Appendix A

Analysis of Existing Roadway Alignment (AASHTO Controlling Design Criteria Report)

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAINLINE SUMMARY (DIVIDED)

PROJECT NUMBER: TRACS NO. 17 MA 215 H5162 01L
PROJECT LOCATION: SR 101L TI - BLACK CANYON TI
HIGHWAY SECTION: PHOENIX - CORDES JUNCTION HIGHWAY
FUNCTIONAL CLASSIFICATION: PRINCIPAL ARTERIAL INTERSTATE - URBAN (MP 214.5 - 218.8)
PRINCIPAL ARTERIAL INTERSTATE - RURAL (MP 218.8 - 244.5)

ROUTE: I - 17
BEGINNING MP: 214.5
ENDING MP: 244.5

LANE AND SHOULDER WIDTH

	EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)
LANE WIDTH:	12	12
INSIDE SHOULDER WIDTH:	4	4
OUTSIDE SHOULDER WIDTH:	10	10

DESIGN SPEED

From MP 214.5 to MP 218.8
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 50 MPH
THE POSTED SPEED LIMIT IS: 55 MPH (MP 214.5 to MP 216.4)
THE POSTED SPEED LIMIT IS: 65 MPH (MP 216.4 to MP 218.8)
TERRAIN IS: LEVEL

From MP 218.8 to MP 224.0
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 70 MPH
THE POSTED SPEED LIMIT IS: 75 MPH
TERRAIN IS: LEVEL

From MP 224.0 to MP 244.5
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 60 MPH
THE POSTED SPEED LIMIT IS: 75 MPH (MP 224.0 TO MP 243.8)
THE POSTED SPEED LIMIT IS: 65 MPH (MP 243.8 TO MP 244.5)
TERRAIN IS: ROLLING

GRADES

EXISTING MAXIMUM GRADE IS: 0.900%	AASHTO ALLOWABLE MAXIMUM GRADE IS: 4% (Level Terrain, 50 MPH)
EXISTING MAXIMUM GRADE IS: 1.262%	AASHTO ALLOWABLE MAXIMUM GRADE IS: 3% (Level Terrain, 70 MPH)
EXISTING MAXIMUM GRADE IS: 5.167% **	AASHTO ALLOWABLE MAXIMUM GRADE IS: 4% (Rolling Terrain, 60 MPH)

CROSS SLOPE

EXISTING CROSS SLOPE IS:
Mainline: 2.0% MP 214.5 to 215.7
1.5% MP 215.7 to 244.5

AASHTO ALLOWABLE RANGE IS:
Mainline: 1.5% - 2.0%

REMARKS

** Design Exception Required

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAINLINE SUMMARY (DIVIDED) (CONTINUED)

TRAFFIC VOLUMES AND FACTORS

	CURRENT YEAR: 2000			DESIGN YEAR: 2025		TRAFFIC FACTORS:
ADT (VPD):	72,300	Under SR 101L TI	Ave. Weekday:	122,000	Under SR 101L TI	K = 7.5%
	55,300	South of Carefree Hwy		114,700	South of Carefree Hwy	D = 55%
	30,400	South of Blk Cyn City TI		55,300	South of Blk Cyn City TI	T = 9% South of Anthem Way
						T = 19% North of Anthem Way

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
Yorkshire Drive TI UP (02087)	214.48	16' 4"	16' 4"	16' 0"
I-17/SR 101L-Ramp NW (02167)	214.90	17' 8"	17' 8"	16' 0"
I-17/SR 101L-Ramp SE (02171)	214.90	19' 6"	19' 6"	16' 0"
Rose Garden Lane TI UP (02136)	215.48	16' 6"	16' 6"	16' 0"
Pinnacle Peak Road TI UP NB (00821)	217.10	15' 11"	15' 11" **	16' 0"
Pinnacle Peak Road TI UP SB (00821)	217.10	16' 11"	16' 11"	16' 0"
Happy Valley Road TI UP NB (00822)	218.01	16' 0"	16' 0"	16' 0"
Happy Valley Road TI UP SB (00822)	218.01	17' 6"	17' 6"	16' 0"
Carefree Highway TI UP NB (00824)	223.99	16' 3"	16' 3"	16' 0"
Carefree Highway TI UP SB (00824)	223.99	15' 10"	15' 10" **	16' 0"
Pioneer Road TI UP NB (01289)	225.50	17' 2"	17' 2"	16' 0"
Pioneer Road TI UP SB (01289)	225.50	16' 5"	16' 5"	16' 0"
Anthem Way TI UP (02537)	229.00	17' 1"	17' 1"	16' 0"
Table Mesa Road TI UP SB (01294)	235.94	16' 3"	16' 3"	16' 0"
Table Mesa Road TI UP NB (01295)	235.94	15' 11"	15' 11" **	16' 0"
Rock Springs TI UP NB (00969)	242.10	16' 1"	16' 1"	16' 0"
Rock Springs TI UP SB (00970)	242.25	16' 0"	16' 0"	16' 0"
Mud Springs UP NB (00863)	242.98	16' 5"	16' 5"	16' 0"
Mud Springs UP SB (00863)	242.98	18' 1"	18' 1"	16' 0"

REMARKS

** Design Exception Required

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAINLINE SUMMARY (DIVIDED) (CONTINUED)

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE LENGTH	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
I-17 TI OP SB (02178)	214.87	479	70	70	Yes	Yes	HS 25	HS 20
I-17 TI OP NB (02179)	214.88	475	80	80	Yes	Yes	HS 27	HS 20
I-17 OP at SB Frontage Rd (02180)	215.00	144	70	70	Yes	Yes	HS 28	HS 20
I-17 OP at NB Frontage Rd (02181)	215.00	144	70	70	Yes	Yes	HS 24	HS 20
Deer Valley TI OP NB (00820)	215.97	166	44	38	Yes	Yes	HS 34.4	HS 20
Deer Valley TI OP SB (01118)	215.97	166	44	38	Yes	Yes	HS 34.4	HS 20
Skunk Creek Br SB (00285)	219.11	268	42	38	Yes	Yes	HS 15 **	HS 20
Skunk Creek Br NB (00790)	219.11	269	42	38	Yes	Yes	HS 24.4	HS 20
CAP Bridge NB (01400)	220.38	86	42	38	Yes	Yes	HS 20	HS 20
CAP Bridge SB (01401)	220.38	86	42	38	Yes	Yes	HS 20	HS 20
Deadman Wash Br SB (00304)	226.95	128	42	38	Yes	Yes	HS 14.4 **	HS 20
Deadman Wash Br NB (00905)	226.95	130	38	38	Yes	No **	HS 22.8	HS 20
New River Br NB (01290)	231.40	347	42	38	Yes	Yes	HS 16.7 **	HS 20
New River Br SB (01291)	231.40	347	42	38	Yes	Yes	HS 14.4 **	HS 20
New River TI OP NB (01292)	232.00	159	38	38	Yes	Yes	HS 23.3	HS 20
New River TI OP SB (01293)	232.00	145	38	38	Yes	Yes	HS 23.3	HS 20
Moore's Gulch Br NB (00967)	238.20	195	38	38	Yes	Yes	HS 21.1	HS 20
Moore's Gulch Br SB (00339)	238.60	178	31.8 **	38	Yes	Yes	HS 17.2 **	HS 20
Little Squaw Creek Br NB (00968)	239.20	315	32.5 **	38	Yes	Yes	HS 19.4 **	HS 20
Little Squaw Creek Br SB (00340)	239.55	179	31.8 **	38	Yes	Yes	HS 17.2 **	HS 20
Agua Fria River Br NB (01807)	243.34	363	42	38	Yes	Yes	HS 20	HS 20
Agua Fria River Br SB (01808)	243.34	363	42	38	Yes	Yes	HS 20	HS 20
Black Canyon TI OP NB (00764)	244.37	97	38	38	Yes	Yes	HS 20.6	HS 20
Black Canyon TI OP SB (00765)	244.37	97	38	38	Yes	Yes	HS 20.6	HS 20

