TRAFFIC IMPACT STUDY

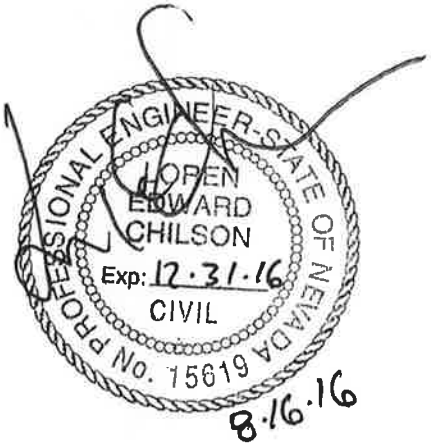
FOR

The Vintage at Kings Canyon

August 16, 2016

PREPARED BY:

TRAFFIC WORKS LLC



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YOUR QUESTIONS ANSWERED QUICKLY

Why did you perform this study?

This Traffic Impact Study evaluates the potential traffic impacts associated with construction of the proposed "The Vintage at Kings Canyon" residential development. The study of potential traffic impacts was undertaken for planning purposes and to assist in determining what traffic controls or mitigations may be needed to reduce potential impacts, if any are found.

What does the project consist of?

The project consists of east and west development areas. The east project area consists of 153 single-family housing units and 96 beds of Assisted/Independent Living facility. The west portion consists of 59 single-family housing units. The project also includes minor ancillary buildings such as a club house, sales office, a greenhouse, and a small retail area that will serve only residents of the project. These ancillary buildings are not anticipated to generate external trips in excess of what is already accounted for in the single-family residential and assisted living facility trip rates.

How much traffic will the project generate?

The proposed project is estimated to generate a total of 2,454 daily trips, 181 AM peak hour trips, and 240 PM peak hour trips.

Are there any traffic impacts?

No, all the studied intersections operate at acceptable level of service conditions now and with the addition of the project traffic. The project's multiple access points effectively distribute traffic to the roadway network and avoid concentration of new traffic at any one location. There are no specific impacts that require mitigation.

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections associated with construction of The Vintage at Kings Canyon, located in Carson City, NV. This traffic impact study has been prepared to document existing traffic conditions, quantify traffic volumes generated by the proposed project, identify potential impacts, document findings, and make recommendations to mitigate impacts, if any are found.

Study Area and Evaluated Scenarios

The project consists of east and west development areas. The east portion is located south of Long Street between Mountain Street and N. Ormsby Boulevard. The west portion is located west of N. Ormsby Boulevard between Kings Street and Ash Canyon Road. The study intersections were identified based on scoping conversations with Carson City staff and are shown in **Figure 1**. The following intersections are included in this study:

- Mountain Street/Long Street
- Mountain Street/East Driveway 1
- Mountain Street/Washington Street
- Washington Street/Lexington Avenue
- Long Street/Bolero Drive
- N. Ormsby Boulevard/Washington Street
- N. Ormsby Boulevard/West Driveway 2
- N. Ormsby Boulevard/West Driveway 1
- N. Ormsby Boulevard/East Driveway 2

This study includes analysis of the both the weekday AM and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The evaluated development scenarios are:

- Existing Conditions (no project)
- Existing Plus Project Conditions

Analysis Methodology

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades "A" through "F" with "A" representing optimum conditions and "F" representing breakdown or over capacity flows. The complete methodology is established in the Highway Capacity Manual (HCM), 2010, published by the Transportation Research Board. **Table 1** presents the delay thresholds for each level of service grade at un-signalized and signalized intersections. Level of service calculations were performed for the study intersections using the Vistro 4.0 software suite, with analysis and results reported in accordance with the current HCM 2010 methodology.

Table 1: Level of Service Definition for Intersections

Level of Service	Brief Description	Un-signalized Intersections (average delay/vehicle in seconds)	Signalized Intersections (average delay/vehicle in seconds)
A	Free flow conditions.	< 10	< 10
B	Stable conditions with some affect from other vehicles.	10 to 15	10 to 20
C	Stable conditions with significant affect from other vehicles.	15 to 25	20 to 35
D	High density traffic conditions still with stable flow.	25 to 35	35 to 55
E	At or near capacity flows.	35 to 50	55 to 80
F	Over capacity conditions.	> 50	> 80

Source: Highway Capacity Manual (2010), Chapters 16 and 17

Level of Service Policy

The Carson Area Metropolitan Planning Organization's 2035 Regional Transportation Plan establishes LOS "D" as the level of service standard.

EXISTING TRANSPORTATION FACILITIES

Roadway Facilities

A brief description of the key roadways in the study area is provided below.

Mountain Street, within the study area, is a two-lane north-south roadway that provides primary access to the east portion of the project. The posted speed limit is 25 miles per hour and on-street parking is permitted.

Long Street is a two-lane east-west roadway. On-street parking is permitted on both sides of Long Street. The posted speed limit is 25 mph.

Washington Street, within the study area, is a two-lane east-west roadway. On-street parking is allowed on both sides of Washington Street. The posted speed limit is 25 mph.

N. Ormsby Boulevard is a two-lane north-south roadway that provides primary access to the west portion of the project and also provides a secondary route to the east project area. The posted speed limit is 35 mph.

Lexington Avenue is a two-lane north-south roadway that provides access to the south side of the east project area. On-street parking is permitted on both sides of Lexington Avenue.

Bolero Drive is a two-lane north-south roadway that provides access to the north side of the east project area. On-street parking is allowed on both sides of Bolero Drive. Several landscaped bulb-outs exist on Bolero Drive that are approximately the same width as a parked vehicle.

Alternate Travel Modes

There are currently paved sidewalks along the full length of Mountain Street and Long Street, on both sides of the roadway, throughout the study area. Discontinuous sidewalks exist on Washington Street. No marked bike lanes exist on any of the roadways in the study area as the roadways are residential collectors and local streets which are generally bikeable without dedicated bike lanes.

Carson City operates public transit service on Mountain Street (Route 2A and Route 2B), adjacent to the project site, as shown in **Exhibit 1**.

Exhibit 1. Transit Routes

EXISTING CONDITIONS

Existing Traffic Volumes

Existing traffic volumes were determined by collecting turning movement counts during the AM and PM peak periods at the study intersections. Counts were conducted on average mid-week days and include traffic levels with local schools in session. The existing peak hour intersection traffic volumes and lane configurations are shown on **Figure 2,** attached.

Existing Intersection Level of Service

Level of service calculations were performed using the existing traffic volumes, lane configurations, and traffic controls. The results are presented in **Table 2** and the calculation sheets are provided in **Appendix A**, attached.

As shown in **Table 2**, all the study intersections and their individual approaches/movements operate at acceptable level of service conditions during both the AM and PM peak hours.

Table 2: Existing Conditions Intersection Level of Service Summary

Intersection	Approach/Movement	Control	Existing AM		Existing PM	
			LOS	Avg Delay	LOS	Avg Delay
Mountain St./Long St.	Northbound Left	TWSC	A	7.56	A	7.70
	Southbound Left		A	7.85	A	7.63
	Eastbound		B	12.30	B	11.72
	Westbound		B	14.60	B	11.47
Mountain St./Washington St.	Overall	AWSC	A	9.86	A	9.12
Washington St./Lexington Ave.	Eastbound Left	TWSC	A	7.34	A	7.39
	Southbound		A	9.75	A	9.14
N. Ormsby Blvd./Washington St.	Southbound Left	TWSC	A	7.85	A	7.41
	Westbound		B	10.32	A	9.59
Long St./Bolero Dr.	Northbound	TWSC	A	8.32	A	8.31
	Southbound		A	8.62	A	8.61

TWSC = Two-Way Stop Control. AWSC = All-Way Stop Control

PROJECT GENERATED TRAFFIC

Project Description

The project consists of east and west development areas. The east portion is located south of Long Street between Mountain Street and N. Ormsby Boulevard. The west project area is located west of N. Ormsby Boulevard between Kings Street and Ash Canyon Road. The site plan is shown in **Figure 3**.

The east project area consists of 153 single-family housing units and 96 beds of Assisted/Independent Living facility. The west portion consists of 59 single-family housing units. The project also includes minor ancillary buildings such as a club house, sales office, a greenhouse, and a small retail area that serve only residents of the project. These ancillary spaces are not anticipated to generate external trips in excess of what is already accounted for in the single-family residential and assisted living facility trip rates.

Trip Generation

Trip generation rates for the proposed project were obtained from the Trip Generation Manual, 9th Edition, published by the Institute of Transportation Engineers. **Table 3** provides the Daily, AM peak hour, and PM peak hour trip generation calculation details for the proposed project.

As shown in **Table 3**, the proposed project is estimated to generate a total of 2,454 daily trips, 181 AM peak hour trips, and 240 PM peak hour trips.

Table 3: Trip Generation Estimates

ITE Land Use	Size	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
East Project Area								
210 - Single-Family Detached Housing	153 Dwelling Units	1,553	117	29	88	154	97	57
254 - Assisted Living	96 beds	255	13	8	5	21	9	12
SUB-TOTAL		1,808	130	37	93	175	106	69
West Project Area								
210 - Single-Family Detached Housing	59 Dwelling Units	646	51	13	38	65	41	24
SUB-TOTAL		646	51	13	38	65	41	24
TOTAL		2,454	181	50	131	240	147	93

Project Access

Interconnectivity of roadways between adjacent neighborhoods is a core urban planning principle and is important for efficient vehicular, bicycle, and pedestrian circulation. Disconnected pocket neighborhoods cause traffic to unnecessarily focus at certain intersections thereby causing higher degrees of congestion, force out-of-direction travel, longer trips, and trips through more intersections, and limit emergency response routes throughout communities. For these reasons, Cities throughout the nation are moving away from/no longer approving disconnected neighborhood designs and returning to more of a grid style connection of at least collector streets.

The Vintage at Kings Canyon project plan incorporates six (6) positive and important roadway connections to nearby collector streets. The east project area has four access points, one each to N. Ormsby Boulevard, Mountain Street, Lexington Avenue, and Bolero Drive. The west portion of the project has two access points on N. Ormsby Boulevard. Connections are thereby made to neighborhoods on each side of the project. The access points are shown on **Figure 3**.

All driveways will be full-access configurations with STOP control on the side-street (minor) approaches (the configurations are shown in **Figure 5**). All access points will be two-lane roadways with one approaching and one departing lane.

Every project access point will be gated, however, all gates shall remain open from 7:00 AM to 7:00 PM, seven days per week, as is stated in the PUD Handbook. The primary access points from the east project area to both Mountain Street and N. Ormsby Blvd. will have turn-around areas. With the gates required to be open during the entire daytime period and peak travel hours, no gate queuing issues are anticipated.

Trip Distribution and Assignment

Traffic generated by the project was distributed to the road network based on the location of the project site, major activity centers, and the access connection points to arterial roadways.

The following trip distribution percentages were used for distributing the project traffic:

East project area:

- 5% to/from the north via N. Ormsby Boulevard
- 5% to/from the south via N. Ormsby Boulevard
- 25% to/from the north via Mountain Street
- 15% to/from the south via Mountain Street
- 25% to/from the east via Long Street
- 25% to/from the east via Washington Street

West project area:

- 30% to/from the north via N. Ormsby Boulevard
- 20% to/from the south via N. Ormsby Boulevard
- 35% to/from the east via Washington Street
- 15% to/from the north via Mountain Street

Project generated trips were assigned to the adjacent roadway system based on the distributions outlined above. The project trip assignment is shown on **Figure 4**, attached.

EXISTING PLUS PROJECT CONDITIONS

Traffic Volumes

Existing plus project traffic volumes were developed by adding the project generated trips (**Figure 4**) to the existing traffic volumes (**Figure 2**) and are shown on **Figure 5**, attached. The "Plus Project" condition Peak Hour Factors (PHF) and travel patterns were assumed to remain the same as were observed under existing conditions.

Intersection Level of Service Analysis

Table 4 presents the level of service analysis summary for the "Plus Project" scenario assuming the existing intersection configurations. Detailed calculation sheets are provided in **Appendix B**, attached.

As shown in **Table 4**, all the study intersections and project driveways continue to operate at acceptable LOS conditions with the addition of the project traffic. The average delay at the Mountain Street/Long Street approaches increases by less than 2.5 seconds per vehicle with the addition of the project traffic, during both the AM and PM peak hours. The average delay at the N. Ormsby Boulevard/Washington Street intersection increases by less than 0.5 seconds per vehicle with the addition of the project traffic, during both the AM and PM peak hours. With the addition of the project traffic, average delay at the Mountain Street/Washington Street intersection increases by 1 second per vehicle during both the AM and PM peak hours. These increases in delay are insignificant and very good levels of service are maintained.

Table 4: Plus Project Intersection Level of Service Summary

Intersection	Approach/Movement	Control	Plus Project AM		Plus Project PM	
			LOS	Avg Delay	LOS	Avg Delay
Mountain St./Long St.	Northbound Left	TWSC	A	7.58	A	7.79
	Southbound Left		A	7.97	A	7.72
	Eastbound		B	13.80	B	13.25
	Westbound		C	16.36	B	13.72
Mountain St./East Dwy 1	Northbound Left	TWSC	A	7.73	A	7.77
	Eastbound		B	11.64	B	11.29
Mountain St./Washington St.	Overall	AWSC	B	10.83	B	10.11
Washington St./Lexington Ave.	Eastbound Left	TWSC	A	7.38	A	7.50
	Southbound		A	9.91	A	9.60
N. Ormsby Blvd./Washington St.	Southbound Left	TWSC	A	7.93	A	7.48
	Westbound		B	10.76	A	9.96
N. Ormsby Blvd./West Dwy 1	Northbound Left	TWSC	A	7.46	A	7.39
	Eastbound		A	9.38	A	9.04
N. Ormsby Blvd./West Dwy 2	Northbound Left	TWSC	A	7.51	A	7.42
	Eastbound		A	9.48	A	9.10
N Ormsby Blvd./East Dwy 2	Southbound Left	TWSC	A	7.49	A	7.43
	Westbound		A	9.42	A	9.15
Long St./Bolero Dr.	Northbound	TWSC	A	8.36	A	8.34
	Southbound		A	8.77	A	8.88

TWSC = Two-Way Stop Control. AWSC = All-Way Stop Control

The project is anticipated to add less than 40 peak hour trips to Bolero Drive. The existing roadway configuration is more than adequate to accommodate this minor increase in traffic volume (less one vehicle per minute on average during the highest hour). Similarly, Lexington Avenue would realize an increase of less than 60 vehicle trips during the peak hour and is design to accommodate traffic volumes significantly greater than what will occur. Neither of these roadways would be significantly impacted by the project.

CONCLUSIONS & RECOMMENDATIONS

Following is a list of our key findings and recommendations to best manage the traffic generated by the proposed project:

Project Trips: The proposed project is estimated to generate a total of 2,454 daily trips, 181 AM peak hour trips, and 240 PM peak hour trips.

Project Access: Access to the project site is planned via six access points. The proposed configuration intelligently distributes traffic throughout the roadway network reducing the project's affect at any one intersection. Connections are provided to each side of the project site consistent with best planning practices.

