STAFF REPORT

Agenda Item: 3E

Report To: Parks and Recreation Commission **Meeting Date:** February 4, 2020

Staff Contact: Gregg Berggren, Trails Coordinator
Dirk Goering, Senior Transportation Planner

Agenda Title: For Discussion Only: Review and discussion regarding the 70% design plans for the Kings Canyon Trailhead project funded by a Federal Lands Access Program grant.

Staff Summary: This item is to review the conceptual design for the proposed Waterfall Trailhead Parking Area, also known as the Kings Canyon Trailhead Parking Lot and provide an opportunity for the Commission to give feedback.

Agenda Action: Other/Presentation **Time Requested:** 15 minutes

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Proposed Motion
For discussion only

Board's Strategic Goal
Quality of Life

Previous Action
N/A

Background/Issues & Analysis
On July 25, 2018, the Carson City Regional Transportation Commission (RTC), the U.S. Forest Service (USFS) and the Federal Highway Administration (FHWA) signed a Memorandum of Agreement to move forward with a Federal Land Access Program (FLAP) project to make improvements to the Kings Canyon Road. A portion of this project includes construction of a new Waterfall Trailhead Parking Area, and below is an excerpt from the agreement:

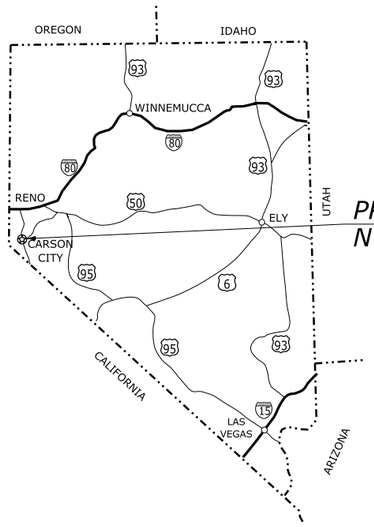
> "***Waterfall Trailhead Parking Area:*** *The parking area will be expanded for approximately 30 car parking stalls (paved), 1 ADA parking concrete pad, 2 trailer parking stalls (gravel) and a vault toilet. An existing covered kiosk and existing interpretive plaque will be relocated. The final parking lot design and capacity will be determined during preliminary design."*

Central Federal Lands (CFL) is responsible for design of the parking lot, and their initial conceptual design was presented to the Parks and Recreation Commission for review and comment on October 1, 2019. Subsequently, CFL has made some modifications to the design and they have now submitted their 70% plans for review. A copy of the 70% plans are attached. Dirk Goering, Senior Transportation Planner, is the City's lead for this project.

Applicable Statute, Code, Policy, Rule or Regulation
N/A

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A1

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION



PROJECT LOCATION
NV FLAP 39(1)

KEY MAP OF NEVADA

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

DESIGN DESIGNATIONS:

ADT (2019)	600
ADT (2039)	892
DHV	100
D	50%
T	2%
V	25 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"

PLANS FOR PROPOSED

NV FLAP 39(1)

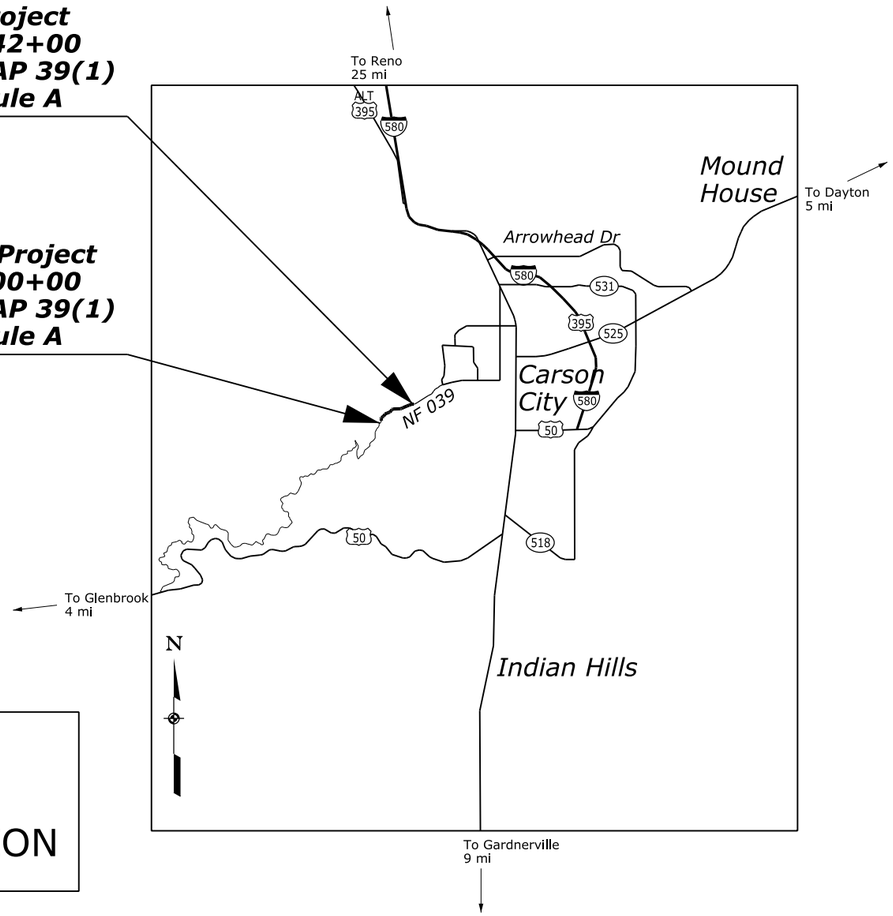
KING'S CANYON ROAD

HUMBOLDT-TOIYABE NATIONAL FOREST
CARSON CITY, NV
LENGTH 0.80 miles

INDEX TO SHEETS	
SHEET	**DESCRIPTION**
A1	TITLE SHEET
A2-A3	CONVENTIONAL PLAN SYMBOLS AND ABBREVIATIONS
A4	SITE MAP
A5	SURVEY CONTROL SHEET
A6-A7	TYPICAL SECTIONS MAINLINE
A8-A9	TYPICAL SECTIONS APPROACH ROADS
B1-B2	SUMMARY OF QUANTITIES - SCHEDULE A
B3-B5	MISCELLANEOUS SUMMARIES
C1-C4	PLAN AND PROFILE - MAINLINE
D1	PARKING LOT LAYOUT
G1	C251-50: PLACED RIPRAP AT CULVERT OUTLETS DETAIL
K1	E401-01: PAVEMENT TRANSITIONS DETAIL
S1	STA 108+66.71 DRAINAGE PLOT
T1	601-4: CONCRETE HEADWALL FOR SMALL PIPE CULVERT STANDARD
T2	601-A: BOX CULVERT HEADWALLS AND WINGWALLS
T3-T6	602-1, 2, 3, 4: METAL PIPE DETAILS
T7	609-A: CURB DETAILS
T8	615-A: SIDEWALK
T9	615-B: ACCESSIBILITY RAMP
T10	C634-50: CENTERLINE STRIPING AND TOP LIFT PAVEMENT JOINT
T11	634-A: PAVEMENT MARKINGS SYMBOLS AND WORDS
T12-T16	SIGNING AND STRIPING SHEETS
T17-T22	635-1, 2, 3, 6, 13, 14: TEMPORARY TRAFFIC CONTROL STANDARDS
X1-X39	MAINLINE CROSS SECTIONS

End Project
STA 142+00
NV FLAP 39(1)
Schedule A

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



0 15,000' 30,000'
Scale in Feet

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

FEDERAL LANDS HIGHWAY
COMMITMENT TO EXCELLENCE

FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE

811
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PRELIMINARY 70%
1/6/20
NOT FOR CONSTRUCTION

PROJECT MANAGER	LEAD DESIGNER
EMILIO BURGOS	THOMAS MCCRARY

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

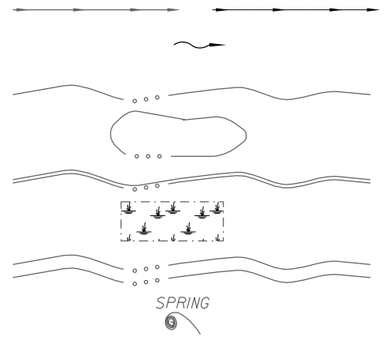
Lake, Pond or Reservoir

Large Creek

Wetland

River

Spring



Bridge (Existing, Proposed)

Box Culvert (Existing, Proposed)

Pipe Culvert (Existing, Proposed)

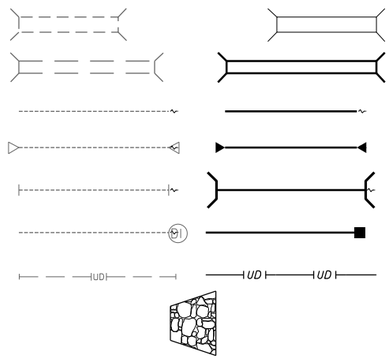
With End Sections (Existing, Proposed)

With Headwalls (Existing, Proposed)

With Drop Inlet (Existing, Proposed)

Underdrain (Existing, Proposed)

Riprap Apron (Proposed)



EROSION & SEDIMENT CONTROL SYMBOLS

Bonded Fiber Matrix Mulching

Check Dam

Diversion Berm

Rolled Erosion Control Product

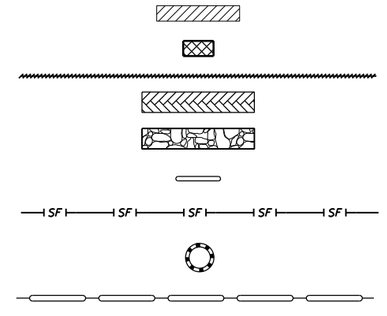
Riprap

Fiber Roll (Ditch and/or Cut Slope)

Silt Fence

Temporary Inlet Protection

Fiber Roll (Slope Protection)

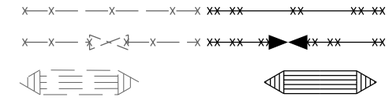


FENCE & CATTLEGUARD SYMBOLS

Fence (Existing, Proposed)

Fence w/ Gate (Existing, Proposed)

Cattleguard (Existing, Proposed)



GEOLOGIC SYMBOLS

Boring Location (Existing, Proposed)

Material Source

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

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

CONVENTIONAL PLAN SYMBOLS AND ABBREVIATIONS

Sheet 1 of 2

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)

¼ Section Corner (Found, Projected)

1/16 Section Corner (Found)

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)
- Surface (Existing, Proposed)

Support Pole (Existing, Proposed)

Support Pole Anchor (Existing, Proposed)

Street Light (Existing, Proposed)

Telephone Booth (Existing, Proposed)

Telephone Pedestal (Existing, Proposed)

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

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

PROJECT SPECIFIC SYMBOLS

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

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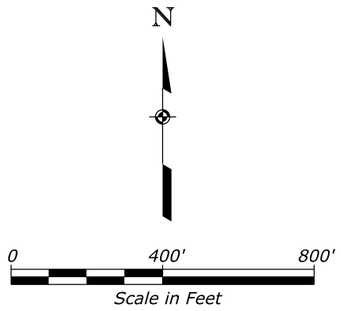
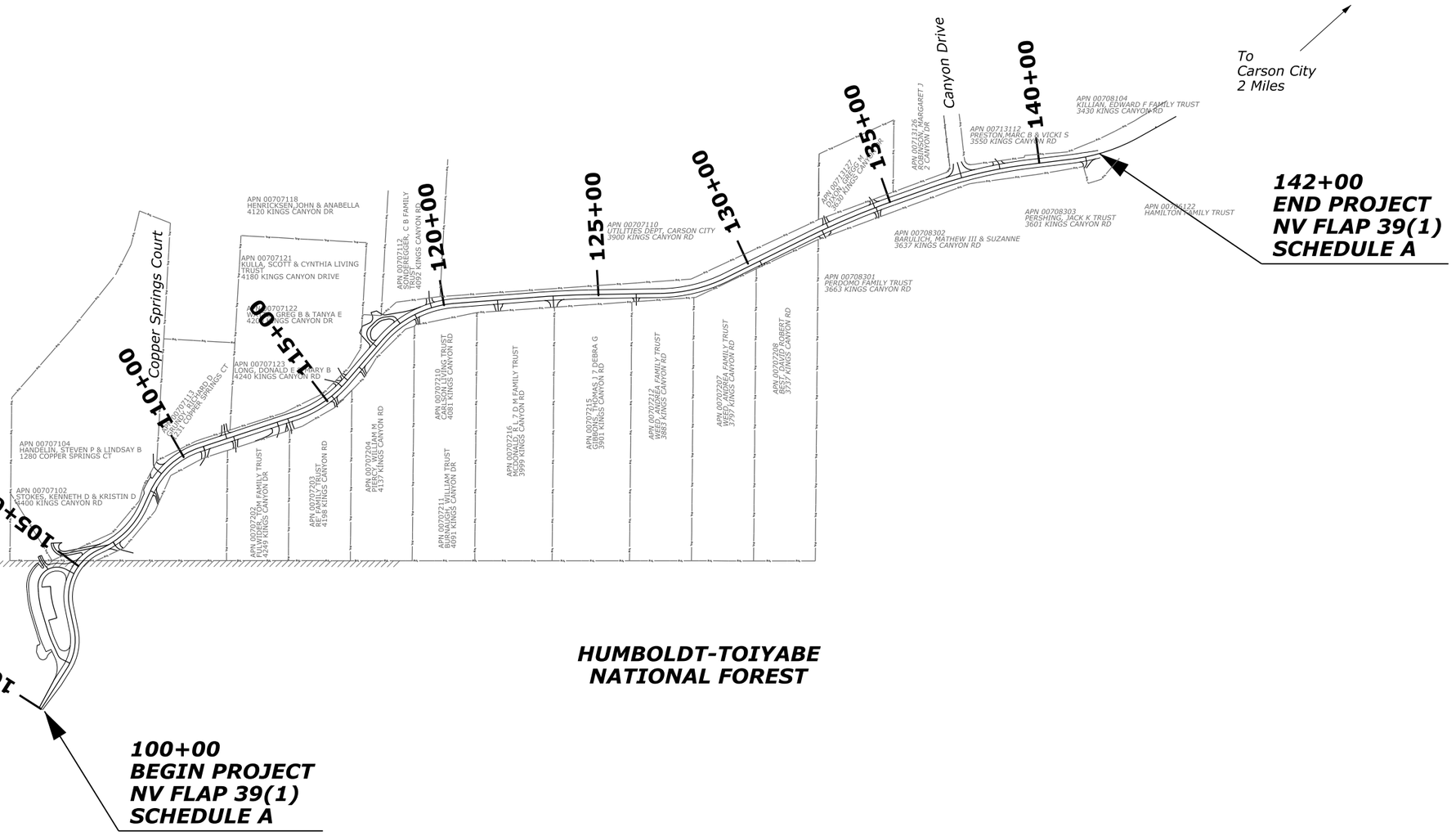
CONVENTIONAL PLAN SYMBOLS AND ABBREVIATIONS

Sheet 2 of 2

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





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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

SITE MAP

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			

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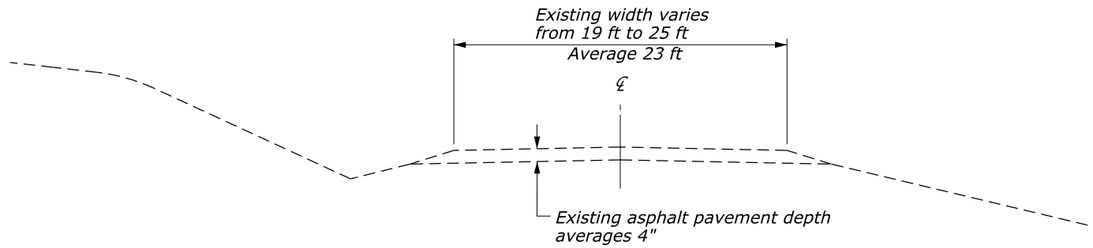
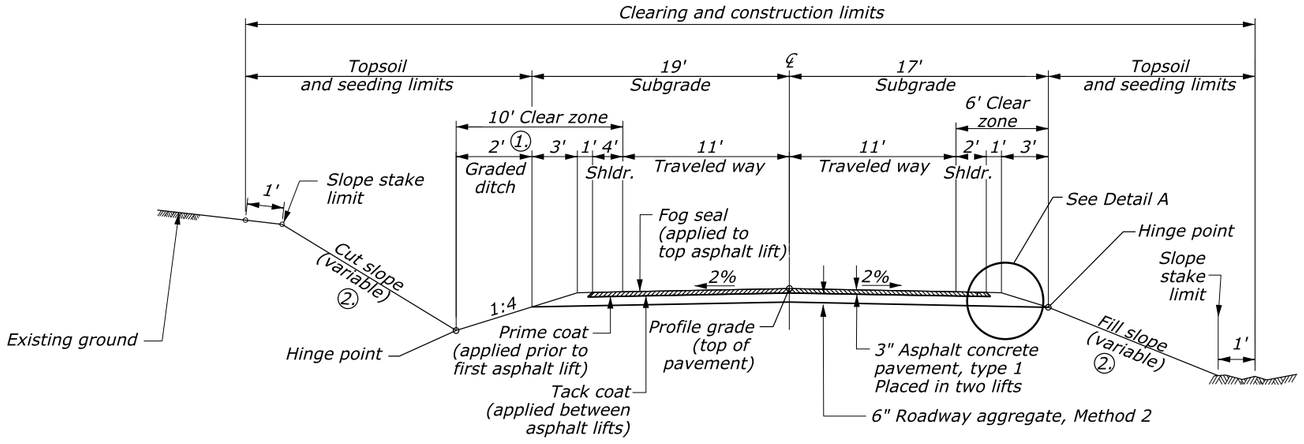
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

SURVEY CONTROL SHEET

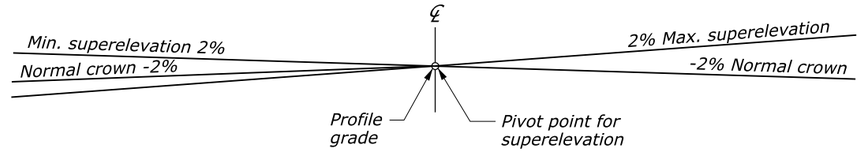
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A6



EXISTING TYPICAL SECTION
100+00 to 142+00



TYPICAL SECTION - NEW PAVEMENT
100+00 to 105+88.69



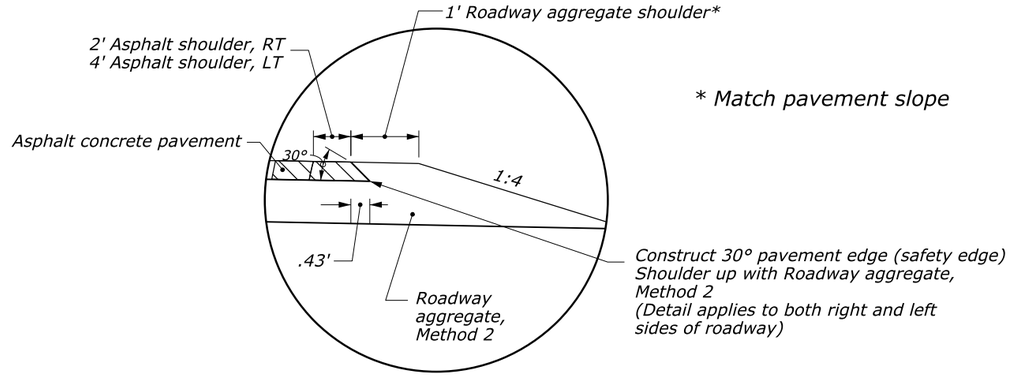
METHOD OF SUPERELEVATION ON CURVES

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.



