WINGWALL)	CONCRETE, HEADWALL FO 36-INCH EQUIVALENT DIAMETER PIPE CULVERT	18-INCH PIPE CULVERT	24-INCH PIPE CULVERT	30-INCH PIPE CULVERT	36-INCH PIPE CULVERT	42-INCH PIPE CULVERT	18-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	30-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	36-INCH EQUIVALENT DIAMETER ARCH OR ELLIPTICAL PIPE CULVERT	END SECTION FOR 18-INC PIPE CULVERT	END SECTION FOR 24-INC PIPE CULVERT	END SECTION FOR 30-INC PIPE CULVERT	END SECTION FOR 36-INC PIPE CULVERT	END SECTION FOR 42-INC PIPE CULVERT	END SECTION FOR 18-INC EQUIVALENT DIAMETER AR OR ELLIPTICAL PIPE CULVE	END SECTION FOR 30-INC EQUIVALENT DIAMETER AR OR ELLIPTICAL PIPE CULVE	END SECTION FOR 36-INC EQUIVALENT DIAMETER AR OR ELLIPTICAL PIPE CULVE
			EACH	CUYD	CUYD	EACH	EACH	EACH	LNFT	LNFT	LNFT	LNFT	LNFT	LNFT	LNFT	LNFT	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
105+23.23	LT/RT	10		16				1								49								1
108+66.31	LT/RT	10	1		11	2																		
137+12.65	RT									94								1						
137+49.78	LT/RT	65									68								1					
138+23.87	RT												123											
139+53.45	RT				34								126								1			
141+13.71	LT/RT	-38							40								1							
141+19.28	LT/RT	-19										37								1				
141+34.61	LT		1				1																	
500+35.63	LT/RT	-5		4						44								2						
500+88.63	RT			9											34								2	
503+91.53	LT/RT	-5		4						56								2						
Driveways														964								46		
TOTALS			**2**	**32**	**45**	**2**	**1**	**1**	**40**	**194**	**68**	**37**	**249**	**964**	**34**	**49**	**1**	**5**	**1**	**1**	**1**	**46**	**2**	**1**

DRAINAGE SUMMARY

60220-1200	60401-0000	NO PAY	
6 FEET SPAN, 4 FEET RIS PRECAST REINFORCED CONCRETE BOX CULVERT	MANHOLE	GEOTEXTILE FILTER, CLASS TYPE E (NON-WOVEN)	Remarks
LNFT	EACH	SQYD	
		37	
44		25	
			Storm Drain Leg B
			Storm Drain Leg A
	1		Storm Drain Leg B
	1	63	Storm Drain Leg B
		13	
		24	
		13	
44	**2**	**175**	

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

DRAINAGE SUMMARY

Sheet 1 of 4

$USER$ $$$DGN$$$$ $TIME$ $$$$DATE$$$$

GRADING SUMMARY

Station to Station	Roadway Excavation		Pay Item 20401-0000	Additional Excavation	Embankment For info only		For info only	Pay Item 20441-0000
	Roadway Prism	Approach Roads	ROADWAY EXCAVATION	(-) Unavailable Material (see note 3)	Roadway Prism	Approach Roads	(+) Various Backfill Material Generated Onsite (see note 4)	WASTE (see note 5)
	BCY	BCY	CUYD	BCY	CCY	CCY	CCY	CUYD
100+00 - 106+50	15,826	0	15,826	690	13,867	0	540	
106+50 - 113+15	1,475	0	1,475	160	160	0	26	
113+15 - 120+35	1,149	0	1,149	131	63	0	24	
120+35 - 127+65	573	0	573	90	126	0	17	
127+65 - 134+90	770	0	770	130	126	0	14	
134+90 - 142+15	675	0	675	90	75	0	12	
142+15 - 143+00	52	0	52	3	4	0	7	
TOTALS	**20,520**	**0**	**20,520**	**1,294**	**14,421**	**0**	**640**	**2,246**

NOTE:

1. Quantities based on prismodial (surface to surface) volumes.
2. Conserve 4 inches of topsoil in cut and fill slope areas. Quantities shown are finished slope quantities.
3. Unavailable material includes topsoil removed in cut areas.
4. Various backfill material generated onsite includes topsoil replacement under fills.
5. Waste quantity calculated using volumes adjusted for shrink/swell factor of 0.9.
6. The quantities shown herein are approximations. Payment will be made for the actual quantities of work performed.
7. BCY = Bank cubic yard - one cubic yard of material as it lies in the natural state.
   CCY = Compacted cubic yard - one cubic yard of material after it has been compacted to specification density.

SURFACING SUMMARY

Item Number	30202-2000	30401-5300	40301-0100	40601-0000	41102-0000	41201-0000	50101-0600	60902-1000	61501-0100	61501-0800	
Station to Station	ROADWAY AGGREGATE, METHOD 2	FULL DEPTH RECLAMATION, METHOD 2, 6-INCH DEPTH	ASPHALT CONCRETE PAVEMENT, TYPE 1	FOG SEAL	PRIME COAT	TACK COAT	MINOR CONCRETE PAVEMENT, REINFORCED, 6-INCH DEPTH	CURB AND GUTTER, CONCRETE, 12-INCH DEPTH	SIDEWALK, CONCRETE	SIDEWALK, AGGREGATE	Remarks
	TON	MILE	TON	TON	SQYD	TON	SQYD	LNFT	SQYD	SQYD	
100+00 - 106+50	1079	0.12	653	0.78	1878	0.81	65	1780	146	568	Includes quantities for parking lot
106+50 - 113+15	716	0.13	607	0.80	1921	0.82					
113+15 - 120+35	618	0.13	599	0.86	2080	0.89					
120+35 - 127+65	459	0.14	501	0.88	2109	0.91	28				
127+65 - 134+90	452	0.14	500	0.87	2094	0.90	26				
134+90 - 142+15	393	0.13	512	0.87	2094	0.90					
142+15 - 143+00	26	0.02	58	0.10	246	0.11					
TOTAL	**3743**	**0.81**	**3430**	**5**	**12422**	**5**	**119**	**1780**	**146**	**568**	

**Surfacing quantities include all driveways and approach roads*

Values used for estimating purposes:

- Aggregate base 139 lb/ft3
- Hot asphalt concrete pavement 145.2 lb/ft3
- Fog seal . . . . 0.1 gal/yd2 (240.7 gal/ton)
- Tack coat . . . . 0.1 gal/yd2 (233 gal/ton)

Prime coat . . . . 0.33 gal/yd2 (251 gal/ton)

$USER$ $$$DGN$$$$ $TIME$ $$$$DATE$$$$

$USER$

$$$$DGN$$

$TIME$

$$$$DATE$$$$

PERMANENT SIGN SUMMARY

Station	Side	MUTCD Reference	Description	Sign Panel	SIGN SYSTEM	OBJECT MARKER	Remarks
			Item Number		63301-0000	63308-0000	
				in x in	EACH	EACH	
100+25	LT	W8-3	Pavement Ends	36 x 36	1		
100+25	RT	Special 1	No Parking	24 x 30	1		
101+34	RT	Special 1	No Parking	24 x 30	1		
102+35	RT	Special 1	No Parking	24 x 30	1		
102+59	LT	Special 1	No Parking	24 x 30	1		
103+22	LT	Special 1	No Parking	24 x 30	1		
103+22	RT	Special 1	No Parking	24 x 30	1		
104+09	RT	Special 1	No Parking	24 x 30	1		
104+37	LT	Special 1	No Parking	24 x 30	1		
105+40	RT	W11-3	Deer	30 x 30	1		
106+03	RT	Special 1	No Parking	24 x 30	1		
106+57	LT	Special 1	No Parking	24 x 30	1		
107+03	RT	R2-1	Speed Limit	24 x 30	1		30 MPH
107+99	RT	W11-1	Bicycle	30 x 30	1		
		W16-1P	Share the Road (plaque)	18 x 24	1		
108+23	LT	Special 2	Private Driveway	24 x 30	1		
108+83	LT	R1-1	Stop	30 x 30	1		Include street name signs
116+99	RT	S3-1	Bus Stop Ahead	30 x 30	1		
118+93	LT	S3-1	Bus Stop Ahead	30 x 30	1		
128+00	LT	W11-1	Bicycle	30 x 30	1		
		W16-1P	Share the Road (plaque)	18 x 24	1		
137+13	LT	R1-1	Stop	30 x 30	1		Include street name signs
140+74	RT	Special 3	Historic Lincoln Highway		1		
140+96	RT	OM3-R	Object Marker	12 x 36		1	
141+17	RT	OM3-L	Object Marker	12 x 36		1	
141+18	LT	OM3-L	Object Marker	12 x 36		1	
141+45	LT	OM3-R	Object Marker	12 x 36		1	
142+10	LT	Special 3	Historic Lincoln Highway		1		
142+84	LT	R2-1	Speed Limit	24 x 30	1		30 MPH
142+84	RT	R2-1	Speed Limit	24 x 30	1		35 MPH
500+52	RT	W11-7	Equestrian	30 x 30	1		
501+13	LT	W11-7	Equestrian	30 x 30	1		
501+32	RT	R6-1	One Way	36 X 12	1		
502+19	LT	Special 4	Trailer Parking	24 x 30	1		
503+34	RT	R7-8	Reserved Parking	12 x 18	1		ADA Parking sign
503+53	RT	R7-8	Reserved Parking	12 x 18	1		ADA Parking sign
	RT	R7-8p	Van Accessible (plaque)	18 x 9	1		
504+06	RT	R1-1	Stop	30 x 30	1		
	RT	R5-1	Do Not Enter	30 x 30	1		Mount on opposite side of STOP sign
504+06	LT	R5-1	Do Not Enter	30 x 30	1		
TOTALS					**36**	**4**	

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

SIGNAGE SUMMARY

Sheet 3 of 4

$USER$

PERMANENT PAVEMENT MARKINGS SUMMARY								
					Item Number	63401-0300	63405-0050	
	LEFT	RIGHT	CENTER					
Station to Station	Edge Solid White 6 inches	Edge Solid White 6 inches	Centerline Solid Yellow 4 inches	Stop Bar Solid White 24 inches	Parking Stripe Solid White 4 inches	PAVEMENT MARKINGS, TYPE B, SOLID	PAVEMENT MARKINGS, SYMBOLS	Remarks
	LNFT	LNFT	LNFT	LNFT	LNFT	LNFT	EACH	
100+00 - 143+00	3919	4195	7893	126		16133		
Parking Lot				84	650	734	4	
SUB-TOTAL						**16867**	**4**	
TOTAL						**33734**	**4**	Double the line quantity for 2 coats

TEMPORARY TRAFFIC CONTROL				
Item Number	Item Description	Unit	Quantity	Remarks
63502-1300	TEMPORARY TRAFFIC CONTROL, DRUM	Each	30	Assume 0.25 mile sections
63502-2100	TEMPORARY TRAFFIC CONTROL, CRASH CUSHION	Each	2	
63503-0400	TEMPORARY TRAFFIC CONTROL, CONCRETE BARRIER	LNFT	50	
63503-1000	TEMPORARY TRAFFIC CONTROL, PLASTIC FENCE	LNFT	500	Storage area
63505-1000	TEMPORARY TRAFFIC CONTROL, PAVEMENT MARKINGS	MILE	4	Doubled for 2 lifts
63506-0500	TEMPORARY TRAFFIC CONTROL, FLAGGER	HOUR	1440	2 flaggers, 90 days

ROLLED EROSION CONTROL PRODUCT SUMMARY			
	Item Number	62901-0000	
Station to Station	Side	ROLLED EROSION CONTROL PRODUCT	Remarks
		SQYD	
119+81.21 - 136+94.89	LT	2352	Ditch Lining
500+93.69 - 503+94.76	RT	4187	Slope Protection
TOTAL		**6539**	

$$$$DGN$$$

CONSTRUCTION SIGN SUMMARY							
					Item Number	63504-1000	
Drawing Reference	MUTCD Reference	Sign Message	Panel Size	Area	Quantity	TEMPORARY TRAFFIC CONTROL, CONSTRUCTION SIGN	Remarks
			Inches	SQFT	Each	SQFT	
635-1	G20-1	Road Work next 1 miles	36x18	4.5	2	9.0	
635-1	G20-2	End Road Work	36x18	4.5	2	9.0	
635-1	W20-1	Road Work Ahead	36x36	9.0	2	18.0	
635-6	W20-4	One Lane Road Ahead	36x36	9.0	4	36.0	
635-6	W20-7	Flagger	36x36	9.0	2	18.0	
TOTAL						**90**	

$TIME$

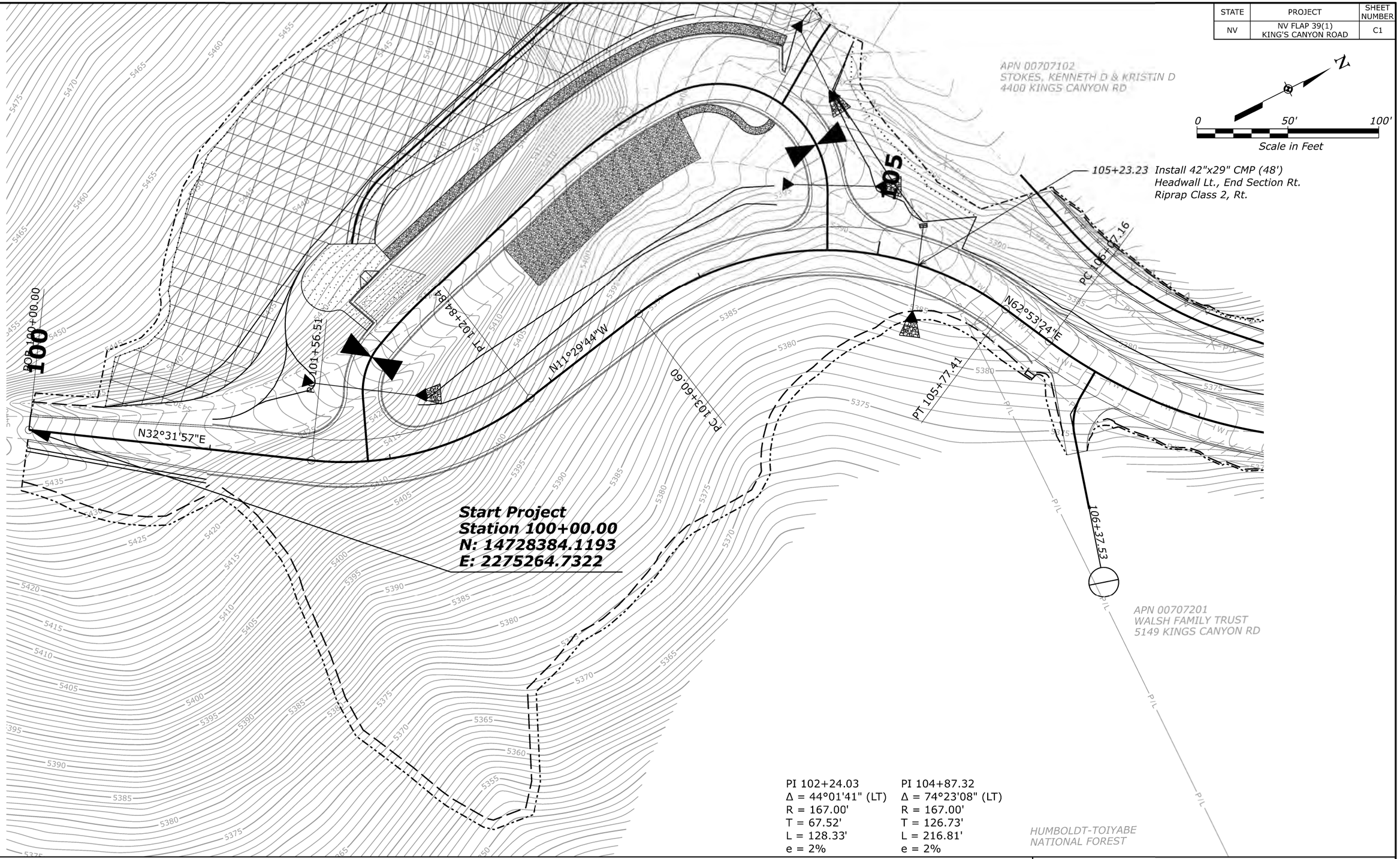
$$$$DATE$$$$

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

MISCELLANEOUS SUMMARIES

Sheet 4 of 4

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	C1



PI 102+24.03
Δ = 44°01'41" (LT)
R = 167.00'
T = 67.52'
L = 128.33'
e = 2%

PI 104+87.32
Δ = 74°23'08" (LT)
R = 167.00'
T = 126.73'
L = 216.81'
e = 2%

KING'S CANYON ROAD
PLAN SHEET
100+00.00 to 106+50.00

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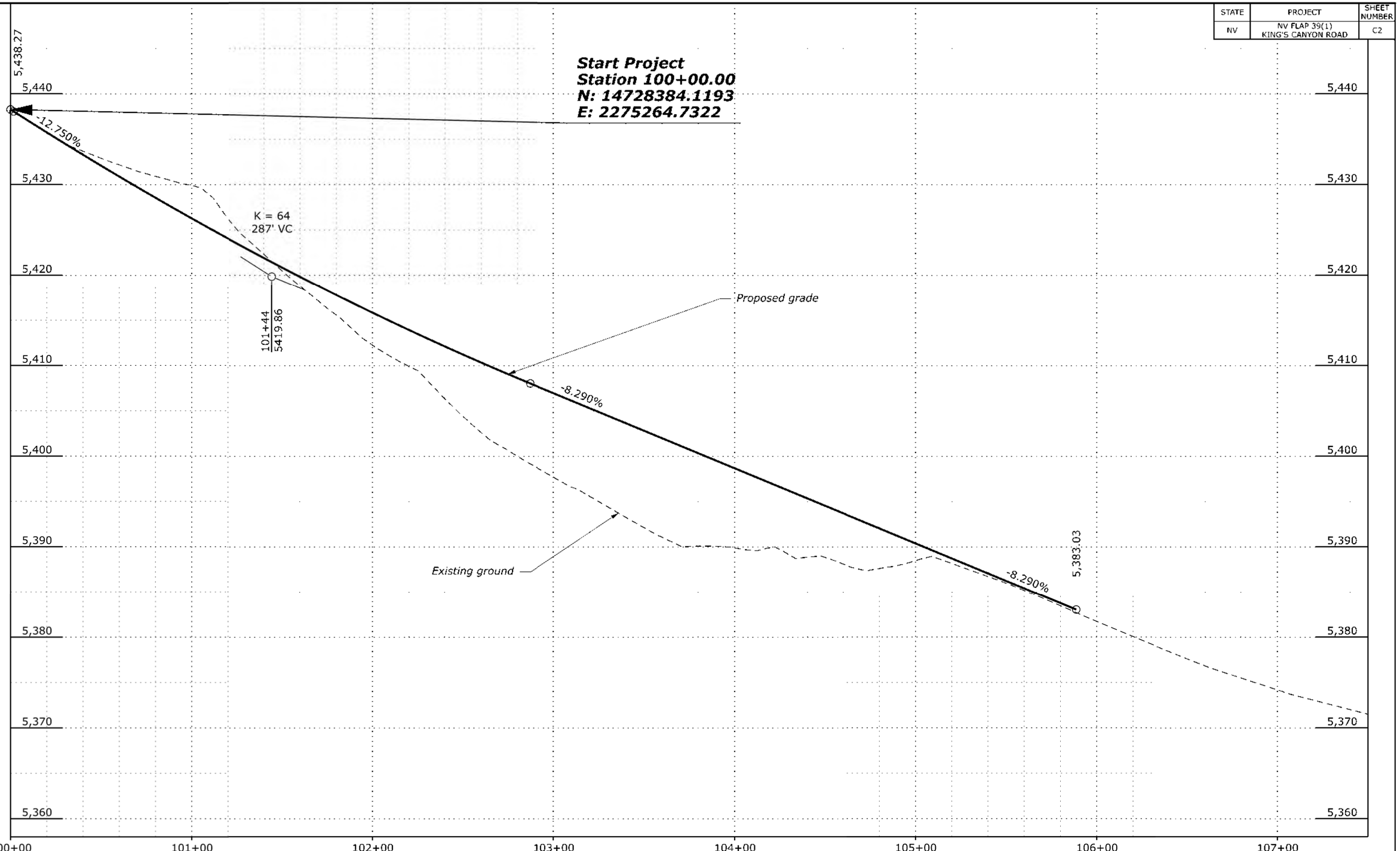
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	C2



KING'S CANYON ROAD
PROFILE SHEET
100+00.00 to 106+50.00

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	C3

NOTE:

1. *Waterlines need to be lowered for installation of 6'x4' RBC. Contractor to provide layout of lowering for approval by CO.*

APN 00707102
STOKES, KENNETH D & KRISTIN D
4400 KINGS CANYON RD

APN 00707104
HANDELIN, STEVEN P & LINDSAY B
1280 COPPER SPRINGS CT

APN 00707113
GRUNDY, RICHARD D
1231 COPPER SPRINGS CT

108+66.31 Install 6'x4' RBC (44 LF)
Headwall w/Wingwalls, Lt. & Rt.
Riprap Class 4, Rt.

Culvert cleanout shoulder, 7' x 45'

Barrier rail to be salvaged and returned to Carson City

107+99.21 Install 21"x15" CMP w/ end sections (40')

Adjust water valves (2)

109+11.26

110

111+55.07 Install 21"x15" CMP w/ end sections (40')

111+54.78

111+50 to 113+00
Do not disturb existing trees, boulders, riprap, and fence

PC 106+67.16

N26°53'39"E

107+79.94

(1) 12" ductile iron and (1) 3" PVC waterline

110+80.96

PT 110+70.09

N72°14'49"E

Do not disturb trees

PC 108+56.86

110+80.13 Install 21"x15" CMP w/ end sections (41')

108+31.27

108+45.61

111+77.00

111+77.05 Install 21"x15" CMP w/ end sections (35')

113+26.25

V62°53'24"E

106+60.10 - 108+37.16 Install 6" asphalt curb (See sheet T9)

APN 00707201
WALSH FAMILY TRUST
5149 KINGS CANYON RD

PI 106+96.51
Δ = 35°59'55" (LT)
R = 275.00'
T = 89.35'
L = 172.78'
e = 2%

PI 109+69.68
Δ = 45°21'20" (LT)
R = 270.00'
T = 112.82'
L = 213.73'
e = 2%

0 50' 100'
Scale in Feet

APN 00707202
FULWIDER, TOM FAMILY TRUST
4249 KINGS CANYON DR

APN 00707123
LONG, DONALD E & MARY B
4240 KINGS CANYON RD

PI 114+88.17
Δ = 31°32'06" (LT)
R = 380.00'
T = 107.30'
L = 209.15'
e = 2%

APN 00707112
SONDEREGGER, C B FAMILY TRUST
4092 KINGS CANYON RD

Install Rolled Erosion Control Product, see Sheet T14

118+41.90 Install 21"x15" CMP w/ end sections (65')

Remove existing culvert

118+46.16

117+38.75

117+38.75 Install 21"x15" CMP w/ end sections (36')

119+61.57

120

113+56.89 Install 21"x15" CMP w/ end sections (86')

115+81.12 Install 21"x15" CMP w/ end sections (62')

PC 113+80.87

115+66.87

115+90.20

115+95.12

115

N40°42'44"E

PC 117+93.21

119+05.07

PT 120+02.29

113+62.46

Do not disturb trees. Trim branches if needed for access.

115+43.00

Relocate rocks around existing culvertinlet

115+22.31 Install 21"x15" CMP w/ end sections (28')

116+51.60

116+49.31 Install 21"x15" CMP w/ end sections (32')

119+61.09 Install 21"x15" CMP w/ end sections (42')

PI 119+03.10
Δ = 43°33'42" (RT)
R = 275.00'
T = 109.89'
L = 209.08'
e = 2%

APN 00707203
RE' FAMILY TRUST
4198 KINGS CANYON RD

APN 00707204
PIERCY, WILLIAM M
4137 KINGS CANYON RD

APN 00707210
CARLSON LIVING TRUST
4081 KINGS CANYON RD

0 50' 100'
Scale in Feet

KING'S CANYON ROAD
PLAN SHEET
106+50.00 to 120+35.00

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	C4

0 50' 100'
Scale in Feet

N

Install Rolled Erosion Control Product, see Sheet T14

APN 00707110
UTILITIES DEPT, CARSON CITY
3900 KINGS CANYON RD

Do not disturb existing tree

125

PC 126+05.96

N84°16'26"E

N89°57'03"E

121+76.04 Install 21"x15" CMP w/ end sections (44')

121+76.04

PC 122+28.42

4" PVC waterline

123+57.41

123+57.41 Install 21"x15" CMP w/ end sections (64')

PT 125+05.85

126+25.33 Install 21"x15" CMP w/ end sections (36')

126+25.33

Relocate rock berm to top of new slope

PI 123+67.25
Δ = 05°40'37" (RT)
R = 2,800.00'
T = 138.83'
L = 277.43'
e = NC

APN 00707216
MCDONALD, R L 7 D M FAMILY TRUST
3999 KINGS CANYON RD

APN 00707215
GIBBONS, THOMAS J 7 DEBRA G
3901 KINGS CANYON RD

APN 00707212
WEED, ANDREA FAMILY TRUST
3883 KINGS CANYON RD

APN 00713127
DIXON, GREGG M
3630 KINGS CANYON DR

0 50' 100'
Scale in Feet

N

PI 127+62.37
Δ = 23°33'34" (LT)
R = 750.00'
T = 156.41'
L = 308.39'
e = 2%

Install Rolled Erosion Control Product, see Sheet T14

PT 129+14.36

130

N66°23'29"E

132+86.11 Install 21"x15" CMP w/ end sections (38')

132+85.56

134+49.15 Install 21"x15" CMP w/ end sections (36')

134+49.33

125

132+64.87 Install 21"x15" CMP w/ end sections (46')

132+64.87

130+43.77

130+43.32 Install 21"x15" CMP w/ end sections (38')

PC 133+50.13

Remove and reset "Address" boulder

134+52.70 Install 21"x15" CMP w/ end sections (33')

134+53.15

PI 134+40.13
Δ = 04°07'24" (RT)
R = 2,500.00'
T = 89.99'
L = 179.91'
e = NC

APN 00707207
WEED, ANDREA FAMILY TRUST
3797 KINGS CANYON RD

APN 00707208
BEST, DAVID ROBERT
3737 KINGS CANYON RD

APN 00708301
PERDOMO FAMILY TRUST
3663 KINGS CANYON RD

KING'S CANYON ROAD
PLAN SHEET
120+35.00 to 134+90.00

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STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	C5

APN 00713126
ROBINSON, MARGARET J
2 CANYON DR

APN 00713112
PRESTON,MARC B & VICKI S
3550 KINGS CANYON RD

134+91.65 Install 21" x 15" CMP w/ end sections (20')

Install Rolled Erosion Control Product, see Sheet T14

Remove existing pipe

Do not disturb trees

Do not disturb tree

137+47.10

138+73.22

135

140

N70°30'53"E

N84°11'22"E

141+13.71 Install 18" CMP (42') End Section, Rt.

Do not disturb fence

See detail below

PI 141+98.44
Δ = 20°34'06" (LT)
R = 350.00'
T = 63.51'
L = 125.64'
e = 2%

PC 141+34.93

26'

24'

134+91.65

PT 135+30.05

135+50.82

135+51.07 Install 21" x 15" CMP w/ end sections (20')

Remove existing pipe

PC 136+74.13

136+81.88

See Sheet S2 and S3 for storm drain layout and profile

PT 139+96.34

141+34.61 Headwall, Lt.

141+53.57

141+19.28 Install 36" CMP (37') End Section, Rt.

PI 138+36.01
Δ = 13°40'29" (RT)
R = 1,350.00'
T = 161.87'
L = 322.20'
e = NC

APN 00708302
BARULICH, MATHEW III & SUZANNE
3637 KINGS CANYON RD

APN 00708303
PERSHING, JACK K TRUST
3601 KINGS CANYON RD

N

0 50' 100'

Scale in Feet

APN 00708104
KILLIAN, EDWARD F FAMILY TRUST
3430 KINGS CANYON RD

PT 142+60.58

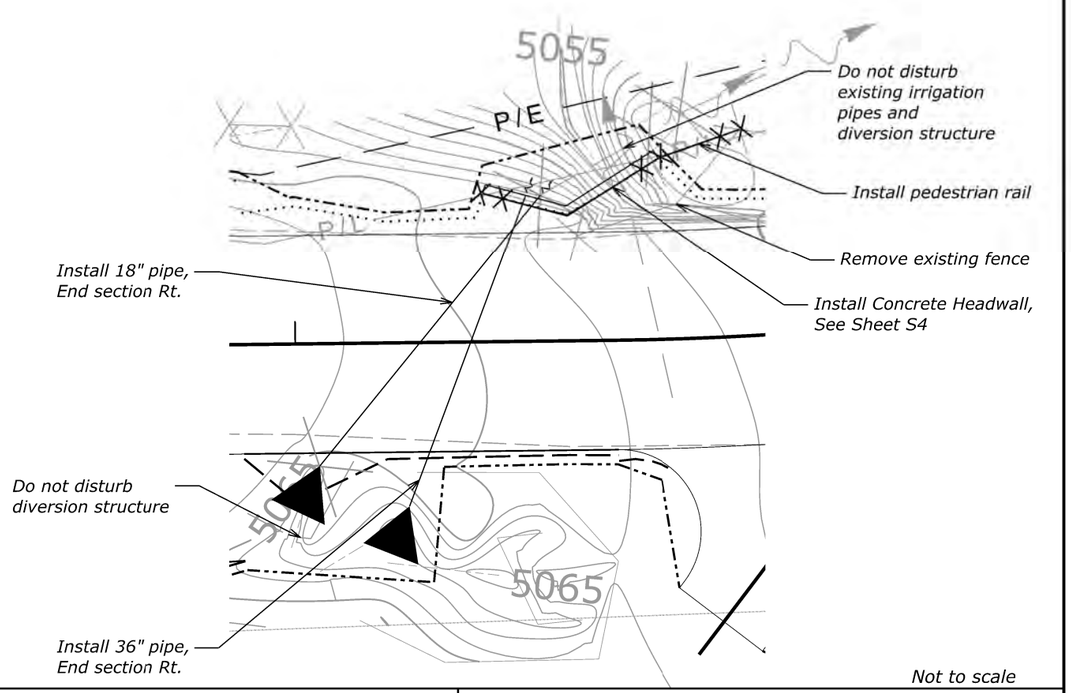
POE 144+76.55

24'

N63°37'16"E

End Project
Station 143+00.00
N: 14730214.7936
E: 2278776.9510

APN 00706122
HAMILTON FAMILY TRUST



Not to scale

KING'S CANYON ROAD
PLAN SHEET
134+90.00 to 143+00.00

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	D1

N

0 60' 120'

Scale in Feet

NOTE:

1. Equestrian parking, trail, and sidewalk shall have an aggregate surface, 4" depth. Max. aggregate size shall be 3/4".
2. Signage and step blocks at the existing trailhead are to be salvaged and returned to Carson City Public Works.

HUMBOLDT-TOIYABE NATIONAL FOREST

Install Rolled Erosion Control Product (RECP), see Sheet T13

Install vault toilet

Ditch flow

Ditch flow

Aggregate sidewalk

ADA curb ramp

N. King's Canyon Road/Waterfall Road

Sta. 500+88.63
Install 35"x24" x 34' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

Equestrian trail, 4' wide

12" Concrete curb and gutter, typ.

Install split rail fence, 4' high, typ.

Sta. 500+35.63
Install 24" x 44' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

APN 00707102
STOKES, KENNETH D & KRISTIN D
4400 KINGS CANYON RD

Sta. 503+91.53
Install 24" x 55' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

Sta. 503+73
Install gate

Curb opening, 2' wide

Curb opening, 4' wide

Curb opening, 2' wide

Sta. 500+59
Install gate

Curb opening, 2' wide

OHV/Equestrian parking

Parking area station 504+19.26 =
Mainline station 101+87.67, 12' Lt
N = 14728548.2136
E = 2275351.9780
Elev. = 5416.7981

Parking area station 500+12.81 =
Mainline station 104+72.00, 12.81' Lt
N = 14728827.5507
E = 2275359.7077
Elev. = 5392.9311

HUMBOLDT-TOIYABE NATIONAL FOREST

APN 00707201
WALSH FAMILY TRUST
5149 KINGS CANYON RD

KING'S CANYON ROAD PARKING LOT LAYOUT

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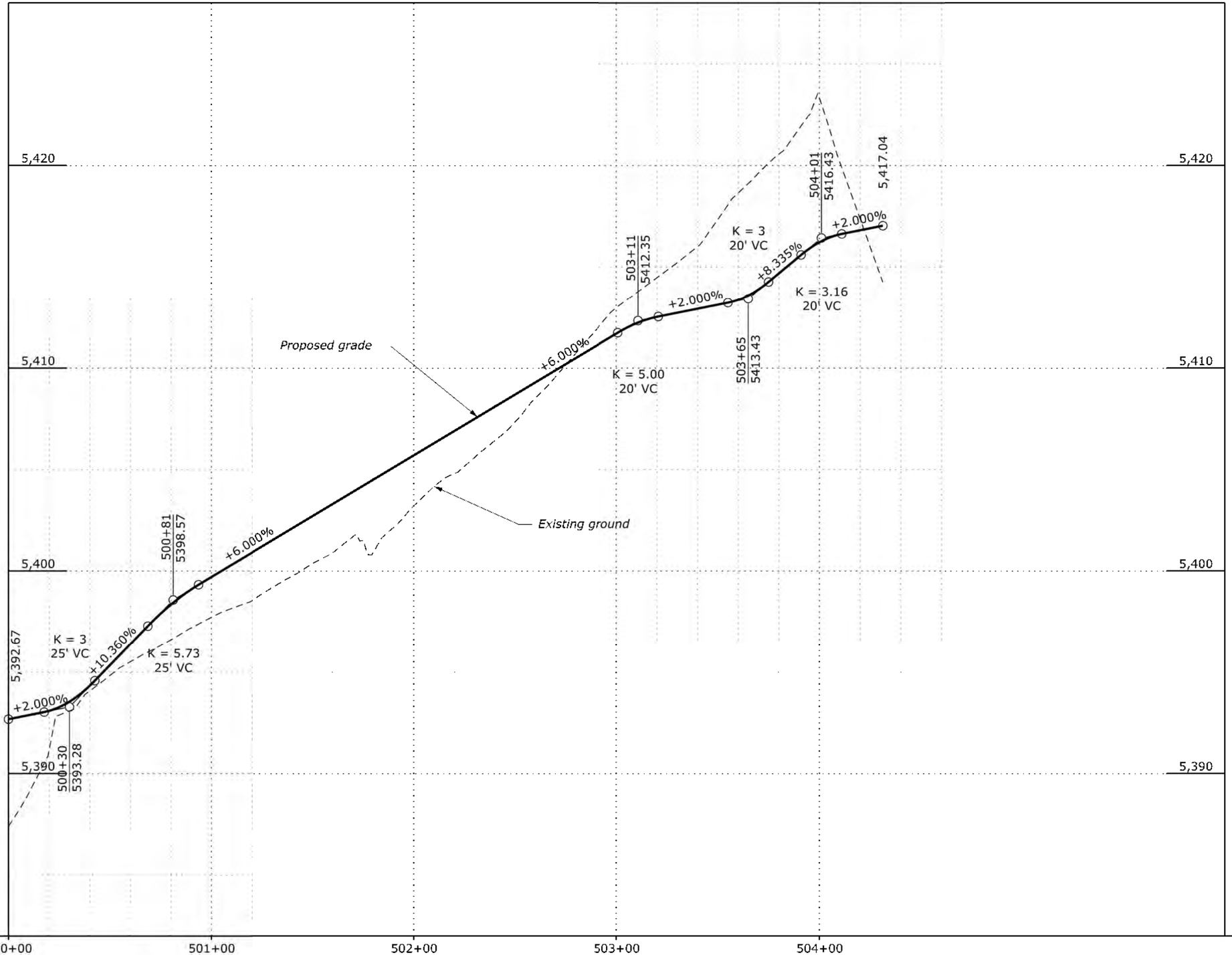
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	D2



KING'S CANYON ROAD
PARKING LOT PROFILE

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STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	D3

N

0 60' 120'

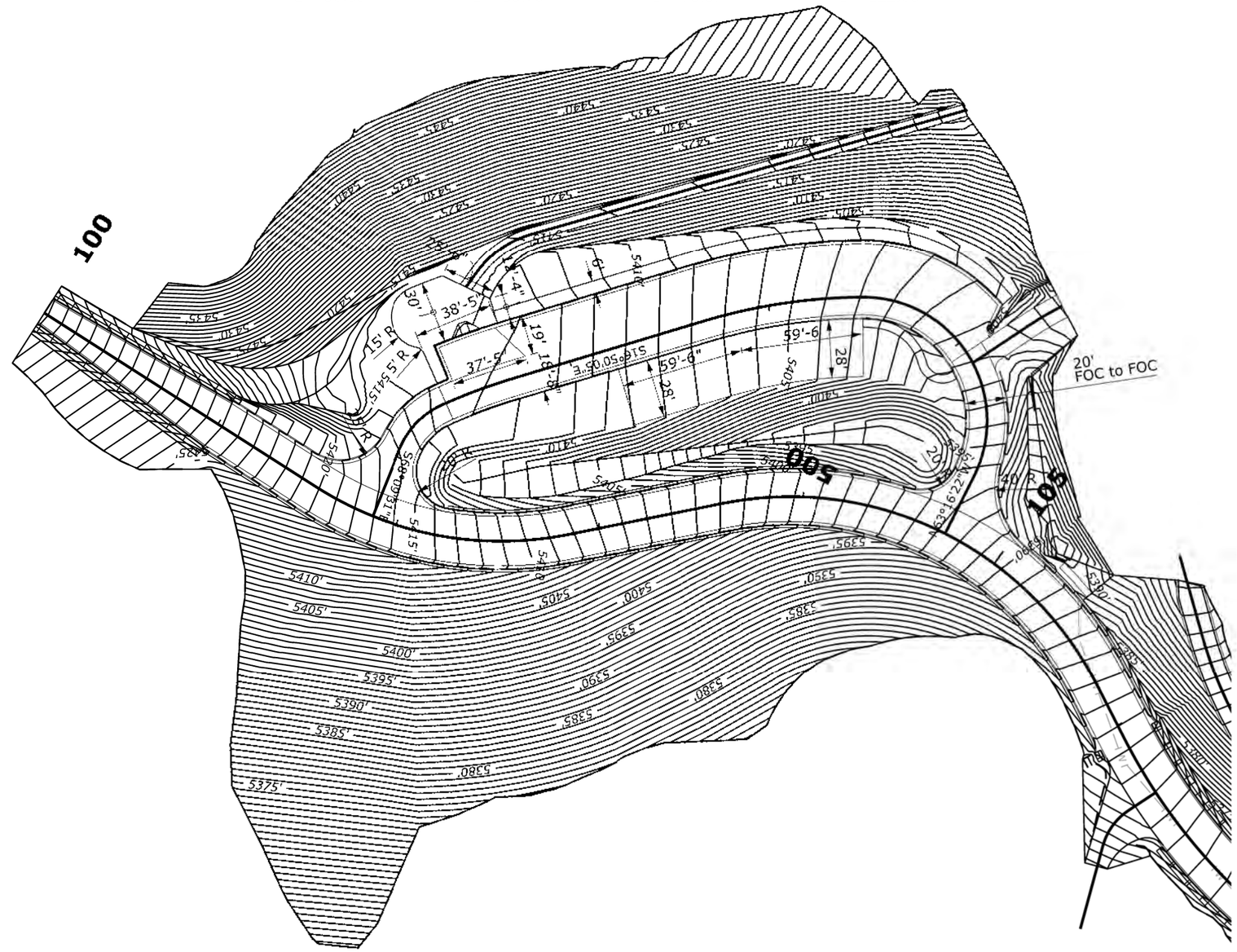
Scale in Feet

PI 503+81.64
Δ = 43°52'28" (LT)
R = 40.00'
T = 16.11'
L = 30.63'