REMARKS

** Design Exception Required

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAINLINE SUMMARY (DIVIDED) (CONTINUED)

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)

See Attachment 1 for Evaluation

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (FT/FT)	SUPERELEVATION EXISTING (FT/FT)	SUPERELEVATION MINIMUM (FT/FT)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING

See Attachment 2 for Evaluation

REMARKS

ATTACHMENT 1 - VERTICAL CURVE INVENTORY

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Northbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
731+67.50	214.70	214.70	0.444	0.449	GB	GB	GB	GB	GB	GB	50
764+00.00	215.20	215.40	0.460	0.335	1000.00	Crest	5816	475	458	+100	50
832+00.00	216.50	216.70	0.332	-0.130	1000.00	Crest	1938	475	462	+100	50
852+00.00	216.90	217.00	-0.130	0.678	800.00	Sag	+9999	475	462	+100	50
874+00.00	217.30	217.50	0.678	0.400	800.00	Crest	2790	475	457	+100	50
886+00.00	217.50	217.70	0.400	0.560	800.00	Sag	+9999	475	457	+100	50
981+00.00	219.30	219.50	0.500	0.958	800.00	Sag	+9999	850	830	+100	70
1005+00.00	219.80	219.90	0.958	0.633	800.00	Crest	2445	850	827	+100	70
1171+00.00	222.90	223.10	0.833	0.533	800.00	Crest	2615	850	829	+100	70
1186+00.00	223.20	223.40	0.533	1.000	800.00	Sag	+9999	850	829	+100	70
1202+00.00	223.50	223.70	1.000	0.320	800.00	Crest	1377	850	833	93	70
1226+00.00	224.00	224.10	0.320	0.755	600.00	Sag	+9999	650	629	+100	60
1241+00.00	224.30	224.40	0.755	0.211	800.00	Crest	1622	650	631	+100	60
1260+00.00	224.60	224.80	0.211	1.168	800.00	Sag	+9999	650	631	+100	60
1283+00.00	225.10	225.20	1.168	2.727	800.00	Sag	+9999	650	618	+100	60
1310+50.00	225.40	225.90	2.727	-2.566	2800.00	Crest	838	650	674	70	60
1335+50.00	226.00	226.30	-2.566	-0.179	1600.00	Sag	3312	650	674	+100	60
1355+00.00	226.40	226.60	-0.179	2.000	800.00	Sag	2498	650	636	+100	60
1366+50.00	226.60	226.80	2.000	-0.259	1000.00	Crest	767	650	638	67	60
1384+00.00	227.00	227.10	-0.259	1.482	800.00	Sag	+9999	650	638	+100	60
1395+50.00	227.20	227.30	1.482	0.800	800.00	Crest	1374	650	623	93	60
1409+00.00	227.40	227.60	0.800	1.310	800.00	Sag	+9999	650	623	+100	60

Meaning Of Symbols:
GB = Grade Break - Stopping Sight Distance and Speed not calculated

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY (CONTD.)

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Northbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
1457+00.00	228.30	228.50	1.167	1.818	800.00	Sag	+9999	650	618	+100	60
1500+00.00	229.10	229.30	1.750	0.833	1000.00	Crest	1225	650	622	87	60
1512+00.00	229.40	229.50	0.833	1.550	800.00	Sag	+9999	650	622	+100	60
1557+50.00	230.20	230.50	1.353	0.153	1400.00	Crest	1245	650	632	88	60
1574+00.00	230.60	230.70	0.169	-0.589	800.00	Crest	1277	650	642	89	60
1594+00.00	230.90	231.10	-0.589	0.300	1000.00	Sag	+9999	650	642	+100	60
1614+00.00	231.20	231.50	0.300	2.900	1600.00	Sag	2682	650	630	+100	60
1650+00.00	232.00	232.20	2.900	-1.070	1200.00	Crest	* 634	650	650	60	60
1670+00.00	232.40	232.50	-1.070	2.000	800.00	Sag	1082	650	650	81	60
1694+00.00	232.80	233.00	2.000	-1.412	1000.00	Crest	* 624	650	655	60	60
1711+00.00	233.10	233.30	-1.412	1.727	800.00	Sag	1048	650	655	80	60
1722+00.00	233.30	233.50	1.727	1.300	800.00	Crest	1956	650	616	+100	60
1736+50.00	233.60	233.80	1.300	0.250	1000.00	Crest	1133	650	630	83	60
1747+50.00	233.80	234.00	0.250	3.500	800.00	Sag	1000	650	630	78	60
1760+00.00	234.00	234.30	3.500	-0.173	1600.00	Crest	761	650	636	67	60
1775+00.00	234.30	234.50	-0.173	1.750	800.00	Sag	5602	650	636	+100	60
1788+00.00	234.60	234.70	1.750	1.237	600.00	Crest	1595	650	617	+100	60
1807+00.00	234.90	235.10	1.237	-0.433	1000.00	Crest	892	650	640	73	60
1822+00.00	235.20	235.40	-0.433	1.357	800.00	Sag	+9999	650	640	+100	60
1838+00.00	235.50	235.70	1.357	2.558	1000.00	Sag	+9999	650	615	+100	60
1855+00.00	235.70	236.10	2.558	-2.158	1900.00	Crest	732	650	667	65	60
1877+00.00	236.30	236.40	-2.158	1.194	800.00	Sag	962	650	667	76	60

Meaning Of Symbols:
* = Existing Stopping Sight Distance less than AASHTO recommended value

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY (CONTD.)