* Match pavement slope

DETAIL A

LENGTH OF PROJECT

Station to Station	Roadway (ft)	Bridge (ft)
100+00 to 105+88.69	589	
TOTALS (ft)	589	
TOTAL (mi)	0.12	

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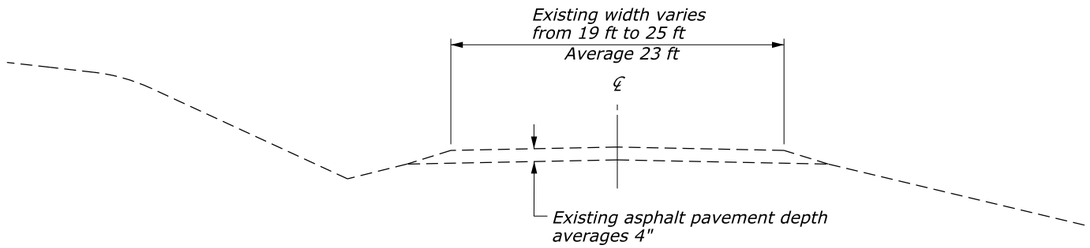
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

TYPICAL SECTIONS MAINLINE

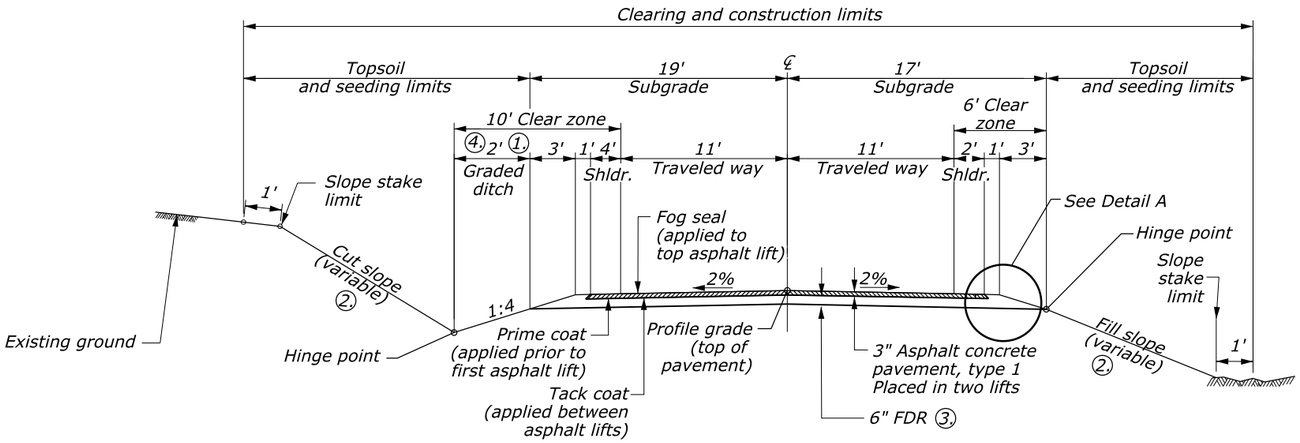
NO SCALE



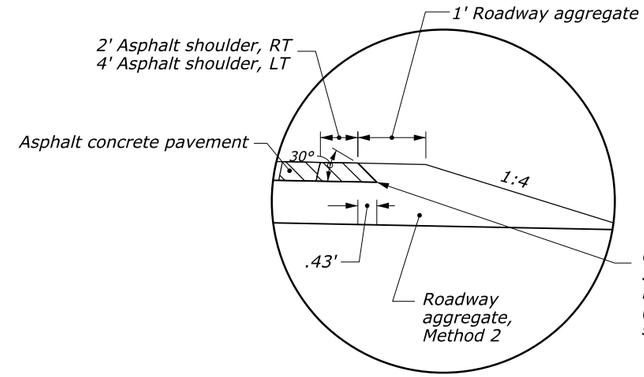
EXISTING TYPICAL SECTION
100+00 to 142+00

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.

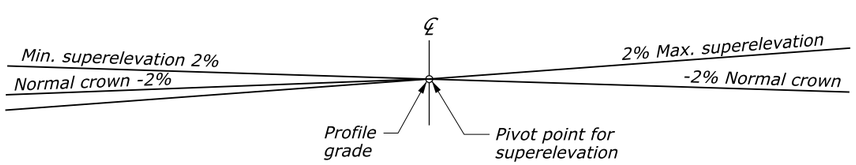


TYPICAL SECTION - FULL DEPTH RECLAMATION
105+88.69 to 142+00



* 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)	Bridge (ft)
105+88.69 to 142+00	3611	
TOTALS (ft)	3611	
TOTAL (mi)	0.68	

NO SCALE

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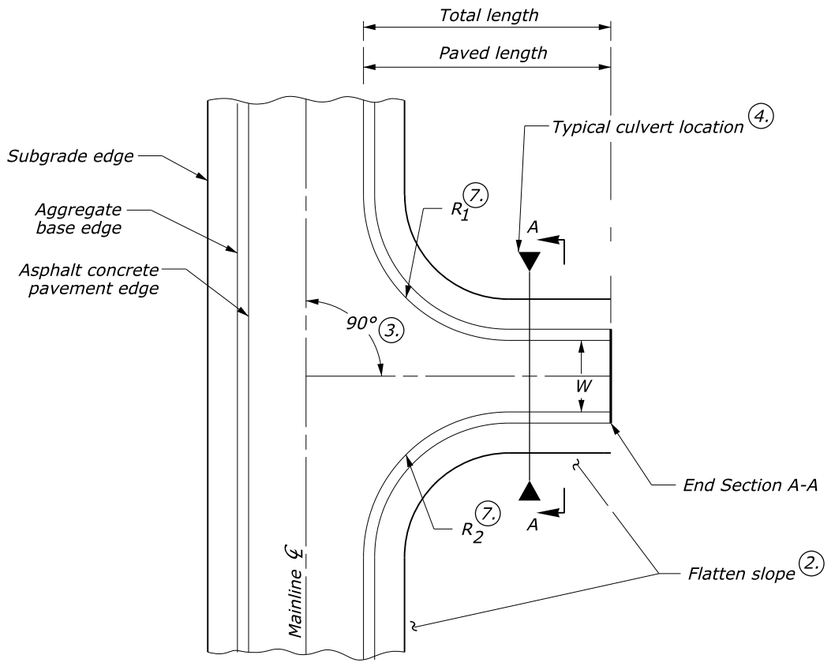
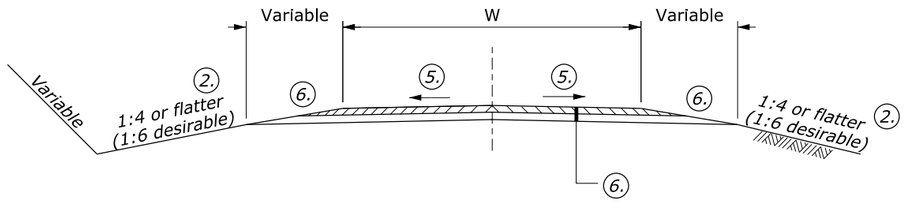
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

TYPICAL SECTIONS MAINLINE

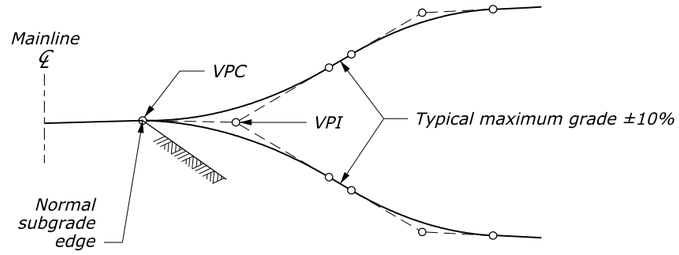
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	A8



APPROACH ROAD TYPICAL PLAN



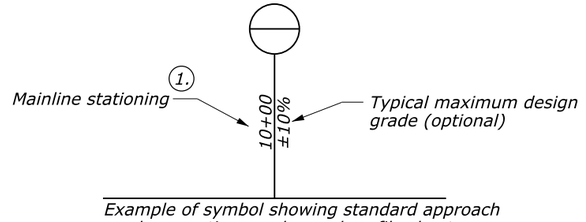
SECTION A-A



TYPICAL PROFILE

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.



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

Sheet 1 of 2

APPROACH ROAD SUMMARY

STATION (1.)	PAVED LENGTH (ft)	TOTAL LENGTH (ft)	W (ft)	R_1 (ft)	R_2 (ft)	REMARKS
106+20.55 Lt.	144	144	14	5	50	
106+37.66 Rt.	22	22	*	10	15	
108+45.87 Rt.	37	37	*	20	5	
109+11.83 Lt.	20	20	*	*	18	
110+75.65 Rt.	25	25	*	5	5	
111+55.46 Lt.	9	9	*	10	10	
111+78.13 Rt.	24	24	*	5	5	
113+26.60 Rt.	27	27	*	*	5	
113+62.71 Rt.	25	25	*	5	*	
115+23.52 Rt.	22	22	*	8	10	
115+67.39 Lt.	14	14	*	5	4	
115+95.65 Lt.	12	12	*	4	5	
116+52.13 Rt.	22	22	*	15	5	
117+39.27 Lt.	77	77	*	10	10	
118+45.46 Lt.	91	91	*	5	300	
119+01.70 Rt.	20	20	*	5	5	
119+59.94 Lt.	18	18	*	5	5	
121+74.79 Rt.	23	23	*	5	5	
123+54.85 Rt.	24	24	*	25	18	
126+23.28 Rt.	12	12	*	5	5	
130+43.38 Rt.	5	5	*	10	5	
132+66.98 Rt.	10	10	*	5	5	
132+88.76 Lt.	20	20	*	5	5	
134+52.16 Lt.	12	12	*	8	15	
134+56.16 Rt.	20	20	*	5	5	
137+49.17 Lt.	36	36	*	35	35	
138+75.83 Lt.	13	13	*	5	10	
141+55.28 Rt.	23	23		30	10	

* Match existing

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

TYPICAL SECTIONS
APPROACH ROADS
Sheet 2 of 2

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
					B3	B4	B5				
					SURFACING AND DRAINAGE SUMMARIES	GRADING SUMMARIES	SIGNAGE AND PAVEMENT MARKINGS SUMMARIES		ALLOWANCE	Bid Schedule	
	A0020	15101-0000	MOBILIZATION	LPSM						ALL	
	A0040	15215-3000	SURVEY AND STAKING, DRAINAGE STRUCTURE	EACH	29					29	
	A0060	15215-7000	SURVEY AND STAKING, PARKING AREA	EACH						1	
	A0080	15225-0000	SLOPE, REFERENCE, AND CLEARING AND GRUBBING CONTROL	MILE						0.800	
	A0100	15236-2000	SURVEY CONTROL, GRADE FINISHING	MILE						1.600	
	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 (NON-STORMWATER CONTROL)	LPSM						ALL	
	A0200	15701-0000	SOIL EROSION CONTROL (EROSION CONTROL)	LPSM						ALL	
	A0220	15701-0000	SOIL EROSION CONTROL (SEDIMENT 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				5.0	0.1	5.1	
	A0300	20304-1000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LPSM						ALL	
	A0320	20401-0000	ROADWAY EXCAVATION	CUYD		21,676			1,824	23,500	
	A0340	20402-0000	SUBEXCAVATION	CUYD						500	As directed by CO
	A0360	20441-0000	WASTE	CUYD		10,973			1,027	12,000	
	A0380	25101-0200	PLACED RIPRAP, METHOD A, CLASS 2	CUYD	20				2	22	
	A0400	25101-0400	PLACED RIPRAP, METHOD A, CLASS 4	CUYD	11				1	12	
	A0420	30202-2000	ROADWAY AGGREGATE, METHOD 2	TON	5,290				260	5,550	
	A0440	30401-5300	FULL DEPTH RECLAMATION, METHOD 2, 6-INCH DEPTH	MILE	0.800				0.200	1.000	
	A0460	40301-0100	ASPHALT CONCRETE PAVEMENT, TYPE 1	TON	3,037				63	3,100	
	A0480	40601-0000	FOG SEAL	TON	5					5	
	A0500	41102-0000	PRIME COAT	SQYD	13,067				433	13,500	
	A0520	41201-0000	TACK COAT	TON	6				1	7	
	A0540	60103-0000	CONCRETE, HEADWALL (INCLUDES WINGWALLS)	EACH	2					2	
	A0560	60103-0000	CONCRETE, HEADWALL (RBC EXTENSION)	EACH	1					1	
	A0580	60103-0100	CONCRETE, HEADWALL FOR 18-INCH PIPE CULVERT	EACH	14					14	
	A0600	60201-0600	18-INCH PIPE CULVERT	LNFT	1,238				62	1,300	
	A0620	60201-0800	24-INCH PIPE CULVERT	LNFT	294				11	305	
	A0640	60201-1000	36-INCH PIPE CULVERT	LNFT	36				4	40	
	A0660	60210-0600	END SECTION FOR 18-INCH PIPE CULVERT	EACH	27					27	
	A0680	60210-0800	END SECTION FOR 24-INCH PIPE CULVERT	EACH	10					10	
	A0700	60210-1000	END SECTION FOR 36-INCH PIPE CULVERT	EACH	1					1	
	A0720	60220-1200	6 FEET SPAN, 4 FEET RISE PRECAST REINFORCED CONCRETE BOX CULVERT	LNFT	52				4	56	
	A0740	60221-2450	9 FEET SPAN, 6 FEET RISE REINFORCED CONCRETE BOX CULVERT, SINGLE BARREL (RBC EXTENSION)	LNFT	7				3	10	
	A0760	60901-1000	CURB, CONCRETE, 12-INCH DEPTH	LNFT	826				24	850	

MileStone: 70%
Date Completed: 01/09/20
Report Date: 01/09/20

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
					B3	B4	B5				
					SURFACING AND DRAINAGE SUMMARIES	GRADING SUMMARIES	SIGNAGE AND PAVEMENT MARKINGS SUMMARIES		ALLOWANCE	Bid Schedule	
	A0780	61501-0100	SIDEWALK, CONCRETE	SQYD	345					360	
	A0800	61504-1000	ACCESSIBILITY RAMP, CONCRETE	SQYD				8		8	
	A0820	61901-2400	FENCE, SPLIT RAIL, 2 RAIL	LNFT				194	6	200	
	A0840	61921-1000	REMOVE AND RESET FENCE	LNFT				100		100	
	A0860	62201-0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	HOUR						40	
	A0880	62201-1000	WHEEL LOADER, 4 CUBIC YARD MINIMUM RATED CAPACITY	HOUR						40	
	A0900	62201-2750	MOTOR GRADER	HOUR						40	
	A0920	62201-3300	HYDRAULIC EXCAVATOR, 3/4 CUBIC YARD MINIMUM CAPACITY	HOUR						40	
	A0940	62301-0000	GENERAL LABOR	HOUR						40	
	A0960	62302-1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	HOUR						40	
	A0980	62302-1100	SPECIAL LABOR, HIRED SURVEY SERVICES	HOUR						40	
	A1000	62407-0000	PLACING CONSERVED TOPSOIL	CUYD				1,071	59	1,130	
	A1020	62510-2000	SEEDING, HYDRAULIC METHOD	ACRE				3.7	0.3	4.0	
	A1040	62515-2000	MULCHING, HYDRAULIC METHOD	ACRE				3.7	0.3	4.0	
	A1060	63301-0000	SIGN SYSTEM	EACH			24			24	
	A1080	63308-0000	OBJECT MARKER	EACH			4			4	
	A1100	63401-0300	PAVEMENT MARKINGS, TYPE B, SOLID	LNFT			37,046		1,454	38,500	
	A1120	63405-0050	PAVEMENT MARKINGS, SYMBOLS	EACH			27			27	
	A1140	63501-0000	TEMPORARY TRAFFIC CONTROL	LPSM						ALL	
	A1160	63502-2100	TEMPORARY TRAFFIC CONTROL, CRASH CUSHION	EACH				2		2	
	A1180	64603-1000	FIXTURE, VAULT TOILET	EACH						1	
	A1200	64620-0000	REMOVE AND RESET (INFORMATION SIGNS)	EACH						1	Information kiosk at parking lot
	A1220	64620-0400	REMOVE AND RESET MAILBOX	EACH						17	
	A1240	64620-1000	REMOVE AND RESET HISTORIC MARKER	EACH						1	Historic monument at parking lot

MileStone: 70%
Date Completed: 01/09/20
Report Date: 01/09/20

DRAINAGE SUMMARY

Item Number			15215-3000	25101-0200	25101-0400	60103-0000	60103-0000	60103-0100	60201-0600	60201-0800	60201-1000	60210-0600	60210-0800	60210-1000	60220-1200	60221-2450	NO PAY	
Station	Side	Skew (deg)	SURVEY AND STAKING, DRAINAGE STRUCTURE	PLACED RIPRAP, METHOD A, CLASS 2	PLACED RIPRAP, METHOD A, CLASS 4	CONCRETE, HEADWALL (INCLUDES WINGWALLS)	CONCRETE, HEADWALL (RBC EXTENSION)	CONCRETE, HEADWALL FOR 18-INCH PIPE CULVERT	18-INCH PIPE CULVERT	24-INCH PIPE CULVERT	36-INCH PIPE CULVERT	END SECTION FOR 18-INCH PIPE CULVERT	END SECTION FOR 24-INCH PIPE CULVERT	END SECTION FOR 36-INCH PIPE CULVERT	6 FEET SPAN, 4 FEET RISE PRECAST REINFORCED CONCRETE BOX CULVERT	9 FEET SPAN, 6 FEET RISE REINFORCED CONCRETE BOX CULVERT, SINGLE BARREL (RBC EXTENSION)	GEOTEXTILE FILTER, CLASS 1, TYPE E (NON-WOVEN)	Remarks
			EACH	CUYD	CUYD	EACH	EACH	EACH	LNFT	LNFT	LNFT	EACH	EACH	EACH	LNFT	LNFT	SQYD	
500+35.65	LT/RT		1	4						44			2				14	
501+33.76	LT/RT	18	1	4						90			2				14	
503+95.14	LT/RT	24	1	4						64			2				14	
105+31.46	LT/RT	24	1	4						50			2				14	
108+66.71	LT/RT	11	1		11	2									52		25	
137+02.34	LT/RT		1	4						46			2				14	
141+16.54	LT/RT	40	1						38			1						
141+20.43	LT/RT	19	1								36			1				
141+42.35	LT/RT		1				1									7		
Driveways			20					14	1200			26						
TOTALS			**29**	**20**	**11**	**2**	**1**	**14**	**1238**	**294**	**36**	**27**	**10**	**1**	**52**	**7**	**95**	

SURFACING SUMMARY

Item Number		30202-2000	30401-5300	40301-0100	40601-0000	41102-0000	41201-0000	60901-1000	61501-0100	
Station to Station	Side	ROADWAY AGGREGATE, METHOD 2	FULL DEPTH RECLAMATION, METHOD 2, 6-INCH DEPTH	ASPHALT CONCRETE PAVEMENT, TYPE 1	FOG SEAL	PRIME COAT	TACK COAT	CURB, CONCRETE, 12-INCH DEPTH	SIDEWALK, CONCRETE	Remarks
		TON	MILE	TON	TON	SQYD	TON	LNFT	SQYD	
100+00 - 107+50		1487	0.14	737	0.97	2333	1.00	826	345	Includes quantities for parking lot
107+50 - 113+00		805	0.11	460	0.71	1711	0.73			
113+00 - 120+00		843	0.13	528	0.90	2178	0.93			
120+00 - 127+00		669	0.13	408	0.90	2178	0.93			
127+00 - 134+00		657	0.13	403	0.90	2178	0.93			
134+00 - 141+00		697	0.13	425	0.90	2178	0.93			
141+00 - 142+00		132	0.03	76	0.13	311	0.13			
TOTAL		**5290**	**0.80**	**3037**	**5**	**13067**	**6**	**826**	**345**	

**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)

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

SURFACING AND DRAINAGE SUMMARIES

Sheet 1 of 3

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

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 - 107+50	17,097	0	17,097	468	6,711	0	309	
107+50 - 113+00	1,084	0	1,084	116	70	0	31	
113+00 - 120+00	988	0	988	92	57	0	26	
120+00 - 127+00	510	0	510	101	92	0	18	
127+00 - 134+00	1,374	0	1,374	166	95	0	3	
134+00 - 141+00	532	0	532	120	129	0	15	
141+00 - 142+00	91	0	91	8	16	0	2	
TOTALS	**21,676**	**0**	**21,676**	**1,071**	**7,170**	**0**	**404**	**10,973**

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.