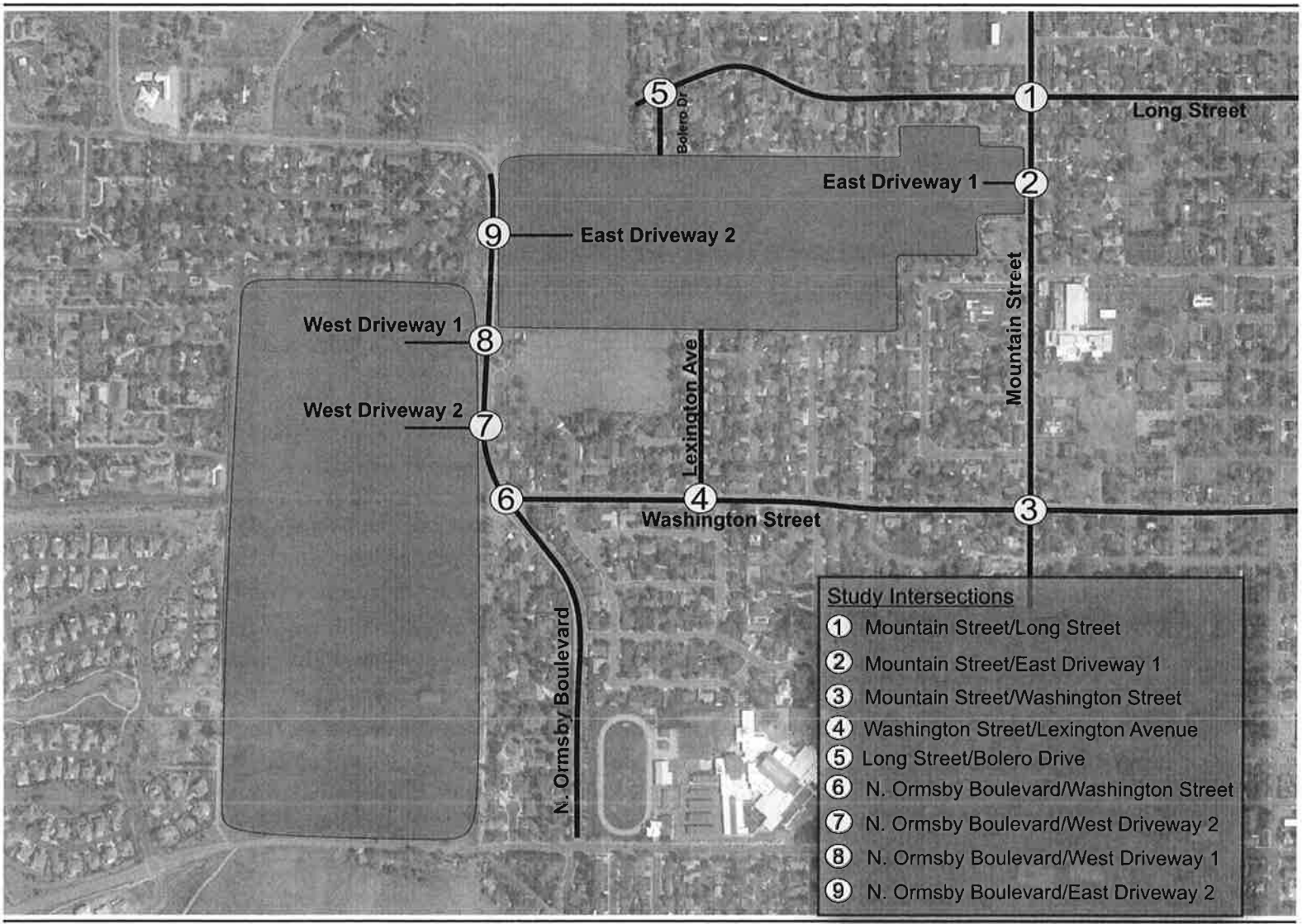
Gates will be constructed at each project access point, however, the gates will all remain open from 7:00 AM to 7:00 PM, seven days per week, as is specified in the PUD Handbook.

Existing Level of Service: All the study intersections currently operate at acceptable levels of service during both the AM and PM peak hours.

Plus Project Level of Service: All the study intersections, approaches and movements will operate at acceptable LOS conditions (LOS "C" or better) with the addition of the project traffic.

Recommendations: There are no identified impacts requiring mitigation. The average delay at the Mountain Street/Long Street approaches increases by less than 2.5 seconds per vehicle with the addition of the project traffic, during both the AM and PM peak hours. The average delay at the and N. Ormsby Boulevard/Washington Street intersection increases by less than 0.5 seconds per vehicle with the addition of the project traffic, during both the AM and PM peak hours. With the addition of the project traffic, average delay at the Mountain Street/Washington Street intersection increases by 1 second per vehicle during both the AM and PM peak hours. These increases in delay are insignificant and very good levels of service are maintained.

Bolero Drive, Lexington Avenue, and all other roadways in the study area will adequately accommodate the added project traffic without significant impacts.



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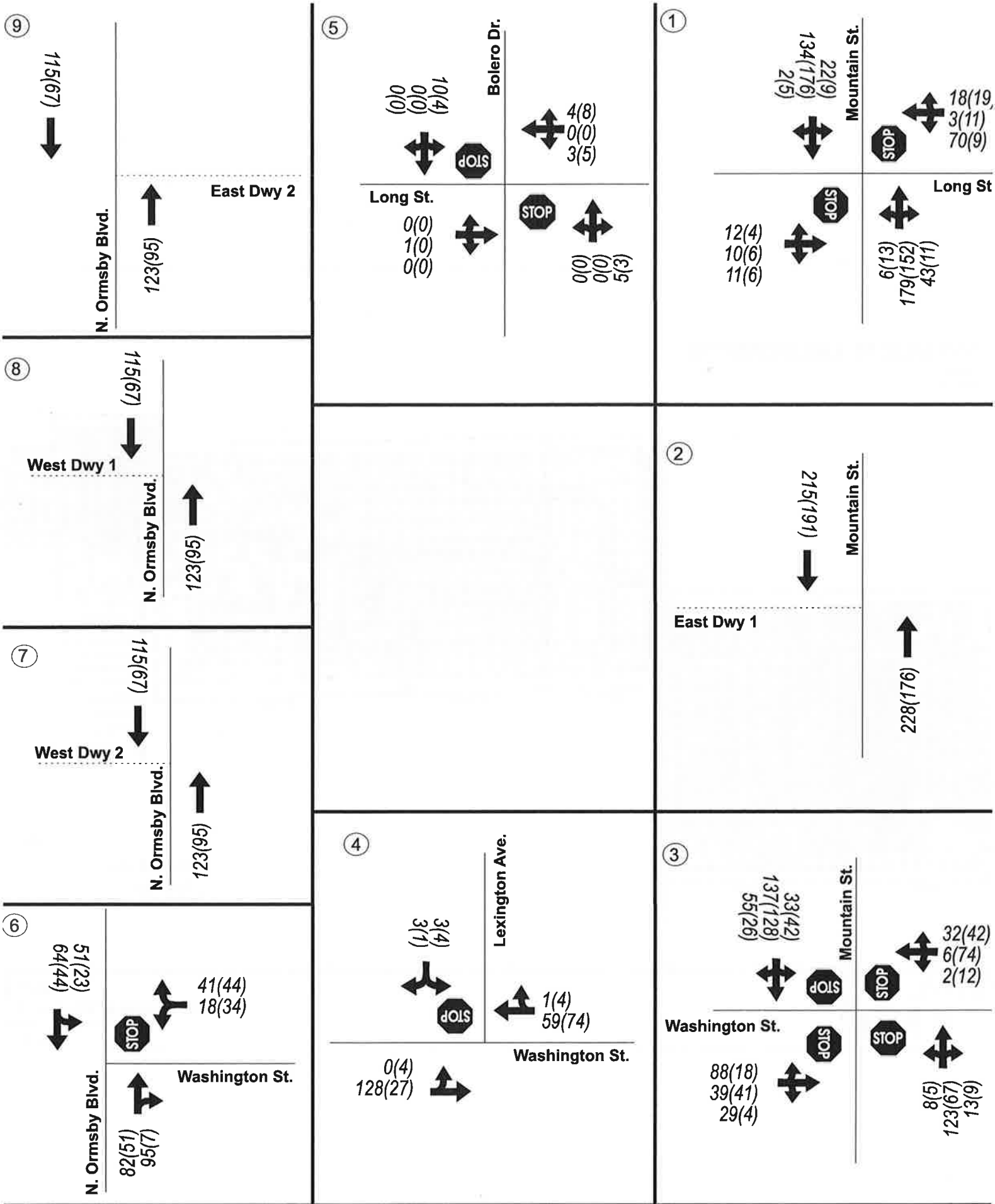

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AM(PM) - Peak Hour Traffic Volumes

- Lane Configuration

STOP - Stop Sign

Figure 2

THE VINTAGE AT KINGS CANYON
TRAFFIC IMPACT STUDY

Existing Traffic Volumes

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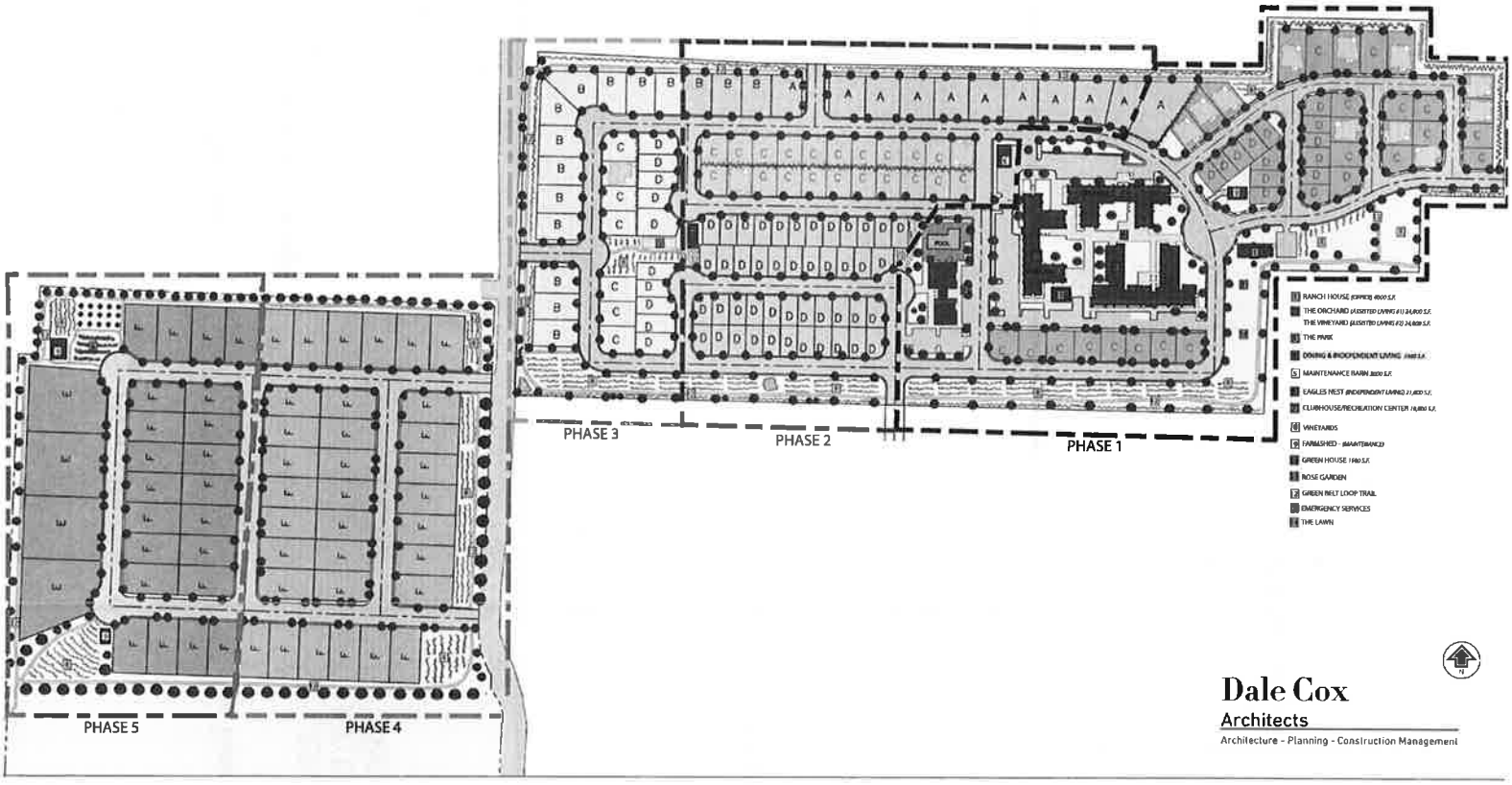

Dale Cox
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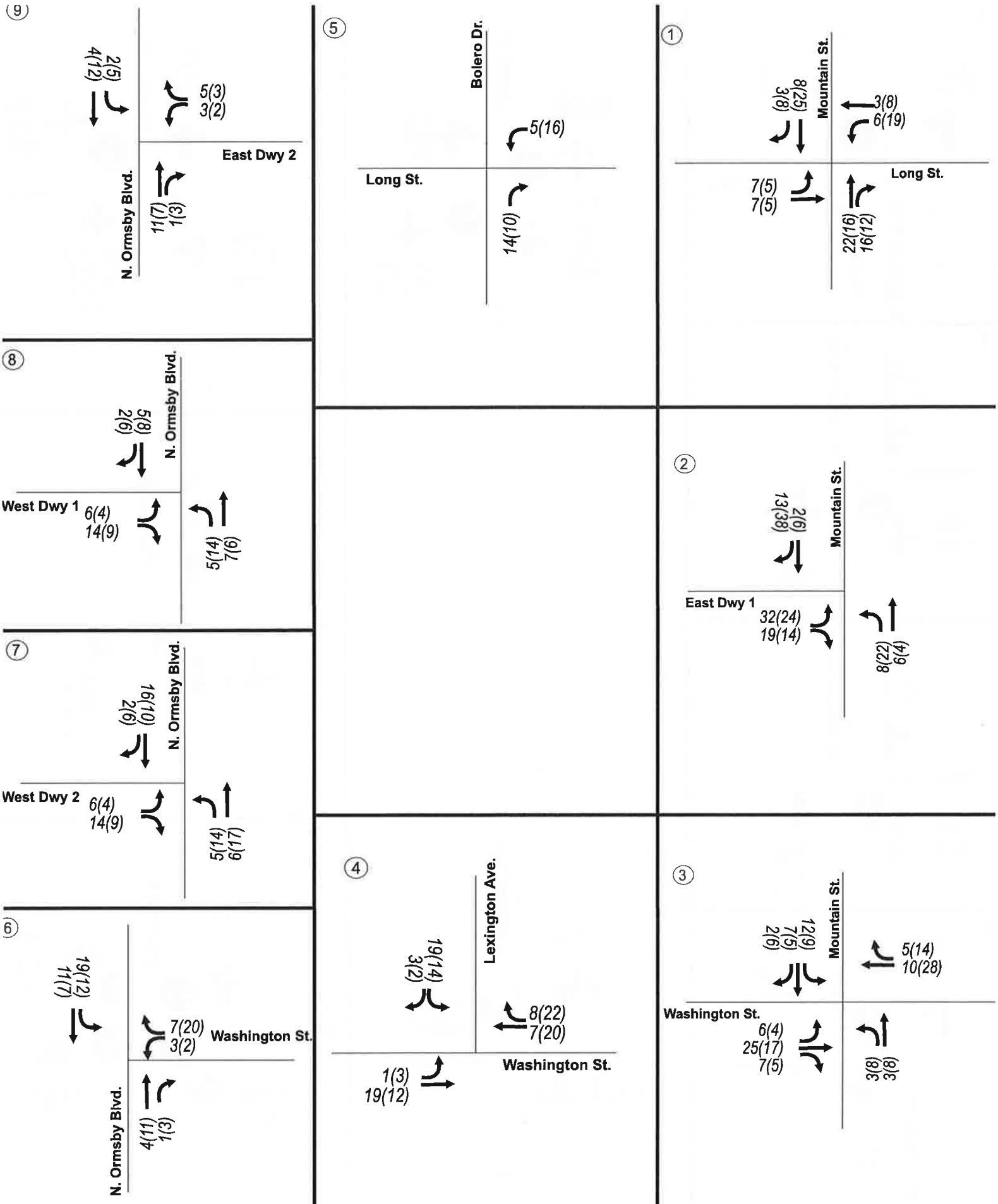

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AM(PM) - Peak Hour Trip Assignment

Figure 4

THE VINTAGE AT KINGS CANYON
TRAFFIC IMPACT STUDY

Project Trips

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AM(PM) - Peak Hour Traffic Volumes

- Lane Configuration

STOP - Stop Sign

Figure 5

THE VINTAGE AT KINGS CANYON
TRAFFIC IMPACT STUDY

Existing Plus Project Traffic Volumes

Appendix A

Existing Conditions LOS Calculations

Intersection Level Of Service Report
Intersection 1: Mountain St/Long St

Control Type:	Two-way stop	Delay (sec / veh):	15.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.199