PI 503+47.68
Δ = 07°26'58" (LT)
R = 275.00'
T = 17.90'
L = 35.75'

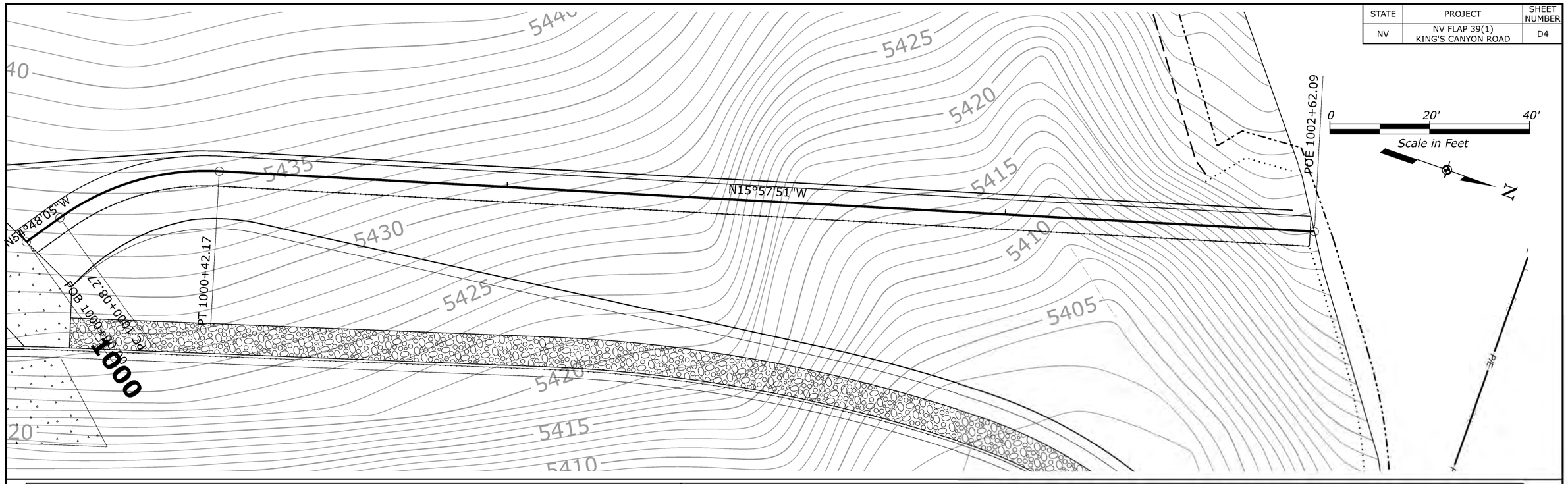
PI 501+93.37
Δ = 16°25'58" (LT)
R = 275.00'
T = 39.71'
L = 78.87'

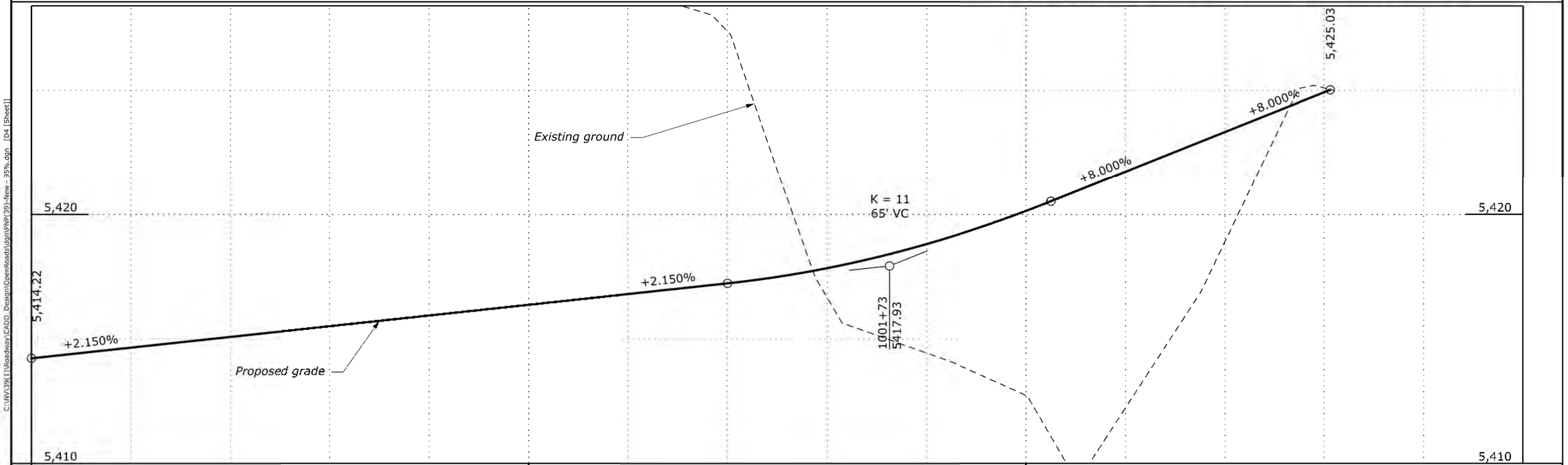
PI 501+29.17
Δ = 117°07'44" (LT)
R = 60.00'
T = 98.16'
L = 122.66'



KING'S CANYON ROAD PARKING LOT GEOMETRIC LAYOUT

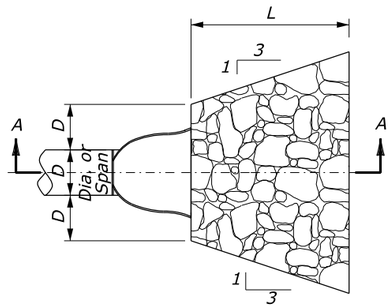
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	D4





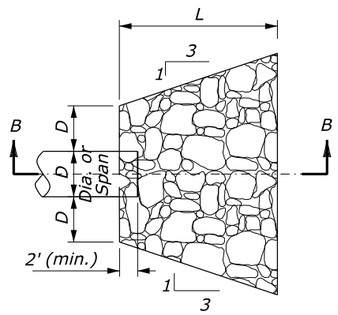
KING'S CANYON ROAD
TRAIL PLAN AND PROFILE

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	G1



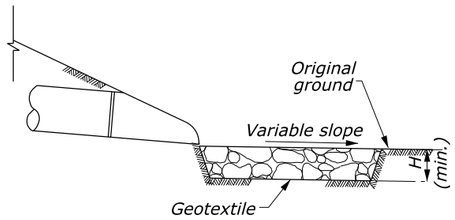
PLAN VIEW

CULVERT WITH STANDARD END SECTION

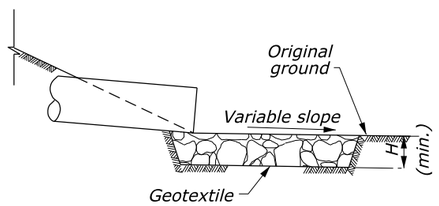


PLAN VIEW

CULVERT WITHOUT STANDARD END SECTION



SECTION A-A



SECTION B-B

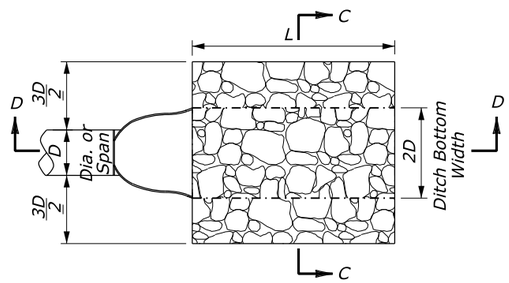
OUTLET WITHOUT DITCH
PROTECTIVE APRON DIMENSIONS AND ESTIMATED QUANTITIES

	CULVERT SIZE D (inches)	RIPRAP CLASS	LENGTH OF APRON L (feet)	DEPTH OF APRON H (feet)	ESTIMATED RIPRAP QUANTITY (CY)	ESTIMATED GEOTEXTILE QUANTITY (SY)
WITH END SECTION	12	2	4	1.5	1	5
	18	2	6	1.5	2.2	9
	24	2	8	1.5	3.9	14
	30	3	12.5	2	10.9	28
	36	3	16	2	15.6	37
	42	4	21	2.5	34.1	63
	48	4	24	2.5	44.5	79
WITHOUT END SECTION	12	2	6	1.5	1.7	8
	18	2	8	1.5	3.2	12
	24	2	10	1.5	5.2	17
	30	3	14.5	2	13.3	33
	36	3	17	2	18.5	43
	42	4	23	2.5	38.7	70
	48	4	26	2.5	49.8	87

NOTE:

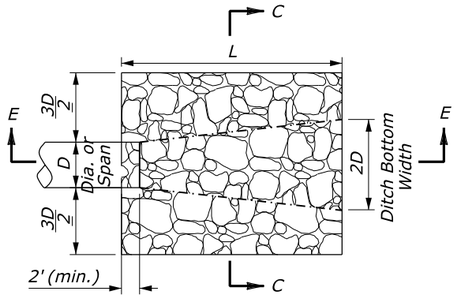
1. Use for aprons serving culverts with slopes of less than 10%.
2. Furnish geotextile conforming to Subsection 714.01(a).
3. Excavation for placement of riprap will not be measured for payment.

PROTECTIVE APRON AT CULVERT OUTLET WITHOUT DITCH



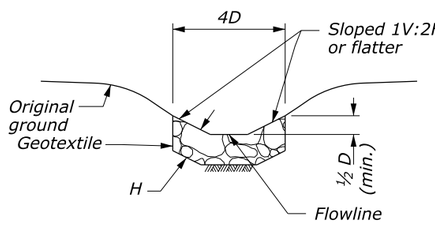
PLAN VIEW

CULVERT WITH STANDARD END SECTION

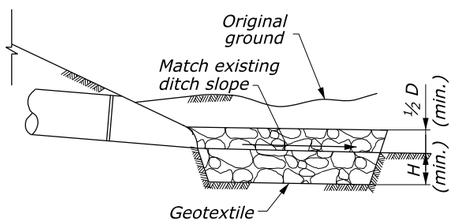


PLAN VIEW

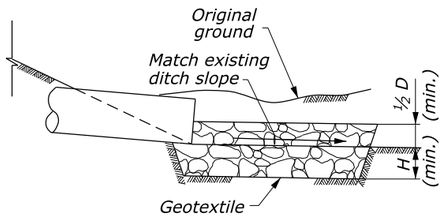
CULVERT WITHOUT STANDARD END SECTION



SECTION C-C



SECTION D-D



SECTION E-E

OUTLET WITH DITCH
PROTECTIVE APRON DIMENSIONS AND ESTIMATED QUANTITIES

	CULVERT SIZE D (inches)	RIPRAP CLASS	LENGTH OF APRON L (feet)	DEPTH OF APRON H (feet)	ESTIMATED RIPRAP QUANTITY (CY)	ESTIMATED GEOTEXTILE QUANTITY (SY)
WITH END SECTION	12	2	4	1.5	0.9	5
	18	2	6	1.5	2	8
	24	2	8	1.5	3.6	13
	30	3	12.5	2	9.3	24
	36	3	15	2	13.4	32
	42	4	21	2.5	27.3	53
	48	4	24	2.5	35.6	65
WITHOUT END SECTION	12	2	6	1.5	1.4	6
	18	2	8	1.5	2.7	10
	24	2	10	1.5	4.5	15
	30	3	14.5	2	10.8	27
	36	3	17	2	15.2	36
	42	4	23	2.5	29.9	57
	48	4	26	2.5	38.6	70

PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

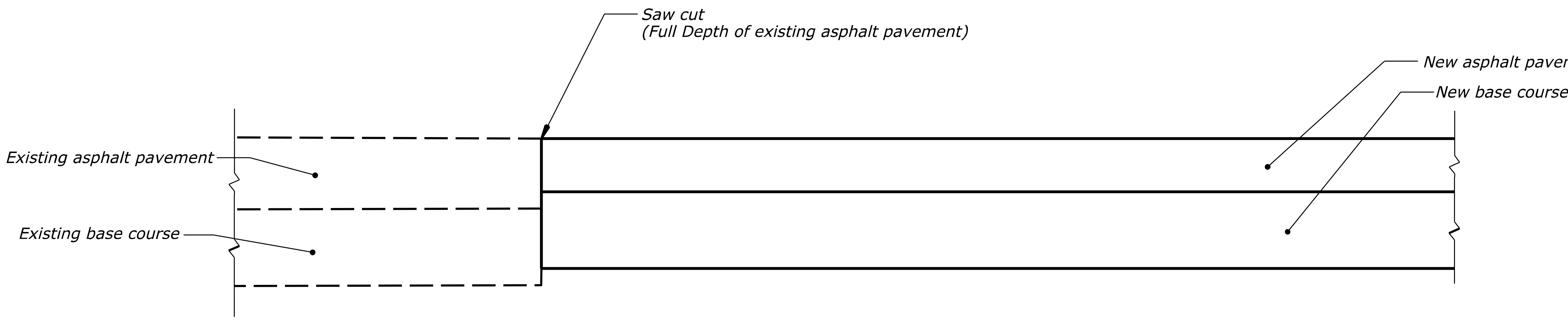
PLACED RIPRAP AT CULVERT OUTLETS

DETAIL APPROVED FOR USE

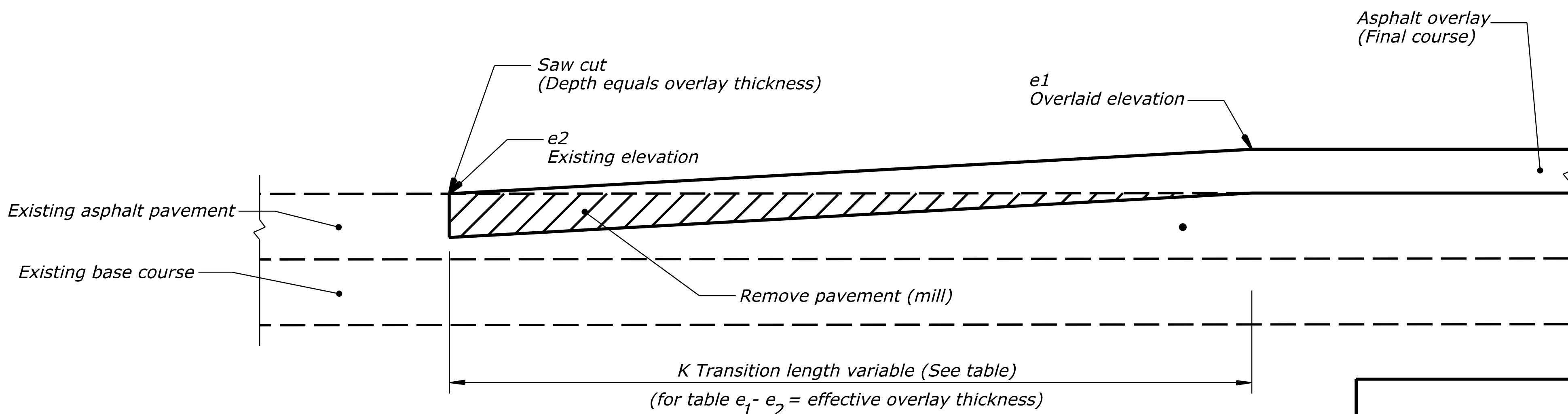
REVISED: 08/2014

DETAIL C251-50

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	K1



NEW PAVEMENT



OVERLAY

NOTE :

Provide a transition length in feet that is not less than the value obtained by multiplying the effective overlay thickness in inches (difference between the existing and overlaid elevations) by the K value from the Table for the posted speed of the roadway.

Use K[e1-e2]=T, or K*[d1-d2]=T (whichever applies), to obtain the transition length.*
(Minimum transition length=30 feet)

Example :
If the posted speed is 55 MPH
Effective overlay thickness = 2 inches
Then the minimum transition length =
2 inches x 42.5 ft./in. = 85 feet.

K VALUE TABLE (ft/in)

POSTED SPEED (MPH) *	30	35	40	45	50	55	60	65	70	75
K	30	32.5	35	37.5	40	42.5	45	47.5	50	52.5

* Use a K Value of 30 for speeds less than 30 MPH.

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

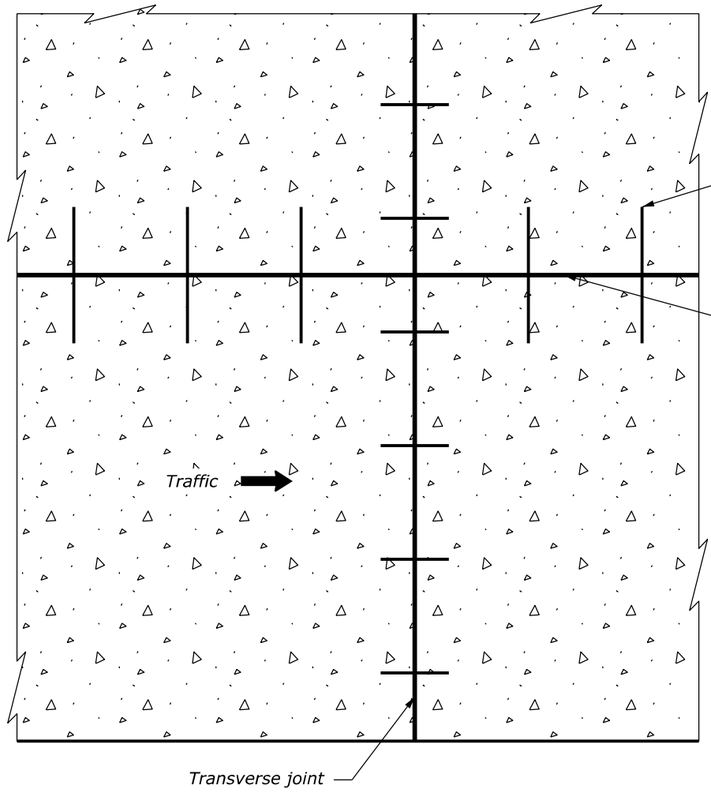
PAVEMENT TRANSITIONS

SPECIAL
401-A

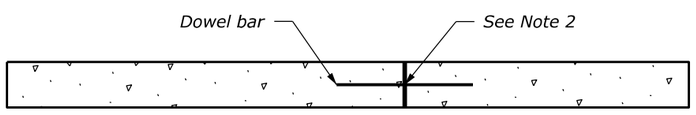
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	R1

NOTE:

1. *Provide the same type of dowel assemblies and tie bars for joints in plain portland cement concrete pavement as shown for joints in reinforced pavement.*
2. *See Standard 501-2 for joint and joint sealing details.*
3. *Lap longitudinal and transverse reinforcement not less than 15 inches.*

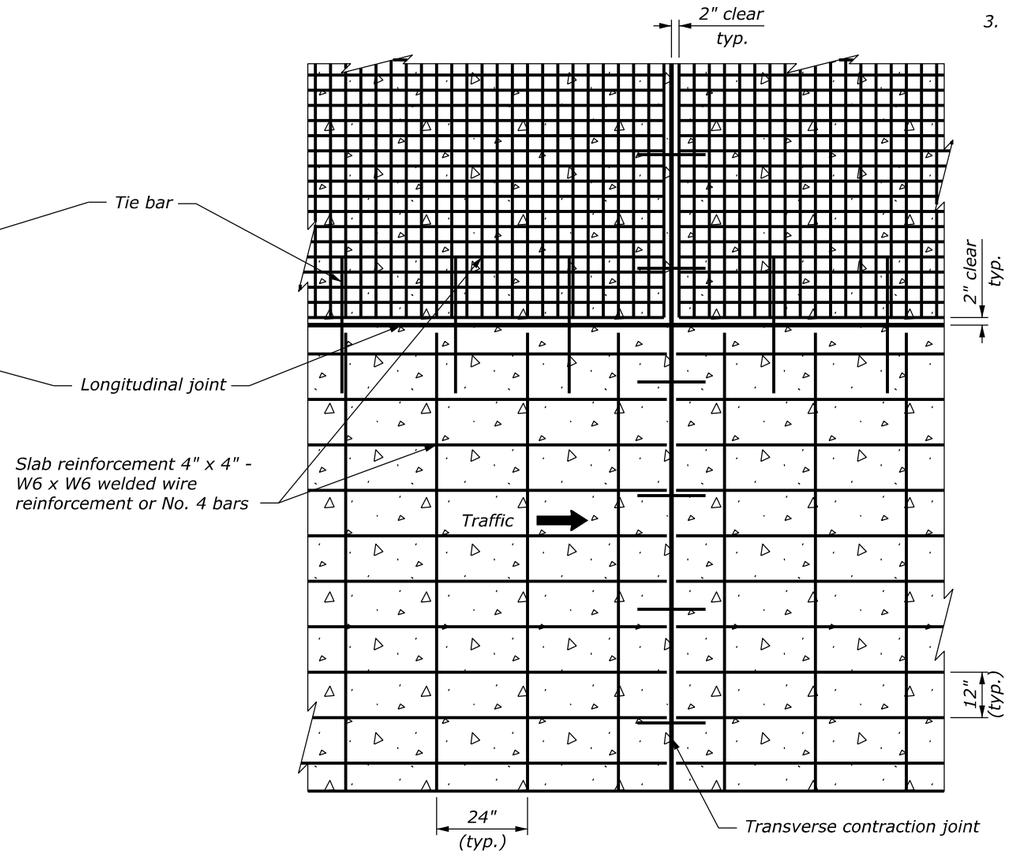


PLAN

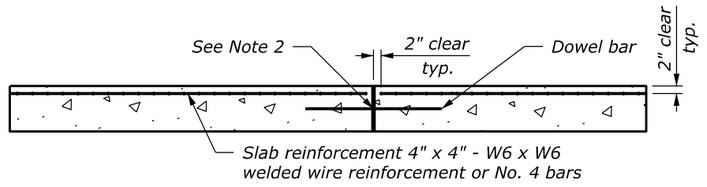


PROFILE

PLAIN MINOR CONCRETE PAVEMENT



PLAN



PROFILE

REINFORCED MINOR CONCRETE PAVEMENT

PAVEMENT THICKNESS (in)	*TRANSVERSE JOINT SPACING (ft)*
T < 6	*10*
6 ≤ T <12	*15*

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

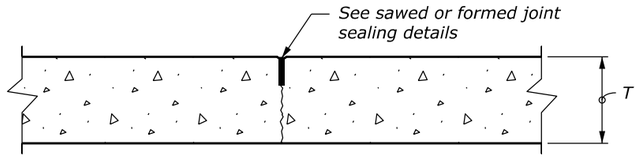
U.S. CUSTOMARY STANDARD

MINOR CONCRETE PAVEMENT

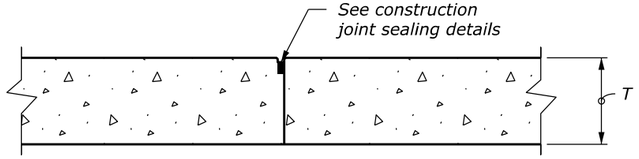
STANDARD APPROVED FOR USE --/---
REVISED: 9/2016

STANDARD
501-1

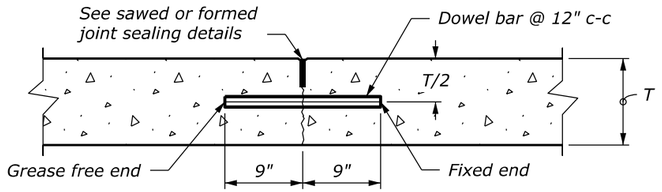
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	R2



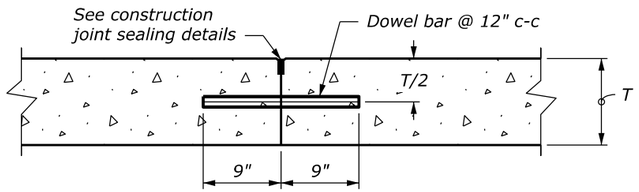
CONTRACTION JOINT
UNDOWELED - TRANSVERSE and UNTIED - LONGITUDINAL



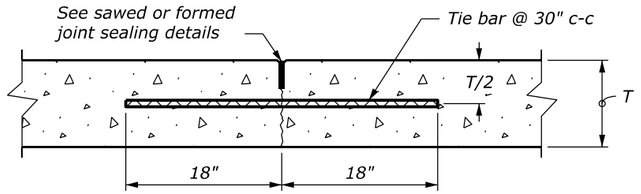
CONSTRUCTION JOINT
PLAIN - TRANSVERSE or LONGITUDINAL



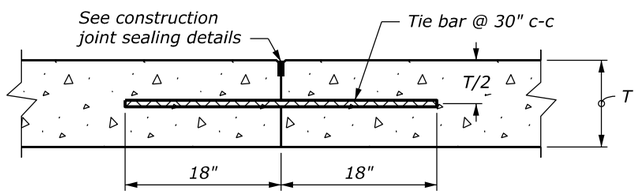
CONTRACTION JOINT
DOWELED - TRANSVERSE



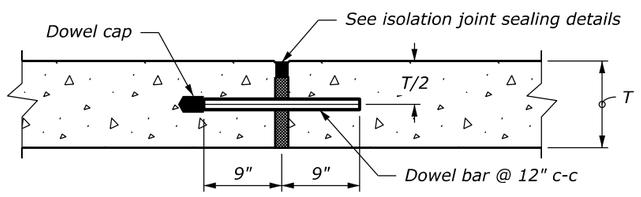
CONSTRUCTION JOINT
DOWEL BUTT - TRANSVERSE



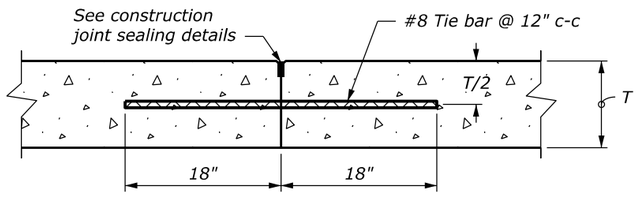
CONTRACTION JOINT
TIED - LONGITUDINAL



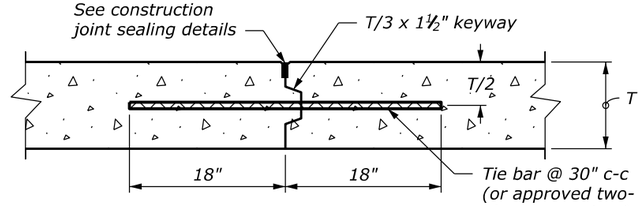
CONSTRUCTION JOINT
TIED BUTT - LONGITUDINAL



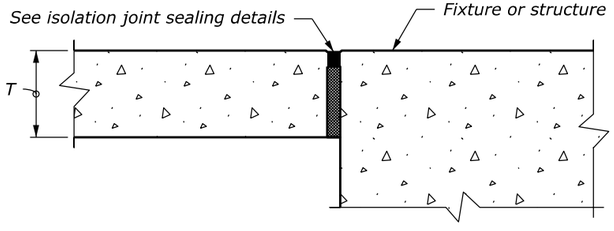
ISOLATION/EXPANSION JOINT
DOWELED - TRANSVERSE



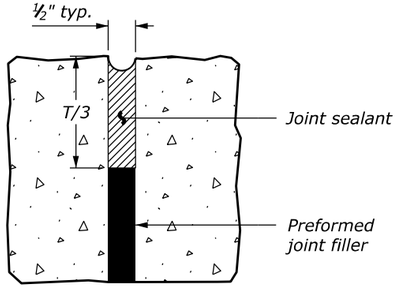
CONSTRUCTION JOINT
TIED BUTT - TRANSVERSE



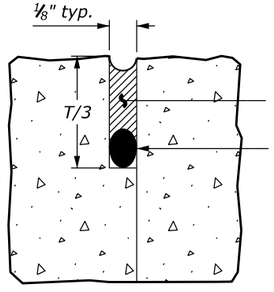
CONSTRUCTION JOINT
KEYWAY - LONGITUDINAL



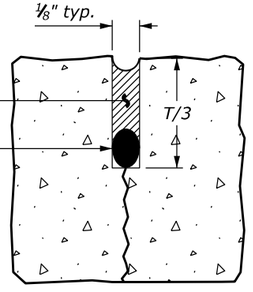
ISOLATION JOINT
UNDOWELED - LONGITUDINAL



ISOLATION JOINT



CONSTRUCTION JOINT



SAWED OR FORMED JOINT

MINOR CONCRETE PAVEMENT JOINT SEALING DETAILS

NO SCALE

NOTE:

1. *Use epoxy-coated material for all tie bars, dowels, and other steel used in the construction of concrete pavement.*
2. *Deformed reinforcing bars or hook bolts may be used for tie bars.*
3. *Do not place tie bars within 15 inches of transverse joints.*
4. *Install isolation joints when abutting a fixed structure. Use expansion joint material extending the full depth and length of the concrete surface.*
5. *Transverse and longitudinal construction joints are not included in the joint layout plan. Use transverse and longitudinal construction joints sparingly. Submit planned construction joint locations for approval.*
6. *For construction joints, if tie bars and dowels are not set into concrete during placement, drill and anchor the tie bars and dowels into the existing concrete construction with epoxy resin.*
7. *Maintain joint sealant shape factor of 1:1; except when silicone sealant is used maintain the width to depth shape factor of 2:1 or as recommended by sealant manufacturer.*
8. *See Section 712 for joint material requirements.*
9. *See Standards 501-1 or 502-1 for reinforcement details.*

BAR SIZES		
PAVEMENT THICKNESS (T) (in)	TIE BAR	DOWEL BAR DIAMETER (in)
T ≤ 8	#5	1
8 < T ≤ 10	#5	1¼
10 < T ≤ 12	#6	1½

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

MINOR CONCRETE PAVEMENT JOINTS

STANDARD APPROVED FOR USE --/---
REVISED: 9/2016

STANDARD 501-2

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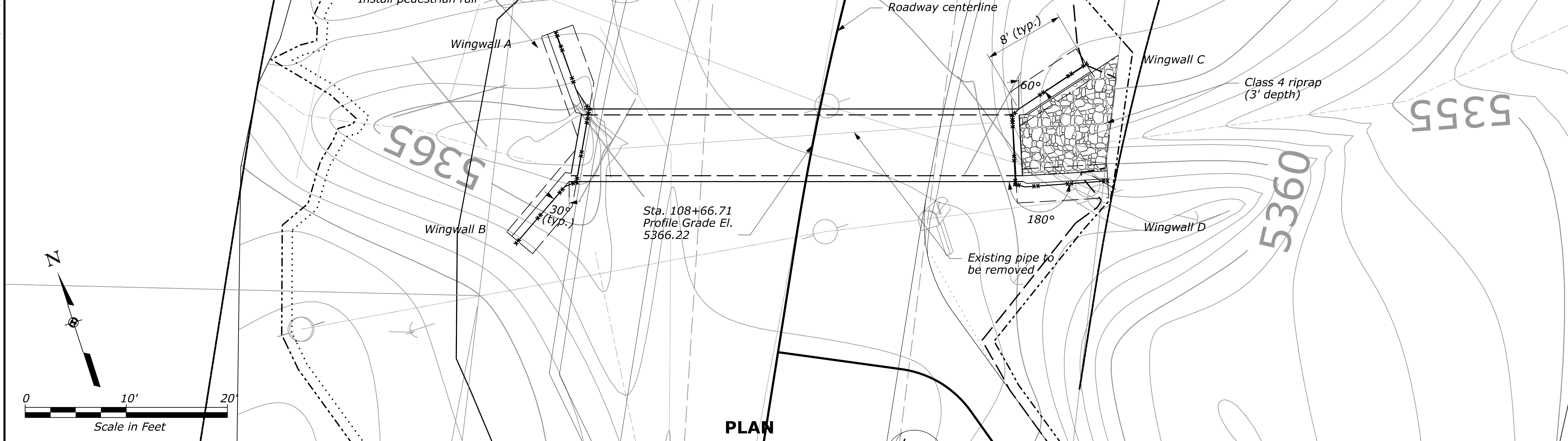
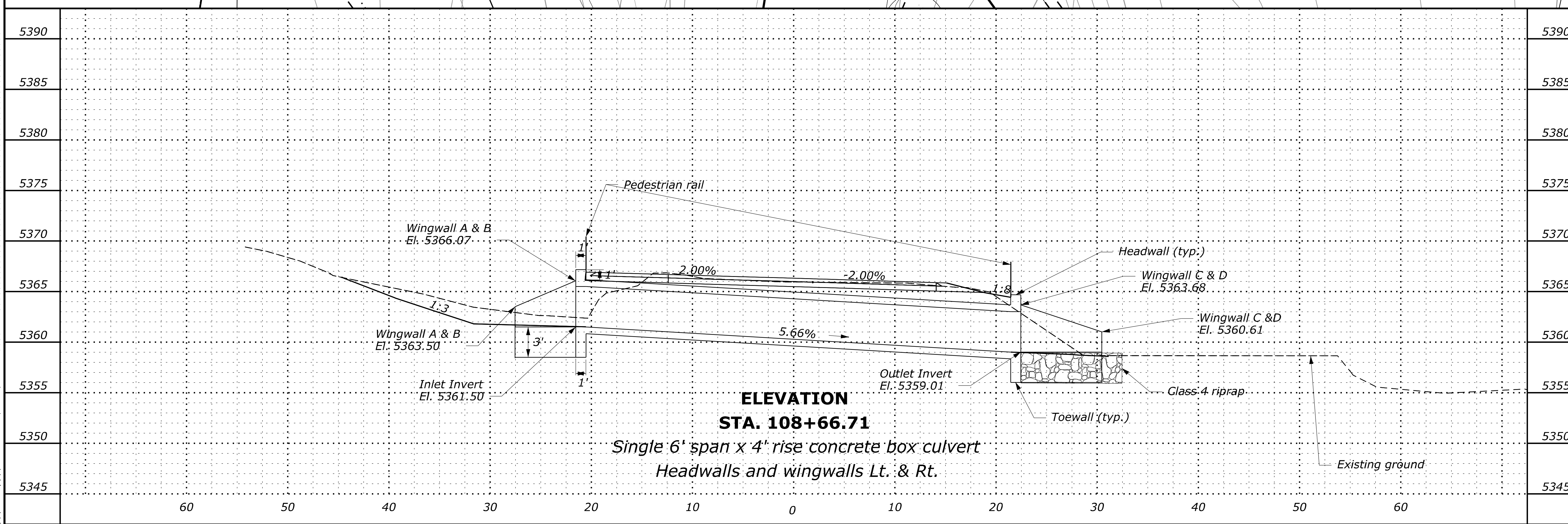
12 May 2020 3:09 PM

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	S1

NOTES:
1. Headwalls, toewalls, and wingwalls will be constructed and paid for according to item 60103-0000, Concrete, Headwall. See Special 601-A for details.



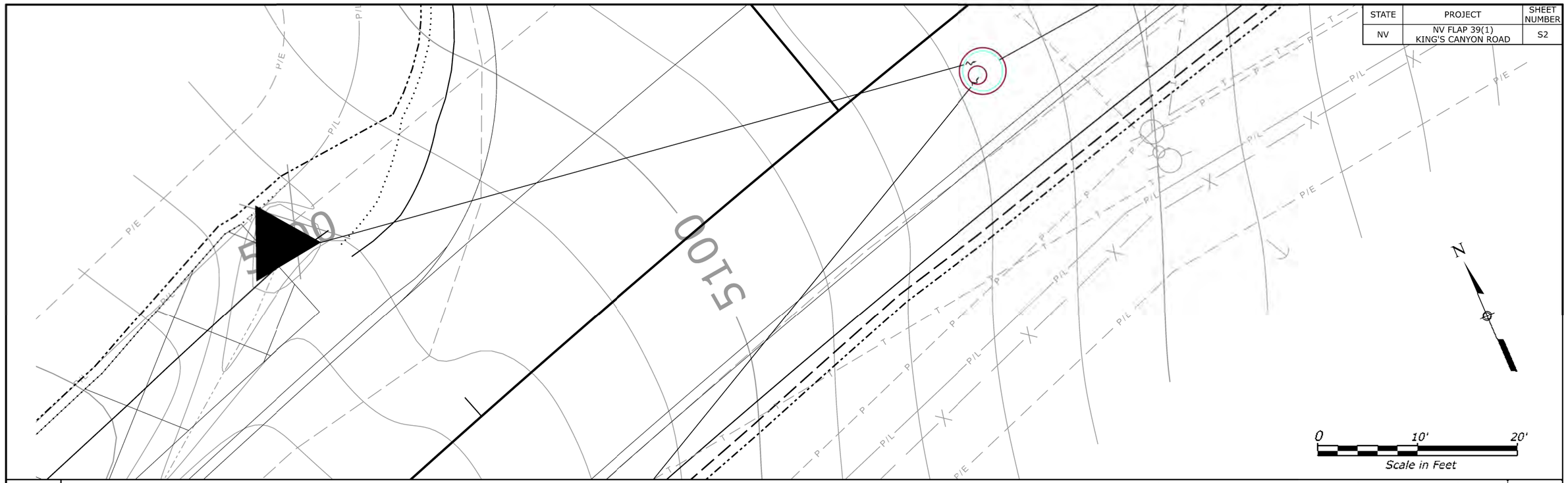
PLAN

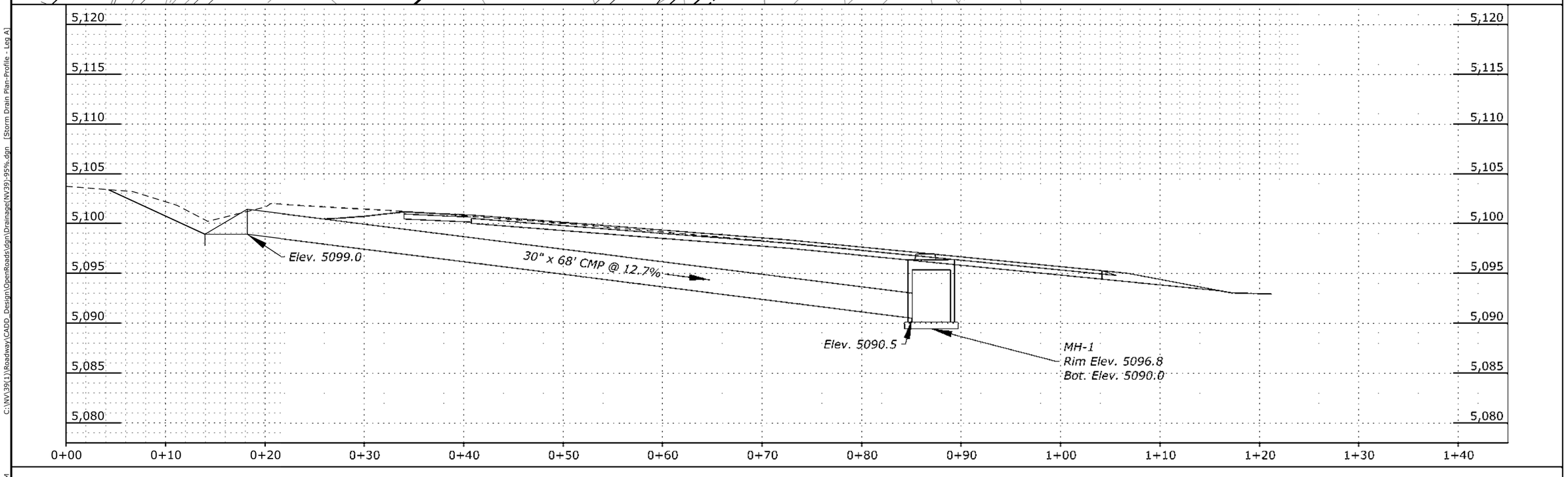


ELEVATION
STA. 108+66.71
Single 6' span x 4' rise concrete box culvert
Headwalls and wingwalls Lt. & Rt.