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

GRADING SUMMARIES

PERMANENT PAVEMENT MARKINGS SUMMARY

Station to Station	LEFT Edge Solid White 6 inches	RIGHT Edge Solid White 6 inches	CENTER Centerline Solid Yellow 4 inches	Stop Bar Solid White 24 inches	Parking Stripe Solid White 4 inches	63401-0300 PAVEMENT MARKINGS, TYPE B, SOLID	63405-0050 PAVEMENT MARKINGS, SYMBOLS	Remarks
	LNFT	LNFT	LNFT	LNFT	LNFT	LNFT	EACH	
100+00 - 142+00	5029	5254	7308	124		17715	16	Quantities adjusted for wider stripes
Parking Lot			164	44	600	808	11	Pavement marking symbols are for Yield Line
SUB-TOTAL						**18523.00**	**27.00**	
TOTAL						**37046.00**	**27.00**	Double the line quantity for 2 coats

PERMANENT SIGN SUMMARY

Station	Side	MUTCD Reference	Description	Sign Panel	63301-0000 SIGN SYSTEM	63308-0000 OBJECT MARKER	Remarks
				in x in	EACH	EACH	
100+00	LT	W8-3	Pavement Ends	36 x 36	1		
100+97	RT	R3-17	Bike Lane	24 x 30	1		
	RT	R3-17bP	Ends (plaque)	12 x 30	1		
102+51	LT	R8-3a	No Parking	24 x 30	1		
103+57	LT	R8-3a	No Parking	24 x 30	1		
104+37	LT	R8-3a	No Parking	24 x 30	1		
105+71	RT	W11-3	Deer	30 x 30	1		
107+33	RT	R2-1	Speed Limit	24 x 30	1		25 mph
108+79	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+91	LT	S3-1	Bus Stop Ahead	30 x 30	1		
137+16	LT	R1-1	Stop	30 x 30	1		Include street name signs
140+66	LT	R2-1	Speed Limit	24 x 30	1		25 mph
140+89	RT	Special 1	Historic Lincoln Highway		1		
140+98	RT	OM3-R	Object Marker	12 x 36		1	
141+13	RT	OM3-L	Object Marker	12 x 36		1	
141+21	LT	OM3-L	Object Marker	12 x 36		1	
141+48	LT	OM3-R	Object Marker	12 x 36		1	
141+93	LT	Special 1	Historic Lincoln Highway		1		
142+10	LT	R3-17	Bike Lane	24 x 30	1		
	LT	R3-17aP	Ahead (plaque)	12 x 30	1		
500+22	LT	R1-1	Stop	30 x 30	1		
500+52	RT	W11-7	Equestrian	30 x 30	1		
501+13	LT	W11-7	Equestrian	30 x 30	1		
503+41	RT	R7-8	No Parking	12 x 18	1		ADA Parking sign
503+58	RT	R7-8	No Parking	12 x 18	1		ADA Parking sign
	RT	R7-8p	Van Accessible (plaque)	18 x 9	1		
504+08	RT	R1-2	Yield	36 x 36 x 36	1		
TOTALS					**24**	**4**	

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

SIGNAGE AND PAVEMENT MARKING SUMMARIES

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

KING'S CANYON ROAD
PLAN SHEET
100+00.00 to 105+88.59

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

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+66.71 Install 6'x4' RBC (52 LF)
Headwall w/Wingwalls, Lt. & Rt.
Riprap Class 4, Rt.

Culvert cleanout shoulder,
7' x 45'

111+55.46 Install 18" CMP
w/ end sections

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

110+75.65 Install 18" CMP
w/ end sections

108+45.87 Install 18" CMP
w/ end sections

PI 106+95.63
Δ = 42°24'43" (LT)
R = 275.00'
T = 106.84'
L = 203.80'
e = 2%

APN 00707201
WALSH FAMILY TRUST
5149 KINGS CANYON RD

PI 109+57.92
Δ = 47°27'55" (RT)
R = 265.00'
T = 116.51'
L = 219.53'
e = -2%

111+78.13 Install 18" CMP
w/ end sections

APN 00707202
FULWIDER, TOM FAMILY TRUST
4249 KINGS CANYON DR

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

PI 114+90.22
Δ = 31°01'04" (LT)
R = 380.00'
T = 105.45'
L = 205.72'
e = -2%

118+45.46 Install 18" CMP
w/ end sections

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

117+39.27 Install 18" CMP
w/ end sections

Do not disturb
existing culvert

115+79.00 Install 18" CMP
w/ end sections

119+01.70 Install 18" CMP
w/ end sections

119+59.94 Install 18" CMP
w/ end sections

PI 119+08.29
Δ = 44°51'20" (RT)
R = 345.00'
T = 142.39'
L = 270.09'
e = 2%

116+52.13 Install 18" CMP
w/ end sections

APN 00707203
RE' FAMILY TRUST
4198 KINGS CANYON RD

115+23.52 Install 18" CMP
w/ end sections

APN 00707204
PIERCY, WILLIAM M
4137 KINGS CANYON RD

APN 00707210
CARLSON LIVING TRUST
4081 KINGS CANYON RD

KING'S CANYON ROAD
PLAN SHEET
105+88.59 to 120+00.00

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

KING'S CANYON ROAD
PLAN SHEET
120+00.00 to 134+00.00

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

End Project
Station 142+00.00
N: 14730176.6676
E: 2278681.8622

KING'S CANYON ROAD
PLAN SHEET
134+00.00 to 142+00.00

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

NOTE:

1. *Equestrian Parking and trail shall have an aggregate surface, 4" depth. Max aggregate size shall be 3/4".*

Sta. 501+33.76
Install 24" x 90' pipe
End section, Lt. & Rt.
Riprap Class 2, Lt.

Concrete sidewalk

Install vault toilet

Equestrian trail, 4' wide

Sta. 503+95.14
Install 24" x 64' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

ADA curb ramp

Install split rail fence, 4' high

12" Concrete curb, typ.

OHV/Equestrian parking (aggregate)

Sta. 500+35.65
Install 24" x 44' pipe
End section, Lt. & Rt.
Riprap Class 2, Rt.

Remove and reset existing fence

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

Parking area station 504+21.61 =
Mainline station 101+74.81, 15' Lt.
N = 14728538.6420
E = 2275344.4245
Elev. = 5417.9730

Parking area station 500+15.00 =
Mainline station 104+72.03, 15' Lt.
N = 14728828.5635
E = 2275357.7659
Elev. = 5392.9143

APN 00707201
WALSH FAMILY TRUST
5149 KINGS CANYON RD

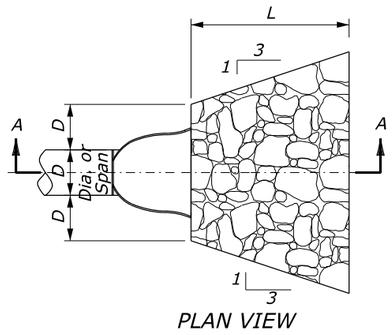
HUMBOLDT-TOIYABE
NATIONAL FOREST

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

PARKING LOT LAYOUT

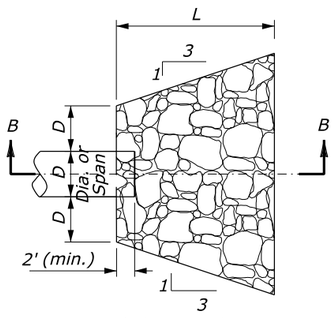
$USER$
$$$$DGN$$$$
$TIME$
$$$$DATES$$$$

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



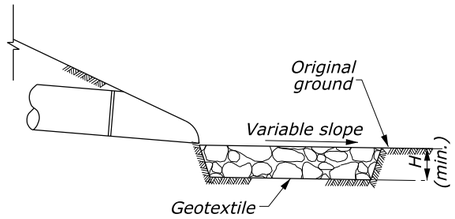
PLAN VIEW

CULVERT WITH STANDARD END SECTION

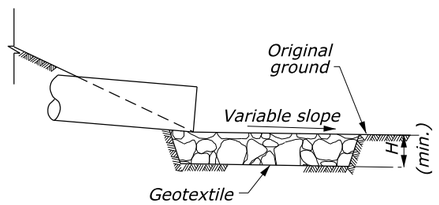


PLAN VIEW

CULVERT WITHOUT STANDARD END SECTION



SECTION A-A



SECTION B-B

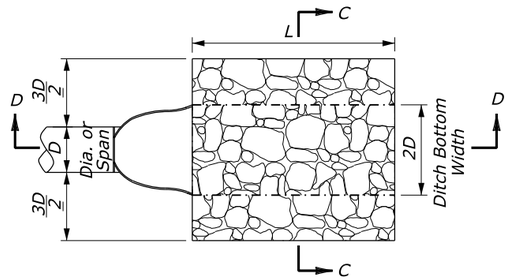
OUTLET WITHOUT DITCH
PROTECTIVE APRON DIMENSIONS AND ESTIMATED QUANTITIES

	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:

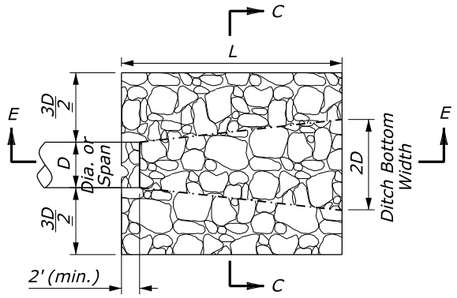
1. Use for aprons serving culverts with slopes of less than 10%.
2. Furnish geotextile conforming to Subsection 714.01(a).
3. Excavation for placement of riprap will not be measured for payment.

PROTECTIVE APRON AT CULVERT OUTLET WITHOUT DITCH



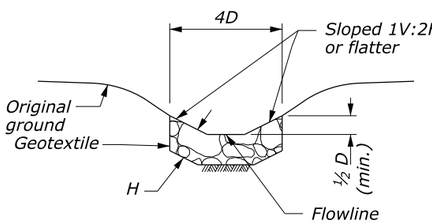
PLAN VIEW

CULVERT WITH STANDARD END SECTION

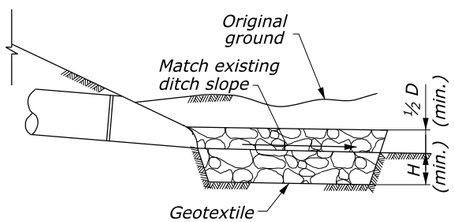


PLAN VIEW

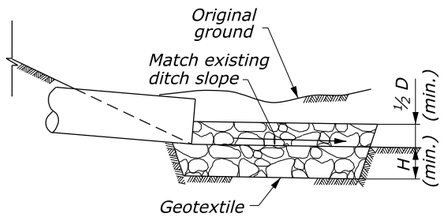
CULVERT WITHOUT STANDARD END SECTION



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

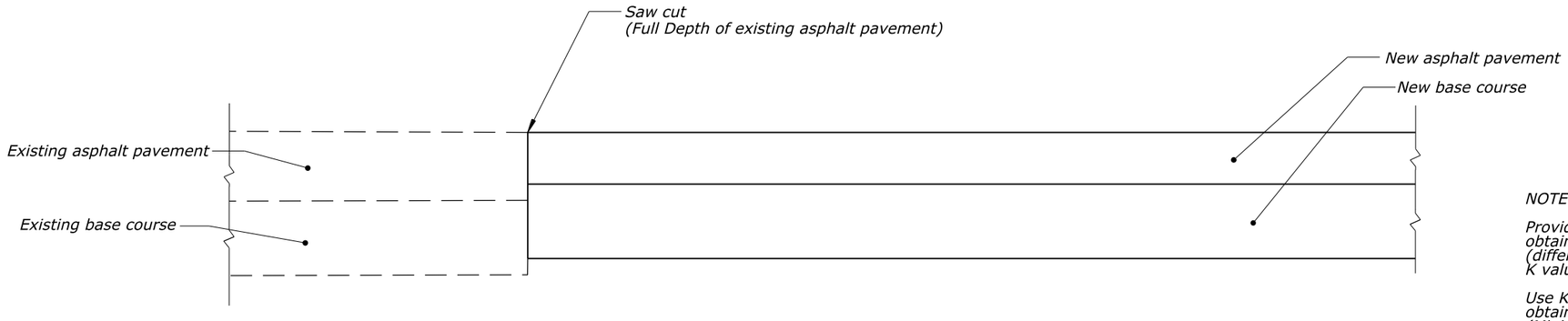
PLACED RIPRAP AT CULVERT OUTLETS

DETAIL APPROVED FOR USE

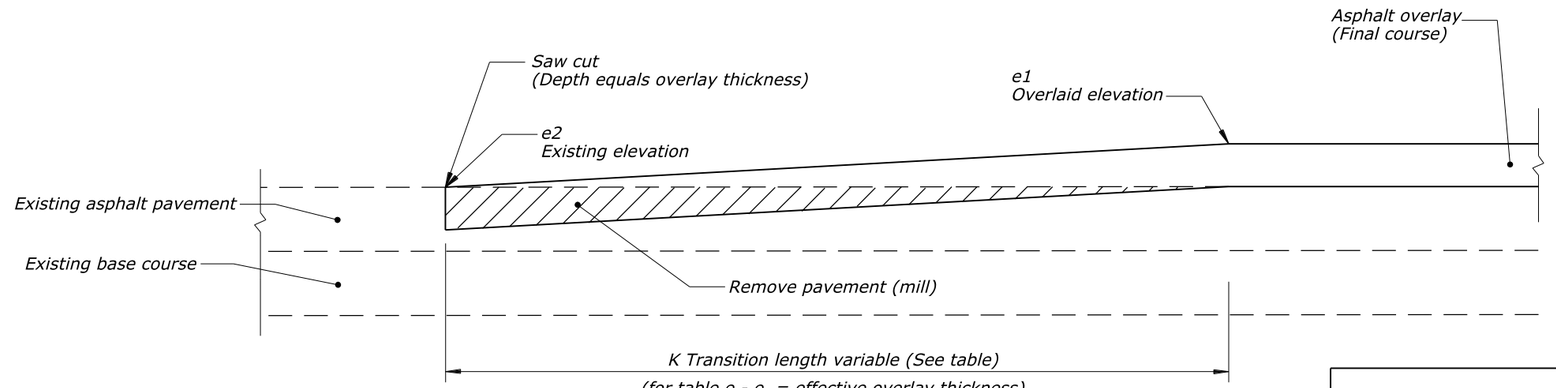
REVISED: 08/2014

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.

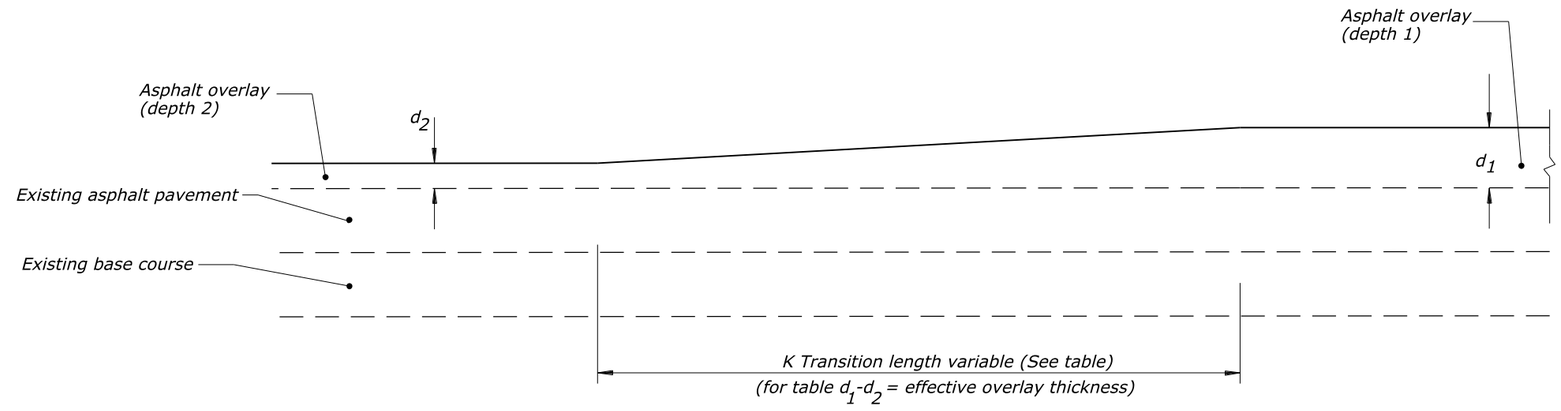
Use K*[e1-e2]=T, or K*[d1-d2]=T (whichever applies), to obtain the transition length.
(Minimum transition length=30 feet)

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.



OVERLAY - DEPTH TRANSITIONS

NO SCALE

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

U.S. CUSTOMARY DETAIL

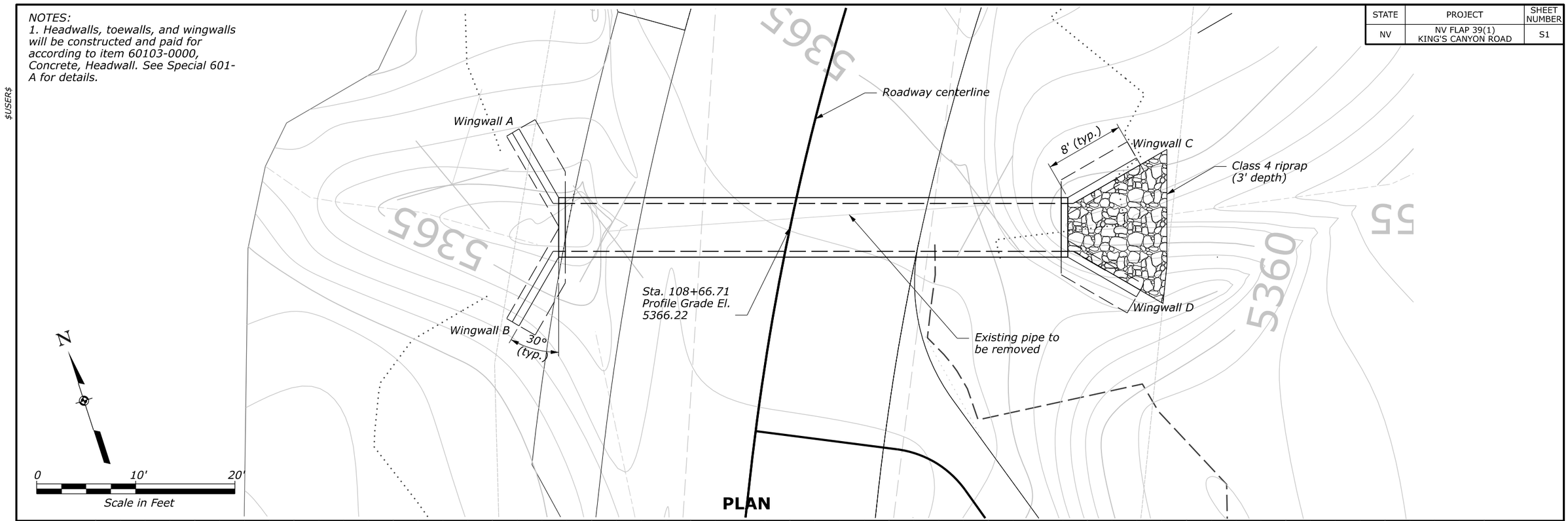
PAVEMENT TRANSITIONS

DETAIL APPROVED FOR USE	DETAIL
APPROVED : FEBRUARY 2013	E401-01

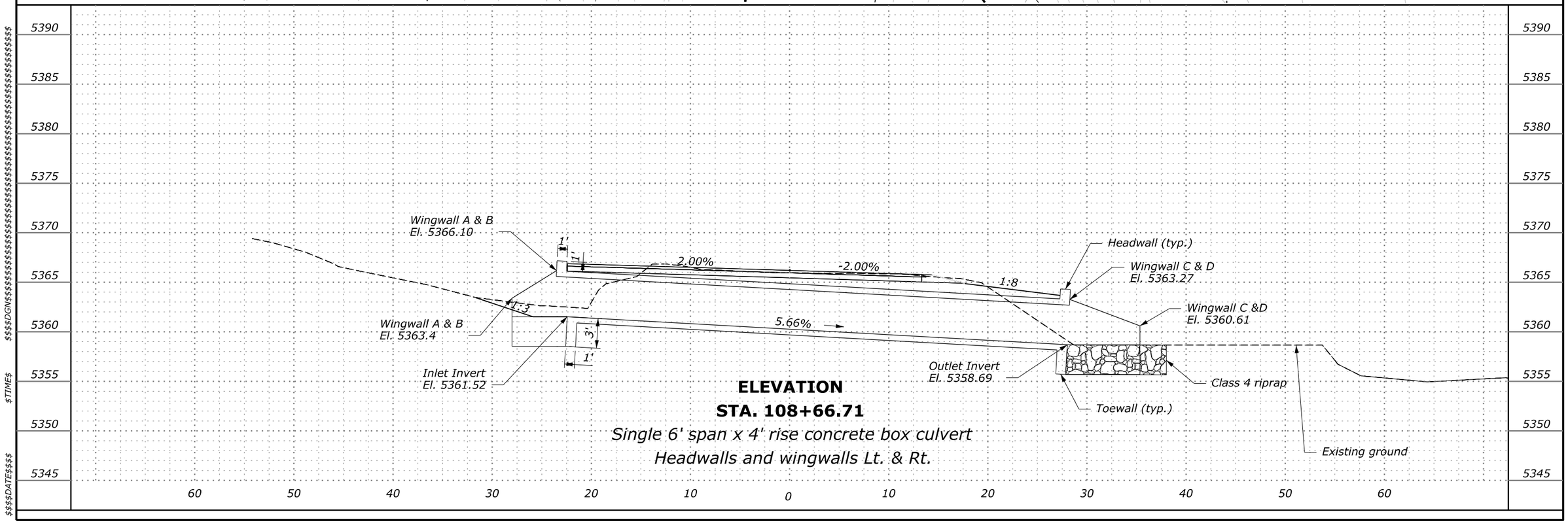
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	S1