Intersection Setup

Name	Mountain St			Mountain St			Long St			Long St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Mountain St			Mountain St			Long St			Long St		
Base Volume Input [veh/h]	6	179	43	22	134	2	12	10	11	70	3	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.94	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	179	43	22	134	2	12	10	11	70	3	18
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	57	14	7	42	1	4	3	3	22	1	6
Total Analysis Volume [veh/h]	8	227	54	28	170	3	15	13	14	89	4	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					No		No	
Storage Area [veh]	0		0		0		0	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.02	0.00	0.00	0.03	0.03	0.02	0.20	0.01	0.03
d_M, Delay for Movement [s/veh]	7.56	0.00	0.00	7.85	0.00	0.00	13.60	13.63	9.68	15.30	15.06	11.82
Movement LOS	A	A	A	A	A	A	B	B	A	C	C	B
95th-Percentile Queue Length [veh]	0.77	0.77	0.77	0.55	0.55	0.55	0.25	0.25	0.25	0.91	0.91	0.91
95th-Percentile Queue Length [ft]	19.13	19.13	19.13	13.75	13.75	13.75	6.36	6.36	6.36	22.80	22.80	22.80
d_A, Approach Delay [s/veh]	0.21			1.09			12.30			14.60		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	3.84											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 2: Mountian St/East Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Mountain St		Mountain St		East Dwy 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Mountain St		Mountain St		East Dwy 1	
Base Volume Input [veh/h]	0	228	215	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.73	0.63	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	228	215	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	62	58	0	0	0
Total Analysis Volume [veh/h]	0	248	234	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.68	0.00	0.00	0.00	11.58	9.44
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		10.51	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Mountian St/Washington St

Control Type:	All-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Mountian St			Mountain St			Washington St			Washington St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Mountian St			Mountain St			Washington St			Washington St		
Base Volume Input [veh/h]	8	123	13	33	137	55	88	39	29	2	6	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	123	13	33	137	55	88	39	29	2	6	32
Peak Hour Factor	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	38	4	10	43	17	28	12	9	1	2	10
Total Analysis Volume [veh/h]	10	154	16	41	171	69	110	49	36	3	8	40
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.95	1.68	1.12	0.22
95th-Percentile Queue Length [ft]	23.77	41.98	28.04	5.54
Approach Delay [s/veh]	9.42	10.34	10.01	8.22
Approach LOS	A	B	B	A
Intersection Delay [s/veh]	9.86			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: N Ormsby Blvd/Washington St

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	N Ormsby		N Ormsby		Washington St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	N Ormsby		N Ormsby		Washington St	
Base Volume Input [veh/h]	82	95	51	64	18	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.44	2.11	1.96	1.56	0.00	2.44
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	95	51	64	18	41
Peak Hour Factor	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	32	17	21	6	14
Total Analysis Volume [veh/h]	109	127	68	85	24	55
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.05	0.00	0.04	0.06
d_M, Delay for Movement [s/veh]	0.00	0.00	7.85	0.00	11.74	9.69
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.39	0.39	0.35	0.35
95th-Percentile Queue Length [ft]	0.00	0.00	9.71	9.71	8.71	8.71
d_A, Approach Delay [s/veh]	0.00		3.49		10.32	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.88					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: N Ormsby Blvd/West Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy	
Base Volume Input [veh/h]	0	123	115	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.63	1.74	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	123	115	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	33	31	0	0	0
Total Analysis Volume [veh/h]	0	134	125	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.44	0.00	0.00	0.00	9.90	8.87
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.39	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: N Ormsby Blvd/East Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	N Ormsby		N Ormsby		East Dwy 2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		East Dwy 2	
Base Volume Input [veh/h]	123	0	0	115	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	0.00	0.00	1.74	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	0	0	115	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	0	0	31	0	0
Total Analysis Volume [veh/h]	134	0	0	125	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	7.46	0.00	9.90	8.91
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 9: N Ormsby Blvd/West Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy 2	
Base Volume Input [veh/h]	0	123	115	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	123	115	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	33	31	0	0	0
Total Analysis Volume [veh/h]	0	134	125	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.46	0.00	0.00	0.00	9.93	8.89
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 17: Washington St/Lexington Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Lexington Ave		Washington St		Washington St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Lexington Ave		Washington St		Washington St	
Base Volume Input [veh/h]	3	3	0	128	59	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	3	0	128	59	1
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	0	39	18	0
Total Analysis Volume [veh/h]	4	4	0	156	72	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.75	8.66	7.34	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.03	0.03	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.70	0.70	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.20		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.31					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 18: Long St/Bolero Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Base Volume Input [veh/h]	0	0	5	10	0	0	0	1	0	3	0	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	5	10	0	0	0	1	0	3	0	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	3	0	0	0	0	0	1	0	1
Total Analysis Volume [veh/h]	0	0	5	10	0	0	0	1	0	3	0	4
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.59	9.08	8.32	8.62	9.09	8.36	7.23	0.00	0.00	7.21	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.01	0.03	0.03	0.03	0.00	0.00	0.00	0.01	0.01	0.01
95th-Percentile Queue Length [ft]	0.35	0.35	0.35	0.75	0.75	0.75	0.00	0.00	0.00	0.32	0.32	0.32
d_A, Approach Delay [s/veh]	8.32			8.62			0.00			3.09		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	6.50											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 1: Mountain St/Long St

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	Mountain St			Mountain St			Long St			Long St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Mountain St			Mountain St			Long St			Long St		
Base Volume Input [veh/h]	13	152	11	9	176	5	4	6	6	9	11	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.66	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	152	11	9	176	5	4	6	6	9	11	19
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	48	3	3	56	2	1	2	2	3	3	6
Total Analysis Volume [veh/h]	16	192	14	11	223	6	5	8	8	11	14	24
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.02	0.01	0.02	0.03	0.03
d_M, Delay for Movement [s/veh]	7.70	0.00	0.00	7.63	0.00	0.00	13.19	12.86	9.65	13.11	13.09	9.77
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.59	0.59	0.59	0.63	0.63	0.63	0.12	0.12	0.12	0.26	0.26	0.26
95th-Percentile Queue Length [ft]	14.69	14.69	14.69	15.76	15.76	15.76	2.93	2.93	2.93	6.58	6.58	6.58
d_A, Approach Delay [s/veh]	0.55			0.35			11.72			11.47		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	1.91											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Mountian St/East Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Mountain St		Mountain St		East Dwy 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Mountain St		Mountain St		East Dwy 1	
Base Volume Input [veh/h]	0	176	191	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.79	0.41	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	176	191	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	48	52	0	0	0
Total Analysis Volume [veh/h]	0	191	208	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.62	0.00	0.00	0.00	10.90	9.30
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		10.10	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Mountian St/Washington St

Control Type:	All-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Mountian St			Mountain St			Washington St			Washington St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Mountian St			Mountain St			Washington St			Washington St		
Base Volume Input [veh/h]	5	67	9	42	128	26	18	41	4	12	74	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	67	9	42	128	26	18	41	4	12	74	42
Peak Hour Factor	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	21	3	13	40	8	6	13	1	4	23	13
Total Analysis Volume [veh/h]	6	84	11	53	160	33	23	51	5	15	93	53
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	1.34	0.37	0.78
95th-Percentile Queue Length [ft]	11.47	33.59	9.20	19.58
Approach Delay [s/veh]	8.48	9.67	8.61	8.89
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	9.11			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: N Ormsby Blvd/Washington St

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.057

Intersection Setup

Name	N Ormsby		N Ormsby		Washington St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	N Ormsby		N Ormsby		Washington St	
Base Volume Input [veh/h]	51	7	23	44	34	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.44	2.11	1.96	1.56	0.00	2.44
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	7	23	44	34	44
Peak Hour Factor	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	2	8	15	11	15
Total Analysis Volume [veh/h]	68	9	31	59	45	59
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.06	0.06
d_M, Delay for Movement [s/veh]	0.00	0.00	7.41	0.00	10.13	9.18
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.19	0.19	0.40	0.40
95th-Percentile Queue Length [ft]	0.00	0.00	4.71	4.71	9.91	9.91
d_A, Approach Delay [s/veh]	0.00		2.55		9.59	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.53					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: N Ormsby Blvd/West Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy	
Base Volume Input [veh/h]	0	95	67	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.63	1.74	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	95	67	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	26	18	0	0	0
Total Analysis Volume [veh/h]	0	103	73	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.34	0.00	0.00	0.00	9.40	8.62
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.01	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: N Ormsby Blvd/East Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	N Ormsby		N Ormsby		East Dwy 2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		East Dwy 2	
Base Volume Input [veh/h]	95	0	0	67	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	0.00	0.00	1.74	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	0	0	67	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	0	18	0	0
Total Analysis Volume [veh/h]	103	0	0	73	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	7.40	0.00	9.40	8.76
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.08	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 9: N Ormsby Blvd/West Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy 2	
Base Volume Input [veh/h]	0	95	67	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	95	67	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	26	18	0	0	0
Total Analysis Volume [veh/h]	0	103	73	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.36	0.00	0.00	0.00	9.42	8.64
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.03	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 17: Washington St/Lexington Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Lexington Ave		Washington St		Washington St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Lexington Ave		Washington St		Washington St	
Base Volume Input [veh/h]	4	1	4	27	74	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	1	4	27	74	4
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	8	23	1
Total Analysis Volume [veh/h]	5	1	5	33	90	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.21	8.74	7.39	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.08	0.08	0.00	0.00
95th-Percentile Queue Length [ft]	0.52	0.52	1.93	1.93	0.00	0.00
d_A, Approach Delay [s/veh]	9.14		0.97		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.66					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 18: Long St/Bolero Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Base Volume Input [veh/h]	0	0	3	4	0	0	0	0	0	5	0	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	3	4	0	0	0	0	0	5	0	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	1	0	0	0	0	0	1	0	2
Total Analysis Volume [veh/h]	0	0	3	4	0	0	0	0	0	5	0	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.11	8.31	8.61	9.10	0.00	0.00	0.00	0.00	7.21	0.00	0.00
Movement LOS		A	A	A	A			A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.02	0.02
95th-Percentile Queue Length [ft]	0.00	0.21	0.21	0.30	0.30	0.00	0.00	0.00	0.00	0.60	0.60	0.60
d_A, Approach Delay [s/veh]		8.31			8.61			0.00			2.77	
Approach LOS		A			A			A			A	
d_I, Intersection Delay [s/veh]	4.77											
Intersection LOS	A											

Appendix B

Existing Plus Project LOS Calculations

Intersection Level Of Service Report
Intersection 1: Mountain St/Long St

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.238

Intersection Setup

Name	Mountain St			Mountain St			Long St			Long St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Mountain St			Mountain St			Long St			Long St		
Base Volume Input [veh/h]	6	179	43	22	134	2	12	10	11	70	3	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.94	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	22	16	0	8	3	7	7	0	6	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	201	59	22	142	5	19	17	11	76	6	18
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	64	19	7	45	2	6	5	3	24	2	6
Total Analysis Volume [veh/h]	8	254	75	28	180	6	24	22	14	96	8	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.02	0.00	0.00	0.06	0.05	0.02	0.24	0.02	0.03
d_M, Delay for Movement [s/veh]	7.58	0.00	0.00	7.97	0.00	0.00	14.89	14.85	10.29	17.14	16.57	13.02
Movement LOS	A	A	A	A	A	A	B	B	B	C	C	B
95th-Percentile Queue Length [veh]	0.94	0.94	0.94	0.62	0.62	0.62	0.44	0.44	0.44	1.17	1.17	1.17
95th-Percentile Queue Length [ft]	23.59	23.59	23.59	15.54	15.54	15.54	10.91	10.91	10.91	29.27	29.27	29.27
d_A, Approach Delay [s/veh]	0.18			1.04			13.80			16.36		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	4.32											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 2: Mountian St/East Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	12.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name	Mountain St		Mountain St		East Dwy 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Mountain St		Mountain St		East Dwy 1	
Base Volume Input [veh/h]	0	228	215	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.73	0.63	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	6	2	13	32	19
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	234	217	13	32	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	64	59	4	9	5
Total Analysis Volume [veh/h]	9	254	236	14	35	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.07	0.03
d_M, Delay for Movement [s/veh]	7.73	0.00	0.00	0.00	12.55	10.12
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh]	0.74	0.74	0.00	0.00	0.31	0.31
95th-Percentile Queue Length [ft]	18.43	18.43	0.00	0.00	7.71	7.71
d_A, Approach Delay [s/veh]	0.26		0.00		11.64	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.27					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Mountian St/Washington St

Control Type:	All-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Mountian St			Mountain St			Washington St			Washington St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Mountian St			Mountain St			Washington St			Washington St		
Base Volume Input [veh/h]	8	123	13	33	137	55	88	39	29	2	6	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	12	7	2	6	25	7	0	10	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	126	13	45	144	57	94	64	36	2	16	37
Peak Hour Factor	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	39	4	14	45	18	29	20	11	1	5	12
Total Analysis Volume [veh/h]	14	158	16	56	180	71	118	80	45	3	20	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.09	2.11	1.61	0.33
95th-Percentile Queue Length [ft]	27.23	52.64	40.22	8.27
Approach Delay [s/veh]	10.06	11.51	11.15	8.78
Approach LOS	B	B	B	A
Intersection Delay [s/veh]	10.83			
Intersection LOS	B			

Intersection Level Of Service Report
Intersection 4: N Ormsby Blvd/Washington St

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.054

Intersection Setup

Name	N Ormsby		N Ormsby		Washington St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	N Ormsby		N Ormsby		Washington St	
Base Volume Input [veh/h]	82	95	51	64	18	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.44	2.11	1.96	1.56	0.00	2.44
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	1	19	11	3	7
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	96	70	75	21	48
Peak Hour Factor	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	32	23	25	7	16
Total Analysis Volume [veh/h]	115	128	93	100	28	64
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.07	0.00	0.05	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	7.93	0.00	12.69	9.91
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.51	0.51	0.44	0.44
95th-Percentile Queue Length [ft]	0.00	0.00	12.76	12.76	10.98	10.98
d_A, Approach Delay [s/veh]	0.00		3.82		10.76	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.27					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: N Ormsby Blvd/West Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy	
Base Volume Input [veh/h]	0	123	115	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.63	1.74	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	7	5	2	6	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	130	120	2	6	14
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	35	33	1	2	4
Total Analysis Volume [veh/h]	5	141	130	2	7	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	7.46	0.00	0.00	0.00	10.19	9.01
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.33	0.33	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	8.28	8.28	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	0.26		0.00		9.39	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.81					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: N Ormsby Blvd/East Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	N Ormsby		N Ormsby		East Dwy 2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		East Dwy 2	
Base Volume Input [veh/h]	123	0	0	115	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	0.00	0.00	1.74	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	1	2	4	3	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	134	1	2	119	3	5
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	0	1	32	1	1
Total Analysis Volume [veh/h]	146	1	2	129	3	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	7.49	0.00	10.09	9.02
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.30	0.30	0.03	0.03
95th-Percentile Queue Length [ft]	0.00	0.00	7.45	7.45	0.74	0.74
d_A, Approach Delay [s/veh]	0.00		0.11		9.42	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.32					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 9: N Ormsby Blvd/West Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy 2	
Base Volume Input [veh/h]	0	123	115	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	6	16	2	6	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	129	131	2	6	14
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	35	36	1	2	4
Total Analysis Volume [veh/h]	5	140	142	2	7	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	7.51	0.00	0.00	0.00	10.30	9.10
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	8.39	8.39	0.00	0.00	2.05	2.05
d_A, Approach Delay [s/veh]	0.26		0.00		9.48	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.79					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 17: Washington St/Lexington Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.037

Intersection Setup

Name	Lexington Ave		Washington St		Washington St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Lexington Ave		Washington St		Washington St	
Base Volume Input [veh/h]	3	3	0	128	59	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	3	1	19	7	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	6	1	147	66	9
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	2	0	45	20	3
Total Analysis Volume [veh/h]	27	7	1	179	80	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.17	8.90	7.38	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.40	0.40	0.00	0.00
95th-Percentile Queue Length [ft]	3.47	3.47	10.08	10.08	0.00	0.00
d_A, Approach Delay [s/veh]	9.91		0.04		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.13					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 18: Long St/Bolero Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Base Volume Input [veh/h]	0	0	5	10	0	0	0	1	0	3	0	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	14	0	0	0	0	0	0	5	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	19	10	0	0	0	1	0	8	0	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	5	3	0	0	0	0	0	2	0	1
Total Analysis Volume [veh/h]	0	0	19	10	0	0	0	1	0	8	0	4
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.69	9.19	8.36	8.77	9.16	8.37	7.23	0.00	0.00	7.21	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.05	0.05	0.05	0.03	0.03	0.03	0.00	0.00	0.00	0.02	0.02	0.02
95th-Percentile Queue Length [ft]	1.33	1.33	1.33	0.79	0.79	0.79	0.00	0.00	0.00	0.55	0.55	0.55
d_A, Approach Delay [s/veh]	8.36			8.77			0.00			4.81		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	7.24											
Intersection LOS	A											