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Northbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
1894+00.00	236.60	236.70	1.194	-1.000	800.00	Crest	696	650	649	63	60
1907+00.00	236.80	237.00	-1.000	1.042	800.00	Sag	3482	650	649	+100	60
1931+00.00	237.20	237.50	1.042	-5.000	1600.00	Crest	* 593	650	720	58	60
1979+00.00	238.20	238.30	-5.000	0.175	800.00	Sag	* 638	650	720	60	60
2036+00.00	239.30	239.40	0.175	-1.667	800.00	Crest	760	650	659	67	60
2054+00.00	239.60	239.80	-1.667	3.793	1000.00	Sag	740	650	659	66	60
2083+00.00	240.00	240.40	3.793	-3.182	2000.00	Crest	* 617	650	685	59	60
2105+00.00	240.60	240.70	-3.182	2.571	1000.00	Sag	707	650	685	64	60
2140+00.00	240.90	241.70	2.571	-2.500	4300.00	Crest	1062	650	673	80	60
2171+00.00	241.80	242.00	-2.500	1.021	800.00	Sag	908	650	673	73	60
2190+00.00	242.20	242.30	1.021	-1.650	800.00	Crest	* 631	650	659	60	60
2187+00.00	242.40	242.50	-1.650	-0.328	800.00	Sag	+9999	650	659	+100	60
2203+00.00	242.70	242.80	-0.328	-1.905	800.00	Crest	821	650	663	69	60
2224+00.00	243.10	243.20	-1.905	-0.150	800.00	Sag	+9999	650	663	+100	60
2244+00.00	243.50	243.60	-0.150	2.005	800.00	Sag	2622	650	636	+100	60
2280+00.00	244.10	244.40	2.005	0.292	1600.00	Crest	1114	650	630	83	60
2303+72.42	244.50	244.80	0.292	3.500	1600.00	Sag	1897	650	630	+100	60

Meaning Of Symbols:
* = Existing Stopping Sight Distance less than AASHTO recommended value

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Southbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
2303+90.00	244.80	244.50	-3.500	-0.292	1600.00	Sag	1897	650	691	+100	60
2280+00.00	244.40	244.10	-0.292	-2.051	1600.00	Crest	1099	650	665	82	60
2244+00.00	243.60	243.50	-2.051	0.150	800.00	Sag	2396	650	665	+100	60
2224+00.00	243.20	243.10	0.150	1.905	800.00	Sag	+9999	650	632	+100	60
2203+00.00	242.80	242.60	1.905	0.328	800.00	Crest	821	650	629	69	60
2187+00.00	242.40	242.20	0.328	1.650	800.00	Sag	+9999	650	629	+100	60
2172+00.00	242.10	241.80	1.650	-2.500	1600.00	Crest	716	650	673	65	60
2153+00.00	241.70	241.60	-2.500	1.227	1000.00	Sag	1044	650	673	79	60
2142+00.00	241.60	241.50	1.227	-0.241	800.00	Crest	853	650	637	71	60
2137+00.00	241.20	241.10	-0.241	1.059	600.00	Sag	+9999	650	637	+100	60
2119+50.00	241.10	240.80	1.059	-2.735	1600.00	Crest	749	650	677	66	60
2106+50.00	240.80	240.60	-2.735	0.238	800.00	Sag	1136	650	677	83	60
2083+00.00	240.30	240.10	0.238	-2.488	1200.00	Crest	765	650	673	67	60
2063+00.00	239.90	239.80	-2.488	-2.833	600.00	Crest	2226	650	679	+100	60
2051+00.00	239.70	239.60	-2.833	2.813	700.00	Sag	* 528	650	679	54	60
2035+00.00	239.50	239.20	2.813	-1.077	1600.00	Crest	739	650	650	66	60
2022+00.00	239.10	239.00	-1.077	0.875	500.00	Sag	3406	650	650	+100	60
2014+00.00	239.00	238.80	0.875	-1.571	1100.00	Crest	773	650	658	68	60
2000+00.00	238.70	238.60	-1.571	5.167	800.00	Sag	* 509	650	658	53	60
1988+00.00	238.50	238.30	5.167	3.000	1000.00	Crest	783	650	595	68	60
1947+00.00	237.80	237.50	3.000	0.241	1200.00	Crest	760	650	630	67	60
1918+00.00	237.20	237.10	0.241	1.000	600.00	Sag	+9999	650	630	+100	60

Meaning Of Symbols:
* = Existing Stopping Sight Distance less than AASHTO recommended value

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY (CONTD.)

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Southbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
1897+86.03	236.80	236.70	1.000	1.941	600.00	Sag	+9999	650	620	+100	60
1877+00.00	236.40	236.30	1.950	2.958	800.00	Sag	+9999	650	608	+100	60
1853+00.00	236.00	235.70	2.958	-3.000	1700.00	Crest	* 616	650	682	59	60
1837+00.00	235.70	235.50	-3.000	1.484	800.00	Sag	723	650	682	65	60
1806+00.00	235.10	234.90	1.484	-2.710	1400.00	Crest	666	650	676	62	60
1775+00.00	234.50	234.30	-2.710	-1.250	800.00	Sag	+9999	650	676	+100	60
1763+00.00	234.30	234.10	-1.250	-2.667	800.00	Crest	869	650	676	71	60
1748+00.00	234.00	233.80	-2.667	2.000	800.00	Sag	698	650	676	64	60
1731+00.00	233.70	233.50	2.000	-1.286	1000.00	Crest	* 636	650	653	60	60
1689+00.00	232.90	232.70	-1.286	-2.941	800.00	Crest	802	650	681	69	60
1672+00.00	232.60	232.40	-2.941	0.955	800.00	Sag	819	650	681	69	60
1650+00.00	232.20	232.00	0.955	-3.000	1200.00	Crest	* 635	650	682	60	60
1613+00.00	231.50	231.20	-3.000	-0.158	1600.00	Sag	2265	650	682	+100	60
1594+00.00	231.10	230.90	-0.158	0.669	800.00	Sag	+9999	650	636	+100	60
1574+00.00	230.70	230.60	0.669	-0.448	800.00	Crest	995	650	640	77	60
1557+00.00	230.40	230.20	-0.333	-1.273	1000.00	Crest	1207	650	653	86	60
1513+00.00	229.50	229.40	-1.600	-0.920	400.00	Sag	+9999	650	658	+100	60
1497+00.00	229.30	229.10	-1.333	-1.759	800.00	Crest	1960	650	661	+100	60
1457+00.00	228.50	228.40	-1.867	-1.205	400.00	Sag	+9999	650	662	+100	60
1407+00.00	227.50	227.40	-1.300	-0.778	700.00	Sag	+9999	650	653	+100	60
1393+50.00	227.30	227.10	-0.778	-1.480	1200.00	Crest	1547	650	656	100	60
1381+50.00	227.00	226.90	-1.480	0.000	600.00	Sag	+9999	650	656	+100	60

Meaning Of Symbols:
* = Existing Stopping Sight Distance less than AASHTO recommended value

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY (CONTD.)