$USER$
$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$TIME$
$$$$DATE$$$$

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	S2





KING'S CANYON ROAD
STORM DRAIN PLAN/PROFILE
LEG A

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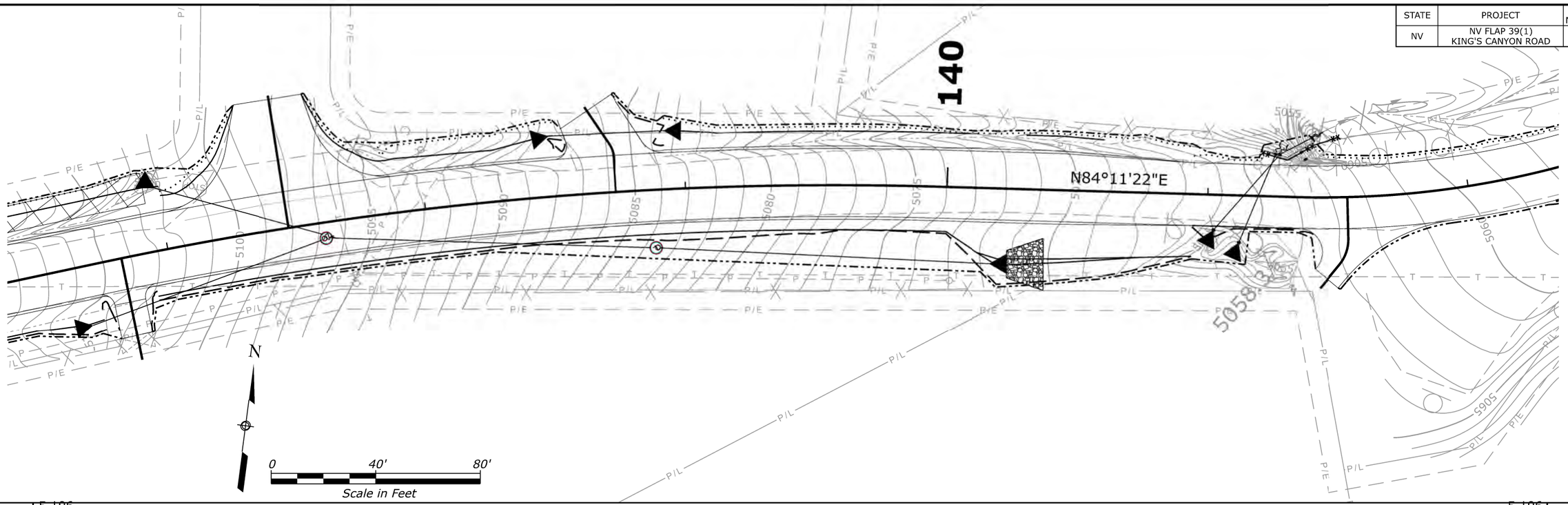
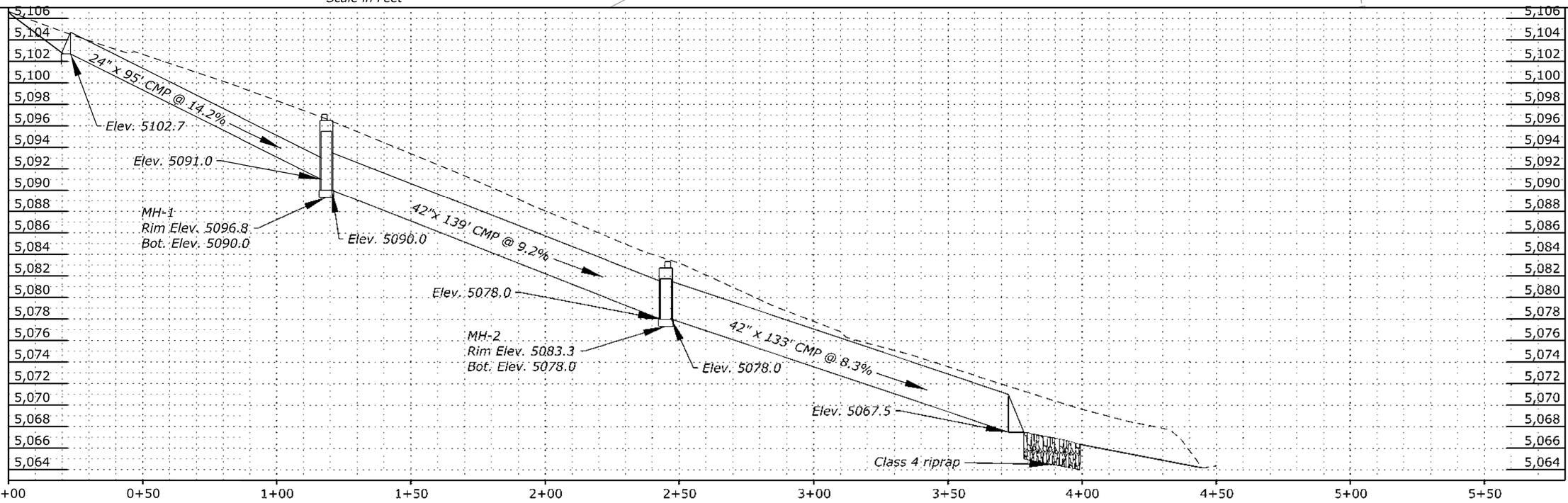
12 January 2021 9:42 AM

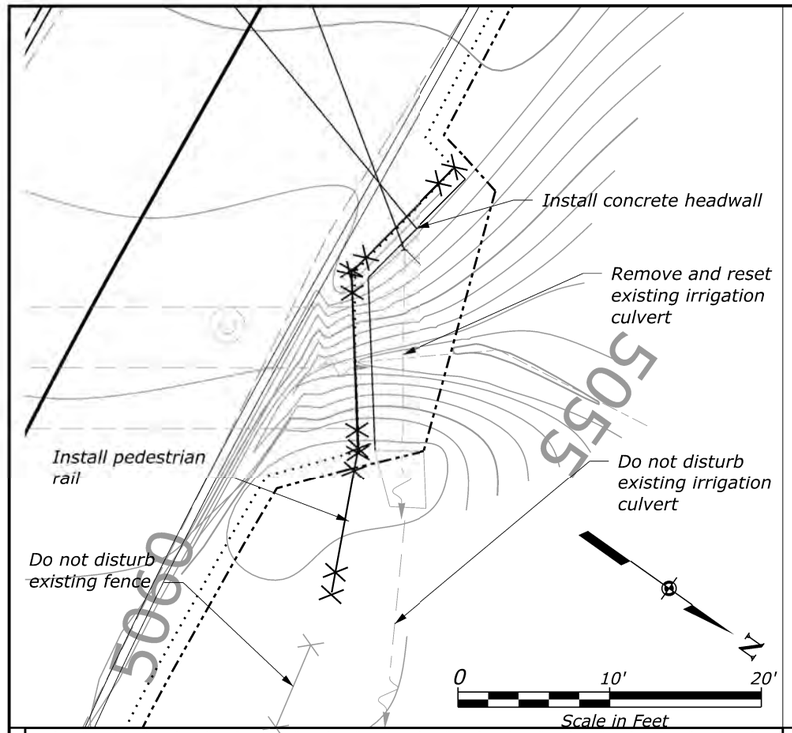
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	S3

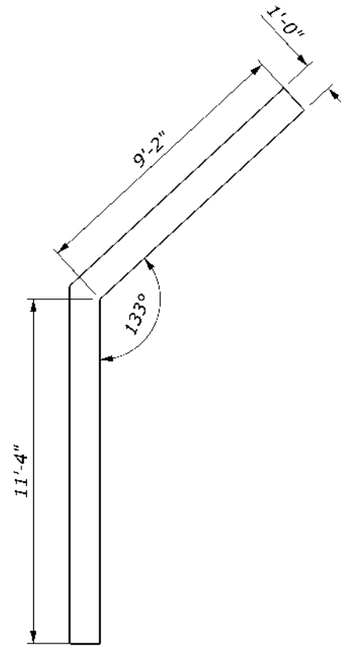




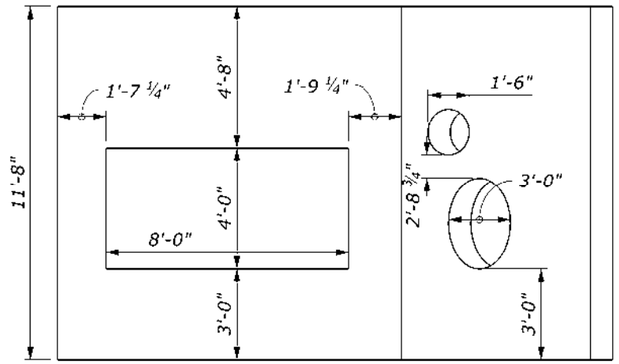
KING'S CANYON ROAD
STORM DRAIN PLAN/PROFILE
LEG B

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	S4

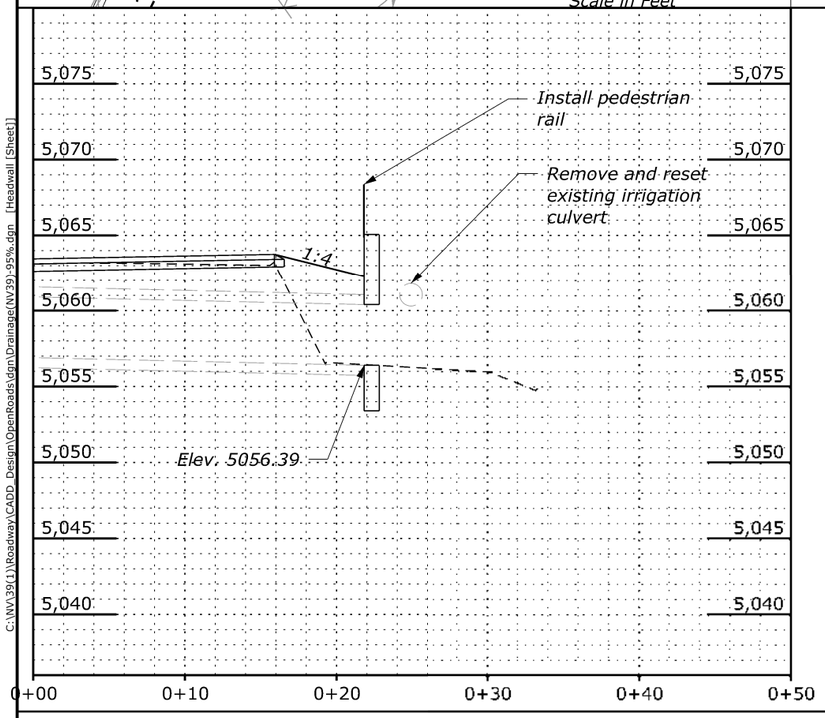




HEADWALL TOP VIEW



HEADWALL FRONT VIEW



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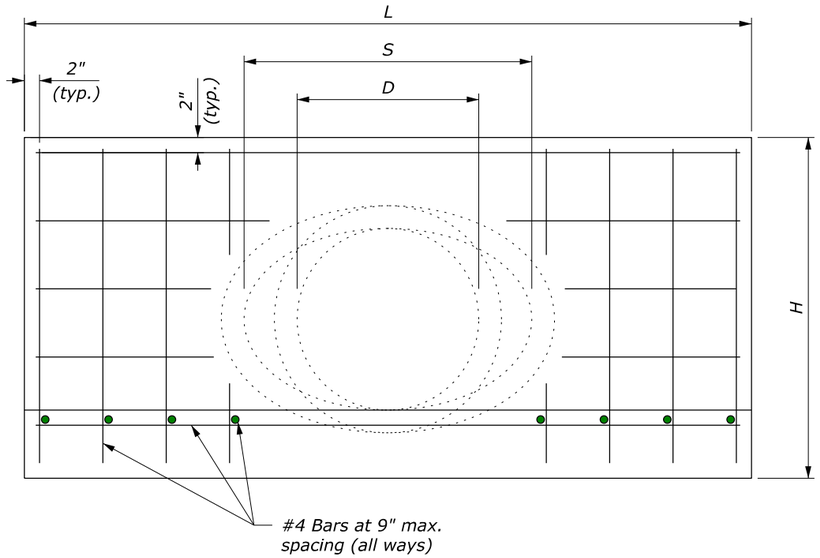
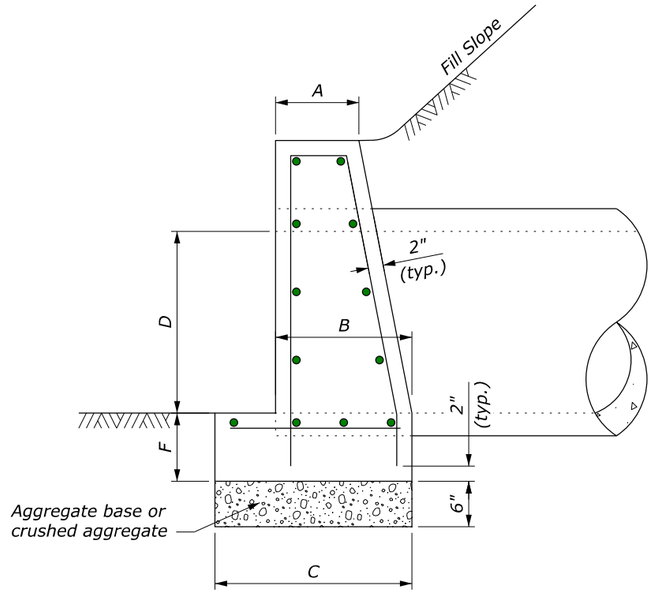
12 January 2021 9:52 AM

KING'S CANYON ROAD
STA 141+34.61 HEADWALL LAYOUT

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T1



FRONT ELEVATION



SIDE ELEVATION

NOTE:

1. Orient all headwalls parallel to the roadway centerline unless otherwise indicated in the plans or by the CO.
2. When pipes are on a skew, adapt and lengthen headwalls as directed.
3. Chamfer all exposed corners not rounded to ¾".
4. Quantities shown are for one headwall with pipe at right angles.
5. Construct headwalls using dimensions shown under values for 1V:1.5H slope, unless otherwise designated by the CO.

HEADWALL FOR ELLIPTICAL PIPE

SIZE OF ELLIPTICAL PIPE CULVERT (SPAN x RISE)										
	23" x 14"	30" x 19"	34" x 22"	38" x 24"	42" x 27"	45" x 29"	49" x 32"	53" x 34"	60" x 38"	68" x 43"
A	0'-8"	0'-9"	0'-10"	0'-10"	0'-11"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
B	1'-2"	1'-5"	1'-6"	1'-8"	1'-9"	1'-10"	1'-11"	1'-11"	1'-11"	2'-0"
C	1'-8"	1'-11"	2'-1"	2'-4"	2'-5"	2'-7"	2'-8"	2'-9"	3'-3"	3'-6"
D	1'-2"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	2'-8"	2'-10"	3'-2"	3'-7"
F	0'-8"	0'-8"	0'-9"	0'-9"	0'-9"	0'-9"	0'-9"	0'-9"	0'-9"	0'-9"
H	2'-10"	3'-3"	3'-7"	3'-9"	4'-0"	4'-2"	4'-5"	4'-7"	4'-11"	5'-4"
L	5'-5"	7'-2"	8'-6"	9'-2"	10'-2"	10'-11"	12'-1"	12'-11"	13'-0"	13'-0"
S	1'-11"	2'-6"	2'-10"	3'-2"	3'-6"	3'-9"	4'-1"	4'-5"	5'-0"	5'-8"
CUBIC YARDS OF CONCRETE										
Conc. Pipe	0.502	0.855	1.236	1.500	1.811	2.101	2.512	2.801	2.969	2.904

HEADWALL FOR CIRCULAR PIPE

DIAMETER OF PIPE CULVERT						
	6"	15"	18"	21" or 24"	27" or 30"	33" or 36"
A	0'-6"	0'-8"	0'-9"	0'-11"	1'-0"	1'-0"
B	0'-9"	1'-1"	1'-3"	1'-6"	1'-9"	2'-0"
C	1'-2"	1'-7"	1'-9"	2'-2"	2'-6"	2'-9"
D	1'-0"	1'-3"	1'-6"	2'-0"	2'-6"	3'-0"
F	0'-6"	0'-8"	0'-8"	0'-9"	0'-9"	0'-9"
H	2'-0"	2'-11"	3'-2"	3'-9"	4'-3"	4'-9"
L	3'-8"	5'-0"	6'-0"	8'-0"	10'-0"	12'-0"
CUBIC YARDS OF CONCRETE						
Conc. Pipe	0.241	0.492	0.697	1.319	2.067	2.947
C.M. Pipe	0.257	0.521	0.739	1.398	2.198	3.145

NO SCALE

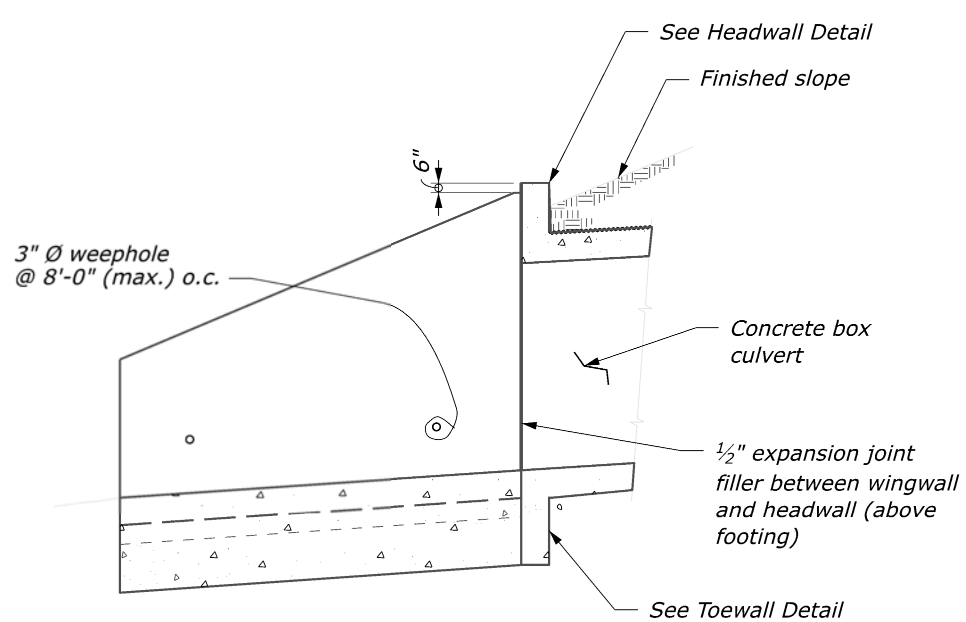
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

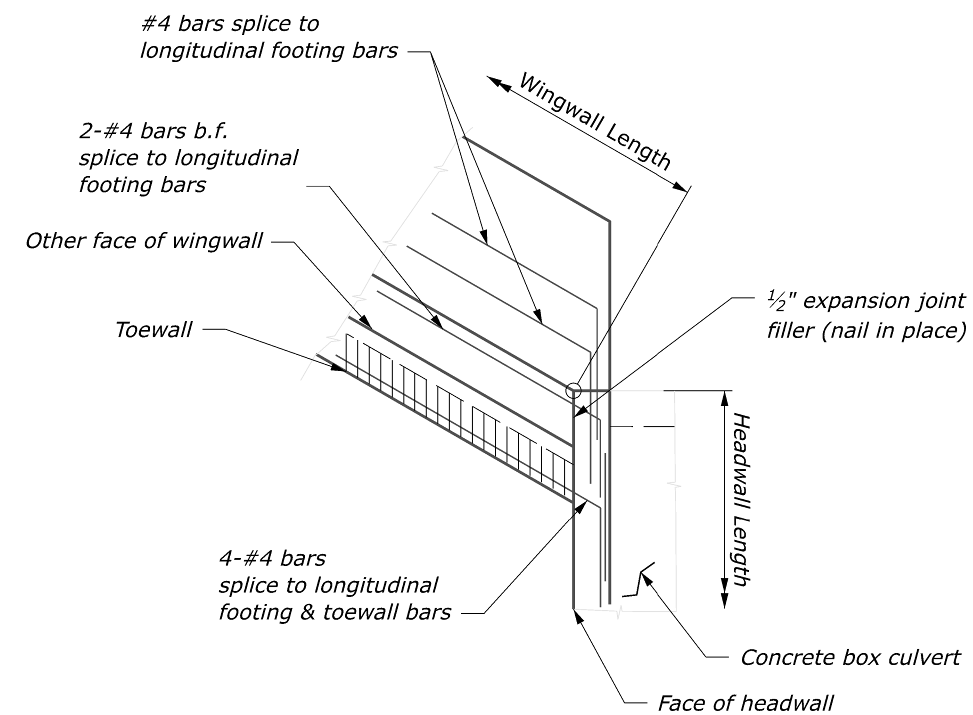
CONCRETE HEADWALL FOR SMALL PIPE CULVERT

STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 3/2016

STANDARD 601-4



WING ELEVATION



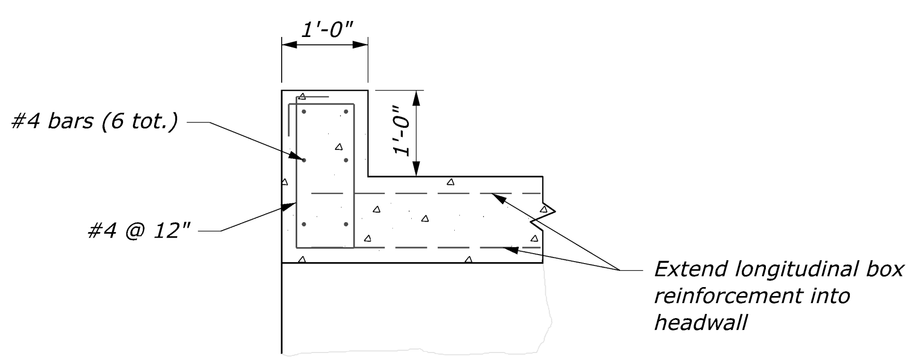
TYPICAL HEADWALL / WINGWALL PLAN DETAIL

See Box Culvert Plan and Profile Sheet

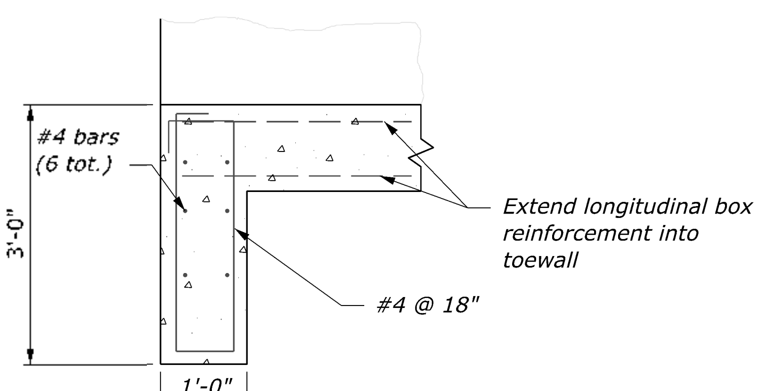
NOTES:

1. Chamfer all exposed concrete corners ¾".
2. Expansion joint material shall conform to AASHTO M213. Payment included in the unit cost of 60103-0000, CONCRETE, HEADWALL.
3. Dimensions, elevations and angles for wingwalls and headwalls are shown on the Box Culvert Plan and Profile Sheet.
4. Use reinforcing steel meeting the requirements of AASHTO M31 or M322, Grade 60 deformed. Use a minimum concrete covering to the face of any bar of 2", unless shown otherwise on the plans.
5. Concrete will conform to Section 601 in the SCRs, with a minimum 28-day compressive strength f'c = 4000 psi.
6. Design Data:
   AASHTO LRFD Bridge Design Specifications 7th Edition, 2014 with interims through 2016. Factored bearing resistance, q_R =5.0 ksf. Lateral earth pressure equivalent to a fluid unit weight = 35 lbs. per cubic foot. Live load surcharge = equivalent height of soil, heq = 2 feet. For sliding, nominal coefficient of friction between concrete and soil = 0.65.
7. Clean all construction joints thoroughly before concrete is poured.
8. Include geocomposite sheet drains in the cost of 60103-0000, CONCRETE, HEADWALL
9. The contractor is responsible for the stability of the structure during construction.
10. Use Backfill material meeting the requirements of subsection 704.03 behind the wingwalls and headwalls. Limits are shown on the wingwall typical section.

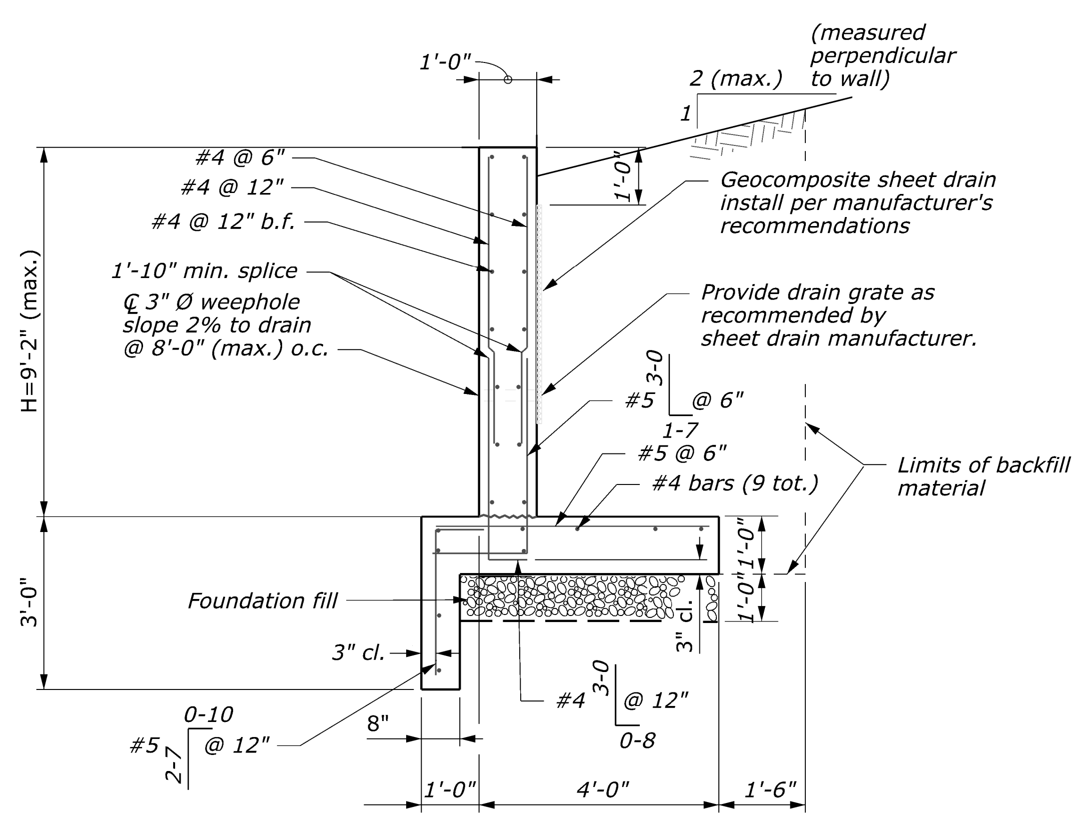
Abbreviations:
f.f. = fill face
o.f. = other face
b.f. = both faces



HEADWALL DETAIL



TOEWALL DETAIL



WINGWALL TYPICAL SECTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

BOX CULVERT HEADWALLS AND WINGWALLS

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T3

METAL ROUND PIPE CULVERT

FILL HEIGHT AND METAL THICKNESS TABLE FOR HELICAL LOCKSEAM AND WELDED SEAM PIPE CULVERT

STEEL

PIPE SIZE DIAMETER INCHES	MINIMUM COVER INCHES	2⅔" x ½" CORRUGATIONS					3" x 1" CORRUGATIONS					5" x 1" CORRUGATIONS				
		METAL THICKNESS (INCH/GAGE)														
		0.064/16	0.079/14	0.109/12	0.138/10	0.168/8	0.064/16	0.079/14	0.109/12	0.138/10	0.168/8	0.064/16	0.079/14	0.109/12	0.138/10	0.168/8
		MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE (FEET)														
12	12	100	100	100	100	100										
15	12	100	100	100	100	100										
18	12	100	100	100	100	100										
21	12	100	100	100	100	100										
24	12	100	100	100	100	100										
30	12	85	100	100	100	100										
36	12	71	89	100	100	100	81	100	100	100	100					
42	12	61	76	100	100	100	70	87	100	100	100					
48	12	53	66	93	100	100	61	76	100	100	100	54	68	95	100	100
54	12		59	83	100	100	54	68	95	100	100	48	60	85	100	100
60	12			74	97	100	49	61	86	100	100	43	54	76	98	100
66	12				87	100	44	55	78	100	100	39	49	69	89	100
72	12				80	97	40	51	71	92	100	36	45	63	82	100
78	12					87	37	47	66	85	100	33	42	58	75	92
84	12					75	35	43	61	78	96	31	39	54	70	86
90	12						32	40	57	73	90	29	36	51	65	80
96	12							38	53	69	84		34	48	61	75
102	18							36	50	65	79		32	45	57	71
108	18								47	61	75			42	54	67
114	18								45	58	71			40	52	63
120	18								43	55	67			38	49	60
126	18									52	64				47	57
132	18									50	61				44	54
138	18									48	58				42	52
144	18										56					50

ALUMINUM

PIPE SIZE DIAMETER INCHES	MINIMUM COVER INCHES	2⅔" x ½" CORRUGATIONS					3" x 1" CORRUGATIONS				
		METAL THICKNESS (INCH/GAGE)									
		0.060/16	0.075/14	0.105/12	0.135/10	0.164/8	0.060/16	0.075/14	0.105/12	0.135/10	0.164/8
		MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE (FEET)									
12	12	100	100	100	100	100					
15	12	100	100	100	100	100					
18	12	100	100	100	100	100					
21	12	88	100	100	100	100					
24	12	77	97	100	100	100					
30	12	62	77	100	100	100	71	89	100	100	100
36	12	52	64	90	100	100	59	74	100	100	100
42	12	44	55	77	99	100	51	64	89	100	100
48	12			67	87	100	44	56	78	100	100
54	18			54	71	88	39	50	69	93	100
60	18				57	72	35	45	62	83	98
66	18					58	32	40	56	76	89
72	18					45	30	37	55	70	82
78	24							34	48	64	75
84	24								44	59	70
90	24								41	62	65
96	24								38	51	61
102	24									46	55
108	24									42	50
114	24										45
120	24										40

NOTE:

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. Fill heights exceeding 100 feet require special analysis by the CO.
3. The fill heights in the table are for helical lockseam and welded seam pipe only. Fill heights for culvert pipe with annular corrugations are more restrictive than those of helical lockseam and welded seam pipe. Obtain approval before furnishing annular corrugation pipe.
4. Measure minimum cover from the top of the pipe culvert to the subgrade for flexible pavements, and to the top of the pavement for rigid pavements. Measure maximum fill height from the top of the pipe to the top of the pavement for both flexible and rigid pavement.

METAL PIPE ARCH CULVERT

FILL HEIGHT AND METAL THICKNESS TABLE FOR HELICAL LOCKSEAM AND WELDED SEAM PIPE CULVERT

STEEL

PIPE ARCH SIZE SPAN x RISE INCHES	EQUI-VALENT DIAMETER INCHES	MINIMUM CORNER RADIUS INCHES	MINIMUM COVER INCHES	2⅔" x ½" CORRUGATIONS					3" x 1" CORRUGATIONS					5" x 1" CORRUGATIONS				
				METAL THICKNESS (INCH/GAGE)														
				0.064/16	0.079/14	0.109/12	0.138/10	0.168/8	0.079/14	0.109/12	0.138/10	0.168/8		0.079/14	0.109/12	0.138/10	0.168/8
				MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE (FEET)														
17 x 13	15	3	12	13														
21 x 15	18	3	12	12														
24 x 18	21	3	12	13														
28 x 20	24	3	12	13														
35 x 24	30	3	12	12														
42 x 29	36	3.5	12	12														
49 x 33	42	4	12		12													
57 x 38	48	5	12			12												
60 x 46	54	8	15							21					21			
64 x 43	54	6	12			12												
66 x 51	60	9	15							21					21			
71 x 47	60	7	12				12											
73 x 55	66	12	18							20					20			
77 x 52	66	8	12					12										
81 x 59	72	14	18						17					17				
83 x 57	72	9	12					12										
87 x 63	78	14	18						17					17				
95 x 67	84	16	18						17					17				
103 x 71	90	16	18							17				17				
112 x 75	96	18	21							16					16			
117 x 79	102	18	21							16					16			
128 x 83	108	18	24								16					16		
137 x 87	114	18	24								16					16		
142 x 91	120	18	24									16						16

ALUMINUM

PIPE ARCH SIZE SPAN x RISE INCHES	EQUI-VALENT DIAMETER INCHES	MINIMUM CORNER RADIUS INCHES	MINIMUM COVER INCHES	2⅔" x ½" CORRUGATIONS				3" x 1" CORRUGATIONS			
				METAL THICKNESS (INCH/GAGE)							
				0.060/16	0.075/14	0.105/12	0.135/10	0.060/16	0.075/14	0.105/12	0.135/10
				MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE (FEET)							
17 x 13	15	3	12	13							
21 x 15	18	3	12	12							
24 x 18	21	3	12	13							
28 x 20	24	3	12		13						
35 x 24	30	3	12		12						
42 x 29	36	3.5	15			12					
49 x 33	42	4	15			12					
57 x 38	48	5	15				12				
60 x 46	54	8	15					21			
64 x 43	54	6	18				12				
66 x 51	60	9	18					21			
73 x 55	66	12	18						20		
81 x 59	72	14	21							17	
87 x 63	78	14	21							17	
95 x 67	84	16	24							17	
103 x 71	90	16	24								17

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

METAL PIPE CULVERT

STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005

STANDARD 602-1

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12 May 2020 2:45 AM

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T4

COUPLING BANDS FOR METAL PIPE CULVERT [1]

CORRUGATION SIZE [2] INCHES	ROUND PIPE DIAMETER INCHES	PIPE ARCH 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
2⅔ × ½	12 to 36	17 × 13 to 42 × 29	7	12	
	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:
⅜" for 18" round culvert (21" × 15" pipe arch) or less
½" for 21" round culvert (24" × 18" pipe arch) or more

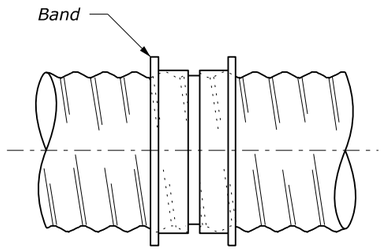
[2] For helically corrugated pipe with rerolled ends, the nominal corrugations size refers to the dimension of the end corrugation in the pipe.

[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 pipe ends rerolled with 2⅔" × ½" corrugations. A 12 inch band is acceptable on pipe ends 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 2⅔" × ½" corrugations on rerolled pipe ends.

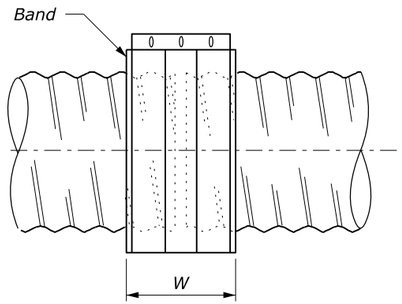
[6] Smooth sleeve-type couplers and flat bands may be used for pipe diameters of 12" or less. Use a matching metal having a nominal thickness of not less than 0.040 inch for steel, or 0.036 inch for aluminum, or a plastic with an equivalent strength to metal.



SLEEVE JOINT

Smoother sleeve with center stop.
Stab type joint

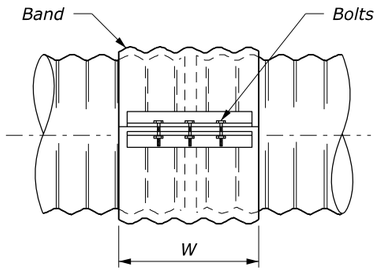
SMOOTH SLEEVE BAND



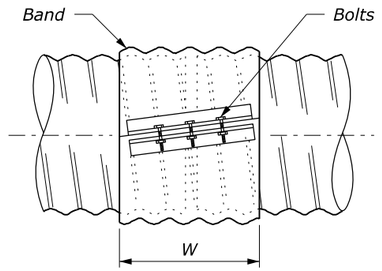
FLAT BAND

NOTE:

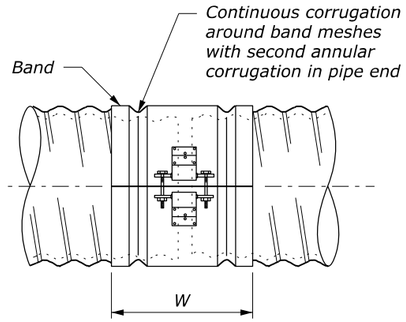
1. Watertight pipe joints are not required unless specified in the Special Contract Requirements.
2. Other types of coupling bands or fastening devices that comply with the joint performance criteria of AASHTO Standard specifications for Highway Bridges, Division II Section 26 may be used.