Intersection Level Of Service Report
Intersection 1: Mountain St/Long St

Control Type:	Two-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.083

Intersection Setup

Name	Mountain St			Mountain St			Long St			Long St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Mountain St			Mountain St			Long St			Long St		
Base Volume Input [veh/h]	13	152	11	9	176	5	4	6	6	9	11	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.66	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	16	12	0	25	8	5	5	0	19	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	168	23	9	201	13	9	11	6	28	19	19
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	53	7	3	64	4	3	3	2	9	6	6
Total Analysis Volume [veh/h]	16	213	29	11	254	16	11	14	8	35	24	24
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.00	0.03	0.03	0.01	0.08	0.06	0.03
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	7.72	0.00	0.00	14.61	13.94	10.19	14.98	14.75	10.86
Movement LOS	A	A	A	A	A	A	B	B	B	B	B	B
95th-Percentile Queue Length [veh]	0.73	0.73	0.73	0.79	0.79	0.79	0.23	0.23	0.23	0.60	0.60	0.60
95th-Percentile Queue Length [ft]	18.37	18.37	18.37	19.85	19.85	19.85	5.65	5.65	5.65	14.92	14.92	14.92
d_A, Approach Delay [s/veh]	0.48			0.30			13.25			13.72		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	2.73											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Mountian St/East Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.048

Intersection Setup

Name	Mountain St		Mountain St		East Dwy 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Mountain St		Mountain St		East Dwy 1	
Base Volume Input [veh/h]	0	176	191	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.79	0.41	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	4	6	38	24	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	180	197	38	24	14
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	49	54	10	7	4
Total Analysis Volume [veh/h]	24	196	214	41	26	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.05	0.02
d_M, Delay for Movement [s/veh]	7.77	0.00	0.00	0.00	12.11	9.87
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.60	0.60	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	14.91	14.91	0.00	0.00	5.36	5.36
d_A, Approach Delay [s/veh]	0.85		0.00		11.29	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.26					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: Mountian St/Washington St

Control Type:	All-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Mountian St			Mountain St			Washington St			Washington St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Mountian St			Mountain St			Washington St			Washington St		
Base Volume Input [veh/h]	5	80	9	42	128	26	22	41	4	12	74	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	8	0	9	5	6	4	17	5	0	28	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	88	9	51	133	32	26	58	9	12	102	64
Peak Hour Factor	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	28	3	16	42	10	8	18	3	4	32	20
Total Analysis Volume [veh/h]	16	110	11	64	166	40	33	73	11	15	128	80
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.72	1.72	0.62	1.29
95th-Percentile Queue Length [ft]	18.08	42.88	15.48	32.24
Approach Delay [s/veh]	9.39	10.82	9.40	10.07
Approach LOS	A	B	A	B
Intersection Delay [s/veh]	10.11			
Intersection LOS	B			

Intersection Level Of Service Report
Intersection 4: N Ormsby Blvd/Washington St

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name	N Ormsby		N Ormsby		Washington St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	N Ormsby		N Ormsby		Washington St	
Base Volume Input [veh/h]	51	7	23	44	34	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.44	2.11	1.96	1.56	0.00	2.44
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	3	12	7	2	20
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	10	35	51	36	64
Peak Hour Factor	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	3	12	17	12	21
Total Analysis Volume [veh/h]	83	13	47	68	48	85
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.00	0.07	0.09
d_M, Delay for Movement [s/veh]	0.00	0.00	7.48	0.00	10.79	9.49
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.25	0.25	0.55	0.55
95th-Percentile Queue Length [ft]	0.00	0.00	6.23	6.23	13.66	13.66
d_A, Approach Delay [s/veh]	0.00		3.06		9.96	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.87					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: N Ormsby Blvd/West Dwy 1

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy	
Base Volume Input [veh/h]	0	95	67	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.63	1.74	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	6	8	6	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	101	75	6	4	9
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	27	20	2	1	2
Total Analysis Volume [veh/h]	15	110	82	7	4	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	0.00	9.81	8.74
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft]	6.71	6.71	0.00	0.00	1.18	1.18
d_A, Approach Delay [s/veh]	0.89		0.00		9.04	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.04					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 6: N Ormsby Blvd/East Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	N Ormsby		N Ormsby		East Dwy 2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		East Dwy 2	
Base Volume Input [veh/h]	95	0	0	67	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	0.00	0.00	1.74	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	3	5	12	2	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	102	3	5	79	2	3
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	1	1	21	1	1
Total Analysis Volume [veh/h]	111	3	5	86	2	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	7.43	0.00	9.63	8.83
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.20	0.20	0.02	0.02
95th-Percentile Queue Length [ft]	0.00	0.00	4.88	4.88	0.43	0.43
d_A, Approach Delay [s/veh]	0.00		0.41		9.15	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.39					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 9: N Ormsby Blvd/West Dwy 2

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	N Ormsby		N Ormsby		West Dwy 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	N Ormsby		N Ormsby		West Dwy 2	
Base Volume Input [veh/h]	0	95	67	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	17	10	6	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	112	77	6	4	9
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	30	21	2	1	2
Total Analysis Volume [veh/h]	15	122	84	7	4	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	7.42	0.00	0.00	0.00	9.92	8.77
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.30	0.30	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft]	7.50	7.50	0.00	0.00	1.20	1.20
d_A, Approach Delay [s/veh]	0.81		0.00		9.10	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.99					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 17: Washington St/Lexington Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.028

Intersection Setup

Name	Lexington Ave		Washington St		Washington St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Lexington Ave		Washington St		Washington St	
Base Volume Input [veh/h]	4	1	4	27	74	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	2	3	12	20	22
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	3	7	39	94	26
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	2	12	29	8
Total Analysis Volume [veh/h]	22	4	9	48	115	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.70	9.04	7.50	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.10	0.10	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	2.49	2.49	3.07	3.07	0.00	0.00
d_A, Approach Delay [s/veh]	9.60		1.18		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.38					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 18: Long St/Bolero Dr

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bolero Dr			Bolero Dr			Long St			Long St		
Base Volume Input [veh/h]	0	0	3	4	0	0	0	0	0	5	0	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	10	0	0	0	0	0	0	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	13	4	0	0	0	0	0	21	0	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	3	1	0	0	0	0	0	5	0	2
Total Analysis Volume [veh/h]	0	0	13	4	0	0	0	0	0	21	0	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.35	8.34	8.88	9.31	0.00	0.00	0.00	0.00	7.23	0.00	0.00
Movement LOS		A	A	A	A			A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.04	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.05	0.05	0.05
95th-Percentile Queue Length [ft]	0.00	0.90	0.90	0.32	0.32	0.00	0.00	0.00	0.00	1.35	1.35	1.35
d_A, Approach Delay [s/veh]		8.34			8.88			0.00			5.23	
Approach LOS		A			A			A			A	
d_I, Intersection Delay [s/veh]	6.43											
Intersection LOS	A											

GEOTECHNICAL INVESTIGATION REPORT

for

THE VINTAGE AT KING'S CANYON

Carson City, Nevada

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GEOTECHNICAL INVESTIGATION REPORT

THE VINTAGE AT KING'S CANYON

Carson City, Nevada

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GEOTECHNICAL INVESTIGATION REPORT
for
THE VINTAGE AT KING'S CANYON
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INTRODUCTION

Submitted herewith are the results of Lumos and Associates, Inc. (Lumos) geotechnical investigation for the proposed Vintage at King's Canyon project to be located in Carson City, Nevada. North Ormsby Boulevard bisects the site. The western portion of the site (approximately 25 acres in size) is located in the northwest quarter of section 18, township 15 north, range 20 east and is bounded by residential developments to the north and west, agricultural fields to the south, and North Ormsby Boulevard to the east. The eastern portion of the site (approximately 50 acres in size) is located in the north half of section 18 and the south half of section 7, township 15 north, range 20 east and is partially bounded by residential developments and agricultural fields to the north and south, is bounded on the west by North Ormsby Boulevard, and is bounded on the east by Mountain Street (refer to Plate 1).

It is our understanding that the proposed project will consist of one to two story houses with conventional foundations, Portland cement concrete improvements (sidewalks, curbs, and gutters), and asphalt concrete roadways. Additionally, we understand an office/medical complex has been proposed on the eastern portion of the site (approximately 9 acres in size) along Mountain Street. Structural loads for the residential portion of the project have been assumed not to exceed 1 to 2 kips per lineal foot and 6 to 8 kips for continuous wall and isolated column loads, respectively. Structural loads for the office/medical buildings have been assumed not to exceed three (3) to four (4) kips per lineal foot and 25 to 30 kips for continuous-wall and isolated-column loads, respectively. We have assumed that final grades at the site will be within five (5) feet from the existing grades.

The purpose of our investigation was to characterize the site geology and soil conditions, describe the native soils and determine their engineering properties as they relate to the proposed construction. The investigation was also intended to identify possible adverse geologic, soil, and/or water table conditions. However, this study did not include an environmental assessment or an evaluation for soil and/or groundwater contamination at the site. For your information, we have included, in Appendix E, the State of Nevada EPA Map of Radon Zones.

This report concludes with recommendations for site grading, foundations, footing area preparation, slope stability, utility installation, asphalt concrete, and Portland cement concrete. In addition, information such as logs of all exploratory borings, laboratory test data, allowable soil bearing capacities, estimated total and differential settlements based on static and dynamic loads, lateral earth pressures, and International Building Code (IBC) seismic site class designation are provided in this report.

The recommendations contained herein have been prepared based on our understanding of the proposed construction, as outlined above. Re-evaluation of the recommendations presented in this report should be conducted after the final site grading and construction plans are completed, if there are any variations from the assumptions described herein.

It is possible that subsurface discontinuities may exist between and beyond exploration points. Such discontinuities are beyond the evaluation of the Engineer at this time. No guarantee of the consistency of site geology and sub-surface conditions is implied or intended.

GEOLOGIC SETTING

Carson City is at the extreme western portion of the Great Basin geomorphic province. The Great Basin is characterized by internal drainage and large normal fault-bounded valleys (grabens) separated by high mountain ranges (horst). The Sierra Nevada province to the west is characterized by large granite masses that have been uplifted and tilted a few degrees toward the west. Overlying the granites are older oceanic meta-sedimentary rocks.

Specifically, the site is located near the western foothills of Eagle Valley. The surface geology of the project area has been mapped as a Qal soil type by Dennis T. Trexler (1977). The mapping indicates that pediment alluvial-fan deposits of Eagle Valley underlie the site. They are yellowish-brown to gray, unbedded to poorly bedded, poorly to moderately sorted, fine silty sand, sandy silt, granular muddy coarse sand, and minor sandy gravel, underlies broad surfaces of low gradient. John W. Bell and Dennis T. Trexler (1979) have also mapped this area as an area to experience the greatest severity of shaking during earthquakes and possible severe liquefaction locally.

SEISMIC CONSIDERATIONS

Carson City, similar to many areas of Nevada, is located near active faults, which are capable of producing significant earthquakes. This area can be described as an area that may experience major damage due to earthquakes having intensities of VII or more when evaluated using the Modified Mercalli Intensity Scale of 1931 (Plate 3).

The Carson City area is located within the Sierra Nevada-Great Basin seismic belt and at least four (4) major earthquakes with moment magnitudes greater than 6.0 (Plate 4) have occurred historically within 15 miles of the site. The areas north and south of Carson City have experienced a number of large earthquakes in the past, with a swarm of large events during the single years 1868 and 1869. During these episodes, the three (3) largest events were magnitudes 6.0, 6.1, and 6.7. The causative faults were located approximately 4 to 15 miles southwest of the site within the Genoa Fault area.

According to the Carson City Quadrangle Earthquake Hazards Map by Trexler and Bell (1979) a north/south trending fault is approximately 500-1000 feet north of the site (Plate 5). The fault is mapped as a Holocene, which is <12,000 years old, which is considered potentially active. However, no active Holocene (<12,000 years) age faulting is known to cross the site, nor has any direct evidence of on-site faulting been observed in the field during the current investigation.

Ground shaking should be anticipated at the site and intensities should be governed by a design earthquake occurring within a few miles of the site on faults belonging to the Sierra Nevada – Great Basin seismic belt that crosses Carson City. For design purposes, ground-shaking intensities should be based on a design earthquake occurring on the Carson City or Genoa Fault Zones with a maximum credible earthquake of 7.5 in moment magnitude.

Liquefaction is the phenomena where more commonly loose saturated sands or silty sands lose their shear strength when subjected to cyclic loading, and become unstable. Large earthquakes, as described above, may provide that type of cyclic loading. Liquefaction is most commonly associated with loose, saturated, relatively clean sands. These conditions were not encountered during our investigation. During our field investigation groundwater was encountered in the eastern portion of the site at a depth of 22 and 23 feet (Borings 3 and 4 respectively). Other holes were explored to as deep as 40 feet without encountering groundwater water. However, The Carson City Quadrangle General Ground Water Map by Terry Katzer (1980) indicates the depth to groundwater is at approximately 10 feet. Additionally, mottling, which indicates previous groundwater presence, was observed in samples taken from 20 of the 24 borings at depths of approximately 10 feet, or less.

2012 IBC Design: The mapped maximum considered earthquake spectral response acceleration at short periods (S_S) is 2.377g corresponding to a 0.2 second spectral response acceleration at five percent (5%) of critical damping and for a Site Class B (IBC Figure 1613.3.1(1)). The mapped maximum considered earthquake spectral response acceleration at a 1-second period (S_1) is 0.875g corresponding to a 1.0 second spectral response acceleration at five percent (5%) of critical damping and for a Site Class B (IBC Figure 1613.3.1(2). According to section 1613.3.2, when the soil properties are not known in sufficient detail to a depth of 100 feet, site Class D shall be assumed. Therefore, the spectral response accelerations must be adjusted for Site Class effects. The site coefficient for spectral response accelerations adjustment at short periods (F_a) is 1.0 (IBC Table 1613.3.3(1)). The site class effect for spectral response accelerations adjustment at 1-second periods (F_v) is 1.5 (IBC Table 1613.3.3(2)). The maximum considered earthquake spectral response acceleration parameter for short period (S_{MS}) is 2.377g and for 1-second period (S_{M1}) is 1.312g. This corresponds to design spectral response acceleration parameters of 1.585g for short period (S_{DS}) and 0.875g for 1-second period (S_{D1}).

It is emphasized that the above values are the minimum requirements intended to maintain public safety during strong ground shaking. These minimum requirements are meant to safeguard against loss of life and major structural failures, but are not intended

to prevent damage or insure the functionality of the structure during and/or after a large seismic event. Additionally, they do not protect against damage to non-structural components or the contents of the building.

In conclusion, seismic concerns for this site are not unlike other sites in the Carson City area. No evidence of active faulting was found on the site. However, due to the proximity of the site to a number of faults that are considered active, as noted above, strong seismic shaking should be anticipated during the life of the proposed structures.

SITE-SPECIFIC LIQUEFACTION EVALUATION

A simplified liquefaction evaluation was performed in accordance with the Geotechnical Earthquake Engineering Reference Manual by Munfakh et. Al. (1998), Federal Highway Administration Report No. FHWA-HI-99-012.

Data used for the liquefaction evaluation included log information Standard Penetration (SPT) blow counts, unit weight of in-situ soils, depth to groundwater, Atterberg limits, and percent fines (percent passing the #200 sieve). Calculations to evaluate liquefaction included total vertical stress, effective vertical stress, effective confining stress, normalized and standardized SPT blow counts, critical stress ratio induced by the deign earthquake, corrected critical stress ratio resisting liquefaction, and the factor of safety. Experience and engineering judgment were also exercised during our evaluation. The following parameters were used as part of analysis:

Moment Magnitude: (M_W) = 7.5
The Peak Ground Acceleration (adjusted for site class effects) = 0.75g (PGAm)(ASCE7-10)
Unit Weight of Soil Above Groundwater = 115 pounds-per-cubic-foot
Unit Weight of Soil Below Groundwater = 55 pounds-per-cubic-foot
Groundwater Depth = 10 feet (from groundwater map)

The peak ground acceleration of 0.75g was determined utilizing an F_{pga} factor for a Site Class D. Therefore, the critical stress ratio induced by the design earthquake was calculated. The critical stress ratio at which liquefaction is expected to occur during a M=7.5 earthquake was evaluated from the chart showing the relationship between cyclic stress ratio causing liquefaction and corrected SPT blow counts, which shows the liquefaction/no liquefaction for sand with fine content of 5, 15 and 35 percent. The corrected critical stress ratio resisting liquefaction was calculated by multiplying the critical stress ratio at which liquefaction is expected to occur times the magnitude scaling factor (not necessary in this case). Finally, the factor of safety against liquefaction was calculated by dividing the corrected critical stress resisting liquefaction by the stress ratio induced by the design earthquake.