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Southbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
1375+50.00	226.90	226.80	0.000	0.320	400.00	Sag	+9999	650	634	+100	60
1368+00.00	226.80	226.70	0.320	-1.680	800.00	Crest	729	650	659	65	60
1355+00.00	226.60	226.40	-1.680	0.222	1200.00	Sag	8824	650	659	+100	60
1337+00.00	226.30	226.00	0.222	2.500	1200.00	Sag	2967	650	631	+100	60
1311+00.00	225.90	225.40	2.500	-2.680	2800.00	Crest	848	650	676	70	60
1283+00.00	225.20	225.10	-2.680	-1.152	800.00	Sag	+9999	650	676	+100	60
1260+00.00	224.80	224.60	-1.152	-0.179	800.00	Sag	+9999	650	651	+100	60
1239+00.00	224.40	224.20	-0.179	-0.770	800.00	Crest	1524	650	645	99	60
1227+00.00	224.10	224.00	-0.770	-0.292	400.00	Sag	+9999	650	645	+100	60
1215+00.00	223.90	223.80	-0.292	-0.529	400.00	Crest	3004	850	851	+100	70
1198+00.00	223.60	223.40	-0.529	-1.262	800.00	Crest	1307	850	868	90	70
1189+00.00	223.40	223.30	-1.262	-0.560	400.00	Sag	+9999	850	868	+100	70
1083+00.00	221.40	221.30	-1.000	-0.706	600.00	Sag	+9999	850	862	+100	70
1021+00.00	220.30	220.10	-0.786	-0.500	600.00	Sag	+9999	850	857	+100	70
1005+00.00	220.00	219.80	-0.500	-1.155	1000.00	Crest	1515	850	865	98	70
996+00.00	219.70	219.70	-1.155	-0.840	400.00	Sag	+9999	850	865	+100	70
981+00.00	219.40	219.40	-0.840	-0.500	400.00	Sag	+9999	850	858	+100	70
932+00.00	218.50	218.40	-0.580	-0.900	400.00	Crest	2277	475	470	+100	50
924+00.00	218.40	218.30	-0.900	-0.250	800.00	Sag	+9999	475	470	+100	50
912+00.00	218.20	218.00	-0.250	-0.740	600.00	Crest	1656	475	468	+100	50
903+50.00	218.00	217.90	-0.740	-0.380	400.00	Sag	+9999	475	468	+100	50
851+50.00	217.00	216.90	-0.620	0.000	800.00	Sag	+9999	475	467	+100	50

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY (CONTD.)

Project Name: I-17 Widening: SR 101L TI to Black Canyon TI, Southbound
Project No: 17 MA 215 H5162 01L
Roadway Type: Divided Roadway (Uni-directional)

VPI STATION (ft)	MILEPOST		GRADE (%)		CURVE	CURVE	STOPPING SIGHT DISTANCE (ft)			SPEED (mph)	
	BEGIN	END	APPROACH	DEPARTURE	LENGTH (ft)	TYPE	EXISTING	AASHTO	ADOT	EXISTING	DESIGN
826+50.00	216.50	216.40	0.000	-0.550	500.00	Crest	1458	475	466	96	50
816+50.00	216.30	216.30	-0.550	-0.220	400.00	Sag	+9999	475	466	+100	50
764+00.00	215.40	215.20	-0.335	-0.460	1000.00	Crest	5816	475	465	+100	50
731+67.00	214.70	214.70	-0.449	-0.444	GB	GB	GB	GB	GB	GB	50

Meaning Of Symbols:
GB = Grade Break - Stopping Sight Distance and Speed not calculated

Stanley Consultants utilized the ADOT English Version 5.0 Vertical Curve Analyzer Program developed by James L. Winn to determine which existing vertical curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 2 - HORIZONTAL CURVE INVENTORY

Project Name: I-17 Widening: SR 101L to Black Canyon TI, Northbound
Project No: 17 MA 215 H5162 01L

HPI STATION (ft)	MILEPOST		SUPERELEVATION (ft/ft)			DEGREE OF CURVE		SPEED (mph)	
	BEGIN	END	AASHTO MIN	EXISTING	AASHTO MAX	EXISTING	AASHTO MAX	EXISTING	DESIGN
811+37.00	215.70	216.70	NC	0.015	0.060	0°-14'-56.00"	6°-45'	>100	50
1043+00.00	220.50	220.70	NC	0.015	0.100	0°-06'-00.00"	3°-30'	>100	70
1054+46.00	220.70	220.90	NC	0.015	0.100	0°-06'-00.00"	3°-30'	>100	70
1267+28.00	224.60	225.10	NC	0.015	0.100	0°-14'-56.00"	5°-15'	>100	60
1347+82.00	225.90	226.80	RC	0.015	0.100	0°-30'-17.42"	5°-15'	97	60
1398+51.00	227.10	227.50	0.022	*0.015	0.100	0°-44'-21.67"	5°-15'	80	60
1545+43.00	229.70	230.50	NC	0.015	0.100	0°-15'-04.34"	5°-15'	>100	60
1668+11.00	231.90	232.90	NC	0.015	0.100	0°-15'-00.00"	5°-15'	>100	60
1718+45.00	233.30	233.40	0.043	*0.023	0.100	1°-30'-03.00"	5°-15'	77	60
1749+73.00	233.80	234.00	0.055	*0.054	0.100	2°-00'-00.00"	5°-15'	77	60
1768+94.00	234.20	234.40	0.043	*0.023	0.100	1°-30'-00.00"	5°-15'	77	60
1795+01.00	234.70	234.90	0.023	*0.015	0.100	0°-45'-00.00"	5°-15'	79	60
1819+93.00	235.20	235.30	0.043	*0.023	0.100	1°-30'-00.00"	5°-15'	77	60
1866+86.00	235.80	236.40	0.043	**	0.100	1°-30'-00.00"	5°-15'	72	60
1932+50.00	237.20	237.60	0.030	*0.015	0.100	1°-00'-00.00"	5°-15'	69	60
2019+29.00	238.50	239.50	0.023	*0.015	0.100	0°-45'-00.00"	5°-15'	79	60
2071+69.00	239.60	240.40	0.030	*0.015	0.100	1°-00'-00.00"	5°-15'	69	60
2191+90.00	242.10	242.50	0.030	*0.015	0.100	1°-00'-00.00"	5°-15'	69	60
2256+93.00	243.50	244.00	0.042	0.050	0.100	1°-28'-45.00"	5°-15'	83	60
2295+95.00	244.30	244.70	0.056	*0.015	0.100	2°-02'-19.00"	5°-15'	70	60

Meaning Of Symbols:
NC = Normal Crown
RC = Remove Adverse Crown
* = Existing Superelevation outside AASHTO recommended range of values
** =Existing Superelevation not shown on as-built plans.