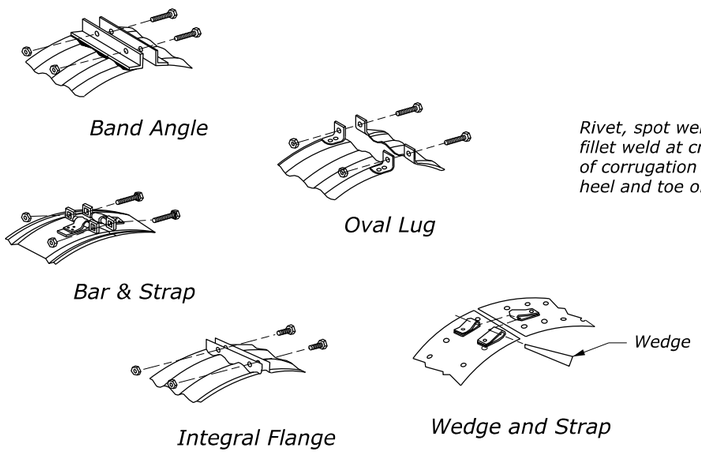
SIDE VIEW



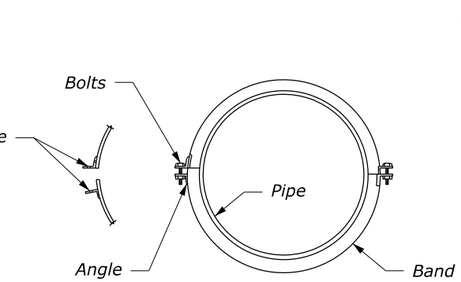
SIDE VIEW



SIDE VIEW



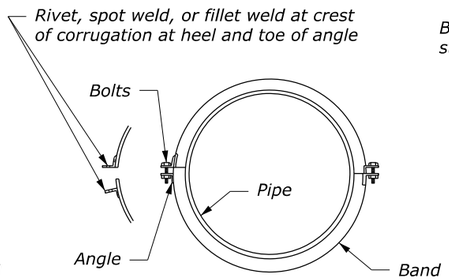
STANDARD BAND CONNECTIONS



END VIEW

Second angle connection optional to 42" diameter, required above 42" diameter

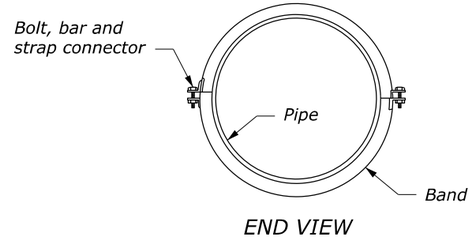
ANNULAR BAND



END VIEW

Second angle connection optional to 42" diameter, required above 42" diameter

HELICAL BAND



END VIEW

SEMI-CORRUGATED BAND

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

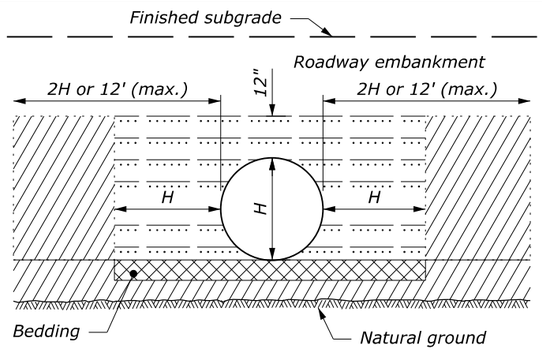
METAL PIPE CULVERT COUPLING BAND

STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005

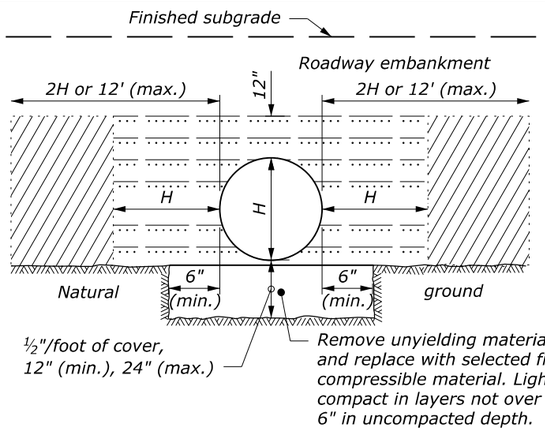
STANDARD 602-2

C:\NV\39(1)\Roadway\CADD_Sheets\T-600\T4_Std602-2.dgn [USC]
12 May 2020 2:46 AM

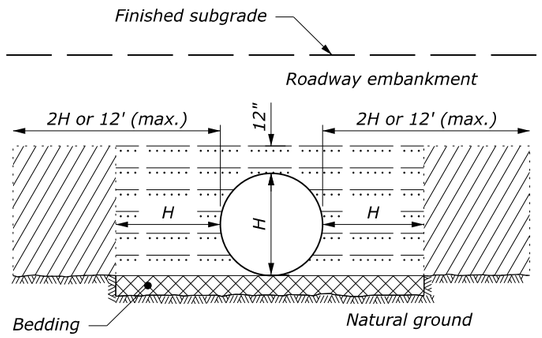
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T5



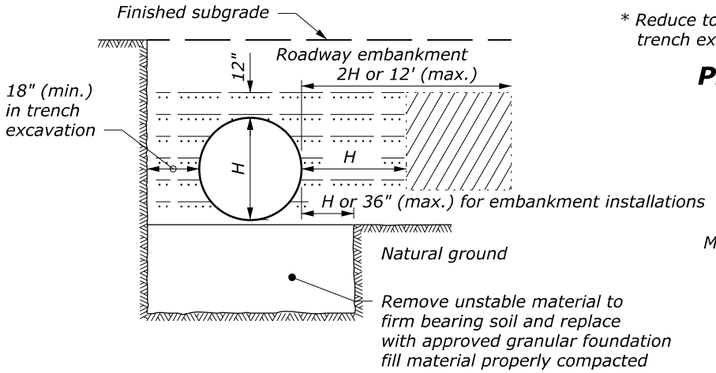
ABOVE NATURAL GROUND



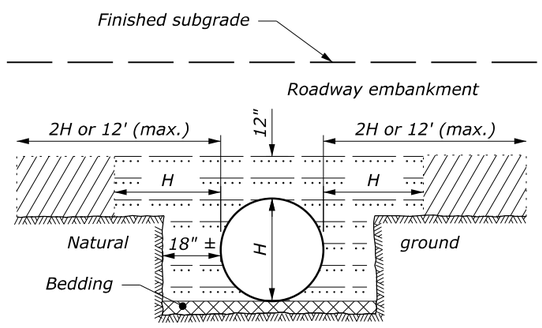
ON UNYIELDING MATERIAL



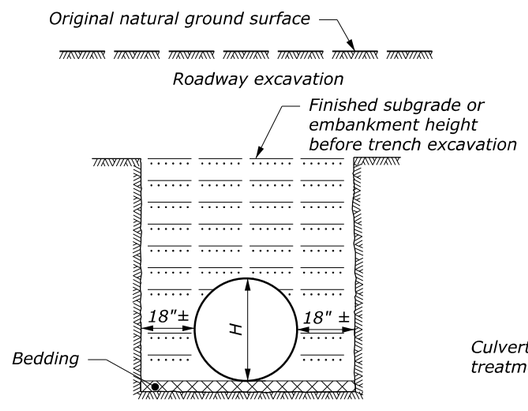
ON NATURAL GROUND



ON UNSTABLE MATERIAL



ABOVE AND BELOW NATURAL GROUND

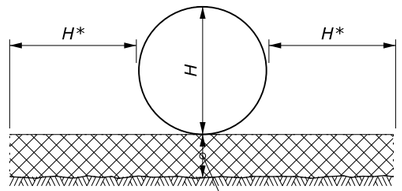


BELOW NATURAL GROUND OR TRENCH EXCAVATION IN EMBANKMENT

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 backfill in accordance with Section 614.
- Impermeable backfill material.

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

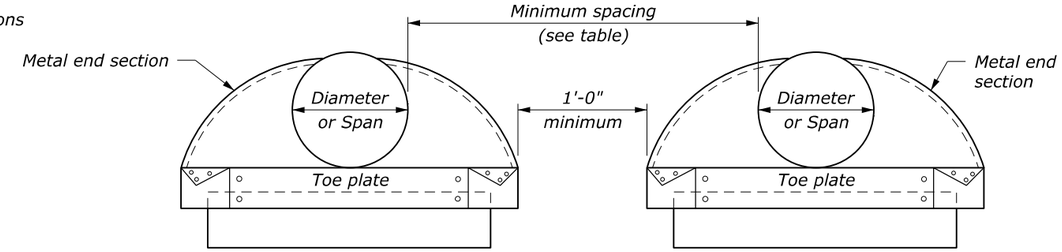


PIPE BEDDING

NOTE:

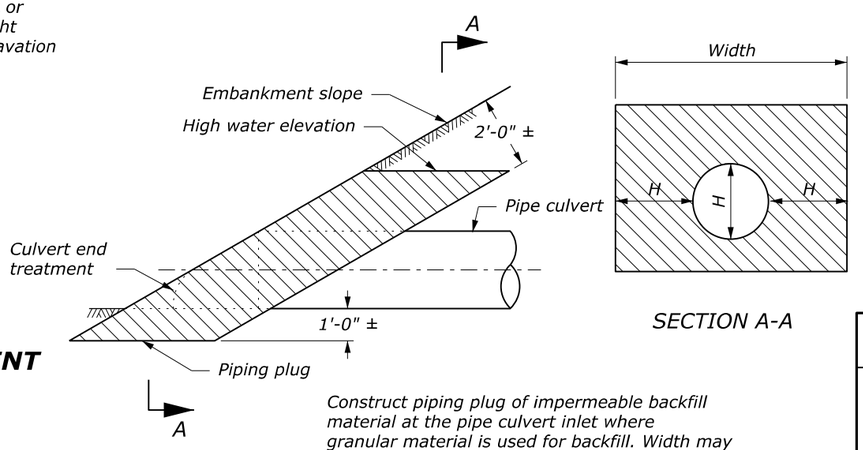
1. When directed, camber pipe culverts upward from a chord through the inlet and outlet inverts an ordinate amount equal to 1% of the pipe length. Develop camber on a parabolic curve. If the midpoint elevation on the parabolic curve as designed exceeds the elevation of the inlet invert, reduce the amount of camber or increase the pipe culvert gradient.
2. H equals the diameter of all round pipe culverts or the rise dimension of all pipe arch culverts.
3. See Section 704 for bedding and backfill requirements.

MINIMUM SPACING	
DIAMETER or SPAN	SPACING
UP to 48"	24"
48" and UP	Half diameter or span or 36", whichever is less



ELEVATION

MULTIPLE PIPE INSTALLATION



SECTION A-A

Construct piping plug of impermeable backfill material at the pipe culvert inlet where granular material is used for backfill. Width may be adjusted to tie into impervious material.

PIPING PLUG

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

METAL AND PLASTIC PIPE CULVERT BEDDING

STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005
DRAFT: 10/2017

STANDARD 602-3

C:\NV\39(1)\Roadway\CADD_Sheets\T-600\T5_Std602-3.dgn [USC]
12 May 2020 2:46 AM

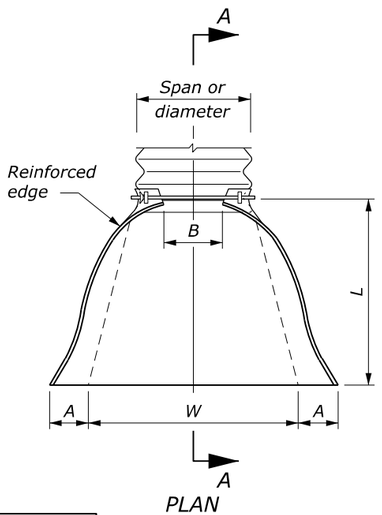
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T6

END SECTIONS FOR ROUND PIPE CULVERT

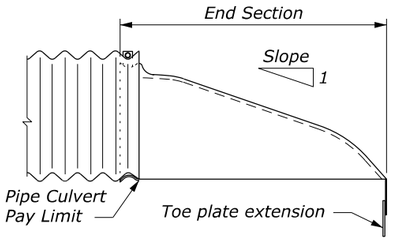
PIPE SIZE DIAMETER INCHES	METAL THICKNESS				DIMENSIONS INCHES					SLOPE Approx.
	STEEL		ALUMINUM							
	INCHES	GAGE	INCHES	GAGE	A (min)	B (max)	H (min)	L (±2")	W (max)	
12	0.064	16	0.060	16	5	7	6	21	44	2¼
15	0.064	16	0.060	16	6	8	6	26	52	2¼
18	0.064	16	0.060	16	7	10	6	31	58	2⅛
21	0.064	16	0.060	16	8	12	6	36	66	2⅛
24	0.064	16	0.060	16	9	13	6	41	72	2⅛
30	0.079	14	0.075	14	11	16	8	51	88	2⅛
36	0.079	14	0.075	14	13	19	9	60	105	2
42	0.109	12	0.105	12	15	25	10	69	122	2⅛
48	0.109	12	0.105	12	17	29	12	78	131	2
54	0.109	12	0.105	12	17	33	12	84	143	2
60	0.109	12	0.105	12	17	36	12	87	157	1⅞
66	0.109	12	0.105	12	17	39	12	87	162	1⅝
72	0.109	12	0.105	12	17	44	12	87	169	1½
78	0.109	12	0.105	12	17	48	12	87	178	1⅜
84	0.109	12	0.105	12	17	52	12	87	184	1⅓
90	0.109	12	0.105	12	17	58	12	87	188	1¼
96	0.109	12	0.105	12	17	58	12	87	197	1⅛

END SECTIONS FOR PIPE ARCH CULVERT

PIPE SIZE SPAN × RISE INCHES	EQUI-VALENT DIAM. (INCHES)	METAL THICKNESS				DIMENSIONS INCHES					SLOPE Approx.
		STEEL		ALUMINUM							
		INCHES	GAGE	INCHES	GAGE	A (min)	B (max)	H (min)	L (±2")	W (max)	
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
35 × 24	30	0.079	14	0.075	14	10	16	8	39	60	2½
42 × 29	36	0.079	14	0.075	14	12	18	9	46	75	2½
49 × 33	42	0.109	12	0.105	12	13	21	12	53	85	2½
57 × 38	48	0.109	12	0.105	12	18	26	12	63	90	2½
60 × 46	54	0.109	12	0.105	12	18	34	12	70	102	2
64 × 43	54	0.109	12	0.105	12	18	30	12	70	102	2
66 × 51	60	0.109	12	0.105	12	18	33	12	77	116	1½
71 × 47	60	0.109	12	0.105	12	18	33	12	77	114	1½
73 × 55	66	0.109	12	0.105	12	18	36	12	77	126	1½
77 × 52	66	0.109	12	0.105	12	18	36	12	77	126	1½
81 × 59	72	0.109	12	0.105	12	18	39	12	77	138	1½
83 × 57	72	0.109	12	0.105	12	18	39	12	77	138	1½
87 × 63	78	0.109	12	0.105	12	20	38	12	77	148	1½
95 × 67	84	0.109	12	0.105	12	20	34	12	87	162	1½
103 × 71	90	0.109	12	0.105	12	20	38	12	87	174	1½
112 × 75	96	0.109	12	0.105	12	20	40	12	87	174	1½



PLAN

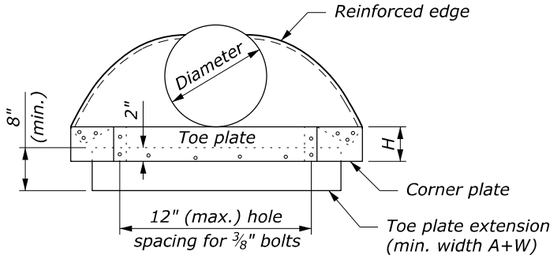


SECTION A-A

ROUND OR PIPE ARCH CULVERT

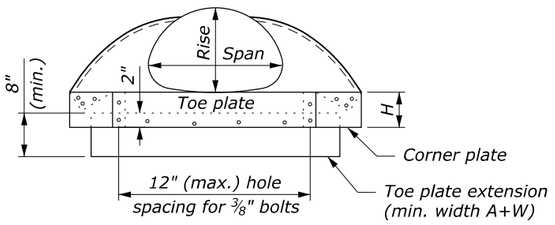
NOTE:

1. Variations in design and dimensions are permitted to allow for manufacturer's standards.
2. Fabricate the diameter of the end section of Design B to match the inside diameter of the concrete pipe culvert.
3. 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.
4. Fabricate multiple piece bodies with lap seams tightly joined by ⅜" rivets or bolts. Fabricate end section center panels for 60" and larger diameter pipe and equivalent pipe arch from 0.138 inch steel or 0.135 inch aluminum.
5. On end section center panels for 66" and larger equivalent pipe arch provide 2½" × 2½" × ¼" angle reinforcement bolted or riveted under the center panel seam.
6. Supplement the reinforced edges of end sections for 60" and larger diameter pipe and 66" and larger equivalent pipe arch with 2½" × 2½" × ¼" stiffener angles attached with bolts or rivets.
7. 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.
8. Warp embankment slopes to match the slope of the flared end sections.



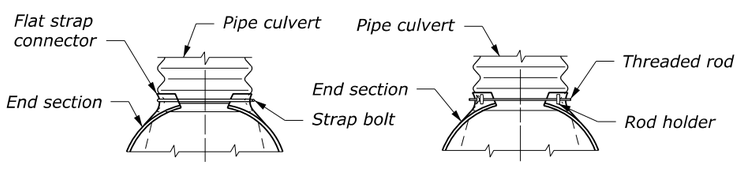
ELEVATION

ROUND PIPE CULVERT



ELEVATION

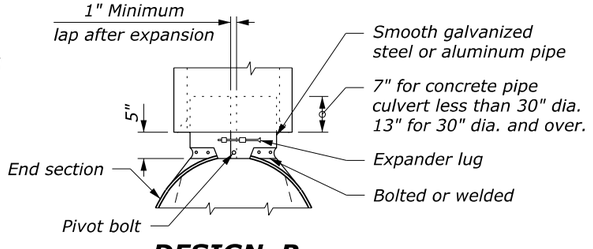
PIPE ARCH CULVERT



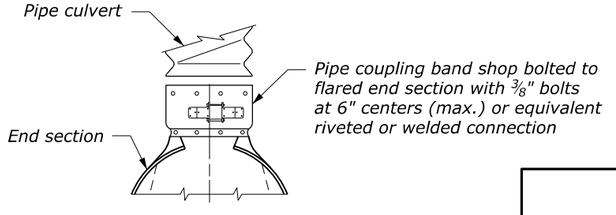
For 12" thru 24" round pipe and 17" × 13" thru 28" × 20" pipe arch

For 30" thru 60" round pipe and 35" × 24" thru 66" × 51" pipe arch

DESIGN A
CONNECTION TO ANNULAR CORRUGATED METAL PIPE



DESIGN B
CONNECTION TO CONCRETE PIPE INLET END



For all sizes of round pipe and pipe arch

DESIGN C
CONNECTION TO METAL PIPE OR OUTLET END OF CONCRETE PIPE

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

METAL END SECTIONS

STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005
DRAFT: 10/2007

STANDARD 602-4

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T7

TYPE 1 ECCENTRIC

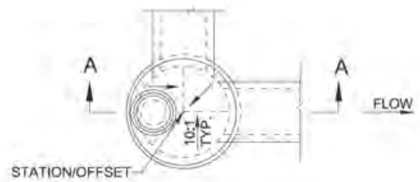
MATERIAL	PIPE SIZE
ROUND RCP	24" MAX.
CONCRETE ARCH PIPE	11" x 18" (15" EQV.), 13 ½" x 22" (18" EQV.) MAX.
CONCRETE ELLIPTICAL	14" x 23" (18" EQV.) MAX.
HDPE	24" MAX.
CMP	24" MAX.

TYPE 2 ECCENTRIC

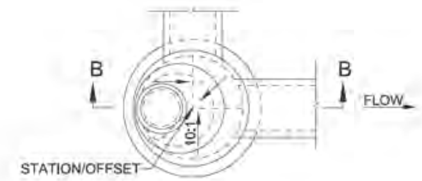
MATERIAL	PIPE SIZE
ROUND RCP	36" MAX.
CONCRETE ARCH PIPE	18" x 28 ½" (24" EQV.), 22 ½" x 36 ¼" (30" EQV.) MAX.
CONCRETE ELLIPTICAL	19" x 30" (24" EQV.) MAX.
HDPE	36" MAX.
CMP	36" MAX.

TYPE 3 ECCENTRIC

MATERIAL	PIPE SIZE
ROUND RCP	48" MAX.
CONCRETE ARCH PIPE	26 ⅝" x 43 ¾" (36" EQV.) MAX.
CONCRETE ELLIPTICAL	24" x 38" (30" EQV.), 27" x 42" (33" EQV.), 29" x 45" (36" EQV.), 32" x 49" (39" EQV.) MAX.
HDPE	48" MAX.
CMP	48" MAX.



PLAN



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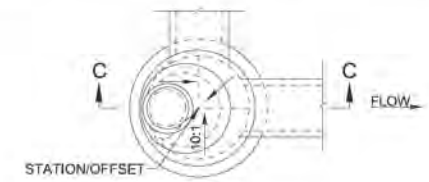
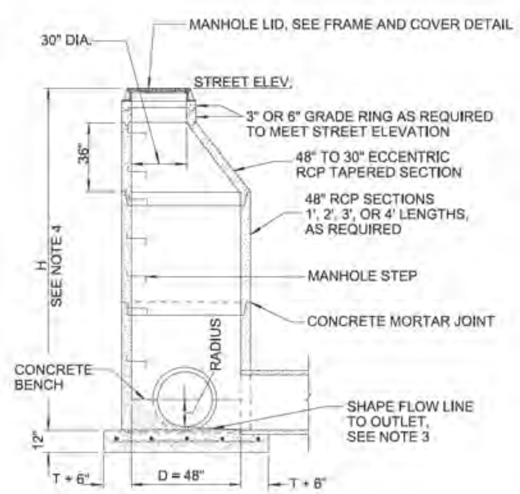
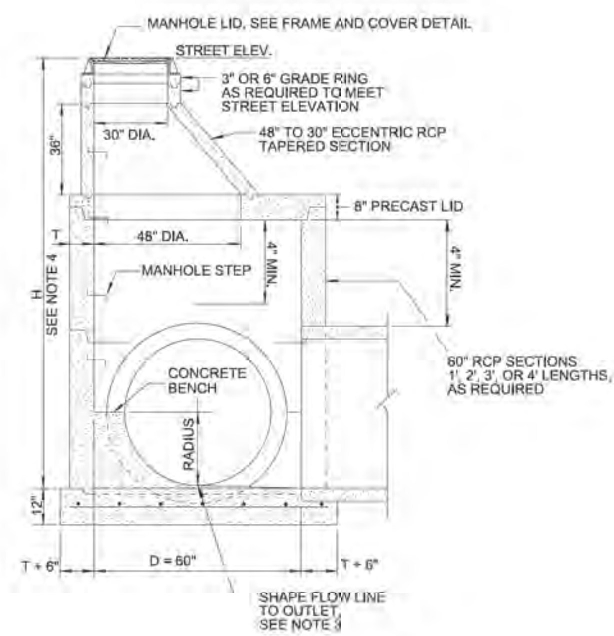


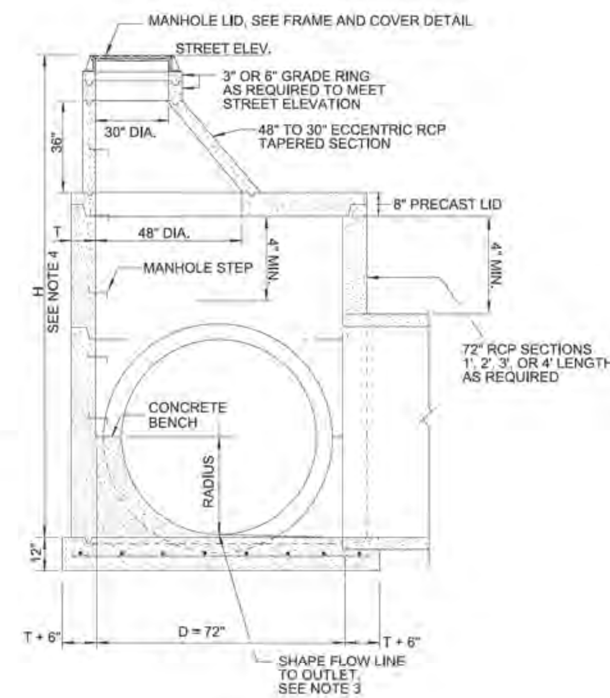
PLAN



SECTION A-A
TYPE 1
ECCENTRIC



SECTION B-B
TYPE 2
ECCENTRIC



SECTION C-C
TYPE 3
ECCENTRIC

NEVADA DEPARTMENT OF TRANSPORTATION
CHIEF HYDRAULICS ENGR. SIGNED ORIGINAL ON FILE
ADOPTED 10/1985
REVISED 10/2015
MANHOLES TYPE 1, 2 AND 3 TYPE 1, 2 AND 3 MODIFIED
SPEC. # 609
DETAIL NUMBER DS-47A

Apopted from NDOT detail DS-47A

NO SCALE

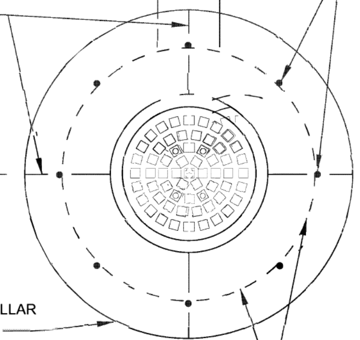
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

MANHOLE

SPECIAL
604-A

$USER$ $$$$DGN$$ $TIME$ $$$$DATE$$$$

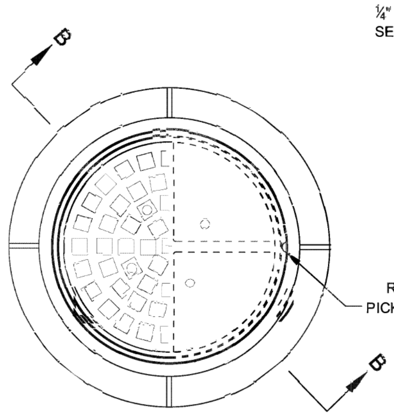


SEE NOTE 8

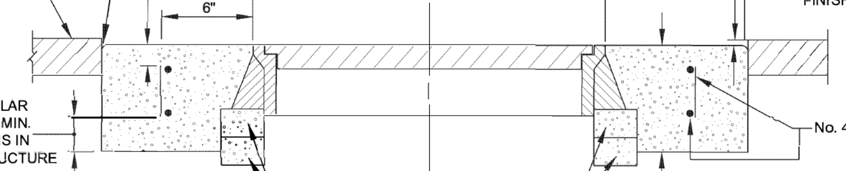
CONCRETE COLLAR PLAN

NOTES:

1. The weight of frame shall be 250 lb. minimum and the weight of cover shall be 300 lb. minimum. Equivalent manhole frames and covers other than shown may be used upon approval by the Engineer.
2. The frame seat and cover edge shall be machined to a true bearing surface all around. The frame and cover shall be compatible to the manufacturers specifications.
3. The surface shown is for illustration only. Any surface design, other than smooth, may be used upon approval.
4. A cast-in-place concrete collar shall be placed around a manhole frame unless otherwise directed.
5. Manhole cover shall bear name of entity and system function, if applicable.
6. Concrete shall be class A or AA.
7. Concrete collars may be poured round, or any other appropriate shape when approved by the engineer.
8. Manhole cover and frame shown. Other shapes may apply to utility and valve covers and frames.

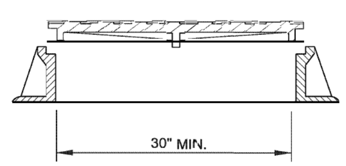


PLAN



SEE NOTE 8

SECTION A-A



SECTION B-B

TRAFFIC-STRENGTH MANHOLE FRAME AND COVER

NEVADA DEPARTMENT OF TRANSPORTATION

CHIEF HYDRAULICS ENGR. SIGNED ORIGINAL ON FILE

ADOPTED 8/1969

REVISED 10/2015

MANHOLE COVER, FRAMS AND CONCRETE COLLAR

SPEC. # 609

DETAIL NUMBER DS-49

Adopted from NDOT detail DS-49

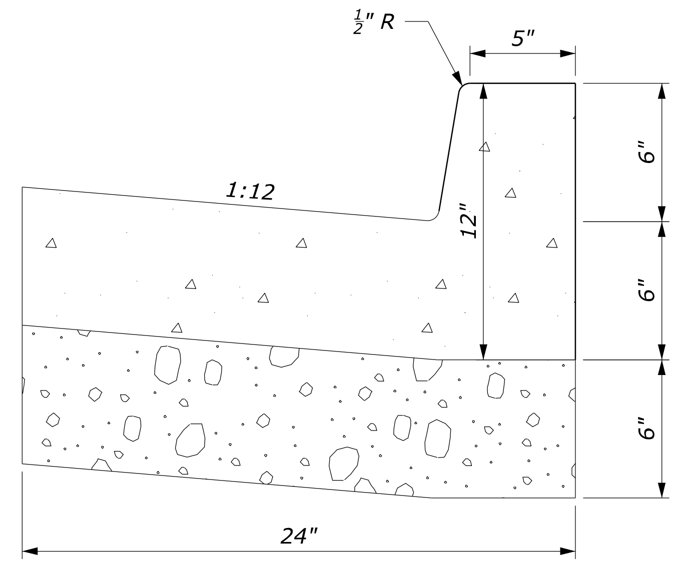
NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

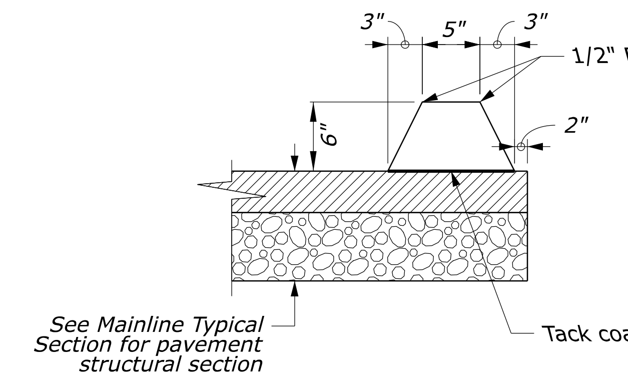
U.S. CUSTOMARY SPECIAL

MANHOLE COVER

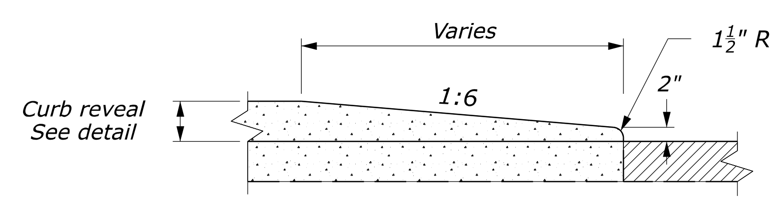
SPECIAL 604-B



CONCRETE CURB AND GUTTER, 12-INCH DEPTH

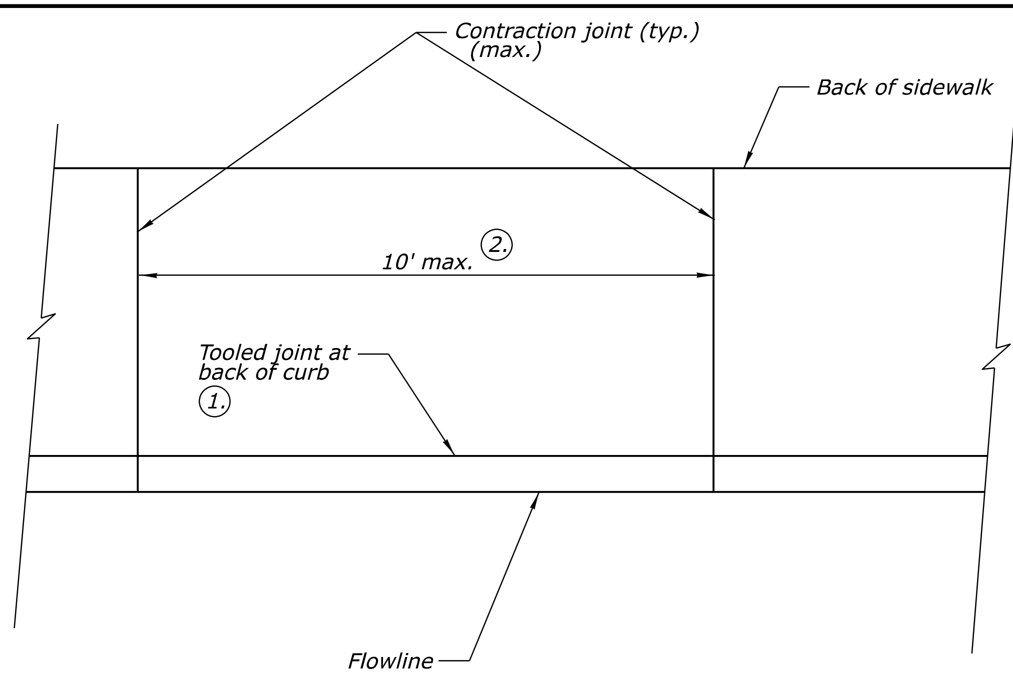


ASPHALT CURB, 6-INCH DEPTH

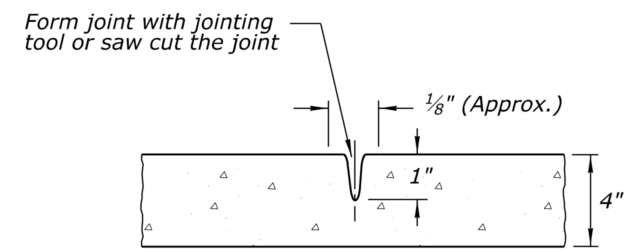


CURB TAPER

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T10



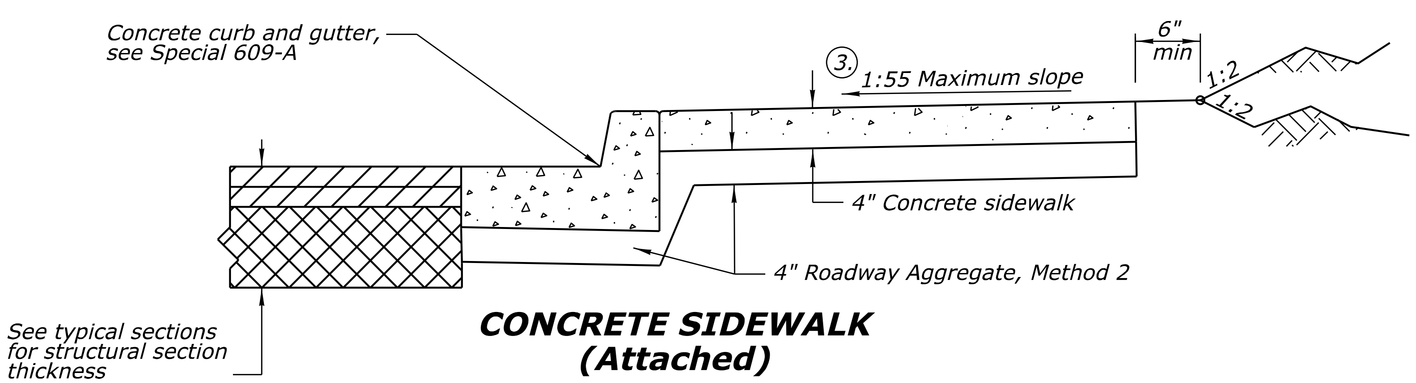
CONCRETE SIDEWALK CONTRACTION JOINT LAYOUT



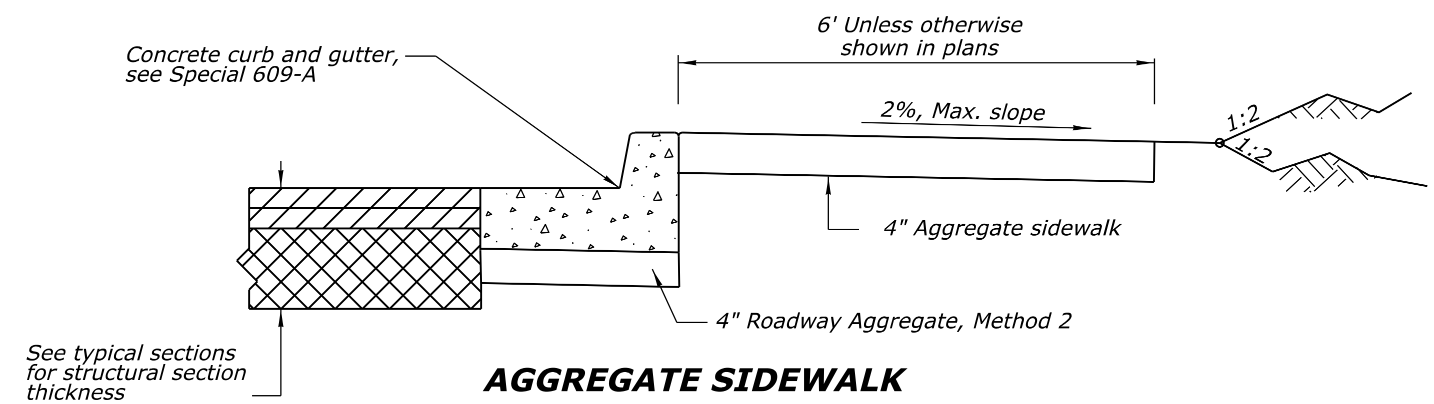
SIDEWALK CONTRACTION JOINT (2.)

NOTE:

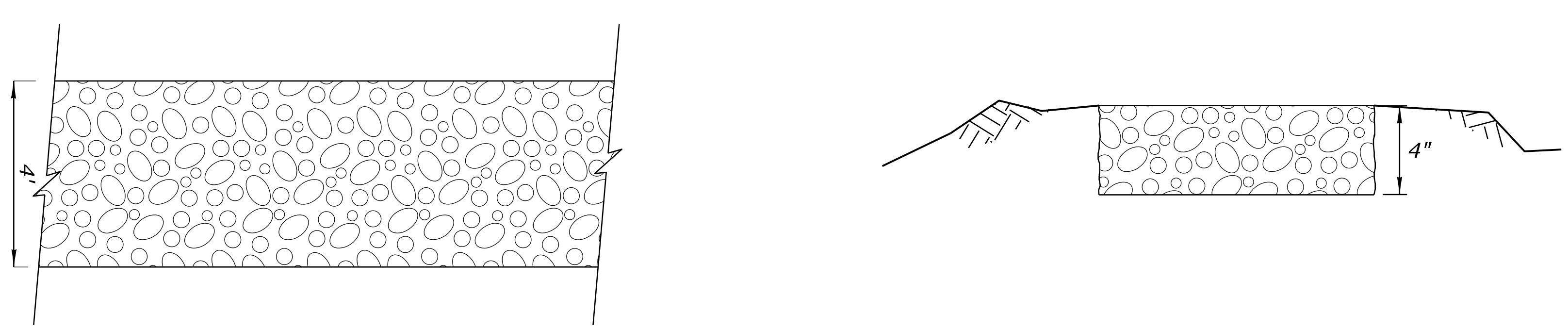
1. Install isolation joints when abutting existing all appurtenances such as manholes, utility poles, buildings and bridges. Use ½ " thick preformed expansion joint material extending the full depth of the concrete surface.
2. Place contraction joints at intervals not exceeding 10'. Form the joint with a jointing tool or saw the joints to a depth of 1" and 1/8" wide.
3. Slope of sidewalk will be checked with a 2' level at intervals determined by the CO.