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



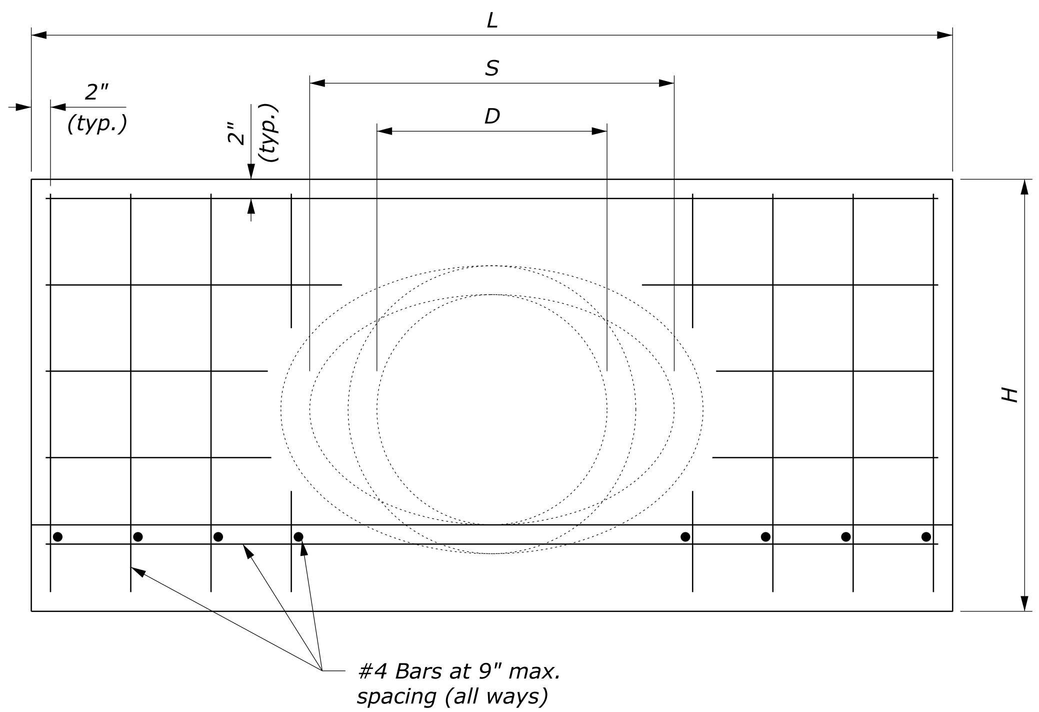
ELEVATION
STA. 108+66.71

Single 6' span x 4' rise concrete box culvert

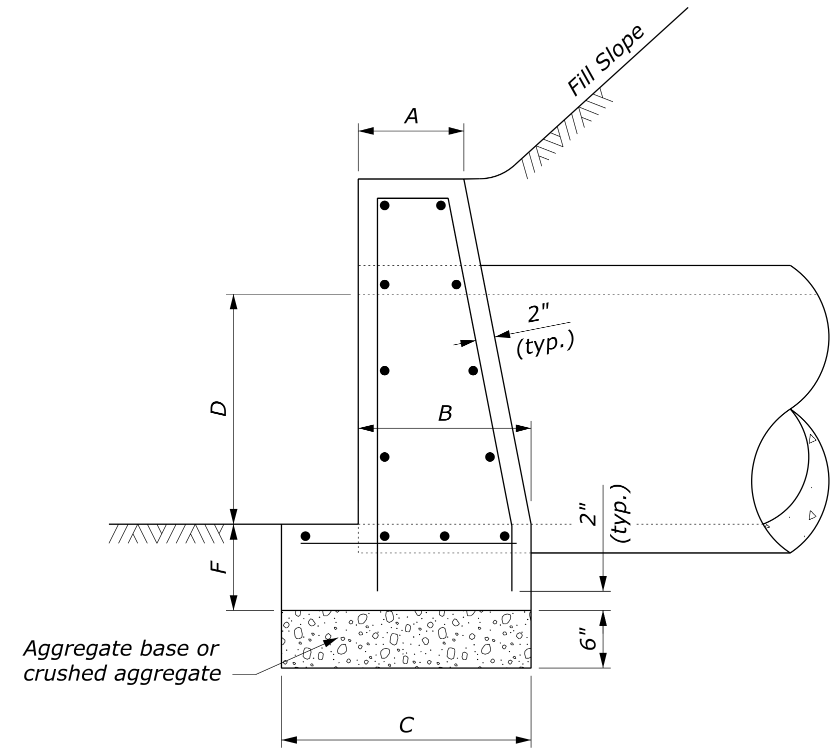
Headwalls and wingwalls Lt. & Rt.

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.



FRONT ELEVATION



SIDE ELEVATION

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

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

NO SCALE

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

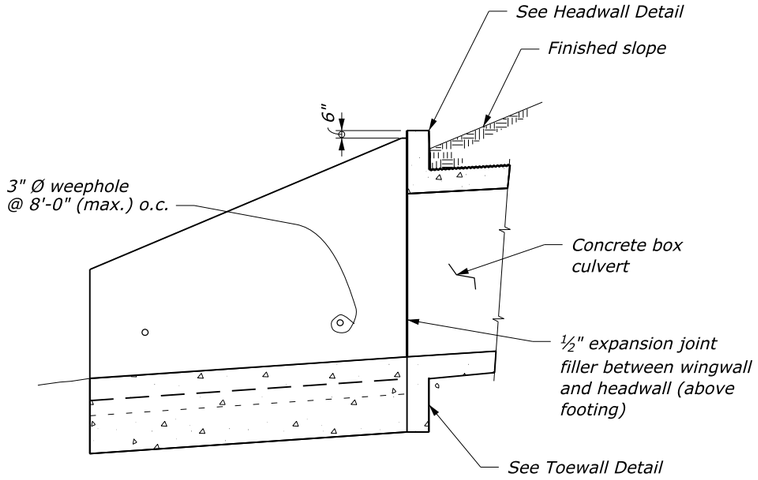
U.S. CUSTOMARY STANDARD

CONCRETE HEADWALL FOR SMALL PIPE CULVERT

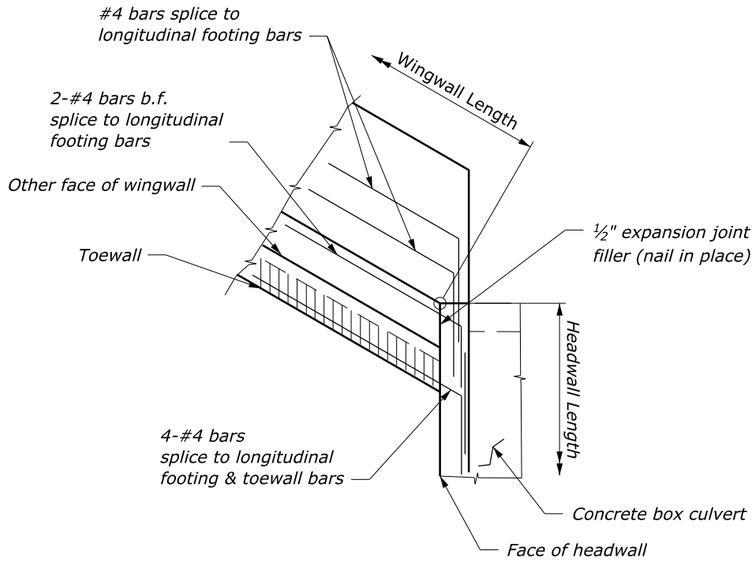
STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 3/2016

STANDARD 601-4

STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T2



WING ELEVATION

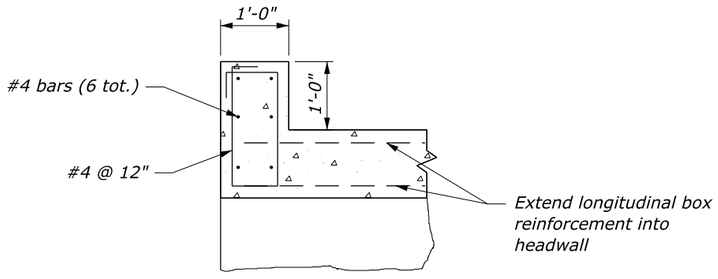


TYPICAL HEADWALL / WINGWALL PLAN DETAIL

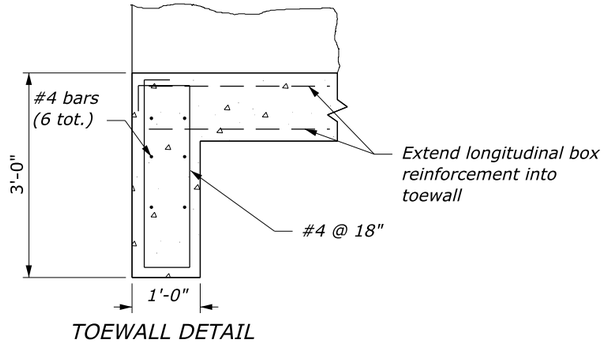
See Box Culvert Plan and Profile Sheet

NOTES:

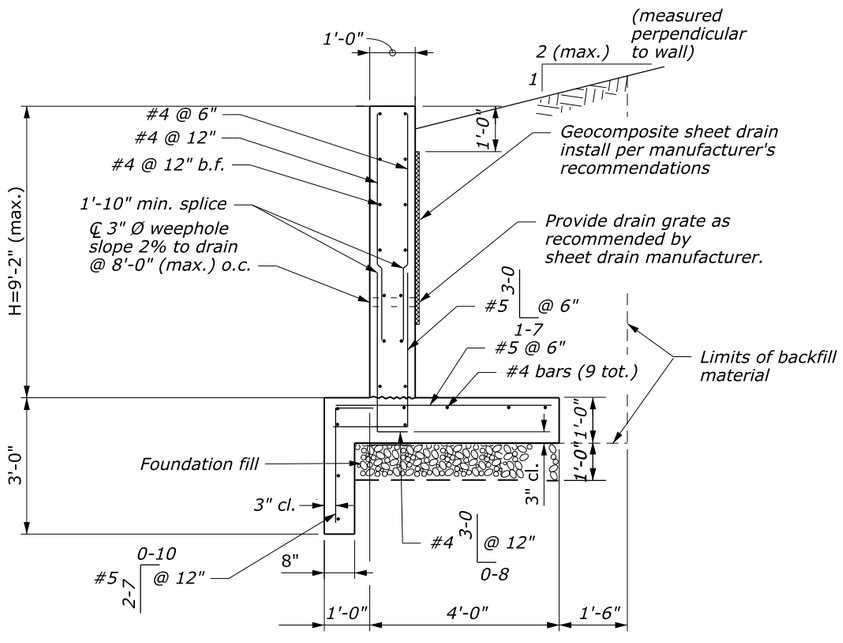
1. Chamfer all exposed concrete corners ¾".
2. Expansion joint material shall conform to AASHTO M213. Payment included in the unit cost of 60103-0000, CONCRETE, HEADWALL.
3. Dimensions, elevations and angles for wingwalls and headwalls are shown on the Box Culvert Plan and Profile Sheet.
4. Use reinforcing 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.



HEADWALL DETAIL



TOEWALL DETAIL



WINGWALL TYPICAL SECTION

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

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

U.S. CUSTOMARY SPECIAL

BOX CULVERT HEADWALLS AND WINGWALLS

	SPECIAL
	601-A

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	EQUIVALENT 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	EQUIVALENT 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

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

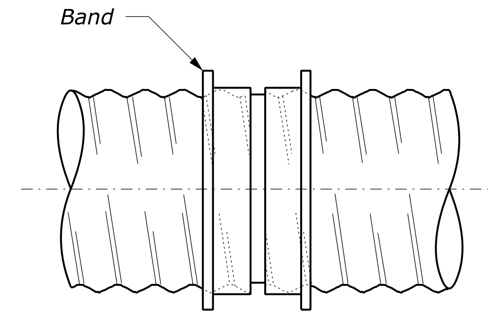
[2] For helically corrugated pipe with rerolled ends, the nominal corrugations size refers to the dimension of the end corrugation in the pipe.

[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.

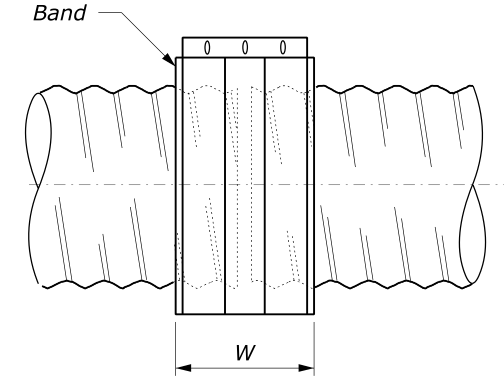
[6] Smooth sleeve-type couplers and flat bands may be used for pipe diameters of 12" or less. Use a matching metal having a nominal thickness of not less than 0.040 inch for steel, or 0.036 inch for aluminum, or a plastic with an equivalent strength to metal.



SLEEVE JOINT

Smoother sleeve with center stop.
Stab type joint

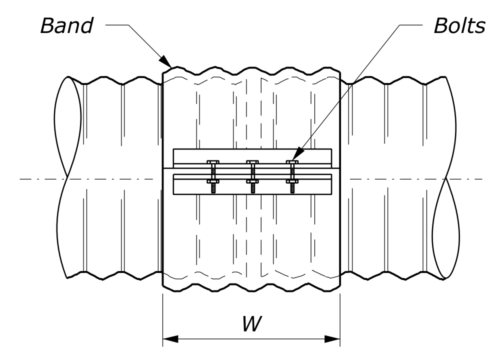
SMOOTH SLEEVE BAND



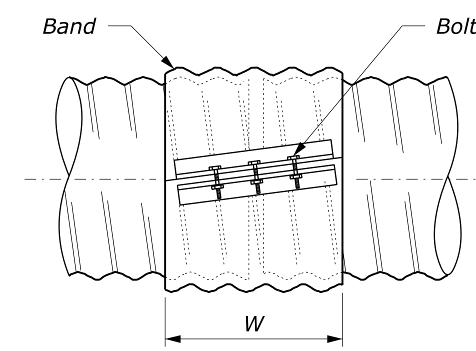
FLAT BAND

NOTE:

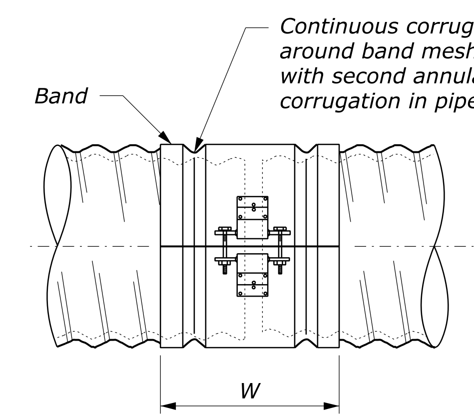
1. Watertight pipe joints are not required unless specified in the Special Contract Requirements.
2. Other types of coupling bands or fastening devices that comply with the joint performance criteria of AASHTO Standard specifications for Highway Bridges, Division II Section 26 may be used.



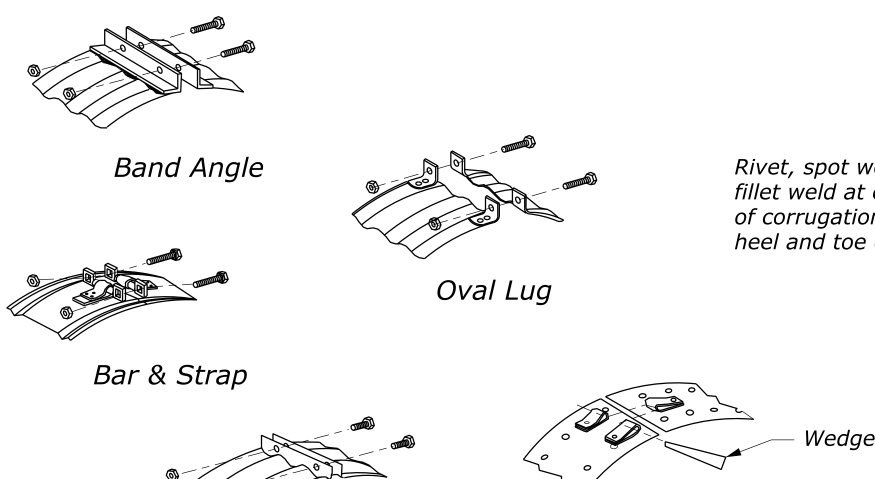
SIDE VIEW



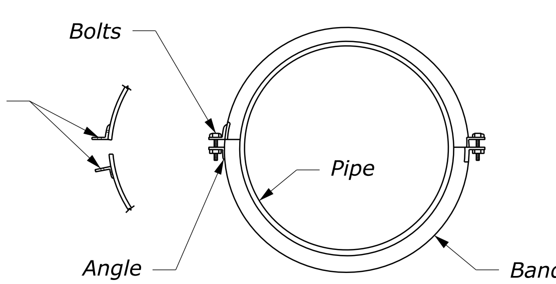
SIDE VIEW



SIDE VIEW



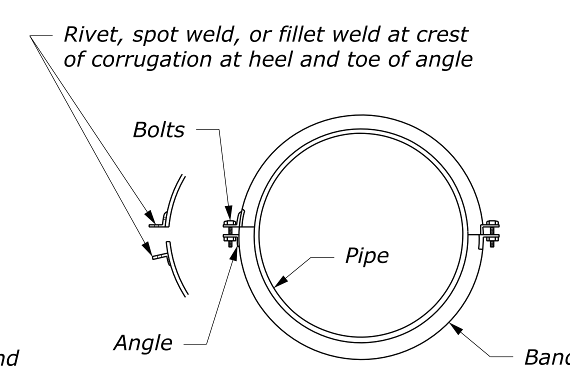
STANDARD BAND CONNECTIONS



END VIEW

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

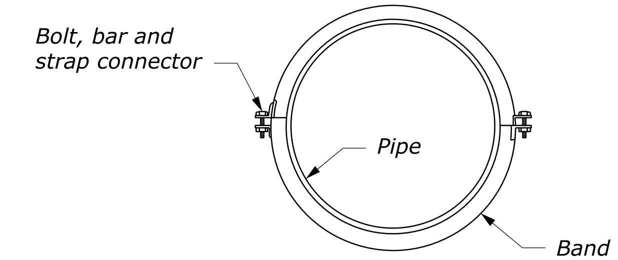
ANNULAR BAND



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

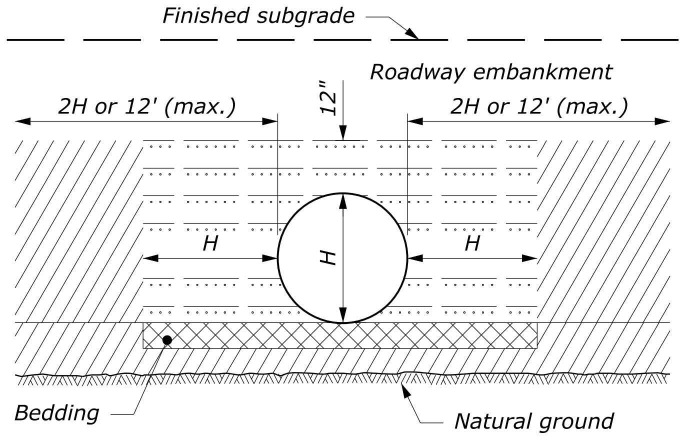
U.S. CUSTOMARY STANDARD

METAL PIPE CULVERT COUPLING BAND

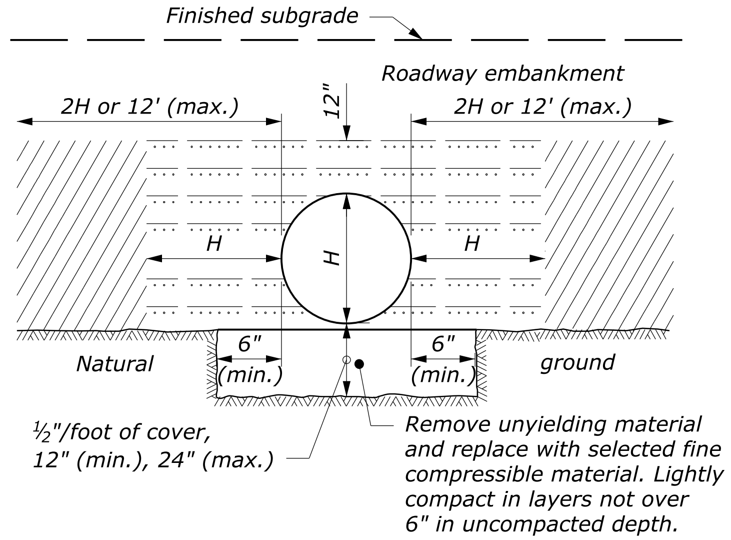
STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005