Stanley Consultants utilized the ADOT English Version 5.2 Horizontal Curve Analyzer Program developed by James L. Winn to determine which existing horizontal curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ATTACHMENT 2 - HORIZONTAL CURVE INVENTORY

Project Name: I-17 Widening: SR 101L to Black Canyon TI, Southbound
Project No: 17 MA 215 H5162 01L

HPI STATION (ft)	MILEPOST		SUPERELEVATION (ft/ft)			DEGREE OF CURVE		SPEED (mph)	
	BEGIN	END	AASHTO MIN	EXISTING	AASHTO MAX	EXISTING	AASHTO MAX	EXISTING	DESIGN
2296+39.00	244.70	244.30	0.054	*0.015	0.100	1°-57'-47.00"	5°-15'	70	60
2256+50.00	244.00	243.50	0.043	0.050	0.100	1°-31'-18.00"	5°-15'	83	60
2132+98.00	241.80	240.90	RC	0.015	0.100	0°-30'-00.00"	5°-15'	97	60
2107+08.00	240.80	240.60	0.055	*0.054	0.100	2°-00'-00.00"	5°-15'	77	60
2062+77.00	240.00	239.70	0.043	*0.023	0.100	1°-30'-00.00"	5°-15'	77	60
2025+73.00	239.30	239.00	NC	0.015	0.100	0°-15'-00.00"	5°-15'	>100	60
1972+98.00	238.40	237.90	0.036	*0.015	0.100	1°-15'-00.00"	5°-15'	79	60
1950+10.00	237.80	237.70	0.030	*0.015	0.100	1°-00'-00.00"	5°-15'	69	60
1925+88.00	237.40	237.10	0.043	*0.023	0.100	1°-30'-00.00"	5°-15'	77	60
1908+24.00	237.00	236.90	0.030	*0.015	0.100	1°-00'-00.00"	5°-15'	69	60
1895+33.00	236.80	236.70	0.030	*0.015	0.100	1°-00'-00.00"	5°-15'	69	60
1866+45.00	236.40	235.80	0.055	**	0.100	2°-00'-00.00"	5°-15'	67	60
1799+91.00	235.40	234.30	RC	**	0.100	0°-30'-00.00"	5°-15'	83	60
1665+31.00	232.60	232.20	NC	0.015	0.100	0°-12'-00.00"	5°-15'	>100	60
1545+52.00	230.50	229.70	NC	0.015	0.100	0°-15'-00.00"	5°-15'	>100	60
1398+38.00	227.50	227.20	0.023	*0.015	0.100	0°-45'-00.00"	5°-15'	79	60
1348+05.00	226.80	225.90	RC	0.015	0.100	0°-30'-00.00"	5°-15'	97	60
1267+21.00	225.10	224.60	NC	0.015	0.100	0°-15'-00.00"	5°-15'	>100	60
811+26.00	216.70	215.70	NC	0.015	0.060	0°-15'-00.00"	6°-45'	>100	50

Meaning Of Symbols:
NC = Normal Crown
RC = Remove Adverse Crown
* = Existing Superelevation outside AASHTO recommended range of values
** =Existing Superelevation not shown on as-built plans.

Stanley Consultants utilized the ADOT English Version 5.2 Horizontal Curve Analyzer Program developed by James L. Winn to determine which existing horizontal curves do not meet current AASHTO (1990 Green Book) recommended guidelines.

ROADWAY ENGINEERING GROUP
ROADWAY PREDESIGN SECTION

DATE: 12-9-99

TO: PE-SHEN YANG
BRIDGE GROUP
BRIDGE MANAGEMENT SECTION, 261E

FROM: Rich DeBoer, Project Monitor
STUDIES SECTION, 050P

SUBJECT: BRIDGE EVALUATION REQUEST

FEDERAL REFERENCE NO: (Not Assigned) TRACS NO.: 17 MA 215 H5162 01L
HIGHWAY: I-17
LOCATION: SR 101L TI to Black Canyon TI
MP LIMITS: 214.5 TO: 244.5 ROUTE NO: I-17
PROJECT DESCPRIPTION: Widen I-17 from SR 101L TI to Black Canyon TI

Please evaluate the following structures per AASHTO guidelines:

