APPENDIX A

2003 Intersection Analysis and Prioritization Study for Cr 252 & US 550, CDOT Region 5

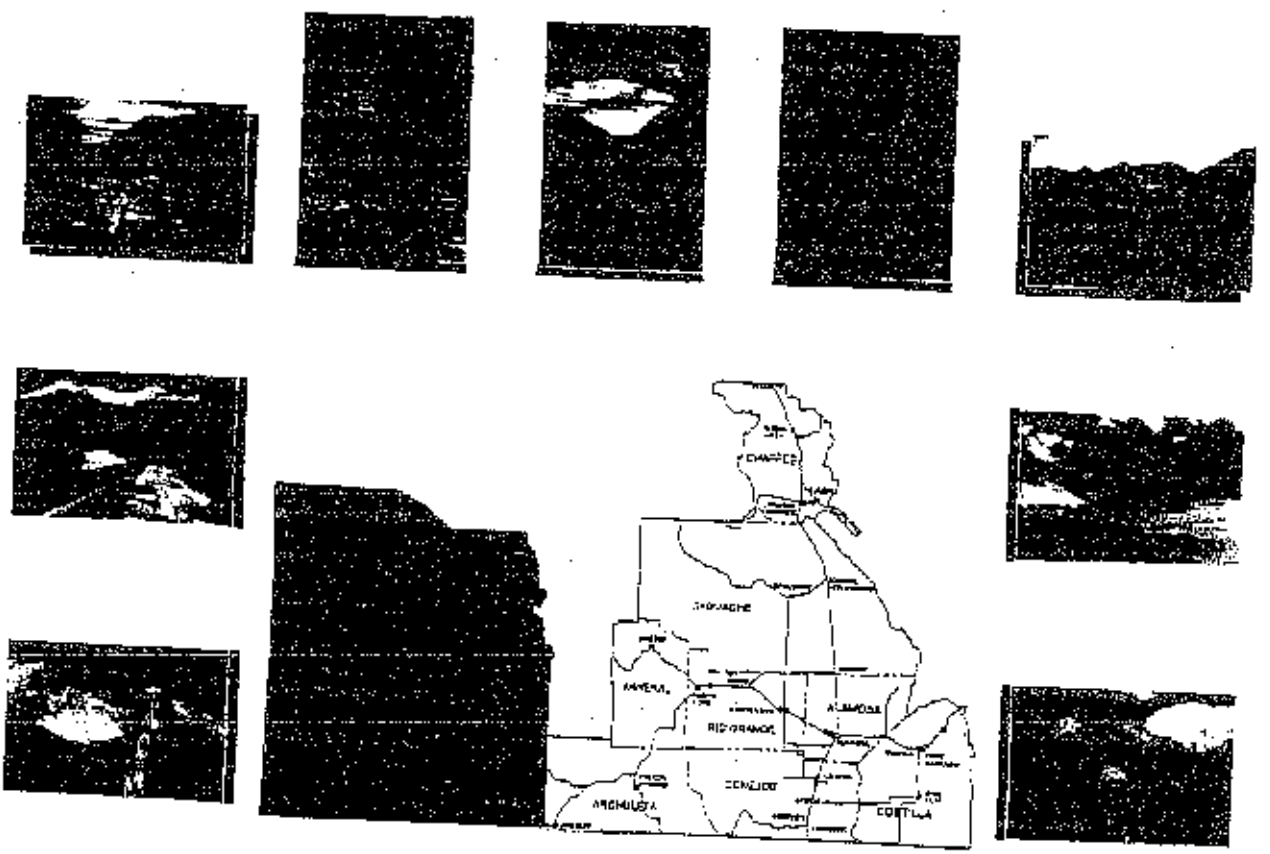
Appendix - West

2003 INTERSECTION ANALYSIS AND PRIORITIZATION STUDY

CDOT Region 5

February 28, 2003

DEPARTMENT OF TRANSPORTATION



RANGE

ESEH

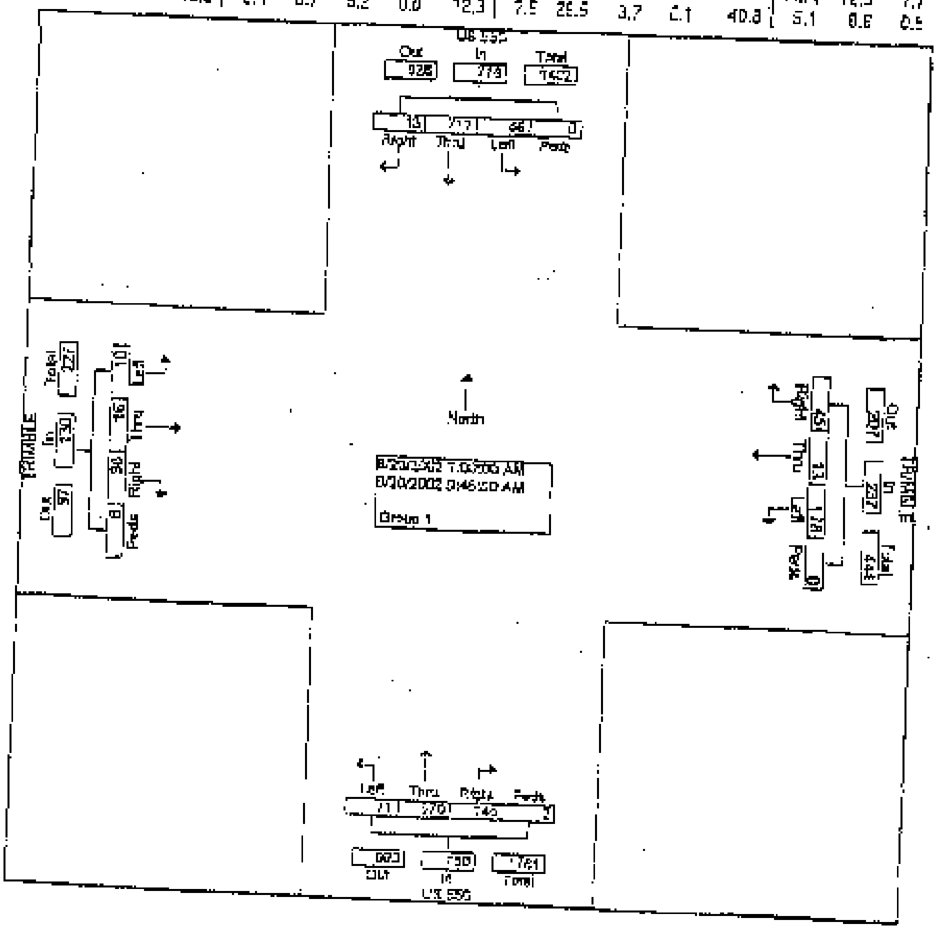
(18)

Rocky Mountain Counts, LLC.
1106 Cherry Ct.
Ft. Lupton, CO 80621
Phone (303) 641-0445 Fax (303) 857-9191

File Name : 550TRIMBLEAM
Site Code : 00000000
Start Date : 08/20/2002
Page No : 1

Groups Printed- Group 1

	US 550 Southbound					TRIMBLE Westbound					US 550 Northbound					TRIMBLE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	1	22	1	0	24	1	0	9	0	10	5	9	4	0	18	9	0	1	0	10	62
07:15 AM	2	52	3	0	57	2	3	11	0	16	4	39	3	0	46	9	0	2	1	12	131
07:30 AM	0	81	2	0	83	5	0	29	0	34	7	49	1	0	57	18	3	0	0	21	195
07:45 AM	3	69	4	0	76	3	1	16	0	20	16	72	5	1	94	9	2	0	0	11	201
Total	6	224	10	0	240	11	4	65	0	80	32	169	13	1	215	45	5	3	1	54	589
08:00 AM	0	45	6	0	51	4	0	14	0	18	17	44	8	0	69	8	1	0	0	9	147
08:15 AM	0	44	5	0	49	4	2	12	0	18	15	50	7	0	72	9	0	0	2	11	150
08:30 AM	1	70	6	0	77	3	2	21	0	26	12	48	9	0	69	8	2	0	1	11	183
08:45 AM	1	47	2	0	50	5	0	12	0	17	9	72	6	0	87	5	1	1	0	7	161
Total	2	206	19	0	227	16	4	59	0	79	53	214	30	0	297	30	4	1	3	38	641
09:00 AM	0	78	1	0	79	2	1	10	0	13	14	43	7	0	64	7	2	2	0	11	167
09:15 AM	1	100	5	0	106	7	1	10	0	18	16	45	4	0	65	7	5	1	2	15	204
09:30 AM	1	69	6	0	76	8	1	25	0	34	17	68	7	1	93	9	0	3	0	12	215
09:45 AM	3	40	5	0	48	2	2	9	0	13	13	31	10	0	54	0	0	0	0	0	115
Total	5	287	17	0	309	19	5	54	0	78	60	187	28	1	276	23	7	6	2	38	701
Grand Total	13	717	46	0	776	46	13	178	0	237	145	570	71	2	788	98	16	10	6	130	1931
Apprch %	1.7	92.4	5.9	0.0		19.4	5.5	75.1	0.0		18.4	72.3	9.0	0.3		75.4	12.3	7.7	4.6		
Total %	0.7	37.1	2.4	0.0	40.2	2.4	0.7	9.2	0.0	12.3	7.5	29.5	3.7	0.1	40.8	5.1	0.8	0.5	0.3	6.7	



Rocky Mountain Counts, LLC.
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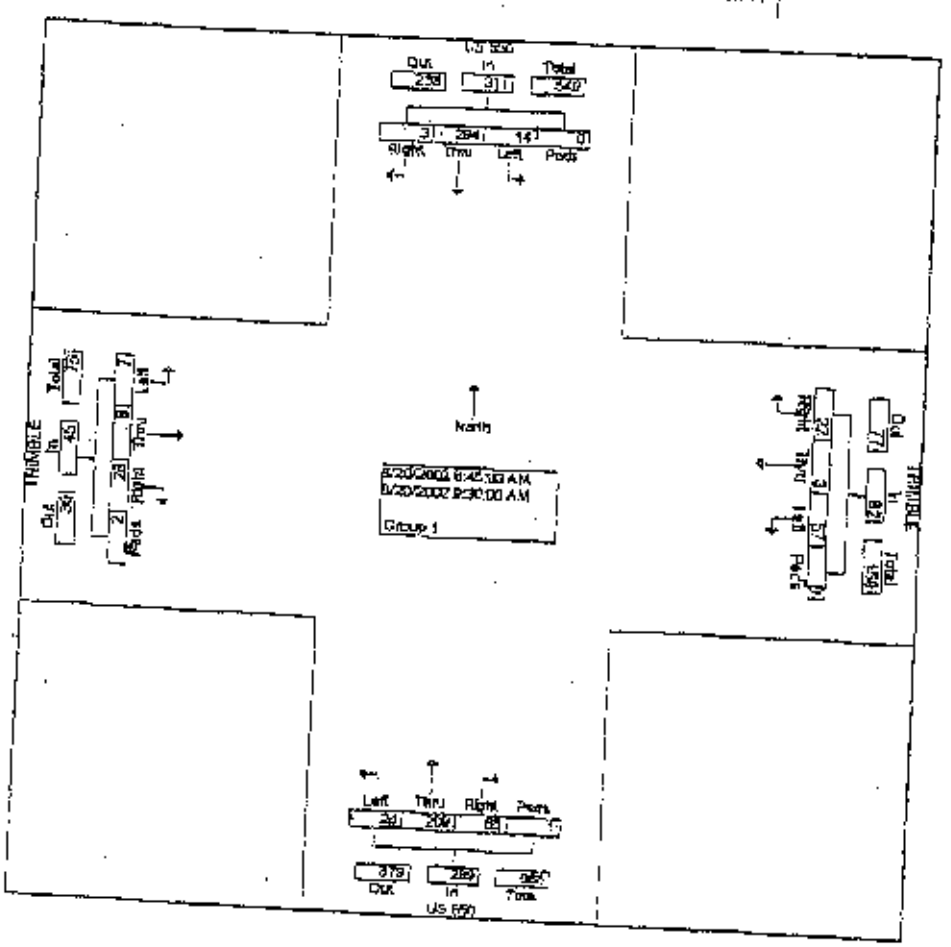
File Name : 550TRIMBLEAM
Site Code : 00000000
Start Date : 08/20/2002
Page No : 2

	US 550 Southbound					TRIMBLE Westbound					US 550 Northbound					TRIMBLE Eastbound					
Start Time	Rig ht	Thr u	Left	Pe ds	App. Total	Rig ht	Thr u	Left	Pe ds	App. Total	Rig ht	Thr u	Left	Pe ds	App. Total	Rig ht	Thr u	Left	Pe ds	App. Total	Int. Total
Peak Hour From 07:30 AM to 09:45 AM - Peak 1 of 1																					
Intersect	08:45 AM																				
Volume	3	294	14	0	311	22	3	37	0	62	55	209	24	1	289	28	9	7	2	46	
Percent	1.0	94.5	4.5	0.0		35.5	4.8	59.7	0.0		19.0	72.3	8.3	0.3		60.9	19.6	15.2	4.3		
09:30 Volume	1	69	6	0	76	8	1	25	0	34	17	68	7	1	93	6	0	3	0	12	727
Peak Factor																					215
High Int.	08:15 AM																				0.845
Volume	1	100	5	0	106	09:30 AM					09:30 AM					09:15 AM					
Peak Factor					0.730	8	1	25	0	34	17	68	7	1	93	7	5	1	2	15	
										0.603					0.777					0.750	



Rocky Mountain Counts, LLC.
1106 Cherry Ct.
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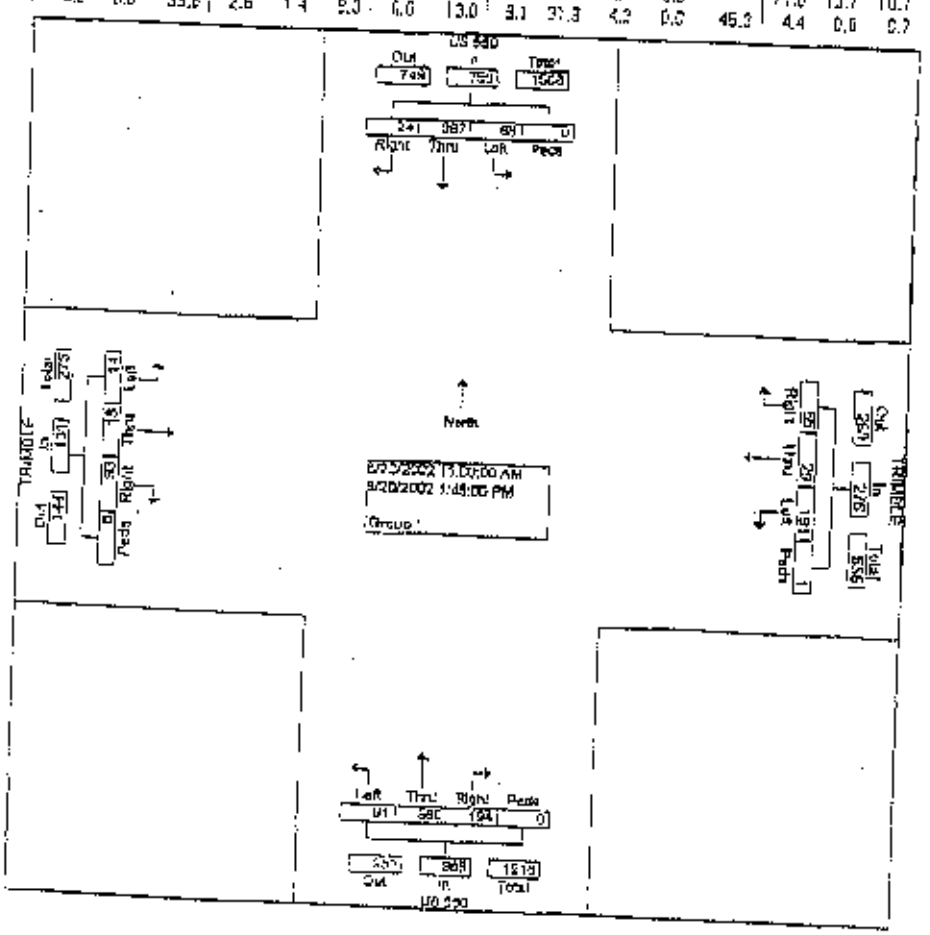
Phone (303) 541-0445 Fax (303) 857-9191

File Name : 550TRIMBLE
Site Code : 00000000
Start Date : 08/20/2002
Page No : 1

Groups Printed- Group 1

	US 550 Southbound					TRIMBLE Westbound					US 550 Northbound					TRIMBLE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
11:00 AM	1	46	3	0	50	2	2	23	0	27	14	56	8	0	78	11	0	0	0	12	167
11:15 AM	0	48	5	0	54	3	0	16	0	19	13	49	5	0	68	13	2	0	0	15	156
11:30 AM	1	70	7	0	78	6	4	9	1	20	9	50	6	0	65	6	1	0	0	7	170
11:45 AM	3	68	9	0	78	4	3	17	0	24	17	59	5	0	81	6	2	3	0	11	194
Total	5	232	29	0	260	15	9	65	1	90	53	214	25	0	292	36	5	3	0	45	687
12:00 PM	3	51	9	0	63	9	3	17	0	29	16	48	4	0	67	6	1	3	0	12	171
12:15 PM	1	59	6	0	66	5	0	16	0	21	15	74	10	0	100	8	2	0	0	10	200
12:30 PM	0	33	10	0	43	1	4	22	0	27	17	47	9	0	73	4	0	2	1	7	156
12:45 PM	3	76	6	0	85	6	5	17	0	28	13	68	17	0	98	7	0	0	0	7	218
Total	7	224	31	0	262	22	12	74	0	108	61	239	40	0	338	27	3	5	1	36	745
01:00 PM	3	37	4	0	44	1	2	10	0	13	20	41	2	0	63	4	3	1	5	13	133
01:15 PM	4	66	5	0	75	10	1	20	0	31	21	72	14	0	107	3	2	1	0	6	219
01:30 PM	3	66	4	0	73	3	1	10	0	14	24	61	6	0	91	0	4	2	0	14	192
01:45 PM	2	42	1	0	45	1	4	12	0	20	15	54	4	0	73	15	0	2	0	17	156
Total	12	211	14	0	237	15	8	52	0	76	80	228	26	0	334	30	9	6	5	50	699
Grand Total	24	667	88	0	759	55	29	191	1	276	194	580	91	0	865	93	15	14	5	131	2131
Approach %	3.2	87.9	8.8	0.0		19.9	10.5	69.2	0.4		20.1	70.5	9.4	0.0		71.0	11.7	10.7	4.6		
Total %	1.1	31.3	3.2	0.0	35.6	2.6	1.4	9.0	0.0	13.0	9.1	27.2	4.3	0.0	40.6	4.4	0.8	0.7	0.3	6.1	



Rocky Mountain Counts, LLC.
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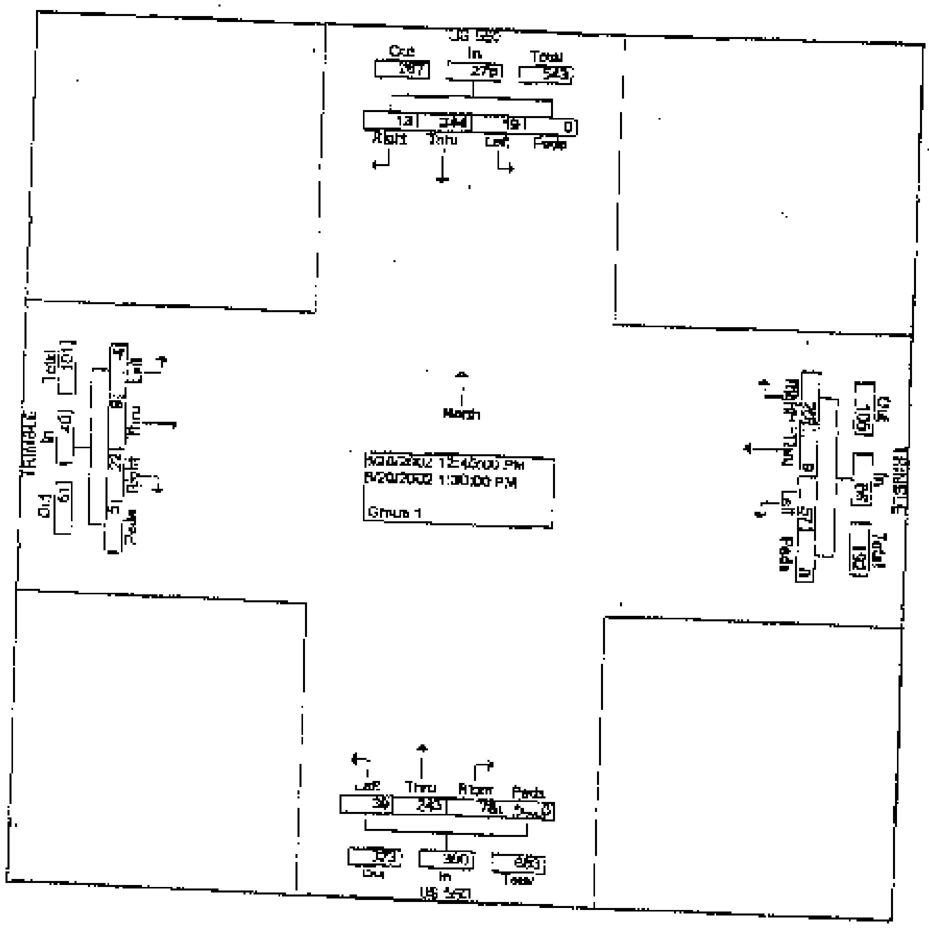
File Name : 550TRIMBLE
Site Code : 00000000
Start Date : 08/20/2002
Page No : 2

US 550 Southbound					TRIMBLE Westbound					US 550 Northbound					TRIMBLE Eastbound					
Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
From 11:00 AM to 01:45 PM - Peak 1 of 1																				
12:45 PM																				
13	244	19	0	276	20	9	57	0	86	78	243	39	0	360	22	9	4	5	40	762
4.7	88.4	6.9	0.0		23.3	10.5	66.3	0.0		21.7	67.5	10.8	0.0		55.0	22.5	10.0	12.5		
4	56	5	0	75	10	1	20	0	31	21	72	14	0	107	3	2	7	0	5	219
																				0.870
12:45 PM					01:15 PM					01:15 PM					01:30 PM					
3	75	5	0	84	10	1	20	0	31	21	72	14	0	107	8	4	2	0	14	
				0.821					0.694					0.841					0.714	



Rocky Mountain Counts, LLC
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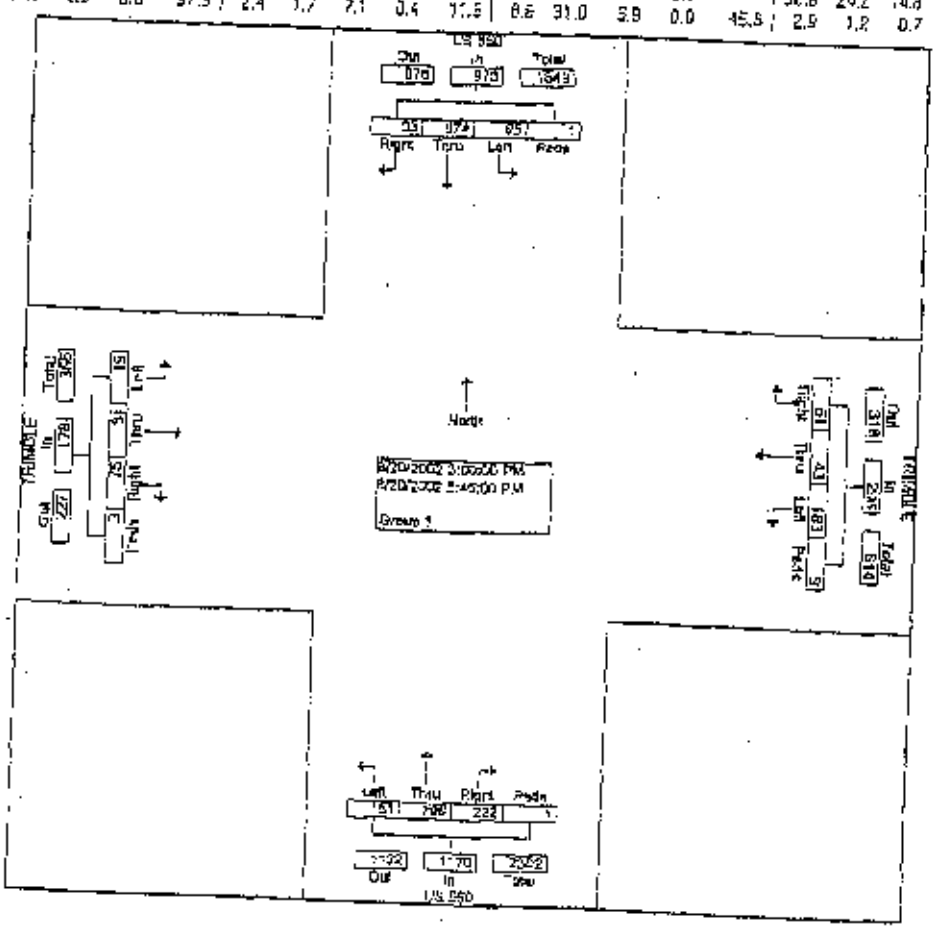
File Name : 550TRIMBLEPM
Site Code : 00000000
Start Date : 09/20/2002
Page No : 1

Groups Printed- Group 1

	US 550 Southbound					TRIMBLE Westbound					US 550 Northbound					TRIMBLE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:00 PM	1	71	2	0	74	5	2	13	0	20	15	44	8	0	67	4	2	3	0	9	170
03:15 PM	2	63	5	0	70	3	5	18	0	32	18	48	5	0	71	10	1	1	0	12	185
03:30 PM	2	58	4	0	64	3	4	28	0	35	28	60	8	0	88	7	2	1	0	10	197
03:45 PM	9	69	2	0	80	2	0	7	0	9	3	72	18	0	93	7	2	0	0	12	199
Total	14	261	13	0	288	13	11	66	0	96	64	223	39	0	324	28	7	5	0	43	751
04:00 PM	3	85	8	0	96	10	9	11	1	29	19	91	11	0	121	3	5	1	0	10	255
04:15 PM	1	64	7	1	73	4	5	21	0	30	18	54	9	0	81	4	5	2	0	11	195
04:30 PM	0	69	10	0	79	6	4	15	2	25	14	58	11	0	93	5	4	0	0	9	206
04:45 PM	3	90	5	0	98	7	5	30	0	32	16	70	16	0	102	5	1	1	0	7	239
Total	7	308	30	1	346	27	23	85	3	116	67	263	47	0	397	17	16	4	0	37	995
05:00 PM	2	68	7	0	77	5	2	13	0	20	34	65	15	2	116	4	2	1	0	7	220
05:15 PM	0	89	4	0	93	3	4	14	3	24	26	94	14	0	134	11	1	1	0	13	264
05:30 PM	2	79	9	0	90	5	3	12	3	23	28	70	24	0	122	7	0	3	0	10	245
05:45 PM	0	69	2	0	79	2	3	13	0	18	11	55	11	0	77	5	5	2	3	18	192
Total	12	305	22	0	339	15	12	52	6	85	99	294	65	1	449	30	8	7	3	48	921
Grand Total	33	874	65	1	973	61	42	163	9	296	222	796	151	1	1170	75	31	19	3	128	2567
Approch %	3.4	89.8	6.7	0.1		20.6	14.5	61.0	3.0		19.0	68.0	12.3	0.1		58.6	24.2	14.8	2.3		
Total %	1.3	34.5	2.5	0.0	37.9	2.4	1.7	7.1	0.4	11.5	8.6	31.0	5.9	0.0	45.6	2.9	1.2	0.7	0.1	5.0	



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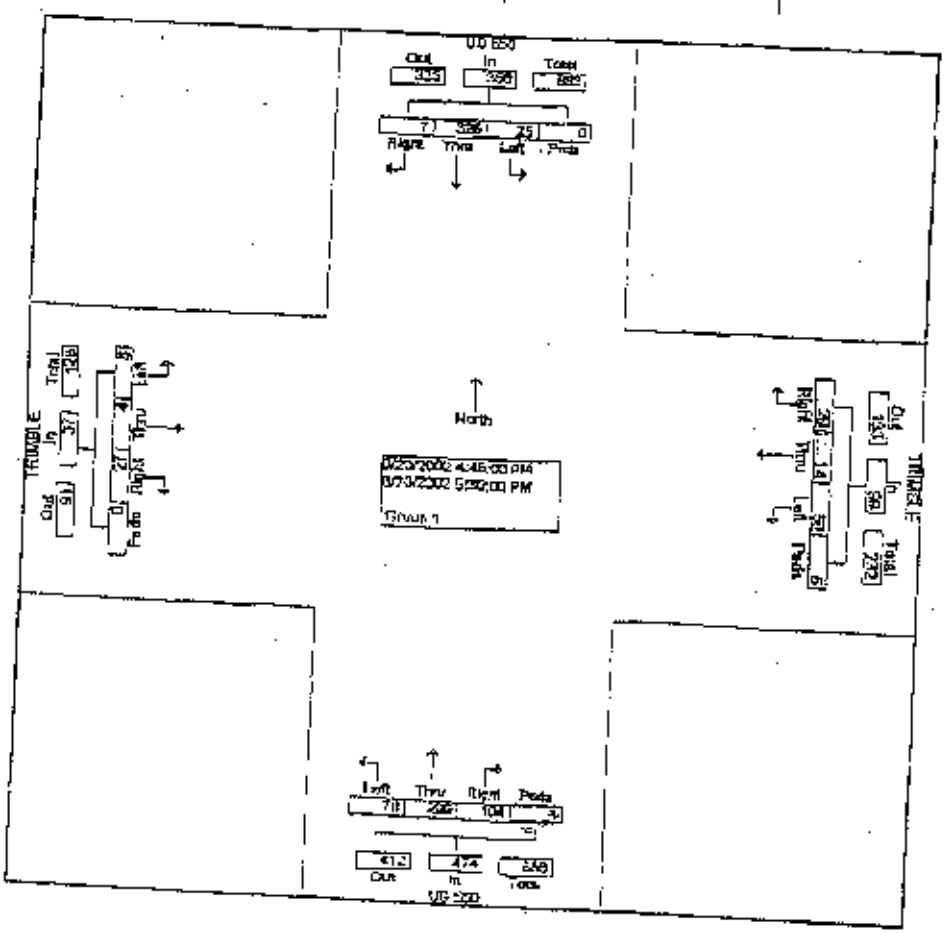
File Name : 550TRIMBLEPM
Site Code : 00000000
Start Date : 08/20/2002
Page No : 2

	US 550 Southbound					TRIMBLE Westbound					US 550 Northbound					TRIMBLE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	7	326	25	0	358	20	14	58	6	98	104	299	70	1	474	27	4	6	0	37	966
Percent	2.0	91.1	7.0	0.0		20.2	14.1	59.6	6.1		21.9	63.1	14.8	0.2		72.0	10.8	16.2	0.0		
05:15 Volume	0	89	4	0	93	3	4	14	3	24	26	94	14	0	134	11	1	1	0	13	264
Peak Factor																					0.917
High Int. Volume	04:45 PM					04:45 PM					05:15 PM					05:15 PM					
Peak Factor	3	80	5	0	96	7	5	20	0	32	26	94	14	0	134	11	1	1	0	13	
					0.913					0.773					0.884					0.712	



HCM Unsignalized Intersection Capacity Analysis
18: Trimble Lane & US 550

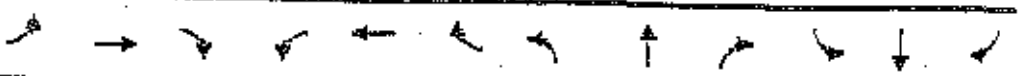
11/7/2002

Lane Configurations												
Sign Control			Stop			Stop			Free			Free
Grade			0%			0%			0%			0%
Volume, veh/h												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)												
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type						None			None			
Median storage veh)												
Upstream signal (ft)												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %			97			90						
cM capacity (veh/h)	312	317	680	297	344	776	1175			1216		
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3					
Volume Total	8	0	68	29	0	17	0	0				
Volume Left	8	0	68	29	0	17	0	0				
Volume Right	0	0	0	0	0	0	0	0				
cSH	315	680	359	1175	1700	1216	1700	1700				
Volume to Capacity	0.03	0.00	0.19	0.02	0.00	0.01	0.00	0.00				
Queue Length (ft)	5	4	27	2	0	1	0	0				
Control Delay (s)												
Lane LOS	C	B	C	A		A						
Approach Delay (s)												
Approach LOS	B		C									
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization												

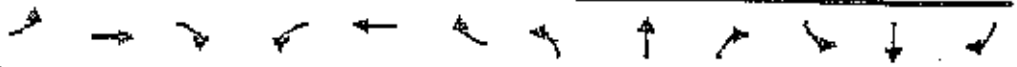
Lane Configurations											
Sign Control											
Grade		0%			0%			0%			0%
Volume (vph)											
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)											
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type		None			None						
Median storage veh)											
Upstream signal (ft)	755			295			730			295	
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2	
tC, 2 stage (s)											
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3	
p0 queue free %											
cM capacity (veh/h)	288	288	735	295	320	736	1224			1146	
Direction, Lane #											
Volume Total	5	26	106	47	0	23	0	0			
Volume Left	5	0	68	47	0	23	0	0			
Volume Right	0	0	38	0	0	0	0	0			
cSH	288	735	337	1224	1700	1146	1700	1700			
Volume to Capacity											
Queue Length (ft)	4	3	32	3	0	2	0	0			
Control Delay (s)											
Lane LOS	C	B	C	A		A					
Approach Delay (s)											
Approach LOS	B		C								
Average Delay			3.7								
Intersection Capacity Utilization											

HCM Unsignalized Intersection Capacity Analysis
18: Trimble Lane & US 550

11/7/2002



Lane Configurations												
Sign Control												
Grade		0%			0%			0%			0%	
Volume (veh/h)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)												
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None										
Median storage veh)												
Upstream signal (ft)												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %												
cM capacity (veh/h)	179	186	647	183	218	674	1132			1054		
Direction, Lane #												
Volume Total												
Volume Left	7	0	71	84	0	30	0	0				
Volume Right												
cSH	182	647	223	1132	1700	1054	1700	1700				
Volume to Capacity												
Queue Length (ft)	5	4	63	6	0	2	0	0				
Control Delay (s)												
Lane LOS	D	B	E	A		A						
Approach Delay (s)												
Approach LOS	C		E									
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization												



Lane Configurations												
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Pedestrians												
Walking Speed (ft/s)												
Right turn flare (veh)												
Median type		None					Jon					
Median storage veh)												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
cM capacity (veh/h)	182	198	557	166	224	674	1030			1081		
Volume Total	26	0	212	100	0	24	505	0				
Volume Left	12	0	98	41	0	24	0	0				
Volume Right	0	0	98	0	0	0	0	0				
cSH	190	557	210	1030	1700	1081	1700	1700				
Volume to Capacity	0.14	0.00	1.01	0.10	0.00	0.02	0.30	0.00				
Queue Length (ft)	12	0	103	3	0	2	0	0				
Control Delay (s)	26.2	11.8	61.2	8.7	0.0	8.3	0.0	0.0				
Lane LOS	D	B	F	A		A						
Approach Delay (s)	17.2		61.2	0.4								
Approach LOS	C		F									
Average Delay			7.4									
Intersection Capacity Utilization			72.7%			ICU Level of Service						