STANDARD 602-2

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

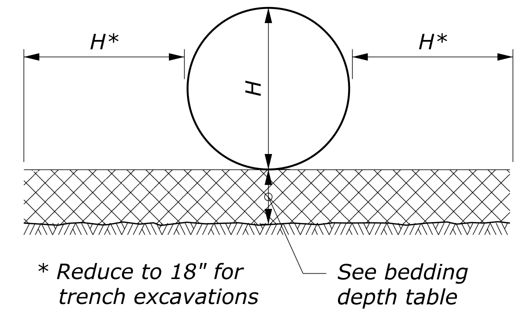


ABOVE NATURAL GROUND



ON UNYIELDING MATERIAL

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

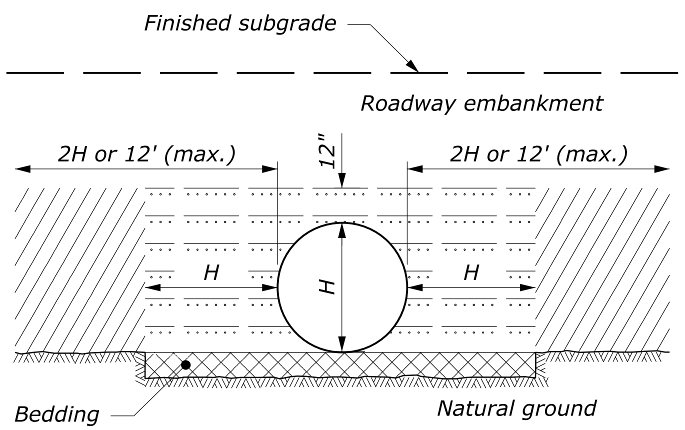


PIPE BEDDING

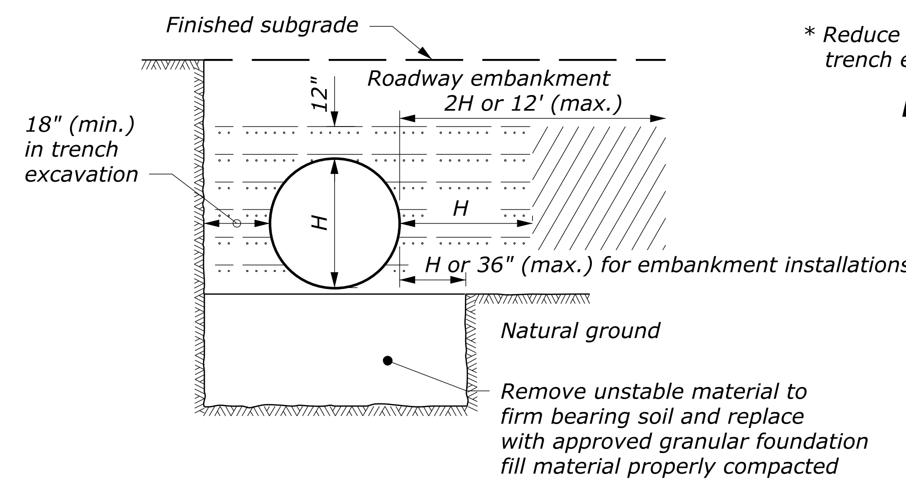
NOTE:

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.

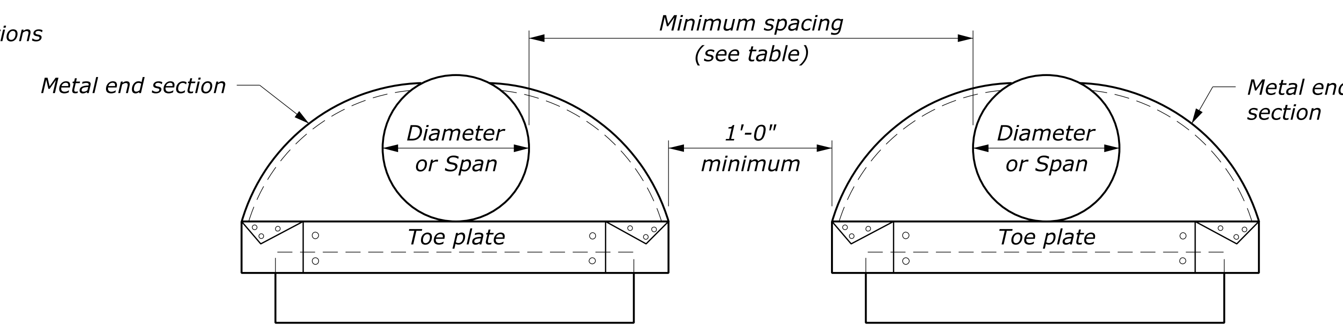
MINIMUM SPACING	
DIAMETER or SPAN	SPACING
UP to 48"	24"
48" and UP	Half diameter or span or 36", whichever is less



ON NATURAL GROUND

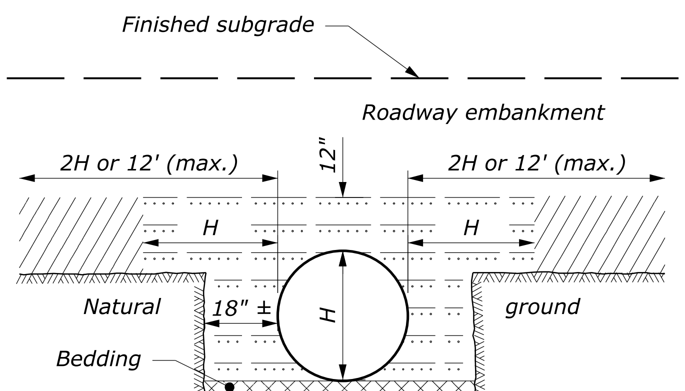


ON UNSTABLE MATERIAL

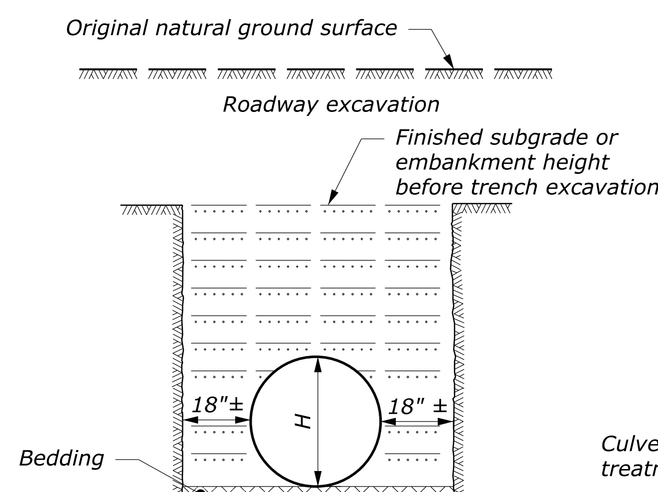


ELEVATION

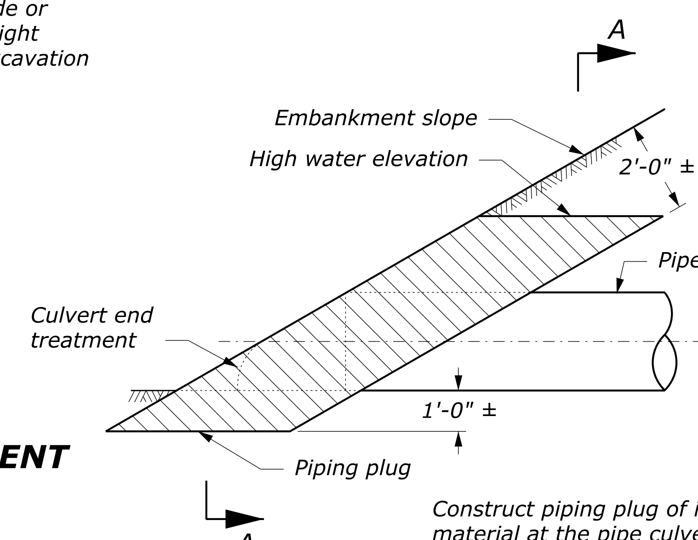
MULTIPLE PIPE INSTALLATION

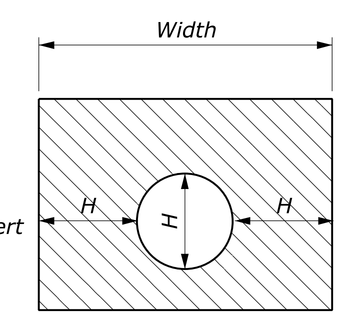


ABOVE AND BELOW NATURAL GROUND



BELOW NATURAL GROUND OR TRENCH EXCAVATION IN EMBANKMENT





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

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.

NO SCALE

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

U.S. CUSTOMARY STANDARD

METAL AND PLASTIC PIPE CULVERT BEDDING

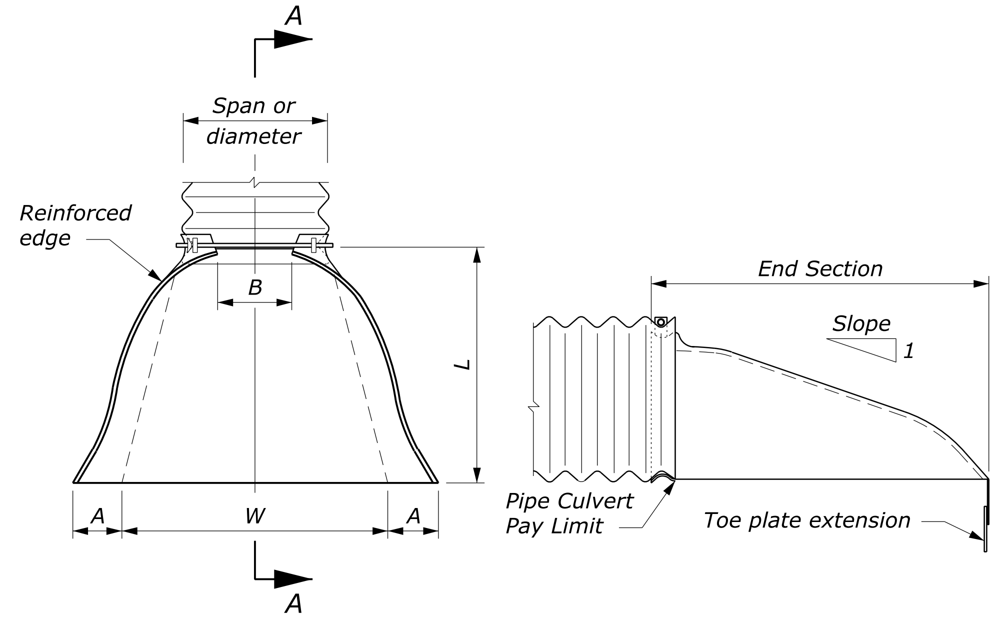
STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005
DRAFT: 10/2017

STANDARD 602-3

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



PLAN

SECTION A-A

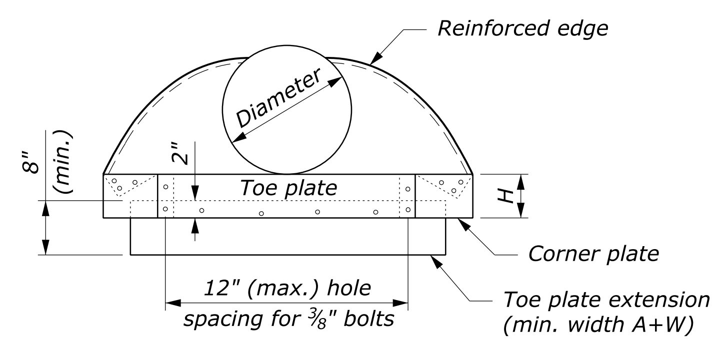
ROUND OR PIPE ARCH CULVERT

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.

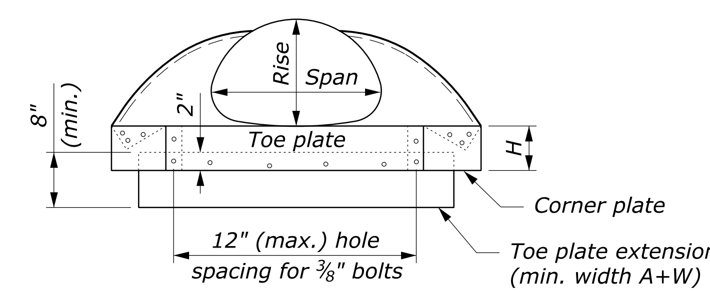
END SECTIONS FOR PIPE ARCH CULVERT

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



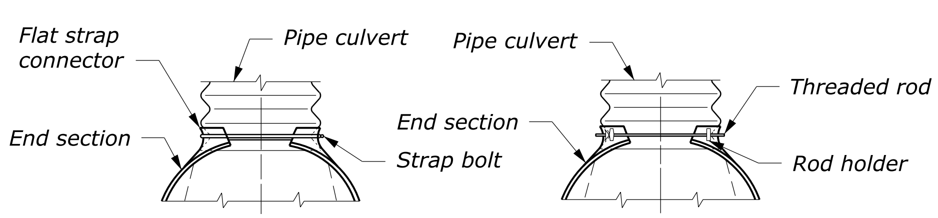
ELEVATION

ROUND PIPE CULVERT



ELEVATION

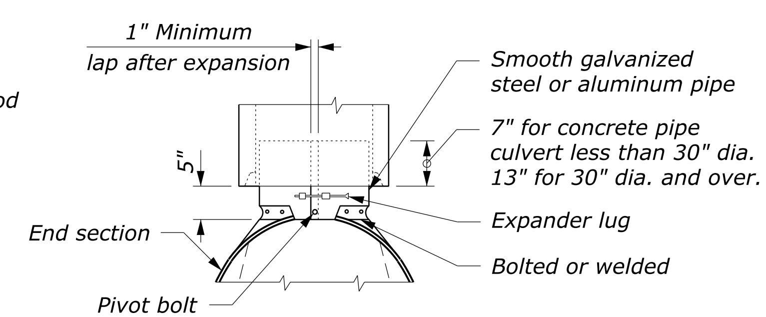
PIPE ARCH CULVERT



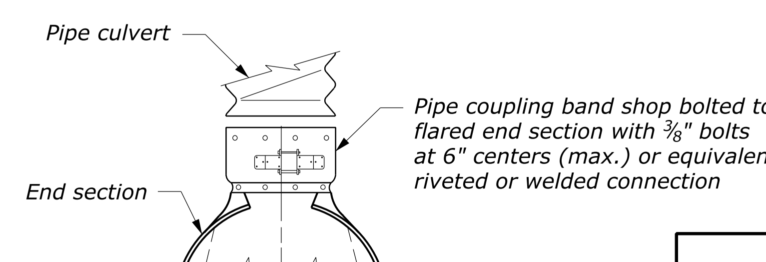
For 12" thru 24" round pipe and 17" × 13" thru 28" × 20" pipe arch

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

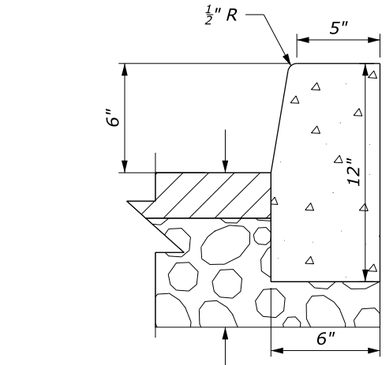
U.S. CUSTOMARY STANDARD

METAL END SECTIONS

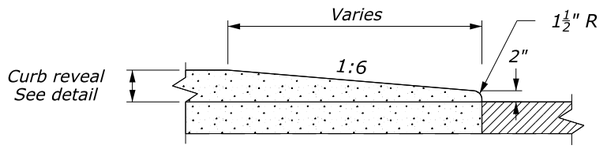
STANDARD APPROVED FOR USE 12/1993
REVISED: 4/1994 6/2005
DRAFT: 10/2007

STANDARD 602-4

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



CONCRETE CURB, 12-INCH DEPTH



CURB TAPER

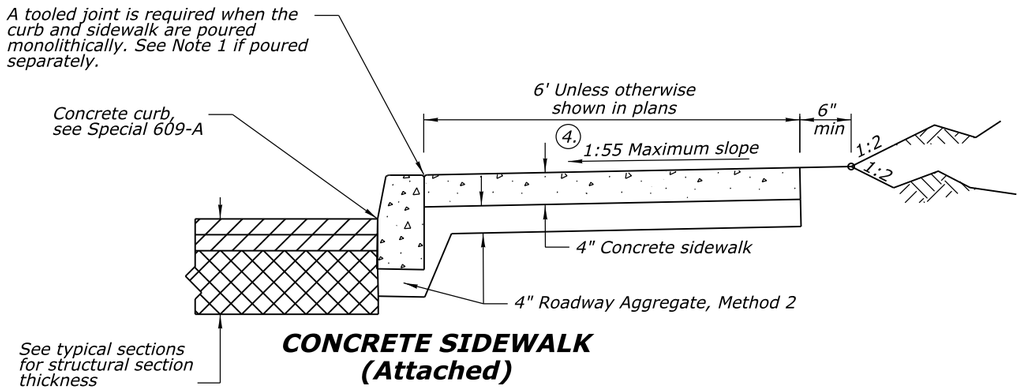
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

CURB DETAILS

SPECIAL
609-A

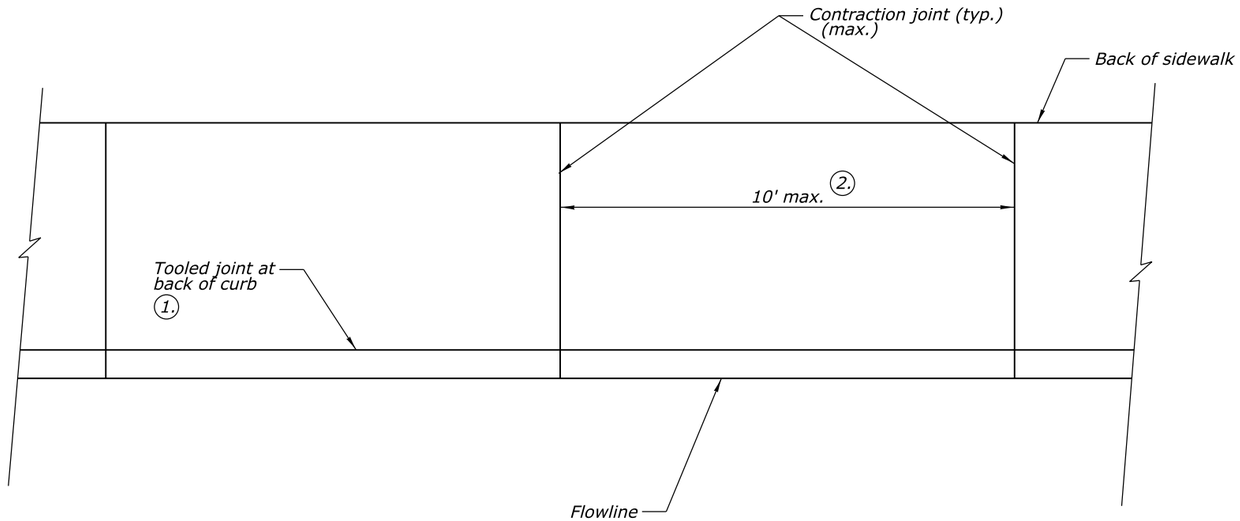
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T8



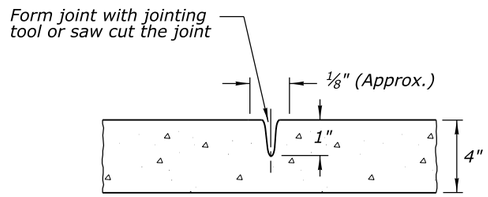
CONCRETE SIDEWALK (Attached)

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. The Roadway Aggregate shown is incidental to the construction of the items shown in this Special and conforming to subsection 302.05 (a), method 2.
4. Slope of sidewalk will be checked with a 2' level at intervals determined by the CO.