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
214.48	02087 Yorkshire DR TI UP	76'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 21.7
		Comments: Vertical clearance of 16'-4" is posted over NB & SB lanes of I17							
214.87	02178 I17 TI OP SB	70'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 25
		Comments:							
214.88	02179 I17 TI OP WB	80'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 27
		Comments:							
214.90	02165 EB101 - NB17 Ramp	28'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 21
		Comments:							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
214.90	02167 NB17-WB101 Ramp	28'	Concrete Barrier	Yes	Yes	None	N/A	N/A	HS 22
		Comments:							
214.90	02169 WB 101-SB 17 Ramp	32'	Concrete Barrier	Yes	Yes	None	N/A	N/A	HS 20
		Comments:							
214.90	02171 SB17-EB 101 Ramp	28'	Concrete Barrier	Yes	Yes	None	N/A	N/A	HS 25
		Comments: Recommended vertical clearance posting is 19'-6".							
215.00	02180 I 17 OP at FRTG RD (SB)	70'	Concrete Barrier	Yes	Yes	None	N/A	N/A	HS 28
		Comments:							
215.00	02181 I17 OP at FRTG RD (NB)	70'	Concrete Barrier	Yes	Yes	None	N/A	N/A	HS 24
		Comments:							
215.48	02136 Rose Garden LN TF OP	76'	Concrete Barrier	Yes	Yes	None	N/A	N/A	HS 20.1
		Comments:							
215.97	00820 Deer Valley TI OP NB	44'	Thrie Beam Retrofit	Yes	Yes	None	N/A	N/A	HS 34.4
		Comments: Vertical clearance of 15'-9" is posted over WB lane.							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
215.97	01118 Deer Valley TI OP SB	44'	Thrie Beam	Yes	Yes	None	N/A	N/A	HS 34.4
		Comments: Vertical clearance of 15'-6" is posted over EB lane.							
217.10	00821 Pinnacle Peak TI UP	28'	H-1-1 on Parapet	No	No	None	N/A	N/A	HS 26.1
		Comments: Vertical clearances of 15'-11" and 16'-11" are posted over NB and SB lanes of I-17. Replace existing bridge rails with new rails of approved design.							
218.01	00822 Happy Valley TI UP	28'	H-1-1 on Parapet	No	No	None	N/A	N/A	HS 27.2
		Comments: Vertical clearances of 16'-0" and 17'-6" are posted over NB and SB lanes of I 17. The existing bridge rails should be considered for replacement with new rails of approved design.							
219.11	00285 Skunk Creek Br SB	42'	Conc. Barrier	Yes	Yes	3"	If needed	If removed	HS 15
		Comments: The structure is carrying normal traffic loads without showing serious structural distress eventhough rated below HS 20.							
219.11	00790 Skunk Creek Br NB	42'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 24.4
		Comments:							
219.11	01078 Skunk Creek Br EFR	26'	H-1-1 on Parapet	No	No	None	N/A	N/A	HS 14.4
		Comments: The structure is carrying normal traffic loads without showing any serious structural distress eventhough rated below HS 20. The existing bridge rails should be replaced with new rails of approved design.							
219.11	01079 Skunk Creek BR WFR	26'	H-1-1 on Parapet	No	No	None	N/A	N/A	HS 14.4
		Comments: The structure is carrying normal traffic loads without showing serious structural distress, eventhough rated below HS 20. The existing bridge rails should be replaced with new rails of approved design.							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
220.38	01400 CAP Bridge NB	42'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 20
		Comments:							
220.38	01401 CAP Bridge SB	42'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 20
		Comments:							
220.38	01402 CAP Bridge EFR	26'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 20
		Comments:							
220.38	01403 CAP Bridge WFR	26'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 20
		Comments:							
223.19	05736 RCB NB-SB 2x10'x5'								
		Comments: The culvert is not at grade. Maximum Fill Height = 2' Culvert Barrel length = 224' Structure length = 24'							
223.99	00824 Carefree TI UP	28'	H-1-1 on Parapet	No	No	None	N/A	N/A	HS 22.8
		Comments: The existing bridge rails may be considered for replacement with new rails of approved design. Vertical clearances of 16'-3" and 15'-10" are posted over NB & SB lanes of I17.							
224.56	05738 RCB NB-SB								
		Comments: The culvert is not at grade. Maximum Fill Height = 2' Culvert Barrel length = 204' Structure length = 26'							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
225.50	01289 Pioneer TI UP	30'	H-2-1	No	Yes	None	N/A	N/A	HS 22.2
		Comments: Vertical clearances of 17'-2" and 16'-5" are posted over NB & SB lanes of I 17.							
226.95	00304 Deadman Wash BY SB	42'	Conc. Barrier	Yes	Yes	2"	If needed	If removed	HS 14.4
		Comments: The structure is carrying normal traffic loads without showing severe structural distress, eventhough rated below HS 20.							
226.95	00905 Deadman Wash BY NB	38'	H-1-1 on Parapet	Yes	NO	None	N/A	N/A	HS 22.8
		Comments: The existing bridge rails should be considered for replacement with new rails of approved design.							
229.00	02537 Desert Hills TI UP	124'	conc. Parapet & Fence	Yes	Yes	None	N/A	N/A	HS 20
		Comments:							
231.20	05740 RCB 2X10'X7'								
		Comments: The culvert is not at grade. Maximum Fill Height = 2' Culvert Barrel length = 200' structure length = 21'							
231.40	01290 New River Bridge NB	42'	Conc. Barrier	Yes	Yes	4"	If needed	If removed	HS 16.7
		Comments: The structure is carrying normal traffic loads without showing severe structural distress, eventhough rated below HS 20.							
231.40	01291 New River Bridge SB	42'	Conc. Barrier	Yes	Yes	4"	If needed	If removed	HS 14.4
		Comments: The structure is carrying normal traffic loads without showing severe structural distress, eventhough rated below HS 20.							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
232.00	01292 New River TI OP NB	38'	H-2-1	Yes	Yes	1"	If needed	If removed	HS 23.3
		Comments: Vertical clearance of 15'-10" is posted at the bridge.							
232.00	01293 New River TI OP SB	38'	H-2-1	Yes	Yes	1"	If needed	If removed	HS 23.3
		Comments: Vertical clearance of 15'-10" is posted at the bridge.							
232.45	05742 RCB NB 2X10'X8'								
		Comments: The ~~ete~~ culvert is not at grade. Maximum Fill Height = 21' Culvert Barrel length = 201' structure length = 29'							
232.52	05743 RCB SB 2X10'X8'								
		Comments: The culvert is not at grade. Maximum Fill Height = 21' Culvert Barrel length = 199' structure length = 29'							
233.85	05744 RCB NB 2X10'X8'								
		Comments: The culvert is not at grade. Maximum Fill Height = 10' Culvert Barrel length = 95' structure length = 24'							
233.85	05745 RCB SB 2X10'X8'								
		Comments: The culvert is not at grade. Maximum Fill Height = 19' Culvert Barrel length = 125' structure length = 21'							
235.94	01294 Table Mesa TI UP SB	28'	H-2-1	No	Yes	1"	If needed	If removed	HS 25
		Comments: Vertical clearance of 16'-3" is posted over I17 SB lanes.							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
235.94	01295 Table Mesa TI UP NB	28'	H-2-1	No	Yes	1"	If needed	If removed	HS 25
		Comments: Vertical clearance of 15'-11" is posted over I17 NB lanes.							
238.20	00967 Moores Gulch Bridge NB	38'	H-2-1	Yes	Yes	1"	If needed	If removed	HS 21.1
		Comments:							
238.60	00339 Moores Gulch Bridge SB	31.8'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 17.2
		Comments: The structure is carrying normal traffic loads without showing severe structural distress, eventhough rated below HS 20.							
238.65	05746 RCB NB 3X10'X10'								
		Comments: The culvert is not at grade. Maximum Fill Height = 24' Culvert Barrel length = 141' structure length = 32'							
239.20	00968 Little Squaw Creek Br NB	32.5'	Conc. Barrier	Yes	Yes	None	N/A	N/A	HS 19.4
		Comments: The structure is carrying normal traffic loads without showing severe structural distress, eventhough rated below HS 20.							
239.55	00340 Little Squaw creek Br SB	31.8'	Conc Barrier	Yes	Yes	None	N/A	N/A	HS 17.2
		Comments: The structure is carrying normal traffic loads without showing severe structural distress, eventhough rated below HS 20.							
241.78	05747 RCB SB & N FR Rd 2X10'X8'								
		Comments: The culvert is not at grade. Maximum Fill Height = 7' Culvert Barrel length = 143' structure length = 24'							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL TYPE	BRIDGE RAIL GEOM. OK	BRIDGE RAIL STRUC OK	AC OVERLAY THICKNESS	AC OVERLAY REMOVE	AC OVERLAY REPLACE	BRIDGE STRUCTURE CAPACITY
241.95	2X10'X8' 05748 RCB NB & Ramp								
		Comments: The culvert is not at grade. Maximum Fill Height = 9' Culvert ~~Str~~ Barrel length = 162' structure length = 24'							
242.10	00969 Rock Spring TI UP NB	40'	H-2-1	Yes	Yes	1"	If needed	If removed	HS 18.9
		Comments: The structure is carrying normal traffic loads without showing any serious structural distress, eventhough rated below HS 20. Vertical clearance of 16'-1" is posted over I17 NB.							
242.25	00970 Rock Spring TI UP SB	40'	H-2-1	Yes	Yes	1"	If needed	If removed	HS 18.9
		Comments: The structure is carrying normal traffic loads without showing any serious structural distress, eventhough rated below HS 20. Vertical clearance of 16'-0" is recommended							
242.98	00863 Mud Springs UP	28'	H-1-1 on Parapet	No	No	1"	If needed	If removed	HS 21.7
		Comments: Vertical clearance of 16'-5" is posted over NB lanes and clearance of 18'-1" posting is recommended for SB lanes. The existing bridge rails should be considered for the replacement with new rails of approved design.							
243.34	01807 Agua Fria River Bridge NB	42'	Concrete Barrier	Yes	Yes	1"	If needed	If removed	HS 20
		Comments:							
243.34	01808 Agua Fria River Bridge SB	42'	Concrete Barrier	Yes	Yes	1"	If needed	If removed	HS 20
		Comments:							
244.37	00764 Black Canyon TI OP NB	38'	Concrete Barrier	Yes	Yes	1"	If needed	If removed	HS 20.6
		Comments: Vertical clearance posting of 14'-1" is recommended at the bridge.							