US 550 at Trimble Lane

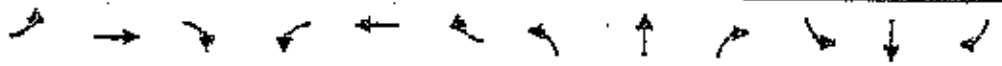
HCM Unsignalized Intersection Capacity Analysis
18: Trimble Lane & US 550

11/7/2002

Lane Configurations												
Sign Control		Stop			Stop							
Grade		0%			0%			0%			0%	
Volume (veh/h)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (veh/h)												
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type			None			None						
Median storage veh)												
Upstream signal (ft)												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2				4.2	
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3				2.3	
p0 queue free %												
cM capacity (veh/h)	159	171	623	155	200	625	1092				994	
Direction, Lane #												
Volume Total	7	0	98	67	0	33	0	0				
Volume Left	7	0	98	67	0	33	0	0				
Volume Right	0	0	0	0	0	0	0	0				
cSH	167	623	194	1092	1700	994	1700	1700				
Volume to Capacity	0.04	0.00	0.50	0.06	0.00	0.03	0.00	0.00				
Queue Length (ft)	11	5	127	5	0	3	0	0				
Control Delay (s)												
Lane LOS	D	B	F	A		A						
Approach Delay (s)			65			1						
Approach LOS	C		F									
Intersection Summary												
Average Delay			9.2									
Intersection Capacity Utilization												

HCM Unsignalized Intersection Capacity Analysis
18: Trimble Lane & US 550

11/7/2002



Lane Configurations												
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Pedestrians												
Walking Speed (ft/s)												
Right turn flare (veh)												
Median storage veh)												
vC1, stage 1 conf vol												
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2				4.2	
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3				2.3	
cM capacity (veh/h)	73	89	518	79	112	551	976				880	
Volume Left	10	0	101	120	0	43	0	0				
cSH	79	518	103	976	1700	880	1700	1700				
Queue Length (ft)	19	7	302	10	0	4	0	0				
Lane LOS	F	B	F	A		A						
Approach LOS	D		F									
Average Delay			37.7									

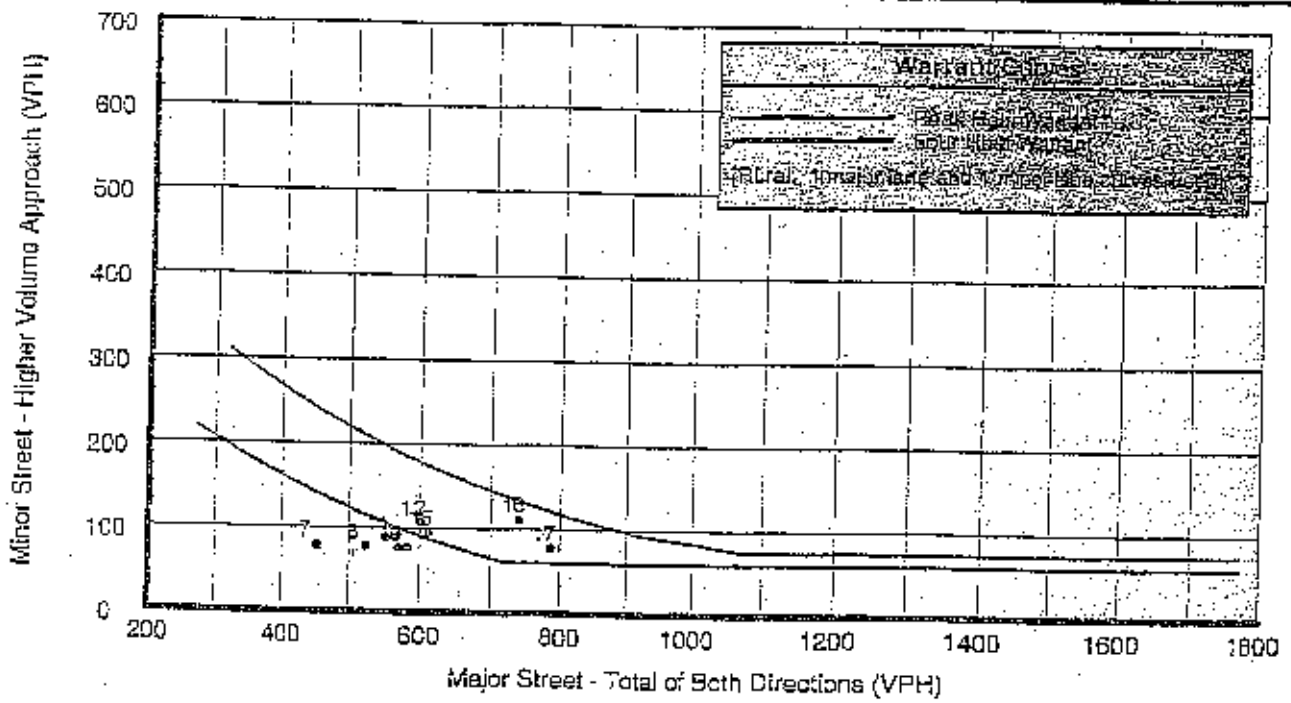
CDOT Region 5 Intersection Study

Year 2002 Raw Counts (Collected: 8/20/02)

SEH, Inc.

Study Name : US550@TrimbleLn_02
Study Date : 11/19/02
Page No. : 2

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour Begin	Major Total	Higher Minor Vol	Minor Dir	Warrant 1 Major Crit.	Warrant 1 Minor Crit.	Warrant 1 Meets?	Warrant 2 Major Crit.	Warrant 2 Minor Crit.	Warrant 2 Meets?	Warrant 3 Major Crit.	Warrant 3 Minor Crit.	Warrant 3 Meets?
00:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
01:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
02:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
03:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
04:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
05:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
06:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
07:00	454	80	WB	[redacted]	105-No	Major	525-No	[redacted]	Minor	[redacted]	84-No	Major
08:00	524	79	WB	[redacted]	105-No	Major	525-No	[redacted]	Minor	[redacted]	84-No	Major
09:00	584	78	WB	[redacted]	105-No	Major	[redacted]	[redacted]	[redacted]	[redacted]	84-No	Major
10:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
11:00	552	89	WB	[redacted]	105-No	Major	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
12:00	601	108	WB	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13:00	571	78	WB	[redacted]	105-No	Major	[redacted]	[redacted]	[redacted]	[redacted]	84-No	Major
14:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
15:00	512	96	WB	[redacted]	105-No	Major	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
16:00	742	172	WB	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
17:00	787	79	WB	[redacted]	105-No	Major	[redacted]	[redacted]	[redacted]	[redacted]	84-No	Major
18:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
19:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
20:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
21:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
22:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
23:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—

CDOT Region 5 Intersection Study

Year 2002 Raw Counts (Collected: 8/20/02)

SEH, inc.

Study Name : US550@TrimbleLn_02
Study Date : 11/19/02
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Northbound: **US 550**
Number of Lanes: 1
Approach Speed: 55
Total Approach Volume: 2,920

Southbound: **US 550**
Number of Lanes: 1
Approach Speed: 55
Total Approach Volume: 2,507

Minor Street Approaches

Eastbound: **Trimble Lane**
Number of Lanes: 1

Total Approach Volume: 374

Westbound: **Trimble Lane**
Number of Lanes: 1

Total Approach Volume: 799

Warrant Summary (Rural values apply.)

Warrant 1 - Minimum Vehicular Volume ..... Not Satisfied
Required volumes reached for 2 hours, 8 are needed

Warrant 2 - Interruption of Continuous Traffic ..... Not Satisfied
Required volumes reached for 7 hours, 8 are needed

Warrant 3 - Minimum Pedestrian Volume ..... Not Satisfied
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 4 - School Crossing ..... Not Satisfied
Number of gaps > 10 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 5 - Progressive Movement ..... Not Satisfied
No adjacent coordinated signals are present

Warrant 6 - Accident Experience ..... Not Satisfied
Number of accidents (-1) is less than minimum (5). Volume minimums are met.

Warrant 7 - Systems Warrant ..... Not Satisfied
Major Route conditions not met. No volume requirement met.

Warrant 8 - Combination of Warrants ..... Not Satisfied
Required volumes reached for 4 hours, 8 are needed

Warrant 9 - Four Hour Volumes ..... Satisfied
Number of hours (4) volumes exceed minimum >= minimum required (4).

Warrant 10 - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 11 - Peak Hour Volume ..... Not Satisfied
Volumes do not exceed minimums for any hour.

Warrant 12 - Volume Warrant for Traffic Actuated Signals ..... Not Evaluated

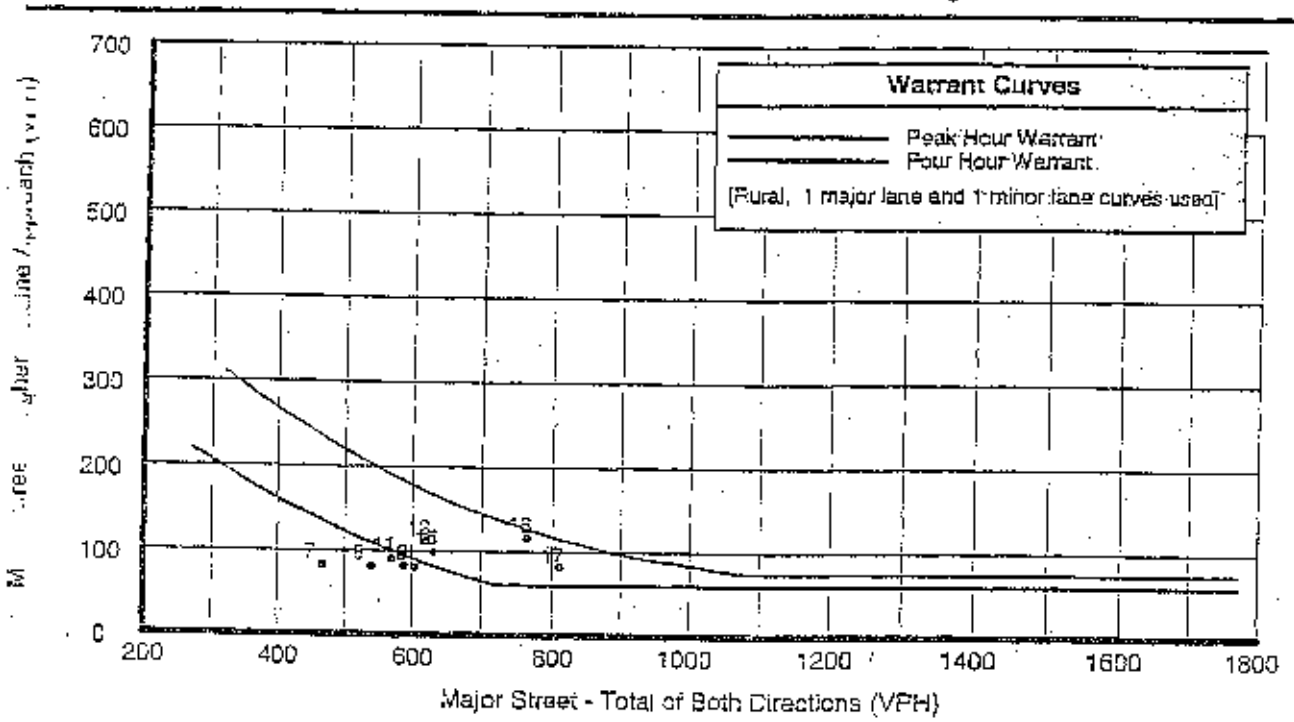
CDOT Region 5 Intersection Study

Year 2003 Factored Counts (Collected: 8/20/02)

SEH, inc.

Study Name : US550@Trimble_n_03
Study Date : 11/20/02
Page No. : 2

Signal Warrants - Summary



alysis of 8-Hour Volume Warrants:

Hour Begin	Major Total	Higher Minor Vol	Higher Minor Dir	Warrant 1 Major Crit	Warrant 1 Minor Crit	Warrant 1 Meets?	Warrant 2 Major Crit	Warrant 2 Minor Crit	Warrant 2 Meets?	Warrant 3 Major Crit	Warrant 3 Minor Crit	Warrant 3 Meets?
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
1:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
4:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
5:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	467	82	WB	[illegible]	105-No	Major	525-No	[illegible]	Minor	[illegible]	84-No	Major
8:00	540	81	WB	[illegible]	105-No	Major	[illegible]	[illegible]	[illegible]	[illegible]	84-No	Major
:00	603	81	WB	[illegible]	105-No	Major	[illegible]	[illegible]	[illegible]	[illegible]	84-No	Major
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
1:00	569	91	WB	[illegible]	105-No	Major	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
:00	519	111	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
:00	587	81	WB	[illegible]	105-No	Major	[illegible]	[illegible]	[illegible]	[illegible]	84-No	Major
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	630	99	WB	[illegible]	105-No	Major	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
00	763	116	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
00	811	81	WB	[illegible]	105-No	Major	[illegible]	[illegible]	[illegible]	[illegible]	84-No	Major
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
:00	0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—

CDOT Region 5 Intersection Study

Year 2003 Factored Counts (Collected: 8/20/02)

SEH, Inc.

Study Name : US550@TrimbleLn_03
Study Date : 11/20/02
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Northbound: US 550
Number of Lanes: 1
Approach Speed: 55
Total Approach Volume: **3,008**

Southbound: US 550
Number of Lanes: 1
Approach Speed: 55
Total Approach Volume: **2,581**

Minor Street Approaches

Eastbound: Trimble Lane
Number of Lanes: 1

Total Approach Volume: **383**

Westbound: Trimble Lane
Number of Lanes: 1

Total Approach Volume: **829**

Warrant Summary (Rural values apply.)

Warrant 1 - Minimum Vehicular Volume ..... Not Satisfied
Required volumes reached for 2 hours, 8 are needed

Warrant 2 - Interruption of Continuous Traffic ..... Satisfied
Required volumes reached for 8 hours, 8 are needed

Warrant 3 - Minimum Pedestrian Volume ..... Not Satisfied
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 4 - School Crossing ..... Not Satisfied
Number of gaps > .0 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 5 - Progressive Movement ..... Not Satisfied
No adjacent coordinated signals are present

Warrant 6 - Accident Experience ..... Not Satisfied
Number of accidents (-1) is less than minimum (5). Volume minimums are met.

Warrant 7 - Systems Warrant ..... Not Satisfied
Major Route conditions not met. No volume requirement met.

Warrant 8 - Combination of Warrants ..... Not Satisfied
Required volumes reached for 4 hours, 8 are needed

Warrant 9 - Four Hour Volumes ..... Satisfied
Number of hours (4) volumes exceed minimum >= minimum required (4).

Warrant 10 - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 11 - Peak Hour Volume ..... Not Satisfied
Volumes do not exceed minimums for any hour.

Warrant 12 - Volume Warrant for Traffic Actuated Signals ..... Not Evaluated

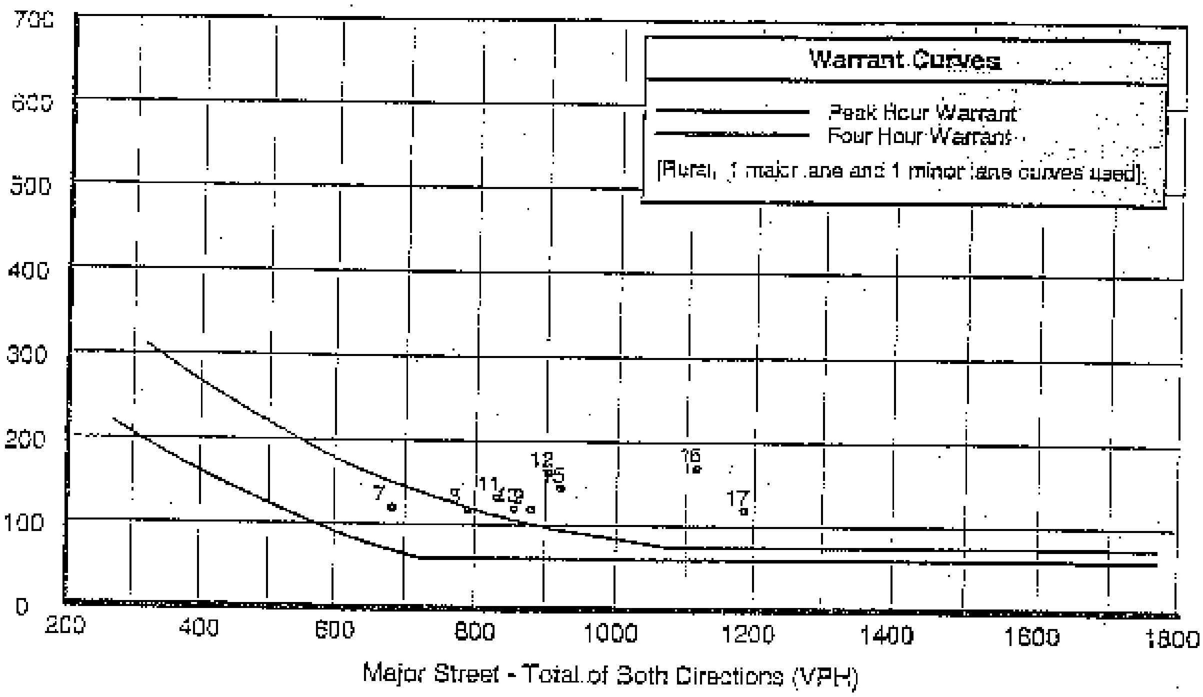
CDOT Region 5 Intersection Study

Year 2023 Factored Counts (Collected: 8/20/02)

SEH, Inc.

Study Name : US550@TrimbleLn_23
Study Date : 11/20/02
Page No. : 2

...nal Warrants - Summary



...sis of 8-Hour Volume Warrants:

Major Total	Higher Minor Vol	Higher Minor Dir	Warrant 1 Major Crit	Warrant 1 Minor Crit	Warrant 1 Meets?	Warrant 2 Major Crit	Warrant 2 Minor Crit	Warrant 2 Meets?	Warrant 3 Major Crit	Warrant 3 Minor Crit	Warrant 3 Meets?
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
582	120	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
782	178	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
880	113	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
830	133	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
904	103	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
957	119	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
920	144	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,114	170	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,185	119	WB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—
0	0	EB	350-No	105-No	—	525-No	52-No	—	420-No	84-No	—

La Plata (Hermosa)
US 550 at Cometti Lane

La Plata (Bayfield)
US 160 at CR 502

La Plata (Hermosa)
US 160/550 at Sawyer Drive

CDOT Region 5 Intersection Study

Year 2023 Factored Counts (Collected: 9/20/02)

SEH, Inc.

Study Name : US550@TrimbleLn_23
Study Date : 11/20/02
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Northbound: US 550
Number of Lanes: 1
Approach Speed: 55
Total Approach Volume: 4,392

Southbound: US 550
Number of Lanes: 1
Approach Speed: 55
Total Approach Volume: 3,768

Minor Street Approaches

Eastbound: Trimble Lane
Number of Lanes: 1

Total Approach Volume: 556

Westbound: Trimble Lane
Number of Lanes: 1

Total Approach Volume: 1,204

Warrant Summary (Rural values apply.)

Warrant 1 - Minimum Vehicular Volume ..... Satisfied
Required volumes reached for 9 hours, 8 are needed

Warrant 2 - Interruption of Continuous Traffic ..... Satisfied
Required volumes reached for 9 hours, 8 are needed

Warrant 3 - Minimum Pedestrian Volume ..... Not Satisfied
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 4 - School Crossing ..... Not Satisfied
Number of gaps > 30 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 5 - Progressive Movement ..... Not Satisfied
No adjacent coordinated signals are present

Warrant 6 - Accident Experience ..... Not Satisfied
Number of accidents (-1) is less than minimum (5). Volume minimums are met.

Warrant 7 - Systems Warrant ..... Not Satisfied
Major Route conditions not met. One or more volume requirement met.

Warrant 8 - Combination of Warrants ..... Satisfied
Required volumes reached for 9 hours, 8 are needed

Warrant 9 - Four Hour Volumes ..... Satisfied
Number of hours (9) volumes exceed minimum >= minimum required (4).

Warrant 10 - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 11 - Peak Hour Volume ..... Satisfied
Volumes exceed minimums for at least one hour.

Warrant 12 - Volume Warrant for Traffic Actuated Signals ..... Not Evaluated

APPENDIX B
LEVEL OF SERVICE CALCULATIONS

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Steve Winters	Intersection	US 550 & CR 252
Agency or Co.	Russell Engineering	Area Type	All other areas
Date Performed	3/8/2004	Jurisdiction	La Plata County, CDOT
Time Period	1 hour	Analysis Year	2004
		Project ID	Trimble Crossing

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	1	1	1	1
Lane group		LTR		L	TR		L	T	R	L	T	R
Volume, V (vph)	10	11	48	181	43	62	128	548	288	69	585	9
% Heavy vehicles, %HV	7	7	7	7	7	7	7	7	7	7	7	7
Peak-hour factor, PHF	0.71	0.71	0.71	0.77	0.77	0.77	0.88	0.88	0.88	0.91	0.91	0.91
Pretimed (P) or actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up lost time, l_1		1.5		1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT		3		3	3		3	3	3	3	3	3
Unit extension, UE		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b		1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Ped / Bike / RTOR volumes	0		7	0		9	0		20	0		9
Lane width		12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	SB Only	07	08
Timing	G = 15.0	G =	G =	G =	G = 35.0	G = 8.0	G =	G =
	Y = 3	Y =	Y =	Y =	Y = 3	Y = 3	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 67.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		87		235	125		145	623	305	76	643	0
Lane group capacity, c		359		390	377		894	941	1205	519	1233	1509
v/c ratio, X		0.24		0.60	0.33		0.16	0.66	0.25	0.15	0.52	0.00
		0.23		0.23	0.23		0.53	0.53	0.80	0.69	0.69	1.00

Total green ratio, g/C												
Uniform delay, d_1		21.0		23.1	21.5		8.1	11.5	1.7		5.0	0.0
Progression factor, PF		1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	0.950
Delay calibration, k		0.50		0.50	0.50		0.50	0.50	0.50	0.50	0.50	0.50
Incremental delay, d_2		1.6		6.7	2.3		0.4	3.7	0.5	0.6	1.6	0.0
Initial queue delay, d_3		0.1		0.1	0.1		0.0	0.0	0.0	0.0	0.0	0.0
Control delay		22.7		29.9	23.9		8.5	15.1	2.2		6.5	0.0+
Lane group LOS		C		C	C		A	B	A		A	A
Approach delay	22.7			27.8			10.6					
Approach LOS	C			C			B					
Intersection delay							Intersection LOS					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2006
Analysis Time Period	AM PEAK HOUR		
Project Description	TRIMBLE CROSSING - EXISTING		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	30	257	68	17	362	4
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	34	292	77	18	397	4
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	70	4	27	9	10	34
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	90	5	35	12	14	47
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (vph)	34	18		130			73	
C (m) (vph)	1163	1201		321			437	
v/c	0.03	0.01		0.40			0.17	
95% queue length	0.09	0.05		2.00			0.60	
Control Delay	8.2	8.0		23.8			14.9	
LOS	A	A		C			B	
Approach Delay	--	--	23.8			14.9		
Approach LOS	--	--	C			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2006
Analysis Time Period	AM PEAK HOUR		
Project Description	TRIMBLE CROSSING - EXISTING & PROJECT		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	30	257	124	31	362	4
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	34	292	140	34	397	4
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	115	7	46	9	18	34
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	149	9	58	12	25	47
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	1	1	0	0	1	0
Configuration	L		TR		LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L		TR		LTR	
v (vph)	34	34	149		67		84	
C (m) (vph)	1163	1138	235		619		369	
v/c	0.03	0.03	0.63		0.11		0.23	
95% queue length	0.09	0.09	4.69		0.36		0.88	
Control Delay	8.2	8.3	45.9		11.5		17.6	
LOS	A	A	E		B		C	
Approach Delay	--	--	35.2			17.6		
Approach LOS	--	--	E			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2026
Analysis Time Period	AM PEAK HOUR		
Project Description	TRIMBLE CROSSING - GROWTH		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	45	383	101	25	529	6
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	51	435	114	27	581	6
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	102	6	39	13	15	49
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	132	7	50	18	21	69
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (vph)	51	27		189			108	
C (m) (vph)	993	1031		157			264	
v/c	0.05	0.03		1.20			0.41	
95% queue length	0.16	0.08		26.64			2.02	
Control Delay	8.8	8.6		500.0			28.0	
LOS	A	A		F			D	
Approach Delay	--	--	500.0			28.0		
Approach LOS	--	--	F			D		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2026
Analysis Time Period	AM PEAK HOUR		
Project Description	TRIMBLE CROSSING - GROWTH & PROJECT		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	45	383	157	39	529	6
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	51	435	178	42	581	6
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	147	9	57	13	23	49
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	190	11	74	18	32	69
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	1	1	0	0	1	0
Configuration	L		TR		LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L		TR		LTR	
v (vph)	51	42	190		85		119	
C (m) (vph)	993	976	104		462		221	
v/c	0.05	0.04	1.83		0.18		0.54	
95% queue length	0.16	0.13	48.84		0.67		3.29	
Control Delay	8.8	8.9			14.5		39.9	
LOS	A	A	F		B		E	
Approach Delay	--	--					39.9	
Approach LOS	--	--		F			E	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2006
Analysis Time Period	PM PEAK HOUR		
Project Description	TRIMBLE CROSSING - EXISTING		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	86	368	128	31	401	9
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	97	418	145	35	455	10
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	73	17	25	7	5	33
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	94	22	32	9	7	46
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (vph)	97	35		148			62	
C (m) (vph)	1102	1019		179			317	
v/c	0.09	0.03		0.83			0.20	
95% queue length	0.29	0.11		9.04			0.73	
Control Delay	8.6	8.7		102.1			19.1	
LOS	A	A		F			C	
Approach Delay	--	--	102.1			19.1		
Approach LOS	--	--	F			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2006
Analysis Time Period	PM PEAK HOUR		
Project Description	TRIMBLE CROSSING - EXISTING & PROJECT		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	86	368	128	55	401	9
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	97	418	145	60	440	9
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	147	35	50	7	9	33
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	190	45	64	9	12	46
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	1	1	0	0	1	0
Configuration	L		TR		LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L		TR		LTR	
v (vph)	97	60	190		109		67	
C (m) (vph)	1117	1019	130		292		260	
v/c	0.09	0.06	1.46		0.37		0.26	
95% queue length	0.29	0.19	37.58		1.75		1.03	
Control Delay	8.5	8.8	943.5		24.6		23.6	
LOS	A	A	F		C		C	
Approach Delay	--	--	608.5			23.6		
Approach LOS	--	--	F			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2026
Analysis Time Period	PM PEAK HOUR		
Project Description	TRIMBLE CROSSING- GROWTH		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	128	548	191	45	585	13
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	145	622	217	49	642	14
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	107	25	37	10	7	48
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	138	32	48	14	9	67
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	1	1	0	0	1	0
Configuration	L		TR		LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L		TR		LTR	
v (vph)	145	49	138		80		90	
C (m) (vph)	936	804	50		157		127	
v/c	0.15	0.06	2.76		0.51		0.71	
95% queue length	0.55	0.19	48.29		2.90		5.60	
Control Delay	9.6	9.8			51.1		95.0	
LOS	A	A	F		F		F	
Approach Delay	--	--					95.0	
Approach LOS	--	--		F			F	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	LORI MOORE	Intersection	US HWY 550 & CR 252
Agency/Co.	RUSSELL ENGINEERING	Jurisdiction	
Date Performed	11/25/2003	Analysis Year	2026
Analysis Time Period	PM PEAK HOUR		
Project Description	TRIMBLE CROSSING - GROWTH & PROJECT		
East/West Street:	CR 252	North/South Street:	US HWY 550
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	128	548	288	69	585	13
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91
Hourly Flow Rate, HFR	145	622	327	75	642	14
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	1	1	1	1
Configuration	L	T	R	L	T	R
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	181	43	62	10	11	48
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.71	0.71	0.71
Hourly Flow Rate, HFR	235	55	80	14	15	67
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			1
Lanes	1	1	0	0	1	0
Configuration	L		TR		LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L		TR		LTR	
v (vph)	145	75	235		135		96	
C (m) (vph)	936	732	37		141		62	
v/c	0.15	0.10	6.35		0.96		1.55	
95% queue length	0.55	0.34	102.44		12.81		23.21	
Control Delay	9.6	10.5			206.5			
LOS	A	B	F		F		F	
Approach Delay	--	--						
Approach LOS	--	--	F			F		

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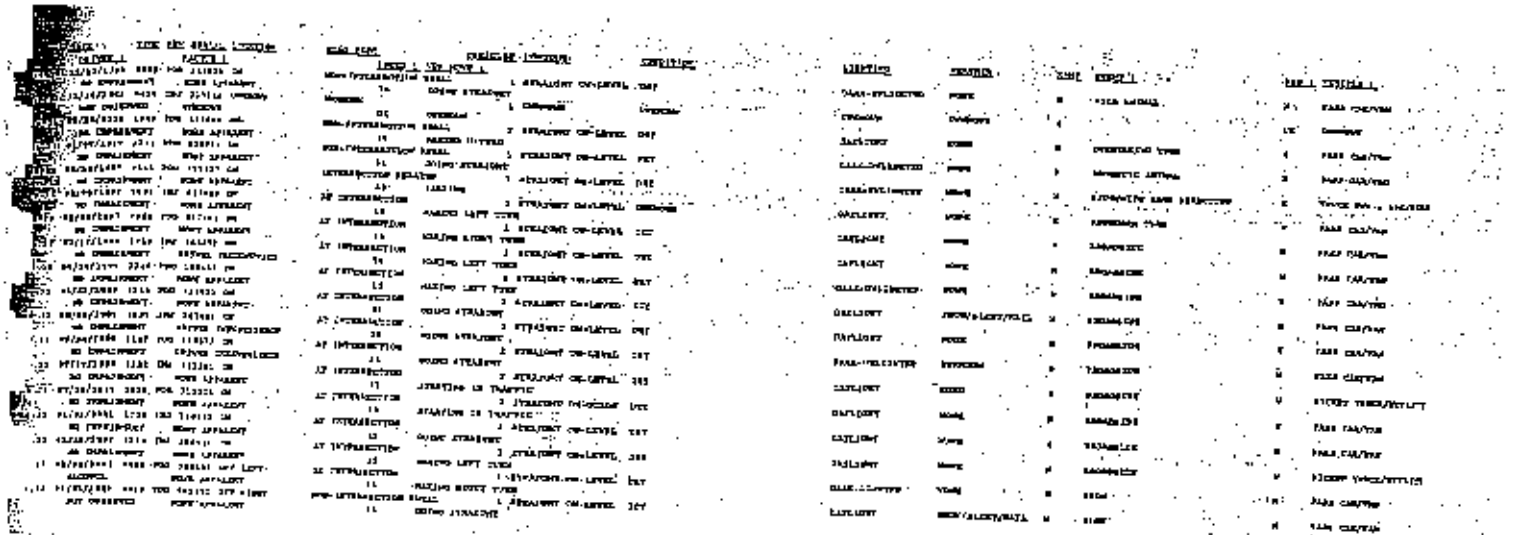
APPENDIX C
ACCIDENT DATA



Severity

PDO:	11	
INJ:	7	13 Injured
FAT:	0	0 Killed

Collision Type

One Vehicle:	5
Two Vehicles:	13
Three or More:	0
Unknown:	0

Driver

On Road:	15	Off in Median:	0
Off Road Left:	1	Unknown:	1
Off Road Right:	1		
Off Road at Tee:	0		

Accident Type

Overturning:	0	Domestic Animal:	1	Tree:	0
Other Non Collision:	0	Wild Animal:	1	Large Boulder:	0
School Age Peds:	0	Light/Utility Pole:	0	Rocks in Roadway:	0
Other Pedestrians:	0	Traffic Signal Pole:	0	Barricade:	0
Broadside:	10	Sign:	2	Wall/Building:	0
Head On:	0	Bridge Rail:	0	Crash Cushion:	0
Rear End:	0	Guard Rail:	0	Mailbox:	0
Sideswipe (Same):	1	Median Barrier:	0	Other Fixed Object:	0
Sideswipe (Opposite):	0	Bridge Abutment:	0	Involving Other Object:	0
Approach Turn:	1	Column/Pier:	0	Road Maintenance Equipment:	0
Overtaking Turn:	1	Culvert/Headwall:	0	Unknown:	1
Parked Motor Vehicle:	0	Embankment:	0		
Railway Vehicle:	0	Curb:	0	Total Fixed Objects:	2
Bicycle:	0	Delineator Post:	0	Total Other Objects:	0
Motorized Bicycle:	0	Fence:	0		

Lighting Conditions

Daylight:	11
Dawn or Dusk:	0
Dark - Lighted:	1
Dark - Unlighted:	5
Unknown:	1

Weather Conditions

None:	14	Dust:	0
Rain:	0	Wind:	0
Snow/Sleet/Hail:	2	Unknown:	2
Fog:	0		

Roadway Relation

At Intersection:	12
At Driveway Access:	0
Intersection Related:	1
Non Intersection Urban:	0
In Alley:	0
Non Intersection Rural:	4
Highway Interchange:	0
Unknown:	1

Road Conditions

Dry:	13
Wet:	0
Muddy:	0
Snowy:	0
Icy:	3
Slushy:	0
Foreign Material:	0
With Road Treatment:	0
Dry w/Icy Road Treatment:	0
Wet w/Icy Road Treatment:	0
Snowy w/Icy Road Treatment:	0
Icy w/Icy Road Treatment:	0
Slushy w/Icy Road Treatment:	0
Unknown:	2

Maintenance Area Hazards

Mainline:	13
Crossroad (Ramp A):	0
Frontage Rd:	0

Ramps

B:	0	H:	0
C:	0	I:	0
D:	0	J:	0
E:	0	K:	0
F:	0	T:	0
G:	0		

Intsx Frontage/Ramps

M:	0	N:	0
O:	0	P:	0

HOV Lanes:	0
Unknown:	0

Accident Rates

PDO:	0.67 MVMT	Total:	1.10 MVMT
Injury:	0.43 MVMT		
Fatal:	0.00 100 MVMT		

APPENDIX F:
Access Permit – 506073

COLORADO DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ACCESS PERMIT

CDOT Permit No.	
506073	
State Highway No/Mp/Side	
550B/030.330/R	

Permit fee	Date of transmittal	Region/Section/Patrol	Local Jurisdiction
300.00	07/14/2006	05/03/11	La Plata County

The Permittee(s):

La Plata County - Trimble Ln
1060 E. Main Ave.
Durango, CO 81301

Trimble Crossing L.P.
5400 W. Plano Parkway, Ste 200
Plano, TX 75093

Applicant:

Russell Engineering
934 Main Ave
Durango, CO 81301

PAID #2020 7/24/06 LVD

is hereby granted permission to have an access to the state highway at the location noted below. The access shall be constructed, maintained and used in accordance with this permit, including the State Highway Access Code and any attachments, terms, conditions and exhibits. This permit may be revoked by the issuing authority if at any time the permitted access and its use violate any parts of this permit. The issuing authority, the Department and their duly appointed agents and employees shall be held harmless against any action for personal injury or property damage sustained by reason of the exercise of the permit.

