I-20: (S.C. Route 6 to End Project) Main Line Culverts Summary																				
												Design Storm			100-Year Storm					
Location	**Video Pipe Inspection Pipe ID**	**Road / Classification**	**Design Storm (25-year / 50-year)**	**Stream Name**	**Drainage Structure**	**Structure Height (ft)**	**Existing Invert (Inlet)**	**Existing Invert (Outlet)**	**Cross-line Drainage Area (acre)**	**Design Flow (cfs)**	**100-Year Flow (cfs)**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Hydraulic Analysis Notes**	**Inspection Notes**	**Recommendation**
Station 508+20 Cross-Line	I-20-32	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	4' x 4' RCBC	4.00	387.65	386.69	57.43	86.08	96.62	391.42	3.77	0.94	391.75	4.10	1.03	Cross-line drainage meets design standards.	VPI not performed. Visually inspected. Crack on wingwall of outlet end of culvert. Scour around inlet side of culvert.	Retain existing culvert. Grout cracking on downstream wingwall. Fill scour holes around wingwalls and protect with riprap.
Station 513+25 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	396.58	395.75												
Station 524+70 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	415.32	414.21												
Station 527+77 Cross-Line	I-20-33	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	30" R.C. Pipe	2.50	407.23	405.29	18.03	42.75	48.05	411.34	4.11	1.64	411.98	4.75	1.90	Headwater exceeds design criteria. Upstream area is undeveloped and headwater will be located between I-20 and Frontage Road. Retain existing pipe with no additional flow to inlet of culvert.	VPI not performed. Pipe in accessible. Pipe outlet surrounded with heavy vegtation and trees. Erosion and scour upstream and downstream end of pipe.	Clean existing pipe and perform inspection. Clean outfall ditch for approximately 100' downstream of pipe. Place riprap outlet protection and pipe end treatment on both inlet and outlet.
Station 529+65 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	419.56	414.43												
Station 546+25 Cross-Line Drainage System	I-20-34WB / I-20-35WB / I-20-35EB	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	18" R.C. Pipe /24" R.C. Pipe	1.50	429.94	414.82	System analyzed with GEOPAK Drainage.									Cross-line drainage meets design standards.	VPI performed. No issues.	Retain existing pipe system. Clean outfall within ROW.
Station 556+12 EB Median Outlet	I-20-36EB	I-20 - Primary			18" R.C. Pipe	1.25	397.94	395.69											VPI performed. No structural issues. Outfall full of sediment.	Retain existing pipe. Clean outfall ditch with ROW. Add riprap outlet protection at pipe oufall.
Station 564+10 Cross-Line Drainage System	I-20-37	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	36" R.C. Pipe	3.00	390.07	389.30	System analyzed with GEOPAK Drainage.									Cross-line drainage meets design standards.	VPI not performed due to debris at pipe. Heavy vegetation at pipe oultet with sediment blockage at approximetly 40%.	Clean existing pipe and perform inspection. Clean outfall ditch within ROW.
Station 576+67 Cross-Line	I-20-38	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	36" R.C. Pipe	3.00	382.17	381.71	24.35	46.69	52.43	387.48	5.31	1.77	388.39	6.22	2.07	Headwater exceeds design criteria. Upstream area is undeveloped. Headwater extends outside of right-of-way.	VPI not performed due to debris at pipe. Minor damage to upstream end of pipe.	Clean existing pipe and perform inspection. Clean outfall ditch within ROW. Recommend inlet improvements to increase capacity of pipe system.
Station 583+39 WB Median Outlet	I-20-39WB	I-20 - Primary			18" R.C. Pipe	1.50	387.02	386.26											VPI performed. Hole located at 105' from median catch basin.	Retain existing pipe. Perform pipe lining repair. Clean outfall ditch approximately 50'.
Station 598+75 Cross-Line	I-20-40	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	24" R.C. Pipe	2.00	390.59	390.41	15.49	16.02	17.98	393.39	2.80	1.40	393.80	3.21	1.61	Headwater exceeds design criteria. Upstream area is undeveloped and headwater will be located between I-20 and Frontage Road. Retain existing pipe with no additional flow to inlet of culvert.	VPI not performed due to pipe inlet and outlet blocked by sediment and vegetation.	Clean existing pipe and perform inspection. Clean outfall ditch within right-of-way. Evaluate need for riprap protection in outfall ditch. Remvoe heavy vegetation from inlet.