CONCRETE SIDEWALK CONTRACTION JOINT LAYOUT



SIDEWALK CONTRACTION JOINT 2.

NO SCALE

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

U.S. CUSTOMARY SPECIAL

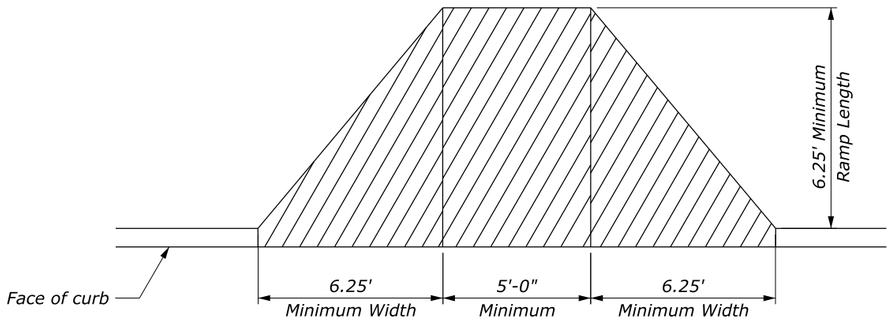
SIDEWALK

SPECIAL
615-A

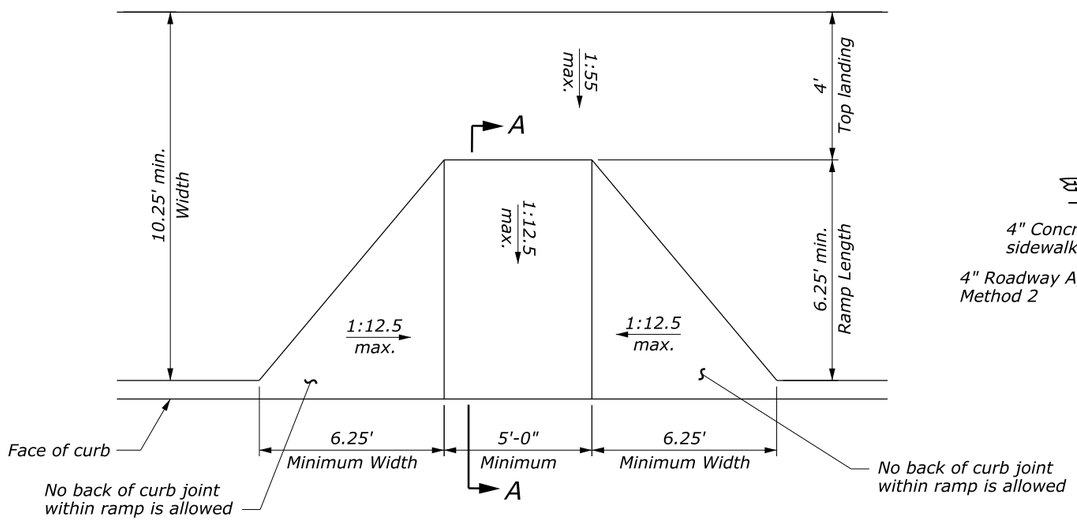
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T9

NOTE:

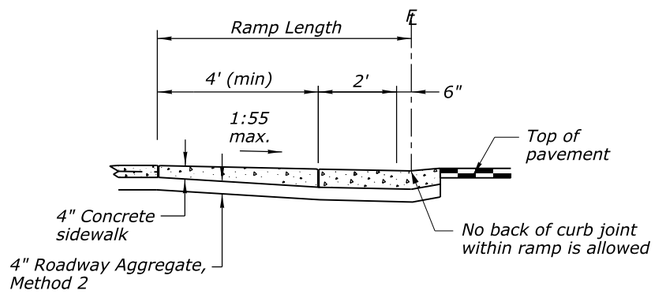
1. *The maximum cross slopes of landings and accessible aisles will not exceed 1:55 (1.8%) in any direction.*
2. *The maximum slope on wheelchair ramps will not exceed 1:12.5 (8%).*
3. *Use a coarse broom finish running perpendicular to the slope to create a slip resistant surface on concrete ramp surfaces.*
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.*
6. *Do not measure Roadway aggregate, method 2 for payment.*



PERPENDICULAR CURB ACCESSIBILTY RAMP PAY AREA



PERPENDICULAR CURB ACCESSIBILITY RAMP



SECTION A-A

NO SCALE

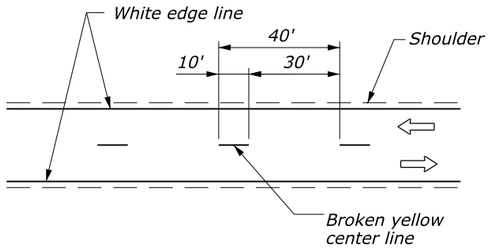
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY SPECIAL

ACCESSIBILITY RAMP

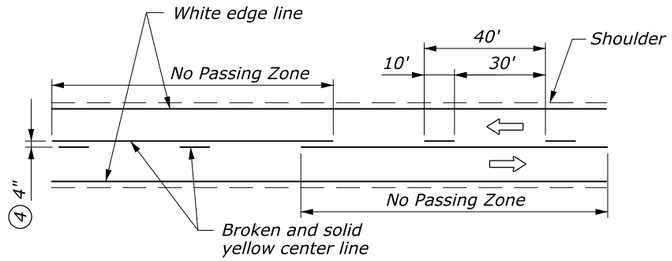
	SPECIAL
	615-B

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



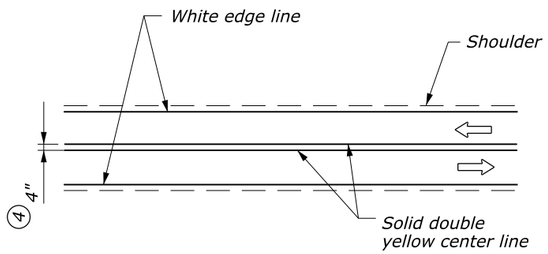
DETAIL A

Passing zone both directions
Two-way traffic



DETAIL B

No passing zone single lane direction
Two-way traffic

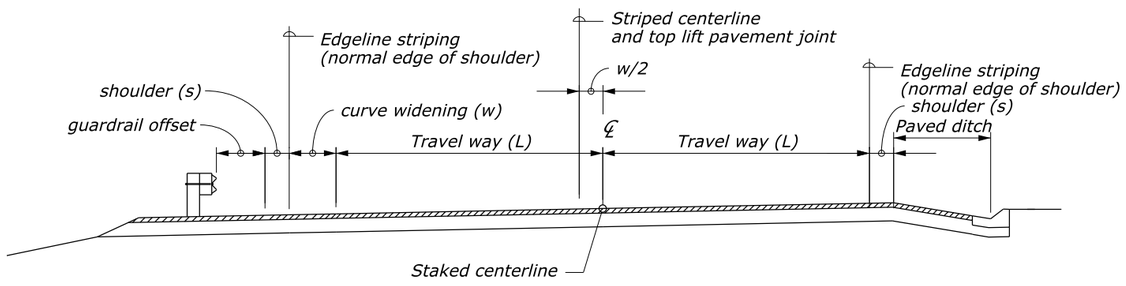


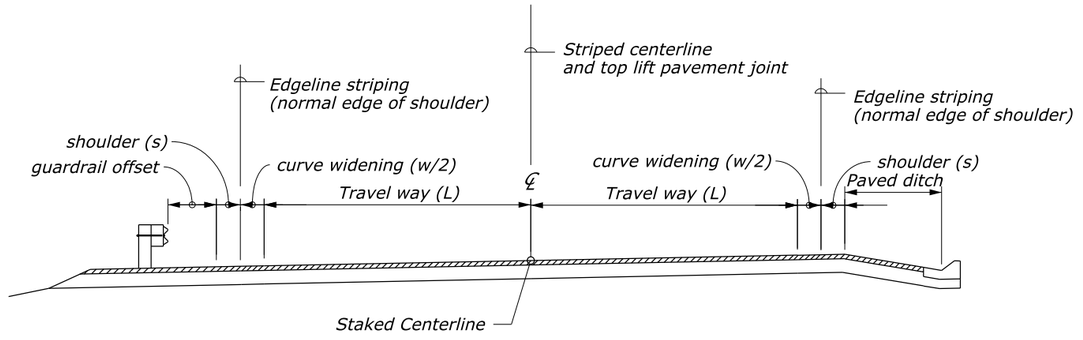
DETAIL C

No passing zone both directions
Two-way traffic

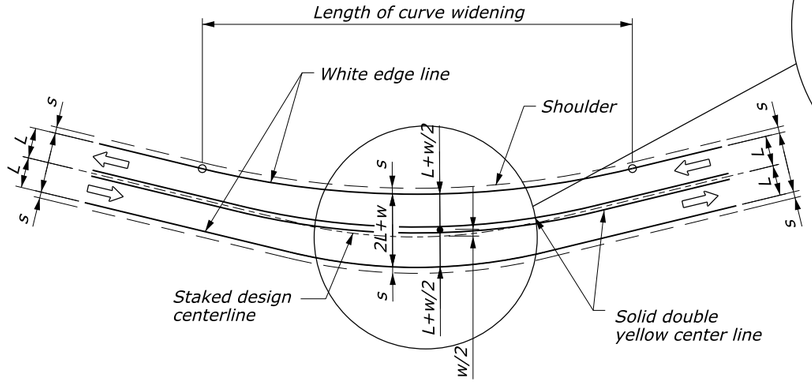
NOTE:

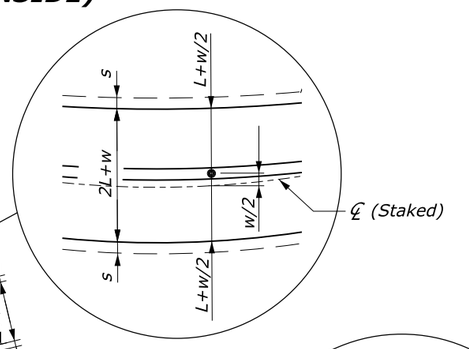
1. *See Summary for tables showing station ranges and quantities for pavement markings.*
2. *Paint centerline striping on curves with curve widening to achieve equal lane widths within the traveled way. Shoulder widths remain constant throughout the curve widening.*
3. *Centerline offset striping is 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)

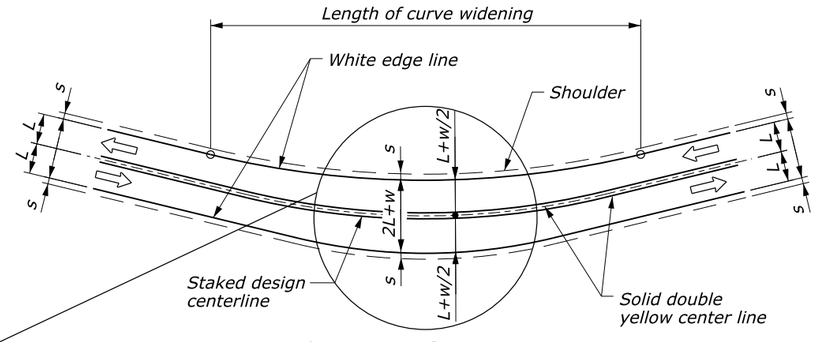


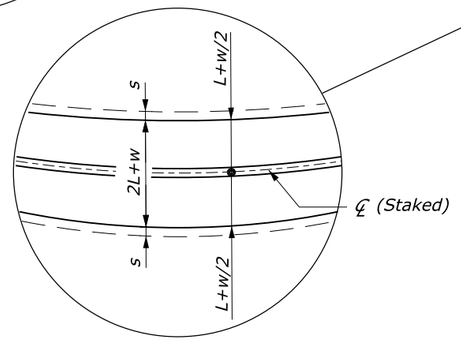


CURVE STRIPING DETAIL ON SIMPLE CURVES

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

CURVE WIDENING ON SPIRAL CURVES





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

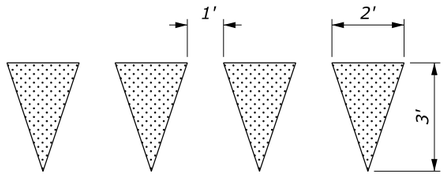
CENTERLINE STRIPING AND TOP LIFT PAVEMENT JOINT

DETAIL APPROVED FOR USE 07/2004

REVISED: 08/2006 08/2014 01/2018

DETAIL C634-50

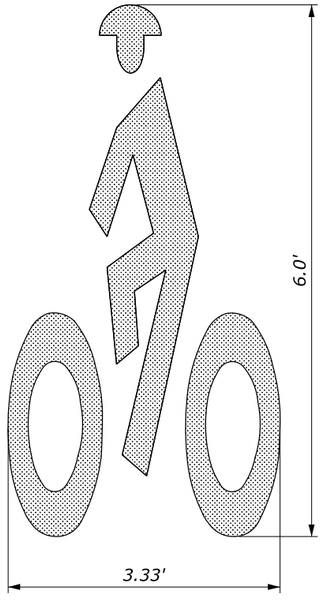
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T11



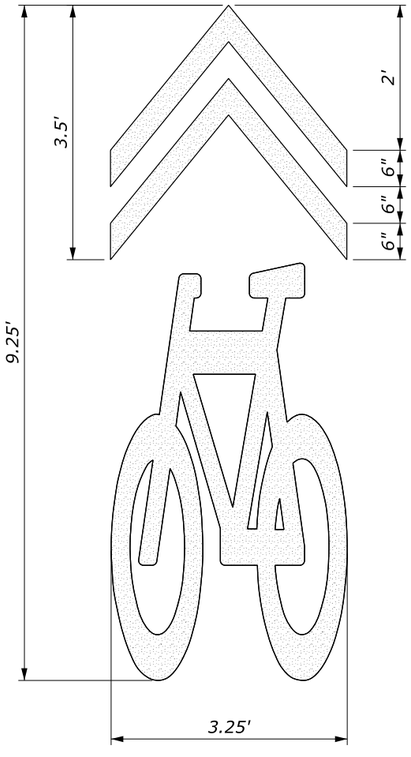
YIELD LINE TRIANGLE SYMBOL

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.*



BIKE LANE SYMBOL MARKING



SHARED ROADWAY BICYCLE MARKING

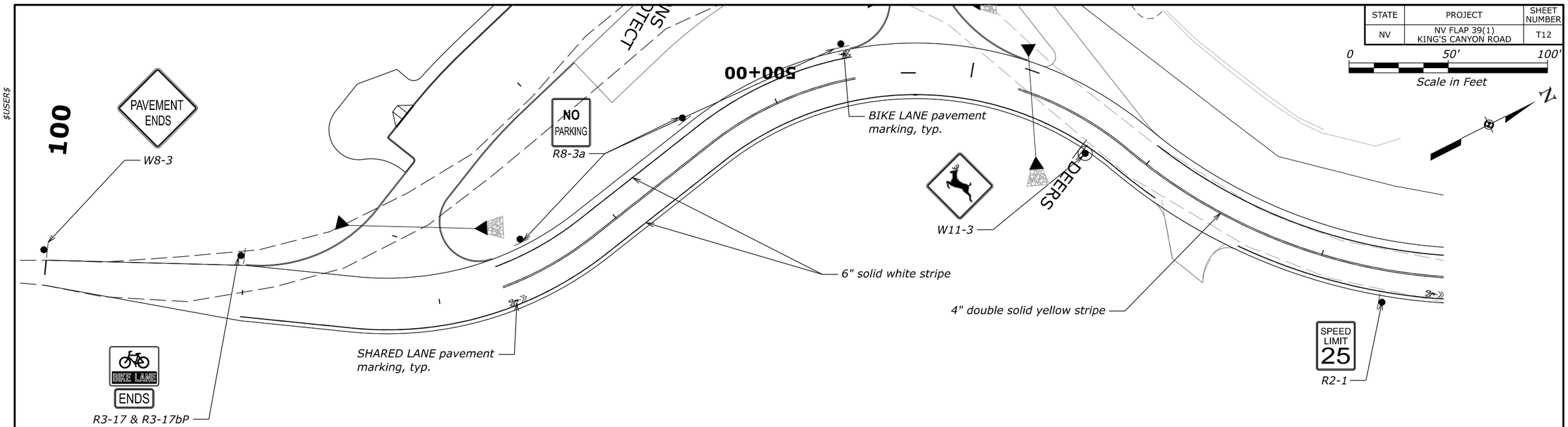
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

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	T12



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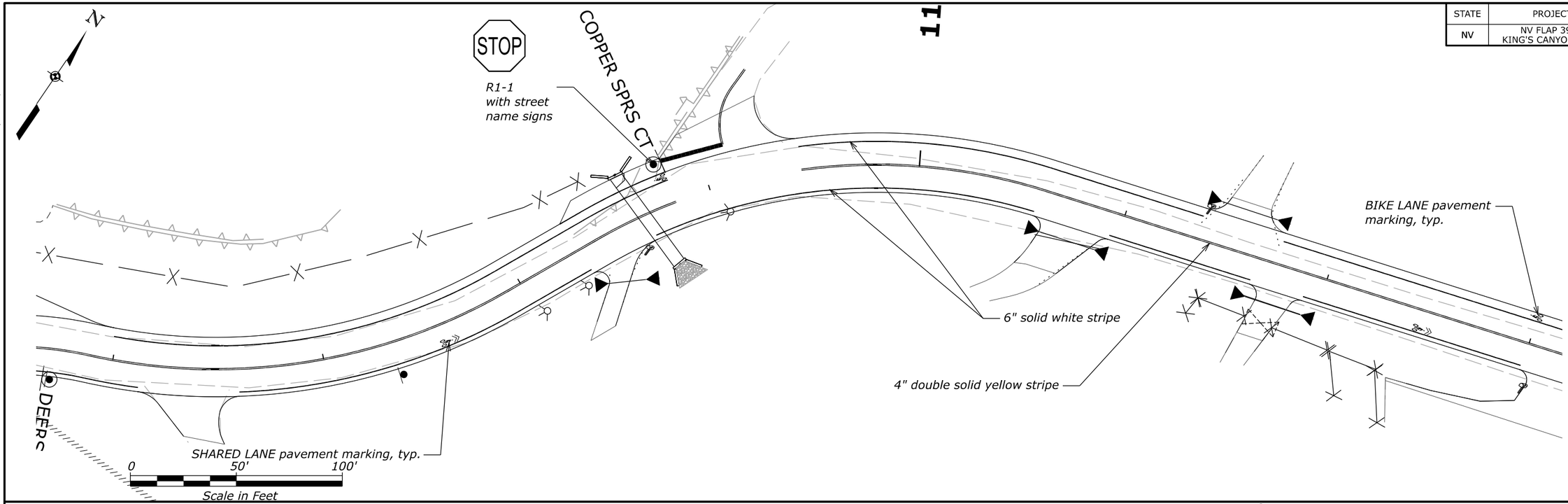
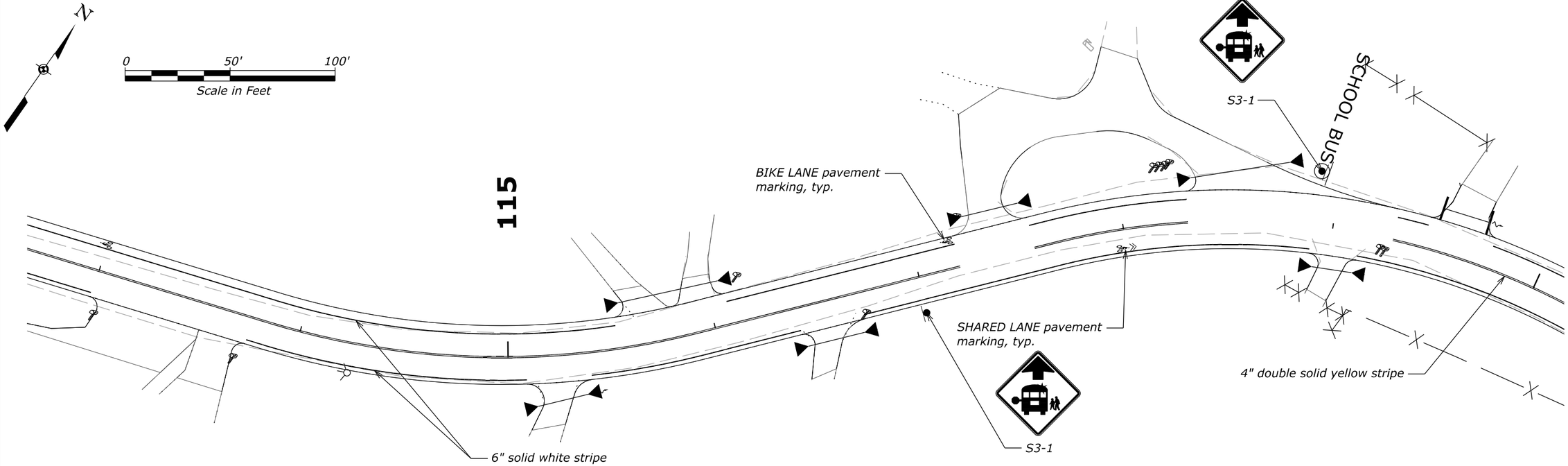
KING'S CANYON ROAD
SIGNING AND STIPING SHEET
100+00.00 to 105+88.59