Results of these analyses indicated that on-site soils between 10' and 17.5' (if the groundwater table were to rise to the mapped level) meet the "Chinese Criteria" and have a factor of safety less than one (1.1) against liquefaction; therefore, they are considered potentially liquefiable if they become saturated (Martin and Lew, 1999). Our calculations indicate that between 1 and 1½ inches of settlement (total and differential) induced by liquefaction is possible. This settlement does not include the potential settlement caused by static loading of the future structure and fill. We, therefore, recommend that structures are designed with this settlement in mind. If requested, Lumos can provide alternative foundation design parameters for deep foundations, such as drilled piers, to mitigate against potential liquefaction. A mat foundation, such as a post tensioned slab, may also be an option to mitigate against the effects of settlements associated with the potential liquefaction.

SITE CONDITIONS AND FIELD EXPLORATION

At the time of our investigation the site was in use as grazing pastures. The vegetation generally consists of thick grasses. The site generally slopes downward from west to east.

Field exploration included a site reconnaissance and subsurface soil-exploration. During the site reconnaissance, surface conditions were noted and the locations of the exploratory boring were determined. They were located using survey techniques. Locations and elevations of the exploratory borings should be considered accurate only to the degree implied by the method used.

Twenty-four (24) exploratory borings were excavated to a maximum depth of 41.5 feet below-ground-surface (bgs). The approximate locations of the exploratory borings within the site are shown on Plate 2. The subsurface soils were continuously logged and visually classified in the field by our Geotechnician in accordance with the Unified Soil Classification System. Representative bulk soil samples were collected within the upper five (5) feet. Standard Penetration Testing (SPT) split spoon samples and modified California samples were collected at 2.5 and five (5) foot intervals within the exploratory borings. All the samples, subsequently, were transported to our Carson City and Reno geotechnical laboratories for testing and analysis.

The native subsurface soils consisted generally of loose to medium dense silty sands and clayey sands in the upper five (5) feet, and relatively dense silty sands and clayey sands below five (5) feet. Layers of silts and clays were encountered in a handful of the borings throughout the site.

Groundwater was encountered at the time of our field investigation in Borings 3 and 4 at 22 and 23 feet bgs respectively. However, seasonal groundwater (water table) fluctuations should be anticipated at the site. According to the groundwater map, the approximate depth to groundwater is 10 feet. Many of the samples collected from a majority of borings had mottling, which could indicate groundwater conditions at some

point in time. The depth of Boring 9 was 25 feet bgs, however, no water was encountered. Deeper holes were drilled, heading west, to as deep as 40 feet, and no groundwater was encountered in those holes.

FIELD AND LABORATORY TEST DATA

Field and laboratory data was developed from samples taken and tests conducted during the field exploration and laboratory phases of this project. The borings were advanced utilizing a Jeff Co Speedstar 15 drill rig. Representative bulk soil samples were collected within the upper five (5) feet. Standard Penetration Testing (SPT) split spoon samples and modified California samples were collected at 2.5 and five (5) foot intervals within the exploratory borings. The samplers were driven utilizing a 140 pound hammer free falling 30 inches.

Laboratory tests performed on representative samples included sieve analysis, Atterberg Limits, modified proctor, R-value, direct shear, expansion index, soluble sulfates, pH value, and resistivity. Much of this data is displayed on the "logs" of the exploratory borings to facilitate correlation. Field descriptions presented on the logs have been modified, where appropriate, to reflect laboratory test results. The logs of the exploratory borings are included in Appendix A of this report as Plates A-1 through A-24. Plate A-25 describes the various symbols and nomenclature shown on the logs.

Individual laboratory test results are presented in Appendix B as Plates B-1 through B-6. Laboratory testing was performed per ASTM standards, except when test procedures are briefly described and no ASTM standard is specifically referenced in the report. Atterberg limits were determined using the dry method of preparation (Plate B-2). Special testing conducted for this project is described below.

Analytical Testing: Silver State Analytical Laboratories, Reno, Nevada, conducted this testing. The testing included pH value, resistivity and soluble sulfates. Test results are included (on Silver State letterhead) in Plates B-6.

The soil samples obtained during this investigation will be held in our laboratory for 30 days from the date of this report. The samples may be retained longer at an additional cost to the client or obtained from this office upon request.

DISCUSSION AND RECOMMENDATIONS

General

From a geotechnical viewpoint, the site is considered suitable for the proposed improvements when prepared as recommended herein.

The following recommendations are based upon the construction and our understanding of this project, as outlined in the introduction of this report. If changes in the construction are proposed, they should be presented to the Lumos Geotechnical Department, so that these recommendations can be reviewed and modified in writing, as necessary. As a minimum, final construction drawings should be submitted to the Lumos Geotechnical Department for review prior to actual construction and verification that our geotechnical design recommendations have been implemented.

General Site Grading

Prior to placement of fill and/or the proposed improvements, the areas to receive fill and/or improvements shall be cleared and grubbed. Clearing and grubbing is anticipated to be as much as 12 inches or more where thicker vegetation/roots are present.

Root- or organic-laden soils encountered during excavations, should be stockpiled in a designated area on site for later use in landscaping, or removed off site as directed by the owner. Excavated soils free from any organics, debris or otherwise unsuitable material and with particles no larger than three (3) inches in maximum dimension may be stockpiled and moisture conditioned for later use as compacted fill provided it meets the criteria for acceptable fill soils. Many of the site soils shall be considered "fine

grained" (for the purposes of this report "fine grained" is defined as soils with greater than or equal to 30% passing the #200 sieve). Site "fine grained" soils are not suitable to provide direct foundation support. The onsite soils maybe utilized as common fill, which is defined as fill outside of structural zones, provided they meet the requirements of common fill. Structural fill must be placed in structural zones.

The onsite clayey sands, clays, and silts ("fine grained" soils) will not meet the requirements of structural fill and shall be overexcavated a minimum of 18 inches below footings. This is due to the potential volume change and/or relatively weak nature of the site "fine grained" soils. Additionally, this is recommended due to the relatively low SPT blow counts observed in the upper five (5) feet of the exploratory borings. This indicates a low relative compaction and increases the potential for settlement induced by structural loading. Removals shall extend horizontally beyond the edge of all foundations a minimum of 18 inches, and then replaced with 18 inches of properly prepared and compacted structural fill as mentioned later in the report. We recommend potholing be done during construction to insure the minimum separation requirement is met.

All Surfaces to receive fill and/or improvements should be observed and approved by a Lumos representative prior to placement of fill. The surfaces shall be scarified to a minimum depth of twelve (12) inches, moisture conditioned to at least optimum moisture content, and re-compacted to at least ninety percent (90%) of the ASTM D1557 standard. Upon re-compaction and prior to placing any fill or aggregate base, the re-compacted surface should be proof-rolled to identify any possible yielding surfaces. Proof-rolling should be conducted with a heavy rubber-tire loader with a fully loaded bucket, or a fully loaded water truck, and observed and approved by a Lumos representative. Yielding (pumping) surfaces shall be stabilized to the satisfaction of the Geotechnical Engineer. Material should not be placed, spread or compacted while the ground is frozen or during unfavorable weather conditions. When site grading is interrupted by heavy rain or snow, grading or fill operations should not resume until a Lumos representative approves the moisture content and density conditions of the subgrade or previously placed fill.

Unstable conditions due to yielding and/or pumping soils may be encountered on site. Native soils may yield or pump under heavy equipment loads or where vibratory equipment draws up water. If yielding or pumping conditions are encountered, the soils should be scarified in place, allowed to dry as necessary and re-compacted, where applicable. Alternatively, the unsuitable or saturated soil should be removed, the exposed surface leveled and compacted/tamped as much as practical without causing further pumping, and covered (including the sides) with geotextile stabilizing fabric (Mirafi HP370 or other equivalent). The fabric should then be covered with at least 12 inches of 4- to 8-inch **angular rock fill** with enough fines to fill the inter-rock pore spaces. Placement should be by end dumping. No traffic or other action should be allowed over the fabric, which may cause it to deflect/deform prior to cobble placement. Test sections should be used to determine the minimum thickness and/or number of layers required for stabilization.

Stabilization should be evaluated by proof-rolling standards commensurate with the equipment used, and approved by a Lumos representative. The placement of the stabilizing rock-fill may require additional over-excavation to maintain appropriate grading elevations. A filter fabric (Mirafi 180N or equal) should also be placed over the cobble rock fill to prevent piping of fines from covering soils into the stabilizing rock matrix.

Acceptable structural fill soils to be used for this project should consist of non-expansive material (LL less than 35 and/or a PI less than 12, and/or an Expansion Index less than 20), and should be free of contaminants, organics (less than two percent (2%)), rubble, or natural rock larger than three (3) inches in largest dimension. The soluble sulfate content shall be less than 0.1% and the R-Value shall be a minimum of 30. Any import soils should be tested and approved prior to being placed or delivered on-site (seven (7) day advanced notice). Structural fill soils shall also meet the following gradation requirements (next page):

TABLE 1
STRUCTURAL FILL GRADATION

Sieve Size	% Passing
3"	100
3/4"	70 - 100
#40	15 - 65
#200	10 - 25

Soils not meeting all of the above requirements may be approved for use as structural fill at the discretion of the Geotechnical Engineer. Soils not approved for use as structural fill may be used as common fill, if approved by the Geotechnical Engineer, and placed outside of structural zones, which is defined as zones within 18 inches, laterally and vertically, of building foundations. Common fill shall have 100% passing the 3" sieve, a maximum of 50% passing the #200 sieve, LL less than 45, PI less than 25, and an EI less than 50. Common fill should be placed only on properly compacted sub-grade or on properly compacted fill in lifts not exceeding eight (8) inches in loose thickness, moisture conditioned to at least optimum moisture content, and compacted to at least ninety percent (90%) relative compaction, as determined by the ASTM D1557 standard. Structural fill, fill within 18 inches of building foundations, shall be placed in eight (8) inch loose lifts, moisture conditioned to within two percent (2%) of optimum, and compacted to a minimum of 95% of the ASTM D1557 Standard. It is anticipated that site soils encountered during grading will meet the requirements for common fill, but not for structural fill. Therefore, structural fill material will need to be imported. If fill is to be placed on a slope greater than 5:1, the slope shall be benched at least the width of the equipment being used to prevent the migration of fill soils down slope.

Landscaped areas should be cleared of all organic and objectionable material such as wood, root stumps, etc., if any. In cut areas, no other work is necessary except grading to proper elevation and drainage conditions. In landscape fill areas, fill should be placed in loose lifts not exceeding eight (8) inches, moisture conditioned to at least optimum moisture, and compacted to at least ninety percent (90%) relative compaction to prevent erosion.

A representative of Lumos should be present during all site clearing, excavation removals, and grading operations to ensure that any unforeseen or concealed conditions within the site are identified and properly mitigated, and to test and observe earthwork construction. This testing and observation is an integral part of our services as acceptance of earthwork construction and is dependent upon compaction and stability of the subgrade soils. The soils engineer may reject any material that does not meet acceptable fill, compaction, and stability requirements. Further, recommendations in this report are provided upon the assumption that earthwork construction will conform to recommendations set forth in this section of the report.

FOUNDATION DESIGN CRITERIA

Conventional spread footings founded on 18 inches of properly prepared structural fill and underlain by properly prepared subgrade/common fill soils may be used to support the proposed building foundations within the project site.

Spread footings: Footings should have a minimum embedment of 24 inches below lowest adjacent grade for frost protection. Footings founded on 18 inches of properly prepared structural fill underlain by properly prepared subgrade/common fill soils may be designed for a net allowable bearing pressure of 2,000 pounds-per-square-foot (psf).

Footing Settlements: The maximum anticipated settlements, caused by static loading, for continuous or isolated footings bearing on 18 inches of properly prepared structural fill and underlain by properly prepared subgrade/common fill soils and designed for a 2,000 psf bearing pressure is estimated at three-quarters (¾) of an inch or less. Differential settlements are generally expected to be half of the total settlements. Settlements in granular soils are primarily expected to occur shortly after dead and sustained live loads are applied. Settlements in clay soils occur over a longer period of time. If settlements due to liquefaction are also considered, total settlement, due to static and dynamic loading, is anticipated to be approximately two (2) inches. Keep in mind, the groundwater level would have to rise to the mapped level, which is 10 feet below existing ground, for the anticipated settlements, due to liquefaction, to be possible.

Lateral Loading: Resistance to lateral loads can be provided by friction acting at the base of foundations and by lateral earth resistance. A coefficient of friction of 0.40 may be assumed at the base of footings bearing on structural fill soils. An allowable passive earth resistance of 250 psf per foot of depth starting six (6) inches below lowest adjacent grade may be used for the sides of footings poured against properly compacted structural fill. Passive resistance should not exceed 2,000 psf. The at-rest lateral pressure can be calculated utilizing an equivalent fluid pressure of 40 pcf.

Dynamic Factors: Vertical and lateral bearing values indicated above are for total dead-load and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing values may be increased by thirty-three percent (33%) for short duration loading due to wind or seismic forces. The additional Dynamic Lateral earth pressure can be calculated utilizing the following equation.

Dynamic Lateral Force = $42H^2K_h$
H = height of wall
K_h = Horizontal Acceleration (which is 0.75 g per ASCE 7-10)

This force should be assumed to act at a height of 0.6H above the bottom of the wall.

RETAINING WALLS

Retaining structures over three (3) feet in height, if used, will require local code compliance and engineered based on parameters described in this section of the report. Retaining structures should be designed to resist the appropriate lateral earth pressures. Cantilevered walls, which are able to deflect at least 0.01 radians, can be designed using an equivalent fluid (backfill) unit weight of 40 pounds-per-cubic-foot (pcf). However, if the wall is fixed against rotation, the wall should be designed using an equivalent fluid (backfill) unit weight of 60 pcf. These design parameters are based upon the assumption that walls will retain only level backfill and no hydrostatic pressure will be present. Any other surcharge pressures should be added to the above recommended lateral earth pressures. Retaining walls should be backfilled with free draining granular material that extends vertically to the bottom of the stem and laterally at least six (6) inches beyond the face of the stem (wall) and wrapped with a Mirafi 180 N or equivalent non-woven filter fabric. Weep holes should be provided on the walls at regular intervals, or a slotted drainpipe placed at the bottom of the wall (bottom of granular material) to relieve any possible build-up of hydrostatic pressure. Backfill material within two (2) feet of the wall should be compacted with hand-held equipment only, and to at least 90% of the maximum ASTM D1557 standard.

CONCRETE SLAB DESIGN

Interior structural concrete slabs should be underlain with at least six (6) inches of Type 2, Class B Aggregate Base, compacted to a minimum of ninety-five percent (95%) relative compaction, as determined by the ASTM D1557 Standard, and supported on 18 inches of properly compacted structural fill and underlain by properly prepared subgrade/common fill soils. We recommend the aggregate base be placed after utility trenches are excavated and backfilled. A vapor barrier should be provided for all interior concrete slabs where floor moisture is undesirable. The vapor barrier shall meet the requirements of ASTM E1745, Class A, and be at least ten (10) mils thick. The vapor barrier shall be installed per the manufacturer's recommendations

Slab thickness design should be based on a Modulus of Subgrade Reaction equal to two-hundred (200) pounds-per-cubic-inch (pci) for construction on 18 inches of properly compacted structural fill. Reinforcement of concrete slabs should be as specified by the Project Structural Engineer.

Exterior concrete improvements (sidewalks, curbs, gutter, etc.) should be underlain with at least six (6) inches of Type 2, Class B aggregate base and at least 12 inches of properly prepared subgrade soils. All subgrade and fill should be prepared and placed as described in the grading section of this report, while the aggregate base material should be compacted to at least ninety-five percent (95%) relative compaction as determined by the ASTM D1557 standard.

PAVEMENT DESIGN

Subgrade soils in areas to be paved shall be scarified in place to a depth of at least 12 inches, moisture conditioned to at least optimum moisture content, and compacted to at least ninety percent (90%) of the laboratory maximum dry density determined by the ASTM D1557 standard. Pavement structural section for the asphalt concrete utilizing an R-value of 21 (laboratory test results) is provided in Table 2, "Recommended Asphalt Pavement Sections". A Traffic Index (TI) value of 5.0 was utilized for design. Prior to placement of aggregate base, we recommend roadway subgrade soils be proof rolled utilizing a loader with a full bucket, or a fully loaded 10 wheel water truck. Observed pumping and/or yielding subgrade soils located during the proof rolling, shall be stabilized to the satisfaction of the Geotechnical Engineer. Aggregate base should consist of Type 2, Class B material and meet the requirements of the Standard Specifications for Public Works Construction (SPPWC). Aggregate base material should be moisture conditioned to within two percent (2%) of optimum and compacted to at least ninety-five percent (95%) of the laboratory maximum density, as determined by the ASTM D1557 standard.