Location:

Access is to be located on the East side of State Highway 550, a distance of approximately 1748 feet north of milepost 30 on the right side.

Access to Provide Service to:

A public street connection known as County Road 252, which includes the proposed Trimble Crossing, LLC Development, consisting of the uses as approved in the Traffic Impact Report for the Trimble Crossing, LLC Development, re-submittal dated June 10, 2004, prepared by Russell Engineering, Inc

Other terms and conditions:

* See Attached Pages 2 and 3 and Other Enclosures for Additional Terms and Conditions.

RECEIVED
JUL 24 2006
COLORADO DEPT. OF TRANSPORTATION
REGION 5
TRAFFIC & SAFETY

MUNICIPALITY OR COUNTY APPROVAL

Required only when the appropriate local authority retains issuing authority.

By	Date	Title
(x)		

Upon the signing of this permit the permittee agrees to the terms and conditions and referenced attachments contained herein. All construction shall be completed in an expeditious and safe manner and shall be finished within 45 days from initiation. The permitted access shall be completed in accordance with the terms and conditions of the permit prior to being used.

The permittee shall notify Robert Butero with the Colorado Department of Transportation in Durango at 970-382-9180 at least 48 hours prior to commencing construction within the State Highway right-of-way.

The person signing as the permittee must be the owner or legal representative of the property served by the permitted access and have full authority to accept the permit and its terms and conditions.

Permittee (x) **La Plata County declined to sign.**	Date
Permittee (x) Richard D. Trimble mgr of G.P. Trimble Crossing, LLC General Partner	Date 7/20/06
Applicant (x) Michael Russell	Date 7/20/06

This permit is not valid until signed by a duly authorized representative of the Department.
COLORADO DEPARTMENT OF TRANSPORTATION

By	Date (of issue)	Title
(x)	7/24/06	Access Program Manager

Copy Distribution:
Required:
1.Region
2.Applicant
3.Staff Access Section
Make copies as necessary for:
Local Authority
MTCE Patrol
Inspector
Traffic Engineer

Previous editions are obsolete and may not be used
CDOT Form #101 8/98

The following paragraphs are excerpts of the State Highway Access Code. These are provided for your convenience but do not alleviate compliance with all sections of the Access Code. A copy of the State Highway Access Code is available from your local issuing authority (local government) or the Colorado Department of Transportation (Department). When this permit was issued, the issuing authority made its decision based in part on information submitted by the applicant, on the access category which is assigned to the highway, what alternative access to other public roads and streets is available, and safety and design standards. Changes in use or design not approved by the permit or the issuing authority may cause the revocation or suspension of the permit.

APPEALS

1. Should the permittee or applicant object to the denial of a permit application by the Department or object to any of the terms or conditions of a permit placed there by the Department, the applicant and permittee (appellant) have a right to appeal the decision to the [Transportation] Commission [of Colorado]. To appeal a decision, submit a request for administrative hearing to the Transportation Commission of Colorado within 60 days of transmittal of notice of denial or transmittal of the permit for signature. Submit the request to the Transportation Commission of Colorado, 4201 East Arkansas Avenue, Denver, Colorado 80222-3400. The request shall include reasons for the appeal and may include changes, revisions, or conditions that would be acceptable to the permittee or applicant.

2. Any appeal by the applicant or permittee of action by a local issuing authority shall be filed with the local authority and be consistent with the appeal procedures of the local authority.

3. In submitting the request for administrative hearing, the appellant has the option of including within the appeal a request for a review by the Department's internal administrative review committee pursuant to [Code] subsection 2.10. When such committee review is requested, processing of the appeal for formal administrative hearing, 2.9(5) and (6), shall be suspended until the appellant notifies the Commission to proceed with the administrative hearing, or the appellant submits a request to the Commission or the administrative law judge to withdraw the appeal. The two administrative processes, the internal administrative review committee, and the administrative hearing, may not run concurrently.

4. Regardless of any communications, meetings, administrative reviews or negotiations with the Department or the internal administrative review Committee regarding revisions or objections to the permit or a denial, if the permittee or applicant wishes to appeal the Department's decision to the Commission for a hearing, the appeal must be brought to the Commission within 60 days of transmittal of notice of denial or transmittal of the permit.

PERMIT EXPIRATION

1. A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one year extension from the issuing authority. No more than two one-year extensions may be granted under any circumstances. If the access is not under construction within three years from date of issue the permit will be considered expired. Any request for an extension must be in writing and submitted to the issuing authority before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. The local issuing authority shall obtain the concurrence of the Department prior to the approval of an extension, and shall notify the Department of all denied extensions within ten days. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures. An approved Notice to Proceed, automatically renews the access permit for the period of the Notice to Proceed.

CONSTRUCTION

1. Construction may not begin until a Notice to Proceed is approved. (Code subsection 2.4]

2. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee except as provided in subsection 2.14. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department. All fencing, guard rail, traffic control devices and other equipment and materials removed in the course of access construction shall be given to the Department unless otherwise instructed by the permit or the Department inspector.

3. The permittee shall notify the individual or the office specified on the permit or Notice to Proceed at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until both the access permit and the Notice to Proceed are issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from initiation of construction within the highway right-of-way. A construction time extension not to exceed 30 working days may be requested from the individual or office specified on the permit.

4. The issuing authority and the Department may inspect the access during construction and upon completion of the access to ensure that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway

property, natural or cultural resources protected by law, or the health and safety of workers or the public.

5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department or issuing authority to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department or issuing authority the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the issuing authority and Department and included in the permit. The Department or issuing authority may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or improvement of the access may be required when the permittee has failed to meet required specifications of design or materials. If any construction element fails within two years due to improper construction or material specifications, the permittee shall be responsible for all repairs. Failure to make such repairs may result in suspension of the permit and closure of the access.

6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the M.U.T.C.D. as required by section 42-4-104, C.R.S., as amended.

7. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair a traffic control device or public or private utilities for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department or issuing authority, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair.

8. In the event it becomes necessary to remove any right-of-way fence, the posts on either side of the access shall be securely braced with an approved end post before the fence is cut to prevent any slacking of the remaining fence. All posts and wire removed are Department property and shall be turned over to a representative of the Department.

9. The permittee shall ensure that a copy of the permit is available for review at the construction site at all times. The permit may require the contractor to notify the individual or office specified on the permit at any specified phases in construction to allow the field inspector to inspect various aspects of construction such as concrete forms, subbase, base course compaction, and materials specifications. Minor changes and additions may be ordered by the Department or local authority field inspector to meet unanticipated site conditions.

10. Each access shall be constructed in a manner that shall not cause water to enter onto the roadway or shoulder, and shall not interfere with the existing drainage system on the right-of-way or any adopted municipal system and drainage plan..

11. By accepting the permit, permittee agrees to save, indemnify, and hold harmless to the extent allowed by law, the issuing authority, the Department, its officers, and employees from suits, actions, claims of any type or character brought because of injuries or damage sustained by any person resulting from the permittee's use of the access permit during the construction of the access.

CHANGES IN ACCESS USE AND PERMIT VIOLATIONS

1. It is the responsibility of the property owner and permittee to ensure that the use of the access to the property is not in violation of the Code, permit terms and conditions or the Act. The terms and conditions of any permit are binding upon all assigns, successors-in-interest, heirs and occupants. If any significant changes are made or will be made in the use of the property which will affect access operation, traffic volume and or vehicle type, the permittee or property owner shall contact the local issuing authority or the Department to determine if a new access permit and modifications to the access are required.

2. When an access is constructed or used in violation of the Code, section 43-2-147(5)(c), C.R.S., of the Act applies. The Department or issuing authority may summarily suspend an access permit and immediately order closure of the access when its continued use presents an immediate threat to public health, welfare or safety. Summary suspension shall comply with article 4 of title 24, C.R.S.

MAINTENANCE

1. The permittee, his or her heirs, successors-in-interest, assigns, and occupants of the property serviced by the access shall be responsible for meeting the terms and conditions of the permit, the repair and maintenance of the access beyond the edge of the roadway including any cattle guard and gate, and the removal or clearance of snow or ice upon the access even though deposited on the access in the course of Department snow removal operations. Within unincorporated areas the Department will keep access culverts clean as part of maintenance of the highway drainage system. However, the permittee is responsible for the repair and replacement of any access-related culverts within the right-of-way. Within incorporated areas, drainage responsibilities for municipalities are determined by statute and local ordinance. The Department will maintain the roadway including auxiliary lanes and shoulders, except in those cases where the access installation has failed due to improper access construction and/or failure to follow permit requirements and specifications in which case the permittee shall be responsible for such repair. Any significant repairs such as culvert replacement, resurfacing, or changes in design or specifications, requires authorization from the Department.

ACCESS PERMIT TERMS & CONDITIONS

1. This permit #506073 is issued to permit and allow the reconstruction of an existing La Plata County Road known as County Road 252 and A.K.A. Trimble Lane, to be a signalized public intersection with gates at the railroad and related auxiliary and highway improvements to State Highway 550 as warranted by the approved Traffic Impact Study dated June 10, 2004, located approximately Milepost 30.331 right. The terms and conditions of previously issued Permit Number 591038, issued to Redcliff Development and La Plata County, will remain valid.

2. The access and improvements will jointly serve that indicated on Page one (1), a public street connection known as County Road 252, which includes the proposed Trimble Crossing, LLC Development, consisting of the uses as approved in the Traffic Impact Report for the Trimble Crossing, LLC Development, re-submittal dated June 10, 2004, prepared by Russell Engineering, Inc. In regard to future development on County Road 252, CDOT will review changes on property that takes access from County Road 252 to State Highway 550, and will determine if, based on the degradation of the intersection below an acceptable level of service "D" for the category of highway that State Highway 550 currently enjoys, a traffic study is needed. If the traffic study is needed in the sole judgment of CDOT, the traffic study will be completed at no cost to CDOT and the new development will be required to mitigate any impacts resulting from an anticipated unacceptable level of service at the intersection.

3. The Permittee(s) is required to install a full-movement public signalized intersection, complete with railroad gates and all other warranted improvements on State Highway 550 and County Road 252 for this access, in conformance with Section Four of the State Highway Access Code; Volume Two, Colorado Code of Regulations 601-1, as amended. The signal and auxiliary lane/highway improvement design plans will be provided and stamped by a Colorado registered professional engineer.

4. Prior to the issuance of the Notice to Proceed, the Permittee(s) will furnish the Colorado Department of Transportation (CDOT) a minimum of five (5) stamped sets of the final approved design plans. The Department will incorporate the stamped plans, which must first be completed to the Department's satisfaction, as part of this permit upon acceptance thereof. A performance bond to CDOT that will insure completion of the required highway improvements and all related intersection improvements in conformance with all CDOT standards and specification will be required to be in place before construction is allowed to commence. The bond must be in the amount of at least 110% of the cost of the construction. A Cost Estimate and a draft of the bond must be provided to CDOT for review and approved by CDOT before acceptance of the final bond and before construction is allowed to commence. When the final design plans, including, but not limited to material specifications and Certifications of Compliance, are accepted and approved, and all other requirements stated herein are completed as required, a Notice To Proceed will be issued that will allow commencement of construction. When accepted and approved, the final design plans will be labeled "EXHIBIT "A" and signed as approved by CDOT. They will be referred to as "EXHIBIT "A", reserved" in the remainder of the terms and conditions of this permit.

5. CDOT standards, specifications and regulations will override the design plans should an oversight, omission or conflict occur. CDOT assumes no liability or responsibility whatsoever for the accuracy, completeness or correctness of the Permittee(s)'s design plans (EXHIBIT "A", reserved). Any design plan errors are the sole responsibility of the Permittee(s)/design engineer.

6. If necessary, minor changes, corrections, and/or additions to this permit will be ordered by the Region 5 Access Program Manager or other authorized Region 5 CDOT representative to meet unanticipated site conditions.

7. Construction of improvements within the highway right-of-way will be in compliance with CDOT's Roadway Design Manual "Typical Section", Section 300 regarding the hinge point, point of slope selection, "Z" slope, shoulder gravel and topsoil placement, etc. Cut or embankment slopes will not be steeper than 3:1 within the highway right-of-way unless otherwise allowed by the Department.

8. **A COPY OF THIS PERMIT AND THE VALIDATED NOTICE TO PROCEED MUST BE ON THE JOB WITH THE CONTRACTOR AT ALL TIMES OR ANY WORK ONSITE AND OFFSITE WILL BE ORDERED TO BE IMMEDIATELY SUSPENDED UNTIL THIS TERM IS COMPLIED WITH.**

9. Incorporated as part of this permit are the following: Application for Access Permit, (Form No. 137), Permit Pages 1-3 and Page 101a, Access Permit Terms and Conditions Pages 1 through 9, EXHIBIT "A", reserved.

10. This permit is issued in accordance with the 1998 Access Code and is based upon the information submitted by the Permittee(s). Any changes in the herein permitted type and use and/or volume of traffic using the access, drainage, or other operational aspects will render this permit void, requiring that a new application be submitted for review based upon currently existing and anticipated future conditions.

11. The access will be constructed in accordance with the approved design plans (EXHIBIT "A", reserved).

12. You must contact the Region 5 Access Program Manager at 3803 North Main Avenue, Durango, Colorado or telephone (970) 385-3626 and leave a message to meet and obtain a Notice To Proceed, a minimum of five working days prior to beginning any access improvements or construction of any kind within the highway right-of-way. This includes but is not limited to the installation of side drain culverts and fencing. Failure to comply with this condition will result in revocation of this permit. **PRIOR TO THE NOTICE TO PROCEED IS ISSUED**, a construction schedule must be submitted to the Region 5 Access Program Manager for approval of any work within the highway right-of-way and any subsequent revisions must be submitted for approval.

13. A construction traffic control plan must be submitted to the Region 5 Access Program Manager, 3803 Main Avenue, Suite 100, Durango, Colorado 81301, or telephone (970) 385-3626 for inspection and approval, a minimum of five (5) working days prior to commencement of construction. The traffic control plan must be in conformance with Manual On Uniform Traffic Control Devices, and all other applicable standards. No Lane closures or traffic detours of any nature will be allowed unless pre-approved and authorized in writing by CDOT.

14. No disruption of traffic flow, highway lane closures or one-way traffic will be allowed during the morning (7:00 A.M. - 8:30 A.M.) and evening (4:30 P.M. - 6:00 P.M.) peak hour traffic flows, unless otherwise authorized in writing by CDOT.

15. No work within the highway right-of-way will be allowed on Saturdays, Sundays, legal holidays, or during periods of adverse weather conditions.

16. All construction activities within the state highway right-of-way will not be allowed to begin before sunrise and will be required to cease prior to sunset. Traffic control operations may begin one half hour before sunrise and continue until one half hour after sunset.

17. The use of appropriate advanced warning and construction signs, flasher barricades and flagging personnel are required at all times during construction. These devices will be located within the State Highway 160 right-of-way and will be in conformance with the Manual On Uniform Traffic Control Devices, Part VI and the Colorado Supplement.

18. Any open cuts that will be left overnight will be barricaded with slashed vertical panels as set forth in the Manual On Uniform Traffic Control Devices, Part VI.

19. All existing highway signs within the limits of the construction activities will be removed and delivered to the CDOT Maintenance Shop for storage and future replacement by the Permittee(s) unless otherwise agreed to by CDOT and Permittee(s). Installation will be as directed by CDOT.

20. All temporary pavement marking will be installed by the Permittee(s) in conformance with the CDOT, Division of Highways, State of Colorado, Standard Specifications for Road and Bridge Construction (1999 or most current edition), Section 627 and all other applicable State standards.

21. All final signing and striping will be installed by the Permittee(s) in conformance with the Colorado M&S Standards, Typical Pavement Markings (S-627-1), unless otherwise agreed to by CDOT and Permittee(s). A final signing and striping plan will be submitted to the Region 5 Permit Unit Manager a minimum of five (5) working days prior to the anticipated striping date.

22. Commencement of the final striping will not proceed without prior authorization in writing from CDOT. All final striping must follow the pavement joints.

23. All required access improvements will be installed prior to the herein authorized use of this access.

24. The Permittee(s)/contractor will be responsible for keeping the State Highway 550 highway travel lanes clear of any mud or debris tracked onto it throughout the construction of the signal and auxiliary lane improvements. Any mud or debris which is tracked onto the highway will be removed daily or as otherwise directed by the Maintenance Foreman. If mud and debris become a safety hazard to the traveling public, as determined by CDOT, all activities causing the mud and debris on the highway will be shut down immediately and a plan that addresses mitigation of the hazards must be submitted to CDOT for review and be approved by CDOT before the activities will be allowed to recommence.

25. **PRIOR** to the start of construction, a proposed mix design for hot bituminous pavement must be submitted to the CDOT Region 5 Access Program Manager for approval. The mix design will be current (<1 year old). Construction will **NOT** begin **PRIOR** to obtaining mix design approval from the Materials Engineer. Also, **PRIOR** to the start of construction, **ALL** aggregate base materials must be approved by the Region 5 Permit Unit Manager.

26. Auxiliary lane design and construction will be performed in accordance with applicable portions of the current editions of the following manuals and documents:

A. Current CDOT Roadway Design Manual.
B. Current CDOT Field Materials Manual.
C. Current CDOT Laboratory Manual of Test Procedures.
D. Current CDOT Construction Manual.
E. Current CDOT M&S Standards.
F. Current CDOT Standard Specifications for Road and Bridge Construction.
G. CDOT Supplemental Specifications to the current Standard Specifications for Road and Bridge Construction.
H. Revisions to the Standard and Supplemental Specifications included herein.
I. CDOT Standard Plans and New and Revised Standards.
J. Current Manual on Uniform Traffic Control Devices for Streets and Highways and the Colorado Supplement thereto.
K. Current AASHTO Policy on Geometric design of Highways and Streets.
L. Transportation and Traffic Engineering Handbook.
M. Trip Generation Manual.
N. 1998 State Highway Access Code, Volume 2, Code of Regulations 601-1, as amended.
O. Current AASHTO Roadside Design Guide.

27. Materials will be placed in separate courses at the depths shown on the plans (EXHIBIT "A", reserved) in conformance with CDOT, Division of Highways, State of Colorado Standard Specifications for Road and Bridge Construction, 1999 Edition or the most current edition.

28. The required depth of bituminous pavement will be determined by a proper pavement design analysis and will be provided and stamped by a Colorado registered professional engineer. A 2-inch overlay is required over the entire length of the reconstruction/widening. The required depths will indicate compacted material. If a pavement design is not submitted, the minimum required pavement structure depths are as follows:

Hot Bituminous Pavement	6 inches (This includes the final 2-inch overlay)
Aggregate Base Course (Class 6)	6 inches
Aggregate Base Course (Class 1 or 2)	12 inches

29. Excavation and Embankment operations will conform to the requirements of Section 203 of the Standard Specifications.

30. Excavation and Backfill for Structures will conform to the requirements of Section 206 of the Standard Specifications, as modified by the attached Special Provision.

31. Placement of base course materials will be in accordance with Section 304 of the Standard Specifications. Compaction will be in conformance with AASHTO T 180 or T 99, whichever is applicable for the soil conditions in the Durango area as approved by the Region 5 Permit Unit Manager **PRIOR** to any placement.

32. Aggregate Base Course will conform to the requirements of Section 304 of the Standard Specifications, amended as follows:

A. Subsection 304.02 will include the following:
   i) Materials for the sub-base will be Aggregate Base Course (Class 1 or 2) as shown in subsection 703.03.
   ii) Materials for the base course will be Aggregate Base Course (Class 6) as shown in subsection 703.03.
   iii) The Aggregate Base Course (Class 1 or 2) and (Class 6) must meet all requirements and have resistance values of at least 70 and 78, respectively, when tested by the Hveem Stabilometer method.

B. Subsection 304.04 will include the following:
   i) The sub-grade on which the Aggregate Base Course will be placed will be frost-free.

33. Minimum construction material testing will include:

A. Aggregate Base Course will be sampled in accordance with CP-30.

   i) Gradation (CP-31), Atterberg Limits (AASHTO T89 & T90, and in place density (CP-22 or CP-80) will be determined every 2,000 tons, or fraction thereof, for Class 1 or 2 Aggregate Base Course material. R-values will be a minimum of 70 or equivalent.

   ii) Gradation (CP-31), Atterberg Limits (AASHTO T89 or T90), and in place density(CP-22 or CP-80) will be determined every 2,000 tons, or fraction thereof, for Class 6 Aggregate Base Course material. R-values will be a minimum of 78 or equivalent.

B. Hot Bituminous Pavement

   i) Gradation (sampled in accordance with CP-30, CP-31) determination will be performed every 1,000 tons, or fraction thereof, for Hot Bituminous Pavement Grading S or SX. Project testing will follow CDOT testing CP-31.

   ii) Asphalt content testing will be performed every 500 tons, or fraction thereof, for Hot Bituminous Pavement Grading S or SX. Project sampling will follow CDOT procedure CP-41 and CP-55 and testing procedure CP-42 or CP-85.

   iii) In place density testing will be performed every 500 tons, or fraction thereof, for Hot Bituminous Pavement. Project testing will follow CDOT testing procedure CP-44 or CP-81.

C. Note: CP's are testing procedures included in the CDOT Field Materials Manual

D. Certified test results for each item will be submitted to the CDOT Region 5 Materials Engineer as soon as those results become available. Out of specification material will be replaced with acceptable material.

34. Construction of sub-grade, embankments and backfill will comply with Section 203 of the CDOT Standard Specifications for Road and Bridge Construction.

35. Compaction of Hot Bituminous Pavement will comply with Section 401-17 of the CDOT Standard Specifications for Road and Bridge Construction.

36. Hot Bituminous Pavement will conform to the requirements of Sections 401 and 403 of the Standard Specifications, modified for this project by the attached Special Provisions.

37. Prime Coat and Tack Coat will conform to the requirements of Section 407 of the Standard Specifications

38. Structural Concrete will conform to the requirements of Section 601 of the Standard Specifications and Supplemental Specifications, as modified by the attached Special Provision.

39. Any layer of bituminous pavement that is to have a succeeding layer placed thereon will be completed full width before succeeding layers are placed. No layer will be less than 2 inches. Placement will be in conformance with Section 401.16 of the CDOT Standard Specifications for Road and Bridge Construction.

40. The following materials will be used in conformance with the standard specifications, within the highway right-of-way:

    (a) Item 304 - Aggregate Base Course - Class 6, and Class 1 or 2
    (b) Item 403 - Hot Bituminous Pavement Grading S or SX

41. The Hot Bituminous Pavement (HBP Grading S and SX) job mix formula and asphalt cement content will be approved by the Region 5 Materials Engineer prior to placement. The CPL 5115 method will be used in determining the job mix formula. Minimum stability of 28 and a lime additive will be used. The mix will meet a minimum TSR of 80 for the Lottman test. The Dry Split Tensile will meet a minimum of 30.

42. Certified tests of each layer of material will be submitted to the Region 5 Access Program Manager as soon as each test is complete. Out of specification material will be removed and replaced with acceptable material.

43. The contractor/Permittee(s) will follow the applicable construction specifications set forth by CDOT in the latest edition of the Standard Specifications for Road and Bridge Construction.

44. The existing asphalt shoulder edge will not be cut back until the future pavement is ready to be installed. The shoulder will be saw cut a minimum of one (1) foot from the existing pavement edge to assure a straight edge for placement of adjacent asphalt material.

45. For placement of patching or new asphalt pavement, the Permittee(s)/contractor will saw cut or score the existing asphalt to assure a straight and uniform edge. Prior to the placement of the new asphalt, the exposed edge of the existing pavement will be thoroughly coated with emulsified asphalt (slow-setting).

46. The joint between the old asphalt mat and new asphalt mat will be placed in such a manner as to maintain good rideability and prevent ponding. If rideability is not maintained and/or ponding occurs, the Permittee(s) will be responsible for curing the problem with the concurrence of the Department.

47. The Permittee(s) must notify owners or operators of underground utility facilities at least two (2) business days prior to beginning excavation in the vicinity of such facilities, as required under Section 9-1.5-103, Colorado Revised Statutes. Call Utility Notification Center of Colorado (UNCC), 1-800-922-1987 for marking of member utilities. Call non-member utilities directly. All utility permits and related construction coordination requirements shall be handled in accordance with the approved plans and specifications. All utility work in the highway right-of-way must be shown in the design plans and be approved by CDOT.

48. No drainage from this site will enter onto the roadway of the highway.

49. The access approach and all related highway improvements will be constructed in accordance with the approved design plans, EXHIBIT "A", reserved.

50. This permit is only for the purpose stated herein. Any changes in the type, use and/or volume of traffic using the access will require revision of the permit.

51. Soil preparation, seeding, and mulching will be required within the right-of-way limits on all disturbed areas not surfaced. The following types and rates will be used:

COMMON NAME	BOTANICAL NAME	LBS. PLS\ACRE
Western Wheatgrass V. Arriba	Pascopyrum Smithii	8
Slender Wheatgrass V. San Luis	Elymus Trachycaulus	3
Indian Ricegrass V. Paloma	Oryzopsis Hymenoides	3
Hard Fescue V. Durar	Festuca Ovina Duriuscula	3
Alsike Clover	Trifolium Hybridium	2
Sand Dropseed	Sporobolus Cryptandrus	0.25
Total lbs/acre		--------- 19.25

Seeding Application: Seed will be mechanically drilled to a depth of .25 or .5 inches into the soil. Broadcast seed on slopes 2:1 or steeper and rake into soil.

52. Mulching requirement and application: 2 tons/acre straw mechanically crimped into soil on slopes flatter than 3:1. Place a soil retention blanket consisting of woven wood or straw coconut material on slopes 3:1 or steeper.

53.

FERTILIZER REQUIREMENT	% AVAILABLE	LBS\ACRE
(a) Nitrogen:	18	45
(b) Phosphorus:	46	115

Incorporate fertilizer to a depth of 2" to 4" into the topsoil.

54. A minimum of 4 inches of topsoil will be placed on all slopes which are to be seeded and mulched.

55. Any damage to any existing highway facilities will be repaired prior to continuing other work.

56. The Permittee(s) will be responsible for verification of existing utility locations. If any damage occurs to these utilities during construction, it will be the Permittee(s) responsibility to repair or replace the utility at no cost to the Department.

57. The Permittee(s)/contractor is required to obtain liability insurance in conformance with Section 107.15 of the Standard Specifications. Copies of insurance coverage will be submitted to the Region 5 Access Program Manager before the Notice to Proceed will be validated and a copy of that policy will be required to be available at the construction site at all times for inspection.

58. All existing drainage structures will be extended to accommodate all new construction and safety criteria, according to appropriate CDOT standards and specifications.

59. All culvert extensions will meet or exceed the minimum requirements for CDOT roadway clear-zone, as outlined in the AASHTO Roadside Design Guide.

60. Break points on slopes and in the bottom of ditches will be rounded on construction for a pleasing appearance. The existing shoulder edge will not be cut back until the future pavement is ready to be installed.

61. The depth and width of roadway drainage ditches will be varied so as to provide proper storm water drainage.

62. All embankment material placed on existing slopes in excess of 4:1 will be benched into the existing grade to provide a stable roadway foundation.

63. The Permittee(s) will notify the CDOT Region 5 Access Program Manager, at (970) 385-3626, a minimum of five (5) working days prior to beginning any electrical or loop detector work. The Contractor will keep the permit unit manager informed of project progress and schedule. CDOT inspection of the work will be in conformance with Section 614.10(k) of the Standard Specifications. The Permittee will submit a list of all signal equipment to CDOT for approval by CDOT before they order the equipment. Any unauthorized equipment will not be accepted.

64. A contractor licensed in the State of Colorado will be employed by the Permittee(s) for the all phases of the signal project. A Colorado licensed electrician employed by that contractor will be on the project at all times during the signal work. Failure to comply with this condition may result in revocation of this permit. Failure to comply with this condition **WILL** result in immediate suspension of signal work.

65. Pursuant to The Colorado State Electrical Board, Title 12, Professions and Occupations; Article 23, Electricians, Section 12-23-110.5 Apprentices – supervision – registration – discipline. "(1) Any person may work as an apprentice but shall not do any electrical wiring for the installation of electrical apparatus or equipment for light, heat, or power except under the supervision of a licensed electrician. The degree of supervision shall be no more than one licensed electrician to supervise no more than one apprentice at the jobsite." Failure to comply with this regulation and maintain the above required ratio of one Colorado licensed electrician to supervise no more than one apprentice at the jobsite **WILL** result in immediate suspension of signal work.

66. A designated Inspector employed by CDOT will also be on the project site at all times during signal work and the hours worked by that inspector during that time will be paid by the Permittee(s) at no cost to the Department pursuant to the State Highway Access Code, Section 2.5(5) Access Construction, copy enclosed. The Permittee(s) **WILL** notify the CDOT Region 5 Permit Unit Manager, a minimum of five (5) days prior to commencing **ANY** signal construction so that inspection by CDOT may be coordinated. Failure to provide proper notification will result in suspension of signal work. Failure to comply with this condition **WILL** result in immediate suspension of signal work.

67. Loop detectors will be installed under all approach lanes on side streets before paving and connected to the controller at the existing or to be constructed junction boxes. In addition to the **REQUIRED** CDOT Inspector, a licensed electrician employed by the Permittee(s) will be required to be on the project at all times during the loop detector work. Failure to comply with this condition **WILL** result in immediate suspension of loop detector work.

68. No electrical splices will be allowed under the pavement surface.

69. No splicing in pull-boxes or water valve boxes will be allowed within the pavement area.

70. All overhead structures will be fabricated and inspected in accordance with the latest revision of CDOT standard and specification 614.02.

71. The Permittee(s) will be required to install a communications link (phone drop) to the controller.

72. In addition to the **REQUIRED** CDOT Inspector, the Permittee(s)/Contractor will have a qualified signal engineer on the project site at the time of signal system field tests and system turn-on.

73. Upon completion of the work, the Contractor/Engineer **WILL** submit an "As Built" plan, showing in detail right-of-way easements, all construction changes, modifications and revisions. The "As Built" Plans will show all wiring, cabling, locations and depths of conduit, in conformance with Section 614.10(a) of the Standard Specifications. All changes, modifications or revisions will be signed and sealed by the engineer.

74. The Contractor **WILL** submit two (2) copies of a schematic wiring diagram to the Department for all completed electrical work.

75. Upon completion of the final work, a letter certifying that all project materials, construction, inspection and workmanship is in accordance with the design plans and specifications will be submitted to the Region 5 Access Program Manager, Colorado Department of Transportation, 3803 Main Avenue, Suite 100, Durango, Colorado 81301. The certification letter must be signed and sealed by the engineer.

76. Reconstruction or improvements to the access will be required when the Permittee(s) have failed to meet the required design and/or materials specifications. If any construction element fails within two years of CDOT's final acceptance due to improper construction or material specifications, the Permittee(s) are responsible for all such repairs. (1998 Access Code, as amended)

77. The permittee is required to comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) that have been adopted by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board), and incorporated by the U.S. Attorney General as a federal standard. These guidelines are defining traversable slope requirements and prescribing the use of a defined pattern of truncated domes as detectable warnings at street crossings. The new Standards Plans and can be found on the Design and Construction Project Support web page at: http://www.dot.state.co.us/DesignSupport/, then click on *Design Bulletins*.

78. The Permittee is responsible for obtaining any necessary additional Federal, State and/or City/County permits or clearances required for construction of the access. Approval of this access permit does not constitute verification of this action by the Permittee. Permittee is also responsible for obtaining all necessary utility permits in addition to this access permit.

79. All workers within the State Highway right of way shall comply with their employer's safety and health policies/procedures, and all applicable U.S. Occupational Safety and Health Administration (OSHA) regulations - including, but not limited to the applicable sections of 29 CFR Part 1910 - Occupational Safety and Health Standards and 29 CFR Part 1926 – Safety and Health Regulations for Construction. Personal protective equipment (e.g. head protection, footwear, high visibility apparel, safety glasses, hearing protection, respirators, gloves, etc.) shall be worn as appropriate for the work being performed, and as specified in regulation.

80. It is the responsibility of the permittee/applicant to determine which environmental clearances and/or regulations apply to the project, and to obtain any clearances that are required directly from the appropriate agency. Please refer to or request a copy of the "CDOT Environmental Clearance Information Summary" for details. FAILURE TO COMPLY WITH REGULATORY REQUIREMENTS MAY RESULT IN SUSPENSION OR REVOCATION OF YOUR CDOT PERMIT, OR ENFORCEMENT ACTIONS BY OTHER AGENCIES.

- ALL discharges are subject to the provisions of the Colorado Water Quality Control Act and the Colorado Discharge Permit Regulations. Prohibited discharges include substances such as: wash water, paint, automotive fluids, solvents, oils or soaps.
- Unless otherwise identified by CDOT or the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) as significant sources of pollutants to the waters of the State, the following discharges to storm water systems are allowed without a Colorado Discharge Permit System permit: landscape irrigation, diverted stream flows, uncontaminated ground water infiltration to separate storm sewers, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, footing drains; water line flushing, flows from riparian habitats and wetlands, and flow from fire fighting activities. However, construction activities may require a Construction Stormwater Permit. Contact the CDOT Water Quality Program Manager at 303-757-9343.
- ANY OTHER DISCHARGES may require Colorado Discharge Permit(s) or separate permits from CDPHE or the appropriate agency before work begins. For additional information and forms, go to the CDPHE website at: http://www.cdphe.state.co.us/wq/PermitsUnits/wqcdpmt.html.

78. **PRIOR** to the issuance of the Notice to Proceed, all deeded access widening requirements, including all required environmental clearances, all P.U.C., and Durango and Silverton Narrow Gauge Railroad approvals must be obtained.