Station 619+05 EB Median Outlet	I-20-41EB	I-20 - Primary			18" R.C. Pipe	1.50	373.93	372.28											VPI performed. Pipe damaged at 38' and 61' from median catch basin. Joint offset at 103' from median.	Retain existing pipe. Perform pipe lining repair.
Station 623+15 WB Median Outlet	I-20-42WB	I-20 - Primary			18" R.C. Pipe	1.50	371.26	368.98											VPI performed. No structural issues.	Retain existing pipe.
Station 624+65 Cross-Line	I-20-44	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	5' x 5' RCBC	5.00	363.54	349.72	75.00	159.78	179.40	368.32	4.78	0.96	368.77	5.23	1.05	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. No apparent structure issues from field investigation.Scour hole with bank armoring in place.	Retain existing culvert.
Station 629+10 EB Median Outlet	I-20-43	I-20 - Primary			18' R.C. Pipe	1.50	381.90*	375.72											VPI performed. Pipe damage located 71' from median catch basin.	Perform pipe lining repair.
Station 645+65 Cross-Line Drainage System	I-20-45EB / I-20-45WB	I-20 - Primary	50-Year Storm		24" R.C. Pipe	2.00	396.76	396.47										Cross-line pipe is part of closed drainage system.	VPI performed. No structural issues. Survey indicated 24" pipe.	Retain existing pipe. Remove trees and heavy vegetation from pipe outfall.
Station 653+25 Cross-Line Drainage System	I-20-46EB / I-20-46WB	I-20 - Primary	50-Year Storm		18" R.C. Pipe	1.50	387.79	384.54										Cross-line pipe is part of closed drainage system.	VPI performed. No structural issues.	Retain existing pipe.
Station 659+52 EB Median Outlet	I-20-47EB	I-20 - Primary			18' R.C. Pipe	1.50	372.67	361.31											VPI performed. No structural issues with pipe. Asphalt ditch, located downstream of pipe, is undercutting.	Retain existing pipe. Reconstruct asphalt ditch downstream of pipe.
Station 667+03 Median Outlet	I-20-48	I-20 - Primary			18' R.C. Pipe	1.50	364.85												VPI performed. Small cracks identified in median area.	Retain existing pipe. Perform pipe lining repair.
Station 667+20 Cross-Line	I-20-49	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	5' x 5' RCBC	5.00	344.00	342.10	290.00	381.90	482.40	356.20	12.20	2.44	361.68	17.68	3.54	Headwater exceeds design criteria. Upstream area is forested. Two 66" pipes located downstream. Retain existing culvert with no additional flow to inlet of culvert.	VPI not performed. Visual inspection. No apparent structure issues from field investigation.	Retain existing culvert. Riprap outfall cahnnel to 66" pipe inlets.
Station 688+50 EB Median Outlet	I-20-50EB	I-20 - Primary			18" R.C. Pipe	1.50	409.72	405.31											VPI performed. Joint separation 116' from median catch basin.	Retain existing pipe. Repair / Replace 12' of pipe at outfall.
Station 692+80 Cross-Line	I-20-51	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	4' x 4' RCBC	5.00	405.82	381.50	16.88	14.67	16.47	406.87	1.05	0.21	406.96	1.14	0.23	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. No apparent structure issues from field investigation. Culvert flow drops 3-4 feet at outlet.	Retain existing culvert. Line outfall channel with riprap downstream of culvert. Extend riprap to downstream 72" R.C. Pipe.
Station 696+05 EB Median Outlet	I-20-52	I-20 - Primary			18" R.C. Pipe	1.50	427.09	423.41											VPI performed. No structural issues.	Retain existing pipe.
Station 713+00 EB Median Outlet	I-20-53EB	I-20 - Primary			18" R.C. Pipe	1.50	420.84	418.95											VPI performed. No structural issues.	Retain existing pipe.
Station 719+60 WB Median Outlet	I-20-54WB	I-20 - Primary			18" R.C. Pipe	1.50	410.64	409.30											VPI performed. Significant cracking in pipe from 83' to 88' from median catch basin. Hole located in pipe 75' from median.	Retain existing pipe. Perform pipe lining repair.