MILEPOST	STR. NO.	CURB TO CURB WIDTH	BRIDGE RAIL			AC OVERLAY			BRIDGE STRUCTURE CAPACITY
			TYPE	GEOM. OK	STRUC OK	THICKNESS	REMOVE	REPLACE	
244.37	00765 Black Canyon TI OP SB	38'	Concrete Barrier	Yes	Yes	1"	If needed	If removed	HS 20.6
		Comments: Vertical clearance posting of 14'-1" is ~~posted~~ recommended at the bridge.							
		Comments:							
		Comments:							
		Comments:							
		Comments:							
		Comments:							

Reviewed By: S Mratye

Date Returned: 1/11/00

Table Mesa TI

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAINLINE SUMMARY (DIVIDED)

PROJECT NUMBER:	017 MA 215 H 5162 01 L	**ROUTE:**	I-17 NB & SB
PROJECT LOCATION:	TABLE MESA RD TI	**BEGINNING MP:**	MP 235.4
HIGHWAY SECTION:	PHOENIX - CORDES JUNCTION HIGHWAY	**ENDING MP:**	MP 236.4
FUNCTIONAL CLASSIFICATION:	PRINCIPAL ARTERIAL INTERSTATE - RURAL		

LANE AND SHOULDER WIDTH

	EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)
LANE WIDTH:	12	12
INSIDE SHOULDER WIDTH:	4	4
OUTSIDE SHOULDER WIDTH:	10	10

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 60

THE POSTED SPEED LIMIT IS: 75 mph
TERRAIN IS: Rolling

GRADES

EXISTING MAXIMUM GRADE IS: 3.00%

AASHTO ALLOWABLE MAXIMUM GRADE IS: 4%

CROSS SLOPE

EXISTING CROSS SLOPE IS: 1.5 - 2.0%

AASHTO ALLOWABLE RANGE IS: 1.5-2.0%

TRAFFIC VOLUMES AND FACTORS

CURRENT YEAR	DESIGN YEAR	TRAFFIC FACTORS
2000	2025	K = 7.5%
		D = 55%
ADT (VPD)	Ave. Weekday (VPD)	T = 19%
31,000	55,300	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAINLINE NB & SB - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
Table Mesa Road TI UP SB (#1294)	235.9	16'-3"	16'-3"	16'-0"
Table Mesa Road TI UP NB (#1295)	235.9	15'-11"	15'-11" ***	16'-0"

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
None							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

	VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)
SB									
	1837+00	235.6	-3.000	1.484	800	723	650	65	60
	1853+00	235.9	2.958	-3.000	1700	616 *	650	59	60
	1877+00	236.3	1.950	2.958	800	9999	650	+100	60
NB									
	1838+00	235.6	1.357	2.558	1000	+9999	650	+100	60
	1855+00	235.9	2.558	-2.158	1900	732	650	65	60
	1877+00	236.4	-2.158	1.194	800	962	650	76	60

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

	HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (FT/FT)	SUPERELEVATION EXISTING (FT/FT)	SUPERELEVATION MINIMUM (FT/FT)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING
SB								
	1866+45	236.1	0.100	**	0.055	67	5°-15'	2°-00'
NB								
	1866+86	236.1	0.100	**	0.043	72	5°-15'	1°-30'

REMARKS

* Existing Stopping Sight Distance less than AASHTO Minimum
** Existing superelevation not shown in as-builts
*** Design Exception Required

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
CROSS ROAD

PROJECT NUMBER: 017 MA 215 H 5162 01 L
MAINLINE MILEPOST: 236.0
PROJECT LOCATION: TABLE MESA RD TI
HIGHWAY SECTION: PHOENIX - CORDES JUNCTION HIGHWAY
CROSS ROAD: TABLE MESA RD
FUNCTIONAL CLASSIFICATION: RURAL COLLECTOR

PAVEMENT AND SHOULDER WIDTH

	EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)
WIDTH OF TRAVELED WAY:	24	20
WIDTH OF USABLE SHOULDER:	2	2

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE CROSSROAD IS: 50 mph

THE POSTED SPEED LIMIT IS: None
TERRAIN IS: Rolling

GRADES

EXISTING MAXIMUM GRADE IS: 3.16%

AASHTO ALLOWABLE MAXIMUM GRADE IS: 7%

CROSS SLOPE

EXISTING CROSS SLOPE IS: 1.50%

AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%

TRAFFIC VOLUMES AND FACTORS

CURRENT YEAR	DESIGN YEAR	TRAFFIC FACTORS
2000	2025	K = 10%
		D = 58%
ADT (VPD)	ADT (VPD)	T = 2%
214	2,700	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
CROSSROAD - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
NONE				

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
Table Mesa Road TI UP SB (#1294)	235.94	28	22'	No *	Yes	HS-25	HS-15
Table Mesa Road TI UP NB (#1295)	235.94	28	22'	No *	Yes	HS-25	HS-15

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)
15+00.00		3.159	-3.00	700	389 *	475	45	50
22+50.00		-3.00	1.58	200	233 *	475	34	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (Ft/Ft)	SUPERELEVATION EXISTING (Ft/Ft)	SUPERELEVATION MINIMUM (Ft/Ft)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING
11+22.50		0.10	0.069 *	**	35	8°-15'	16°-00' *

REMARKS

* Design Exception Required
** Not calculated because degree of curve exceeds the AASHTO maximum allowable.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236A

PROJECT NUMBER: 017 MA 215 H 5162 01 L
MAINLINE MILEPOST: 236
PROJECT LOCATION: TABLE MESA RD TI
HIGHWAY SECTION: PHOENIX - CORDES JUNCTION HIGHWAY
INTERCHANGE: TABLE MESA TI
RAMP DESIGNATION: 236A
DESCRIPTION: NB EXIT RAMP

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH			
EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)	AASHTO MAXIMUM (FEET)	MINIMUM RAMP INSIDE RADIUS (FEET)
22	21	27	1432.39

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 50 mph

GRADES

EXISTING MAXIMUM GRADE IS (%)		AASHTO ALLOWABLE MAXIMUM GRADE (%)	
ASCENDING	DESCENDING	ASCENDING	DESCENDING
2.735	None	+8	-8