81. Final acceptance will be by the Regional Transportation Director or their authorized designee.

PERMITTEE(S) **La Plata County Declined to Sign** DATE _____
La Plata County

PERMITTEE(S) _____ Mgr of GP Trimble Crossing LLC DATE 7/24/06
~~Trimble Crossing, L.P.~~ General Partner

APPLICANT _____ DATE 7/20/06
Russell Engineering

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COLORADO DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ACCESS PERMIT APPLICATION

Issuing authority application acceptance date:

Instructions: 060053
Please print or type 5x13

- Contact the Colorado Department of Transportation (CDOT) or your local government to determine your issuing authority.
- Contact the issuing authority to determine what plans and other documents are required to be submitted with your application.
- Complete this form (some questions may not apply to you) and attach all necessary documents and Submit it to the issuing authority.
- Submit an application for each access affected.
- If you have any questions contact the issuing authority.
- For additional information see CDOT's Access Management website at http://www.dot.state.co.us/AccessPermits/index.htm

1) Property owner (Permittee): Trimble Crossing LP
Street address: 5400 W Plano Parkway Ste 200
City, state & zip: Plano TX 75093
Phone #:
E-mail address:

2) Agent for permittee (if different from property owner): Russell Engineering
Mailing address: 934 Main Ave
City, state & zip: Durango CO 81301
Phone # (required): 385-4566
E-mail address if available:

3) Address of property to be served by permit (required): 131 CR 252 & 197 CR 252

4) Legal description of property: If within jurisdictional limits of Municipality, city and/or County, which one?
county: LaPlata | subdivision: Trimble Crossing | block: | lot: | section: 15 | township: 36 North | range: 9 west

5) What State Highway are you requesting access from? US 550

6) What side of the highway? ☐ N ☐ S ☐ E ☐ W

7) How many feet is the proposed access from the nearest mile post? feet ☐ N ☐ S ☐ E ☐ W from:
How many feet is the proposed access from the nearest cross street? 0 feet ☐ N ☐ S ☐ E ☐ W from: Trimble Lane

8) What is the approximate date you intend to begin construction? Fall 2006

9) Check here if you are requesting a:
☐ new access ☐ temporary access (duration anticipated:) ☑ improvement to existing access
☐ change in access use ☐ removal of access ☐ relocation of an existing access (provide detail)

10) Provide existing property use: Agricultural

11) Do you have knowledge of any State Highway access permits serving this property, or adjacent properties in which you have a property interest?
☐ no ☑ yes, if yes - what are the permit number(s) and provide copies: and/or, permit date:
504090

12) Does the property owner own or have any interests in any adjacent property?
☒ no ☐ yes, if yes - please describe:

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13) Are there other existing or dedicated public streets, roads, highways or access easements bordering or within the property?
☐ no ☒ yes, if yes - list them on your plans and indicate the proposed and existing access points.

14) If you are requesting agricultural field access - how many acres will the access serve?

15) If you are requesting commercial or industrial access please indicate the types and number of businesses and provide the floor area square footage of each.

business/land use	square footage	business	square footage
office	665	Restaurant	475
Commercial	32,250	Gas Station	6 pumps

16) If you are requesting residential development access, what is the type (single family, apartment, townhouse) and number of units?

type	number of units	type	number of units
town house	64		

17) Provide the following vehicle count estimates for vehicles that will use the access. Leaving the property then returning is two counts. See Traffic Study

Indicate if your counts are ☐ peak hour volumes or ☐ average daily volumes.

# of single unit vehicles in excess of 30 ft	# of passenger cars and light trucks at peak hour volumes	# of multi unit trucks at peak hour volumes
	# of farm vehicles (field equipment)	Total count of all vehicles: 0

18) Check with the issuing authority to determine which of the following documents are required to complete the review of your application.

a) Property map indicating other access, bordering roads and streets.
b) Highway and driveway plan profile.
c) Drainage plan showing impact to the highway right-of-way.
d) Map and letters detailing utility locations before and after development in and along the right-of-way.
e) Subdivision, zoning, or development plan.
f) Proposed access design.
g) Parcel and ownership maps including easements.
h) Traffic studies.
i) Proof of ownership.

1- It is the applicant's responsibility to contact appropriate agencies and obtain all environmental clearances that apply to their activities. Such clearances may include Corps of Engineers 404 Permits or Colorado Discharge Permit System permits, or ecological, archeological, historical or cultural resource clearances. The CDOT Environmental Clearances Information Summary presents contact information for agencies administering certain clearances, information about prohibited discharges, and may be obtained from Regional CDOT Utility/Special Use Permit offices or accessed via the CDOT Planning/Construction-Environmental-Guidance webpage **http://www.dot.state.co.us/environmental/Forms.asp**.

2- All workers within the State Highway right of way shall comply with their employer's safety and health policies/ procedures, and all applicable U.S. Occupational Safety and Health Administration (OSHA) regulations - including, but not limited to the applicable sections of 29 CFR Part 1910 - Occupational Safety and Health Standards and 29 CFR Part 1926 - Safety and Health Regulations for Construction.

Personal protective equipment (e.g. head protection, footwear, high visibility apparel, safety glasses, hearing protection, respirators, gloves, etc.) shall be worn as appropriate for the work being performed, and as specified in regulation. At a minimum, all workers in the State Highway right of way, except when in their vehicles, shall wear the following personal protective equipment: High visibility apparel as specified in the Traffic Control provisions of the documentation accompanying the Notice to Proceed related to this permit (at a minimum, ANSI/ISEA 107-1999, class 2); head protection that complies with the ANSI Z89.1-1997 standard; and at all construction sites or whenever there is danger of injury to feet, workers shall comply with OSHA's PPE requirements for foot protection per 29 CFR 1910.136, 1926.95, and 1926.96. If required, such footwear shall meet the requirements of ANSI Z41-1999.

Where any of the above-referenced ANSI standards have been revised, the most recent version of the standard shall apply.

3- The Permittee is responsible for complying with the Revised Guidelines that have been adopted by the Access Board under the American Disabilities Act (ADA). These guidelines define traversable slope requirements and prescribe the use of a defined pattern of truncated domes as detectable warnings at street crossings. The new Standards Plans and can be found on the Design and Construction Project Support web page at:
<http://www.dot.state.co.us/DesignSupport/>, then click on *Design Bulletins*.

If an access permit is issued to you, it will state the terms and conditions for its use. Any changes in the use of the permitted access not consistent with the terms and conditions listed on the permit may be considered a violation of the permit.

The applicant declares under penalty of perjury in the second degree, and any other applicable state or federal laws, that all information provided on this form and submitted attachments are to the best of their knowledge true and complete.

I understand receipt of an access permit does not constitute permission to start access construction work.

Applicant's signature	Print name	Date
Michael K. Russell	Michael K. Russell	3/24/06

If the applicant is not the owner of the property, we require this application also to be signed by the property owner or their legally authorized representative (or other acceptable written evidence). This signature shall constitute agreement with this application by all owners-of-interest unless stated in writing. If a permit is issued, the property owner, in most cases, will be listed as the permittee.

Property owner signature	Print name	Date
Michael K. Russell	Michael K. Russell	3/24/06

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APPENDIX G:

Synchro Output

2022 AM Peak Hour
2022 PM Peak Hour
2042 AM Peak Hour
2042 PM Peak Hour

HCM 2010 Signalized Intersection Summary
2: US 550 & CR 252

03/04/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	18	56	105	12	72	24	300	99	48	216	5
Future Volume (veh/h)	9	18	56	105	12	72	24	300	99	48	216	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.89		1.00	1.00		1.00	0.92		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1810	1810	1900	1810	1810	1810	1810	1810	1810
Adj Flow Rate, veh/h	10	20	0	119	14	0	27	341	0	55	245	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	185	325	0	656	724	0	467	603	513	414	603	513
Arrive On Green	0.27	0.27	0.00	0.07	0.40	0.00	0.07	0.33	0.00	0.07	0.33	0.00
Sat Flow, veh/h	393	1220	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Grp Volume(v), veh/h	30	0	0	119	14	0	27	341	0	55	245	0
Grp Sat Flow(s),veh/h/ln	1612	0	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Q Serve(g_s), s	0.0	0.0	0.0	2.8	0.3	0.0	0.6	9.3	0.0	1.2	6.3	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	2.8	0.3	0.0	0.6	9.3	0.0	1.2	6.3	0.0
Prop In Lane	0.33		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	510	0	0	656	724	0	467	603	513	414	603	513
V/C Ratio(X)	0.06	0.00	0.00	0.18	0.02	0.00	0.06	0.57	0.00	0.13	0.41	0.00
Avail Cap(c_a), veh/h	510	0	0	656	724	0	467	603	513	414	603	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.4	0.0	0.0	12.9	10.9	0.0	11.3	16.4	0.0	11.9	15.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.6	0.0	0.0	0.2	3.8	0.0	0.7	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.4	0.1	0.0	0.3	5.3	0.0	0.6	3.5	0.0
LnGrp Delay(d),s/veh	16.6	0.0	0.0	13.5	10.9	0.0	11.5	20.2	0.0	12.6	17.4	0.0
LnGrp LOS	B			B	B		B	C		B	B	
Approach Vol, veh/h		30			133			368			300	
Approach Delay, s/veh		16.6			13.3			19.6			16.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	24.0	8.0	20.0	8.0	24.0		28.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	20.0	4.0	16.0	4.0	20.0		24.0
Max Q Clear Time (g_c+I1), s	3.2	11.3	4.8	2.7	2.6	8.3		2.3
Green Ext Time (p_c), s	0.0	1.2	0.0	0.1	0.0	0.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
2: US 550 & CR 252

03/04/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	23	46	123	27	74	80	292	175	89	421	13
Future Volume (veh/h)	4	23	46	123	27	74	80	292	175	89	421	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.88		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1810	1810	1900	1810	1810	1810	1810	1810	1810
Adj Flow Rate, veh/h	5	26	0	140	31	0	91	332	0	101	478	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	89	371	0	593	659	0	391	726	617	495	724	615
Arrive On Green	0.23	0.23	0.00	0.08	0.36	0.00	0.08	0.40	0.00	0.07	0.40	0.00
Sat Flow, veh/h	143	1588	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Grp Volume(v), veh/h	31	0	0	140	31	0	91	332	0	101	478	0
Grp Sat Flow(s),veh/h/ln	1731	0	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Q Serve(g_s), s	0.0	0.0	0.0	4.4	0.8	0.0	2.2	10.1	0.0	2.5	16.2	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.0	4.4	0.8	0.0	2.2	10.1	0.0	2.5	16.2	0.0
Prop In Lane	0.16		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	460	0	0	593	659	0	391	726	617	495	724	615
V/C Ratio(X)	0.07	0.00	0.00	0.24	0.05	0.00	0.23	0.46	0.00	0.20	0.66	0.00
Avail Cap(c_a), veh/h	460	0	0	593	659	0	391	726	617	495	724	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	0.0	0.0	17.9	15.4	0.0	12.8	16.5	0.0	11.7	18.3	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.9	0.1	0.0	1.4	2.1	0.0	0.9	4.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	2.2	0.4	0.0	1.2	5.4	0.0	1.3	8.9	0.0
LnGrp Delay(d),s/veh	22.7	0.0	0.0	18.9	15.6	0.0	14.2	18.5	0.0	12.7	23.0	0.0
LnGrp LOS	C			B	B		B	B		B	C	
Approach Vol, veh/h		31			171			423			579	
Approach Delay, s/veh		22.7			18.3			17.6			21.2	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	34.1	9.8	21.5	9.7	34.0		31.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	5.6	30.1	5.8	17.5	5.7	30.0		27.3
Max Q Clear Time (g_c+I1), s	4.5	12.1	6.4	3.0	4.2	18.2		2.8
Green Ext Time (p_c), s	0.0	1.8	0.0	0.1	0.0	2.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
2: US 550 & CR 252

03/04/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	20	62	113	13	77	27	332	109	52	239	6
Future Volume (veh/h)	10	20	62	113	13	77	27	332	109	52	239	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.89		1.00	1.00		1.00	0.93		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1810	1810	1900	1810	1810	1810	1810	1810	1810
Adj Flow Rate, veh/h	11	23	0	128	15	0	31	377	0	59	272	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	180	331	0	656	724	0	450	603	513	389	603	513
Arrive On Green	0.27	0.27	0.00	0.07	0.40	0.00	0.07	0.33	0.00	0.07	0.33	0.00
Sat Flow, veh/h	378	1242	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Grp Volume(v), veh/h	34	0	0	128	15	0	31	377	0	59	272	0
Grp Sat Flow(s),veh/h/ln	1620	0	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Q Serve(g_s), s	0.0	0.0	0.0	3.0	0.3	0.0	0.7	10.5	0.0	1.3	7.1	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.0	0.3	0.0	0.7	10.5	0.0	1.3	7.1	0.0
Prop In Lane	0.32		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	511	0	0	656	724	0	450	603	513	389	603	513
V/C Ratio(X)	0.07	0.00	0.00	0.20	0.02	0.00	0.07	0.63	0.00	0.15	0.45	0.00
Avail Cap(c_a), veh/h	511	0	0	656	724	0	450	603	513	389	603	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.4	0.0	0.0	13.0	10.9	0.0	11.4	16.8	0.0	12.2	15.7	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.1	0.0	0.3	4.8	0.0	0.8	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.5	0.2	0.0	0.3	6.0	0.0	0.7	3.9	0.0
LnGrp Delay(d),s/veh	16.7	0.0	0.0	13.7	10.9	0.0	11.7	21.7	0.0	13.0	18.1	0.0
LnGrp LOS	B			B	B		B	C		B	B	
Approach Vol, veh/h		34			143			408			331	
Approach Delay, s/veh		16.7			13.4			20.9			17.2	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	24.0	8.0	20.0	8.0	24.0		28.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	20.0	4.0	16.0	4.0	20.0		24.0
Max Q Clear Time (g_c+I1), s	3.3	12.5	5.0	2.8	2.7	9.1		2.3
Green Ext Time (p_c), s	0.0	1.2	0.0	0.1	0.0	1.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
2: US 550 & CR 252

03/04/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	25	51	133	30	80	88	323	189	96	465	14
Future Volume (veh/h)	5	25	51	133	30	80	88	323	189	96	465	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.88		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1810	1810	1900	1810	1810	1810	1810	1810	1810
Adj Flow Rate, veh/h	6	28	0	151	34	0	100	367	0	109	528	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	95	363	0	588	654	0	359	731	621	473	731	621
Arrive On Green	0.23	0.23	0.00	0.07	0.36	0.00	0.07	0.40	0.00	0.07	0.40	0.00
Sat Flow, veh/h	164	1555	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Grp Volume(v), veh/h	34	0	0	151	34	0	100	367	0	109	528	0
Grp Sat Flow(s),veh/h/ln	1719	0	0	1723	1810	0	1723	1810	1538	1723	1810	1538
Q Serve(g_s), s	0.0	0.0	0.0	4.8	0.9	0.0	2.4	11.4	0.0	2.6	18.4	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.0	4.8	0.9	0.0	2.4	11.4	0.0	2.6	18.4	0.0
Prop In Lane	0.18		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	458	0	0	588	654	0	359	731	621	473	731	621
V/C Ratio(X)	0.07	0.00	0.00	0.26	0.05	0.00	0.28	0.50	0.00	0.23	0.72	0.00
Avail Cap(c_a), veh/h	458	0	0	588	654	0	359	731	621	473	731	621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.5	0.0	0.0	18.2	15.6	0.0	13.4	16.7	0.0	11.9	18.8	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	1.1	0.2	0.0	1.9	2.5	0.0	1.1	6.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	2.4	0.5	0.0	1.3	6.1	0.0	1.4	10.3	0.0
LnGrp Delay(d),s/veh	22.8	0.0	0.0	19.2	15.7	0.0	15.3	19.2	0.0	13.0	24.9	0.0
LnGrp LOS	C			B	B		B	B		B	C	
Approach Vol, veh/h		34			185			467			637	
Approach Delay, s/veh		22.8			18.6			18.3			22.9	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	34.3	9.6	21.5	9.6	34.3		31.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	5.6	30.3	5.6	17.5	5.6	30.3		27.1
Max Q Clear Time (g_c+I1), s	4.6	13.4	6.8	3.1	4.4	20.4		2.9
Green Ext Time (p_c), s	0.0	2.0	0.0	0.1	0.0	2.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

Appendix F

CR 252 Pavement Analysis

Geotechnical Engineering Study Proposed Durango River View RV Resort and A Limited Evaluation of CR 252 – Durango, CO (June 26, 2023)

CR 252 Pavement Analysis Summary

CR 252 Summary of ESALs					
Year	2025	2040	2045		
	ADT	ADT	ADT	**ESAL -2025 (20 Year)**	Max Yearly ESAL
RR to Dalton	4415	5077.25	5298	1,508,031	75,402
Dalton to Bridge	1847	2124.05	2216.4	630,879	31,544
Trucks = 5%					

Roberts RV Summary of ESALs					
Year	2025	2040	2045		
	ADT	ADT	ADT	**ESAL -2024 (20 Year)**	Max Yearly ESAL
Project	458	458	458	1,420,945	71,050
Trucks = 50%					

Existing CR 252 Road Section				
	HMA	**ABC Layer**	**Pit Run**	**Existing SN**
Location/SN	0.35	0.11	0.08	
TB-15	6.50	10.50	4.00	3.75
TB-16	6.50	4.00	10.00	3.52

Road Section with Proposed Overlays					
	Overlay	HMA	ABC Layer	Pit Run	Existing SN
Location/SN	0.44	0.35	0.11	0.08	
TB-15	2.00	6.50	10.50	4.00	4.63
TB-16	2.00	6.50	4.00	10.00	4.40

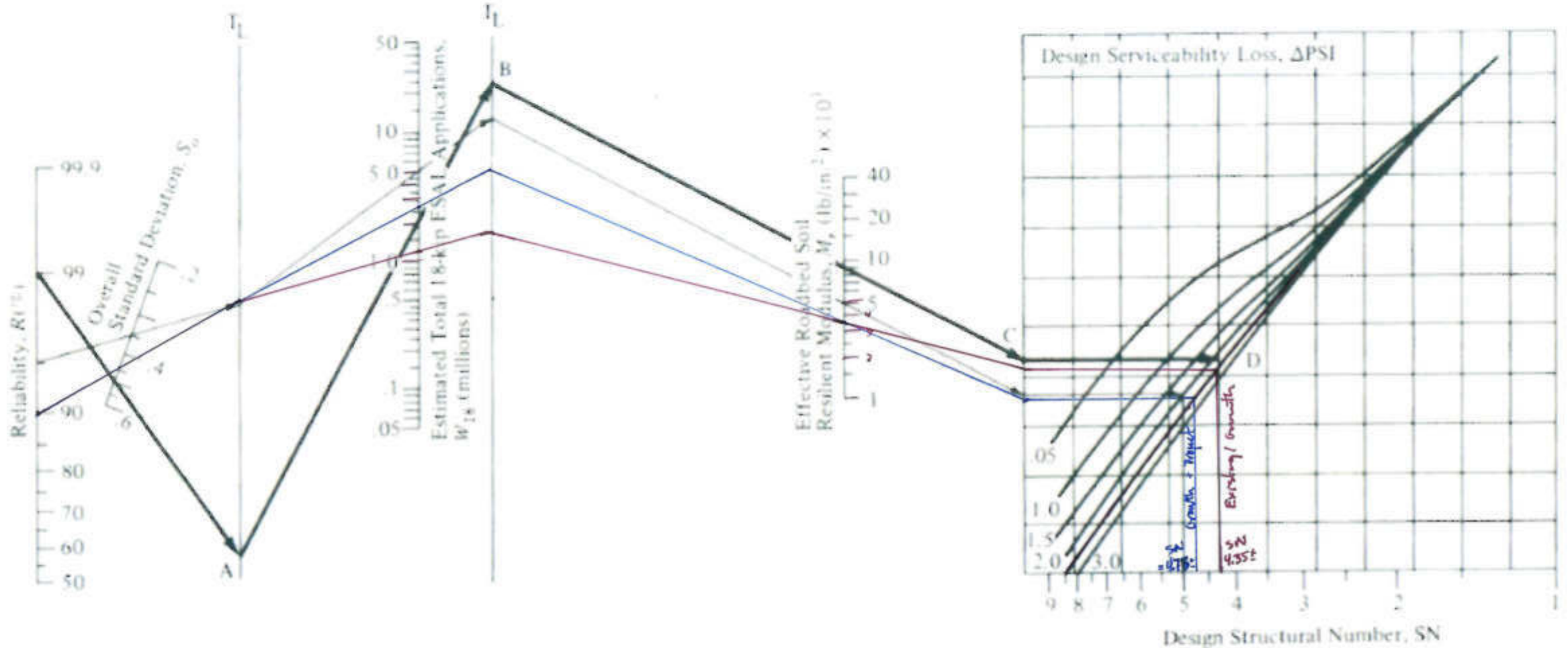
Section Summary								
RR to Dalton								
Traffic	ESAL	Reliability	Standard Dev	M_r	Delta PSI	SN (90%)	SN (80%)	SN (70%)
Background	1,508,031	90	0.44	3562	2.5	4.35	4.10	3.85
Background and Project	2,928,976	90	0.44	3562	2.5	4.75	4.50	4.30
Dalton to Bridge								
Traffic	ESAL	Reliability	Standard Dev	M_r	Delta PSI	SN (90%)	SN (80%)	SN (70%)
Background	630,879	90.0	0.44	3562	2.5	4.05	3.90	3.75
Background and Project	2,051,824	90.0	0.44	3562	2.5	4.55	4.45	4.20

Calculation of Missing Overlay to achieve adequate Structural Section (SN = 4.50)						
Section	Length (ft)	Width (ft)	Thickness (In)	Tons	Price	Total Price
RR to Trimble Entrance	650	48	2	390	200	$ 78,000.00
Dalton Ranch Road to West Entry	800	30	2	300	200	$ 60,000.00
						$ 138,000.00

* RR to Dalton Ranch Section - 90% Reliability

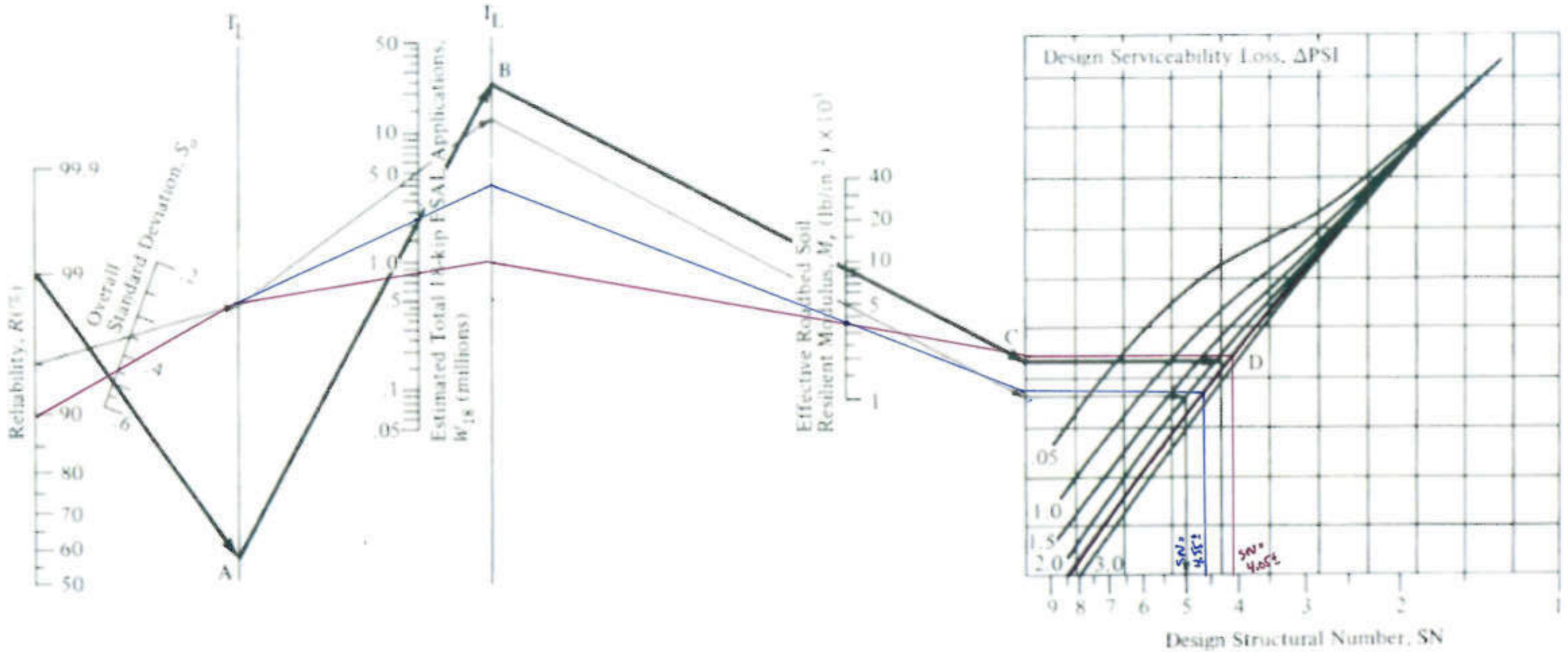
Nomograph for estimating needed structural numbers

SN Δ = 0.40 ~ 1" Asphalt



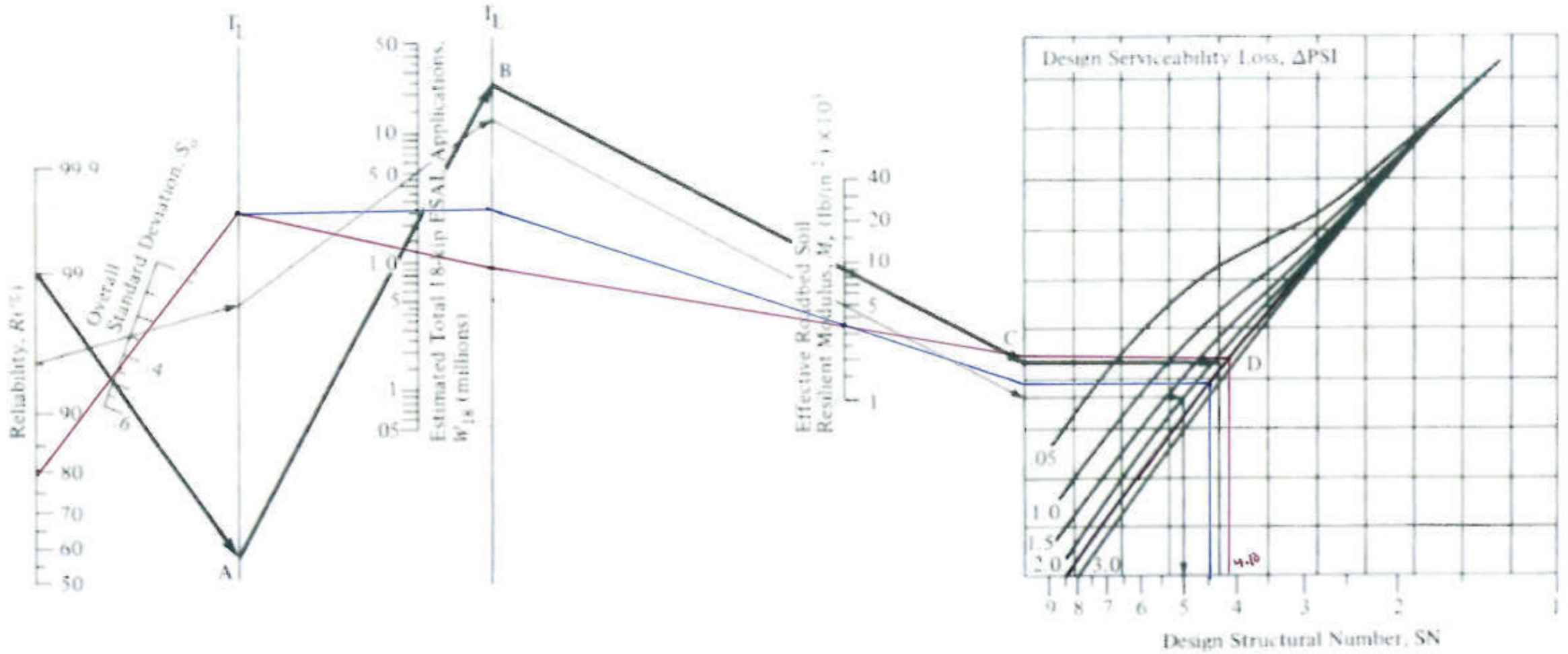
* Dalton Reach to Bridge Section - 90% Reliability

Nomograph for estimating needed structural numbers



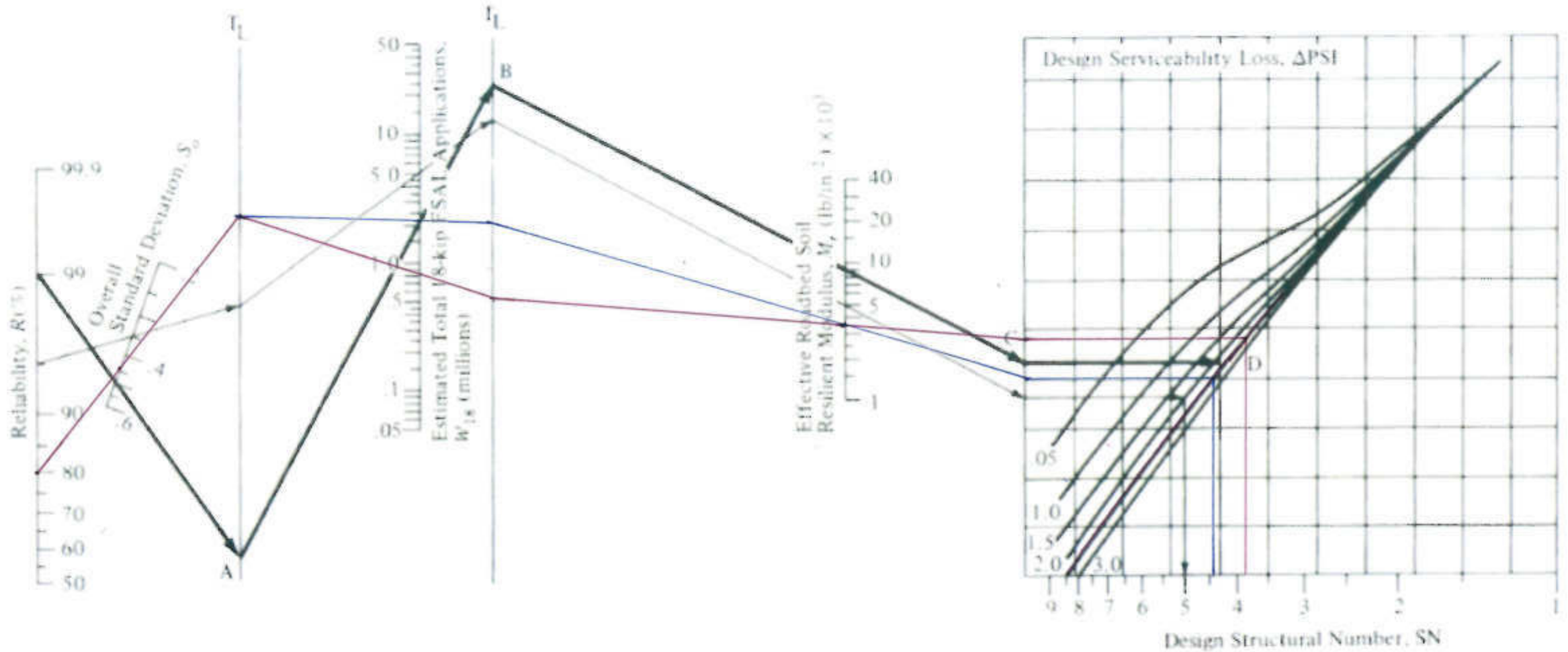
* Rtt to Bottom Trench section - 80% Reliability

Nomograph for estimating needed structural numbers



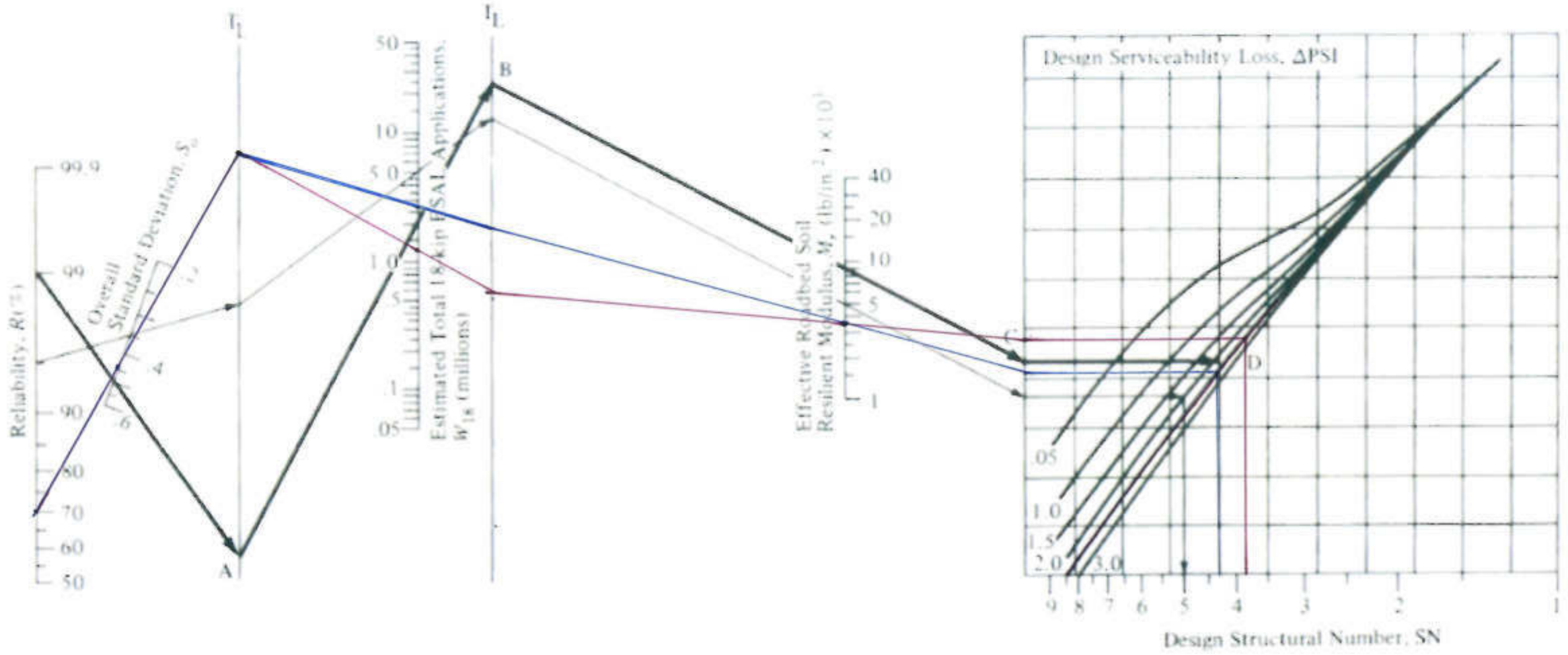
Dalton Branch to Bridge Section - 80% Reliability

Nomograph for estimating needed structural numbers



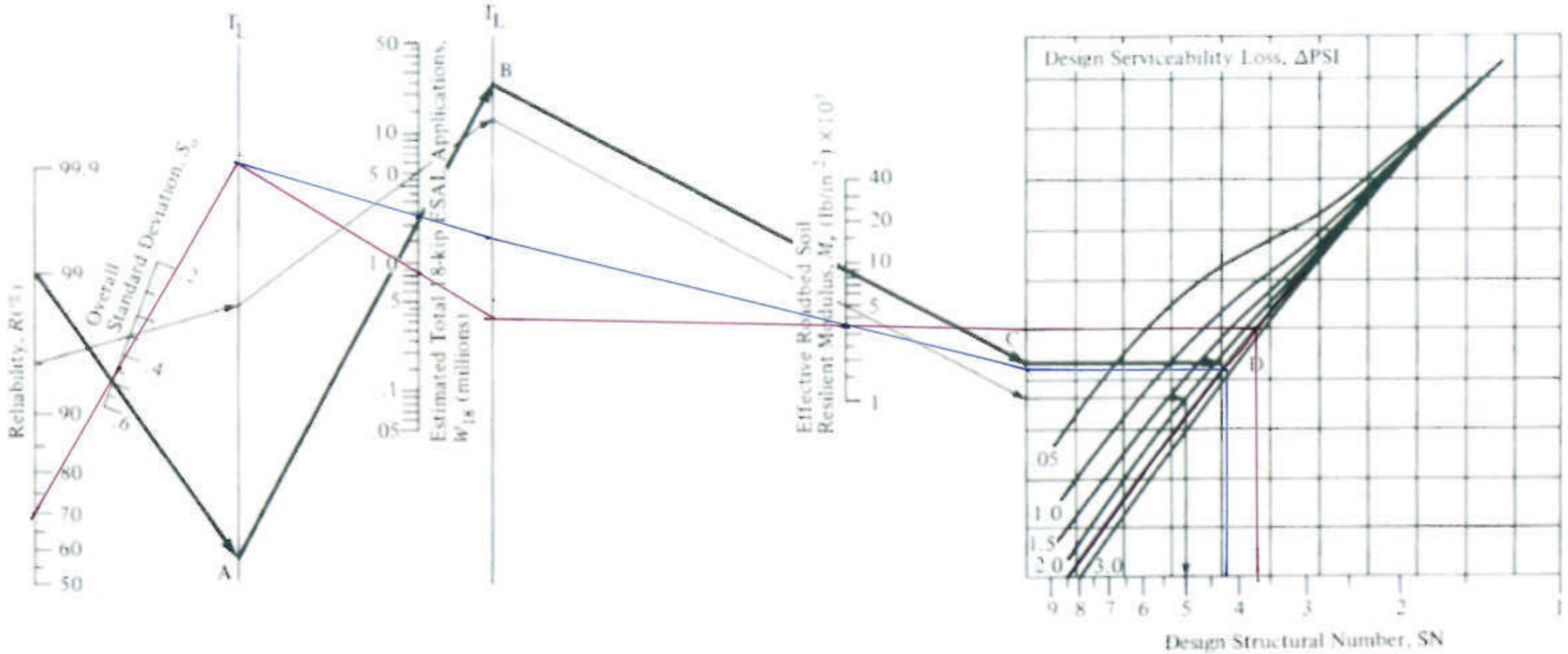
RR to Dalton Ranch Section - 70% Reliability

Nomograph for estimating needed structural numbers



Dalton Ranch to Bridge section - 70% Reliability

Nomograph for estimating needed structural numbers



GEOTECHNICAL ENGINEERING STUDY
PROPOSED DURANGO RIVER VIEW RV RESORT
AND
A LIMITED EVALUATION OF CR 252
DURANGO, COLORADO

June 26, 2023

PREPARED FOR:

Brian Fero
Roberts Communities and Resorts
c/o Travis Mooney, PE (CO, NM)
Short Elliott Hendrickson, Inc. (SEH®)
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PROJECT NO. 57927GE

Table of Contents

1.0 REPORT INTRODUCTION

This report presents our geotechnical engineering recommendations for the proposed Durango River View RV Resort to be located along CR 252 in Durango, Colorado. This report was requested by Mr. Travis Mooney, SEH, on behalf of Mr. Brian Fero, Roberts Communities and Resorts and was prepared in accordance with our revised proposal dated May 15, 2023, Proposal No. 23195-Revised. In addition, this report contains a limited evaluation of County Road 252, which was prepared in accordance with our proposal dated June 12, 2023, Proposal No. 23235P.