I-20: (S.C. Route 6 to End Project) Main Line Culverts Summary																				
												Design Storm			100-Year Storm					
Location	Video Pipe Inspection Pipe ID	Road / Classification	Design Storm (25-year / 50-year)	Stream Name	Drainage Structure	Structure Height (ft)	Existing Invert (Inlet)	Existing Invert (Outlet)	Cross-line Drainage Area (acre)	Design Flow (cfs)	100-Year Flow (cfs)	Calculated Headwater	Headwater Depth (from inlet)	Hw / D	Calculated Headwater	Headwater Depth (from inlet)	Hw / D	Hydraulic Analysis Notes	Inspection Notes	Recommendation
Station 722+85 Cross-Line Drainage System	I-20-55EB / I-20-55WB	I-20 - Primary	50-Year Storm		18" R.C. Pipe / 30" R.C. Pipe	2.50	413.08	401.11										Cross-line pipe part of interchange closed drainage system.	VPI performed. Cracking identifed in 18" pipe approximatley 40' from pipe end. No issues with 30" pipe.	Retain existing pipe. Perform pipe lining repair to 18" pipe.
Station 729+40 EB Ditch Inlet to Median	I-20-56EB	I-20 - Primary			24" R.C. Pipe	2.00	393.32	387.47											VPI not performed. Pipe blocked and full of debris.	Clean existing pipe and perform inspection.
Station 741+05 WB Median Outlet	I-20-57WB	I-20 - Primary			18" R.C. Pipe	1.50	371.74	370.16											VPI performed. Pipe cracked 92' from median outside of travel lane. Mower damage at pipe end.	Retain existing pipe. Replace 16' of pipe at pipe end.
Station 745+45 Cross-Line	I-20-58	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	5' x 5' RCBC	5.00	355.00	350.26	99.75	169.61	190.31	360.12	5.12	1.02	360.60	5.60	1.12	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. Minor scour at upstream end of cuvlert. Large scour hole downstream of culvert apron.	Retain existing culvert. Provide rip-rap outlet protection downstream of cuvlert apron.
Station 747+98 EB Median Outlet	I-20-59EB	I-20 - Primary			18" R.C. Pipe	1.50	359.46	354.50											VPI performed. Major joint separation 100 feet from median. Located near pipe outfall.	Retain existing pipe. Replace 8-12' of pipe at outfall. Provide outlet riprap protection and pipe end riprap protection.
Station 751+98 EB Median Outlet	I-20-60EB	I-20 - Primary			18" R.C. Pipe	1.50	356.47	354.45											VPI performed. No structural issues.	Retain existing pipe.
Station 754+85 Cross-Line	I-20-61	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	8' x 8' RCBC	8.00	342.58	341.18	399.54	115.10	192.40	345.42	2.84	0.36	346.58	4.00	0.50	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. Some debris and downed trees at downstream end of culvert.	Clean existing pipe. Clean outfall ditch approximately 50'.
Station 759+45 EB Median Outlet	I-20-62EB	I-20 - Primary			18" R.C. Pipe	1.50	376.53	357.59											VPI performed. VPI indicated pipe cracking and debris located within pipe.	Retain existing pipe. Clean and perform pipe lining repair.
Station 763+98 WB Median Outlet	I-20-63WB	I-20 - Primary			18" R.C. Pipe	1.50	394.33	386.89											VPI performed. Minor joint offset located 160' from median catch basin. Located outside of paved shoulder.	Retain existing pipe.
Station 776+44 EB Median Outlet	I-20-64	I-20 - Primary			18" R.C. Pipe	1.50	428.65	427.65											VPI performed. No structural issues	Retain existing pipe.
Station 781+65 Cross-Line	I-20-65EB / I-20-65WB	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	36" R.C. Pipe	3.00	419.86	411.91	38.53	36.57	41.02	422.72	2.86	0.95	422.96	3.10	1.03	Cross-line drainage meets design standards.	VPI performed. No structural issues	Retain existing pipe.