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





$USER$

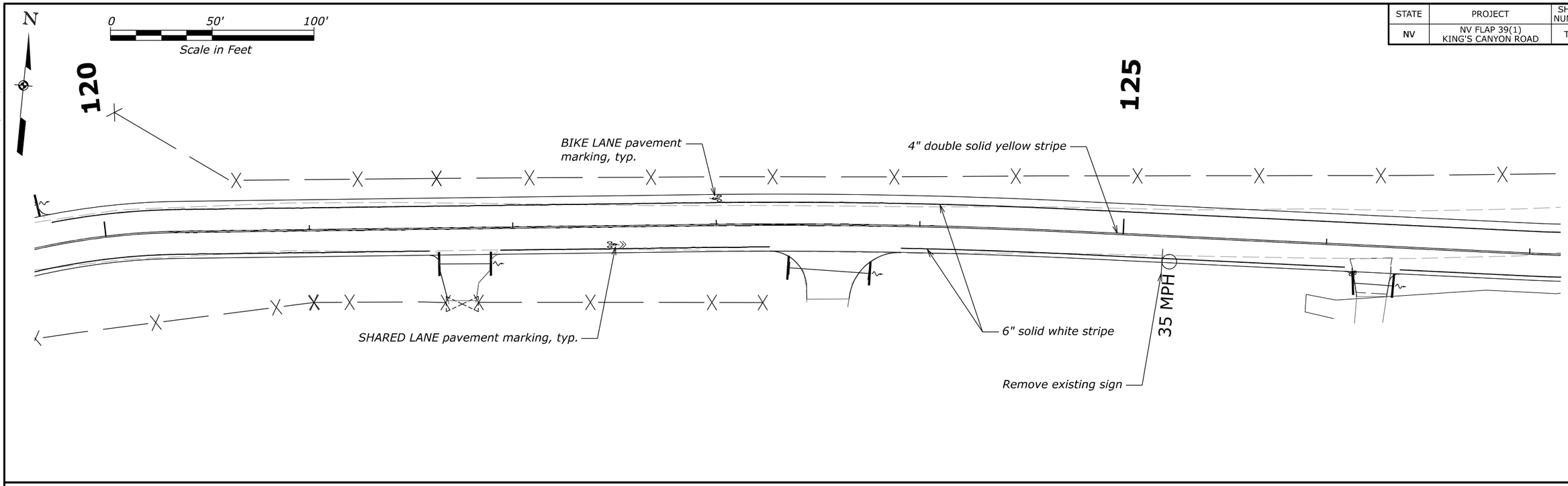
$$$$DGN$$$

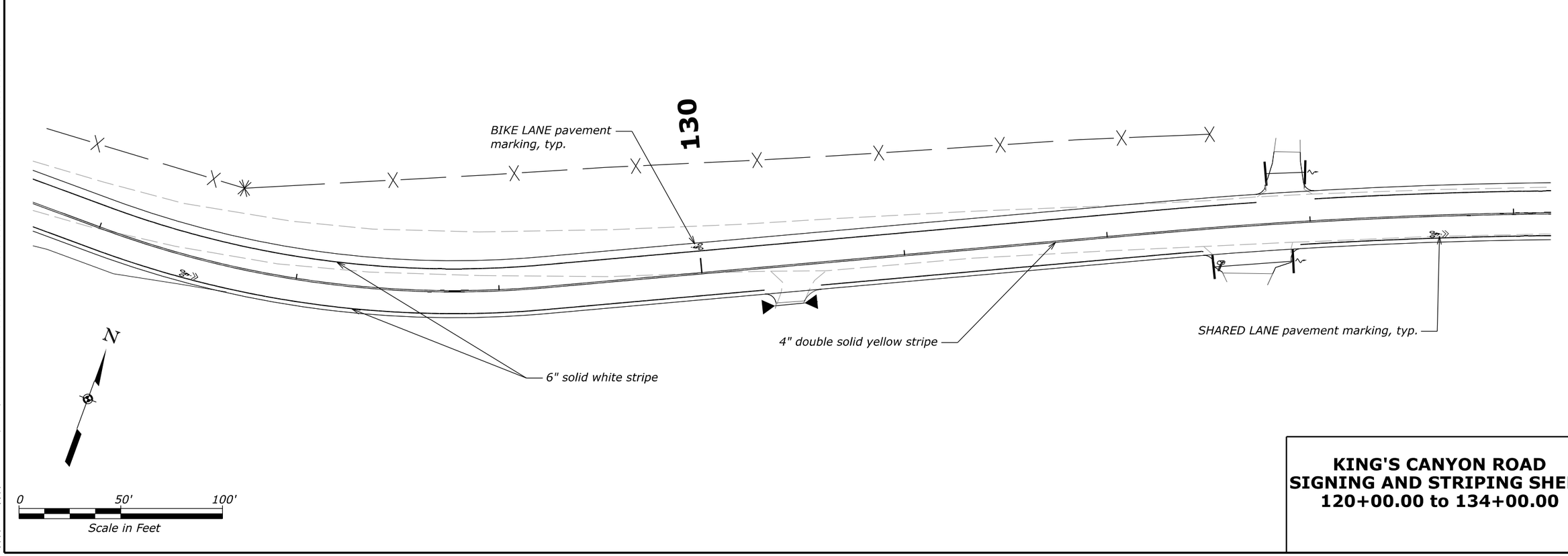
$TIME$

$$$$DATE$$$$

KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
105+88.59 to 120+00.00

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





$USER$

$$$$DGN$$$

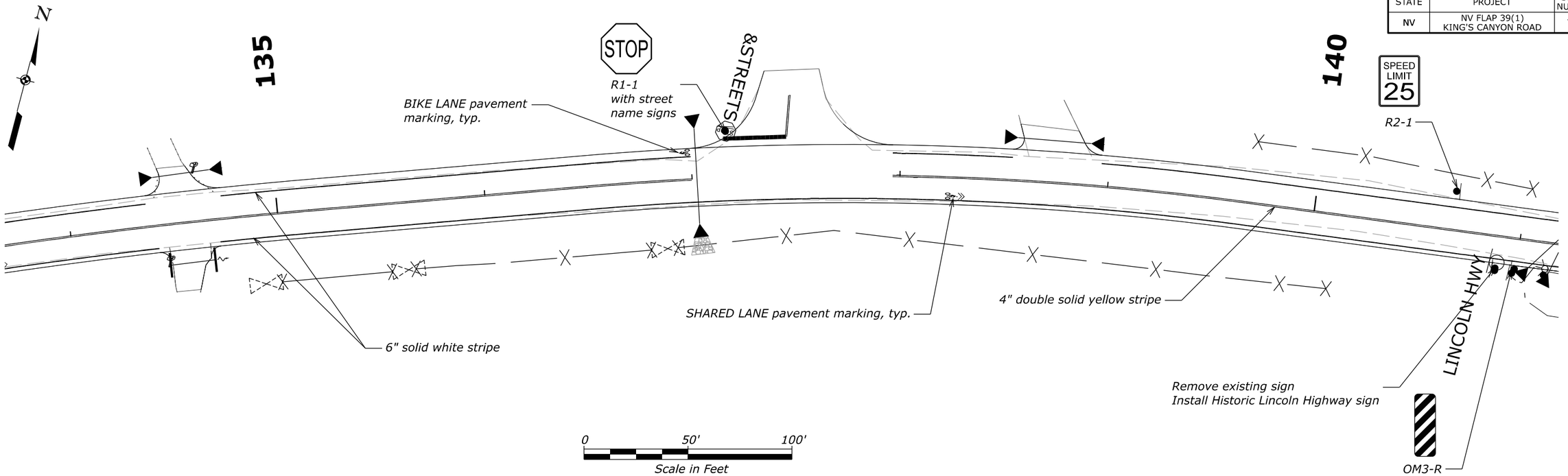
$TIME$

$$$$DATE$$$$

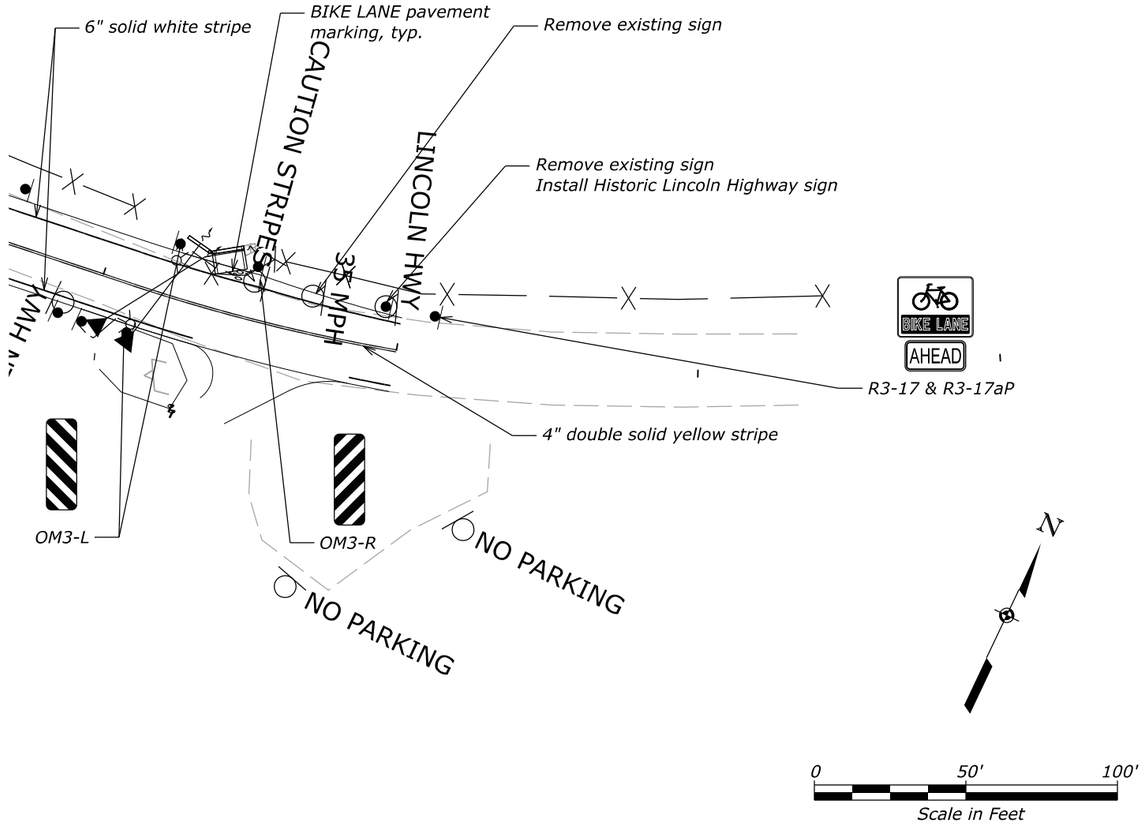
KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
120+00.00 to 134+00.00

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

$USER$



$$$$DGN$$$



$TIME$

$$$$DATE$$$$

KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
134+00.00 to 142+00.00

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

NOTE:

1. Trailhead signage to be removed and reset by others. Awaiting input on USFS signage

KING'S CANYON ROAD
SIGNING AND STRIPING SHEET
PARKING LOT

$USER$

$$$$DGN$$$

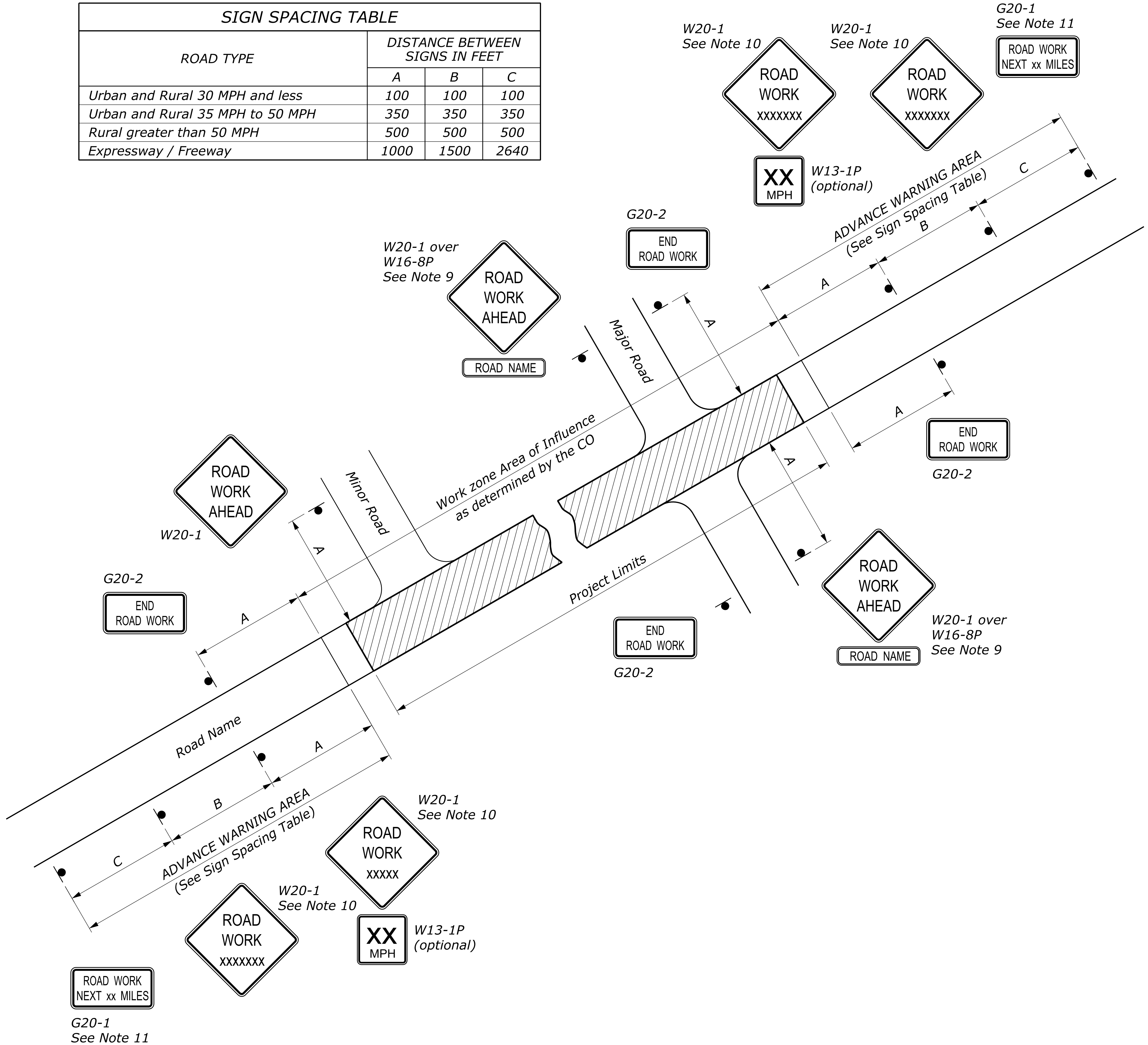
$TIME$

$$$$DATE$$$$

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

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

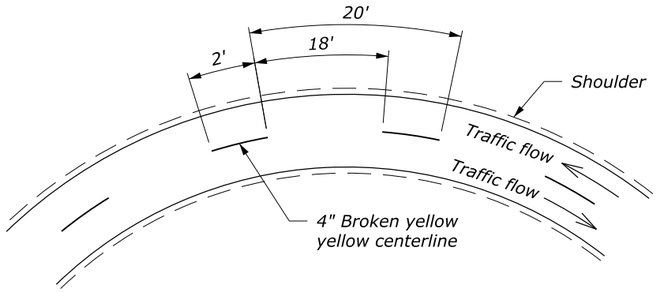
U.S. CUSTOMARY STANDARD

TEMPORARY TRAFFIC CONTROL
ADVANCE SIGNING

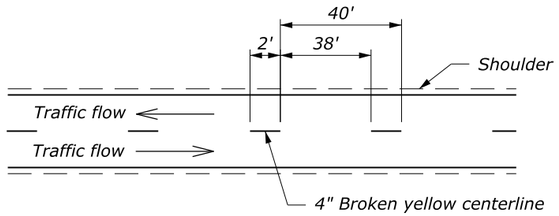
STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 6/2014

STANDARD
635-1

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



DETAIL A1
Passing zone both directions
Two-way traffic



DETAIL B1
Passing zone both directions
Two-way traffic

NOTE:

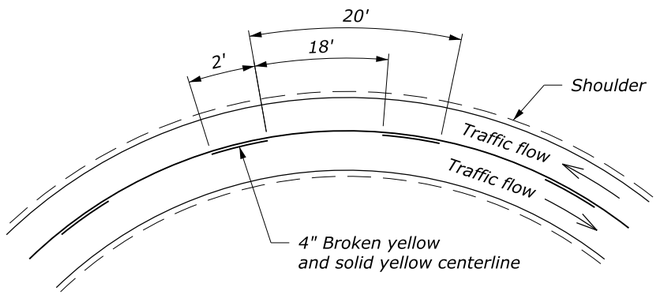
1. *To substitute raised pavement markers for lines, use the following patterns:*

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

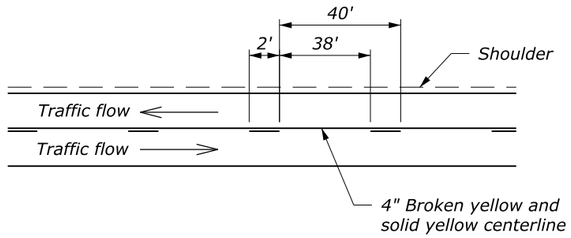
   Single solid line: pavement markers spaced on 10' centers.