CROSS SLOPE

EXISTING CROSS SLOPE IS: 1.50%

AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%

TRAFFIC VOLUMES AND FACTORS

CURRENT YEAR	DESIGN YEAR	TRAFFIC FACTORS
2000	2025	K = 10%
		D = N/A
ADT (VPD)	ADT (VPD)	T = 2%
164	1300	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236A - NB EXIT RAMP - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
		None		

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
			None				

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)
6+00.00		1.20	2.735	400	+9999	475	+100	50
10+00.00		2.735	1.000	200	483	475	51	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (Ft/Ft)	SUPERELEVATION EXISTING (Ft/Ft)	SUPERELEVATION MINIMUM (Ft/Ft)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING
8+40.00		0.10	0.015 *	0.072	55	8°15'	4°-00'-00"

REMARKS

* Design Exception Required

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236D

PROJECT NUMBER: 017 MA 215 H 5162 01 L
MAINLINE MILEPOST: 236
PROJECT LOCATION: TABLE MESA RD TI
HIGHWAY SECTION: PHOENIX - CORDES JUNCTION HIGHWAY
INTERCHANGE: TABLE MESA TI
RAMP DESIGNATION: 236D
DESCRIPTION: SB EXIT RAMP

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): B

TOTAL PAVEMENT WIDTH			
EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)	AASHTO MAXIMUM (FEET)	MINIMUM RAMP INSIDE RADIUS (FEET)
24	21	28	150

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 25 mph (LOOP RAMP)

GRADES

EXISTING MAXIMUM GRADE IS (%)		AASHTO ALLOWABLE MAXIMUM GRADE (%)	
ASCENDING	DESCENDING	ASCENDING	DESCENDING
3.353	-3.000	+8	-8

CROSS SLOPE

EXISTING CROSS SLOPE IS: 1.50%

AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%

TRAFFIC VOLUMES AND FACTORS

CURRENT YEAR	DESIGN YEAR	TRAFFIC FACTORS
2000	2025	K = 10%
		D = N/A
ADT (VPD)	ADT (VPD)	T = 2%
83	<100	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236D - SB EXIT RAMP - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
		None		

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
			None				

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)
4+25.00		-3.0	3.353	200	180	150	28	25

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (Ft/Ft)	SUPERELEVATION EXISTING (Ft/Ft)	SUPERELEVATION MINIMUM (Ft/Ft)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING
1+48.92		0.10	0.015	NC	70	36°-15'	2°-01'
6+99.85		0.10	0.08	***	24	36°-15'	38°-12' **
6+96.33		0.10	****	0.075	29	36°-15'	16°-30'

REMARKS

** Design Exception Required
*** Not calculated because degree of curve exceeds the AASHTO maximum allowable.
**** Superelevation not shown on as-builts

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236G

PROJECT NUMBER: 017 MA 215 H 5162 01 L
MAINLINE MILEPOST: 236
PROJECT LOCATION: TABLE MESA RD TI
HIGHWAY SECTION: PHOENIX - CORDES JUNCTION HIGHWAY
INTERCHANGE: TABLE MESA TI
RAMP DESIGNATION: 236G
DESCRIPTION: NB ENTRANCE RAMP

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH			
EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)	AASHTO MAXIMUM (FEET)	MINIMUM RAMP INSIDE RADIUS (FEET)
22	21	27	Tangent

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 50 mph

GRADES

EXISTING MAXIMUM GRADE IS (%)		AASHTO ALLOWABLE MAXIMUM GRADE (%)	
ASCENDING	DESCENDING	ASCENDING	DESCENDING
None	-5.605	+8	-8

CROSS SLOPE

EXISTING CROSS SLOPE IS: 1.50%

AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%

TRAFFIC VOLUMES AND FACTORS

CURRENT YEAR	DESIGN YEAR	TRAFFIC FACTORS
2000	2025	K = 10%
		D = N/A
ADT (VPD)	ADT (VPD)	T = 2%
163	<100	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236G - NB ENTRANCE RAMP - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
		None		

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
			None				

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)
1+00.00		-2.00	-5.605	150	259 *	475	36	50
5+00.00		-5.605	-2.234	300	435 *	475	48	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (Ft/Ft)	SUPERELEVATION EXISTING (Ft/Ft)	SUPERELEVATION MINIMUM (Ft/Ft)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING
			Tangent				

REMARKS

* Design Exception Required

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236J

PROJECT NUMBER: 017 MA 215 H 5162 01 L
MAINLINE MILEPOST: 236
PROJECT LOCATION: TABLE MESA RD TI
HIGHWAY SECTION: PHOENIX - CORDES JUNCTION HIGHWAY
INTERCHANGE: TABLE MESA TI
RAMP DESIGNATION: 236J
DESCRIPTION: SB ENTRANCE RAMP

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH			
EXISTING (FEET)	AASHTO RECOMMENDED MINIMUM (FEET)	AASHTO MAXIMUM (FEET)	MINIMUM RAMP INSIDE RADIUS (FEET)
22	21	27	954.93

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 50 mph

GRADES

EXISTING MAXIMUM GRADE IS (%)		AASHTO ALLOWABLE MAXIMUM GRADE (%)	
ASCENDING	DESCENDING	ASCENDING	DESCENDING
None	3.1587	+8	-8

CROSS SLOPE

EXISTING CROSS SLOPE IS: 1.50%

AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%

TRAFFIC VOLUMES AND FACTORS

CURRENT YEAR	DESIGN YEAR	TRAFFIC FACTORS
2000	2025	K = 10%
		D = N/A
ADT (VPD)	ADT (VPD)	T = 2%
129	1400	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
RAMP 236J - SB ENTRANCE RAMP - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POSTCONSTRUCTION CLEARANCE	AASHTO MINIMUM ALLOWABLE CLEARANCE
		None		

STRUCTURES

STRUCTURE	MILEPOST	EXISTING BRIDGE WIDTH	RECOMMEND. BRIDGE WIDTH	BRIDGE RAIL GEOMETRY ADEQUATE?	BRIDGE RAIL STRUCTURE ADEQUATE?	EXISTING STRUCTURAL CAPACITY	RECOMMEND. STRUCTURAL CAPACITY
			None				

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	MILE POST	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FEET)	EXISTING SIGHT DISTANCE (FEET)	RECOMMEND. SIGHT DISTANCE (FEET)	EXISTING SPEED (MPH)	RECOMMEND. DESIGN SPEED (MPH)
2+00.00		-3.159	-3.000	GB	GB	475	GB	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	MILE POST	SUPERELEVATION MAXIMUM (Ft/Ft)	SUPERELEVATION EXISTING (Ft/Ft)	SUPERELEVATION MINIMUM (Ft/Ft)	EXISTING SPEED (MPH)	DEGREE OF CURVE MAXIMUM	DEGREE OF CURVE EXISTING
3+33.48		0.10	0.0399 *	0.092	50	8°-15'	6°-00'

REMARKS

* Design Exception Required