As outlined within our proposal for services for this project the client is responsible for appropriate distribution of this report to other design professionals and/or governmental agencies unless specific arrangements have been made with us for distribution.

Geotechnical engineering is a discipline which provides insight into natural conditions and site characteristics such as; subsurface soil and water conditions, soil strength, swell (expansion) potential, consolidation (settlement) potential, and often slope stability considerations. The information provided by the geotechnical engineer is utilized by many people including the project owner, architect or designer, structural engineer, civil engineer, the project builder and others. The information is used to help develop a design and subsequently implement construction strategies that are appropriate for the subsurface soil and water conditions, and slope stability considerations. We are available to discuss any aspect of this report with those who are unfamiliar with the recommendations, concepts, and techniques provided below.

This geotechnical engineering report is the beginning of a process involving the geotechnical engineering consultant on any project. It is imperative that the geotechnical engineer be consulted throughout the design and construction process to verify the implementation of the geotechnical engineering recommendations provided in this report. Often the design has not been started or has only been initiated at the time of the preparation of the geotechnical engineering study. Changes in the proposed design must be communicated to the geotechnical engineer so that we have the opportunity to tailor our recommendations as needed based on the proposed site development and structure design.

The following outline provides a synopsis of the various portions of this report;

- Sections 1.0 provides an introduction and an establishment of our scope of service.
- Sections 2.0 and 3.0 of this report present our geotechnical engineering field and laboratory studies
- Sections 4.0 through 7.0 presents our geotechnical engineering design parameters and recommendations which are based on our engineering analysis of the data obtained.
- Section 8.0 provides a brief discussion of construction sequencing and strategies which may influence the geotechnical engineering characteristics of the site. Ancillary information such as some background information regarding soil corrosion and radon considerations is also presented as general reference.
- Section 9.0 presents our pavement section recommendations.
- Section 10.0 provides our general construction monitoring and testing recommendations.
- Sections 11.0 and 12.0 provides our conclusions and limitations.

The data used to generate our recommendations are presented throughout this report and in the attached figures.

All recommendations provided within this report must be followed in order to achieve the intended performance of the foundation system and other components that are supported by the site soil.

1.1 Proposed Construction

Architectural details and grading plans were not available at the time of this report. We understand the project consists of development of an RV resort on approximately 30 acres at the subject property along County Road 252. The proposed construction will consist of approximately 133 RV sites, 54 RV Cabin sites, 90 Park Models, asphalt paved roadways, a clubhouse building and bathhouse building, and utility infrastructure. We understand the Park Models will be modular structures set on a permanent foundation. The clubhouse and bathhouse will be supported by steel reinforced, permanent, concrete foundation systems, and the floors will either be structurally supported over a crawl space or concrete slab on grade. We assume relatively light foundation loadings, typical of the proposed type of construction.

When final building locations, grading and loading information have been developed, we should be notified to re-evaluate the recommendations presented in this report.

2.0 FIELD STUDY

2.1 Site Description and Geomorphology

The project site is located along the north of the Animas River and along the west side of County Road 252. We understand the property was previously used as a gravel pit and various other uses. The ground surface in a majority of the site had been graded relatively flat. An oxbow lake feature exists in the western portion of the site. Based on the previous use of the site and given the site is located in a river valley, we suspect deeper pockets of previously placed fill may exist throughout the site. Based on review of historical imagery from 1968, it appears the Animas River was located in the vicinity of the western half of the site. A site plan prepared by nadigroup and provided SEH is shown below on Figure 2.1

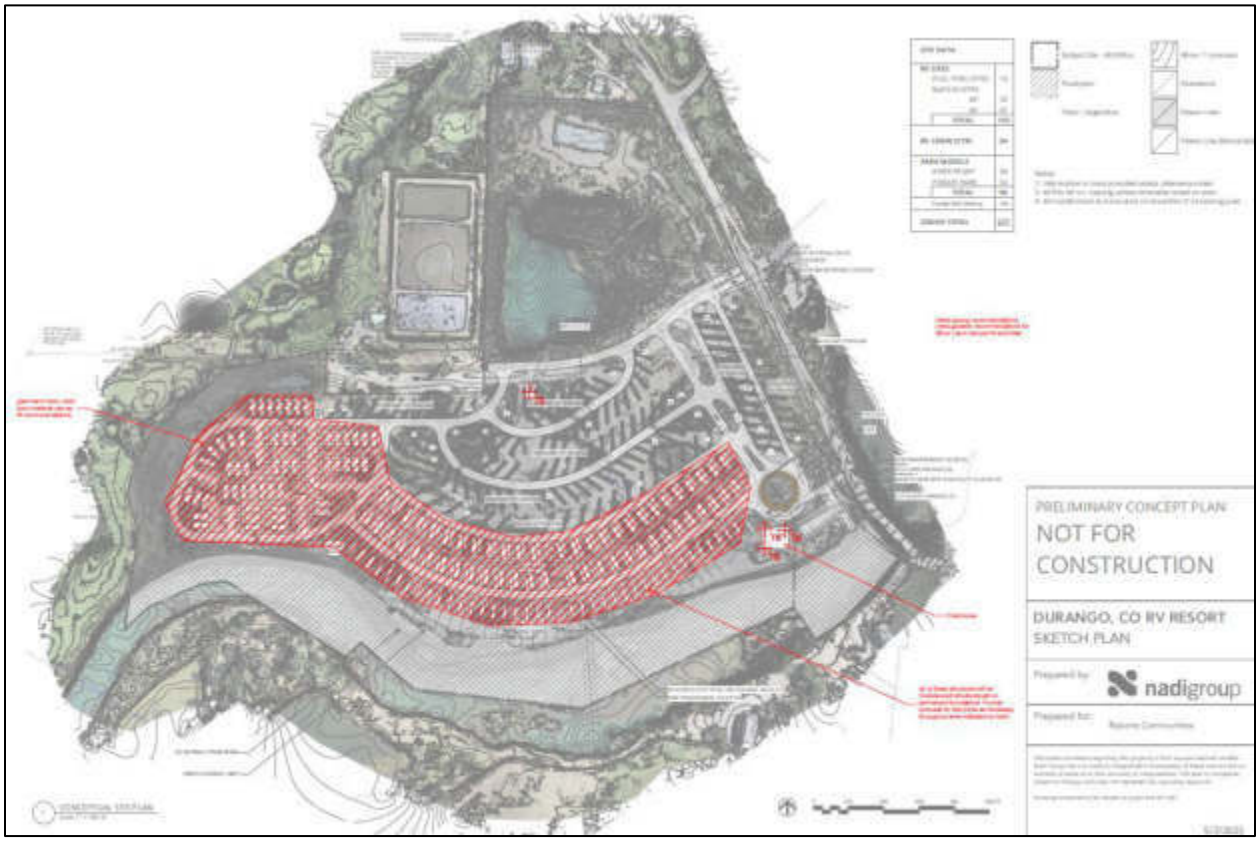


Figure 2.1; Site plan prepared by nadigroup and provided by SEH.

2.2 Subsurface Soil and Water Conditions

We advanced fourteen test borings in the vicinity of the proposed structures and roadways, and we advanced two test borings along CR 252. Schematics showing the approximate boring locations is provided below as Figures 2.2 and 2.3. The logs of the soils encountered in our test borings are presented in Appendix A.

Figure 2.2: Locations of Exploratory Borings. Adapted from La Plata County GIS Image.

Figure 2.3: Locations of Exploratory Borings along CR 252. Adapted from La Plata County GIS Image.

The schematics presented above were prepared using notes and field measurements obtained during our field exploration and is intended to show the approximate test boring locations for reference purposes only.

The subsurface conditions encountered in our test borings consisted of man-placed fill material from the existing ground surface to depths of up to 2 feet. We suspect deeper pockets of previously placed fill material will be encountered during construction in other areas of the site given the historical use of the site and the river environment. The native soils encountered below the fill material consisted of various mixtures of clay, silt, sand, gravel and cobbles to the bottom of our test borings. We advanced our test borings to depths that ranged from about 12 to 19 feet. Many of the test borings encountered practical auger refusal on dense cobbles at various depths.

In the test borings (TB-15 and TB-16) advanced in CR 252, we encountered 6½ inches of asphalt, over 4 to 10.5 inches of ¾ to 1½ inch base course material, over 3 to 8 inch pit run type material. We encountered practical auger refusal on dense cobble at 21 inches in TB-15 and 20 inches in TB-16. A tabulation of TB-15 and TB-16 is presented in Section 9.5 below.

We encountered free subsurface water at about 7½ to 8 feet in some of our test borings at the time of the advancement. We suspect that the subsurface water elevation and soil moisture conditions will be influenced by snow melt and/or precipitation, local irrigation, and the seasonal elevation of the Animas River.

The logs of the subsurface soil conditions encountered in our test borings are presented in Appendix A. The logs present our interpretation of the subsurface conditions encountered in the test borings at the time of our field work. Subsurface soil and water conditions are often variable across relatively short distances. It is likely that variable subsurface soil and water conditions will be encountered during construction. Laboratory soil classifications of samples obtained may differ from field classifications.

3.0 LABORATORY STUDY

The laboratory study included tests to estimate the strength, swell and consolidation potential of the soils tested. We performed the following tests on select samples obtained from the test borings. The laboratory test results are provided in Appendix B.

- Moisture Content and Dry Density
- Sieve Analysis (Gradation)
- Atterberg Limits, Liquid Limit, Plastic Limit and Plasticity Index
- Swell Consolidation Tests
- Moisture Content Dry Density Relationship Test

A synopsis of some of our laboratory data for some of the samples tested is tabulated below.

Sample Designation	Percent Passing #200 Sieve	Atterberg Limits LL/PI	Moisture Content (percent)	Dry Density (PCF)	Measured Swell Pressure (PSF)	Swell or Consolidation Potential	Estiamted R-Value	Maximum Dry Density (pcf)	Optimum Moisture (percent)
TB-3 @ 0-4’	5	NLL/NP	2.3	-	-	-	-	-	-
TB-4 @ 2’	-	-	14.1	105.3	320	0.2 (% under 100 psf load)	-	-	-
TB-6 @ 4’	-	-	24.9	93.5	0	0.0 (% under 500 psf load)	-	-	-
TB-9 @ 4’	-	-	11.2	105.5	0	-0.1 (% under 500 psf load)	-	-	-
TB-12 @ 2’	-	-	22.6	101.8	0	0.0 (% under 100 psf load)	-	-	-
TB-14 @ 0-4’	44	27/9	11.3	-	-	-	-	-	-
TB-14 @ 4’	-	-	40.2	82.3	180	0.1 (% under 100 psf load)	-	-	-
Bulk from TB-1 » TB-14	39	25/7	7.4	-	-	-	10*	-	-
Bulk from Berm Material	63	NLL/NP	11.4	81.8	410	0.4 (% under 100 psf load)	-	110.5	16.9
TB-15 @ 8-17” ABC	6.5	NLL/NP	2.9	-	-	-	72*	-	-
TB-16 @ 10-20” PR	8.3	NLL/NP	2.7	-	-	-	65*	-	-

*NOTES:

1. We determine the swell pressure as measured in our laboratory using the graphically estimated load-back swell pressure method.
2. Negative Swell-Consolidation Potential indicates compression under conditions of loading and wetting.
3. ABC = aggregate base course; PR = Pit Run sub-base
4. NLL = No Liquid Limit; NP = Non-Plastic
5. * = Estimated R-Value based on Sieve and Atterberg correlation

4.0 FOUNDATION RECOMMENDATIONS

There are two general types of foundation system concepts, “deep” and “shallow”, with the designation being based on the depth of support of the system. We have provided a discussion of viable foundation system concepts for this project below. The choice of the appropriate foundation system for the project is best made by the project structural engineer or project architect. We should be contacted once the design choice has been made to provide consultation regarding implementation of our design parameters.

Deep foundations will provide for the least likelihood of post-construction movement of the structure. Deep foundation system design concepts may be viable for this project; however, we anticipate that only a shallow foundation system design is being considered at this time. We are available to develop deep foundation design parameters if desired.

4.1 Shallow Foundation System Concepts

Subsurface data indicate that various soil mixtures of clay, silt, sand, gravel, and cobbles will likely be encountered beneath shallow foundations. The soils were found to have a nil to low swell potential and moderate consolidation potential. Deep foundation system design concepts which include isolation of shallow components including floor systems from shallow soils are less likely to experience post-construction movement due to volume changes in the site soil.

There are numerous types of shallow foundation systems and variants of each type. Shallow foundation system concepts discussed below include:

- Spread Footings (continuous) and stem walls
- Mat or Raft Foundations

The integrity and long-term performance of each type of system is influenced by the quality of workmanship which is implemented during construction. It is imperative that all excavation and fill placement operations be conducted by qualified personnel using appropriate equipment and techniques to provide suitable support conditions for the foundation system.

4.1.1 Spread Footings

A spread footing foundation system consists of a footing which dissipates, or spreads, the loads imposed from the stem wall (or beam) from the structure above. Properly designed and constructed continuous spread footings with stem walls (or beams) have the ability to distribute the forces associated with consolidation of the support soil. The rigidity of the system helps reduce differential movement and associated damage to the overlying structure. Settlement of the soil supporting isolated pad footings will result in direct settlement of the columns and structural components supported by the columns. Damage to the structure due to this type of movement can be severe. We recommend that isolated pad footings be avoided and that the foundation system be designed as rigid as is reasonably possible.

Careful preparation of the support soils, placement of granular compacted structural fill, careful placement and compaction of stem wall backfill and positive surface drainage adjacent to the foundation system all help reduce the influence of volume changes of the soils on the performance of the spread footing foundation system.

We recommend that the footings be supported by a layer of moisture conditioned and compacted natural soil which is overlain by a layer of compacted structural fill material. This concept is outlined below:

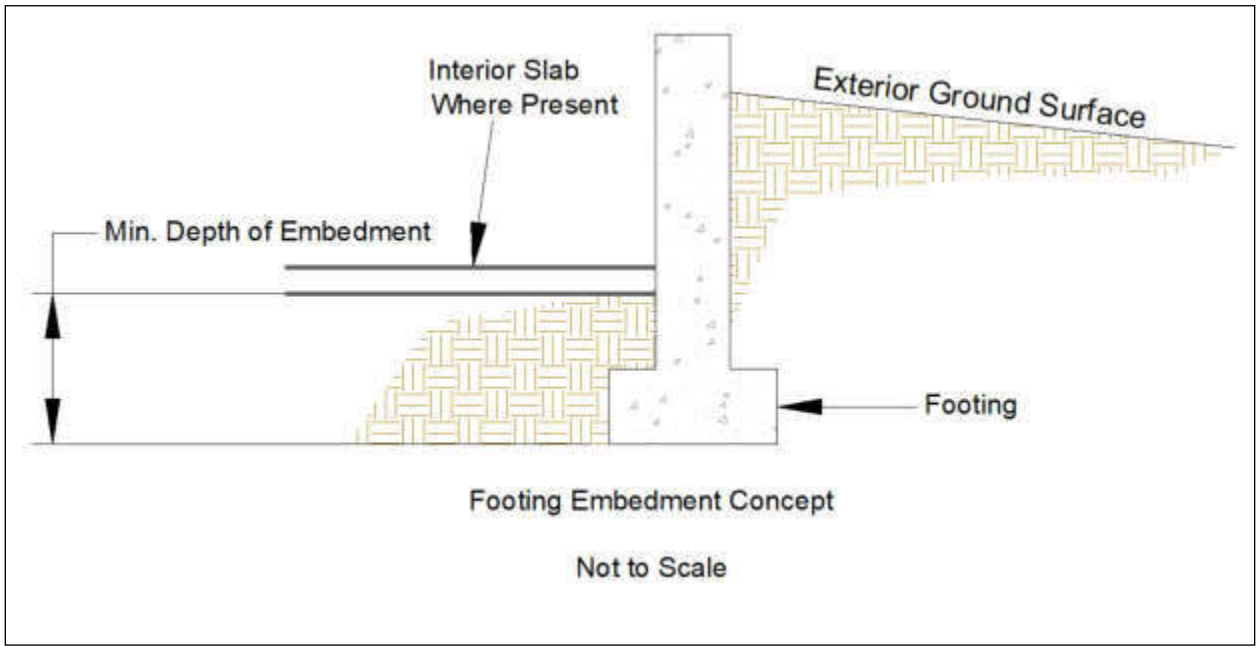
- The foundation excavation should be excavated to at least 12 inches below the proposed footing support elevation. A representative of Trautner Geotech must observe the excavation at the time of construction to verify the bearing conditions.
- The foundation excavation should extend down to through any existing fill material, if encountered.
- The natural soils exposed in the bottom of the excavation should be scarified to a depth of about 6 to 8 inches

- The scarified soil should be thoroughly moisture conditioned to about 2 percent above the laboratory determined optimum moisture content and then compacted.
- If the subgrade is yielding under compactive effort, we should be contacted to observe the subgrade conditions. Conceptual mechanical stabilization recommendations presented in Section 8.1.1 may be necessary.
- After completion of the compaction of the moisture conditioned natural soil a 12 inch thick layer of granular aggregate base course structural fill material should be placed, moisture conditioned and compacted.
- The moisture conditioned natural soil material and the granular soils should be compacted as discussed under the Compaction Recommendations portion of this report below.
- In the absence of structural engineering design and for general geotechnical engineering purposes, we recommend the stem walls be designed to act as beams and reinforced with continuous steel reinforcement, 4 reinforcement bars, 2 top and 2 bottom. Taller walls may require additional reinforcement bar.
- The structural engineer should be contacted to provide the appropriate reinforcement bar diameter and locations.
- The exterior foundation backfill must be well compacted and moisture conditioned to above optimum moisture content. Recommendations for exterior foundation backfill are provided later in this report.

We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by installing a foundation drain and wall drain systems. Topographic conditions on the site may influence the ability to install a subsurface drain system which promotes water flow away from the foundation system. The subsurface drain system concept is discussed under the Subsurface Drain System section of this report below.

The footing embedment is a relatively critical, yet often overlooked, aspect of foundation construction. The embedment helps develop the soil bearing capacity, increases resistance of the footing to lateral movement and decreases the potential for rapid moisture changes in the footing support soils, particularly in crawl space areas. Interior footing embedment reduces the exposure of the crawl space support soils to dry crawl space air. Reduction in drying of the support soil helps reduce downward movement of interior footings due to soil shrinkage.

All footings should have a minimum depth of embedment of at least one 1 foot. The embedment concept is shown below.



Spread footings located away from sloped areas may be designed using the bearing capacity information tabulated below.

Minimum Depth of Embedment (Feet)	Continuous Footing Design Capacity (psf)	Isolated Footing Design Capacity (psf)
1	1,500	Not Recommended
2	2,000	
3	2,500	

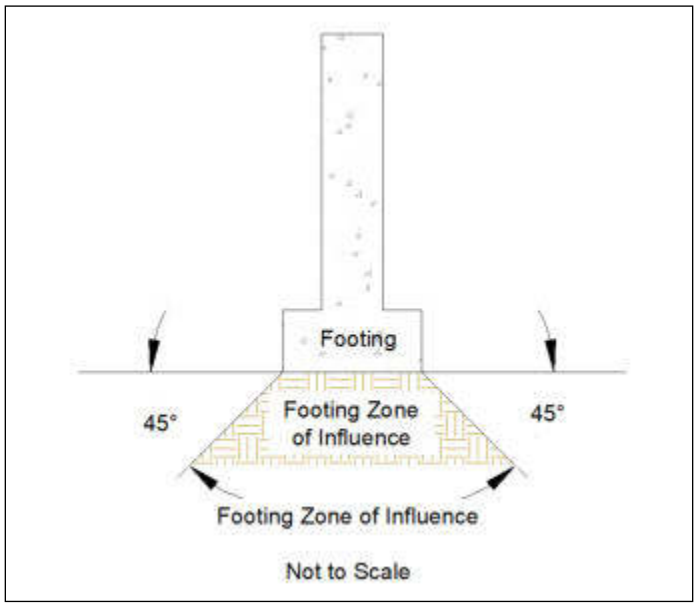
The bearing capacity values tabulated above may be increased by 20 percent for transient conditions associated with wind and seismic loads. Snow loads are not transient loads.

The bearing capacity values above were based on footing placed directly on the natural soils and on a continuous spread footing width of 2 feet. Larger footings and/or footings placed on a blanket of compacted structural fill will have a higher design soil bearing capacity. Development of the final footing design width is usually an iterative process based on evaluation of design pressures, footing widths and the thickness of compacted structural fill beneath the footings. We should be contacted as the design process continues to re-evaluate the design capacities above based on the actual proposed footing geometry.

Due to the consolidation potential of the soils tested we recommend isolated footings for support of interior column loads be avoided. A more rigid structure consisting of interior continuous footings and grade beams will help reduce the potential for damage due to settling soils.

The compacted structural fill should be placed and compacted as discussed in the Construction Considerations, "Fill Placement Recommendations" section of this report, below. The zone of influence of the footing (at elevations close to the bottom of the footing) is often approximated as being between two lines subtended at 45 degree angles from each bottom corner of the footing.

The compacted structural fill should extend beyond the zone of influence of the footing as shown in the sketch below.



A general and simple rule to apply to the geometry of the compacted structural fill blanket is that it should extend beyond each edge of the footing a distance which is equal to the fill thickness.

We estimate that the footings designed and constructed above will have a total post construction settlement of about 1 inch or less.

All footings should be support at an elevation deeper than the maximum depth of frost penetration for the area. This recommendation includes exterior isolated footings and column supports. Please contact the local building department for specific frost depth requirements.

The post construction differential settlement may be reduced by designing footings that will apply relatively uniform loads on the support soils. Concentrated loads should be supported by footings that have been designed to impose similar loads as those imposed by adjacent footings.

Under no circumstances should any footing be supported by more than 3 feet of compacted structural fill material unless we are contacted to review the specific conditions supporting these footing locations.

The design concepts and parameters presented above are based on the soil conditions encountered in our test borings. We should be contacted during the initial phases of the foundation excavation at the site to assess the soil support conditions and to verify our recommendations.

4.1.2 General Shallow Foundation Considerations

Some movement and settlement of any shallow foundation system will occur after construction. Movement associated with swelling soils also occurs occasionally. Utility line connections

through and foundation or structural component should be appropriately sleeved to reduce the potential for damage to the utility line. Flexible utility line connections will further reduce the potential for damage associated with movement of the structure.

5.0 RETAINING STRUCTURES

We anticpate that laterally loaded walls will be constructed as part of this site development. Lateral loads will be imposed on the retaining structures by the adjacent soils and, in some cases, additional surcharge loads will be imposed on the retained soils from vehicles or adjacent structures. The loads imposed by the soil are commonly referred to as lateral earth pressures. The magnitude of the lateral earth pressure forces is partially dependent on the soil strength characteristics, the geometry of the ground surface adjacent to the retaining structure, the subsurface water conditions and on surcharge loads.

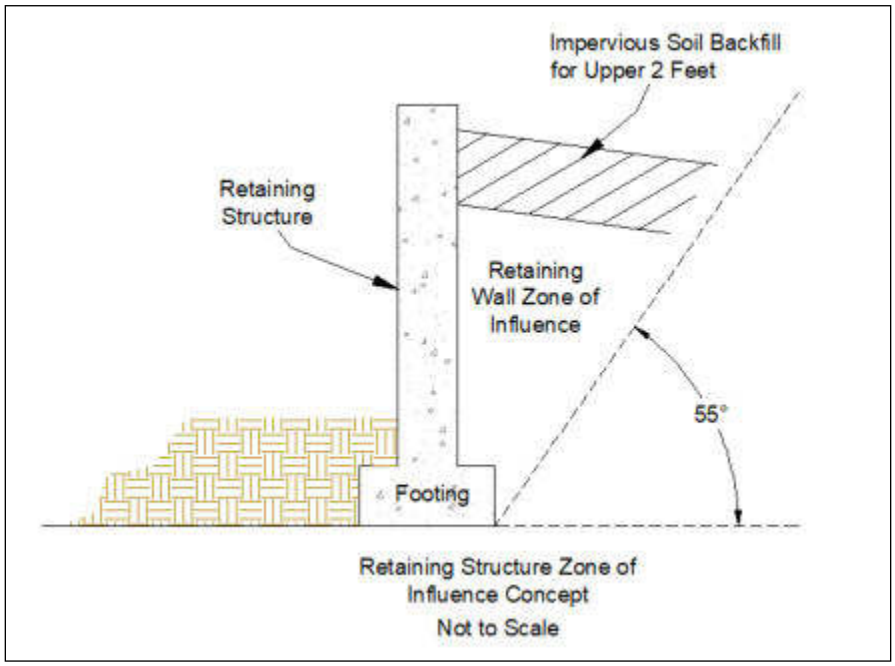
Due to the variability of the site soils, we do not recommend that the site soils be used for retaining wall backfill. The gravel and cobble soils are also not considered suitable for wall backfill without considerable processing. The retaining walls may be designed using the lateral earth pressure values for imported granular soil that are tabulated below.

Type of Lateral Earth Pressure	Level Granular Soil Backfill (pounds per cubic foot/foot)
Active	35
At-rest	55
Passive	460
Allowable Coefficient of Friction	0.45

The granular soil that is used for the retaining wall backfill may be permeable and may allow water migration to the foundation support soils. There are several options available to help reduce water migration to the foundation soils, two of which are discussed here. An impervious geotextile layer and shallow drain system may be incorporated into the backfill, as discussed in Section 9.5, Landscaping Considerations, below. A second option is to place a geotextile filter material on top of the granular soils and above that place about 1½ to 2 feet of moisture conditioned and compacted site clay soils. It should be noted that if the site clay soils are used volume changes may occur which will influence the performance of overlying concrete flatwork or structural components.

The values tabulated above are for well drained backfill soils. The values provided above do not include any forces due to adjacent surcharge loads or sloped soils. If the backfill soils become saturated the imposed lateral earth pressures will be significantly higher than those tabulated above.

The granular imported soil backfill values tabulated above are appropriate for material with an angle of internal friction of 35 degrees, or greater. The granular backfill must be placed within the retaining structure zone of influence as shown below in order for the lateral earth pressure values tabulated above for the granular material to be appropriate.



If an open graded, permeable, granular backfill is chosen it should not extend to the ground surface. Some granular soils allow ready water migration which may result in increased water access to the foundation soils. The upper few feet of the backfill should be constructed using an impervious soil such as silty-clay and clay soils from the project site, if these soils are available. The 55 degree angle shown in the figure above is approximately correct for most clay soils. The angle is defined by 45 + (φ/2) where "φ" if the angle of internal friction of the soil.

Backfill should not be placed and compacted behind the retaining structure unless approved by the project structural engineer. Backfill placed prior to construction of all appropriate structural members such as floors, or prior to appropriate curing of the retaining wall concrete, may result in severe damage and/or failure of the retaining structure.

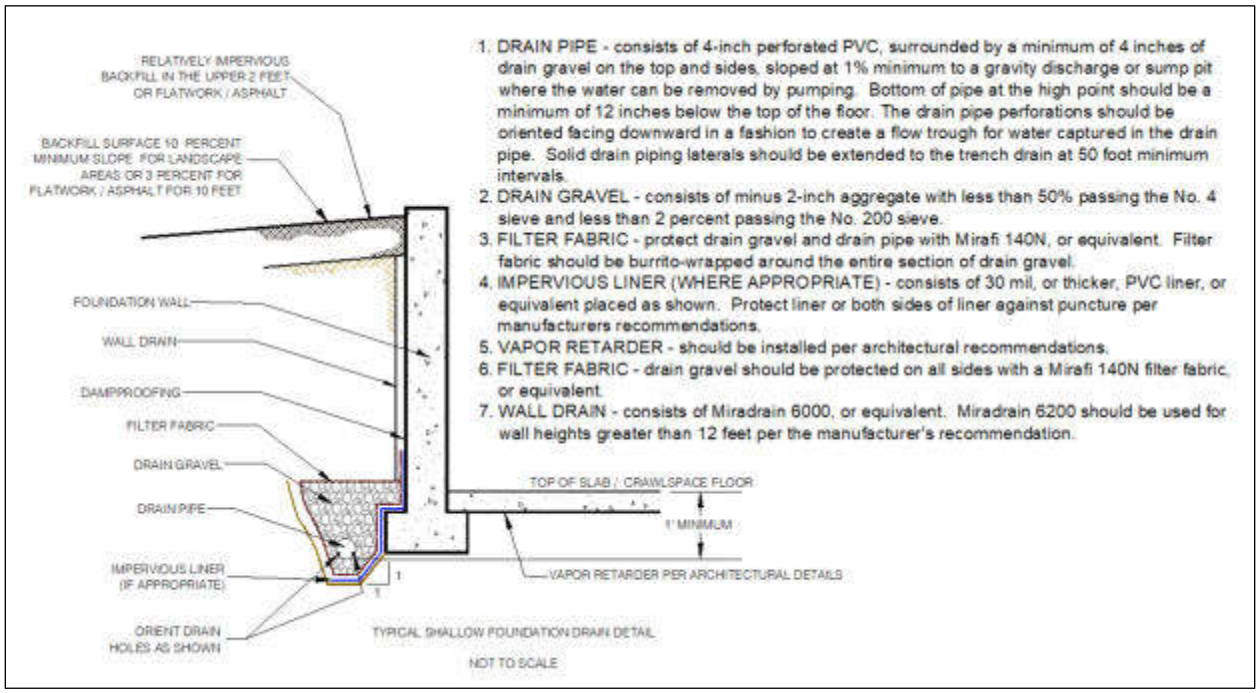
6.0 SUBSURFACE DRAIN SYSTEM

We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain and wall drain system. Exterior retaining structures may be constructed with weep holes to allow subsurface water migration through the retaining structures. Topographic conditions on the site may influence the ability to install a subsurface drain system which promotes water flow away from the foundation system. The subsurface drain system concept is discussed under the Subsurface Drain System section of this report below.

A drain system constructed with a free draining aggregate material and a 4 inch minimum diameter perforated drain pipe should be constructed adjacent to retaining structures and/or adjacent to foundation walls. The drain pipe perforations should be oriented facing downward. The system should be protected from fine soil migration by a fabric-wrapped aggregate which surrounds a rigid perforated pipe. We do not recommend use of flexible corrugated perforated pipe since it is not possible to establish a uniform gradient of the flexible pipe throughout the drain system

alignment. Corrugated drain tile is perforated throughout the entire circumference of the pipe and therefore water can escape from the perforations at undesirable locations after being collected. The nature of the perforations of the corrugated material further decreases its effectiveness as a subsurface drain conduit.

The drain should be placed at each level of excavation and at least 12 inches below lowest adjacent finish floor or crawlspace grade. The drain system pipe should be graded to surface outlets or a sump vault. The drain system should be sloped at a minimum gradient of about 2 percent, but site geometry and topography may influence the actual installed pipe gradient. Water must not be allowed to pool along any portion of the subsurface drain system. An improperly constructed subsurface drain system may promote water infiltration to undesirable locations. The drain system pipe should be surrounded by about 2 to 4 cubic feet per lineal foot of free draining aggregate. If a sump vault and pump are incorporated into the subsurface drain system, care should be taken so that the water pumped from the vault does not recirculate through pervious soils and obtain access to the basement or crawl space areas. An impervious membrane should be included in the drain construction for grade beam and pier systems or other foundation systems such as interrupted footings where a free pathway for water beneath the structure exists. A generalized subsurface drain system concept is shown below.



There are often aspects of each site and structure which require some tailoring of the subsurface drain system to meet the needs of individual projects. Drain systems that are placed adjacent to void forms must include provisions to protect and support the impervious liner adjacent to the void form. We are available to provide consultation for the subsurface drain system for this project, if desired.