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

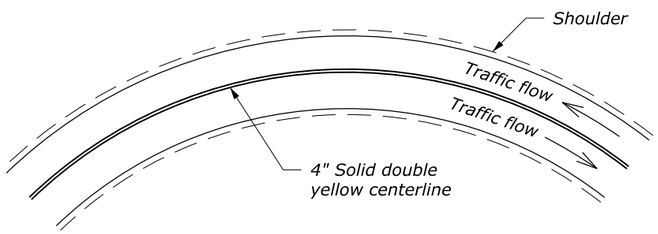
2. *On two- or three-lane roads, signs may be used instead of temporary pavement markings as shown on Standard 635-3.*



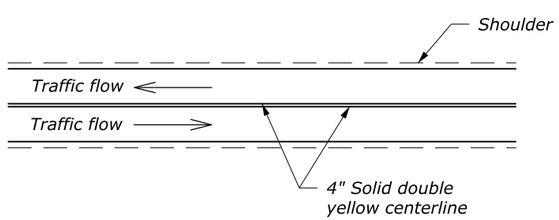
DETAIL A2
No passing zone one direction
Two-way traffic



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

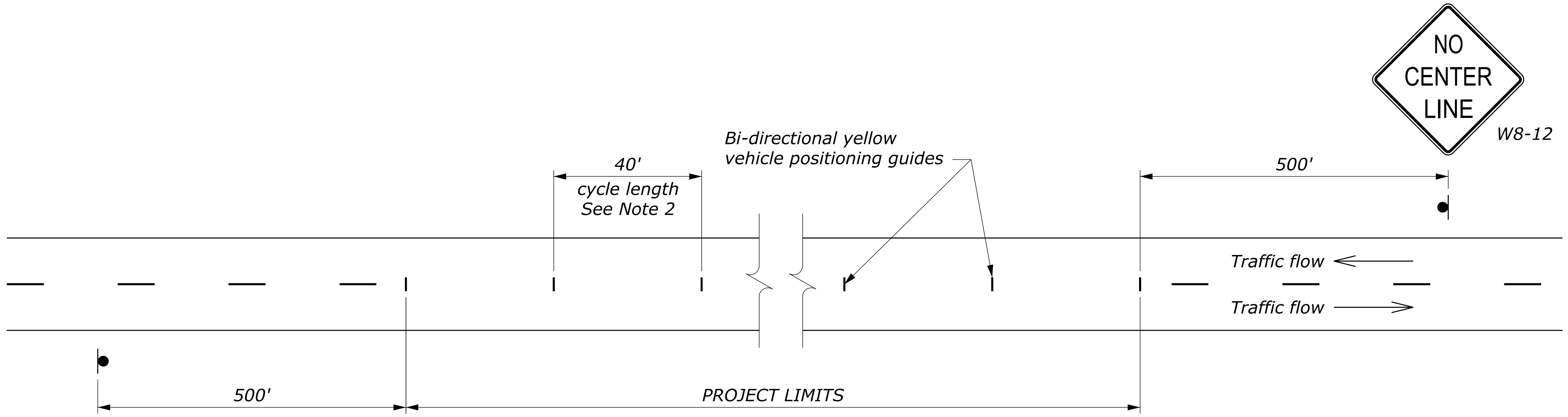
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

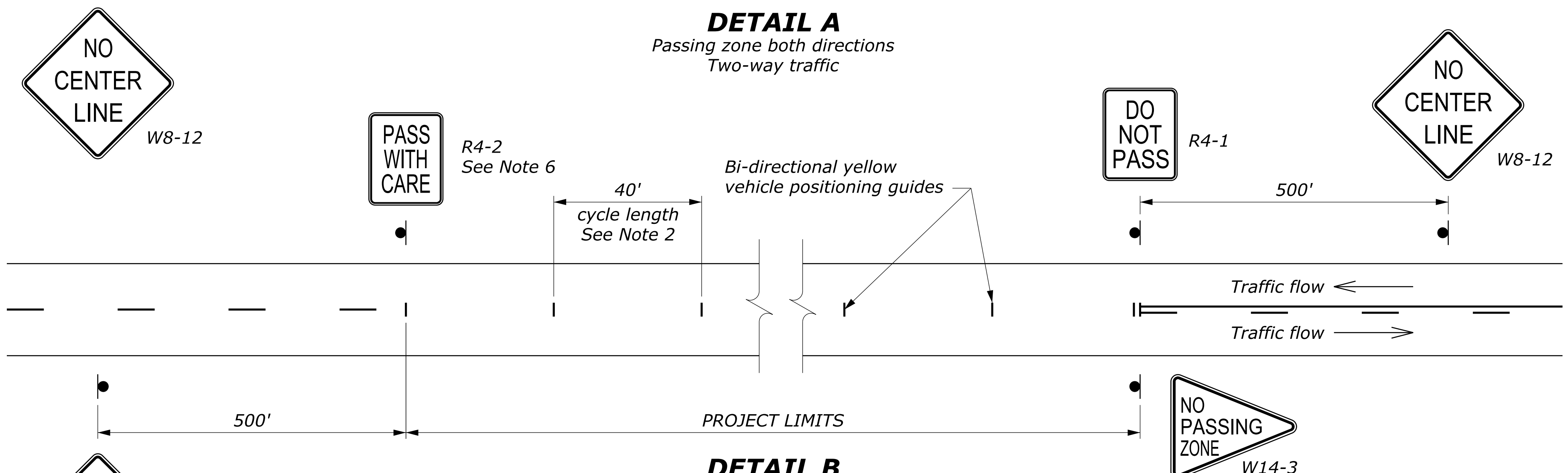
TEMPORARY PAVEMENT MARKINGS

STANDARD APPROVED FOR USE 6/2005	STANDARD
REVISED: DRAFT: 9/2016	635-2

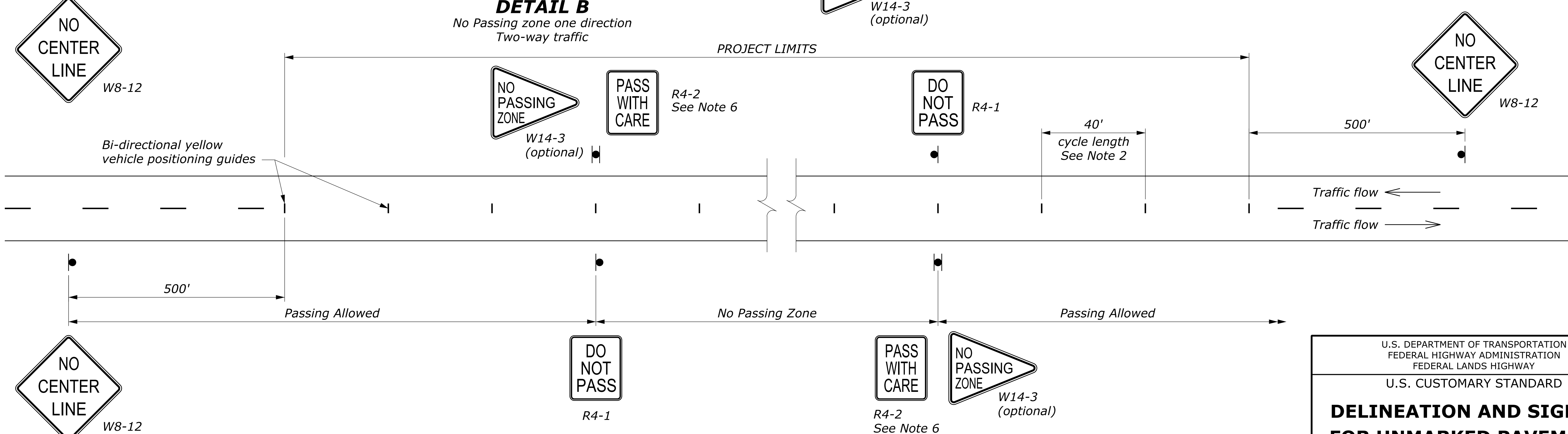
STATE	PROJECT	SHEET NUMBER
NV	NV FLAP 39(1) KING'S CANYON ROAD	T19



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

User: thomas.mccrary

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

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

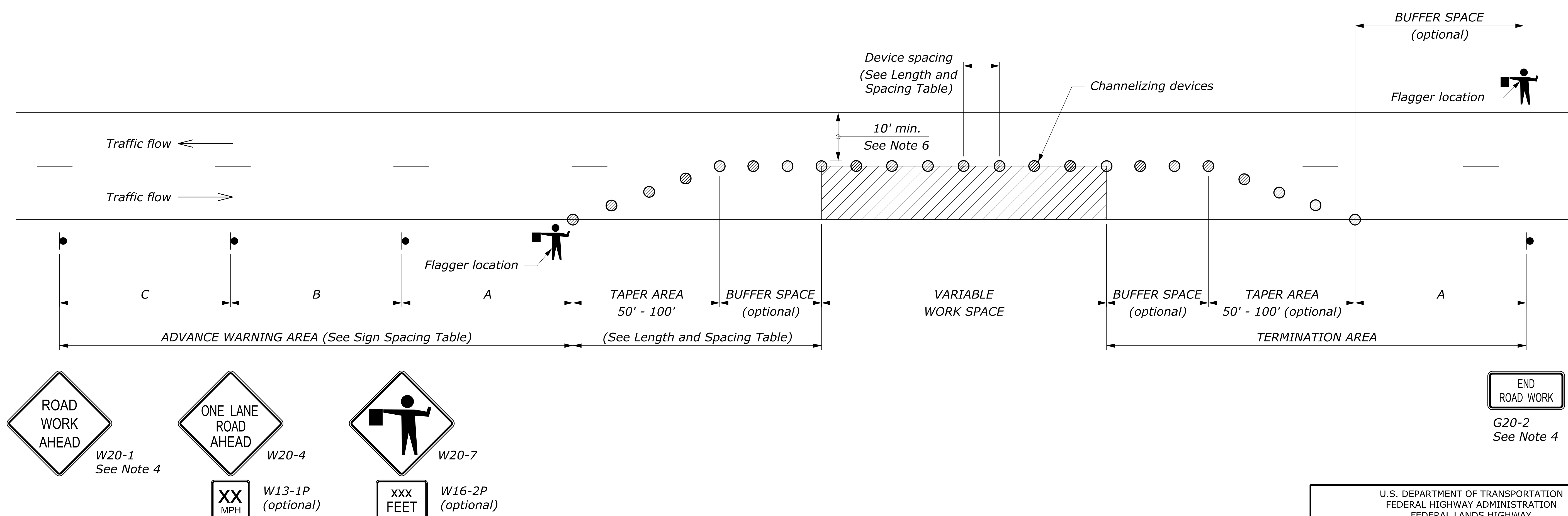
* Approach speed based on the regulatory posted speed, not the advisory speed.

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.



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

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

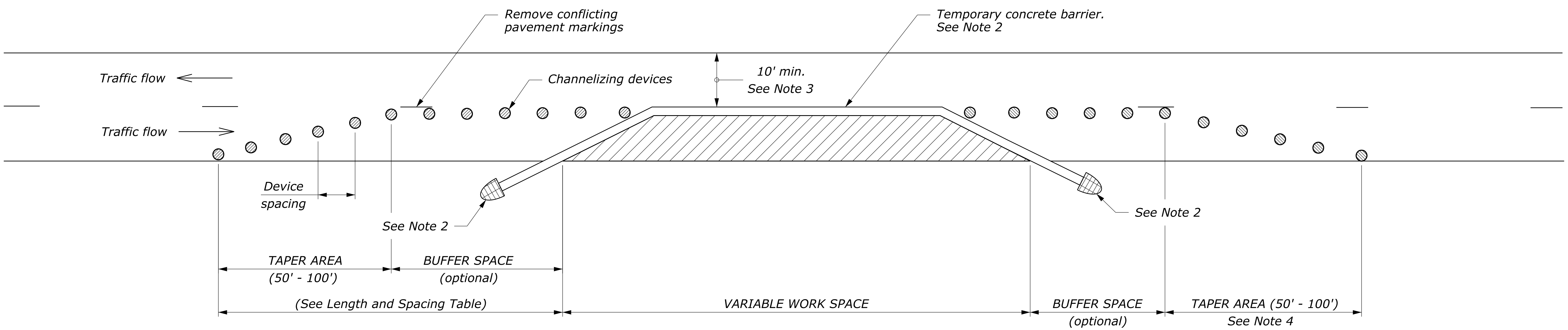
LENGTH AND SPACING TABLE

APPROACH SPEED* MPH	BUFFER SPACE LENGTH FEET	CHANNELIZING DEVICE SPACING IN FEET: TAPER AREA	BUFFER SPACE	WORK SPACE	CONCRETE BARRIER FLARE RATE	WORK ZONE CLEAR ZONE WIDTH 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

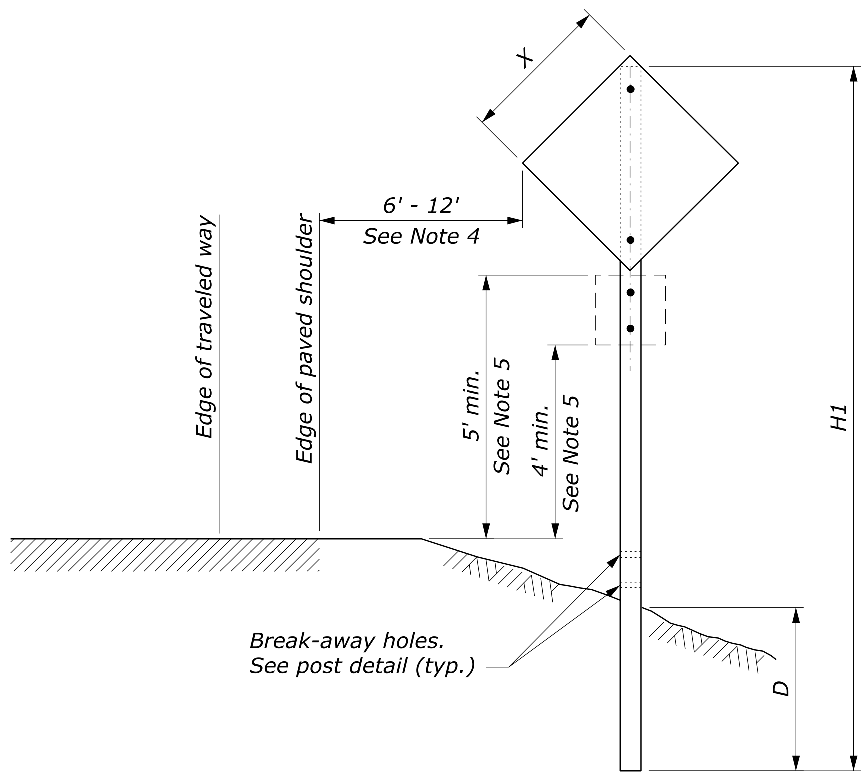
U.S. CUSTOMARY STANDARD

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

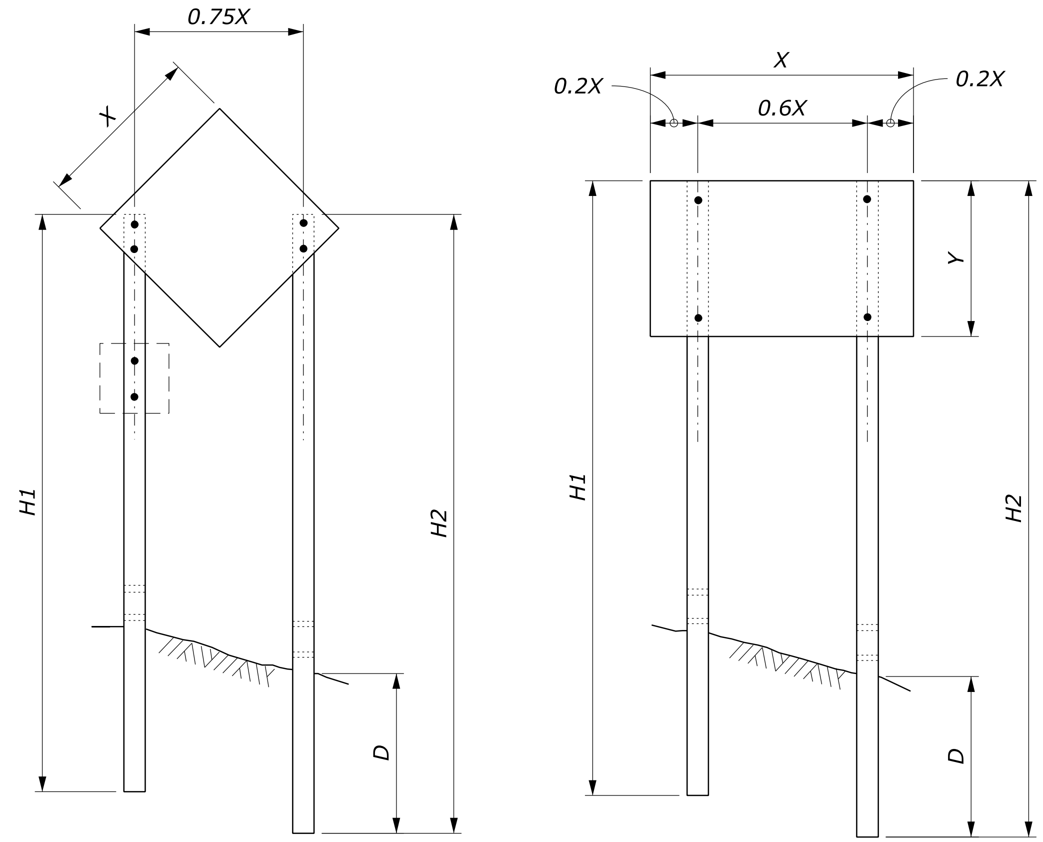
STANDARD APPROVED FOR USE 6/2005
REVISED:
DRAFT: 6/2015

STANDARD 635-13

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



SINGLE POST SIGN



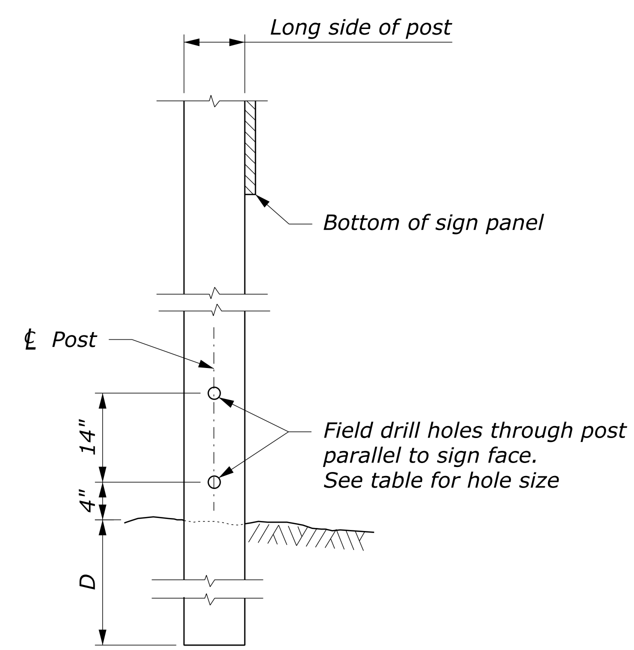
TWO POST SIGN

NOTE:

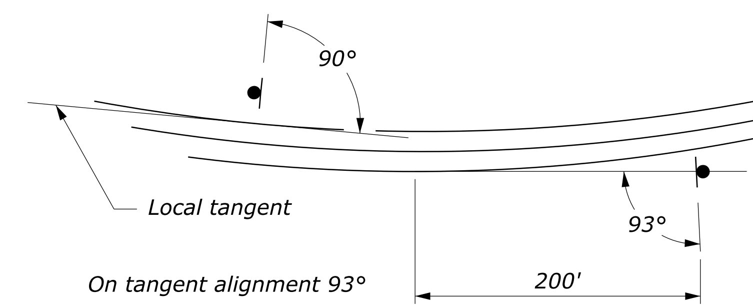
1. Attach sign panels with a minimum of 2 - ¼" dia. bolts per post.
2. H1 and H2 = Overall post length. Select post lengths to fit field conditions.
3. D = Post embedment depth for average soil conditions.
4. In areas where lateral distance is limited, a minimum lateral offset of 2' may be used. In areas 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

User: thomas.mccrary

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

$USER$

$$$$DGN$$$$

$TIME$

$$$$DATE$$$$

KING'S CANYON ROAD
PLAN SHEET
100+00.00 to 105+88.59

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

$USER$

$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

$TIME$

$$$$DATE$$$$

KING'S CANYON ROAD
PLAN SHEET
105+88.59 to 120+00.00

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

KING'S CANYON ROAD
PLAN SHEET
120+00.00 to 134+00.00

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

$USER$

$$$$DGN$$$

$TIME$

$$$$DATE$$$$

KING'S CANYON ROAD
PLAN SHEET
134+00.00 to 142+00.00

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

NOTE:

1. *Equestrian Parking and trail shall have an aggregate surface, 4" depth. Max aggregate size shall be 3/4".*

Parking area station 504+21.61 =
Mainline station 101+74.81, 15' Lt.
N = 14728538.6420
E = 2275344.4245
Elev. = 5417.9730

Parking area station 500+15.00 =
Mainline station 104+72.03, 15' Lt.
N = 14728828.5635
E = 2275357.7659
Elev. = 5392.9143

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

PARKING LOT LAYOUT

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