CONCRETE SIDEWALK (Attached)



AGGREGATE SIDEWALK



EQUESTRIAN TRAIL

NO SCALE

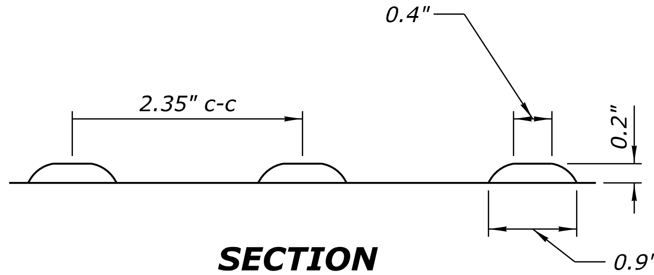
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

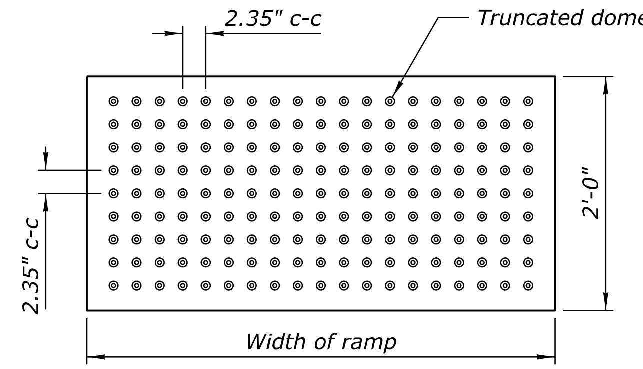
SIDEWALK

SPECIAL
615-A

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T11



SECTION
TRUNCATED DOME

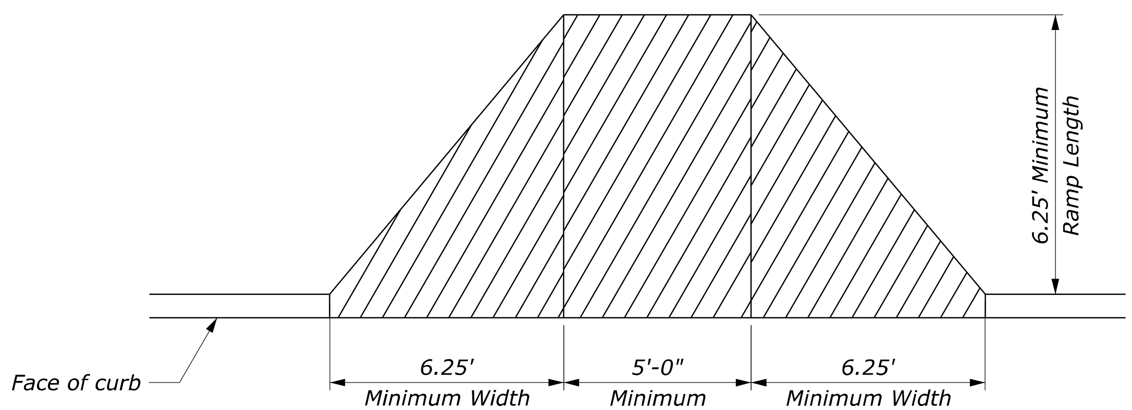


PLAN

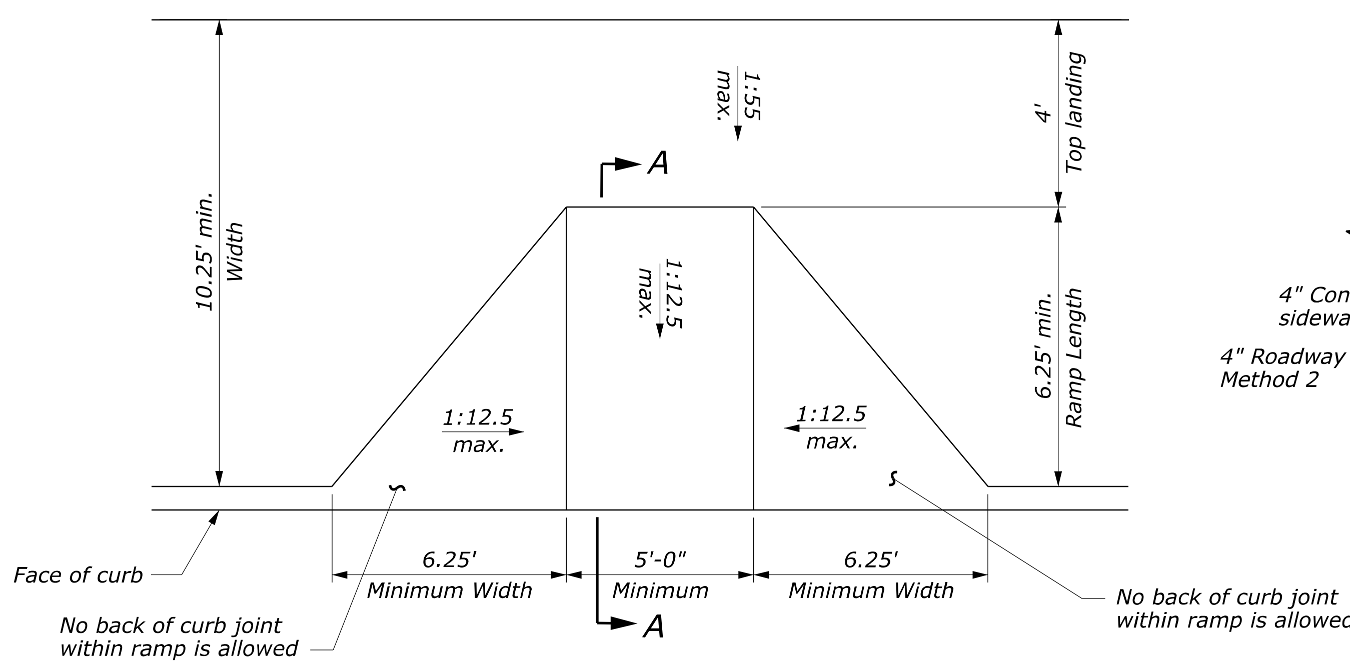
DETECTABLE WARNING FIELD WITH TRUNCATED DOMES (CAST IRON)

NOTE:

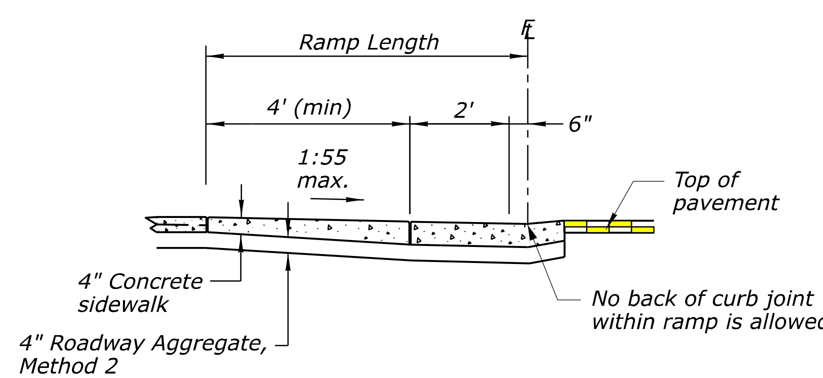
1. The maximum cross slopes of landings and accessible aisles will not exceed 1:55 (1.8%) in any direction.
2. The maximum slope on wheelchair ramps will not exceed 1:12.5 (8%).
3. Use a coarse broom finish running perpendicular to the slope to create a slip resistant surface on concrete ramp surfaces.
4. The clear width of curb ramp runs and turning spaces shall be 4-feet minimum.
5. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces.



PERPENDICULAR CURB ACCESSIBILTY RAMP PAY AREA



PERPENDICULAR CURB ACCESSIBILITY RAMP



SECTION A-A

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

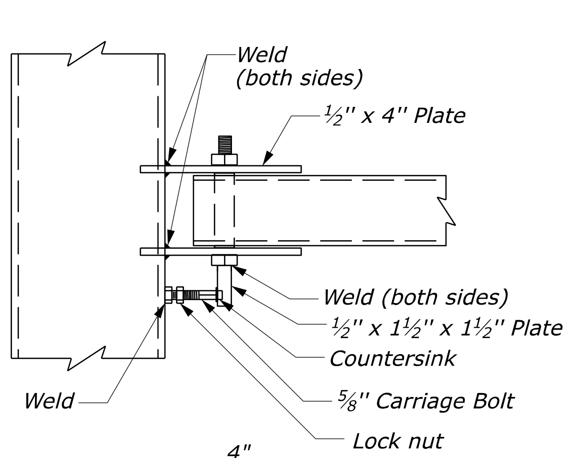
U.S. CUSTOMARY SPECIAL

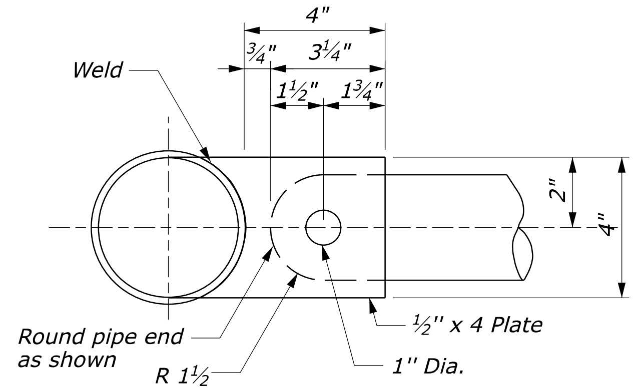
ACCESSIBILITY RAMP

SPECIAL
615-B

$USER$
$$DGN$
$TIME$
$$$$DATE$$$$

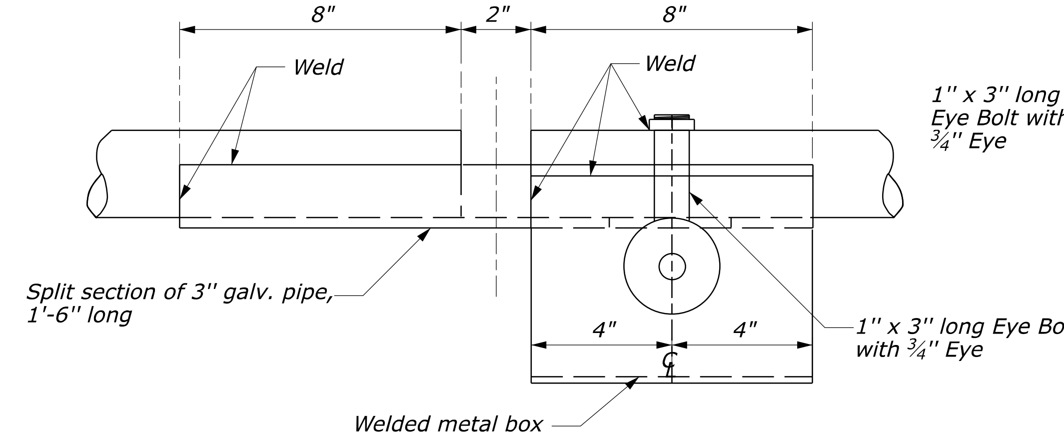
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T12



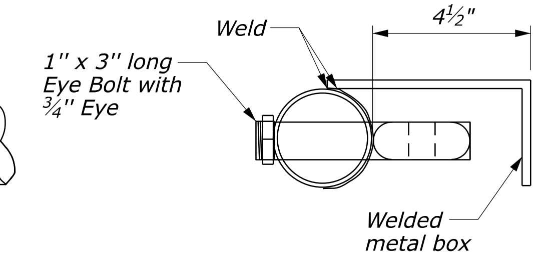


SECTION A-A

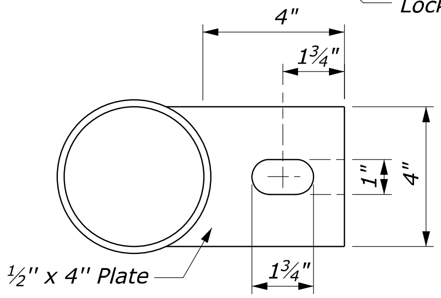
(TOP HANGER)



VIEW B-B

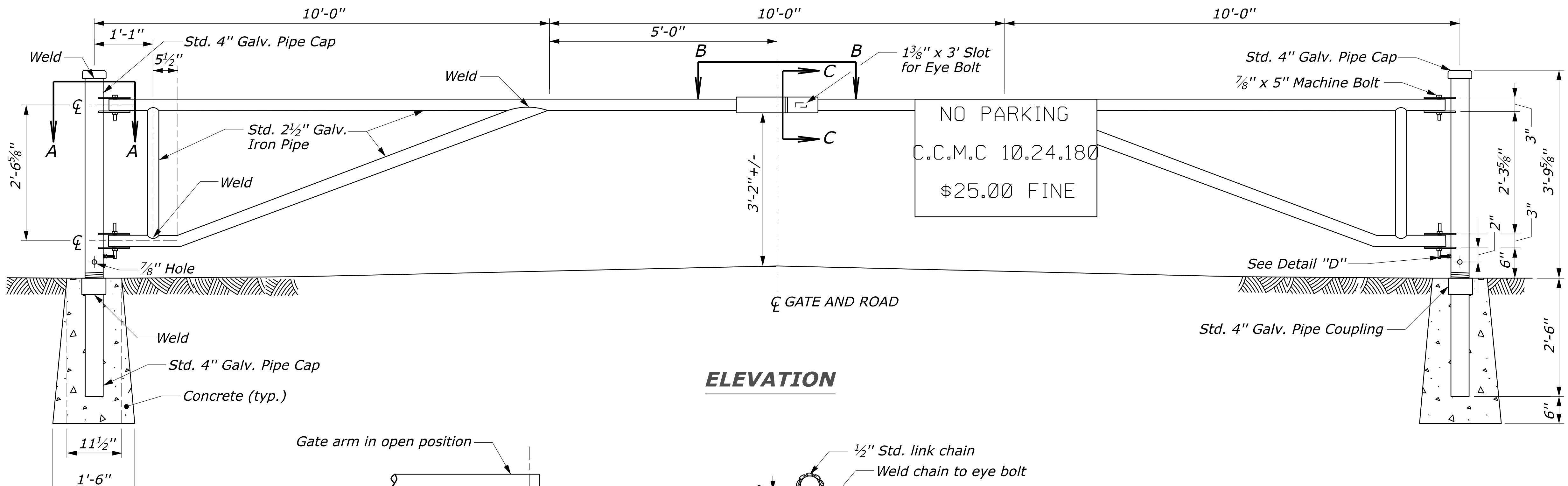


SECTION C-C

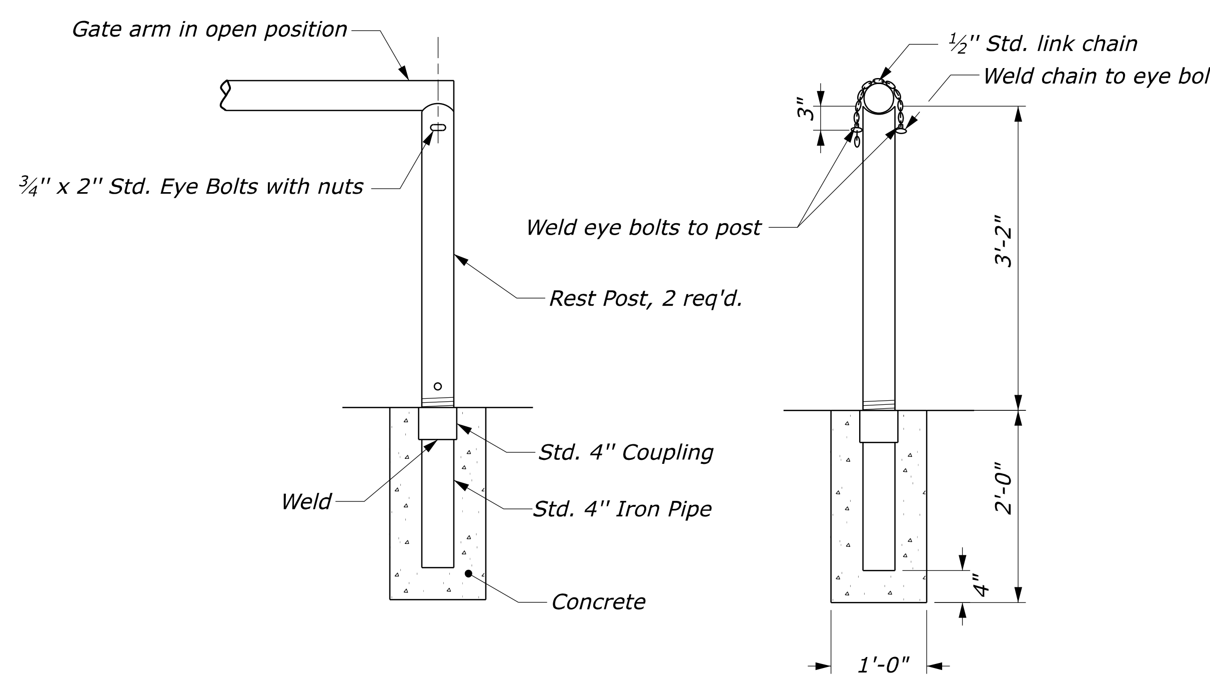


DETAIL ''D''

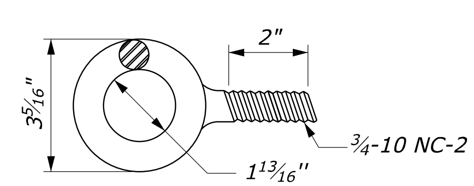
(BOTTOM HANGER)



ELEVATION



REST POST DETAIL



STD. EYE BOLT DETAIL

NOTES:

1. *Close top end of Rest Posts with 4½-inch dia. x ⅛-inch thick steel plate, form to fit and weld in place.*
2. *Paint gates and posts either alternating black and reflectorized white 4-inch stripes at 45° or use galvanized metal parts, as directed by CO.*
3. *Mount one ''Parking Lot Closed'' sign on gates as shown. Center the sign over the lane carrying the incoming traffic.*

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

METAL GATE
30 FT

SPECIAL
619-A

REVISED: MARCH 2015

$$$$DATE$$$$ $TIME$ $$$$DGN$$

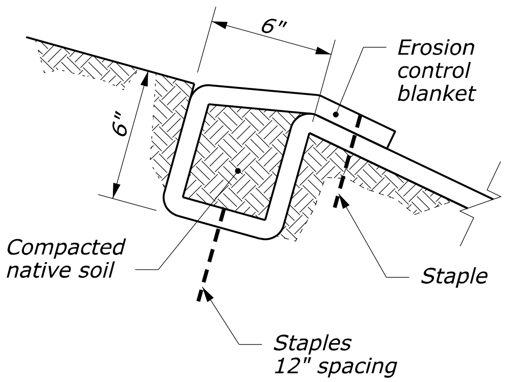
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T13

$USER$

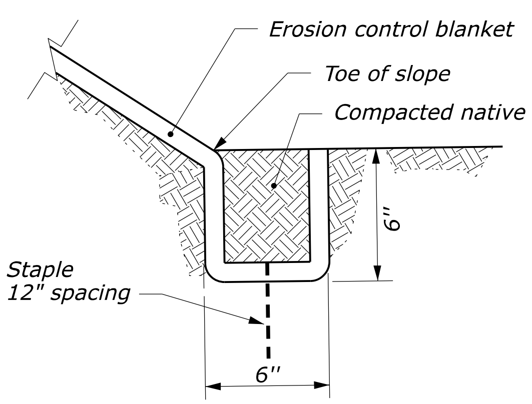
NOTE:

1. Install staples according to the manufacturer's recommendations.
2. Overlap in the direction of the prevailing wind.

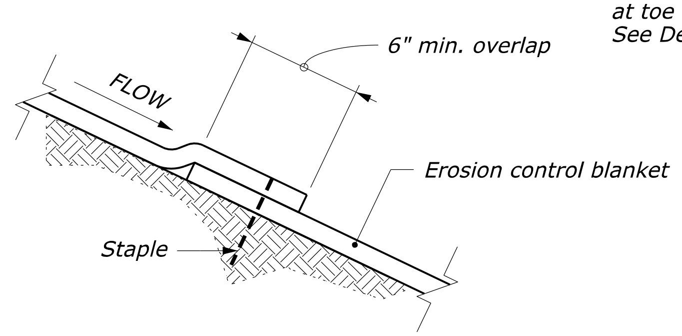
PERSPECTIVE VIEW



DETAIL A
ANCHOR TRENCH AT TOP OF SLOPE



DETAIL B
ANCHOR TRENCH AT TOE OF SLOPE



DETAIL C
SHINGLE SPLICE

$$$$DGN$$$

$TIME$

$$$$DATE$$$$

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

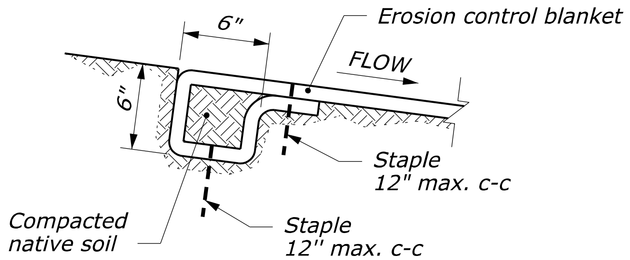
ROLLED EROSION CONTROL PRODUCT ON SLOPES

DETAIL APPROVED FOR USE 01/2011	DETAIL
REVISED: 08/2014	C629-50

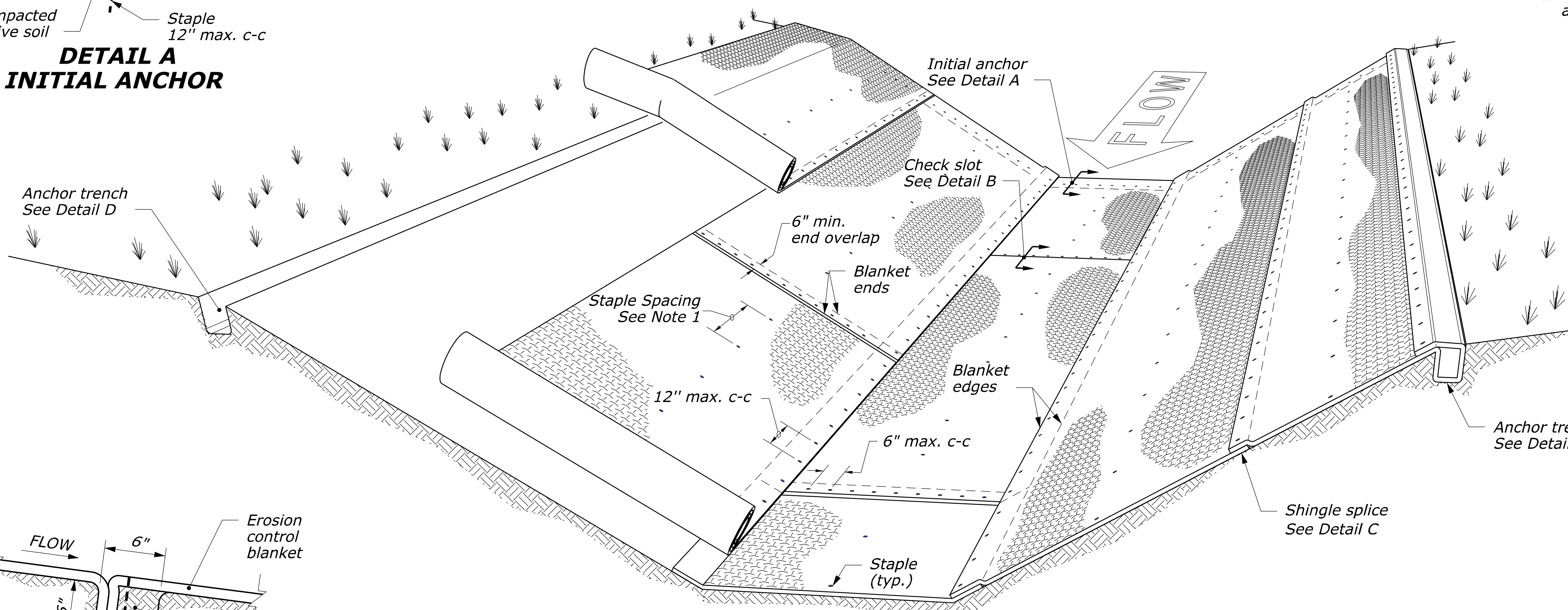
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T14

NOTE:

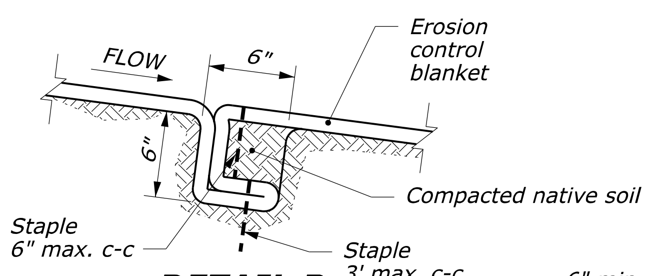
1. Install staples according to the manufacturer's recommendations.
2. Provide check slots according to the manufacturer's recommendations.
3. Roll ends may be spliced in a check slot.
4. Trapezoidal ditch shown. Similar details for a V-ditch.



DETAIL A
INITIAL ANCHOR

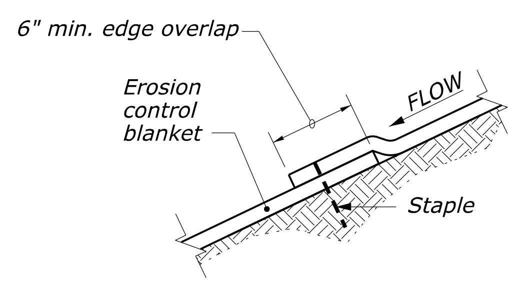


PERSPECTIVE VIEW

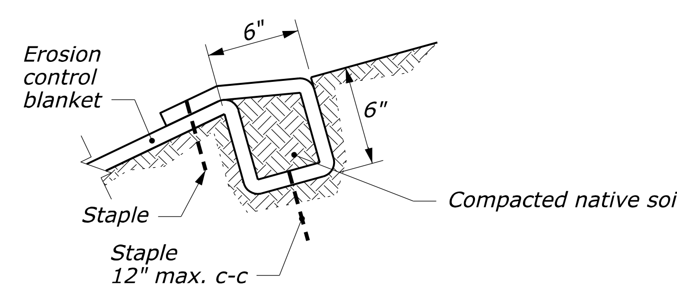


DETAIL B
CHECK SLOT

See Note 2



DETAIL C
SHINGLE SPLICE



DETAIL D
ANCHOR TRENCH

NO SCALE

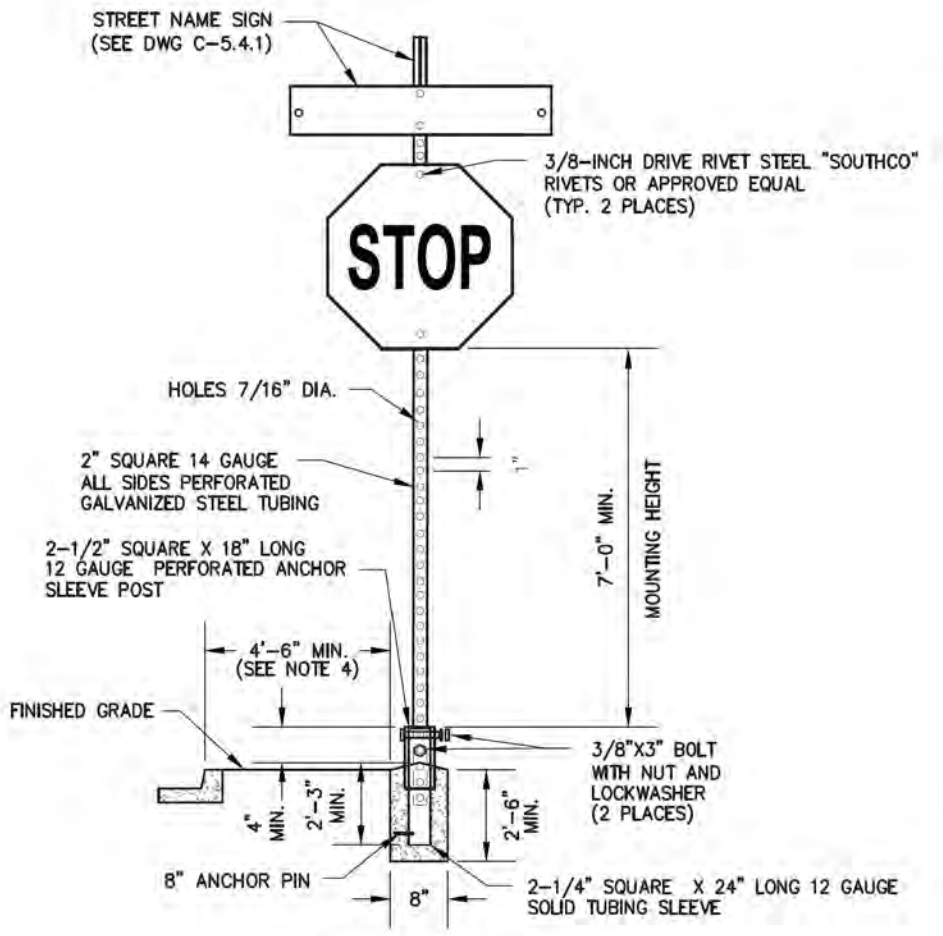
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

ROLLED EROSION CONTROL PRODUCT IN CHANNEL

DETAIL APPROVED FOR USE 01/2011	DETAIL
REVISED: 08/2014	C629-51

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T15

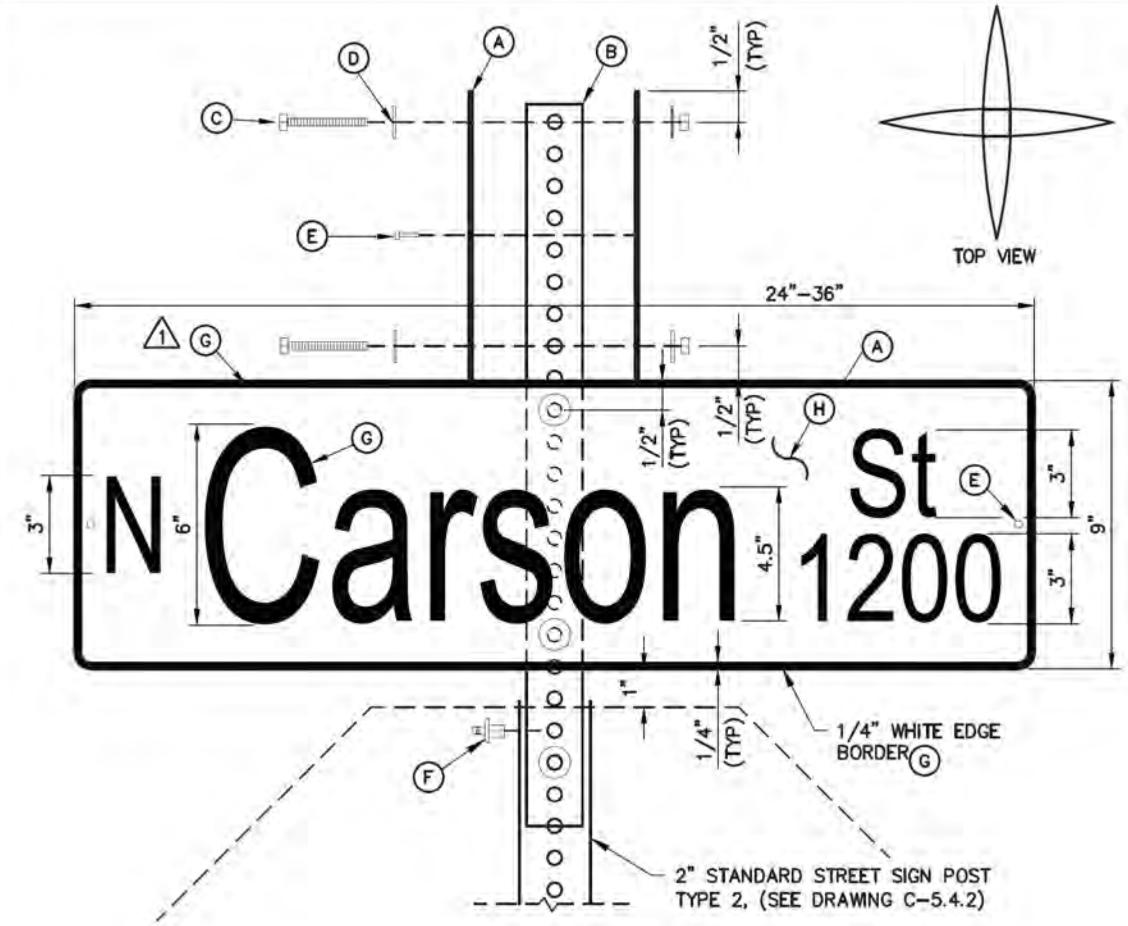


TYPICAL SECTION
NTS

NOTES:

1. SIGN MATERIALS, CONSTRUCTION AND PLACEMENT SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
2. STREET NAME SIGN SHALL BE AS SPECIFIED IN STANDARD DETAIL DRAWING NO. C-5.4.1
3. ON STREETS WHERE CURBING DOES NOT EXIST, SET SIGN 6 FEET MINIMUM FROM PAVEMENT EDGE.
4. CONCRETE BASE SHALL BE LOCATED AT BACK OF SIDEWALK, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
5. ALL REGULATORY SIGNS SHALL USE ASTM TYPE 3 OR 4 INTENSITY SHEETING.