TABLE 2
RECOMMENDED ASPHALT PAVEMENT SECTIONS

Pavement Area	Minimum Asphalt Pavement	Minimum Aggregate Base	Properly Prepared Subgrade Soils
T.I. = 5	3"	8"	12"

See Appendix C for Test Results and Calculations

In all areas of the project, asphalt concrete should consist of PG64-28NV, and Type 3 asphalt aggregate per the "Orange Book" standards. We recommend a 50-blow Marshall mix that targets three percent (3%) air voids. Asphalt concrete, in any case, should be compacted to between ninety-two percent (92%) and ninety-seven percent (97%) of the Rice theoretical maximum density.

All mix designs for asphalt concrete should be submitted to the Geotechnical Engineer for review and approval a minimum of seven (7) days prior to paving.

CORROSION AND CHEMICAL ATTACK

On-site soils have a negligible water soluble sulfate content of less than 0.10% (<0.01% actual). No specific type of cement is required for concrete in direct contact with on-site soils, as required by the International Building Code. However, Type II cement (meeting ASTM C150) is recommended for concrete in direct contact with on-site soils.

All exterior concrete should have between 4.5 and 7.5 percent entrained air, a maximum water-cement ratio of 0.45, and comply with all other ACI recommendations for concrete placed in areas subject to freezing. A minimum compressive strength of 4,000 psi is recommended for all external concrete. All interior concrete should also be placed pursuant to ACI recommendations.

Native soils have a pH of between 6.34 and 7.05 and have a resistivity of between 2,178 and 6,398 ohm-cm under saturated conditions. This indicates a corrosive potential for ferrous metals in contact with these soils. Corrosion mitigation measures, such as protective coatings, wrappings, and cathodic protection are therefore recommended. If protective coatings are used, the type and quantity will depend on the kind of steel and specific construction application. Steel and wire concrete reinforcement cover of at least three (3) inches where cast against soil, unformed, is recommended.

SLOPE STABILITY AND EROSION CONTROL

The results of our exploration and testing confirm that 2:1 (H:V) maximum slopes will be stable for on-site materials both in cut and fill. All slopes shall incorporate a brow ditch to direct surface drainage away from the slope face. Slopes steeper than 2:1 will require stabilization, such as retaining walls.

The potential for dust generation is high at this project. Dust control will be mandatory on this project in order to comply with air quality standards. The contractor shall be responsible for submitting a dust control plan and securing any required permits.

Stabilization of all slopes and areas disturbed by construction will be required to prevent erosion and to control dust. Stabilization may consist of rip-rap, revegetation, or dust pallative, depending on the inclination of the slope.

In order to minimize storm water discharge from this site, best management practices should be implemented.

UTILITY EXCAVATIONS

On-site soils are anticipated to be excavatable with conventional construction equipment. Compliance with OSHA regulations should be enforced for Type C soils. Excavated soils will be suitable for backfill of utility trenches after screening any oversize material and debris, are moisture conditioned to at least optimum moisture content, placed in eight (8) inch maximum loose lifts, and compacted to a minimum of ninety percent (90%) (ASTM D1557). However, on-site soils are not suitable for use as, and do not meet the minimum requirements for, Class A bedding and should be imported, where required.

MOISTURE PROTECTION, EROSION AND DRAINAGE

The finish surfaces around all structures should slope away from the building and toward appropriate drop inlets or other surface drainage devices. It is recommended that within ten (10) feet of the buildings a minimum slope of five percent (5%) be used for soil subgrades and one percent (1%) be used for pavements. These grades should be maintained for the life of the structures.

Landscaping and downspouts should be planned to prevent discharge adjacent to buildings. Instead, water flow should be conveyed and re-routed to discharge areas away from any improvements. Additionally, foundation drains should be utilized, due to the potential for the groundwater table to rise to its mapped elevation (10 feet below existing grade) and the fact that mottling was observed in many samples from a majority of the borings at depths of 10 feet and less. Foundation drains may consist of perforated pipe, wrapped with Geotextile filter fabric, located at an elevation of approximately 1 foot below bottom of footing elevation and 1 foot laterally outside of foundations, sloped to drain toward appropriate inlets.

Backfill adjacent to the proposed building perimeters should be properly compacted to minimize water infiltration into the foundation soils.

CONSTRUCTION SPECIFICATIONS

All work on-site shall be governed by the latest edition of the International Building Code (IBC) as accepted by Carson City, except where modified herein.

All work off-site shall be governed by the Standard Specifications and Standard Details for Public Works Construction (SSPWC), as distributed by Carson City, except as modified herein.

LIMITATIONS

This report has been prepared in accordance with the currently accepted engineering practices in Northern Nevada and Northern California. The analysis and recommendations in this report are based upon exploration performed at the locations shown on the site plan, the proposed improvements as described in the Introduction section of this report and upon the property in its condition as of the date of this report. Lumos makes no guarantee as to the continuity of conditions as subsurface variations may occur between or beyond exploration points and over time. Any subsurface variations encountered during construction should be immediately reported to Lumos so that, if necessary, Lumos' recommendations may be modified.

This report has been prepared for and provided directly to The Vintage at Kings Canyon, LP ("The Client"), and any and all use of this report is expressly limited to the exclusive use of the Client. The Client is responsible for determining who, if anyone, shall be provided this report, including any designers and subcontractors whose work is related to this project. Should the Client decide to provide this report to any other individual or entity, Lumos shall not be held liable for any use by those individuals or entities to whom this report is provided. The Client agrees to indemnify, defend and hold harmless Lumos, its agents and employees from any claims resulting from unauthorized users.

If this report is utilized in the preparation of an Engineer's Estimate of Probable Construction Costs, then the preparer of the estimate acknowledges that the report recommendations are based on the subsurface conditions found at the specific locations investigated on site; that subsurface conditions may vary outside these locations; and that no guaranty or warranty, express or implied, is made that the conditions encountered are representative of the entire site. The preparer of the estimate agrees to indemnify, defend and hold harmless Lumos & Associates, its agents and employees from any and all claims, causes of action or liability arising from any claims resulting from the use of the report in the preparation of an Engineer's Cost Estimate.

This report is not intended for, nor should be utilized for, bidding purposes. If it is utilized for bidding purposes, Client acknowledges that the report recommendations are based on the subsurface conditions found at the specific locations investigated on site; that subsurface conditions may vary outside these locations; and that no guaranty or warranty, express or implied, is made that the conditions encountered are representative of the entire site. The Client agrees to indemnify, defend and hold harmless Lumos & Associates, its agents and employees from any and all claims, causes or action or liability arising from any claims resulting from the use of the report for bidding purposes.

As explained above, subsurface variations may exist and as such, beyond the express findings located in this report, no warranties express, or implied, are made by this report. No affirmation of fact, including but not limited to statements regarding suitability for use of performance shall be deemed to be a warranty or guaranty for any purpose.

6/2/16

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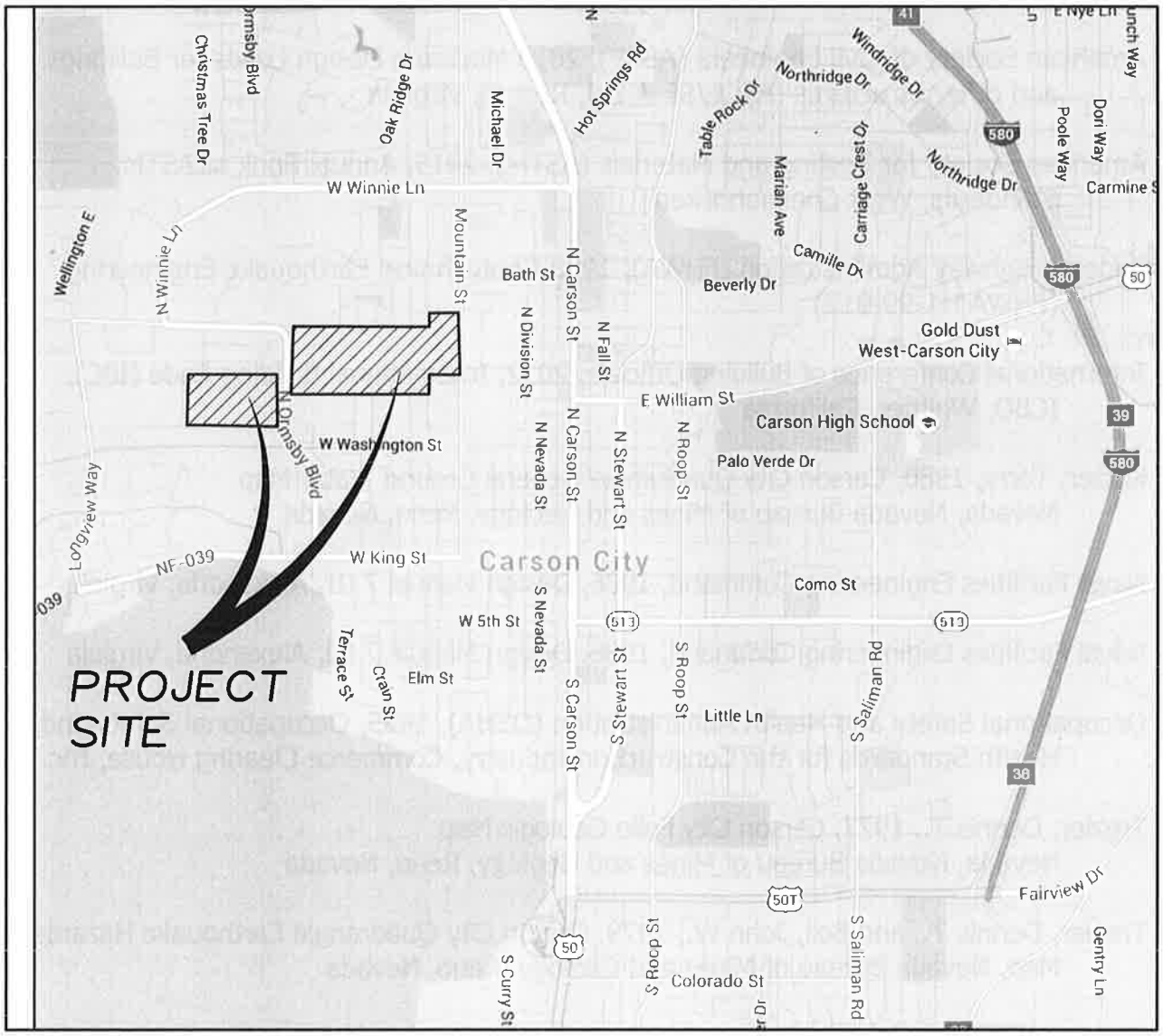
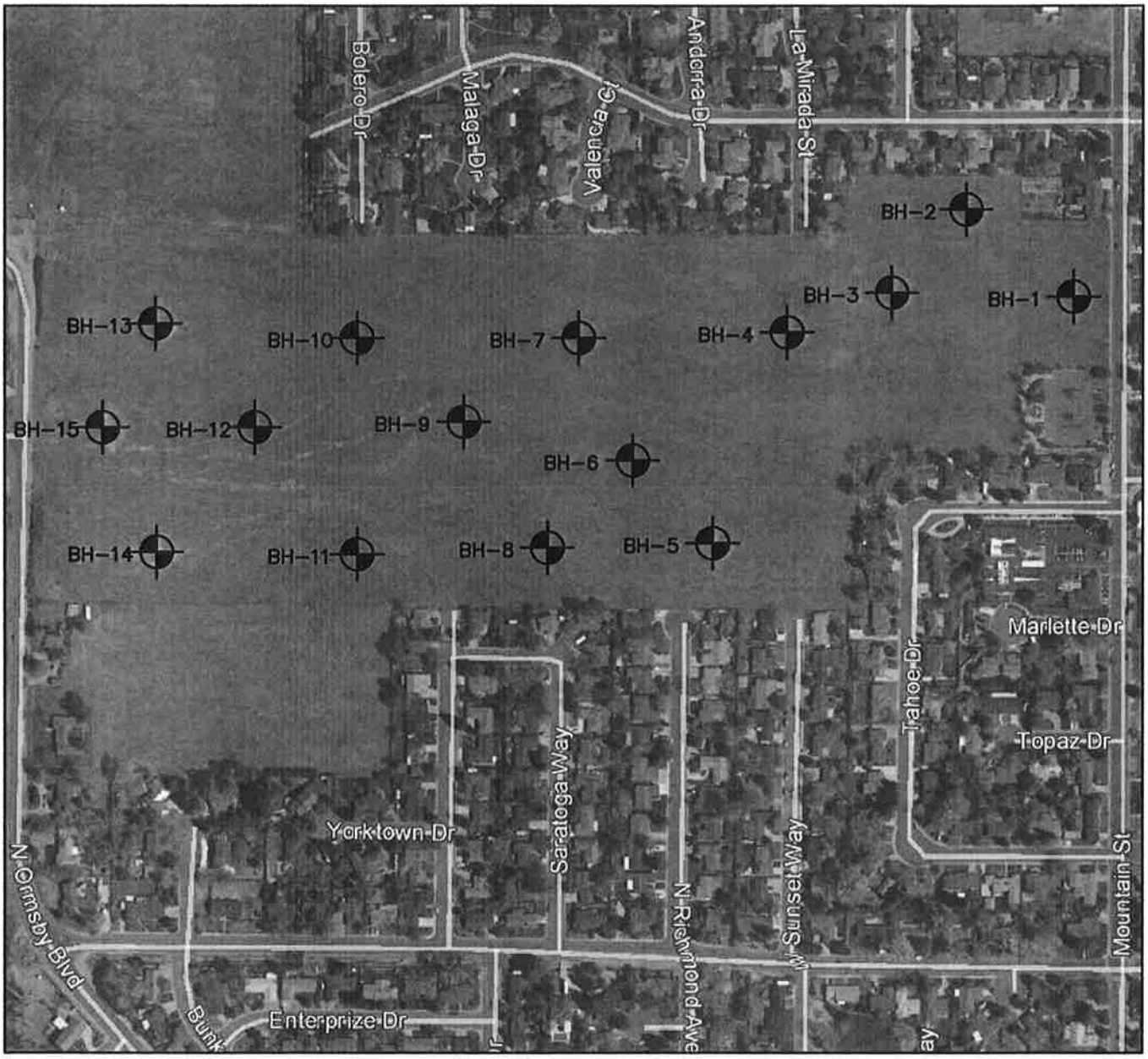


LUMOS & ASSOCIATES 800 E. COLLEGE PARKWAY CARSON CITY, NEVADA 89706 PH. (775) 883-7077 FAX (775) 883-7114	The Vintage at King's Canyon **VICINITY MAP** Carson City — Nevada	Date: May 2016 Scale: N.T.S. Job No: 8947.000 PLATE 1