Water often will migrate along utility trench excavations. If the utility trench extends from areas above the site, this trench may be a source for subsurface water within the proposed basement or crawl space. We suggest that the utility trench backfill be thoroughly compacted to help reduce the amount of water migration. The subsurface drain system should be designed to collect subsurface water from the utility trench and direct it to surface discharge points.

7.0 CONCRETE FLATWORK

We anticipate that both interior and exterior concrete flatwork will be considered in the project design. Concrete flatwork is typically lightly loaded and has a limited capability to resist shear forces associated with uplift from swelling soils and/or frost heave. It is prudent for the design and construction of concrete flatwork on this project to be able to accommodate some movement associated with swelling soil conditions.

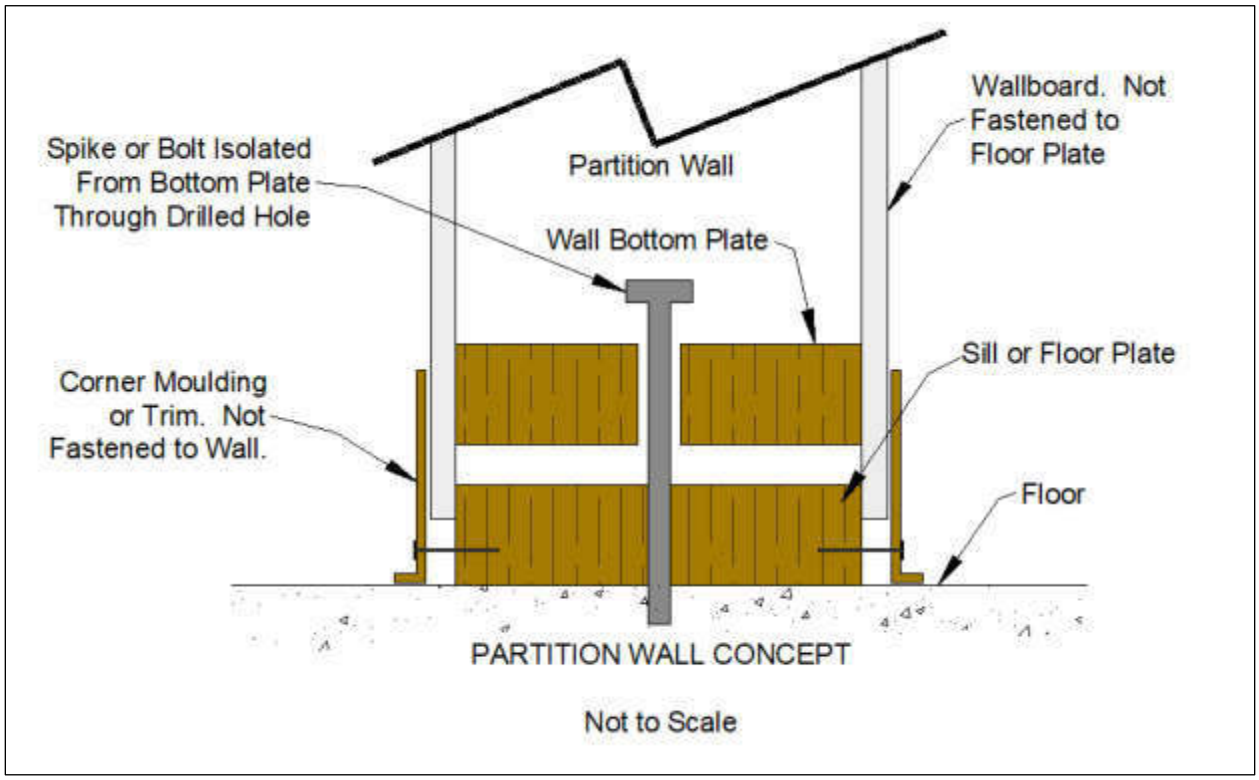
Due to the consolidation potential of the site soils, interior floors supported over a crawl space are less likely to experience movement than are concrete slabs support on grade. The following recommendations are appropriate for garage floor slabs and for interior floor slabs if the owner is willing to accept the risk of potential movement beyond normal tolerances.

7.1 Interior Concrete Slab-on-Grade Floors

A primary goal in the design and construction of concrete slab-on-grade floors is to reduce the amount of post construction uplift associated with swelling soils, or downward movement due to consolidation of soft soils. A parallel goal is to reduce the potential for damage to the structure associated with any movement of the slab-on-grade which may occur. There are limited options available to help mitigate the influence of volume changes in the support soil for concrete slab-on-grade floors, these include:

- Preconstruction scarification, moisture conditioning and re-compaction of the natural soils in areas proposed for support of concrete flatwork, and/or,
- Placement and compaction of granular compacted structural fill material

Although the soil on this site does not exhibit a high swell potential when wetted, performance of the structure may be improved by isolating the floors from the interior partition walls. Interior walls may be structurally supported from framing above the floor, or interior walls and support columns may be supported on interior portions of the foundation system. Partition walls should be designed and constructed with voids above, and/or below, to allow independent movement of the floor slab. This concept is shown below.



The sketch above provides a concept. If the plans include isolation of the partition walls from the floor slab, the project architect or structural engineer should be contacted to provide specific details and design of the desired system.

If the owner chooses to construct the structures with concrete slab-on-grade floors, the floors should be supported by a layer of granular structural fill overlying the processed natural soils. Interior concrete flatwork, or concrete slab-on-grade floors, should be underlain by scarification, moisture conditioning and compaction of about 6 inches of the natural soils followed by placement of at least 12 inches of compacted granular structural fill material that is placed and compacted as discussed in the Construction Considerations, "Fill Placement Recommendations" section of this report, below.

The above recommendations will not prevent slab heave if the expansive soils underlying slabs-on-grade become wet. However, the recommendations will reduce the effects if slab heave occurs. All plumbing lines should be pressure tested before backfilling to help reduce the potential for wetting. The only means to completely mitigate the influence of volume changes on the performance of interior floors is to structurally support the floors over a void space. Floors that are suspended by the foundation system will not be influenced by volume changes in the site soils. The suggestions and recommendations presented in this section are intended to help reduce the influence of swelling soils on the performance of the concrete slab-on-grade floors.

7.1.1 Capillary and Vapor Moisture Rise

Capillary and vapor moisture rise through the slab support soil may provide a source for moisture in the concrete slab-on-grade floor. This moisture may promote development of mold or mildew

in poorly ventilated areas and may influence the performance of floor coverings and mastic placed directly on the floor slabs. The type of floor covering, adhesives used, and other considerations that are not related to the geotechnical engineering practice will influence the design. The architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of protection required for their products.

Comments for Reduction of Capillary Rise

One option to reduce the potential for capillary rise through the floor slab is to place a layer of clean aggregate material, such as washed concrete aggregate for the upper 4 to 6 inches of fill material supporting the concrete slabs.

Comments for Reduction of Vapor Rise

To reduce vapor rise through the floor slab, a moisture barrier such as a 6 mil (or thicker) plastic, or similar impervious geotextile material is often be placed below the floor slab. The material used should be protected from punctures that will occur during the construction process.

There are proprietary barriers that are puncture resistant that may not need the underlying layer of protective material. Some of these barriers are robust material that may be placed below the compacted structural fill layer. We do not recommend placement of the concrete directly on a moisture barrier unless the concrete contractor has had previous experience with curing of concrete placed in this manner. As mentioned above, the architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of moisture and vapor protection required for their products.

7.1.2 Slab Reinforcement Considerations

The project structural engineer should be contacted to provide steel reinforcement design considerations for the proposed floor slabs. Any steel reinforcement placed in the slab should be placed at the appropriate elevations to allow for proper interaction of the reinforcement with tensile stresses in the slab. Reinforcement steel that is allowed to cure at the bottom of the slab will not provide adequate reinforcement.

7.2 Exterior Concrete Flatwork Considerations

Exterior concrete flatwork includes concrete driveway slabs, aprons, patios, and walkways. The desired performance of exterior flatwork typically varies depending on the proposed use of the site and each owner's individual expectations. As with interior flatwork, exterior flatwork is particularly prone to movement and potential damage due to movement of the support soils. This movement and associated damage may be reduced by following the recommendations discussed under interior flatwork, above. Unlike interior flatwork, exterior flatwork may be exposed to frost heave, particularly on sites where the bearing soils have a high silt content. It may be prudent to remove silt soils from exterior flatwork support areas where movement of exterior flatwork will adversely affect the project, such as near the interface between the driveway and the interior garage floor slab. If silt soils are encountered, they should be removed to the maximum depth of frost penetration for the area where movement of exterior flatwork is undesirable.

If some movement of exterior flatwork is acceptable, we suggest that the support areas be prepared by scarification, moisture conditioning and re-compaction of about 6 inches of the natural soils followed by placement of at least 12 inches of compacted granular fill material. The scarified material and granular fill materials should be placed as discussed under the Construction Considerations, "Fill Placement Recommendations" section of this report, below.

It is important that exterior flatwork be separated from exterior column supports, masonry veneer, finishes and siding. No support columns, for the structure or exterior decks, should be placed on exterior concrete unless movement of the columns will not adversely affect the supported structural components. Movement of exterior flatwork may cause damage if it is in contact with portions of the structure exterior.

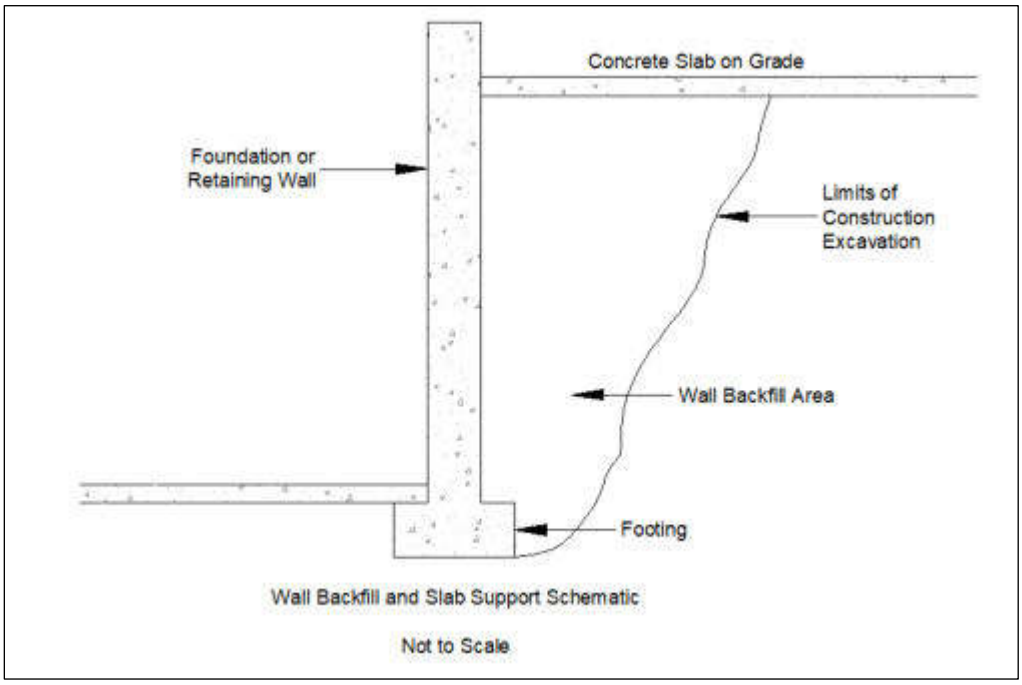
It should be noted that silt and silty sand soils located near the ground surface are particularly prone to frost heave. Soils with high silt content have the ability to retain significant moisture. The ability for the soils to accumulate moisture combined with a relatively shallow source of subsurface water and the fact that the winter temperatures in the area often very cold all contribute to a high potential for frost heave of exterior structural components. We recommend that silty soils be removed from the support areas of exterior components that are sensitive to movement associated with frost heave. These soils should be replaced with a material that is not susceptible to frost heave. Aggregate road base and similar materials retain less water than fine-grained soils and are therefore less prone to frost heave. We are available to discuss this concept with you as the plans progress.

Landscaping and landscaping irrigation often provide additional moisture to the soil supporting exterior flatwork. Excessive moisture will promote heave of the flatwork either due to expansive soil, or due to frost action. If movement of exterior slabs is undesirable, we recommend against placement of landscaping that requires irrigation. The ground surfaces near exterior flatwork must be sloped away from flatwork to reduce surface water migration to the support soil.

Exterior flatwork should not be placed on soils prepared for support of landscaping vegetation. Cultivated soils will not provide suitable support for concrete flatwork.

7.3 General Concrete Flatwork Comments

It is relatively common that both interior and exterior concrete flatwork is supported by areas of fill adjacent to either shallow foundation walls or basement retaining walls. A typical sketch of this condition is shown below.



Settlement of the backfill shown above will create a void and lack of soil support for the portions of the slab over the backfill. Settlement of the fill supporting the concrete flatwork is likely to cause damage to the slab-on-grade. Settlement and associated damage to the concrete flatwork may occur when the backfill is relatively deep, even if the backfill is compacted.

If this condition is likely to exist on this site it may be prudent to design the slab to be structurally supported on the retaining or foundation wall and designed to span to areas away from the backfill area as designed by the project structural engineer. We are available to discuss this with you upon request.

8.0 CONSTRUCTION CONSIDERATIONS

This section of the report provides comments, considerations and recommendations for aspects of the site construction which may influence, or be influenced by the geotechnical engineering considerations discussed above. The information presented below is not intended to discuss all aspects of the site construction conditions and considerations that may be encountered as the project progresses. If any questions arise as a result of our recommendations presented above, or if unexpected subsurface conditions are encountered during construction we should be contacted immediately.

8.1 Fill Placement Recommendations

There are several references throughout this report regarding both natural soil and compacted structural fill recommendations. The recommendations presented below are appropriate for the fill placement considerations discussed throughout the report above.

All areas to receive fill, structural components, or other site improvements should be properly prepared and grubbed at the initiation of the project construction. The grubbing operations should include scarification and removal of organic material and soil. No fill material or concrete should be placed in areas where existing vegetation or fill material exist.

We observed evidence of previous site use and encountered existing man-placed fill during our field work. We suspect that man-placed fill and subterranean structures may be encountered as the project construction progresses. All existing fill material should be removed from areas planned for support of structural components. Excavated areas and subterranean voids should be backfilled with properly compacted fill material as discussed below.

8.1.1 Subgrade Soil Stabilization

We encountered subsurface water within our test borings. We suspect that soft, yielding soil conditions may be encountered at various locations on the project site during construction, especially in the ox-bow area of the site. This material may be challenging to compact in preparation for placement of overlying fill material. We have provided two general categories of concepts to stabilize these soils to provide a suitable substrate for placement and compaction of overlying compacted fill. These include:

1.) Mechanical Stabilization; using soil and/or geotextile materials, and,
2.) Chemical Stabilization; using dry Portland cement.

Mechanical stabilization of soil often includes placement of aggregate material and/or larger cobbles (3-4 inch size) into an area where the soils are yielding. The most predictable technique is to over-excavate these soft areas by about 8 to 12 inches, (or more, if needed) lightly proof compact the exposed soil, place a layer of woven geosynthetic or geogrid-type material, such as or Mirafi RS 280i or BXG 120 geogrid, followed by placement of a “clean crushed aggregate” material with a nominal maximum size of 3 inches and not more than about 5 percent passing the #4 sieve. This clean crushed aggregate material should then be consolidated with a plate-type compactor. A less robust fabric, such as a non-woven geofabric, (such as Mirifi 140N) is placed on top of this aggregate layer followed by placement and compaction of the overlying fill material. For sites with extremely soft conditions it may be necessary to increase the clean aggregate layer to about 18 inches and place an intermediate layer of geogrid (or fabric) at mid-height of this layer.

Chemical stabilization using Portland cement is effective for most soils. Generally, this technique is more suitable for isolated soft areas. Generally dry Portland cement powder may be placed on the surface of the soft yielding material and subsequently mixed into the soil. The effectiveness of this technique is partially dependent upon the thoroughness of the mixing. If it can be thoroughly mixed the application rate of the Portland cement need not be more than 10 percent, and often an application of 5 to 7 percent will provide a significant decrease in free water and stabilize the material. After mixing, the material should be allowed to “rest” for about two of more hours prior to compaction. The treated material will often yield some during initial compaction, but will generally increase in rigidity as the process of hydration begins takes place. If yielding under compaction is excessive, the material should be allowed “cure” additionally prior to continued compaction effort being applied. Often it takes more time, such as overnight, to allow the cement to fully stabilize the material so this strategy is often implemented in an area at the end

of a work day and allowed to cure overnight followed by subsequent fill placement on the following day.

8.1.2 Natural Soil Fill

Any natural soil used for any fill purpose should be free of all deleterious material, such as organic material and construction debris. Natural soil fill includes excavated and replaced material or in-place scarified material. Due to the consolidation potential of the natural soil we do not recommend that it be used as fill material for direct support of structural components. The natural soils may be used to establish general site elevation. Our recommendations for placement of natural soil fill are provided below.

- The natural soils should be moisture conditioned, either by addition of water to dry soils, or by processing to allow drying of wet soils. The proposed fill materials should be moisture conditioned to between about optimum and about 2 percent above optimum soil moisture content. This moisture content can be estimated in the field by squeezing a sample of the soil in the palm of the hand. If the material easily makes a cast of soil which remains in-tact, and a minor amount of surface moisture develops on the cast, the material is close to the desired moisture content. Material testing during construction is the best means to assess the soil moisture content.
- Moisture conditioning of clay or silt soils may require many hours of processing. If possible, water should be added and thoroughly mixed into fine grained soil such as clay or silt the day prior to use of the material. This technique will allow for development of a more uniform moisture content and will allow for better compaction of the moisture conditioned materials.
- The moisture conditioned soil should be placed in lifts that do not exceed the capabilities of the compaction equipment used and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.
- We typically recommend a maximum fill lift thickness of 6 inches for hand operated equipment and 8 to 10 inches for larger equipment.
- Care should be exercised in placement of utility trench backfill so that the compaction operations do not damage underlying utilities.
- The maximum recommended lift thickness is about 6 to 8 inches. The maximum recommended rock size for natural soil fill is about 3 inches. This may require on-site screening or crushing if larger rocks are present. We must be contacted if it is desired to utilize rock greater than 3 inches for fill materials.

8.1.3 Berm Borrow Material

We sampled and tested the proposed borrow material currently stockpiled and located along the western boundary of the site. Based on the results of the laboratory testing, the material classified as a sandy silt (ML) and had a maximum dry density of 110.5 PCF and an optimum moisture content of 16.9%. In addition, we performed a one-dimensional swell/consolidation on a remolded sample of the berm material to estimate the post construction settlement of this material. Based on the results of the swell/consolidation test, the sample exhibited a low swell potential and a high consolidation potential. The sample had an initial moisture content of 11.4 and a final moisture

content of 32.0.

We estimate the compacted berm material will have a post construction consolidation potential of approximately 4 to 5 percent, therefore a 10 foot thick fill of compacted berm material may settle up to approximately 6 inches over time even when properly placed. Due to the consolidation potential of the berm material and the high moisture contents, we do not recommend that it be used as fill material for support of structural components. The berm material may be used to establish general site elevation outside of structural components.

8.1.4 Granular Compacted Structural Fill

Granular compacted structural fill is referenced in numerous locations throughout the text of this report. Granular compacted structural fill should be constructed using an imported commercially produced rock product such as aggregate road base. Many products other than road base, such as clean aggregate or select crusher fines may be suitable, depending on the intended use. If a specification is needed by the design professional for development of project specifications, a material conforming to the Colorado Department of Transportation (CDOT) "Class 6" aggregate road base material can be specified. This specification can include an option for testing and approval in the event the contractor's desired material does not conform to the Class 6 aggregate specifications. We have provided the CDOT Specifications for Class 6 material below.

Grading of CDOT Class 6 Aggregate Base-Course Material	
Sieve Size	Percent Passing Each Sieve
1 inch	100
¾ inch	95-100
#4	30-65
#8	25-55
#200	3-12

Liquid Limit less than 30

All compacted structural fill should be moisture conditioned and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test. Areas where the structural fill will support traffic loads under concrete slabs or asphalt concrete should be compacted to at least 95 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.

Although clean-screened or washed aggregate may be suitable for use as structural fill on sites with sand or non-expansive silt soils, or on sites where shallow subsurface water is present, clean aggregate materials must not be used on any site where expansive soils exist due to the potential for water to accumulate in the voids of the clean aggregate materials.

Clean aggregate fill, if appropriate for the site soil conditions, must not be placed in lifts exceeding 8 inches and each lift should be thoroughly vibrated, preferably with a plate-type vibratory compactor prior to placing overlying lifts of material or structural components. We should be contacted prior to the use of clean aggregate fill materials to evaluate their suitability for use on this project.

8.1.4 Deep Fill Considerations

Deep fills, in excess of approximately 3 feet, should be avoided where possible. Fill soils will settle over time, even when placed properly per the recommendations contained in this report. Natural soil fill or engineered structural fills placed to our minimum recommended requirements will tend to settle an estimated 1 to 3 percent; therefore, a 3 foot thick fill may settle up to approximately 1 inch over time. A 10 foot thick fill may settle up to approximately 3½ inches even when properly placed. Fill settlement will result in distress and damage to the structures they are intended to support. There are methods to reduce the effects of deep fill settlement such as surcharge loading and surveyed monitoring programs; however, there is a significant time period of monitoring required for this to be successful. A more reliable method is to support structural components with deep foundation systems bearing below the fill envelope. We can provide additional guidance regarding deep fills up on request.

8.2 Excavation Considerations

Unless a specific classification is performed, the site soils should be considered as an Occupational Safety and Health Administration (OSHA) Type C soil and should be sloped and/or benched according to the current OSHA regulations. Excavations should be sloped and benched to prevent wall collapse. Any soil can release suddenly and cave unexpectedly from excavation walls, particularly if the soils is very moist, or if fractures within the soil are present. Daily observations of the excavations should be conducted by OSHA competent site personnel to assess safety considerations.

We did encounter free subsurface water in our test borings. If water is encountered during construction, it may be necessary to dewater excavations to provide for suitable working conditions.

If possible, excavations should be constructed to allow for water flow from the excavation the event of precipitation during construction. If this is not possible it may be necessary to remove water from snowmelt or precipitation from the foundation excavations to help reduce the influence of this water on the soil support conditions and the site construction characteristics.

8.2.1 Excavation Cut Slopes

We anticipate that some permanent excavation cut slopes may be included in the site development. Temporary cut slopes should not exceed 5 feet in height and should not be steeper than about 1:1 (horizontal to vertical) for most soils. Permanent cut slopes greater than 5 feet or steeper than 2½:1 must be analyzed on a site-specific basis. We are available to perform limited slope stability analysis as the project progresses; however, we do not perform shoring designs. If shoring is needed, then a shoring design engineer will need to be contacted to provide temporary and/or permanent shoring.

We did not observe evidence of existing unstable slope areas influencing the site, but due to the steepness and extent of the slopes in the area we suggest that the magnitude of the proposed excavation slopes be minimized, supported by retaining structures, and/or temporary or permanent shoring.

8.3 Utility Considerations

Subsurface utility trenches will be constructed as part of the site development. Utility line backfill often becomes a conduit for post construction water migration. If utility line trenches approach the proposed project site from above, water migrating along the utility line and/or backfill may have direct access to the portions of the proposed structure where the utility line penetrations are made through the foundation system. The foundation soils in the vicinity of the utility line penetration may be influenced by the additional subsurface water. There are a few options to help mitigate water migration along utility line backfill. Backfill bulkheads constructed with high clay content soils and/or placement of subsurface drains to promote utility line water discharge away from the foundation support soil.

Some movement of all structural components is normal and expected. The amount of movement may be greater on sites with problematic soil conditions. Utility line penetrations through any walls or floor slabs should be sleeved so that movement of the walls or slabs does not induce movement or stress in the utility line. Utility connections should be flexible to allow for some movement of the floor slab.

8.4 Exterior Grading and Drainage Comments

The following recommendations should be following during construction and maintained for the life of the structure with regards to exterior grading and surface drainage.

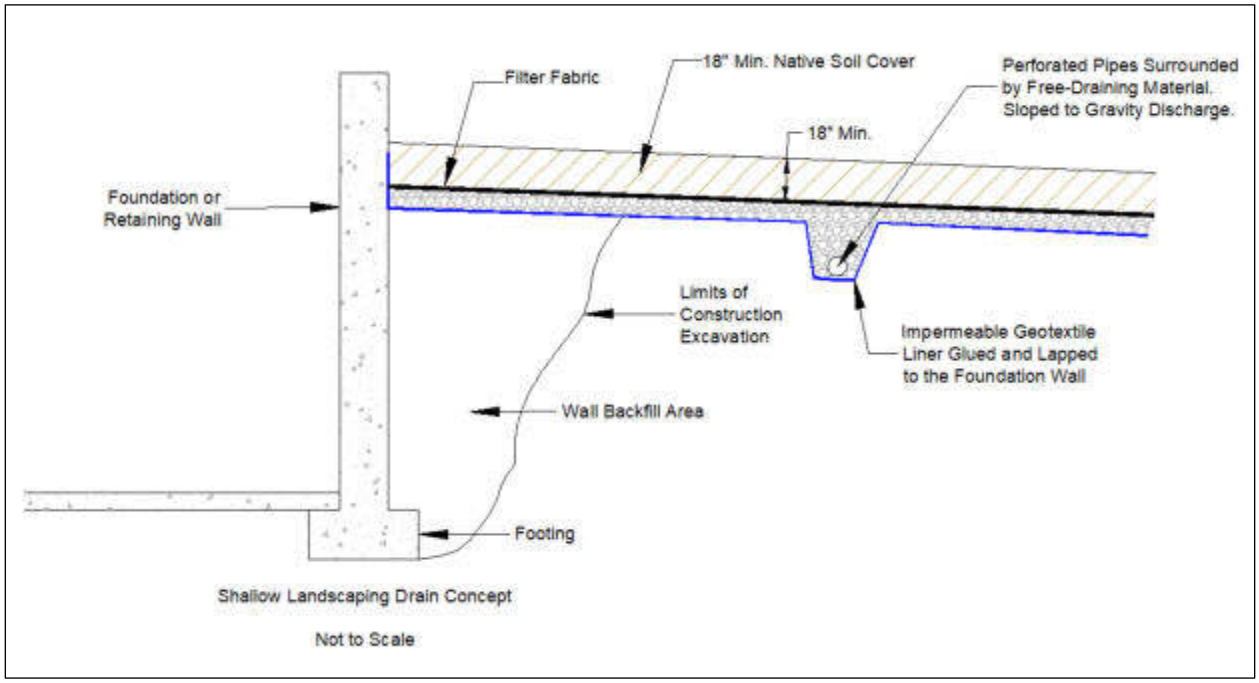
- The ground surface adjacent to the structure should be sloped to promote water flow away from the foundation system and flatwork.
- Snow storage areas should not be located in areas which will allow for snowmelt water access to support soils for the foundation system or flatwork.
- The project civil engineer, architect or builder should develop a drainage scheme for the site. We typically recommend the ground surface surrounding the exterior of the building be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 12 inches in the first 10 feet in unpaved areas and a minimum slope of 3 inches in the first 10 feet in paved areas.
- Water flow from the roof of the structure should be captured and directed away from the structure. If the roof water is collected in an eave gutter system, or similar, the discharge points of the system must be located away from areas where the water will have access to the foundation backfill or any structure support soils. If downspouts are used, provisions should be made to either collect or direct the water away from the structure.
- Care should be taken to not direct water onto adjacent property or to areas that would negatively influence existing structures or improvements.

8.5 Landscaping Considerations

We recommend against construction of landscaping which requires excessive irrigation. Generally landscaping which uses abundant water requires that the landscaping contractor install topsoil which will retain moisture. The topsoil is often placed in flattened areas near the structure to further trap water and reduce water migration from away from the landscaped areas.

Unfortunately, almost all aspects of landscape construction and development of lush vegetation are contrary to the establishment of a relatively dry area adjacent to the foundation walls. Excess water from landscaped areas near the structure can migrate to the foundation system or flatwork support soils, which can result in volume changes in these soils.

A relatively common concept used to collect and subsequently reduce the amount of excess irrigation water is to glue or attach an impermeable geotextile fabric or heavy mill plastic to the foundation wall and extend it below the topsoil which is used to establish the landscape vegetation. A thin layer of sand can be placed on top of the geotextile material to both protect the geotextile from punctures and to serve as a medium to promote water migration to the collection trench and perforated pipe. The landscape architect or contractor should be contacted for additional information regarding specific construction considerations for this concept which is shown in the sketch below.



A free draining aggregate or sand may be placed in the collection trench around the perforated pipe. The perforated pipe should be graded to allow for positive flow of excess irrigation water away from the structure or other area where additional subsurface water is undesired. Preferably the geotextile material should extend at least 10 or more feet from the foundation system.

Care should be taken to not place exterior flatwork such as sidewalks or driveways on soils that have been tilled and prepared for landscaping. Tilled soils will settle which can cause damage to the overlying flatwork. Tilled soils placed on sloped areas often "creep" down-slope. Any structure or structural component placed on this material will move down-slope with the tilled soil and may become damaged.

8.6 Soil Sulfate and Corrosion Issues

The requested scope of our services did not include assessment of the chemical constituents of corrosion potential of the site soils. Most soils in southwest Colorado are not typically corrosive to concrete. There has not been a history of damage to concrete due to sulfate corrosion in the area.

We are available to perform soluble sulfate content tests to assess the corrosion potential of the soils on concrete if desired.

8.7 Radon Issues

The requested scope of service of this report did not include assessment of the site soils for radon production. Many soils and formational materials in western Colorado produce Radon gas. The structure should be appropriately ventilated to reduce the accumulation of Radon gas in the structure. Several Federal Government agencies including the Environmental Protection Agency (EPA) have information and guidelines available for Radon considerations and home construction. If a radon survey of the site soils is desired, please contact us.

8.8 Mold and Other Biological Contaminants

Our services do not include determining the presence, prevention or possibility of mold or other biological contaminants developing in the future. If the client is concerned about mold or other biological contaminants, a professional in this special field of practice should be consulted.

9.0 PAVEMENT SECTION THICKNESS DESIGN RECOMMENDATIONS

We have provided recommendations for a flexible asphalt and rigid Portland concrete pavement sections for the RV Park. We have provided our traffic estimates in Section 9.1 below. Our flexible asphalt pavement section thickness recommendations are provided in Section 9.2 and general asphalt pavement construction recommendations are provided in Section 9.3. Rigid Portland concrete recommendations are provided in Section 9.4. Our limited pavement evaluation of CR 252 is presented in Section 9.5.

9.1 *Traffic Estimates*

SEH provided an average daily traffic (ADT) projection of 335 for the RV Park. Based on an ADT of 335, we estimated a corresponding 10 year, 18,000 pound (18k) equivalent single axel load (ESAL) of 126,000. We have provided conceptual pavement section thickness recommendations for an estimated 126,000 ESALs. If different ESAL values are anticipated or if alternative recommendations are required, the pavement sections presented in this report should be re-evaluated.

9.2 *Asphalt Pavement Design Recommendations*

The aggregate materials used within the pavement section should conform to the requirements outlined in the current Specifications for Road and Bridge Construction, Colorado Department of

Transportation (CDOT). The aggregate base material should be a ¾-inch minus material that conforms to the CDOT Class 6 aggregate base course specifications and have an R-value of at least 78. The aggregate sub-base course should conform to the CDOT specifications for Class 2 material and should have a minimum R-value 70. Other material may be suitable for use in the pavement section, but materials different than those listed above should be tested and observed by us prior to inclusion in the project design or construction. Aggregate sub-base and base-course materials should be compacted to at least 95 percent of maximum dry density as defined by the modified Proctor test, ASTM D1557.

We recommend that the asphalt concrete used on this project be mixed in accordance with a design prepared by a licensed professional engineer, or an asphalt concrete specialist. We should be contacted to review the mix design prior to placement at the project site. We recommend that the asphalt concrete be compacted to between 92 and 96 percent of the maximum theoretical density.

We have provided several pavement section design thicknesses below for 126,000 estimated ESALs. The project civil engineer, or contractor can evaluate the best combination of materials for economic considerations.

We performed a California Bearing Ratio (CBR) test on a composite sample of soil obtained from the project site. Based on the laboratory analysis, we estimated the R-Value of 10 for the on-site soils, which correlates to a resilient modulus of 3,562 pounds per square inch. The CBR results are provided in Appendix A. Other assumptions made for our analysis are listed below.

- Reliability Factor R(%) = 90%
- Overall Standard Deviation, So = 0.44
- Estimated Total 18K-ESAL value(s) = 126,000
- Effective Roadbed Soils Resilient Modulus, Mr = 3,562
- Change is serviceability index, Delta PSI = 2.5
- Structural Coefficient of Asphalt Pavement = 0.44
- Structural Coefficient of Aggregate Base Course = 0.12
- Structural Coefficient of Aggregate Sub-Base Course = 0.09
- Modifying Structural Layer Coefficients for aggregate base course and aggregate sub-base course layers, mi = 1.0 (fair drainage conditions with 5%-25% saturation frequency)

We have estimated a pavement reliability factor ® of 90 percent. The Federal Highway Administration defines R as “the probability that a pavement section will perform satisfactorily over the design period. It must account for uncertainties in traffic loading, environmental conditions, and construction materials. The AASHTO design method accounts for these uncertainties by incorporating a reliability level R to provide a factor of safety into the pavement design and thereby increase the probability that the pavement will perform as intended over its design life.” A higher R will result in thicker pavement section materials; however, may lead to a greater reliability in the pavement performance. The designer or project civil engineer should evaluate the desired R factor for the intended use. We can provide alternate reliability factors for the proposed pavement section upon request.

Based on the above assumptions and laboratory test data obtained for the native on-site soil materials, we obtained a structural number (SN) equal to 3.09 for an assumed 126,000 18k-ESAL. Our pavement thickness design recommendations are provided below. We have shown alternate pavement sections below that meet the minimum structural numbers. We generally feel that the design with the thicker (4 inch) asphalt mat will be more resilient and able to withstand the rigors associated with exposure to heavy RV, equipment or truck traffic, and will allow for a mill and overlay for future maintenance.

Pavement Section Design Thickness –126,000 ESAL (Minimum SN = 3.09)

Pavement Section Component	Alternative Thickness of Each Component (inches)			
Asphalt Concrete	4	4	4.5	5
Class 6 Roadbase	4	12	10	8
Class 2 Sub-Base	10	0	0	0
Structural Number	3.14	3.2	3.18	3.16

We do not recommend use of Class 6, ¾-inch aggregate base course in layers less than 4 inches or the use of Class 2 sub-base in layers less than 6 inches. This may result in total structural numbers that are in excess of the minimum required by the anticipated traffic loading as can be seen in the tables above.

Water intrusion into the pavement section support materials will negatively influence the performance of the parking lot surface. Water from irrigation, water from natural sources that migrates into the soils beneath landscapes surface and water from any source that gains access to the support materials can all decrease the life of the parking lot surface. Care should be taken along curbs and any edge of the parking lot to develop an interface between the material that will reduce subsurface and surface water migration into the support soil and pavement section materials. Landscape islands and other irrigated features often promote water migration since no surface flow from these features typically occurs. The same can occur along perimeter cub areas.