NO.	REVISION	DATE	STANDARD DETAIL FOR PUBLIC WORKS CONSTRUCTION	SECTION CARSON CITY
			TRAFFIC SIGN INSTALLATION	DRAWING NO. C-5.4.2
APPROVED BY:		9/17		DATE SEP 2017



TYPICAL LAYOUT
NTS

NOTES:

1. STREET NAME SIGN SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE M.U.T.C.D.
2. LETTERING FONT SHALL BE "HIGHWAY EM".
3. SUBMITTAL REQUIRED TO CITY FOR LONGER NAMES OR DROP LETTERS.
4. MATERIALS SHALL CONSIST OF:
   A. (4) FLAT PLATE ALUMINUM NO. 6061-T6, .080 GAUGE.
   B. (1) 2-FOOT LONG 1 3/4-INCH "TELESPAR" OR EQUIVALENT
   C. (4) 2 1/2-INCH LONG, 5/16-INCH SAE GRADE 5 BOLT & NUT
   D. (8) FLAT WASHERS
   E. (4) 1/8-INCH DIAMETER, STEEL POP RIVET (MEDIUM LENGTH) WITH 1/8-INCH WASHER (ALUMINUM OR STEEL)
   F. (1) 3/8-INCH DRIVE RIVET STEEL "SOUTHCO"
   G. WHITE SHEETING – RETROREFLECTIVE ASTM IX DIAMOND GRADE VIP "3M" OR EQUIVALENT
   H. GREEN SHEETING – TRANSPARENCY ELETRO CUT FILM 1177C "3M" OR EQUIVALENT

NO.	REVISION	DATE	STANDARD DETAIL FOR PUBLIC WORKS CONSTRUCTION	SECTION CARSON CITY
			STREET NAME SIGN AND MOUNTING	DRAWING NO. C-5.4.1
APPROVED BY:		9/17		DATE SEP 2017

Adopted from Carson City detail C-5.4.1 and C-5.4.2

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

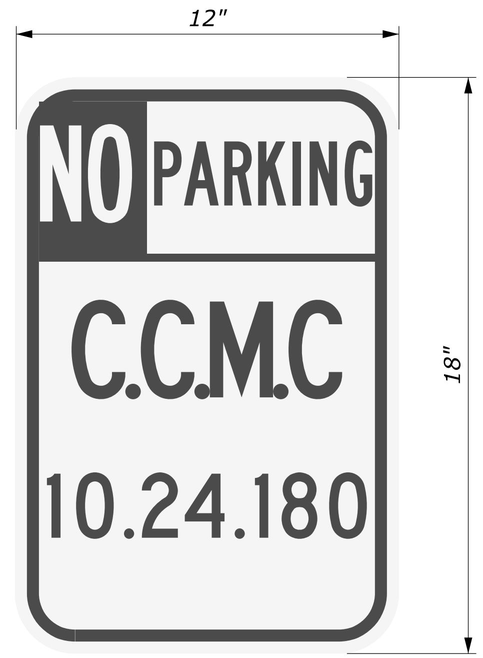
SIGN INSTALLATION

SPECIAL
633-A

$USER$ $$DGN$$$$ $TIME$ $$$$DATE$$$$

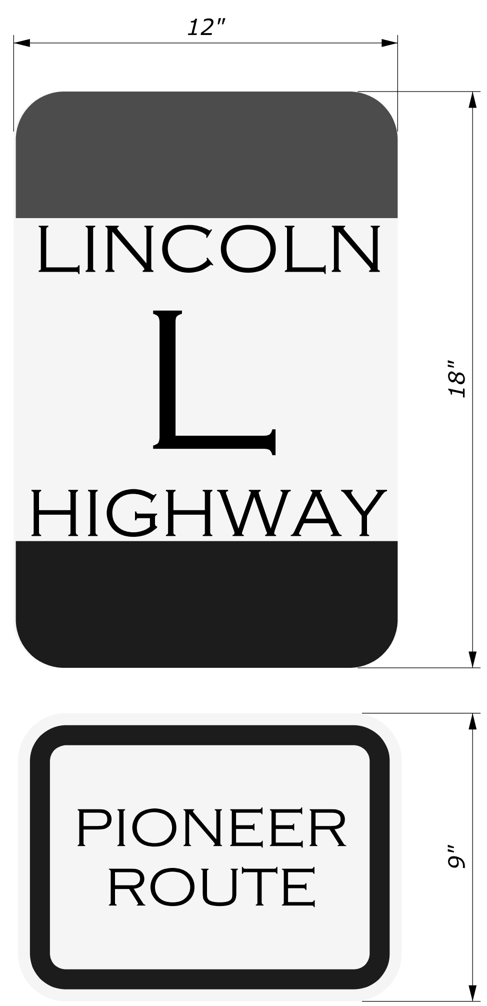
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T16

$USER$



SPECIAL 1

SPECIAL 2



SPECIAL 3

SPECIAL 4

NO SCALE

$$$$DGN$$

$TIME$

$$$$DATE$$$$

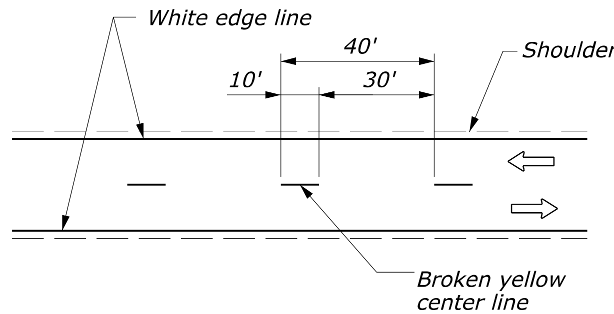
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

SPECIAL SIGNS

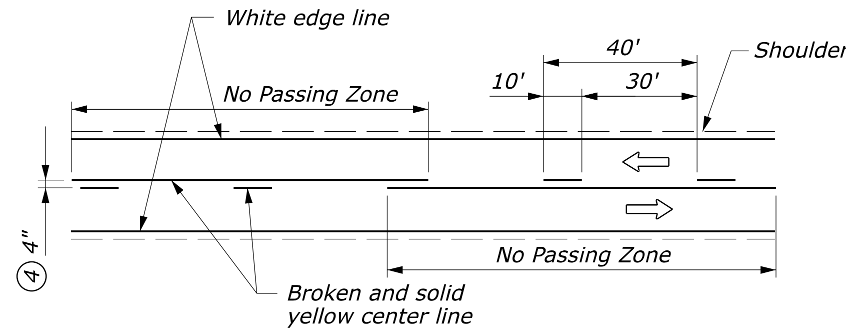
SPECIAL
633-B

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T17



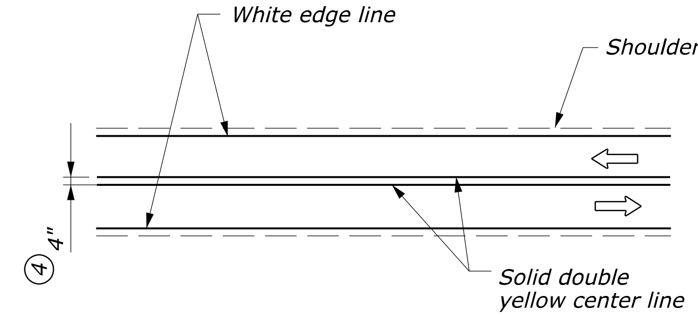
DETAIL A

Passing zone both directions
Two-way traffic



DETAIL B

No passing zone single lane direction
Two-way traffic

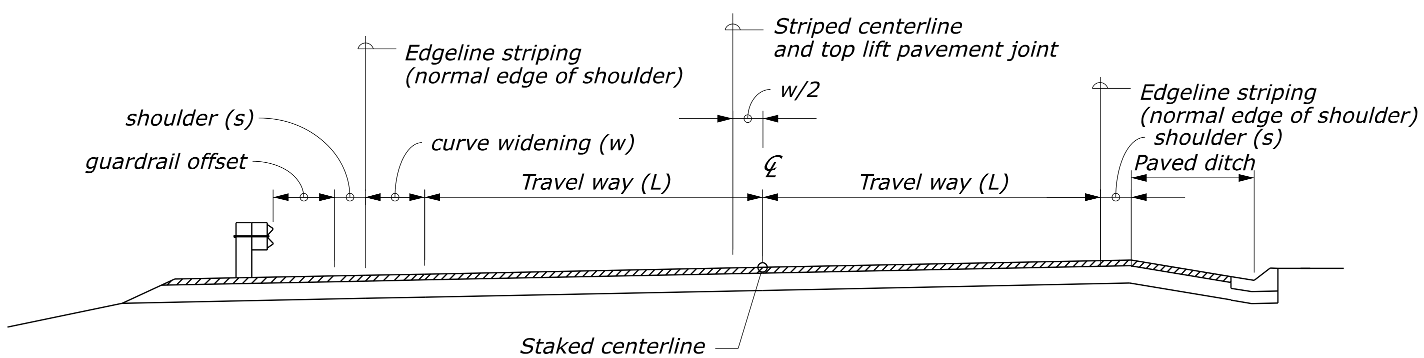


DETAIL C

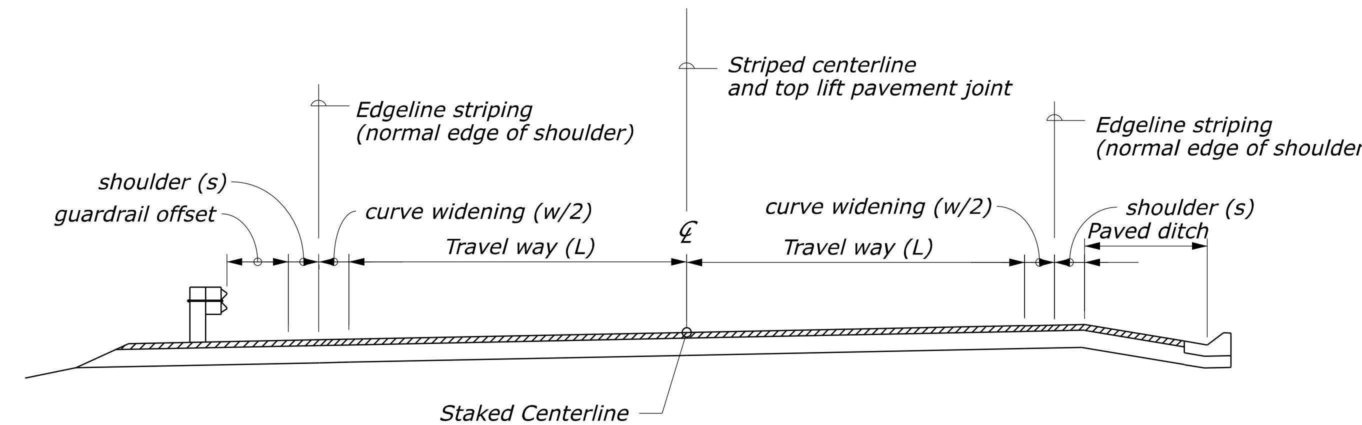
No passing zone both directions
Two-way traffic

NOTE:

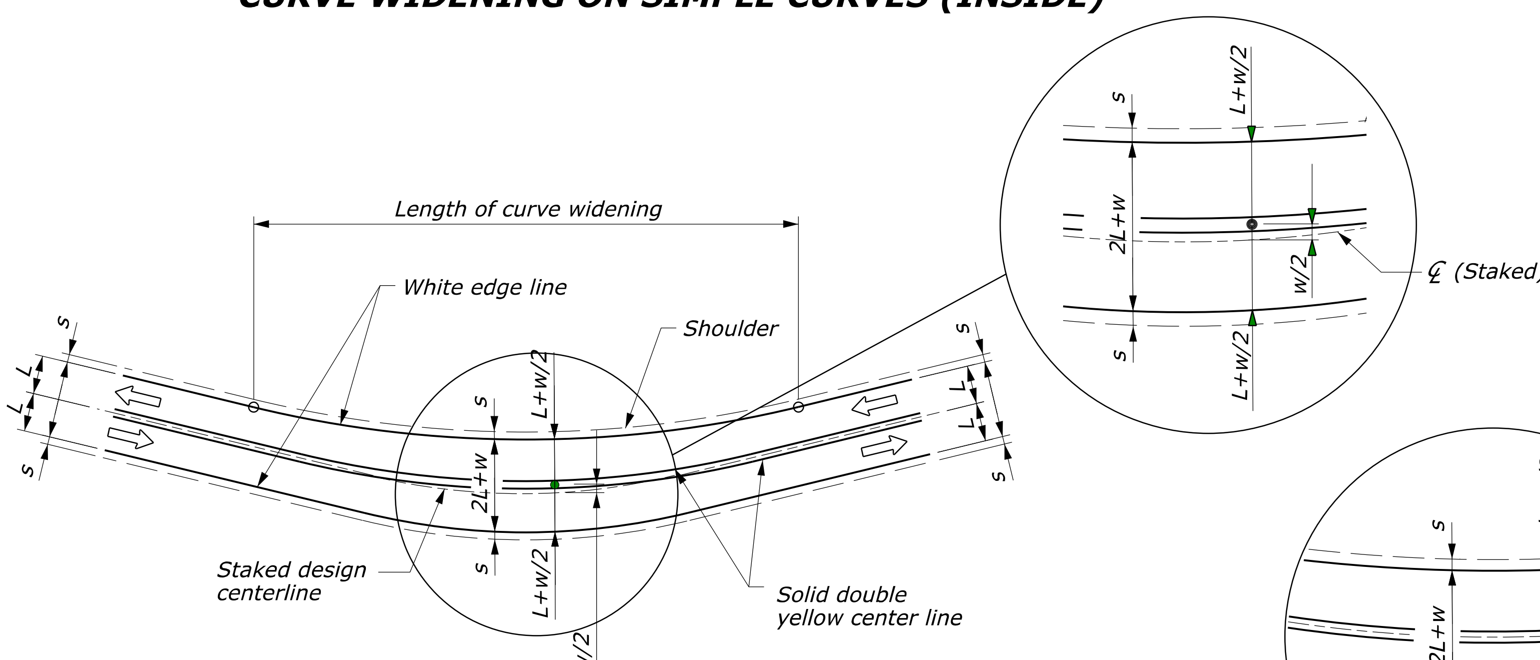
1. See Summary for tables showing station ranges and quantities for pavement markings.
2. Paint centerline striping on curves with curve widening to achieve equal lane widths within the traveled way. Shoulder widths remain constant throughout the curve widening.
3. Centerline offset striping is only applicable to curve widening on simple curves.
4. 4" or as required by the state.
5. Paint the edgeline striping outside the travel way and curve widening, 2" (max.) from the normal edge of shoulder.



CURVE WIDENING ON SIMPLE CURVES (INSIDE)

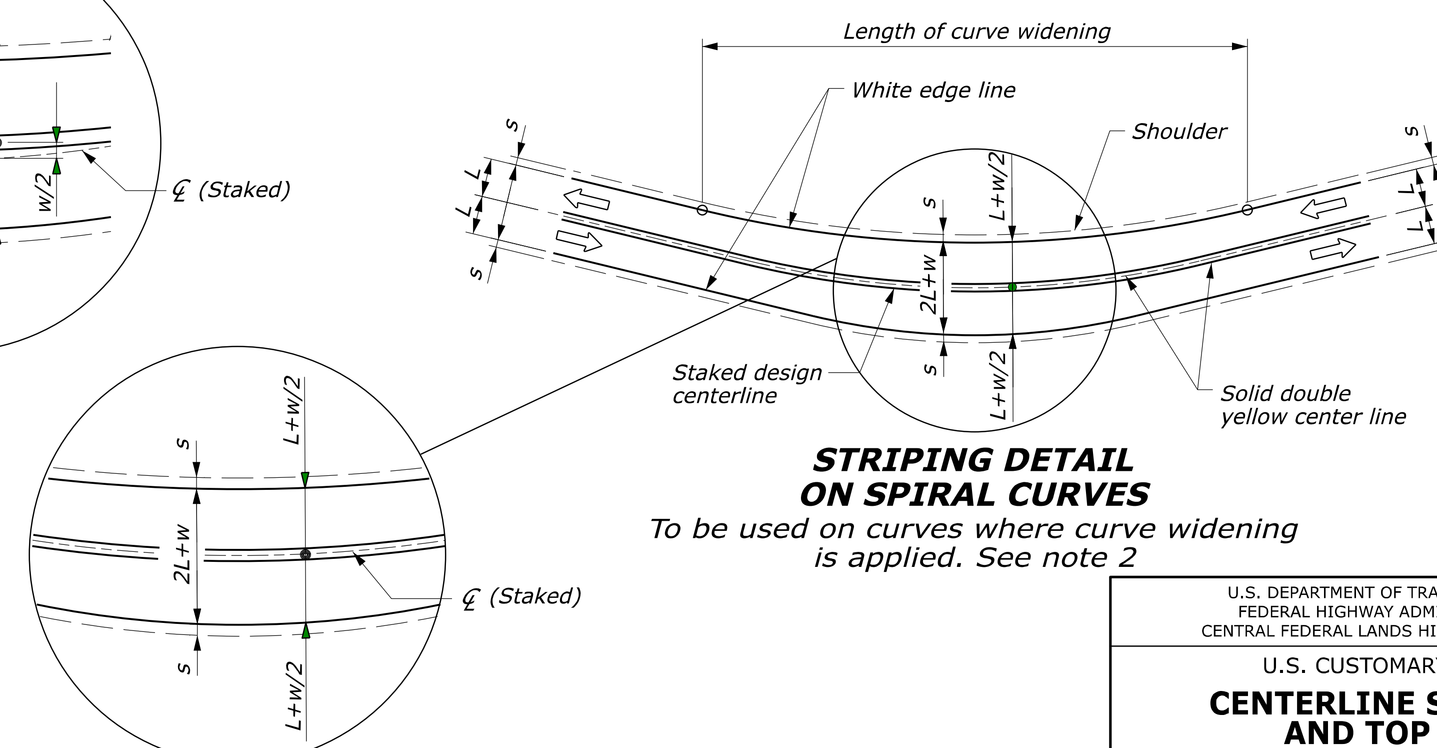


CURVE WIDENING ON SPIRAL CURVES



CURVE STRIPING DETAIL ON SIMPLE CURVES

To be used on curves where curve widening
is applied. See note 2



STRIPING DETAIL ON SPIRAL CURVES

To be used on curves where curve widening
is applied. See note 2

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

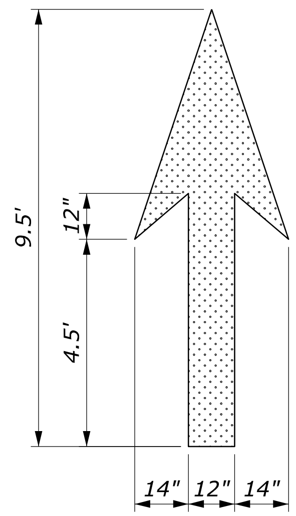
CENTERLINE STRIPING AND TOP LIFT PAVEMENT JOINT

DETAIL APPROVED FOR USE 07/2004

REVISED: 08/2006 08/2014 01/2018

DETAIL C634-50

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T18



THROUGH LANE-USE ARROW

NOTE:

1. *Place pavement word and symbol markings according to the "Manual on Uniform Traffic Control Devices" (MUTCD), current edition.*

2. *Ensure all letters, numerals and symbols conform with the "Standard Highway Signs", current edition.*

$USER$
$$$$DGN$$$
$TIME$
$$$$DATE$$$$

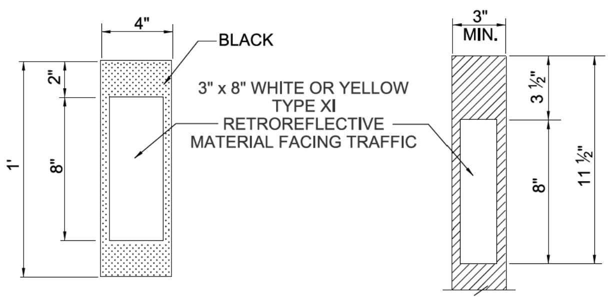
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

PAVEMENT MARKINGS SYMBOLS AND WORDS

SPECIAL
634-A

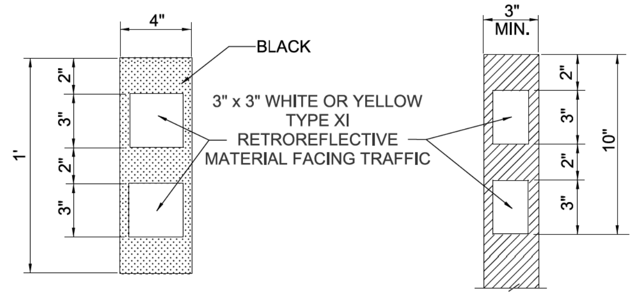
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T19



RIGID POST FLEXIBLE POST

ROADWAY - RAMPS

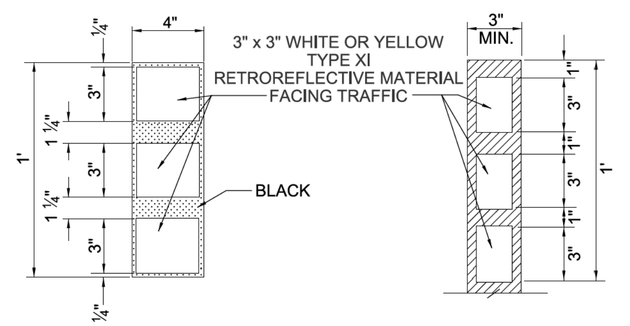
TYPE 1 REFLECTORS



RIGID POST FLEXIBLE POST

ALL APPROACHES SHALL BE DELINEATED WITH WHITE TYPE 2 GUIDEPOSTS AT THE BEGINNING AND ENDING LIMITS OF THE APPROACHES, TYPE 4 AND 5 APPROACHES WILL HAVE AN ADDITIONAL GUIDEPOST AT EACH TAPER SETBACK

TYPE 2 REFLECTORS
APPROACHES, ACCELERATION/DECELERATION LANES



RIGID POST FLEXIBLE POST

ISLANDS, CURBS, SHOULDER DIKES

TYPE 3 REFLECTORS

TABLE 1

MAXIMUM SPACING FOR GUIDEPOSTS ON HORIZONTAL CURVES LESS THAN OR EQUAL TO 10,000' — ALL DISTANCES SHOWN IN FEET AND ROUNDED TO THE NEAREST 5'				
RADIUS OF CURVE, R	SPACING ON CURVE, S	SPACING IN ADVANCE OF AND BEYOND CURVE		
		1ST	2ND	3RD
50	20	40	60	120
150	30	60	90	180
200	35	70	105	210
250	40	80	120	240
300	50	100	150	300
400	55	110	165	300
500	65	130	195	300
600	70	140	210	300
700	75	150	225	300
800	80	160	240	300
900	85	170	255	300
1,000	90	180	270	300
1,200	100	200	300	300
1,400	110	220	300	300
1,600	120	240	300	300
1,800	125	250	300	300
2,000	130	260	300	300
2,500	150	300	300	300
3,000	165	300	300	300
5,000	210	300	300	300
10,000	300	300	300	300

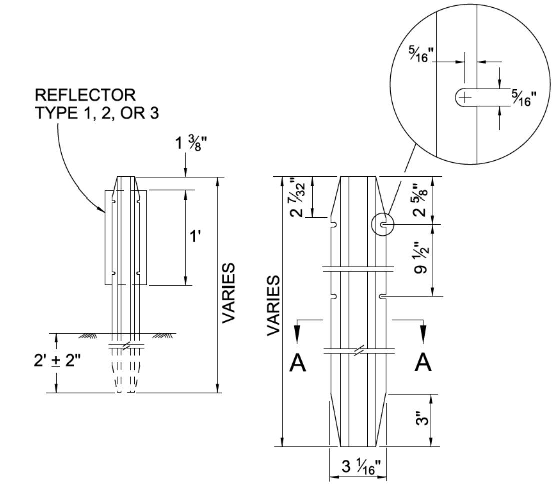
SPACING FOR SPECIFIC RADII NOT SHOWN MAY BE INTERPOLATED FROM TABLE 1 OR COMPUTED FROM THE FORMULA $S = 3\sqrt{R-50}$. S REFERS TO THE DELINEATOR SPACING AND R REFERS TO THE RADIUS OF THE CURVE. THE MINIMUM SPACING SHOULD BE 20-FEET. THE MAXIMUM SPACING ON CURVES SHOULD NOT EXCEED 300-FEET. IN ADVANCE OF AND BEYOND A CURVE, AND MEASURED PROCEEDING AWAY FROM THE END POINT OF THE CURVE, THE SPACING OF THE FIRST DELINEATOR IS 2S. THE THE SECOND IS 3S, AND THE THIRD 6S; BUT IN NO CASE TO EXCEED 300-FEET.

NOTES:

1. Guidepost reflector color shall conform to the color of adjacent striped edge line.

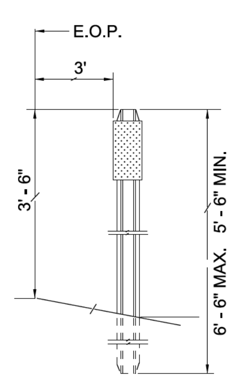
2. Guidepost Spacing:
   - A. Tangent sections and curves with radii greater than 10,000-feet: spacing shall be 400-feet both sides of roadway.
   - B. Curves with radii of 10,000-feet or less: spacing 20-foot minimum - 300-foot maximum.
     - I. Distance shall be measured along centerline of roadway and projected perpendicularly across to inside and outside of curve.
     - II. Guidepost shall be placed at beginning and end of curve, with spacing transitioned within the tangent as shown in table 1. "1st" indicates guidepost nearest curve, "3rd" is furthest away.
     - III. Spacing within curve as shown in table 1.
   - C. Acceleration/deceleration lanes and ramps: spacing 100-foot maximum for tangents and curves.
   - D. Truck escape ramps: spacing 50-feet.
   - E. Guardrail and barrier rail sections: see detail DM-2.
   - F. Islands, curbs and shoulder dikes: spacing 20-foot minimum - 50-foot maximum.
   - G. If normal spacing is interrupted by features such as driveways, approaches, etc., the guideposts may be moved a maximum of ¼ of normal spacing. Guideposts falling within such features shall be eliminated.

3. Guideposts installed on exit ramps shall have red reflective sheeting installed on the back of flexible guide posts and conform to Type XI as specified in ASTM D4956 and a red cat eye reflectors installed on the back of rigid guide posts.

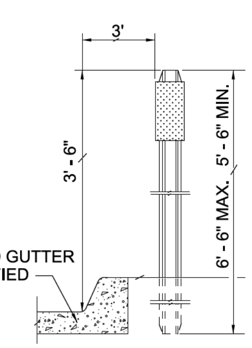


10 OR 11 GAGE THICKNESS

RIGID POST DETAILS

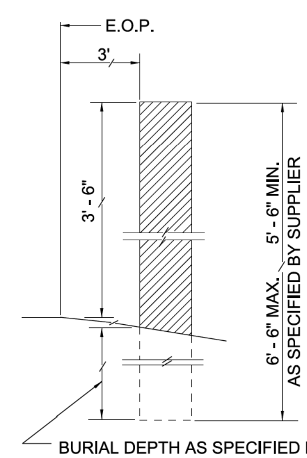


RIGID POST/REFLECTOR WITHOUT CURB AND GUTTER



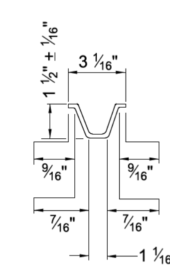
RIGID POST/REFLECTOR WITH CURB AND GUTTER

TYPICAL INSTALLATIONS



FOR TUBULAR POST, WRAPAROUND REFLECTORS ARE ACCEPTABLE, SEE TYPES FOR VERTICAL DIMENSIONS

FLEXIBLE POST



SECTION A-A

NEVADA DEPARTMENT OF TRANSPORTATION

CHIEF ROAD DESIGN ENGR. SIGNED ORIGINAL ON FILE

ADOPTED 10/2015

REVISED 7/2019

GUIDE POSTS

SPEC. # 619

Adopted from NDOT detail DM-1

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

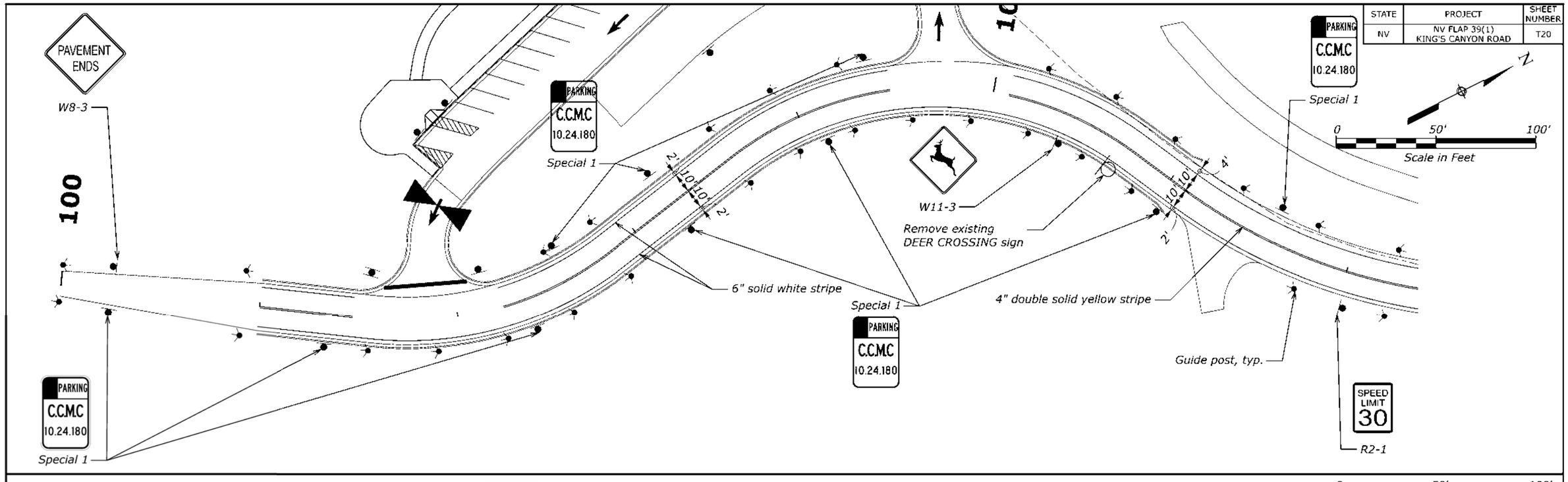
U.S. CUSTOMARY SPECIAL

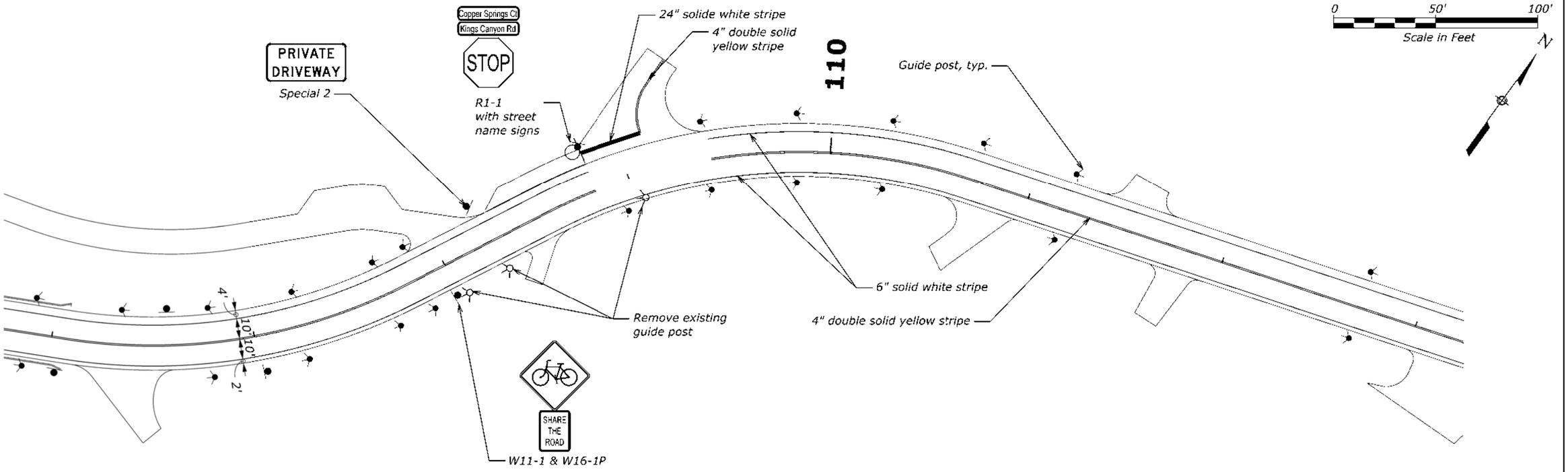
GUIDE POST

SPECIAL 634-B

$USER$ $$$$DGN$$ $TIME$ $$$$DATE$$$$

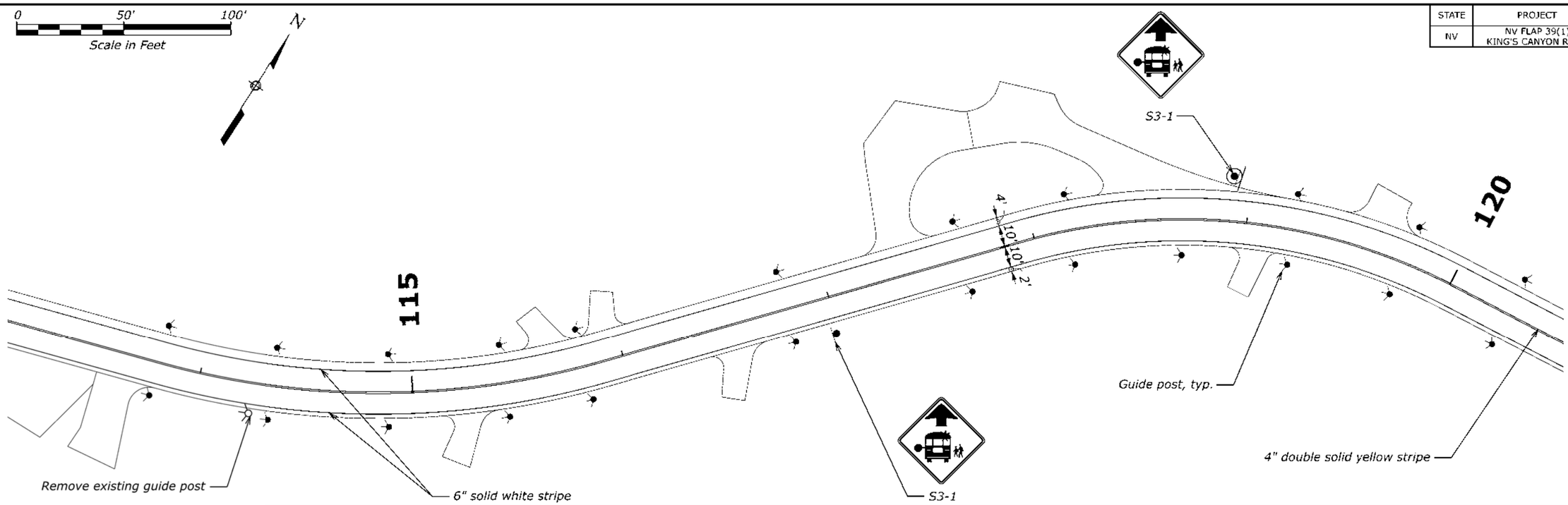
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T20

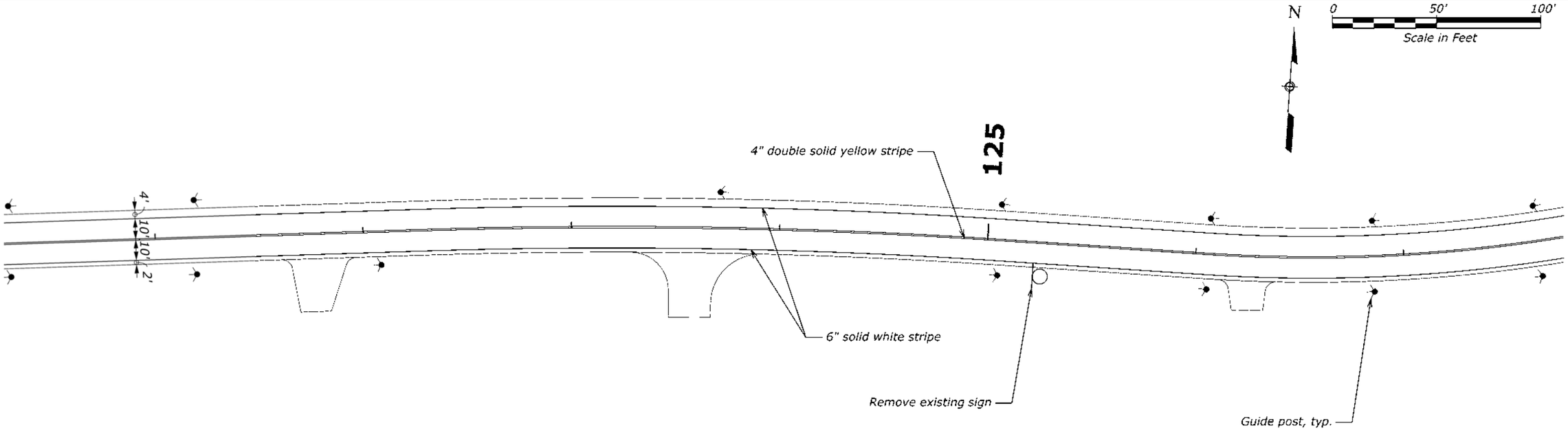




KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
100+00.00 to 113+15.00

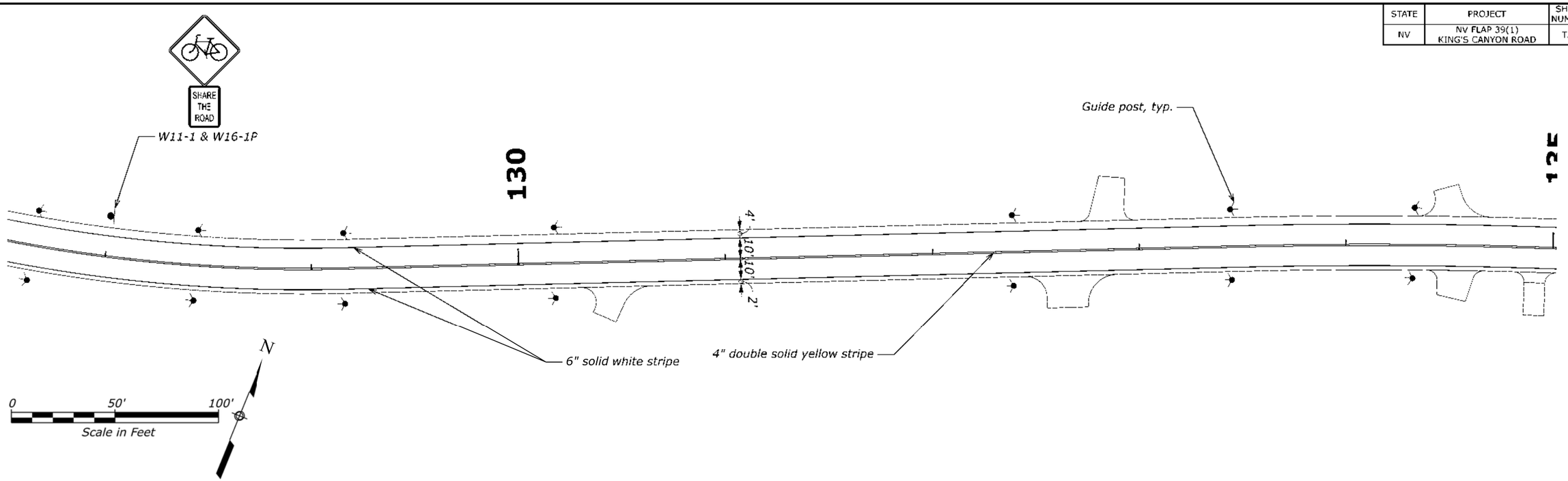
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T21

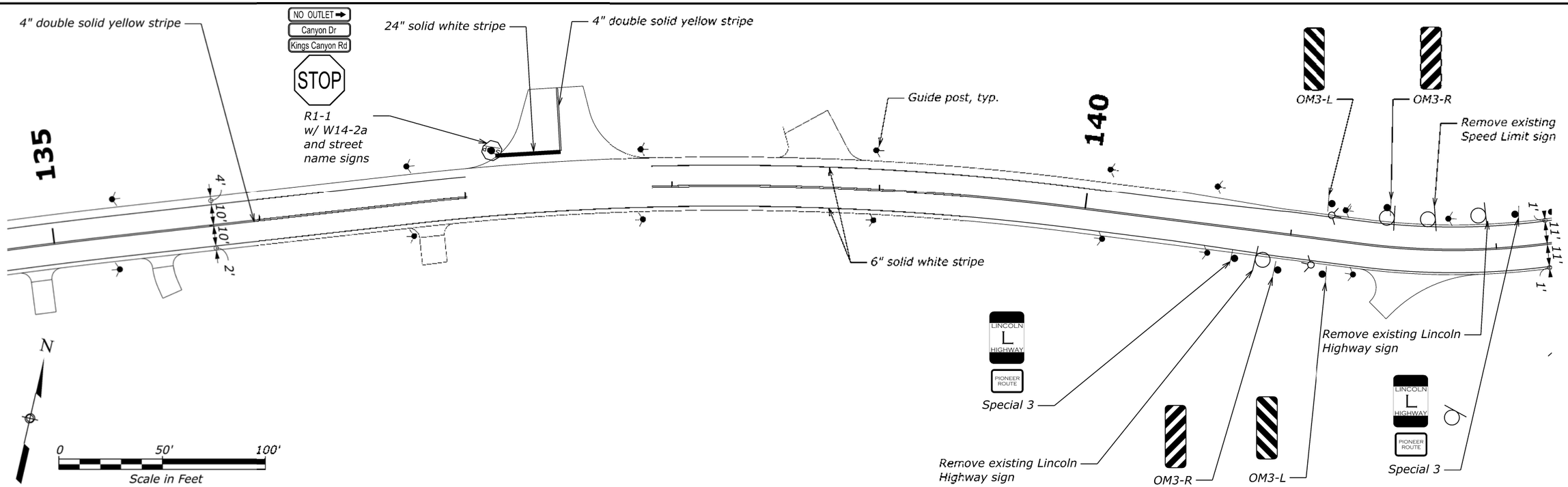




KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
113+15.00 to 127+65.00

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T22





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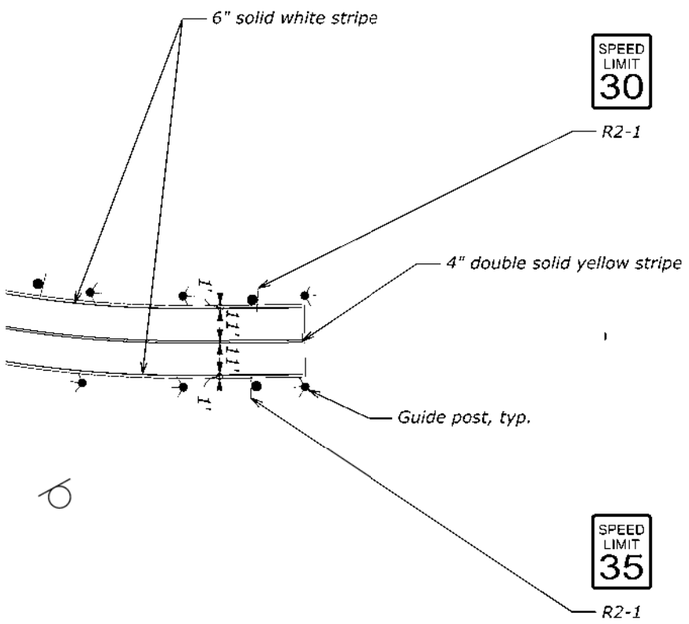
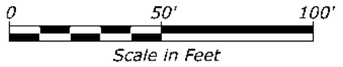
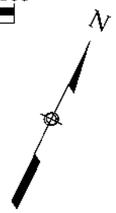
19 January 2021 9:33 AM

KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
127+65.00 to 142+15.00







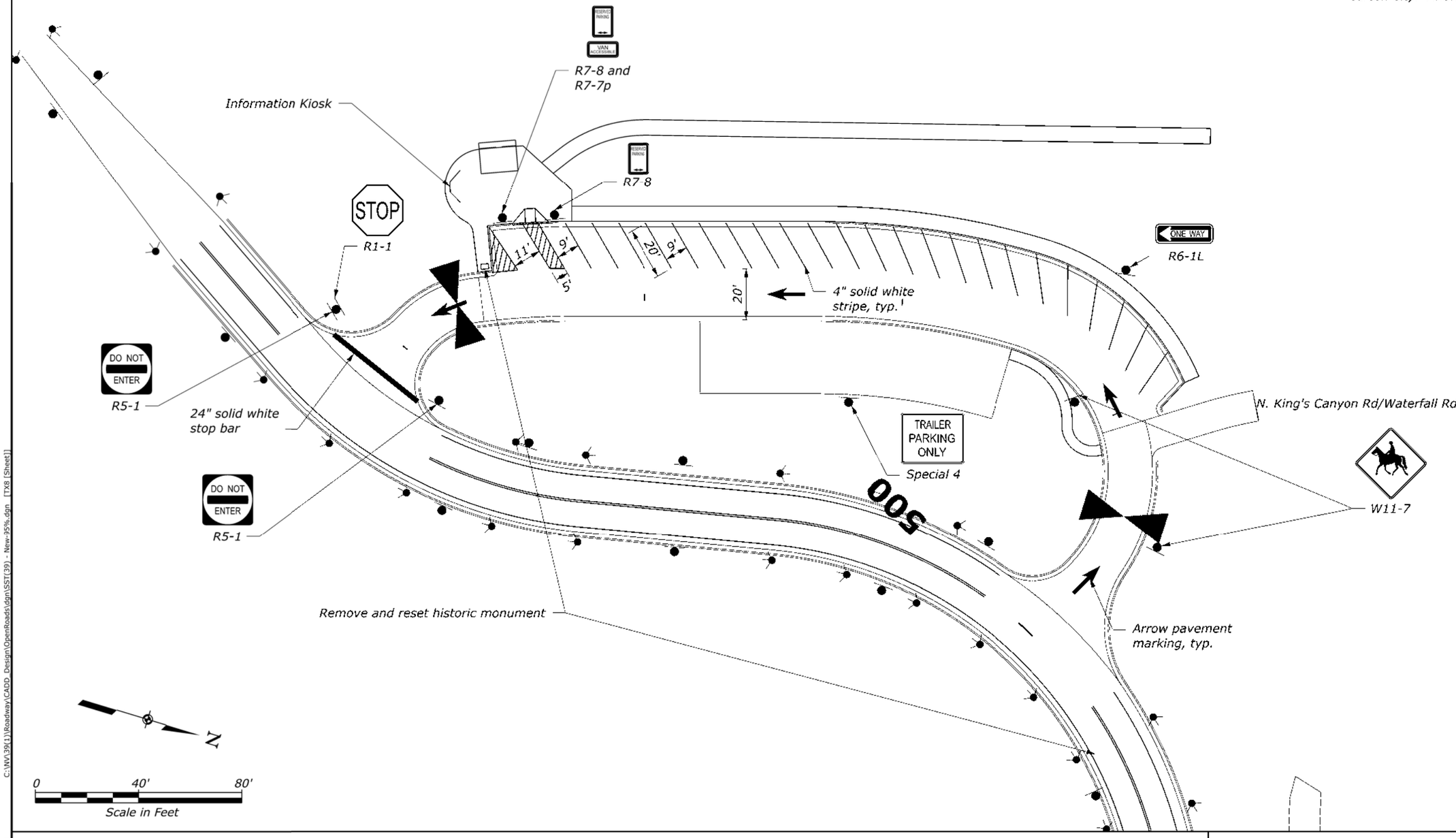
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T23

KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
142+15.00 to 143+00.0

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T24

NOTE:

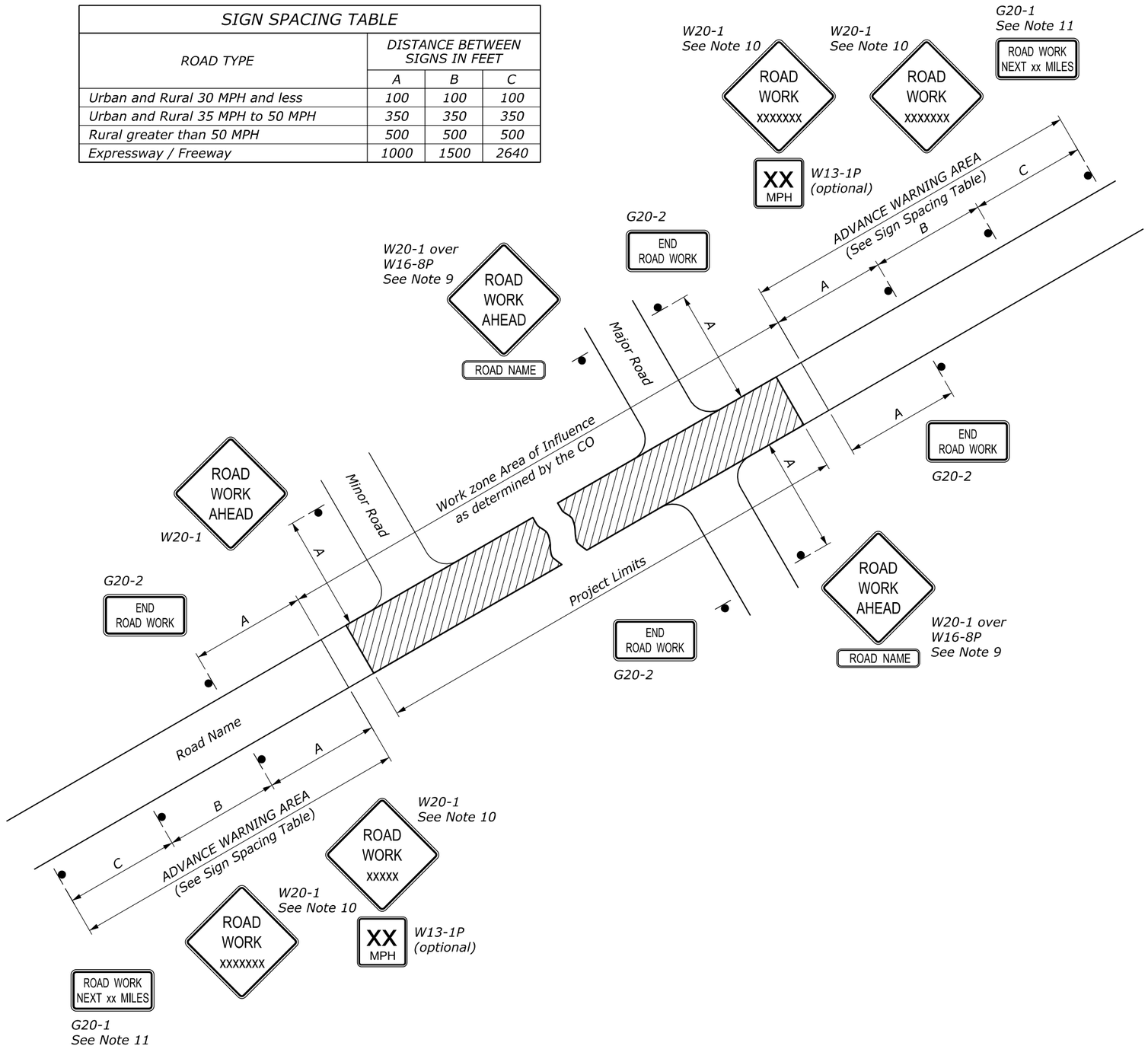
1. *Trailhead signage and existing Information Kiosk to be salvaged and returned to Carson City. Awaiting input on USFS signage.*



KING'S CANYON ROAD SIGNING AND STRIPING SHEET PARKING LOT

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T25

SIGN SPACING TABLE			
ROAD TYPE	DISTANCE BETWEEN SIGNS IN FEET		
	A	B	C
Urban and Rural 30 MPH and less	100	100	100
Urban and Rural 35 MPH to 50 MPH	350	350	350
Rural greater than 50 MPH	500	500	500
Expressway / Freeway	1000	1500	2640



NOTE:

1. *Erect all project advance warning signs before starting construction work.*
2. *Not all details shown on the temporary traffic control sheets may be applicable to this project. The Contractor may add or delete information and details in this traffic control plan as necessary to accommodate actual operations.*
3. *Where advance warning signs, placed as shown, interfere with permanent signs, locate the warning signs as determined by the CO for best results. Vary messages as required.*
4. *Additional or different message signs may be required to fit the actual construction conditions.*
5. *Install advisory speed plates under the W20 series warning signs as needed to indicate a maximum recommended speed through the construction area.*
6. *Ensure all sign supports exposed to impact by traffic meet the requirements of NCHRP-350 or MASH for crashworthiness.*
7. *Maintain two-way traffic during all non-work hours except as approved by the CO.*
8. *Do not store traffic control devices along the roadway when not in use. Cover post-mounted signs when not applicable.*
9. *If W20-1 is placed on a roadway other than that on which the actual construction work occurs, include a supplementary plaque indicating the name of the road on which the construction does occur (applies to major roads only).*
10. *The message on the W20-1 signs may be "ROAD WORK AHEAD" or may specify the distance to the work area in feet or in miles. Install an additional W20-1 sign when approach speeds exceed 50 MPH. When used place the two W20-1 signs "B" feet apart according to the Sign Spacing Table.*
11. *For work zones that are 2 miles or more in length, install G20-1 signs at each end of the project. Show the distance on the G20-1 sign to the nearest whole mile.*
12. *If signing on a roadway under a jurisdiction other than the client agency, verify that an encroachment permit has been obtained.*
13. *State standards may be used as an alternative if approved by the CO.*
14. *Refer to the Section 635 of the Special Contract Requirements for allowable retroreflective sheeting types.*

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

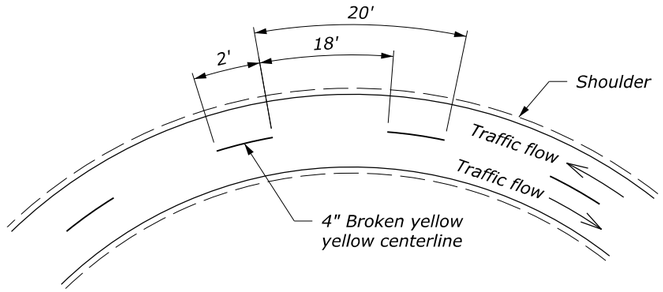
U.S. CUSTOMARY STANDARD

TEMPORARY TRAFFIC CONTROL ADVANCE SIGNING

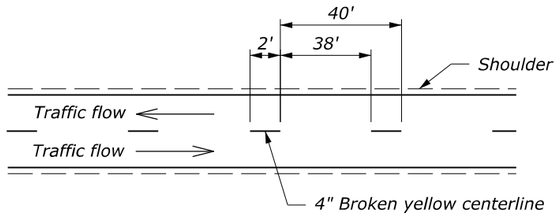
STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 6/2014

STANDARD 635-1

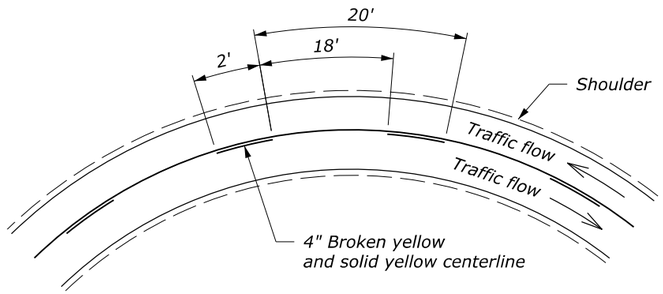
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T26



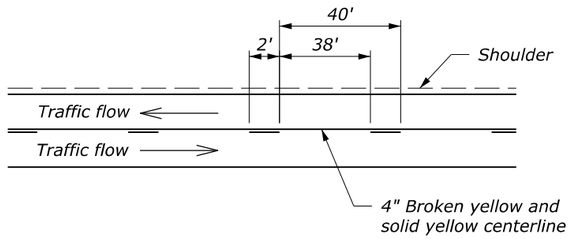
DETAIL A1
Passing zone both directions
Two-way traffic



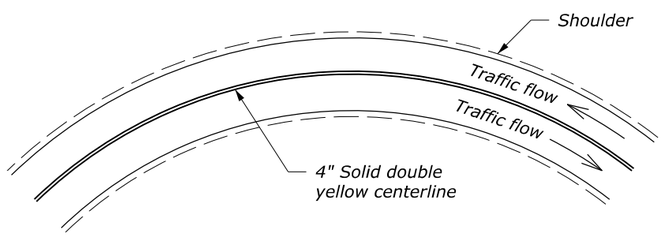
DETAIL B1
Passing zone both directions
Two-way traffic



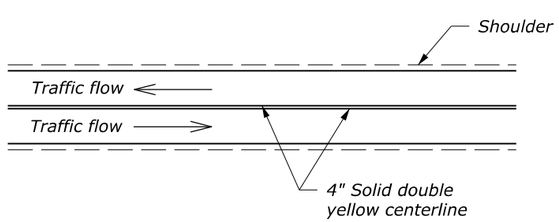
DETAIL A2
No passing zone one direction
Two-way traffic



DETAIL B2
No Passing zone one direction
Two-way traffic



DETAIL A3
No passing zone both directions
Two-way traffic



DETAIL B3
No Passing zone both directions
Two-way traffic

DETAIL A
Curves < 500' Radius

DETAIL B
Tangents or Curves ≥ 500' Radius

NOTE:

1. *To substitute raised pavement markers for lines, use the following patterns:*

   2' broken line: two pavement markers spaced 2' apart allowed by the gap shown based on curvature.

   Single solid line: pavement markers spaced on 10' centers.

   Double solid line: two pavement markers, side by side, spaced on 10' centers.

2. *On two- or three-lane roads, signs may be used instead of temporary pavement markings as shown on Standard 635-3.*

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

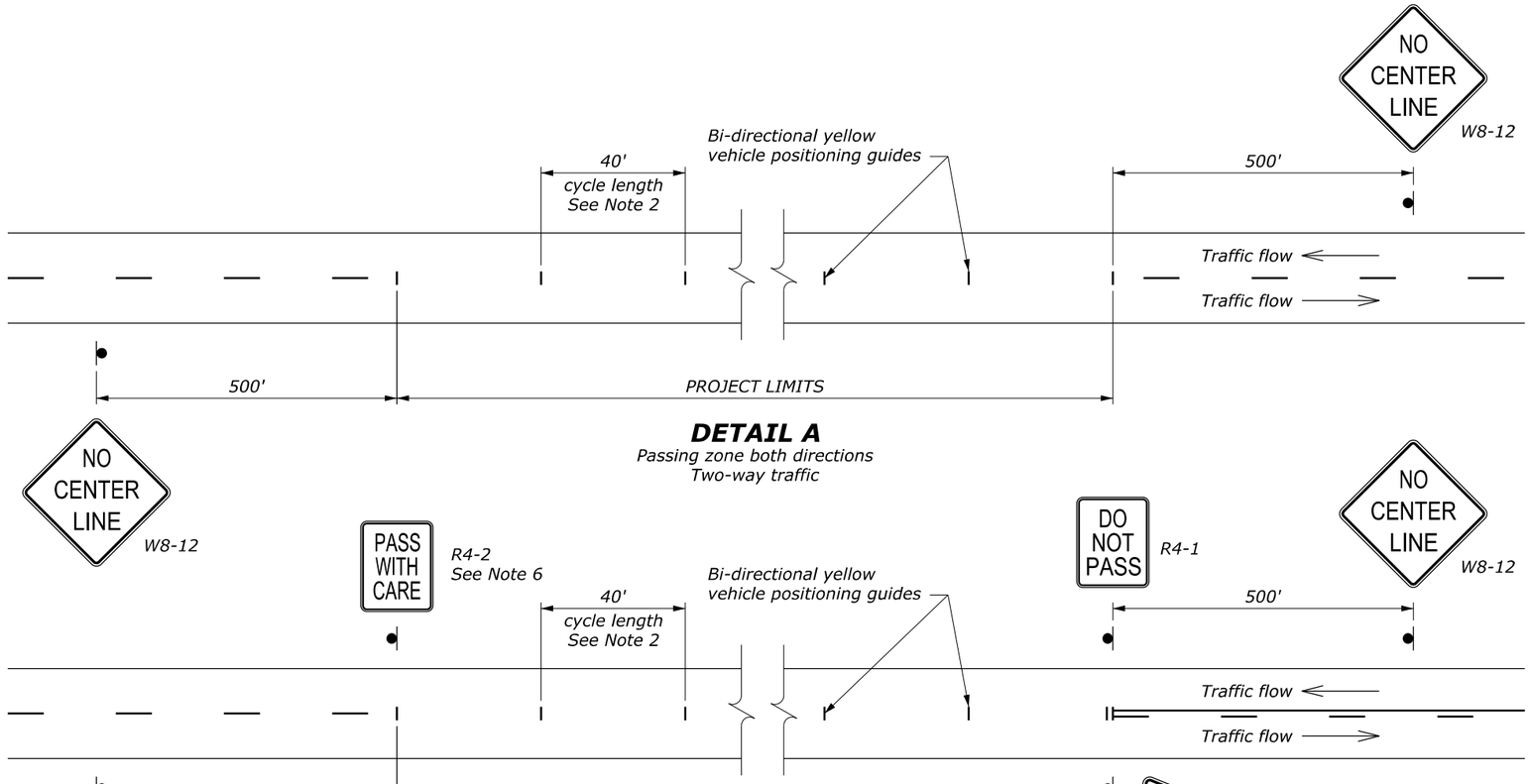
U.S. CUSTOMARY STANDARD

TEMPORARY PAVEMENT MARKINGS

STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 9/2016

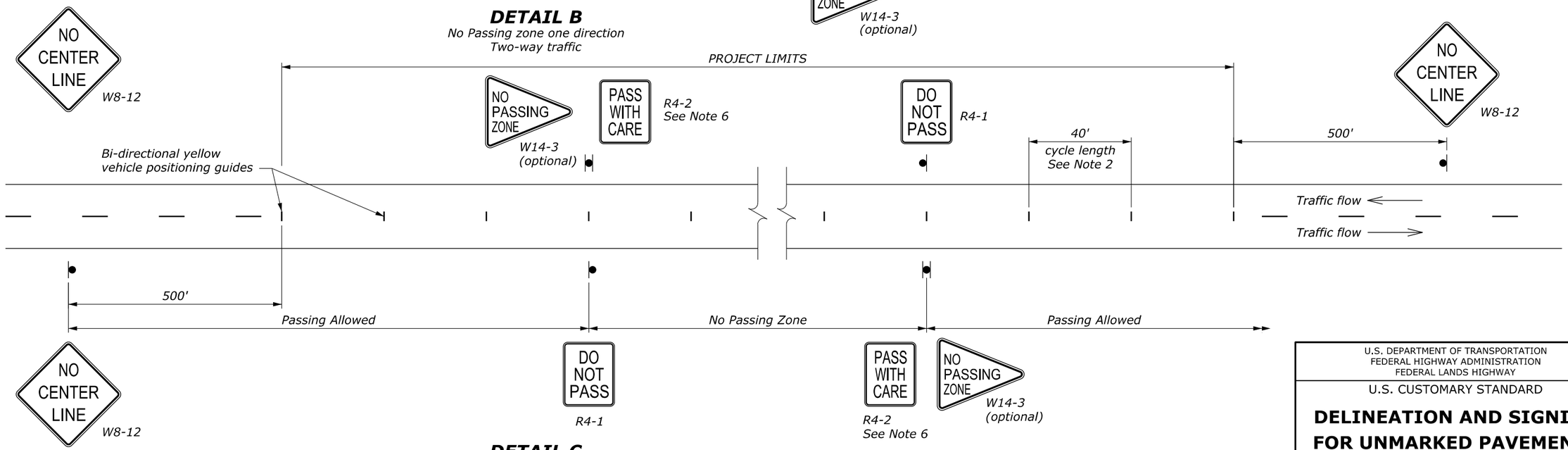
STANDARD 635-2

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T27



DETAIL A
Passing zone both directions
Two-way traffic

DETAIL B
No Passing zone one direction
Two-way traffic



DETAIL C
No Passing zone both directions
Two-way traffic

NOTE:

1. *The pavement on two- or three-lane roads may remain unmarked up to 14 days when providing signs according to this standard. Optionally use the vehicle positioning guides to provide additional delineation.*
2. *On curves with radius less than 500', reduce cycle length to 20'.*
3. *Use permanent markings plan to determine no passing zones for each direction of travel.*
4. *Repeat R4-1 at 1 mile intervals.*
5. *Repeat W8-12 after each major intersection and every 2 miles for temporary traffic control zones greater than 3 miles long.*
6. *Use the "PASS WITH CARE" (R4-2) sign at the downstream end of a no-passing zone only if a "DO NOT PASS" (R4-1) sign has been installed at the upstream end of the zone.*

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

DELINEATION AND SIGNING FOR UNMARKED PAVEMENTS

STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 8/2013

STANDARD 635-3

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12 May 2020 2:40 PM

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T28

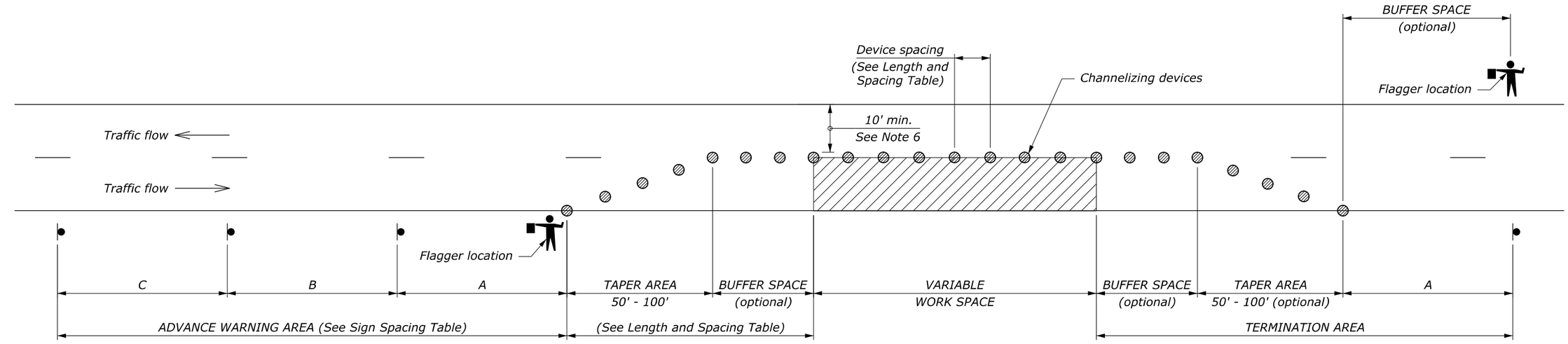
LENGTH AND SPACING TABLE				
APPROACH SPEED*	BUFFER SPACE LENGTH	CHANNELIZING DEVICE		
		TAPER AREA	BUFFER SPACE	WORK SPACE
MPH	FEET	SPACING IN FEET		
20	115	20	40	40
25	155	20	50	50
30	200	20	60	60
35	250	20	70	70
40	305	20	80	80
45	360	20	90	90
50	425	20	100	100
55	495	20	110	110
60	570	20	120	120
65	645	20	130	130
70	730	20	140	140

* Approach speed based on the regulatory posted speed, not the advisory speed.

SIGN SPACING TABLE			
ROAD TYPE	DISTANCE BETWEEN SIGNS IN FEET		
	A	B	C
Urban and Rural 30 MPH and less	100	100	100
Urban and Rural 35 MPH to 50 MPH	350	350	350
Rural greater than 50 MPH	500	500	500
Expressway / Freeway	1000	1500	2640

NOTE:

1. Signs are shown for one direction of travel only. Place devices similar to those depicted for the opposite direction of travel.
2. Final location and spacing of signs and devices may be changed to fit field conditions as approved by the CO.
3. For pilot car operation, mount the PILOT CAR FOLLOW ME (G20-4) sign at a conspicuous location on the rear of vehicle. Prominently display the name of the contractor on the pilot car.
4. If closure is completely within the project limits, eliminate the "ROAD WORK AHEAD" (W20-1) and "END ROAD WORK" (G20-2) signs.
5. For night time flagging operation, provide floodlighting at flagger stations.
6. For project specific minimum width, refer to the Special Contract Requirements, Section 156.
7. Do not allow equipment, materials, or vehicles to be parked or stored in the buffer space.

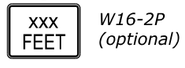


W20-1
See Note 4

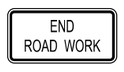
W20-4

W13-1P
(optional)

W20-7



W16-2P
(optional)



G20-2
See Note 4

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

TEMPORARY TRAFFIC CONTROL SINGLE LANE CLOSURE LAYOUT (WITH FLAGGERS)

STANDARD APPROVED FOR USE 6/2005

REVISED:
DRAFT: 8/2013

STANDARD
635-6

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12 May 2020 2:43 PM

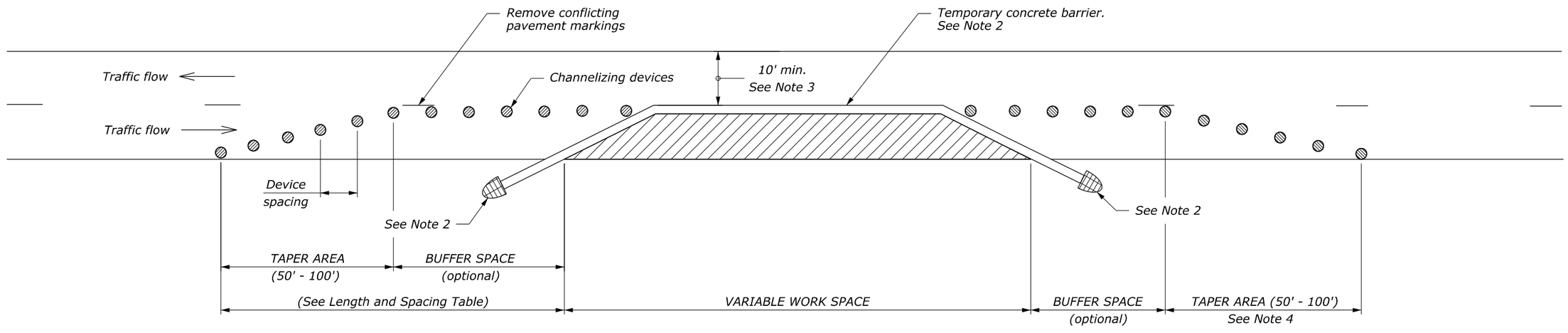
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T29

LENGTH AND SPACING TABLE						
APPROACH SPEED*	BUFFER SPACE LENGTH	CHANNELIZING DEVICE			CONCRETE BARRIER FLARE RATE	WORK ZONE CLEAR ZONE WIDTH
		TAPER AREA	BUFFER SPACE	WORK SPACE		
MPH	FEET	SPACING IN FEET				FEET
20	115	20	40	40	1:8	10
25	155	20	50	50	1:8	10
30	200	20	60	60	1:8	10
35	250	20	70	70	1:9	10
40	305	20	80	80	1:10	15
45	360	20	90	90	1:12	20
50	425	20	100	100	1:14	20
55	495	20	110	110	1:16	20
60	570	20	120	120	1:16	30
65	645	20	130	130	1:16	30
70	730	20	140	140	1:16	30

* Approach speed based on the regulatory posted speed, not the advisory speed.

NOTE:

1. Install signs and other devices for single lane closure according to Standard 635-6, 7, 8, or 9. Final location and spacing of signs and devices may be changed to fit field conditions as approved by the CO.
2. Place barrier according to the AASHTO Roadside Design Guide. Terminate barrier ends outside the work zone clear zone or protect the barrier ends with a crash cushion. Include reflectors on barrier at 25' intervals.
3. For project specific minimum width, refer to Special Contract Requirements, Section 156.
4. Place channelizing devices at downstream taper during non-work hours or when access is not needed.
5. Do not allow equipment, materials, or vehicles to be parked or stored in the buffer space.
6. Reduce or eliminate drums and barrier in downstream taper if necessary to provide access to work space.



NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

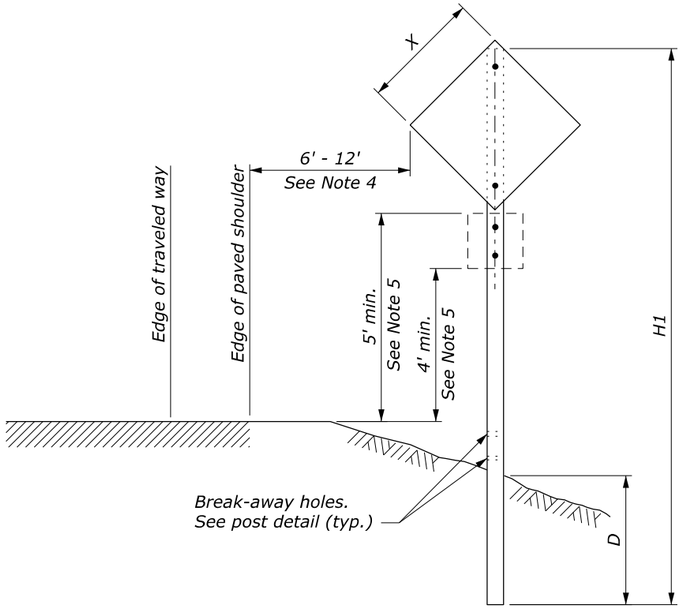
U.S. CUSTOMARY STANDARD

TEMPORARY TRAFFIC CONTROL SINGLE LANE CLOSURE LAYOUT (WITH TEMPORARY BARRIER)

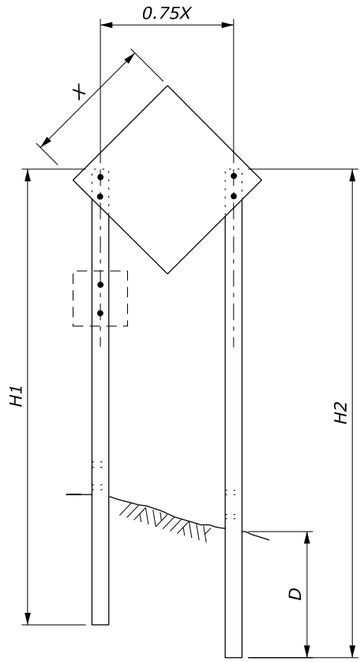
STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 6/2015

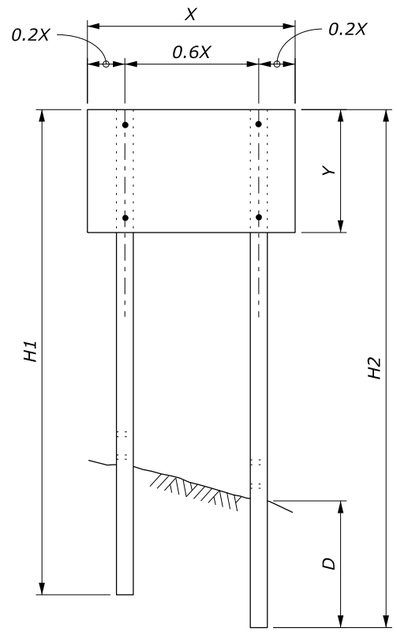
STANDARD 635-13

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T30



SINGLE POST SIGN





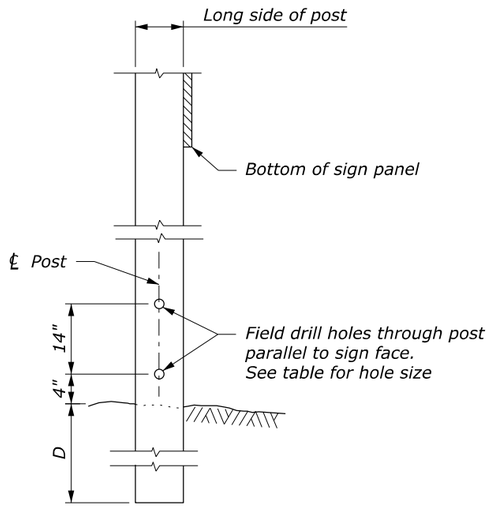
TWO POST SIGN

NOTE:

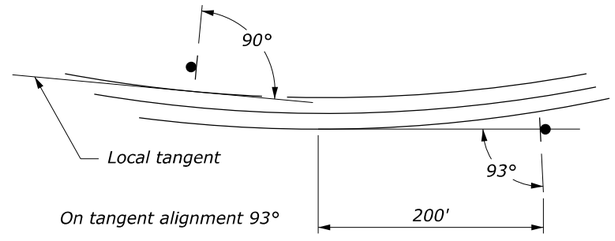
1. *Attach sign panels with a minimum of 2 - ¼" dia. bolts per post.*
2. *H1 and H2 = Overall post length. Select post lengths to fit field conditions.*
3. *D = Post embedment depth for average soil conditions.*
4. *In areas where lateral distance is limited, a minimum lateral offset of 2' may be used. In areas with curbs, a minimum lateral distance of 1' behind the face of the curb may be used.*
5. *In pedestrian locations, or in areas with obstructed views, use 7' minimum mounting height for main sign and 6' minimum mounting height for secondary sign.*
6. *Use 7' minimum spacing between posts for sign posts 6" x 6" or larger.*
7. *State standards may be used as an alternative if approved by the CO.*

WOOD POST SELECTION TABLE

WIDTH "X"	AREA (SQFT)	NUMBER OF POSTS	POST SIZE (INCH)	D (INCH)	HOLE SIZE (INCH)
Diamond ≤ 36" Other Shapes ≤ 48"	< 10	1	4 x 4	36	0
		1	4 x 6	48	1.5
Diamond ≤ 48"	10 - 20	1	6 x 6	48	2
Diamond ≤ 48" Other Shapes ≤ 12'	10 - 20	2	4 x 4	36	0
	20 - 50	2	4 x 6	48	1.5
> 13'	50 - 65	2	6 x 6	48	2
12' - 16'	50 - 65	3	4 x 6	48	1.5
> 17'	65 - 95	4	4 x 6	48	1.5
> 30'	65 - 95	3	6 x 6	48	2



POST DETAIL



SIGN INSTALLATION ANGLE

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

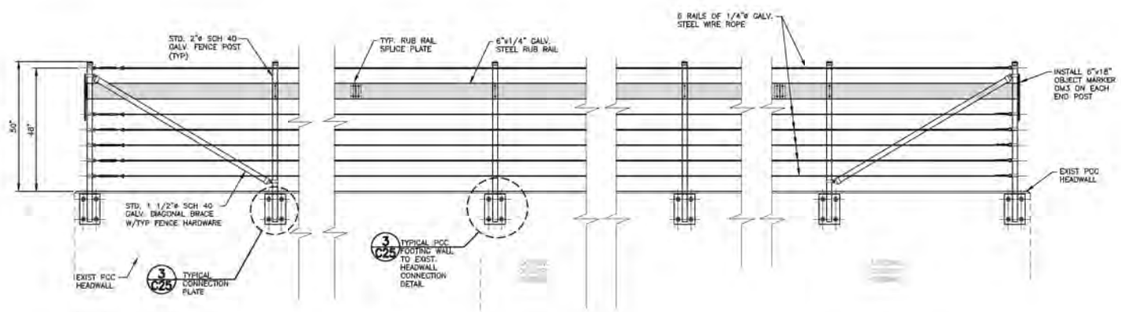
U.S. CUSTOMARY STANDARD

TEMPORARY TRAFFIC CONTROL SIGN INSTALLATION WOOD POSTS

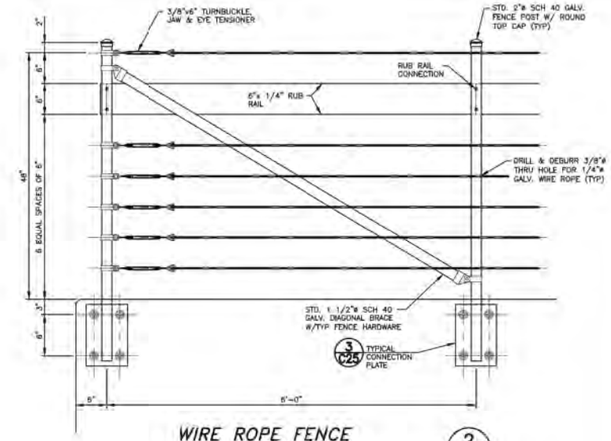
STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 10/2017

STANDARD 635-14

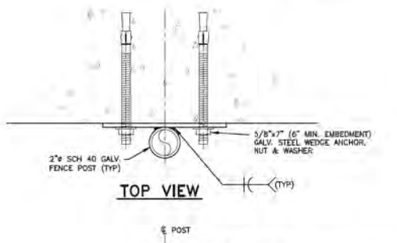
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T31



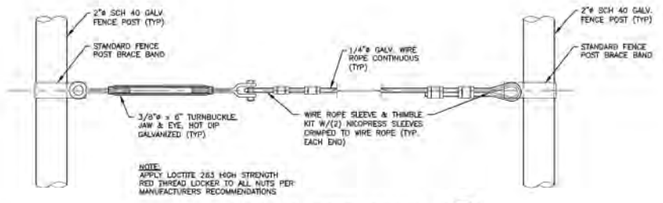
WIRE ROPE FENCE 1



WIRE ROPE FENCE 2

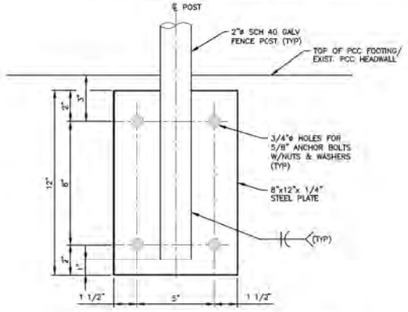


TOP VIEW



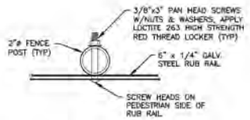
NOTE:
APPLY LOCTITE 263 HIGH STRENGTH RED THREAD LOCKER TO ALL NUTS PER MANUFACTURERS RECOMMENDATIONS

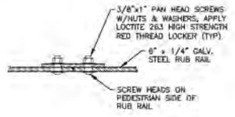
TYPICAL WIRE ROPE CONNECTION DETAIL 4

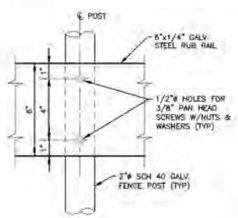


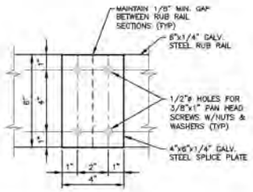
TYPICAL FENCE POST CONNECTION DETAIL 3

NOTE:
ALL FENCE POSTS WITH CONNECTION PLATES SHALL BE HOT DIPPED GALVANIZED FOLLOWING WELDING AND HOLE DRILLING









NOTE:
ALL FIELD DRILLED HOLES SHALL BE PAINTED WITH TWO COATS GALVANOX ZINC PAINT, PRIOR TO PLACING BOLTS.