Station 788+16 Cross-Line Drainage System	I-20-66EB / I-20-66WB	I-20 - Primary	50-Year Storm	UT to Red Bank Creek	24" R.C. Pipe	2.00	443.51	417.37	System analyzed with GEOPAK Drainage.									Cross-line drainage meets design standards.	VPI peformed. No structural issues located on pipe on WB side. EB pipe deformed 58' from median on downstream side and Root infiltration at 91 feet.	Retain existing pipe. Clean EB existing pipe and perform EB pipe lining repair. Clean outfall ditch 100 feet.
Station 794+45 EB Median Outlet	I-20-67EB	I-20 - Primary			18" R.C. Pipe	1.50	437.01	435.82											VPI performed. Minor damage to pipe end from mowing operations.	Retain existing pipe.

I-20: (U.S. Route 1 to S.C. Route 6) Main Line Culverts Summary																				
												Design Storm			100-Year Storm					
Location	**Video Pipe Inspection Pipe ID**	**Road / Classification**	**Design Storm (25-year / 50-year)**	**Stream Name**	**Drainage Structure**	**Structure Height (ft)**	**Existing Invert (Inlet)**	**Existing Invert (Outlet)**	**Cross-line Drainage Area (acre)**	**Design Flow (cfs)**	**100-Year Flow (cfs)**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Hydraulic Analysis Notes**	**Inspection Notes**	**Recommendation**
Station 364+45 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	349.43	349.02												
Station 369+42 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	353.42	353.02												
Station 373+40 WB Median Outlet	I-20-20WB	I-20 - Primary			18" R.C. Pipe	1.50	361.95	355.31											VPI performed. Joint separation 45' from median catch basin.	Retain existing pipe. Perform pipe lining repair.
Station 374+90 Cross-Line	I-20-21	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	6' x 6' RCBC / 60" R.C. Pipe	6.00	352.90	349.40	261.53	514.20	618.50	364.65	11.75	1.96	368.10	15.20	2.53	Headwater exceeds design criteria. Headwater will overtop frontage road but not I-20. 60" pipe attached to the outlet. Undersized pipes downstream in system. Retain existing culvert with no additional flow to inlet of culvert.	VPI not performed. Visually inpected. 60" R.C. Pipe tied to downstream end of culvert. Streambanks protected with riprap.	Retain existing culvert system. Clean outfall ditch approximately 100' downstream.
Station 379+92 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	387.83	359.01												
Station 397+41 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	404.79	401.37												
Station 401+05 Cross-Line	I-20-23EB / I-20-23WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	393.49	392.37	9.10	20.68	23.27	396.23	2.74	1.37	396.59	3.10	1.55	Headwater exceeds design criteria. Headwater contained within right-of-way. Retain existing pipe with no additional flow to inlet of culvert.	VPI performed. No structural issues. Pipe ends damaged from maintenance activities.	Retain existing pipe. Replace 8' pipe on downstream end (WB).
Station 405+90 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	384.35	379.72												
Station 412+60 Cross-Line	I-20-24	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	4' X 4' RCBC	4.00	364.29	363.44	142.05	148.60	194.60	370.30	6.01	1.50	372.79	8.50	2.13	Headwater exceeds design criteria. Headwater contained within right-of-way. Retain existing culvert with no additional flow to inlet of culvert.	VPI not performed. Visual inspection. No apparent structure issues from field investigation.	Retain existing cuvlert. Clean outfall ditch to Right-of-Way line.
Station 413+91 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	371.19	367.43												
Station 417+90 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	377.15	376.10												
Station 421+45 Cross-Line Drainage System	No VPI	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	383.00	381.29	System analyzed with GEOPAK Drainage.									Anaysis indicates insufficient capacity whin drainage system. The analysis neglects additional pipe located in eastbound ditch.	N/A	Verify survey data and perform pipe inspection. Recommend retain existing cross-line pipe and retain / replace lateral pipe in eastbound ditch as needed.
Station 430+80 EB Median Outlet		I-20 - Primary			24" Pipe	2.00	393.26	392.53												
Station 439+80 Cross-Line	I-20-26EB / I-20-26WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	18" R.C. Pipe	1.50	396.42	396.04	3.79	11.31	12.71	399.65	3.23	2.15	400.01	3.59	2.39	Headwater exceeds design criteria. Headwater will bypass pipe inlet to cross-line system at Station 421+45.	VPI performed. Debris accumulation on EB side from 40' median. WB pipe has hole 6' from median. Pipe ends (EB and WB) damaged from maintenance activities.	Retain existing pipe. Replace approximately 20' of damaged pipe in median. Clean existing pipe & remove debris.