LEGEND

BH- ⊕ = APPROXIMATE EXPLORATORY BORING LOCATION

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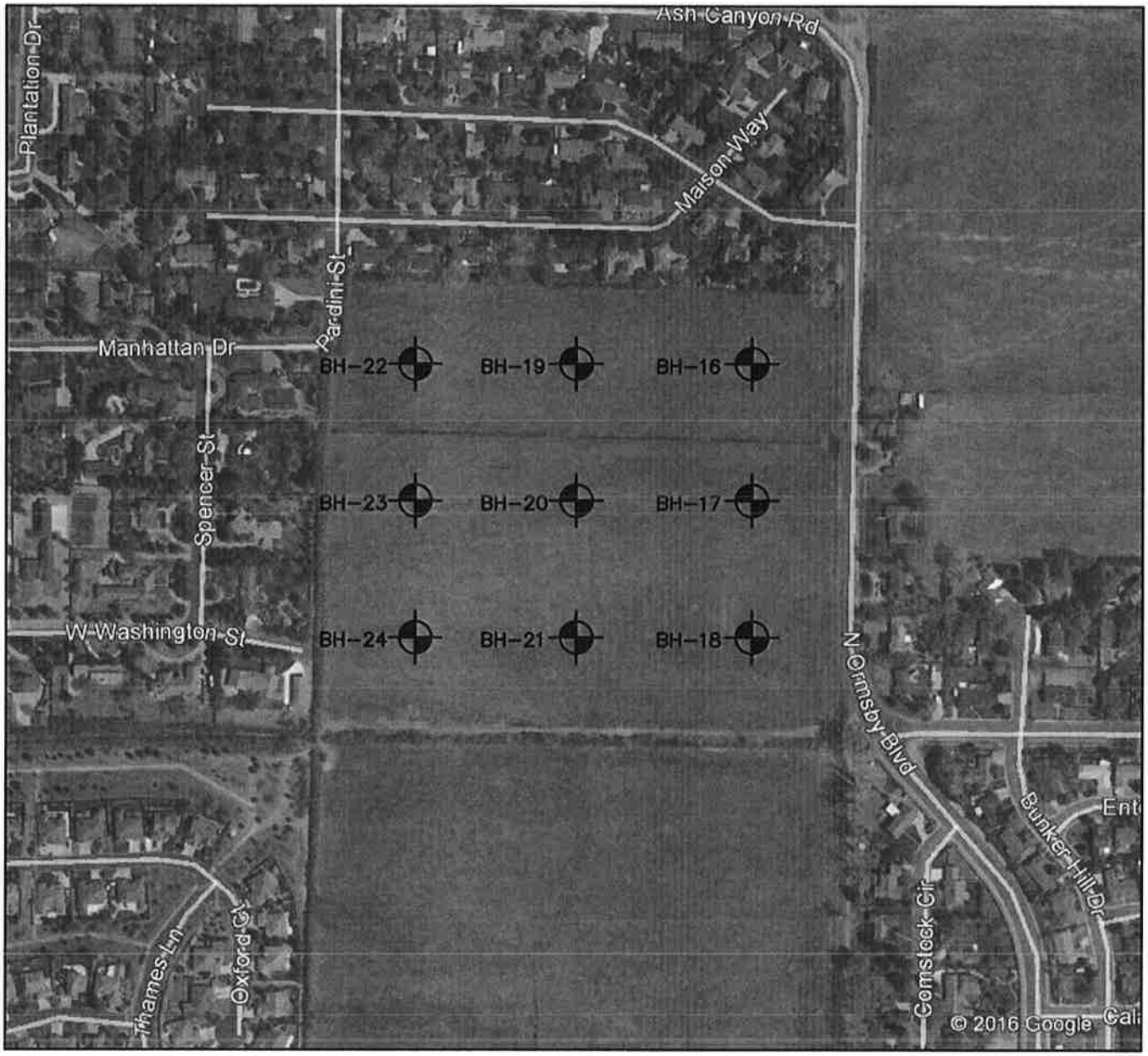
The Vintage at King's Canyon

SITE MAP

Carson City Nevada

Date:	May 2016
Scale:	N.T.S.
Job No:	8947.000
PLATE	2.1



LEGEND

BH- ⊕ = APPROXIMATE EXPLORATORY BORING LOCATION

N

LUMOS & ASSOCIATES 800 E. COLLEGE PARKWAY CARSON CITY, NEVADA 89706 PH. (775) 883-7077 FAX (775) 883-7114	The Vintage at King's Canyon **SITE MAP** Carson City — Nevada	Date: May 2016 Scale: N.T.S. Job No: 8947.000 PLATE 2.2

MODIFIED MERCALLI INTENSITY SCALE

INTENSITY	EFFECTS
I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeable indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt indoors by many, outdoors by few. At night some awaken. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building; standing motor cars rock noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbance of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well- built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Disturbs persons driving motor cars.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures with foundations destroyed; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (sloped) over banks.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipe lines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.

From Wood and Newman, 1931, by U.S. Geological Survey, 1974, Earthquake Information Bulletin, v. 6, no. 5, p. 28

Richter Magnitude	Intensity (maximum expected Modified Mercalli)
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - VIII
7.0 - 7.9	IX - X
8.0 - 8.9	XI - XII

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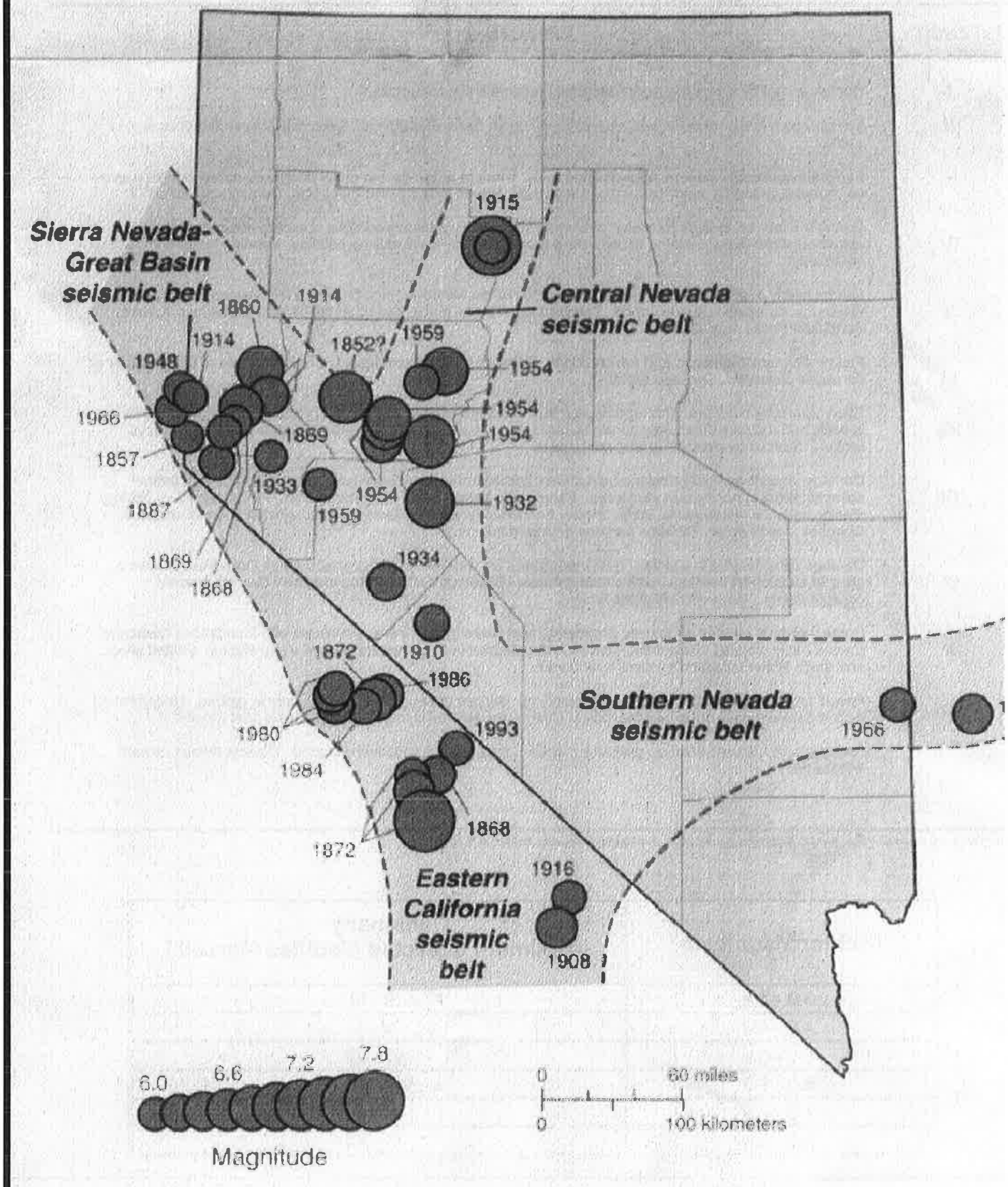
The Vintage at King's Canyon

MODIFIED MERCALLI SCALE

Carson City Nevada

Date: May 2016
Scale: N.T.S.
Job No: 8947.000
PLATE 3

MAJOR EARTHQUAKES AND SEISMIC BELTS



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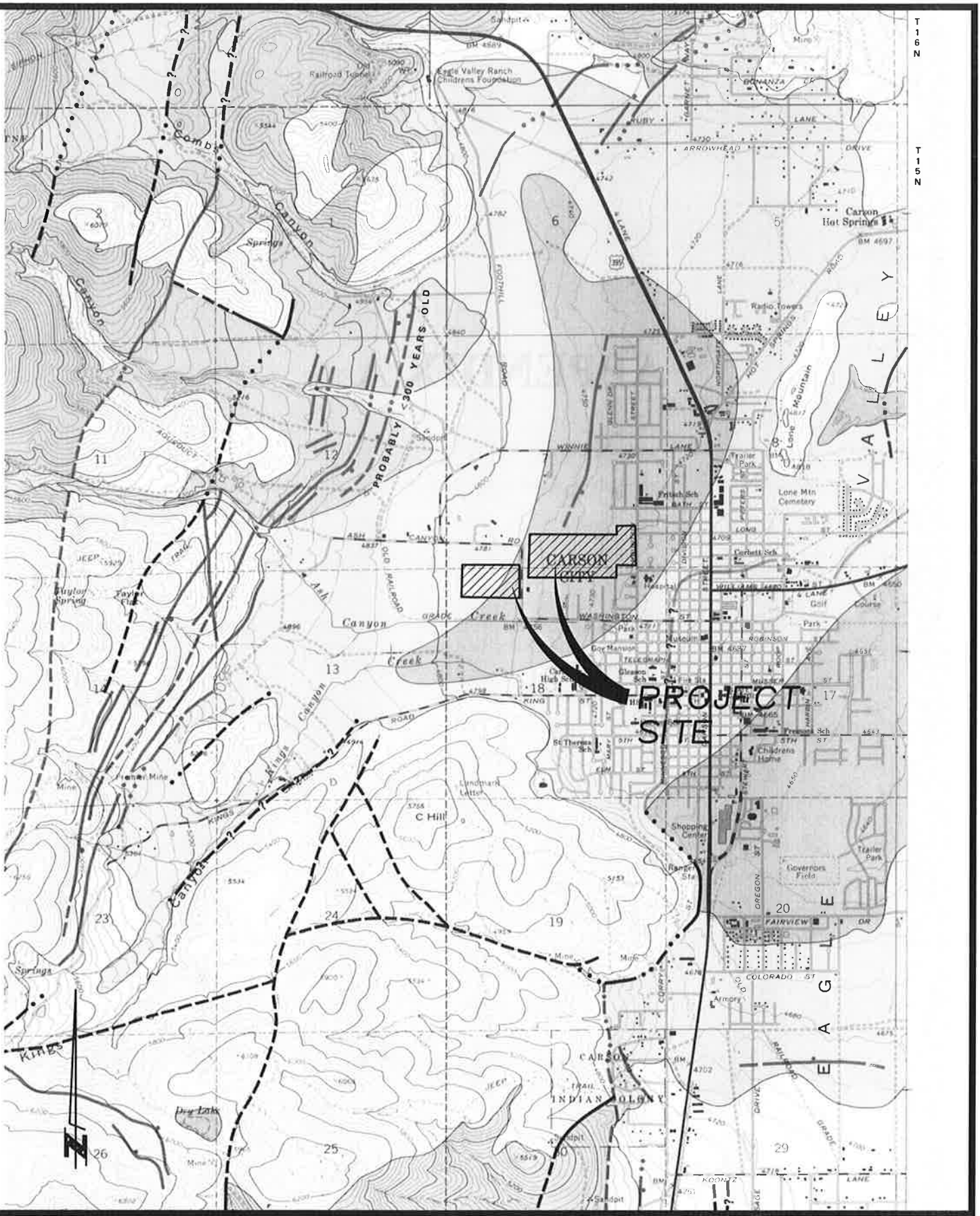
The Vintage at King's Canyon

MAJOR EARTHQUAKES/ SEISMIC BELTS

Carson City Nevada

Date:	May 2016
Scale:	N.T.S.
Job No:	8947.000
PLATE	4



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APPENDIX A

TEST PIT No. B-01

Logged By:	**B. Sexton**	Total Depth:	**21.5 feet**
Date Logged:	**4-18-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
		B	**Brown Clayey SAND (SC),** Moist, Medium Dense, with Roots.	6.7			36	14	0.8	61.3	38.0	43	
5			5.0										
		B	**Reddish Brown Clayey SAND (SC),** Moist, Medium Dense, with Mottling.	14.1			34	18	0.0	71.4	28.6		
10			10.5										
		Z	**Brown Silty SAND (SM),** Moist, Medium Dense. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
15			15.0										
			15.5										
		Z	**Reddish Gray Brown Sandy SILT (ML),** Moist, Stiff, with Mottling. Estimated 30% Medium to Fine Sand and 70% Non-Plastic Silt.										
			16.0										
		Z	**Reddish Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Medium Dense. Estimated 10% Fine Gravel, 80% Coarse to Fine Sand, and 10% Non-Plastic Silt.										
			17.5										
			Brown Clayey SAND (SC), Moist, Medium Dense. Estimated 55% Coarse to Fine Sand and 45% Clay.										
20			**Gray Brown Silty SAND (SM),** Moist, Medium Dense.										
			21.5	17.1			NP	NP	0.5	83.0	16.5		

Test pit terminated at 21.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-1

TEST PIT No. B-02

Logged By:	**B. Sexton**	Total Depth:	**21.5 feet**
Date Logged:	**4-18-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
		B	**Brown Clayey SAND (SC),** Moist, Medium Dense, Roots. See Plate A-1 for Test Results.										
5			5.0										
		X	**Reddish Brown Silty SAND (SM),** Moist, Dense.	5.5			NP	NP	2.2	82.6	15.2		
10			10.0										
		X	**Gray Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Dense, with Slight Verticle Mottling. Estimated 5% Fine Gravel, 85% Coarse to Fine Sand, and 10% Non-Plastic Silt.										
15			15.7										
		Z	16.0 **Gray Brown Clayey SAND (SC),** Miost, Medium Dense. Estimated 60% Coarse to Fine Sand and 40% Clay.										
			Gray Brown Poorly Graded SAND (SP), Moist, Medium Dense. Estimated 95% Coarse to Fine Sand and 5% Non-Plastic Silt.										
20			20.0										
		X	**Gray Brown Clayey SAND (SC),** Miost, Medium Dense. Estimated 60% Coarse to Fine Sand and 40% Clay. 21.0										
		Z	21.5 **Gray Brown Poorly Graded SAND (SP),** Moist, Medium Dense. Estimated 95% Coarse to Fine Sand and 5% Non-Plastic Silt.										

Test pit terminated at 21.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-2

TEST PIT No. B-03

Logged By: **B. Sexton** | Total Depth: **41.5 feet**
Date Logged: **4-18-2016** | Water Depth: **22 feet ±**
Drill Type: **Jeff Co Speedstar 15** | Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0		B	**Brown Clayey SAND (SC),** Moist, Dense. See Test Results on Plate A-1.										
5		Z											
			Light Gray Brown Poorly Graded SAND with Silt (SP-SM), Moist, Dense. Estimated 5% Fine Gravel, 85% Coarse to Fine Sand, and 10% Non-Plastic Silt.										
10			**Brown Silty SAND (SM),** Moist, Dense. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
		Z	**Gray Brown Clayey SAND (SC),** Moist, Dense. Estimated 70% Coarse to Fine Sand and 30% Clay.										
15			**Reddish Brown Silty SAND (SM),** Moist, Dense, with Mottling. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
			Gray Brown Clayey SAND (SC), Moist, Dense. Estimated 60% Coarse to Fine Sand and 40% Clay.										
20			**Gray Brown Silty SAND (SM),** Moist, Dense. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt. Groundwater Encountered at 22' Below Ground Surface. Switch to Mud Rotary at 22' Due to Slight Heaving of the Hole after Obtaing the Sample.										
25		Z											
30			**Red Brown Poorly Graded SAND with Silt (SP-SM),** Wet, Dense, with Mottling.	16.9			NP	NP	13.0	75.1	11.9		
35													
		Z	**Red Brown Silty SAND (SM),** Wet, Dense, with Mottling. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
40			**Gray Poorly Graded SAND (SP),** Wet, Dense, with Layered Mottling.										