TYPICAL WIRE ROPE CONNECTION DETAIL 5

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

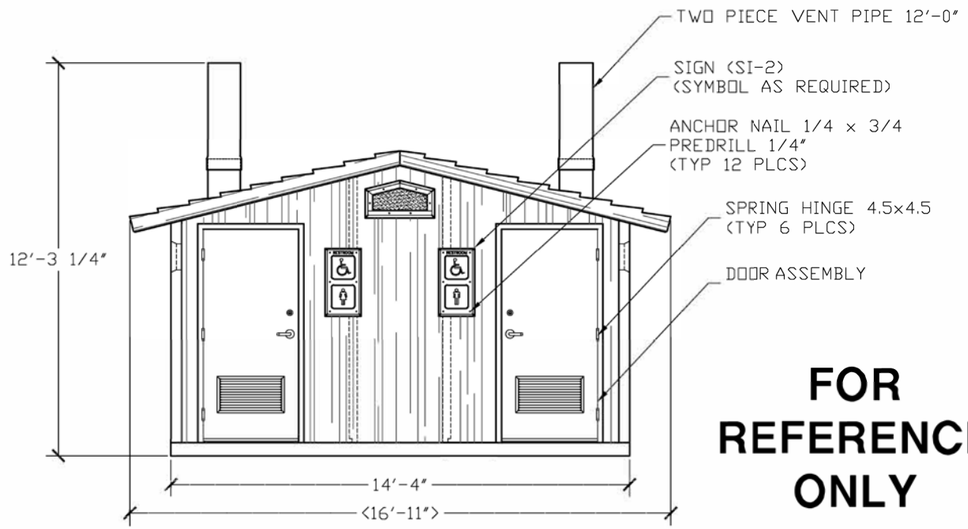
U.S. CUSTOMARY SPECIAL

PEDESTRIAN RAILING

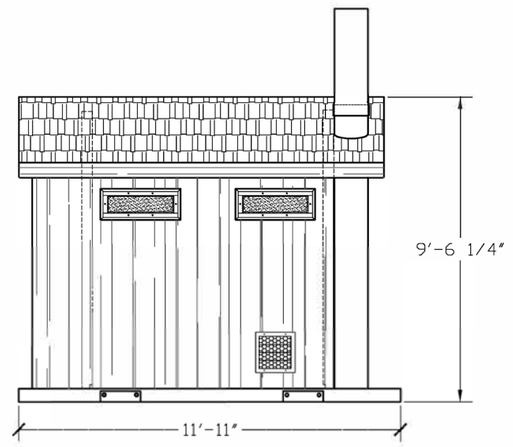
NO SCALE

SPECIAL
646-A

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T32

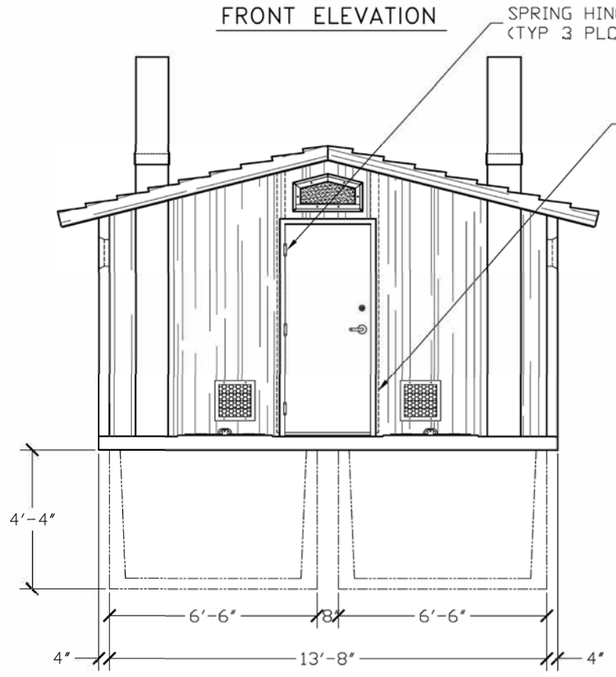


FRONT ELEVATION

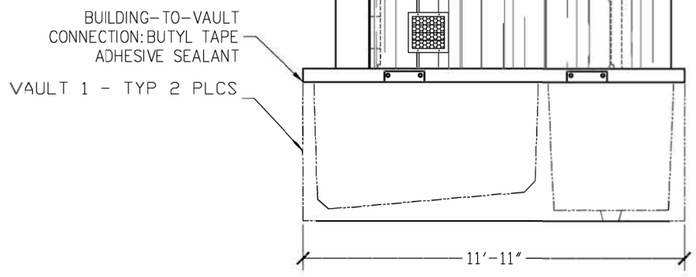


RIGHT SIDE ELEVATION

FOR REFERENCE ONLY



REAR ELEVATION



LEFT SIDE ELEVATION

NOTE:

1. *See Section 646 of the Special Contract Requirements.*
2. *See the Parking Lot layout for location*

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

VAULT TOILET

SPECIAL
646-B

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	D1

N

0 60' 120'

Scale in Feet

NOTE:

1. Equestrian parking, trail, and sidewalk shall have an aggregate surface, 4" depth. Max. aggregate size shall be 3/4".
2. Signage and step blocks at the existing trailhead are to be salvaged and returned to Carson City Public Works.

HUMBOLDT-TOIYABE NATIONAL FOREST

Install Rolled Erosion Control Product (RECP), see Sheet T13

Install vault toilet

Ditch flow

Ditch flow

Aggregate sidewalk

ADA curb ramp

N. King's Canyon Road/Waterfall Road

Sta. 500+88.63
Install 35"x24" x 34' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

Equestrian trail, 4' wide

12" Concrete curb and gutter, typ.

Install split rail fence, 4' high, typ.

Sta. 500+35.63
Install 24" x 44' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

APN 00707102
STOKES, KENNETH D & KRISTIN D
4400 KINGS CANYON RD

Sta. 503+91.53
Install 24" x 55' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

Sta. 503+73
Install gate

Curb opening, 2' wide

Curb opening, 4' wide

Curb opening, 2' wide

Sta. 500+59
Install gate

Curb opening, 2' wide

OHV/Equestrian parking

Parking area station 504+19.26 =
Mainline station 101+87.67, 12' Lt
N = 14728548.2136
E = 2275351.9780
Elev. = 5416.7981

Parking area station 500+12.81 =
Mainline station 104+72.00, 12.81' Lt
N = 14728827.5507
E = 2275359.7077
Elev. = 5392.9311

HUMBOLDT-TOIYABE NATIONAL FOREST

APN 00707201
WALSH FAMILY TRUST
5149 KINGS CANYON RD

KING'S CANYON ROAD PARKING LOT LAYOUT

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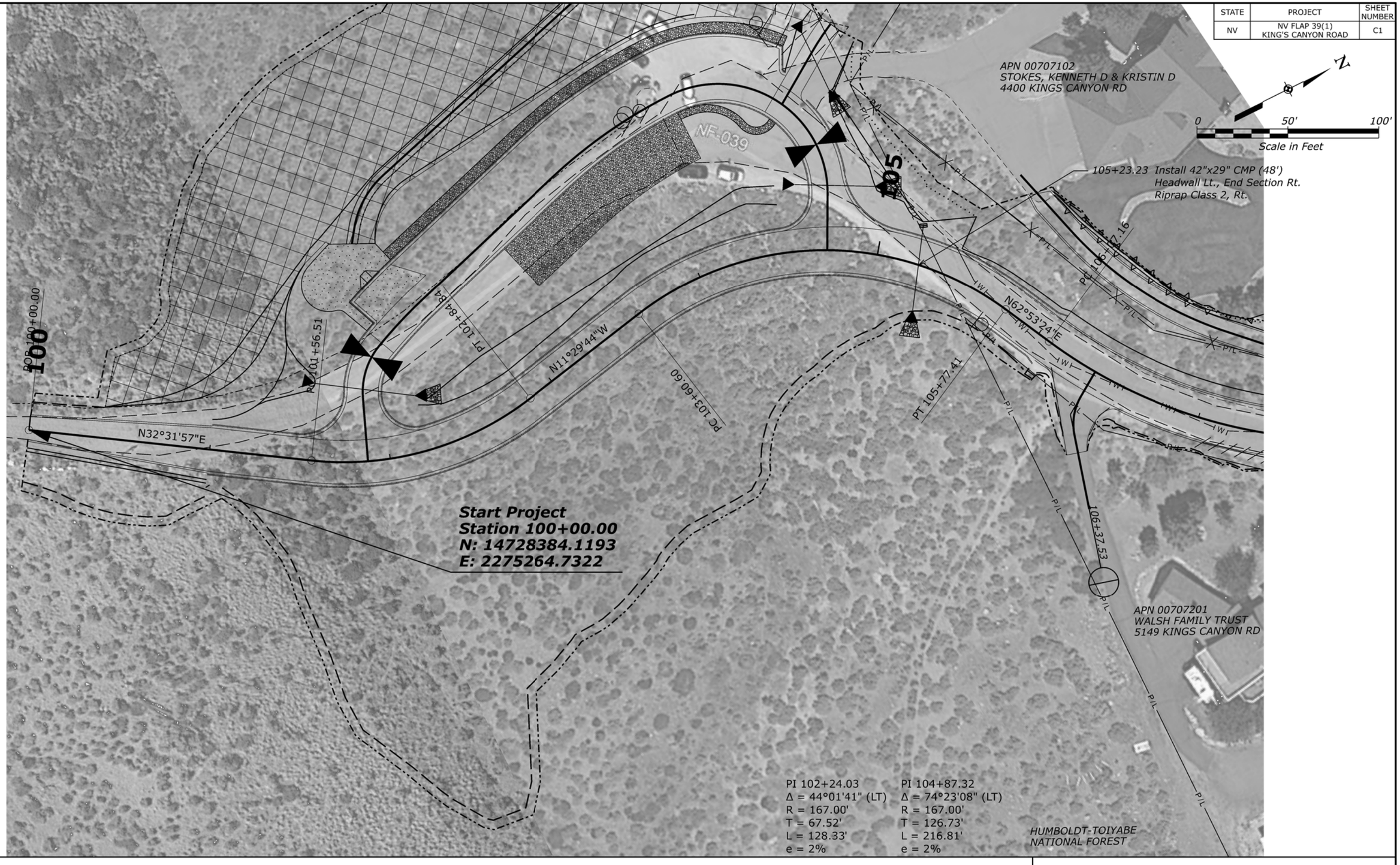
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	C1



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KING'S CANYON ROAD
PLAN SHEET
100+00.00 to 106+50.00

Kings Canyon Road and Trailhead Project Public Comment and Responses

TOPIC	NO.	COMMENT	RESPONSE
General	1	Desire for a project which facilitates access without increasing harm for all users and inhabitants of our community and the canyon. A safer road (parking area to Longview Drive) must be the major component in the equation.	We agree. It is the desire of the City and Central Federal Lands as well. Carson City will make improvements to the lower (eastern) portion of Kings Canyon Road between the end of this project and Longview Way as funding allows.
General	2	Revise the schedule for implementation of this project until current safety issues at the trailhead can be addressed.	This project is meant to better manage the current parking issues, including those associated with safety at the trailhead. The current schedule is to construct the project in 2021.
General	3	Provide a water storage tank near the parking area for use by the fire department in an emergency.	While not part of this project, the City has investigated potential tank options and sources. Funding has not been identified at this time to purchase, transport, or install the tank; however, the City would be willing to partner with residents in the area to facilitate installation of the tank.
General	4	The initial grant application was submitted without notice or consultation to the property owners.	The initial grant application was presented to, and approved by, the RTC Board of Commissioners in November 2017. The Memorandum of Agreement (MOA) was executed by the RTC Board in August 2018.
General	5	There has been a lack of public input on this project.	A summary of the public notices is as follows: - September 2018, the City sent a letter to 51 property owners who use this portion of Kings Canyon as access to their homes. The letter introduced the project, informed residents that survey teams may be on site, and solicited comments and feedback. - In October 2018, Public Works and Open Space staff met with the two property owners abutting the trailhead. - In April 2019, the City received 30% design plans, a second letter was sent to the same property owners, informing the public that plans are online and available at the library and at public works. The letter invited the residents to meet with staff. - Plans were presented to the RTC, Park Commission, and Open Space Advisory Committee in October and November in 2019. - February 11, 2020, a third Letter was sent regarding stakes being placed on property. - May 22, 2020, a fourth letter was sent to abutting properties and surrounding properties regarding 70% design plans informing residents that plans are available online and that staff was happy to meet on site or virtually. - August to January, coordination with individual property owners related to right-of-way. - January 27, 2021, letter was sent to abutting and surrounding properties regarding 95% design plans.
Parking Area	6	Move the trailhead parking area farther south into Forest Service land.	The location of the parking lot is extending to the south from its current location to accommodate additional parking area. The area will be within the jurisdiction of Carson City, allowing the City to enforce parking restrictions and limit nighttime uses through a management agreement with the US Forest Service. Currently, the City does not have an agreement with the US Forest Service and has limited enforcement power.
Parking Area	7	Prevent parking along the road for 1000 feet prior to the parking area with signage and tow-away zones to ensure access for emergency vehicles.	The City has coordinated with Central Federal Lands to include curbing, steeper roadside slopes, and additional "NO PARKING" signs along both sides Kings Canyon Road leading up to the parking area.
Parking Area	8	Make the trailhead parking lot one-way.	The City has coordinated with Central Federal Lands to refine the design, making the parking lot one-way.
Parking Area	9	The traffic controls are insufficient to support the current usage of the trail. Additional parking and perhaps other facilities are needed.	This project will improve the existing constraints at the trailhead by providing a designated parking area that allows for the management of vehicles, pedestrians, and emergency activities.
Parking Area	10	Once there is a formal parking lot, then please enforce no parking along the road.	Agreed. The Parks Department and the Sherriff's Office will work to enforce the planned 'NO PARKING' areas.
Parking Area	11	30 parking spaces is too many parking spaces for the trailhead parking area. People only park for a short time to visit the waterfall.	The number of parking spaces was based on typical observed and anticipated use of the existing trailhead area, prior to COVID-19. The parking area not only serves the Waterfall Trail, but also provides parking for other trails that start at this location as well as additional backcountry access into Forest Service public land. The revised design reduces the parking lot to approximately 25 parking spaces.
Parking Area	12	15 parking spaces is all that is needed.	Please see previous comment number 11 regarding the number of parking spaces.
Parking Area	13	Provide area for two trailers to park.	A parking area for OHV trailers or other trailers is being provided.

Parking Area	**14**	There is no need for restrooms or vault toilets at the parking area.	Some residents have expressed concern that with current visitation numbers, there could be a health risk associated with lack of restrooms. The addition of restrooms addresses this concern. The restrooms are also being requested/required by the USFS as standard practice based on the visitation numbers to the trailhead.
Parking Area	**15**	Vehicles are parking on the side of the Kings Canyon Road and blocking the road creating an unsafe situation.	Agreed. The parking area will provide a larger, designated area for vehicles to park. 'NO PARKING' signs will be placed along the sides of Kings Canyon Road near the parking lot.
Parking Area	**16**	There is no supervision or enforcement of the current parking area to protect adjacent landowners.	See responses to comments number 6 and 10.
Parking Area	**17**	Equestrians rarely use the road. Why are we providing parking for equestrian trailers?	The trailer parking area will accommodate all types of trailers including OHV trailers, not just equestrian.
Roadway	**18**	Resurface the road using the same 24' width to keep the driver's attention elevated to pedestrians and bicycles on the road.	The roadway will be fully reconstructed with new aggregate base and pavement. The pavement width will be 26' in accordance with nationally accepted design standards as developed by the American Association of State Highway and Transportation Officials (AASHTO). A width of 26' is a reduction of 2' from what was shown on the 70% plans.
Roadway	**19**	The proposed roadway width of 28' is wider than the lower (eastern) potion of Kings Canyon Road creating a dangerous bottleneck between two wider sections.	The roadway width will be changed to 26', which is only about 2' wider than the existing roadway section and 2' wider than the lower (eastern) portion of Kings Canyon Road between the end of the project and Longview Way. Roadway improvements to this lower section will be considered as part of Carson City's Pavement District projects listed in the CAMPO 2050 Regional Transportation Plan and 5-year Capital Improvement Program (CIP).
Roadway	**20**	Vehicles are less likely to move over and generally provide less passing distance on roads with centerline striping as compared to roads with no centerline striping.	Some studies do appear to indicate a decrease in the space a vehicle provides when passing a bicycle. These same studies, along with other research have shown that buffered or protected bike lanes are safer for the cyclist than a conventional bike lane; however, there are other benefits to providing some form of bicycle facility along a roadway, including a paved shoulder. These include: - Creating a more predictable traffic environment by reducing conflicts. - Improving safety for the cyclist by reducing the chances of being impacted from the rear. - Increasing the bicycle rider's comfort. - Visually alerting drivers to the presence of bicycles. The National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* , and the AASHTO *Guide for the Development of Bicycle Facilities* each describe the benefits and typical application for bicycle facilities. Given the concerns related to the bike lane, and the current lack of bicycle facilities between the project limits and Longview Way, the City has directed Central Federal Lands to <u>not</u> stripe the 4' shoulder as a designated bike lane at this time. The shoulder area can be used by bikers, walkers, or equestrian users; however, Carson City is committed to improving bicycle access to all areas of the City for all types of users.
Roadway	**21**	If stripped, the road will be less comfortable for most bicyclists.	The proposed striping and will provide additional space for other road users outside of the vehicle travel lanes.
Roadway	**22**	Do not stripe the road.	Central Federal Lands requires the road to be striped. The roadway will be striped with centerline and edge line striping. Striping increases safety and provides additional guidance to drivers when visibility is poor such as at night or in bad weather.
Roadway	**23**	Current design steepens the existing driveways.	We have worked with Central Federal Lands to ensure that driveways are not being made excessively steeper than the existing, pre-project condition.
Roadway	**24**	How will my driveway and driveway culvert be effected?	All the driveways along Kings Canyon will be reconstructed, pending right-of-way agreements. Driveways will either be asphalt or concrete depending on the existing pavement material. All gravel driveway approaches will be paved, unless otherwise requested by the property owner. Each driveway will get a new culvert where drainage flows.
Roadway	**25**	Please provide a turnaround at the end of the paved road to enable fire trucks to turn around.	We have coordinated with the Fire Department to ensure they can turn around. They will always have access to the parking area, even after hours when the gates are closed.

Roadway	**26**	Please look at ways to limit impacts to existing trees and other features along my property.	We have worked with Central Federal Lands to limit impacts to specific trees or other features located within City right-of-way. Additional coordination is anticipated to occur during construction.
Roadway	**27**	This is a scenic road and the turns prevent cars from going any faster. Straightening the road will increase speeds.	The roadway alignment is not changing significantly. None of the curves are being straightened.
Roadway	**28**	The lower potion of Kings Canyon Road between the end of this project and Longview is unsafe and improvements are needed before completing this project.	The lower (eastern) portion of Kings Canyon Road between the end of the project and Longview Way will be considered as part of Carson City's Pavement District projects listed in the CAMPO 2050 Regional Transportation Plan and 5-year Capital Improvement Program (CIP).
Roadway	**29**	Coordination with the Carson City School District is needed regarding school bus access.	Carson City staff discussed the project with the School District in 2018. At that time it was identified that buses turned around at the paved loop area near 4902 King Canyon Road. Subsequent conversations with the school district in June 2020 indicate that access into Kings Canyon is difficult for a verity of reasons including snow, the narrowness of the road, and the lack of a turn-around at the top of the road. The loop area is being repaved to allow a bus to turn-around. Should buses continue to the top of the road, they will be able to utilize the parking area when the gates are open. If the gates are not open, sufficient space is provided in accordance with the Fire Code to preform a three-point turn.
Speed	**30**	Vehicle Speeds on Kings Canyon Road are too high. They will continue to increase once the project is completed.	Speeding is a concern all around Carson City. The posted speed limit will be 30 mph, a reduction of 5 mph from the existing condition. Vehicle speeds are a concern on this road because of the steep gradient of the road. Striping and the installation of guideposts will have some minor effect on reducing speeds.
Speed	**31**	Provide ways to slow vehicles, including installing a speed feedback sign on Kings Canyon Road.	Additional signing and striping will be provided. Installation of speed tables or rumble strips are effective a reducing speeds, but always cause additional noise and associated complaints. Placement of roadway obstructions such as median islands will require additional right-of-way and will increase the cost of maintaining the road. Providing parking along the sides of the road is another method used for reducing speeds; however, there is not a need for parking along most of the road and it would require additional widening the road.
Creek	**32**	The upper creek crossing culvert is too large.	The culvert being proposed at the upper creek crossing is designed to minimize the potential of water from overtopping the roadway, washing out the roadside ditches, and flooding adjacent properties. The culvert is sized to keep water in the existing creek channel for the designed storm event.
Creek	**33**	The lower creek crossing is a pinch point and it is difficult to see other vehicles, pedestrians, bicycles, and deer.	The proposed design slightly alters the roadway alignment and widens the pavement to better match the proposed section. Through the construction, many of the bushes will be removed at the creek crossing increasing sight distance around the curve.
Creek	**34**	Why is the City reconstructing the lower creek crossing if they just did it a couple of years ago?	The work a couple of years ago installed a 4'x4' concrete bypass channel to accommodate higher flows in the creek. That channel will remain and not be reconstructed.
Visitors	**35**	There is a general lack of enforcement of the trail and trail system. People are littering and carrying out other activities that harm the environment and creek.	While the City cannot control the numbers of people who are using a public road to access public lands, we can, and are, committed to management and maintenance of both the trailhead and the trail. Recently the Parks Department completed trail maintenance including widening of the trail, decommissioning of social trails, and construction of a rock wall near the waterfall in order to complete safety enhancements. In November we will be decommissioning the social trail adjacent to Kings Creek, replacing missing signage, and repairing fencing. Further, we are working on a future installation of a surveillance camera at the waterfall so that we can have 24/7 real-time visual of activities at that location. The planned trailhead improvements will organize what is currently a somewhat chaotic parking situation, and the City will have the ability to close gates at night. A well-managed and maintained trailhead/parking lot tends to affect behavior in a positive way. Lastly, The Parks Department received approval to hire a third Park Ranger which will give the City additional patrolling ability.
Visitors	**36**	Increased visitation to the area and backcountry use will increase the risk of fire.	Public lands are open for the public's use. Providing a larger, dedicated, paved parking area will assist in the management of vehicles and limit the potential for vehicles looking for places to park off the road in vegetated areas.

Visitors	**37**	Increasing the size of the parking lot will increase the use of the trail.	The parking area serves and provides access to public lands. The area is well known to the residents of Carson City and open for the public's use. City staff and nearby residents have observed that the number of cars currently parking in the area exceed the available parking. Providing a new parking area will assist with the management of vehicles and provide safer access for all open space users.
Visitors	**38**	Provide a JAC bus route from Carson Middle School or other community facility in Carson City to the parking area.	The RTC completed and approved the Transit Development and Coordinated Human Services Plan in 2019. Demand for additional service up Kings Canyon did not arise as a critical service need, so was not included as either a short- or long-term transit need. Transit services accessing federal land is an eligible use of FLAP funding, and a future FLAP grant funding could potentially be applied for, should this become a priority for the City. There are other considerations to take into account, including: transit bus noise impacts, water quality impacts of additional trail use, ability of Parks Dept. to manage additional use and large groups.
Visitors	**39**	The City's drinking water quality is being effected by people walking along and into the water of the creek near the waterfall.	With more traffic, both human and domestic animals, it will become more imperative that we more closely monitor the activities in and around the waterfall area. More education is needed for public awareness of the sensitivity of this area. We are currently working on a Watershed Control Plan that address and protects the Ash and King's Creek drinking water intakes as part of our continued compliance with the Nevada Division of Environmental Protection.
Visitors	**40**	The number of visitors are effecting the condition of the waterfall trail and the environment around the waterfall trail.	The City has hired a contractor to make some improvements to the upper portion of the trail, including construction of a short section of wall in order to stabilize the upper-most portion of the trail. Work will also include placement of large rocks on the north side of the waterfall to help stabilize that slope and decommission social trails. Public Works is also working with Carson City IT Department to identify the feasibility of placing a camera at the waterfall.

STAFF REPORT

Report To: Open Space Advisory Committee **Meeting Date:** August 6, 2018

Staff Contact: Jennifer Budge, CPRP, Parks and Recreation Director

Agenda Title: Discussion and possible recommendation to staff regarding the use of approximately $35,000 from the Quality of Life (Open Space) fund to serve as a portion of the required 5% local match to a Federal Lands Access Program grant (total project cost approximately $3.7 million) for trailhead/roadway improvements in Kings Canyon; and further direct staff to pursue additional grant funding to supplement the trailhead improvements. (Jennifer Budge, CPRP) (Jennifer Budge, jbudge@carson.org)

Staff Summary: Carson City Public Works and Parks, Recreation and Open Space Departments have been working cooperatively to secure funding through the Federal Lands Access Program for much needed improvements to Kings Canyon Road and the Waterfall Trailhead. This project is estimated at $2.9 million dollars and requires a 5% local match for the grant program. If approved, this item will allocate approximately $35,000 from the Open Space budget, with the remaining required match from Public Works, as authorized by the Regional Transportation Commission.

Agenda Action: Formal Action/Motion **Time Requested:** 20 minutes

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Proposed Motion

"I move to recommend that staff approve the use of approximately $35,000 from the Quality of Life (Open Space) fund to serve as a portion of the required 5% local match to a Federal Lands Access Program grant (total project cost approximately $3.7 million) for trailhead/roadway improvements in Kings Canyon; and further direct staff to pursue additional grant funding to supplement the trailhead improvements."

Board's Strategic Goal

Sustainable Infrastructure

Previous Action

November 27, 2017 - Carson City Regional Transportation Commission approved pursuit of this FLAP grant and accepted the fiscal impact associated with the 5% required local match.

Background/Issues & Analysis

The grant application requested funds for improvements to Kings Canyon Road and to expand the existing trailhead located on U.S. Forest Service property. Project improvements include roadway reconstruction, storm water improvements, and the expansion of the existing trailhead. The trailhead is significantly undersized for current levels of use, creating roadway obstruction and possible delays to emergency responders in the area.

Attached for the Committee's reference are copies of the FLAP funding documents, notice of award, project site map, scope of work, and site photos.

Applicable Statute, Code, Policy, Rule or Regulation

Carson City Grant Policy and Procedures
Carson City Municipal Code 13.06.140
Carson City Municipal Code 13.06.150

Financial Information

Is there a fiscal impact? ☒ Yes ☐ No

If yes, account name/number: Quality of Life – Open Space. Maintenance and Management / 254-5047-452-0450

Is it currently budgeted? ☐ Yes ☐ No

Explanation of Fiscal Impact: While it hasn't yet been confirmed from the FLAP grant administrator, it is anticipated that the $35,000 would be contributed with 50% from FY 19 and 50% from FY 20. There is currently adequate funding available in the open space budget that is not encumbered or obligated to other grant projects.

Alternatives

Do not approve the item and provide additional direction to staff.

Committee Action Taken:

Motion: _____ 1) _____ Aye/Nay
2) _____ _____
_____
_____
_____
_____

_____
(Vote Recorded By)

NV FLAP 39(1)
Kings Canyon Road (and Trailhead)
Funding Summary

	Scoping Estimate	Trailhead (approx. 20% of project)	Open Space (5% cash match)
Fiscal Year 2019			
Scoping/Prelim. Engineering	$ 435,000	$ 87,000	$ 4,350
Construction Engineering	$ 346,000	$ 69,200	$ 3,460
Sub-total	**$ 781,000**	$ 156,200	$ 7,810
Fiscal Year 2020			
Construction (with construction cost escalation)	$ 2,660,000	$ 532,000	$ 26,600
Sub-total	**$ 2,660,000**	$ 532,000	$ 26,600
Total	**$ 3,441,000**	**$ 688,200**	**$ 34,410**

Kings Canyon FLAP Grant Exhibits

Kings Canyon Trailhead Pedestrian & Bicycle Counts

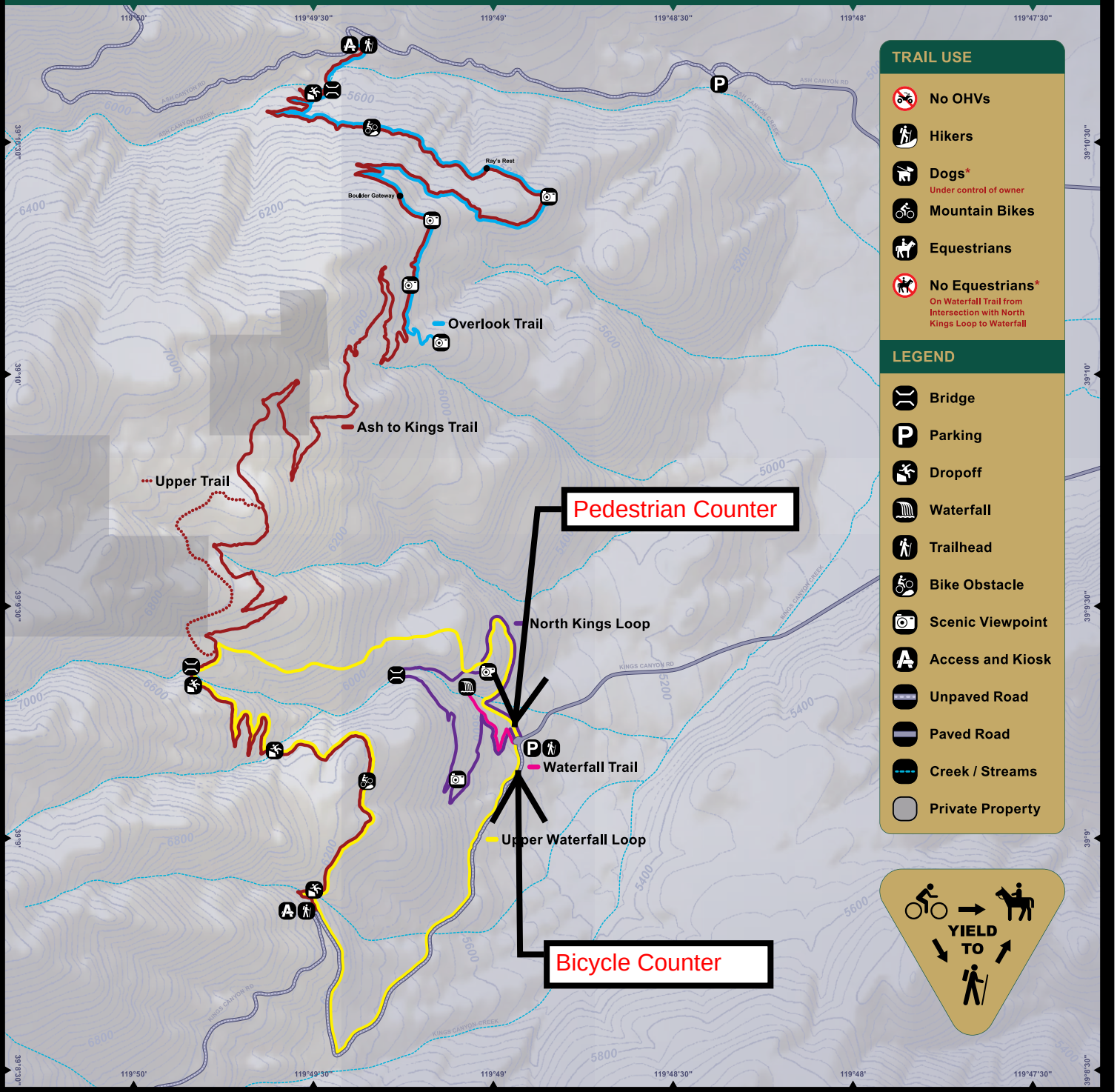
Date	Day of the Week	Pedestrian Counts (in & out)	Total Pedestrians	Bicycle Counts
11/8/2017	Wednesday	82	41	4
11/9/2017	Thursday	70	35	1
11/10/2017	Friday	188	94	4
11/11/2017	Saturday	447	224	22
11/12/2017	Sunday	427	214	23
11/13/2017	Monday	88	44	1
11/14/2017	Tuesday	136	68	4
11/15/2017	Wednesday	23	12	0
11/16/2017	Thursday	8	4	1
11/17/2017	Friday	127	64	5
11/18/2017	Saturday	298	149	8
11/19/2017	Sunday	270	135	8
11/20/2017	Monday	81	41	4
11/21/2017	Tuesday	No Data Collected	No Data Collected	12
11/22/2017	Wednesday	No Data Collected	No Data Collected	8
11/23/2017	Thursday	No Data Collected	No Data Collected	23
11/24/2017	Friday	No Data Collected	No Data Collected	12
11/25/2017	Saturday	No Data Collected	No Data Collected	9
11/26/2017	Sunday	No Data Collected	No Data Collected	2
11/27/2017	Monday	No Data Collected	No Data Collected	3
11/28/2017	Tuesday	No Data Collected	No Data Collected	0
11/29/2017	Wednesday	No Data Collected	No Data Collected	3
11/30/2017	Thursday	No Data Collected	No Data Collected	3
12/1/2017	Friday	No Data Collected	No Data Collected	2
12/2/2017	Saturday	No Data Collected	No Data Collected	2
12/3/2017	Sunday	No Data Collected	No Data Collected	3
12/4/2017	Monday	No Data Collected	No Data Collected	1
	Total	2,245	1,123	168
	Daily Average		86	6
	Estimated Annual Counts		31,516	2,271
Annual Total Pedestrian and Bicyclists		33,787		

Counts collected by Carson City Public Works Staff

ASH TO KINGS TRAIL

0 0.5 km
0 0.5 mi

North



TRAIL USE

- No OHVs
- Hikers
- Dogs*
  Under control of owner
- Mountain Bikes
- Equestrians
- No Equestrians*
  On Waterfall Trail from Intersection with North Kings Loop to Waterfall

LEGEND

- Bridge
- Parking
- Dropoff
- Waterfall
- Trailhead
- Bike Obstacle
- Scenic Viewpoint
- Access and Kiosk
- Unpaved Road
- Paved Road
- Creek / Streams
- Private Property

TRAIL ACCESS INFORMATION

Trail Name	Length	Grade Typical	Grade Maximum	Cross Slope Typical	Cross Slope Maximum	Tread Width Typical	Tread Width Minimum	Surface Type
Ash to Kings Trail	7.4 mi	8.2%	0.38 mi is 21% - 35%	6.1%	0.23 mi is 20% - 31%	18 in	15 in	Soil
Overlook Trail	2.8 mi	8.4%	2322 ft is 16% - 32%	5.9%	438 ft is 16% - 30%	17 in	15 in	Soil
Upper Water Fall Loop	4.4 mi	10.3%	476 ft is 21% - 35%	5.4%	573 ft is 16% - 23%	106 in	15 in	Soil
Waterfall Trail	0.2 mi	12.1%	21 ft is > 42%	5.9%	95 ft is 13% - 17%	26 in	6 in	Soil / Rock / Boulder
North Kings Loop	1.7 mi	11.5%	768 ft is 21% - 38%	6.3%	376 ft is 16% - 37%	57 in	6 in	Soil

WARNING: Trail conditions may have changed since of June 2015 when these trails were assessed. Signage created by **Beneficial Designs Inc.** using trail data collected by a certified trail assessment coordinator.

1. FOR POSSIBLE ACTION ON APPROVAL OF MINUTES (No action).

(6:02:38) – There were no minutes for approval.

2. MODIFICATIONS TO THE AGENDA

(6:02:39) – There were no modifications to the agenda.

3. MEETING ITEMS

A. FOR POSSIBLE ACTION: DISCUSSION AND POSSIBLE RECOMMENDATION TO STAFF REGARDING THE USE OF APPROXIMATELY $35,000 FROM THE QUALITY OF LIFE (OPEN SPACE) FUND TO SERVE AS A PORTION OF THE REQUIRED 5% LOCAL MATCH TO A FEDERAL LANDS ACCESS PROGRAM GRANT (TOTAL PROJECT COST APPROXIMATELY $3.7 MILLION) FOR TRAILHEAD/ROADWAY IMPROVEMENTS IN KINGS CANYON; AND FURTHER DIRECT STAFF TO PURSUE ADDITIONAL GRANT FUNDING TO SUPPLEMENT THE TRAILHEAD IMPROVEMENTS.

(6:02:47) – Chairperson Scott introduced the item and gave background on having the Public Works Department "secure a very significant grant with a very small [five percent] local match which includes a trailhead". He also reviewed the information provided in the Staff Report, noting that part of the match was being provided by the Regional Transportation Commission (RTC) and suggested applying for an OHV grant as well. Ms. Budge acknowledged the Public Works Department's collaboration as well, and noted that "a five percent match is unheard of". She also responded to clarifying questions by the members, and noted that the urgency for this meeting was to be able to report this Committee's feedback to the August 8, 2018 RTC meeting. There were no public comments.

(6:15:20) – MOTION: I move to recommend that Staff approve the use of approximately $35,000 from the Quality of Life (Open Space) fund to serve as a portion of the required 5 percent local match to a Federal Lands Access Program grant (total project cost approximately $3.7 million) for trailhead/roadway improvements in Kings Canyon; and further direct staff to pursue additional grant funding to supplement the trailhead improvements.

(6:12:24) – Ms. Budge clarified that the $35,000 amount will be 50 percent funded from this year's budget and 50 percent funded from next year's budget. Member Hall received confirmation from Ms. Budge that the match will not cause a budget discrepancy.

RESULT:	**APPROVED (5-0-0)**
MOVER:	Scott
SECONDER:	Massad
AYES:	Scott, Welch, Hall, Massad, Michael
NAYS:	None
ABSTENTIONS:	None
ABSENT:	Evans, Inversin