Water will often migrate along the interface of concrete curbs and gutter areas early in the life of any parking area. The tendency for this type of migration often decreases with time but can be reduced by compaction of materials along the outside base of curb areas adjacent to the interface of the concrete curb and the underlying soil prior to placement of landscaping soil above this interface.

9.3 *General Asphalt Pavement Recommendations*

The asphalt pavement used on this project should be mixed in accordance with a design prepared by a licensed professional engineer, or an asphalt pavement specialist. We should be contacted to review the mix design prior to placement at the project site. We recommend that the asphalt pavement be compacted to between 92 and 96 percent of the maximum theoretical density.

We suspect that the subgrade soils will be well above the optimum moisture content in many areas of the project. We anticipate that conventional scarification and drying of the subgrade soils will be sufficient for most areas of the roadway subgrade provided warm and preferably breezy weather conditions are present during the project construction, and there is adequate time to perform scarification and drying construction procedures. However, it is likely that some areas of the subgrade will require specialty stabilization techniques. We have provided cursory recommendations for stabilization of severely yielding soil materials in Section 5.0 below.

The subgrade soil materials should be scarified to a depth of about 8 inches, moisture conditioned, and compacted to at least 90 percent of the maximum dry density as defined by ASTM D1557 or AASHTO T180 (Modified Proctor). Proof rolling observations should then be performed over the prepared subgrade surface. Any areas of significant yielding should be stabilized as needed prior to placement of the overlying aggregate base course materials. The surface of the subgrade soil should be graded and contoured to be approximately parallel to the finished grade of the asphalt surface.

The aggregate materials used within the pavement section should conform to the requirements outlined in the current Specifications for Road and Bridge Construction, Colorado Department of Transportation (CDOT). The aggregate base material should be a ¾ inch minus material that conforms to the CDOT Class 6 aggregate base course specifications and have an R-value of at least 78. The aggregate sub-base course should conform to the CDOT specifications for Class 2 material and should have a minimum R-value 70. Other material may be suitable for use in the pavement section, but materials different than those listed above should be tested and observed by us prior to inclusion in the project design or construction. Aggregate sub-base and base-course materials should be compacted to at least 95 percent of maximum dry density as defined by the modified Proctor test, ASTM D1557.

Thorough proof rolling with a fully loaded tandem axle water truck should be performed across the prepared aggregate surface prior to placement of the asphalt cement. Any areas that are observed to yield should be stabilized as necessary. We should be contacted to observe the proof rolling operations and provide recommendations for stabilization if necessary.

The drainage characteristics of the roadway should be addressed by the project civil engineer. Surface water must not be allowed to pool in areas adjacent to the asphalt pavement roadway.

9.4 *Portland Cement Concrete Pavement Recommendations*

For concrete pavements (rigid pavements), we recommend a minimum of 5-inches of Portland cement concrete (PCC). Concrete pavement underlain by 12 inches Class 6 aggregate base course is recommended 1) to create a uniform subbase/base, 2) to limit potential of pumping of fines from beneath the pavement, 3) provide a working platform for construction, and 4) to help control frost heave soils.

All concrete should be based on a mix design established by a qualified engineer. A CDOT Class P or D mix would be acceptable. The design mix should consist of aggregate, Portland cement, water, and additives which will meet the requirements contained in this section. The concrete should have a modulus of rupture of third point loading of 650 psi. Normally, concrete with a 28-

day compressive strength of 4,200 psi will meet this requirement. Concrete should contain approximately 6 percent entrained air. Maximum allowable slump should not exceed 4 inches.

The concrete should contain joints not greater than 10 feet on centers. Joints should be sawed or formed by pre-molded filler. The joints should be at least 1/3 of the slab thickness. Joints should be reinforced with dowels to provide load transfer between slabs. Concrete pavement joints should meet the requirements of CDOT Standard Plan No. M 412-1 and CDOT Standard Specifications Section 412.13. Expansion joints should be provided at the end of each construction sequence and between the concrete slab and adjacent structures. Expansion joints, where required, should be filled with a ½-inch thick asphalt impregnated fiber. Concrete should be cured by protecting against loss of moisture, rapid temperature changes and mechanical injury for at least three days after placement. After sawing joints, the saw residue shall be removed and the joint sealed.

9.5 *Limited Pavement Evaluation of County Road 252*

This section of the report provides an analysis for the existing structural number of the existing asphalt pavement section in the areas tested along CR 252. As requested, we advanced two test borings along County Road 252. A tabulation of the subsurface conditions is tabulated below. The locations are presented on Figure 2.3 above. Our analysis is intended to be general in nature as it is based on limited field and laboratory data and is intended to provide the structural number and corresponding 18K ESAL for the existing roadway. The following analysis should be considered valid only for the portion of County Road 252 within the tested areas.

Table 1 – Subsurface Conditions Summary Table

Test Boring#	Asphalt Thickness	ABC Thickness	Minimum Pit Run Thickness	Comments
TB-15	6.5”	10.5”	4”	Auger refusal on pit run material at 21 inches
TB-16	6.5”	4”	10”	Auger refusal on pit run material at 20 inches

Based on our observations of the existing asphalt pavement surface, we feel that the existing asphalt pavement in the project area may be considered as being in fair to good condition. We observed localized areas on the roadway surface where moderate alligator cracking, potholing/patching, and longitudinal and transverse cracking has occurred in the pavement surface. We suspect that the distressed area is related to the age of the pavement section, poor drainage, freeze-thaw, and structurally deficient sections of asphalt pavement for the existing traffic loading.

Based on the subsurface conditions encountered and laboratory test data, we feel that the following general assumptions can be made regarding the average asphalt pavement section and underlying aggregate base course and subgrade support conditions;

- The thickness of the existing asphalt pavement materials encountered in our test boring is 6.5 inches.
- Aggregate base course (ABC) ranged in thickness from approximately 4 to 10.5 inches.
- 3 to 8 inch Pit Run type material was encountered below the ABC layer to depths of

practical auger refusal at 20 and 21 inches.

- A structural number coefficient of the existing asphalt pavement layer of 0.35 has been assumed. A structural number coefficient of the existing aggregate base course material of 0.11 has been assumed. A structural number coefficient of the existing pit run material of 0.08 has been assumed. The R-value of a composite sample of the existing aggregate base course was 72.
- We estimated an R-Value of 10 for the subgrade soils. A roadbed resilient modulus M_r equal to about 3,562 psi was estimated based on laboratory testing.
- A structural number of the total existing asphalt pavement section of 3.5 has been estimated based on the averages and details assumed above.

An estimated structural number of 3.5 can support an estimated 18-kip ESAL value of 350,000, assuming a 10 year design life.

10.0 CONSTRUCTION MONITORING AND TESTING

Engineering observation of subgrade bearing conditions, compaction testing of fill material and testing of foundation concrete are equally important tasks that should be performed by the geotechnical engineering consultant during construction. We should be contacted during the construction phase of the project and/or if any questions or comments arise as a result of the information presented below. It is common for unforeseen, or otherwise variable subsurface soil and water conditions to be encountered during construction. As discussed in our proposal for our services, it is imperative that we be contacted during the foundation excavation stage of the project to verify that the conditions encountered in our field exploration were representative of those encountered during construction. Our general recommendations for construction monitoring and testing are provided below.

- Consultation with design professionals during the design phases: This is important to ensure that the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.
- Grading Plan Review: A grading plan was not available for our review at the time of this report. A grading plan with finished floor elevations for the proposed construction should be prepared by a civil engineer licensed in the State of Colorado. Trautner Geotech should be provided with grading plans once they are complete to determine if our recommendations based on the assumed bearing elevations are appropriate.
- Observation and monitoring during construction: A representative of the Geotechnical engineer from our firm should observe the foundation excavation, earthwork, and foundation phases of the work to determine that subsurface conditions are compatible with those used in the analysis and design and our recommendations have been properly implemented. Placement of backfill should be observed and tested to judge whether the proper placement conditions have been achieved. Compaction tests should be performed on each lift of material placed in areas proposed for support of structural components.
- We recommend a representative of the geotechnical engineer observe the drain and dampproofing phases of the work to judge whether our recommendations have been properly implemented.
- If asphaltic concrete is placed for driveways or aprons near the structure we are available to provide testing of these materials during placement.

11.0 CONCLUSIONS

While we feel that it is feasible to develop this site as planned using relatively conventional techniques we feel that it is prudent for us to be part of the continuing design of this project to review and provide consultation in regard to the proposed development scheme as the project progresses to aid in the proper interpretation and implementation of the recommendations presented in this report. This consultation should be incorporated in the project development prior to construction at the site.

12.0 LIMITATIONS

This study has been conducted based on the geotechnical engineering standards of care in this area at the time this report was prepared. We make no warranty as to the recommendations contained in this report, either expressed or implied. The information presented in this report is based on our understanding of the proposed construction that was provided to us and on the data obtained from our field and laboratory studies. Our recommendations are based on limited field and laboratory sampling and testing. Unexpected subsurface conditions encountered during construction may alter our recommendations. We should be contacted during construction to observe the exposed subsurface soil conditions to provide comments and verification of our recommendations.

The recommendations presented above are intended to be used only for this project site and the proposed construction which was provided to us. The recommendations presented above are not suitable for adjacent project sites, or for proposed construction that is different than that outlined for this study.

This report provides geotechnical engineering design parameters, but does not provide foundation design or design of structure components. The project architect, designer or structural engineer must be contacted to provide a design based on the information presented in this report.

This report does not provide an environmental assessment nor does it provide environmental recommendations such as those relating to Radon or mold considerations. If recommendation relative to these or other environmental topics are needed and environmental specialist should be contacted.

The findings of this report are valid as of the present date. However, changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or the broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

We are available to review and tailor our recommendations as the project progresses and additional information which may influence our recommendations becomes available.

Please contact us if you have any questions, or if we may be of additional service.

Respectfully,
TRAUTNER GEOTECH

Tom R. Harrison P.E.
Geotechnical Engineer

APPENDIX A

Field Study Results

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/24/2023
Total Depth (approx.)	: 12 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-1

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	POORLY GRADED GRAVEL WITH SILT AND SAND, medium dense, moist to very moist, brown to tan	GP-GM					Fill material to 1 foot
1							
2							Hole collapsed to 2 feet
3							Pocket of SP from 3-5 feet
4							
5							
6							
7	SANDY SILTY CLAY WITH GRAVEL, soft, wet, brown	CL-ML					
8							
9							
10							
11	POORLY GRADED GRAVEL WITH SILT AND SAND AND COBBLE, dense, wet, brown	GP-GM					
12	Auger refusal on cobble at 12 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/24/2023
Total Depth (approx.)	: 19 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-2

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND AND COBBLE, medium dense, slightly moist, tan	GC					Top 4 inches of fill
1	POORLY GRADED SAND, silty and slightly sandy, loose to medium dense, moist, brown	SP					
2					4/6		
3	POORLY GRADED GRAVEL WITH SAND, medium dense to dense, moist, brown				14/6		Hole collapsed to 3.5 feet after drilling
4							Pockets of SP
5							
6		GP-GM					
7							
8							
9							
10	POORLY GRADED GRAVEL WITH SAND, silty, medium dense to loose, very moist,						
11							
12							
13							
14		GP-SP					
15							
16							
17							
18							
19	Boring terminated at 19 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/24/2023
Total Depth (approx.)	: 14 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-3

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0–6	SILTY CLAYEY GRAVEL WITH SAND SILT AND COBBLE, dense, slightly moist to moist, tan to brown	GC-GM			20/6 28/6		Top 8 inches fill
6–8	POORLY GRADED SAND, organics, medium dense to loose, very moist to wet, dark brown to brown	SP				▼	
8–14	SILTY GRAVEL WITH SAND, few cobbles, medium dense, wet, brown	GM			6/6 8/6 7/6		
14	Boring terminated at 14 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/24/2023
Total Depth (approx.)	: 18.5 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-4

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND, slightly silty, medium dense, slightly moist to moist, tan	GC					
1	CLAYEY SAND WITH GRAVEL, loose, moist to very moist to wet, brown						
2					4/6		
3					4/6		
4					3/6		
5					4/6		
6		SC					Few cobbles from 6-8 feet
7							
8						▼	
9							
10							
11	LEAN CLAY, very soft to soft, wet, brown to gray						Pond material
12							
13		CL					
14					1/6		
15					1/6		
16					1/6		
17	SILTY GRAVEL WITH SAND AND CLAY AND COBBLE, loose to dense, wet, brown	GM					Increase in density at 17 feet
18							
19	Boring terminated at 18.5 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/24/2023
Total Depth (approx.)	: 14 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-5

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0–2	SANDY LEAN CLAY WITH GRAVEL AND SILT, stiff, moist, brown	CL					Fill up to 2 feet
2–4	SILTY GRAVEL WITH SAND AND COBBLE, medium dense, moist, brown	GM					
4–6	CLAYEY SAND WITH SILT, very stiff, moist, brown	SC			10/6 13/6		Hole collapsed to 5 feet
6–8	POORLY GRADED GRAVEL WITH COBBLE, dense, very moist, brown	GP					
8–14	POORLY GRADED SAND WITH SILT, few gravels, loose, wet, brown	SP					
14	Boring terminated at 14 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/24/2023
Total Depth (approx.)	: 14 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-6

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0–1	CLAYEY GRAVEL AND SAND WITH SILT, medium dense, moist, brown	GC-SC					
2–4	SILTY CLAY WITH SAND, few organics, soft, moist, brown	CL-ML			2/6		Fill up to 2 feet
4–5					2/6		
5–13	CLAYEY SAND WITH SILT, soft to loose, moist to wet, brown	SC					Attempted drive at 14 feet, 6 inches of sluff
14	Boring terminated at 14 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 4.5 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-7

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND, medium dense, slightly moist, tan	GC					
1	CLAYEY SAND WITH GRAVEL, slightly silty, medium dense to dense, moist, brown	SC					Fill up to 10 inches
2	SILTY GRAVEL, dense, moist, brown	GM			42/6		
3					50/4		
4	POORLY GRADED GRAVEL WITH COBBLE, very dense, moist, brown	GP					
	Auger refusal on heavy cobble at 4.5 feet						
5							

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 3.5 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-8

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND, medium dense, slightly moist, tan	GC					
1	POORLY GRADED GRAVEL WITH SILT AND SAND, very dense, moist, brown	GP-GM					
2							
3							
	Auger refusal on heavy cobble at 3.5 feet						
4							

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 17.5 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-9

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND, medium dense, slightly moist, brown	GC					
1	SILTY SAND WITH GRAVEL, medium dense, moist, brown to dark brown	SM					Fill up to 1 foot
2							
3	SANDY SILTY CLAY, medium stiff, moist, brown	CL-ML					
4					4/6		
5	SILTY CLAYEY GRAVEL WITH SAND AND COBBLE, medium dense, moist, brown				11/6		
6							
7							Pocket of SP from 7.5 to 9.5 feet
8							
9							Attempted drive at 9 feet, hole collapsed to 4 feet
10							
11		GC-GM					
12							
13							
14							
15							
16							Increase in cobble at 16 feet
17							
18	Auger refusal on heavy cobble at 17.5 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 7.5 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-10

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND, medium dense, slightly moist, tan	GC					
1	CLAYEY SAND WITH SILT, medium dense, moist, brown	SC			10/6		
2							
3	POORLY GRADED GRAVEL WITH SAND AND SILT, medium dense to dense to very dense, moist, brown	GP			14/6		Heavy rounded river cobbles with minor fines
4							
5							
6							
7							
8	Auger refusal on heavy cobble at 7.5 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 6.5 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-11

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY SAND WITH GRAVEL AND SILT, medium dense, slightly moist, tan	SC					
1							
2	SILTY GRAVEL WITH SAND AND COBBLE, dense, moist, brown	GM					
3							
4							
5	POORLY GRADED GRAVEL WITH SAND AND COBBLE, slightly silty, very dense, moist, brown	GP					
6							
7	Auger refusal on heavy cobble at 6.5 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 8 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-12

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	CLAYEY GRAVEL WITH SAND, medium dense, slightly moist, brown	GC					ABC fill top 10 inches
2	POORLY GRADED SAND WITH SILTY GRAVEL, very loose to loose, moist, brown	SP-GM			push/6 2/6 2/6		Gravels at 3.5 feet
5	POORLY GRADED GRAVEL WITH SAND AND COBBLE, very dense, moist, brown	GP					
8	Auger refusal on heavy cobble at 8 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 19 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-13

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0–1	POORLY GRADED GRAVEL WITH SAND AND COBBLE, medium dense to dense, slightly moist, tan	GP					
2–5	POORLY GRADED SAND WITH SILT AND GRAVEL, medium dense, moist, brown	SP			9/6 9/6		
6–19	SILTY GRAVEL WITH SAND AND COBBLE, very dense to medium dense, moist to very moist, brown	GM					Pockets of SP Decrease in density at 10 feet
19	Boring terminated at 19 feet						

TRAUTNER GEOTECH LLC

Field Engineer	: C. Deleon
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 05/26/2023
Total Depth (approx.)	: 14 feet
Location	: See Figure in Report

LOG OF TEST BORING TB-14

Durango River View Resort
Brian Fero
C/O Travis Mooney, PE
970-459-9009

57927GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

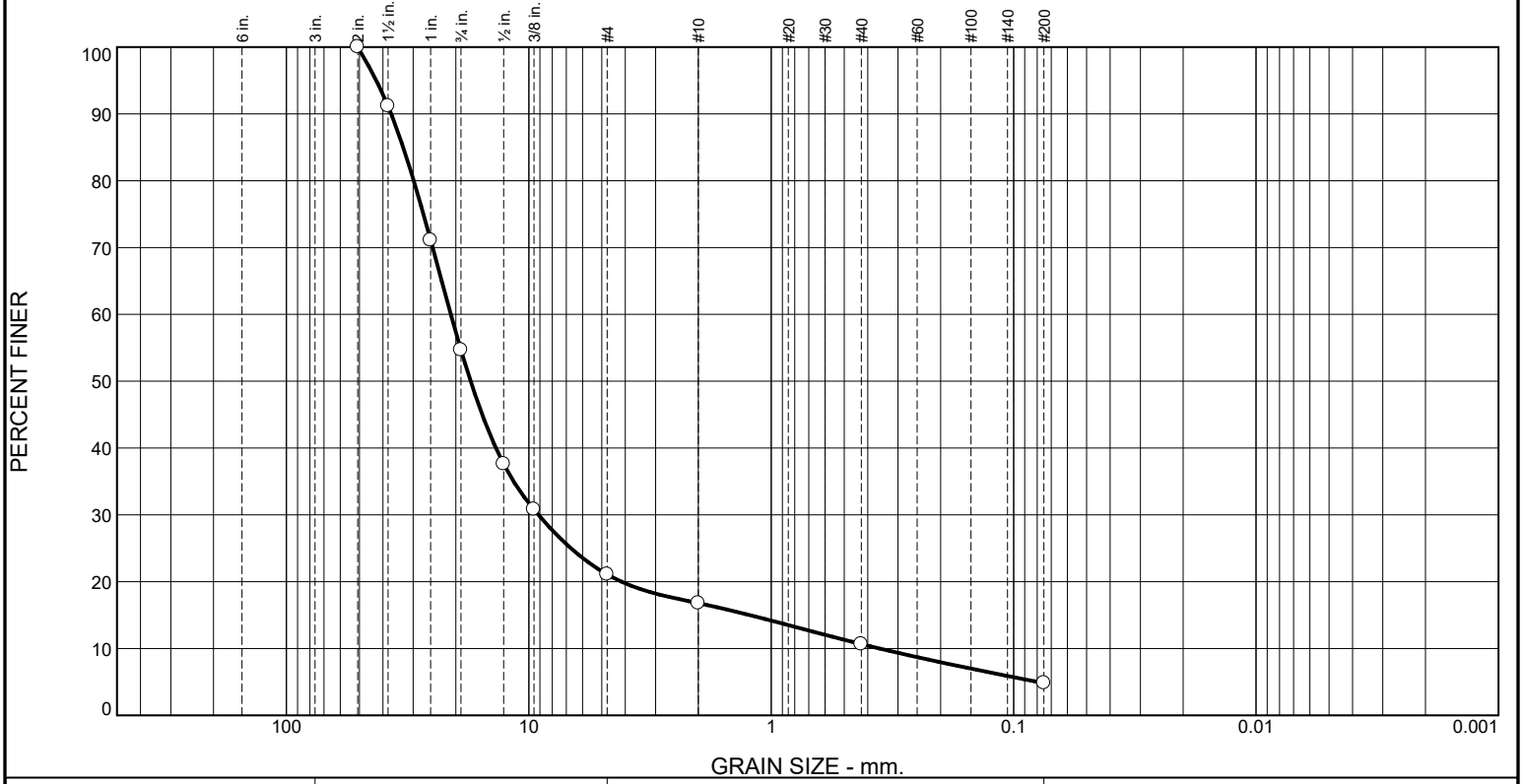
Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	SILTY GRAVEL WITH SAND, slightly clayey, medium dense, moist, brown	GM					
3	SANDY SILTY CLAY, soft, moist to very moist, brown to gray	CL-ML			2/6 2/6		Pond material from 3 to 7.5 feet
8	SILTY GRAVEL WITH SAND AND COBBLE, medium dense to dense, wet, brown	GM			7/6 6/6 5/6		Increase in density at 13 feet
14	Boring terminated at 14 feet						

APPENDIX B

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	45	34	4	6	6	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100		
1-1/2"	91		
1"	71		
3/4"	55		
1/2"	38		
3/8"	31		
#4	21		
#10	17		
#40	11		
#200	5		

* (no specification provided)

Material Description

GP-GM-Poorly Graded Gravel with Silt and Sand

Atterberg Limits

PL= 0 LL= 0 PI= 0

Coefficients

D_{90}= 36.9556 D_{85}= 32.9768 D_{60}= 20.9802
D_{50}= 17.3820 D_{30}= 9.1235 D_{15}= 1.2278
D_{10}= 0.3572 C_u= 58.74 C_c= 11.11

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

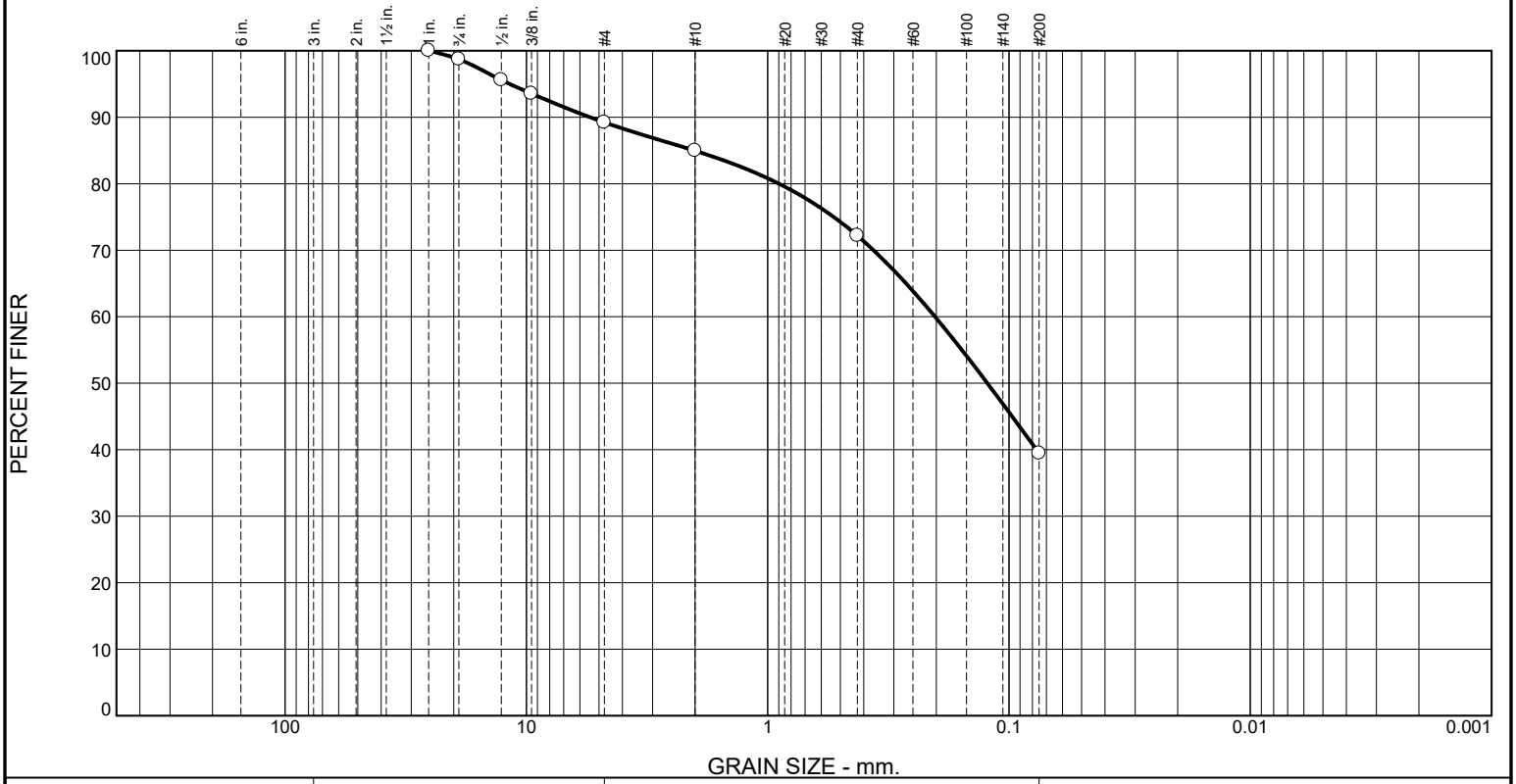
Source of Sample: Test Boring 3 **Depth:** 0'-4'
Sample Number: 13074-E **Date:** 5-24-23

TRAUTNER GEOTECH LLC

Client: Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort
Project No: 57927GE **Figure** B.1

Tested By: N. Ellis **Checked By:** J. Koch

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	1	10	4	13	33	39	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
3/4"	99		
1/2"	96		
3/8"	94		
#4	89		
#10	85		
#40	72		
#200	39		

* (no specification provided)

Material Description

SC-SM-Silty, Clayey Sand

Atterberg Limits

PL= 18 LL= 25 PI= 7

Coefficients

D_{90}= 5.4486 D_{85}= 2.0174 D_{60}= 0.2025
D_{50}= 0.1229 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Source of Sample: Bulk Subgrade
Sample Number: 13074-Y

Date: 5-26-23

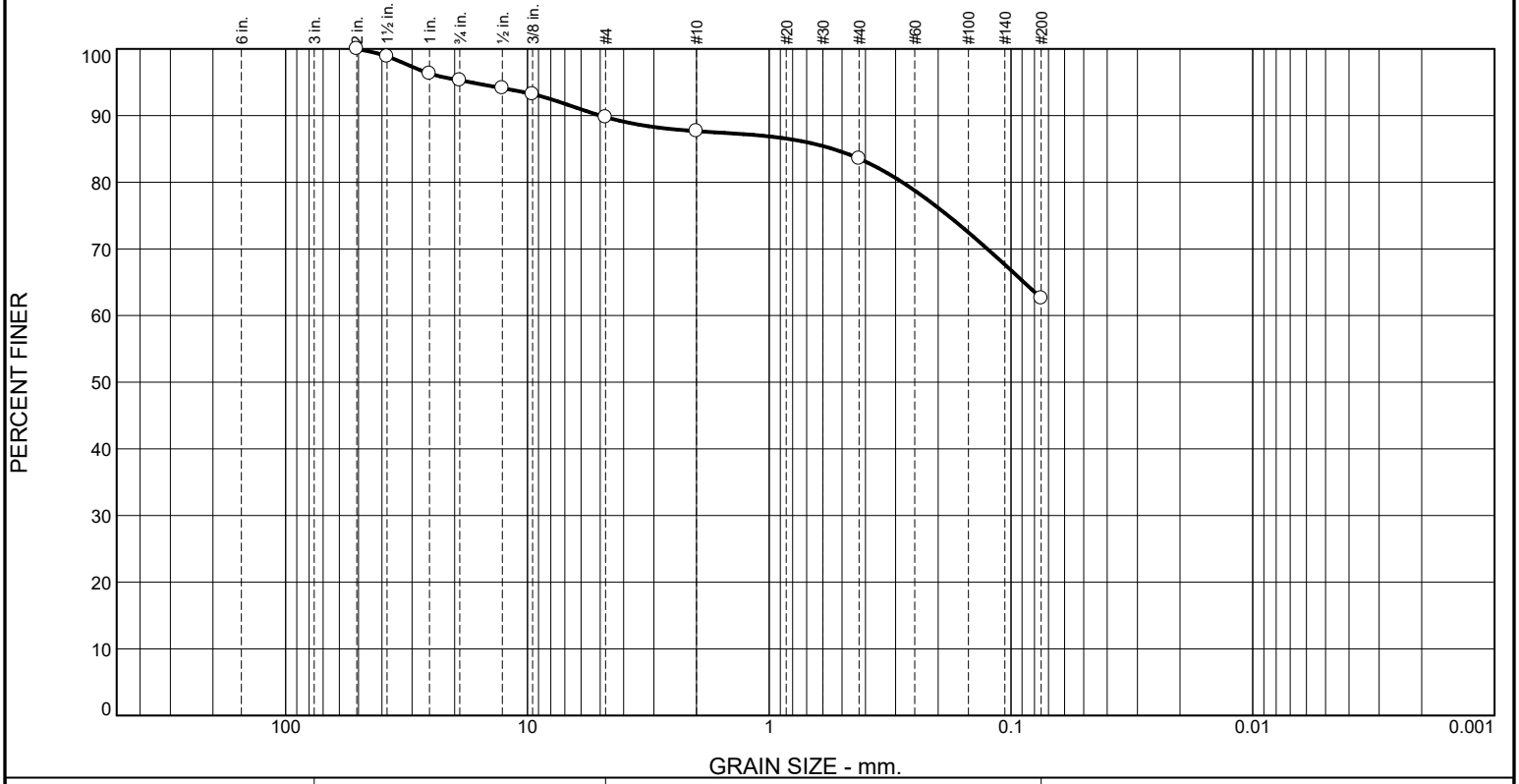
TRAUTNER GEOTECH LLC

Client: Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort

Project No: 57927GE **Figure** B.2

Tested By: N. Ellis **Checked By:** J. Koch

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	5	5	2	4	21	63	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100		
1.5	99		
1.	96		
3/4"	95		
1/2"	94		
3/8"	93		
#4	90		
#10	88		
#40	84		
#200	63		

* (no specification provided)

Material Description

ML-Sandy Silt

Atterberg Limits

PL= Non Plastic LL= NLL PI= NPI

Coefficients

D_{90}= 4.9980 D_{85}= 0.5454 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

Source of Sample: Bulk Berm Material
Sample Number: 13074-Z

Date: 5-24-23

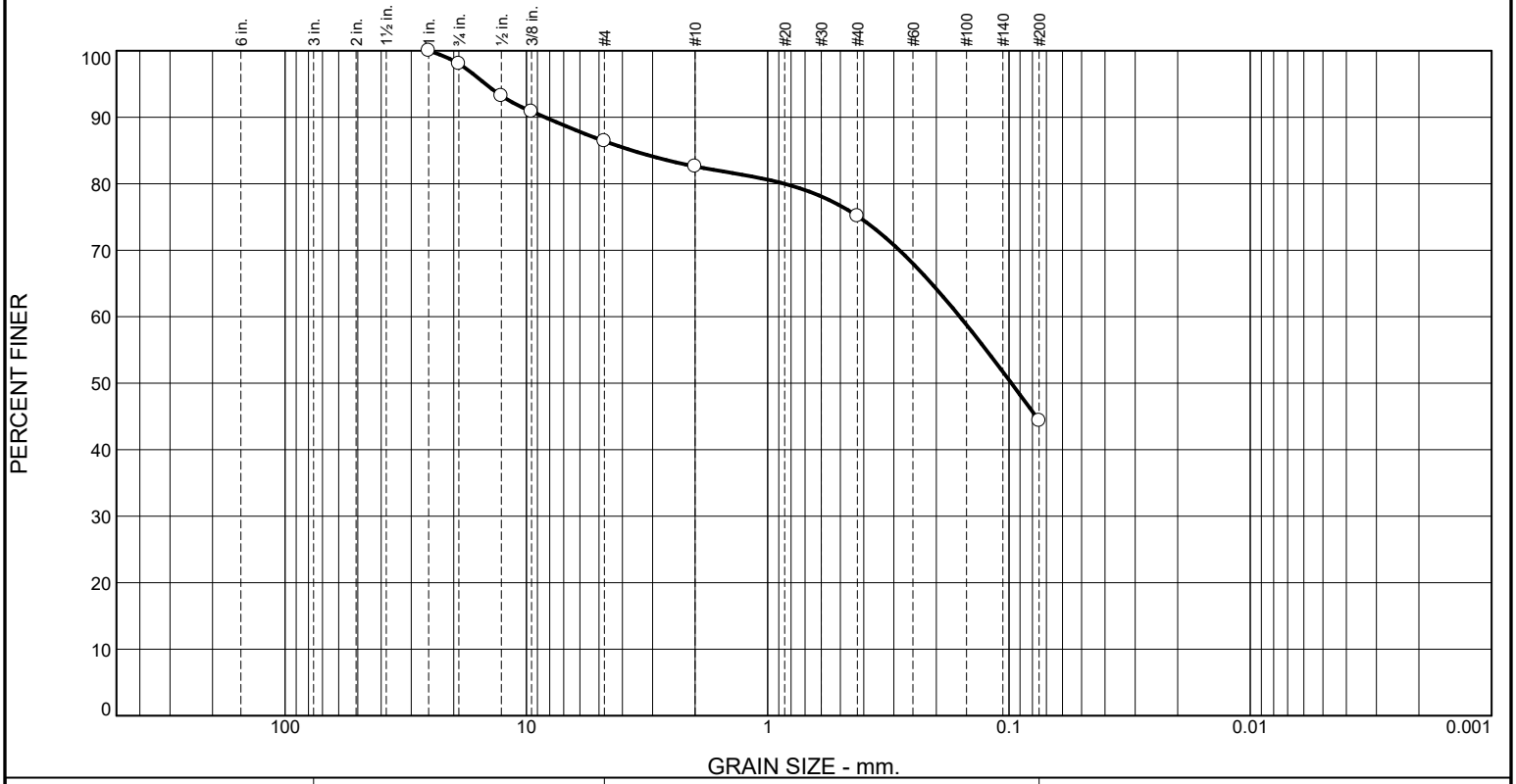
TRAUTNER GEOTECH LLC

Client: Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort

Project No: 57927GE **Figure** B.3

Tested By: G. Jadrych **Checked By:** J. Koch

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	2	12	3	8	31	44	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
.75	98		
.50	93		
.375	91		
#4	86		
#10	83		
#40	75		
#200	44		

* (no specification provided)

Material Description

SC-Clayey Sand

Atterberg Limits

PL= 18 LL= 27 PI= 9

Coefficients

D_{90}= 8.3787 D_{85}= 3.6437 D_{60}= 0.1597
D_{50}= 0.0977 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