Station 444+80 Cross-Line Drainage System	I-20-27	I-20 - Primary			30" R.C. Pipe	2.50	396.73	395.30										Cross-line pipe is part of closed drainage system.	VPI not performed. Pipe not accessible.	Clean existing pipe and perform VPI. Clean outfall to Right-of-Way line.
Station 450+80 Cross-Line Drainage System	I-20-28EB / I-20-28WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	401.95	398.18	System analyzed with GEOPAK Drainage.									Cross-line drainage meets design standards.	VPI performed. No structural issues. 24" pipe connects to 30" pipe downstream of roadway.	Retain existing pipe. Clean oufall approximately 50 feet. Add riprap pipe protection at outfall.
Station 455+78 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	409.38	407.23												
Station 461+00 Cross-Line	I-20-29EB / I-20-29WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	415.03	413.83	7.12	21.31	23.95	417.86	2.83	1.42	418.28	3.25	1.63	Headwater exceeds design criteria. Headwater bypasses cross line and continues in eastbound ditch to Station 450+80.	VPI performed. No structural issues.	Retain existing pipe. Clean existing pipe. Place riprap pipe protection at outfall.
Station 466+80 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	420.26	419.29												
Station 472+40 Cross-Line	I-20-30EB / I-20-30WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	30" R.C. Pipe	2.50	420.46	416.48	9.16	30.60	34.39	423.40	2.94	1.18	423.72	3.26	1.30	Cross-line drainage meets design standards.	VPI performed. Dense vegatation located at pipe inlet(EB). Sedimentation in WB pipe and some erosion at pipe outfall. No structural issues.	Retain existing pipe. Clean existing pipe and outfall to ROW. Add riprap outlet protection. Remove vegetation from pipe inlet, repair scour areas at inlet and add pipe end riprap treatment.
Station 477+80 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	426.47	425.97												
Station 489+95 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	420.73	420.35												
Station 494+75 Cross-Line Drainage System	I-20-31EB	I-20 - Primary	50-Year Storm		24" R.C. Pipe	2.00	411.62	410.26										Cross-line pipe is part of closed drainage system.	VPI performed. Separated joints identified by VPI.	Retain existing pipe. Perform pipe lining repair.
Station 502+25 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	399.40	-												

I-20: (Begin Project to U.S. Route 1) Main Line Culverts Summary

												Design Storm			100-Year Storm					
Location	**Video Pipe Inspection Pipe ID**	**Road / Classification**	**Design Storm (25-year / 50-year)**	**Stream Name**	**Drainage Structure**	**Structure Height (ft)**	**Existing Invert (Inlet)**	**Existing Invert (Outlet)**	**Cross-line Drainage Area (acre)**	**Design Flow (cfs)**	**100-Year Flow (cfs)**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Hydraulic Analysis Notes**	**Inspection Notes**	**Recommendation**
Station 229+15 Cross-Line Drainage System	I-20-3 / I-20-3A	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	36" R.C. Pipe	3.00	295.03	282.20	23.64	32.79	36.85	297.69	2.66	0.89	297.89	2.86	0.95	Cross-line drainage meets design standards.	VPI performed. Pipe 3 is pipe under interstate. Pipe 3A is pipe under Ginny Lane. Cracking and infiltration identified in pipe video. Joint separations at 9' and 265' from Ginny Lane. Ginny Lane pipe has offset joint and wash out at pipe outlet.	Retain existing pipe. Perform pipe lining repair on all sections of pipe. Replace riprap at pipe outfall.
Station 232+75 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	306.95	302.72												
Station 239+15 Cross-Line Drainage System	I-20-4EB / I-20-4WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	18" R.C. Pipe	1.50	297.90	294.76	System analyzed with GEOPAK Drainage.									Cross-line drainage meets design standards.	VPI performed. No issues with EB pipe. WB pipe has significant debris blockage and root penetration. VPI could not be completed for WB pipe.	Retain existing pipe. Remove exposed reinforcement from EB pipe end. Clean WB pipe and perform inspection.
Station 245+15 WB Median Outlet	No VPi	I-20 - Primary			15" R.C. Pipe	1.25	288.05	288.14												
Station 248+65 Cross-Line	I-20-5	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	4' X 4' RCBC	4.00	262.92	249.14	36.88	42.04	47.24	265.39	2.47	0.62	265.59	2.67	0.67	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. Heavy vegetation and sediment at downstream culvert end. Scour around upstream wingwalls.	Retain existing cuvlert. Clean outfall ditch approximately 100'. Repair scour around wingwalls and place riprap protection.
Station 250+15 Cross-Line Drainage System	I-20-6	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	283.17	249.89	5.06	4.38	4.92	284.08	0.91	0.45	284.14	0.97	0.48	Cross-line drainage meets design standards.	VPI performed. Offset joint 21' from downstream pipe end (near Ginny Lane).	Retain existing pipe. Perform pipe lining repair from shoulder of Ginny Lane to outfall. Clean outfall ditch approximately 50' and place riprap along outfall.
Station 256+98 Cross-Line	I-20-7	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	30" R.C. Pipe	2.50	264.56	253.67	7.59	8.27	9.28	265.82	1.26	0.50	265.91	1.35	0.54	Cross-line drainage meets design standards.	VPI performed. Significant infiltration along the pipe. Standing water at downstream end of pipe with sediment build-up at pipe end.	Retain existing pipe. Clean outfall ditch for approximately 100' and place riprap at pipe outfall.
Station 264+65 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	247.77	245.38												
Station 265+60 Cross-Line	I-20-8	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	12' X 12' RCBC	12.00	232.46	230.38	1600.00	962.08	1036.43	242.27	9.81	0.82	243.10	10.64	0.89	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. Erosion / failure of concrete ditch on inlet end of culvert. Scour holes near wingwalls.	Retain existing culvert. Consider adding pipe to carry slope drains to bottom of fill slopes. Repair scour holes at wingwalls and add riprap protection at inlet and outlet end of culvert. Remove failed section of concrete ditch and place riprap ditch lining.
Station 271+07 Cross-Line Drainage System	I-20-9	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	258.85	240.17	7.71	13.30	14.99	260.73	1.88	0.94	260.89	2.04	1.02	Cross-line drainage meets design standards.	VPI not peformed. Pipe inaccessible. Pipe outfall under water with heavy vegetation at outfall	Clean existing pipe and perform inspection. Clean outfall ditch approximately 100' and place riprap protection.
Station 275+06 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	275.86	267.20												
Station 275+80 Cross-Line	I-20-10	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	4' X 4' RCBC	4.00	259.16	249.68	47.12	56.57	63.60	262.24	3.08	0.77	262.49	3.33	0.83	Cross-line drainage meets design standards.	VPI not performed. Visual inspection. No apparent structure issues from field investigation. Outfall is stable.	Retain existing culvert.
Station 279+85 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe / 18" R.C. Pipe	1.25	293.33	283.27												
Station 285+05 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe / 18" R.C. Pipe	1.25	312.41	303.86												
Station 292+15 Cross-Line Drainage System	I-20-11EB / I-20-11WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	18" R.C. Pipe / 24" R.C. Pipe	1.50	351.76	327.16	4.56	9.38	10.55	353.63	1.87	1.25	353.86	2.10	1.40	Headwater exceeds design criteria. The headwater is located upstream of the frontage road and stays within low area at the pipe inlet.	VPI performd. EB and WB pipe has significant joint offsets at multiple locations. Scour at downstream pipe and in outfall ditch. Last segment pipe has fallen into outfall ditch.	Retain existing pipe. Perform pipe lining repair on EB and WB pipe. Reconstruct pipe outfall and add pipe end riprap protection and riprap in outfall ditch.
Station 297+20 Cross-Line Drainage System	I-20-12	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe / 30" R.C. Pipe	2.00	-	347.50	System not analyzed. Insufficient data.									Cross-line pipe is part of closed drainage system.	VPI not performed. Pipe inaccessible. Heavy vegeation in outfall ditch.	Clean existing pipe and perform inspection. Clean outfall ditch for approximately 500 feet (within ROW).