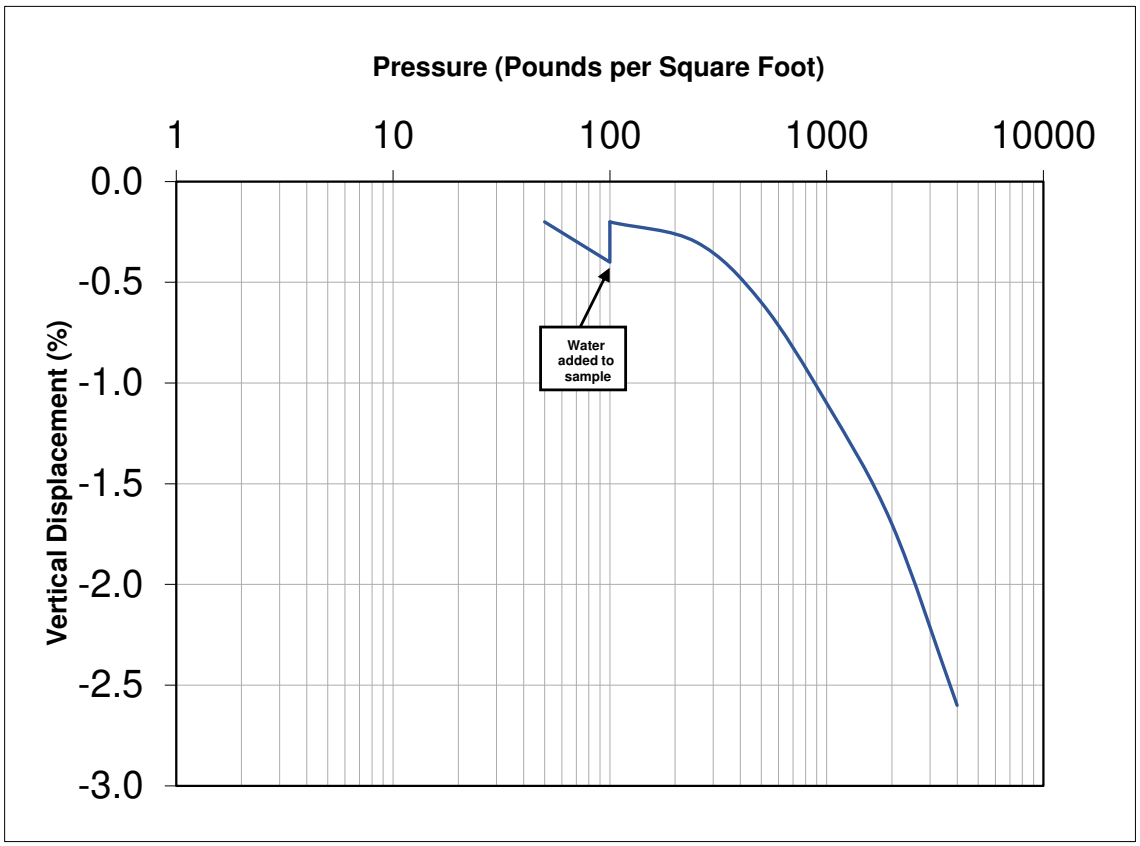
Source of Sample: Test Boring 14 **Depth:** 0'-4'
Sample Number: 13074-I **Date:** 5-26-23

TRAUTNER GEOTECH LLC

Client: Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort
Project No: 57927GE **Figure** B.4

Tested By: N. Ellis **Checked By:** J. Koch

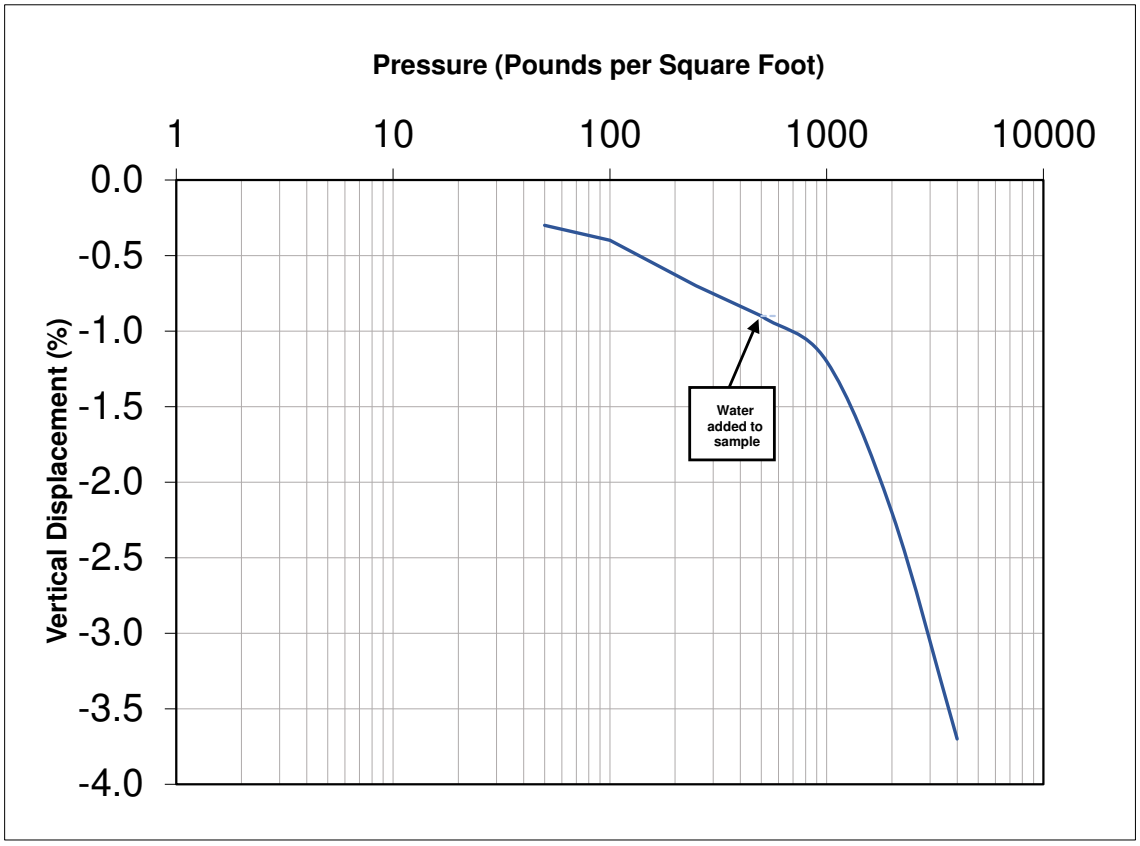
SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-4 @ 2'	
Visual Soil Description:	CL-ML	
Swell Potential (%)	0.2%	
Estimated Load-Back Swell Pressure (lb/ft^2):	320	
	Initial	**Final**
Moisture Content (%):	14.1	22.4
Dry Density (lb/ft^3):	105.3	104.6
Height (in.):	1.000	0.974
Diameter (in.):	1.94	1.94

Project Number:	57927 GE
Sample ID:	13074-I
Figure:	B.5

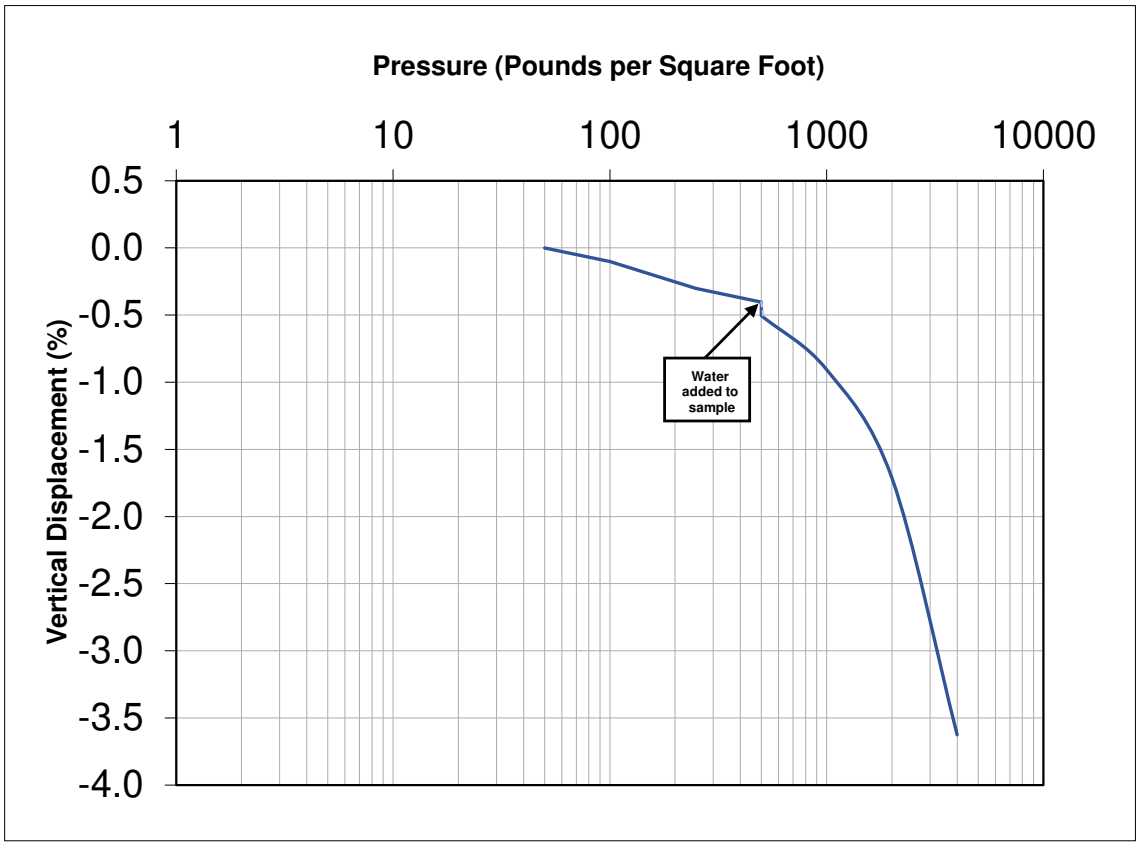
SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-6 @ 4'	
Visual Soil Description:	CL-MC	
Swell Potential (%)	0.0%	
Estimated Load-Back Swell Pressure (lb/ft^2):	0	
	Initial	**Final**
Moisture Content (%):	24.9	26.6
Dry Density (lb/ft^3):	93.5	96.8
Height (in.):	1.000	0.963
Diameter (in.):	1.94	1.94

Project Number:	57927 GE
Sample ID:	13074-O
Figure:	B.6

SWELL - CONSOLIDATION TEST

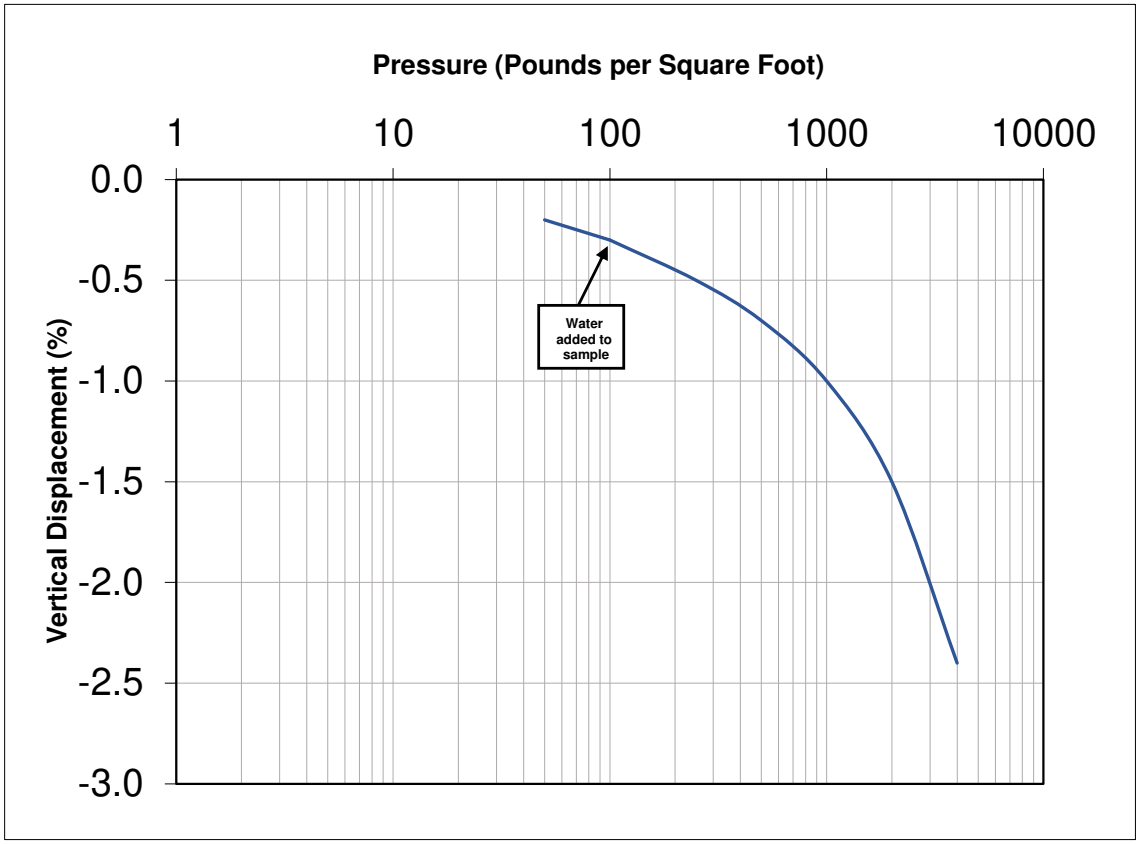


SUMMARY OF TEST RESULTS		
Sample Source:	TB-9 @ 4'	
Visual Soil Description:	SC	
Swell Potential (%)	-0.1%	
Constant Volume Swell Pressure (lb/ft^2):	0	
	Initial	**Final**
Moisture Content (%):	11.2	20.0
Dry Density (lb/ft^3):	105.5	109.0
Height (in.):	0.993	0.957
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	57927GE
Sample ID:	13074-U
Figure:	B.7

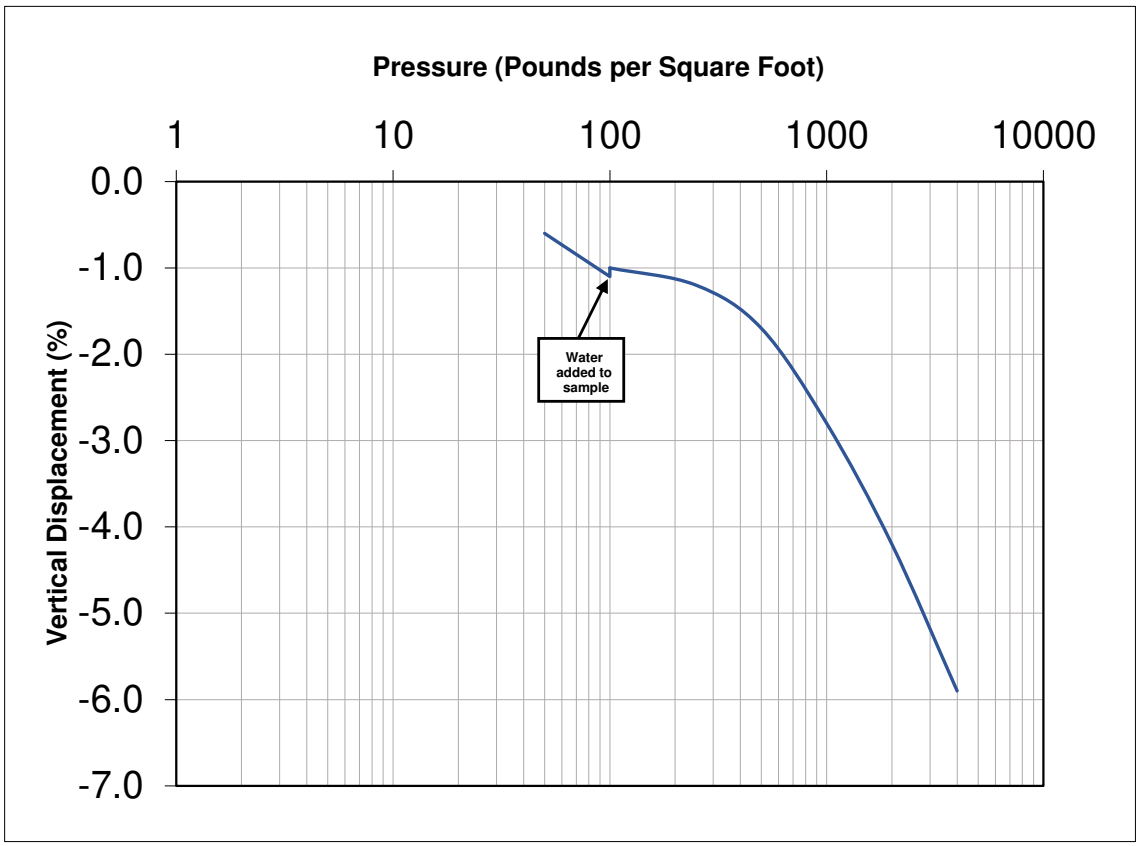
SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-12 @ 2'	
Visual Soil Description:	SC	
Swell Potential (%)	0.0%	
Estimated Load-Back Swell Pressure (lb/ft^2):	0	
	Initial	**Final**
Moisture Content (%):	22.6	17.1
Dry Density (lb/ft^3):	101.8	111.0
Height (in.):	1.000	0.976
Diameter (in.):	1.94	1.94

Project Number:	57927GE
Sample ID:	13074-AD
Figure:	B.8

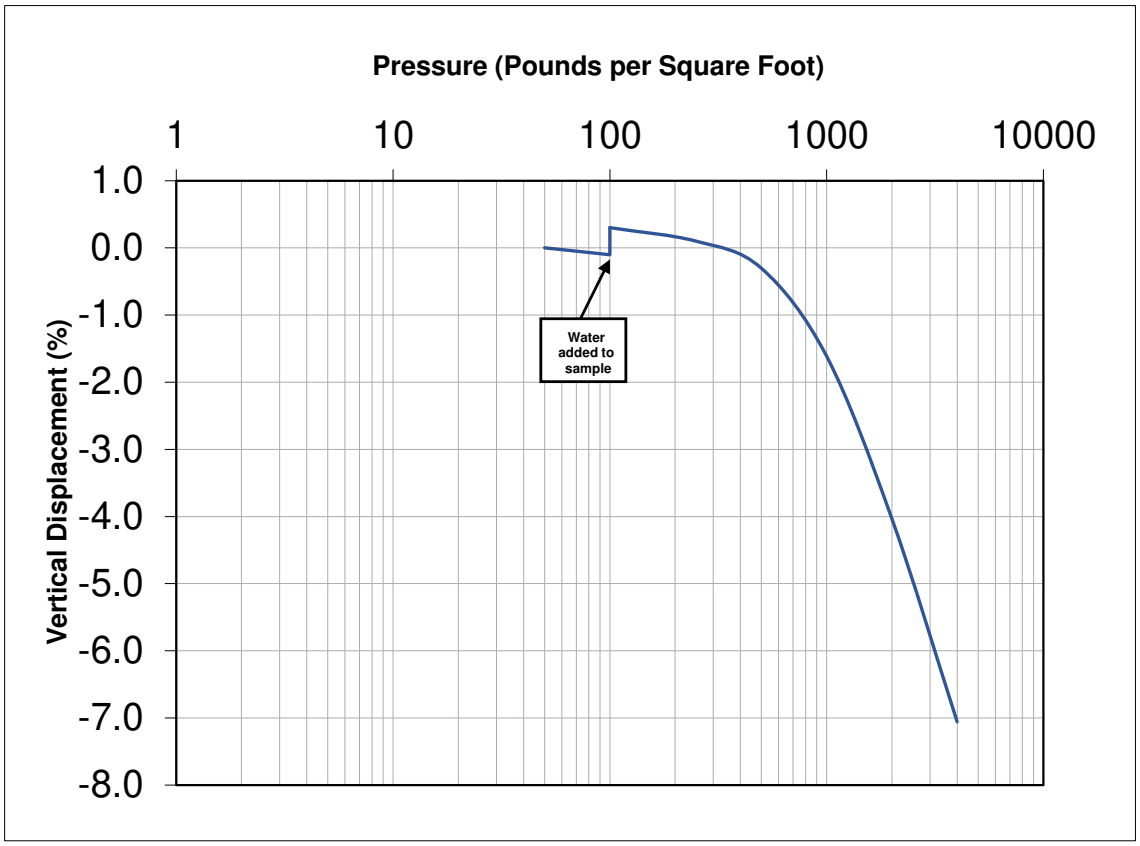
SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-14 @ 4'	
Visual Soil Description:	CL-ML	
Swell Potential (%)	0.1%	
Estimated Load-Back Swell Pressure (lb/ft^2):	180	
	Initial	**Final**
Moisture Content (%):	40.2	35.2
Dry Density (lb/ft^3):	82.3	89.1
Height (in.):	1.000	0.941
Diameter (in.):	1.94	1.94

Project Number:	57927GE
Sample ID:	13074-J
Figure:	B.9

SWELL - CONSOLIDATION TEST

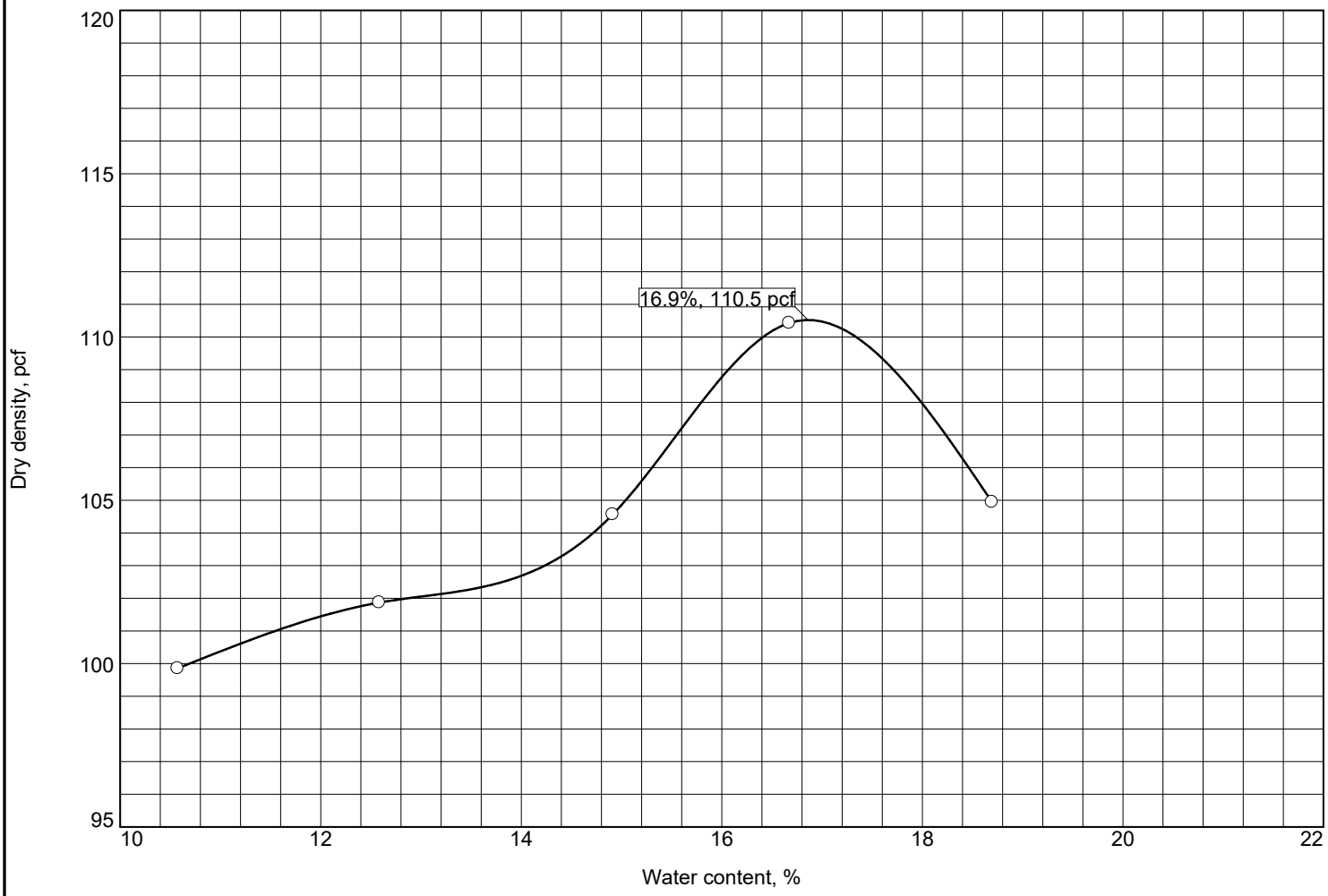


SUMMARY OF TEST RESULTS		
Sample Source:	Berm Material	
Visual Soil Description:	ML	
Swell Potential (%)	0.4%	
Estimated Free Swell Pressure (psf):	410	
	Initial	**Final**
Moisture Content (%):	11.4	32.0
Dry Density (lb/ft^3):	81.8	87.1
Height (in.):	0.992	0.922
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	57927GE
Sample ID:	13074-Z
Figure:	B.10

MOISTURE/DENSITY RELATIONSHIP



Test specification: ASTM D 1557-12 Method C Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	ML	A-4(0)			NV	NP	5	63

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 110.5 pcf Optimum moisture = 16.9 %	ML-Sandy Silt

Project No. 57927GE **Client:** Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort

○ **Source of Sample:** Bulk Berm Material **Sample Number:** 13074-Z

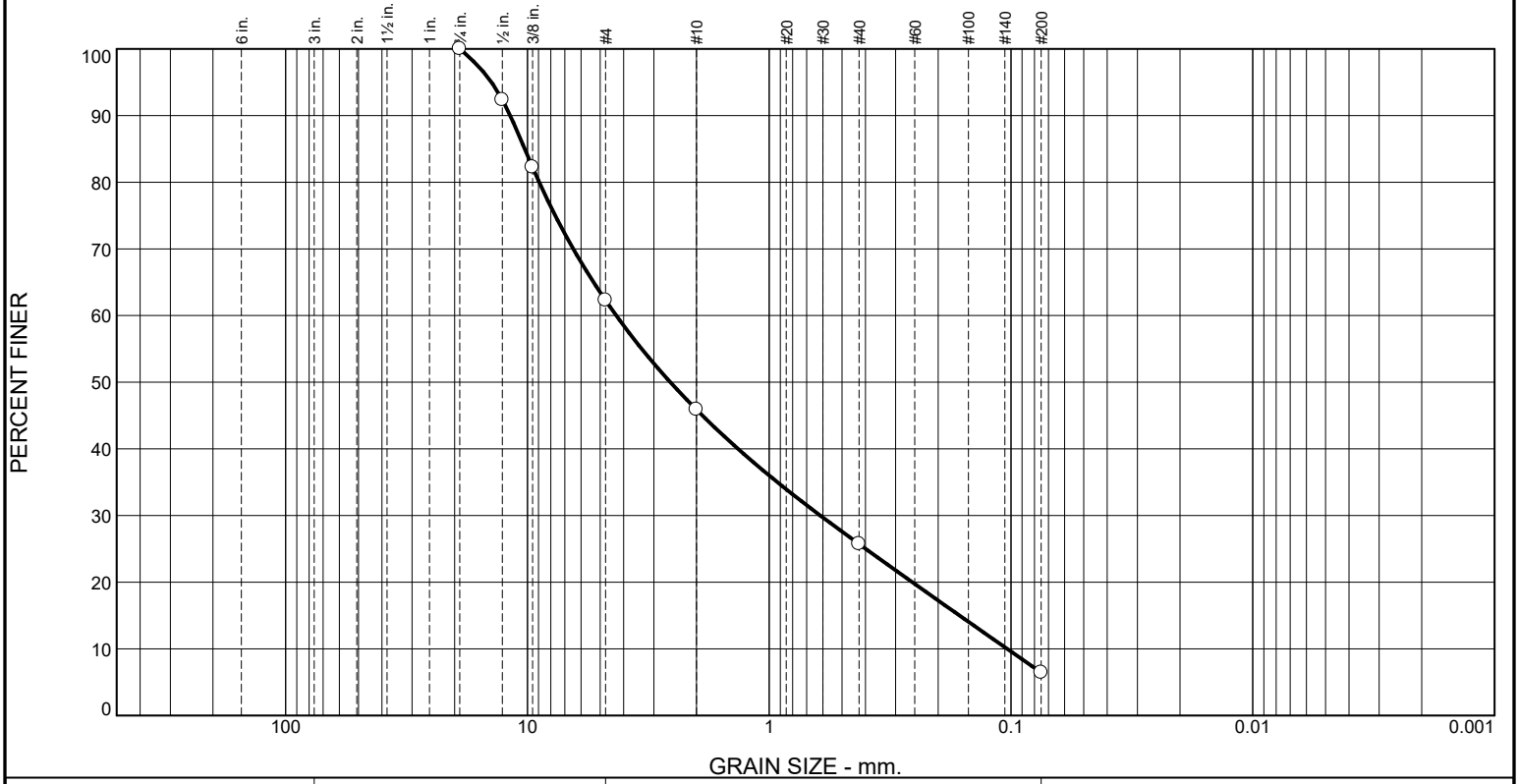
Remarks:

TRAUTNER GEOTECH LLC

Figure B.11

Tested By: N. Ellis **Checked By:** K. Moran

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	38	16	20	20	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100		
.50	92		
.375	82		
#4	62		
#10	46		
#40	26		
#200	6		

* (no specification provided)

Material Description

SP-SM-Poorly Graded Sand with Silt and Gravel

Atterberg Limits

PL= NPL LL= NLL PI= Non-Plastic

Coefficients

D_{90}= 11.7873 D_{85}= 10.2630 D_{60}= 4.2908
D_{50}= 2.5638 D_{30}= 0.6143 D_{15}= 0.1632
D_{10}= 0.1037 C_u= 41.40 C_c= 0.85

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

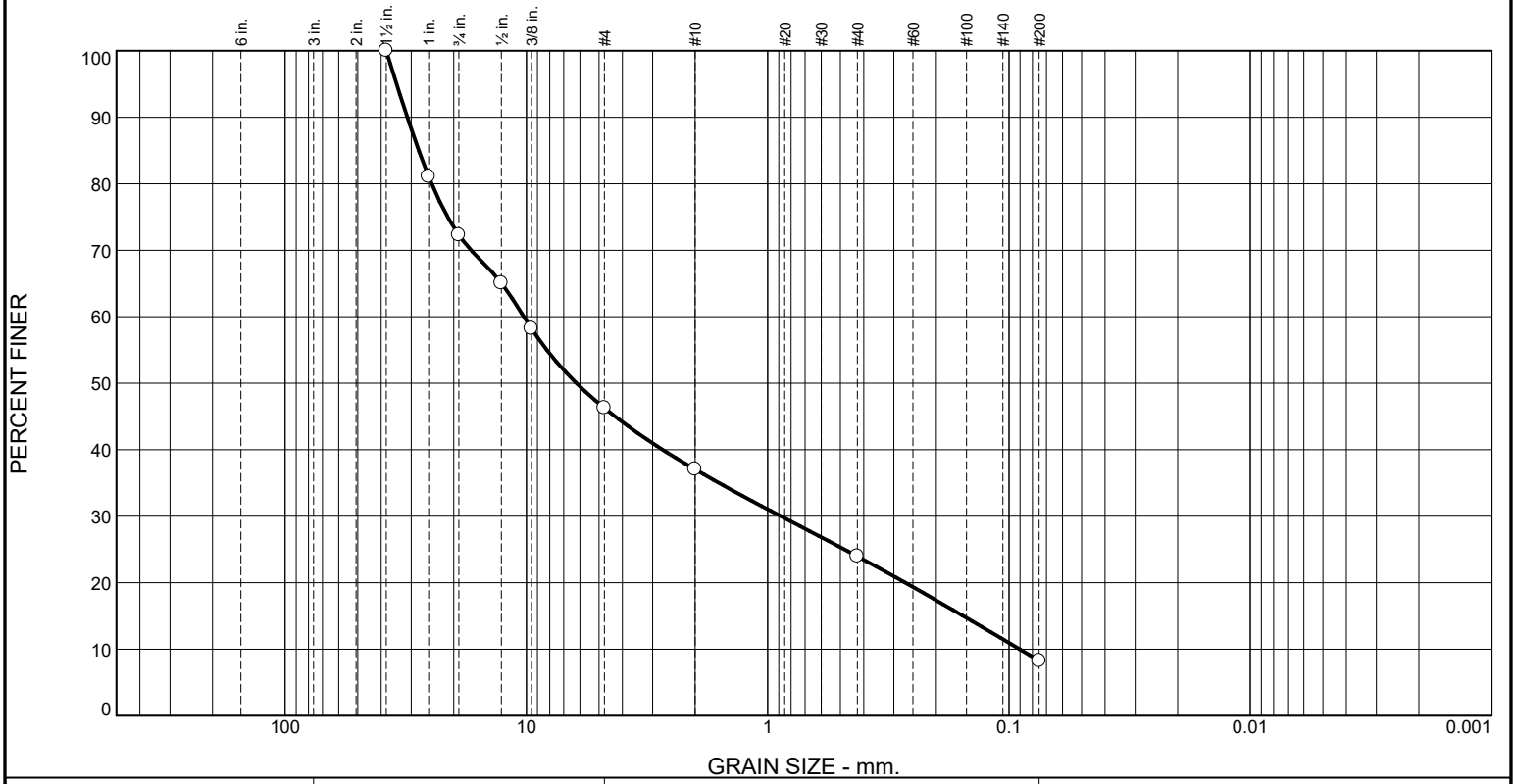
Source of Sample: Test Boring 15 **Depth:** 8"-17'
Sample Number: 13086-B **Date:** 6-19-23

TRAUTNER GEOTECH LLC

Client: Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort
Project No: 57927GE **Figure** B.12

Tested By: J. Vaughn **Checked By:** J. Koch

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	28	26	9	13	16	8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100		
1"	81		
3/4"	72		
1/2"	65		
3/8"	58		
#4	46		
#10	37		
#40	24		
#200	8		

* (no specification provided)

Material Description

GP-GM-Poorly Graded Gravel with Silt and Sand

Atterberg Limits

PL= 18 LL= 20 PI= 2

Coefficients

D_{90}= 31.1446 D_{85}= 27.9249 D_{60}= 10.2472
D_{50}= 6.2015 D_{30}= 0.8813 D_{15}= 0.1548
D_{10}= 0.0903 C_u= 113.44 C_c= 0.84

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

Source of Sample: Test Boring 16 **Depth:** 10"-20"
Sample Number: 13086-D **Date:** 6-19-23

TRAUTNER GEOTECH LLC

Client: Roberts Communities and Resorts, Brian Fero
Project: Durango River View RV Resort
Project No: 57927GE **Figure** B.13

Tested By: C. Manchester **Checked By:** J. Deem

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