Station 300+00 WB Median Outlet	No VPI	I-20 - Primary			18" R.C. Pipe	1.50	355.07	354.56												
Station 306+00 Cross-Line Drainage System	I-20-13EB / I-20-13WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	363.89	355.82										Cross-line pipe is part of closed drainage system.	VPI performed. No issues with EB pipe. WB pipe has several joint separations.	Retain existing pipe. Perform pipe lining repair WB pipe. Clean outfall ditch within ROW.
Station 310+00 Cross-Line	I-20-14EB / I-20-14WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	363.53	356.11	4.67	10.16	11.42	365.14	1.61	0.81	365.25	1.72	0.86	Headwater exceeds design criteria. The headwater will remain in the roadway ditch and be conveyed along the roadway upstation and downstation to alternate cross-lines prior to impacting the roadway.	VPI performed. Crack located 64' from median.	Retain existing pipe. Perform pipe lining repair WB pipe. Clean outfall ditch and place riprap outfall protection.
Station 314+98 Cross-Line Drainage System	I-20-15EB / I-20-15WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	-	350.75	System not analyzed. Insufficient data.									Cross-line pipe is part of closed drainage system.	VPI performed. Some infiltration located along pipe. No structural issues identified.	Retain existing pipe. Clean exsiting pipe and outfall.
Station 319+97 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	359.25	357.85												

I-20: (Begin Project to U.S. Route 1) Main Line Culverts Summary																				
												Design Storm			100-Year Storm					
Location	**Video Pipe Inspection Pipe ID**	**Road / Classification**	**Design Storm (25-year / 50-year)**	**Stream Name**	**Drainage Structure**	**Structure Height (ft)**	**Existing Invert (Inlet)**	**Existing Invert (Outlet)**	**Cross-line Drainage Area (acre)**	**Design Flow (cfs)**	**100-Year Flow (cfs)**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Calculated Headwater**	**Headwater Depth (from inlet)**	**Hw / D**	**Hydraulic Analysis Notes**	**Inspection Notes**	**Recommendation**
Station 324+65 Cross-Line Drainage System	I-20-16EB / I-20-16WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. Pipe	2.00	-	352.36	System not analyzed. Insufficient data.									Cross-line pipe is part of closed drainage system.	VPI performed. Joint separations identified outside of roadway area. Drainage system ties to offsite neighborhood drainage system.	Retain existing pipe. Clean existing pipe and perform pipe lining repair.
Station 330+26 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	346.37	344.47												
Station 336+00 WB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	334.95	333.50												
Station 340+46 Cross-Line	I-20-17	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	8' X 8' RCBC	8.00	305.00	296.00	530.74	422.80	537.10	312.32	7.32	0.91	313.71	8.71	1.09	Cross-line drainage meets design standards.	No VPI performed. Visual inspection. Concrete ditches at inlet have failed and scour holes forming around wingwalls.	Retain existing culvert. Remove failed concrete ditch and replace with riprap. Repair scour holes around wingwalls.
Station 341+47 EB Median Outlet	No VPI	I-20 - Primary			15" R.C. Pipe	1.25	327.29													
Station 345+98 WB Median Outlet	No VPI	I-20 - Primary			18" R.C. Pipe	1.50	331.64	329.96												
Station 353+18 Cross-Line Drainage System	I-20-18EB / I-20-18WB	I-20 - Primary	50-Year Storm	UT to Twelvemile Creek	24" R.C. PIPE	2.00	341.98	335.97	3.85	7.99	9.00	343.38	1.40	0.70	343.48	1.50	0.75	Cross-line drainage meets design standards.	VPI performed. Hole located in EB pipe as well as infiltration. WB pipe damaged near guardrail.	Retain existing pipe. Perform pipe lining repair. Replace WB pipe under U.S. Route 1 ramp.
Station 353+20 wB Ditch Inlet to Median	I-20-18A	I-20 - Primary			24" R.C. Pipe	2.00	341.96	-											VPI performed. No issues.	Retain existing pipe.
Station 358+98 EB Median Outlet	I-20-19EB	I-20 - Primary			18" R.C. Pipe	1.25	344.91	346.11											VPI performed. Joint offset located 80' from median catch basin.	Retain existing pipe. Remove exposed rebar from pipe end. Clean outfall ditch.