Test pit terminated at 41.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 | Date: May 2016

PLATE A-3

TEST PIT No. B-04

Logged By: **B. Sexton** | Total Depth: **25 feet**
Date Logged: **4-21-2016** | Water Depth: **23 feet ±**
Drill Type: **Jeff Co Speedstar 15** | Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			Brown Clayey SAND (SC), Moist, Medium Dense. Estimated 60% Coarse to Fine Sand and 40% Clay.										
5			5.0										
			Reddish Brown Silty SAND (SM), Moist, Medium Dense. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
			5.5 **Light Brown Silty SAND (SM),** Moist, Medium Dense, with Mottling.										
10				8.8			NP	NP	1.2	68.5	30.3		
15			Color Change at 15' to Brown.										
			Pocket Penetrometer Field Test at 16' = 1.7tsf 16.0										
			Gray Brown Clayey SAND (SC), Moist, Medium Dense.	18.0			31	15	0.0	53.9	46.1		
20			Color Change at 20' to Reddish Brown.										
			21.0 **Reddish Brown Silty SAND (SM),** Wet, Dense. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
			Continued to Drill Straight to 25'. Encountered Groundwater at 23'.										
25			25.0										

Test pit terminated at 25 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-4

TEST PIT No. B-05

Logged By: **B. Sexton**
Date Logged: **4-21-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **11.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1			**Brown Clayey SAND (SC),** Moist, Medium Dense.										
2		B											
3				11.1			32	11	0.7	65.5	33.8		
4													
5													
6													
7													
8			Mottling Noted at 7.5'.										
9													
10			10.0										
11			**Reddish Brown Lean CLAY with Sand (CL),** Moist, Medium Stiff, Mottling. Estimated 20% Medium to Fine Sand and 80% Moderately Plastic Clay.										
			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000

Date: May 2016

PLATE A-5

TEST PIT No. B-06

Logged By:	**B. Sexton**	Total Depth:	**41.5 feet**
Date Logged:	**4-19-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0			**Brown Clayey SAND (SC),** Moist, Dense, Slight Mottling. Estimated 60% Coarse to Fine Sand and 40% Clay. Entire Hole Drilled Utilizing Mud Rotary Technique.										
5		X											
10		X	**Gray Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Dense. Estimated 90% Coarse to Fine Sand and 10% Non-Plastic Silt.										
15		X	**Reddish Brown Silty SAND (SM)** Moist, Dense. Estimated 5% Fine Gravel, 80% Coarse to Fine Sand, and 15% Non-Plastic Silt.										
20		X	**Gray Brown Lean CLAY with Sand (CL)** Moist, Stiff, with Mottling.	32.2			37	16	0.0	18.8	81.2		
		Z	**Gray Brown Silty SAND (SM)** Moist, Dense, Mottling. Estimated 5% Fine Gravel, 80% Coarse to Fine Sand, and 15% Non-Plastic Silt.										
25		X	**Reddish Brown Silty SAND (SM)** Moist, Dense. Estimated 5% Fine Gravel, 80% Coarse to Fine Sand, and 15% Non-Plastic Silt.										
30		X	2" Layer of Purple SM at 31'.										
35		X	Heavy Mottling Noted at 35'.										
40		X											
		Z	**Gray Reddish Brown Lean CLAY with Sand (CL),** Moist, Stiff, with Mottling. Estimated 20% Medium to Fine Sand and 80% Moderately Plastic Clay.										

Test pit terminated at 41.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-6

TEST PIT No. B-07

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-21-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Clayey SAND (SC)** Moist, Medium Dense. Estimated 60% Coarse to Fine Sand and 40% Clay.										
2													
3			3.0										
3		B	**Gray Brown Silty SAND (SM),** Moist, Medium Dense, with Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
4													
5			5.0										
5			**Gray Brown Clayey SAND (SC)** Moist, Medium Dense. Estimated 70% Coarse to Fine Sand and 30% Clay.										
6													
7													
8													
9													
10			Color Change at 10' to Brown.										
		Z	10.8										
11		Z	**Gray Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Dense.	4.4			NP	NP	0.5	88.8	10.8		
			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-7

TEST PIT No. B-08

Logged By: **B. Sexton** | Total Depth: **21.5 feet**
Date Logged: **4-21-2016** | Water Depth: **No groundwater encountered**
Drill Type: **Jeff Co Speedstar 15** | Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0			**Brown Clayey SAND (SC)** Moist, Medium Dense. Estimated 60% Coarse to Fine Sand and 40% Clay.										
5			5.5										
			Reddish Brown Clayey SAND (SC) Moist, Medium Dense, with Mottling.	13.5			45	24	0.2	49.9	49.9		
10			10.0 **Gray Brown Silty SAND (SM)** Moist, Medium Dense, Roots. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
15			Color Change at 15' to Brown. 16.0										
			Light Gray Brown Silty SAND (SM) Moist, Dense. Estimated 10% Fine Gravel, 60% Coarse to Fine Sand, and 30% Non-Plastic Silt.										
20			20.0 **Gray Reddish Brown Silty Gravel (GM),** Moist, Very Dense, with Mottling. Estimated 40% Coarse to Fine Gravel, 40% Coarse to Fine Sand, and 20% Non-Plastic Silt. 21.5										

Test pit terminated at 21.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-8

TEST PIT No. B-09

Logged By:	**B. Sexton**	Total Depth:	**25 feet**
Date Logged:	**4-21-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample (B) | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0		B	**Brown Clayey SAND (SC)** Moist, Medium Dense.	8.0			40	24	3.2	48.9	47.9		35
5			Color Change to Reddish Brown at 5'.										
10			**Reddish Brown Silty SAND (SM)** Moist, Dense. Estimated 10% Fine Gravel, 60% Coarse to Fine Sand, and 30% Non-Plastic Silt.										
15			**Gray Brown Clayey SAND (SC)** Moist, Dense. Estimated 70% Coarse to Fine Sand and 30% Clay.										
20			**Gray Brown Silty SAND (SM)** Moist, Dense. Estimated 10% Fine Gravel, 60% Coarse to Fine Sand, and 30% Non-Plastic Silt. Drilled Straight from 21.5' to 25' to Search for Water. No Water Present in Boring Hole at 25' After Waiting 2 Hours.										
25			Test pit terminated at 25 feet. Test Pits backfilled without compaction verification										

10.0 | 15.0 | 16.2 | 25.0

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The Vintage at King's Canyon

LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-9

TEST PIT No. B-10

Logged By: **B. Sexton**
Date Logged: **4-21-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **11.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Clayey SAND (SC)** Moist, Dense. Estimated 55% Coarse to Fine Sand and 45% Clay.										
2													
3			3.5										
4		Z	**Gray Brown Silty SAND (SM)** Moist, Dense, with Roots. Estimated 60% Coarse to Fine Sand, and 40% Non-Plastic Silt.										
5													
6													
7			8.0										
8			**Gray Brown Clayey SAND (SC)** Moist, Dense, with Mottling.	7.9			26	9	0.1	56.3	43.7		
9													
10													
11			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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The Vintage at King's Canyon

LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000

Date: May 2016

PLATE A-10

TEST PIT No. B-11

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-21-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Clayey SAND (SC)** Moist, Medium Dense.										
2													
3			Slight Mottling Noted at 3.5'.										
4													
5													
6			Color Change to Light Brown and Contains Roots at 5.7'.	7.6			31	13	1.0	49.0	49.9		
7													
8													
9													
10			10.0										
11			**Reddish Brown Silty SAND (SM)** Moist, Medium Dense, with Heavy Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-11

TEST PIT No. B-12

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-21-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Clayey SAND (SC)** Moist, Medium Dense. Estimated 55% Coarse to Fine Sand and 45% Clay.										
2													
3			Slight Mottling Noted at 3.5'.										
4													
5			Heavier Mottling Noted at 5'.										
6													
7													
8			8.0										
8			**Gray Brown Sandy SILT (ML).** Moist, Stiff.	6.6			38	10	0.3	30.4	69.3		
9													
10			Slightly More Coarse at 10'.										
11			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-12

TEST PIT No. B-13

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-21-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample (B) | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Clayey SAND (SC)** Moist, Medium Dense.										
2													
3													
4													
5													
6				5.8			30	11	0.8	61.7	37.6		
			6.5										
7			**Gray Brown Silty SAND (SM),** Moist, Medium Dense to Dense, Roots, and Slight Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
8													
9													
10													
11													
			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-13

TEST PIT No. B-14

Logged By: **B. Sexton**
Date Logged: **4-19-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **41.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0			**Brown Clayey SAND (SC),** Moist, Medium Dense. Estimated 55% Coarse to Fine Sand and 45% Clay.										
5			Entire Hole Drilled Utilizing Mud Rotary Technique.										
10			10.0										
			Reddish Brown Silty SAND (SM), Moist, Medium Dense, with Roots and Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
			10.5 **Gray Brown Silty SAND (SM),** Moist, Medium Dense to Very Dense, with Roots and Mottling. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
15			No Mottling Noted but Still Containing Roots at 15'. Also a 1" Layer of a Black Silty SAND (SM). No Odor.										
20			20.0 **Gray Reddish Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Dense to Very Dense. Estimated 10% Angular Fine Gravel, 80% Coarse to Fine Sand, and 10% Non-Plastic Silt.										
25			Color Change to just Reddish Brown at 25'.										
30			30.0 **Reddish Brown Silty SAND (SM),** Moist, Dense, with Mottling.	19.8			NP	NP	0.3	59.6	40.1		
35													
40			Slightly More Coarse at 40'.										
			41.5										

Test pit terminated at 41.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000

Date: May 2016

PLATE A-14

TEST PIT No. B-15

Logged By: **B. Sexton**
Date Logged: **4-20-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **11.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Sandy SILT (ML).** Moist, Medium Stiff, with Roots, and Mottling.										
2													
3				15.5			36	7	0.8	38.3	61.0		
4													
5			5.5										
6		Z	**Gray Brown Silty SAND (SM).** Moist, Medium Dense, Slight Roots, and Slight Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
7													
8													
9													
10													
11			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000
Date: May 2016

PLATE
A-15

TEST PIT No. B-16

Logged By: **B. Sexton**
Date Logged: **4-20-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **11.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Silty SAND (SM).** Moist, Loose.	6.5			33	6	1.4	62.7	35.9	21	0
2													
3													
4													
5			5.0										
6			**Gray Brown Silty SAND (SM).** Moist, Medium Dense to Dense. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
7													
8													
9													
10													
11			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000

Date: May 2016

PLATE A-16

TEST PIT No. B-17

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-20-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0			**Brown Silty SAND (SM).** Moist, Loose.										
1		B											
2													
3		Z		17.5			30	5	0.5	54.5	44.9		
3.7			**Gray Brown Silty SAND (SM).** Moist, Medium Dense, with Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
4													
5													
6													
7													
7.5			Small Roots Noted at 7.5'.										
8													
9													
10													
10.0			**Brown Clayey SAND (SC).** Moist, Dense, with Roots, and Mottling. Estimated 55% Coarse to Fine Sand and 45% Clay.										
11													
11.5			Test pit terminated at 11.5 feet. Test Pits backfilled without compaction verification										

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-17

TEST PIT No. B-18

Logged By: **B. Sexton**
Date Logged: **4-20-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **11.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Silty SAND (SM).** Moist, Loose, with Roots. Estimated 55% Coarse to Fine Sand and 45% Plastic Silt.										
2													
3													
4													
5			5.0										
6			**Brown Clayey SAND (SC).** Moist, Medium Dense, with Slight Mottling. Estimated 55% Coarse to Fine Sand and 45% Clay.										
7													
8													
9													
10			10.0										
11			**Gray Brown Clayey SAND (SC).** Moist, Medium Dense, with Mottling.										
			11.5	8.4			29	11	0.1	51.7	48.1		

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000
Date: May 2016

PLATE A-18

TEST PIT No. B-19

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-20-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Silty SAND (SM),** Moist, Medium Dense, with Roots. See Plate A-16 for Test Results.										
2													
3													
4													
5													
6													
7													
8			8.5										
9			**Gray Brown Silty SAND (SM),** Moist, Medium Dense, with Mottling and Roots. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
10													
11			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-19

TEST PIT No. B-20

Logged By: **B. Sexton**
Date Logged: **4-19-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **41.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0			**Brown Silty SAND (SM),** Moist, Medium Dense, with Roots. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
5		X											
10		X											
10.0			**Gray Reddish Brown Silty SAND (SM),** Moist, Medium Dense, with Mottling. Estimated 5% Fine Gravel, 55% Coarse to Fine Sand and 40% Non-Plastic Silt.										
15		X											
15.0			**Gray Brown Clayey SAND (SC),** Moist, Medium Dense.	21.9			32	9	3.1	53.6	43.3		
20		X											
20.0			**Gray Brown Silty SAND (SM),** Moist, Dense, with Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
25		X											
30		X											
30.0			**Gray Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Dense. Estimated 10% Fine Angular Gravel, 90% Coarse to Fine Sand, and 10% Non-Plastic Silt.										
35		X											
35.0			**Brown Silty SAND (SM),** Moist, Dense, with Mottling. Estimated 70% Coarse to Fine Sand and 30% Non-Plastic Silt.										
40		X											
40.0			**Gray Brown Poorly Graded SAND with Silt (SP-SM),** Moist, Dense. Estimated 10% Fine Angular Gravel, 90% Coarse to Fine Sand, and 10% Non-Plastic Silt.										
41.5													

Test pit terminated at 41.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000

Date: May 2016

PLATE A-20

TEST PIT No. B-21

Logged By: **B. Sexton** | Total Depth: **40 feet**
Date Logged: **4-20-2016** | Water Depth: **No groundwater encountered**
Drill Type: **Jeff Co Speedstar 15** | Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
0		B	**Brown Silty SAND (SM).** Moist, Loose, with Roots. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
5		X	Slight Mottling Noted at 6'.										
		Z	8.5										
10		X	**Gray Brown Clayey SAND (SC).** Moist, Medium Dense, with Mottling. Color Change to Brown at 10'.	6.6			30	8	0.3	53.9	45.9		
			11.5										
15			Drilled First Down to 25'. No Water Noted. Then Proceded to Drill to 40'. No Water Noted. Left the Hole Open for Approximately 2 Hours. No Water Noted within the Boring Hole to 40' Below Ground Surface.										
20													
25													
30													
35													
40			40.0										

Test pit terminated at 40 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 | Date: May 2016

PLATE A-21

TEST PIT No. B-22

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-20-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Silty SAND (SM),** Moist, Loose to Medium Dense. See Plate A-6 for Test Results.										
2													
3													
4													
5		Z											
			5.7										
6			**Gray Brown Silty SAND (SM),** Moist, Loose, with Mottling. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
7													
8													
9													
10													
11													
			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-22

TEST PIT No. B-23

Logged By: **B. Sexton**
Date Logged: **4-20-2016**
Drill Type: **Jeff Co Speedstar 15**

Total Depth: **11.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Silty, Clayey SAND (SC-SM),** Moist, Loose to Dense, with Roots.	8.5			28	6	3.4	62.6	33.9		
6.2			**Gray Reddish Brown Silty SAND (SM),** Moist, Loose, with Mottling and Roots. Estimated 60% Coarse to Fine Sand and 40% Non-Plastic Silt.										
7.5			**Gray Brown Clayey SAND (SC),** Moist, Medium Dense, with Mottling. Estimated 60% Coarse to Fine Sand and 40% Clay.										
11.5			Test pit terminated at 11.5 feet. Test Pits backfilled without compaction verification										

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The Vintage at King's Canyon

LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000

Date: May 2016

PLATE A-23

TEST PIT No. B-24

Logged By:	**B. Sexton**	Total Depth:	**11.5 feet**
Date Logged:	**4-20-2016**	Water Depth:	**No groundwater encountered**
Drill Type:	**Jeff Co Speedstar 15**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
1		B	**Brown Silty SAND (SM).** Moist, Loose to Medium Dense, with Roots.										
2													
3				9.8			29	7	6.8	65.5	27.7		
4													
5			Roots and Mottling Noted at 5'.										
6													
7													
8													
9													
10			10.0 **Reddish Brown Silty SAND (SM).** Moist, Loose, with Heavy Mottling. Estimated 60% Coarse to Fine Sand and 40% Plastic Silt.										
11			11.5										

Test pit terminated at 11.5 feet.
Test Pits backfilled without compaction verification

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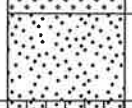
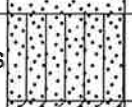
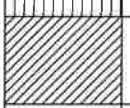
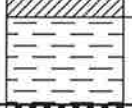
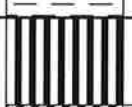
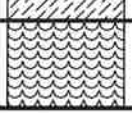
LOG OF EXPLORATORY TEST PIT

Job Number: 8947.000 Date: May 2016

PLATE A-24

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Other Tests	
AN	ANALYTICAL TEST (pH, Soluble Sulfate, and Resistivity)
C	CONSOLIDATION TEST
DS	DIRECT SHEAR TEST
MD	MOISTURE DENSITY CURVE

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LEGEND

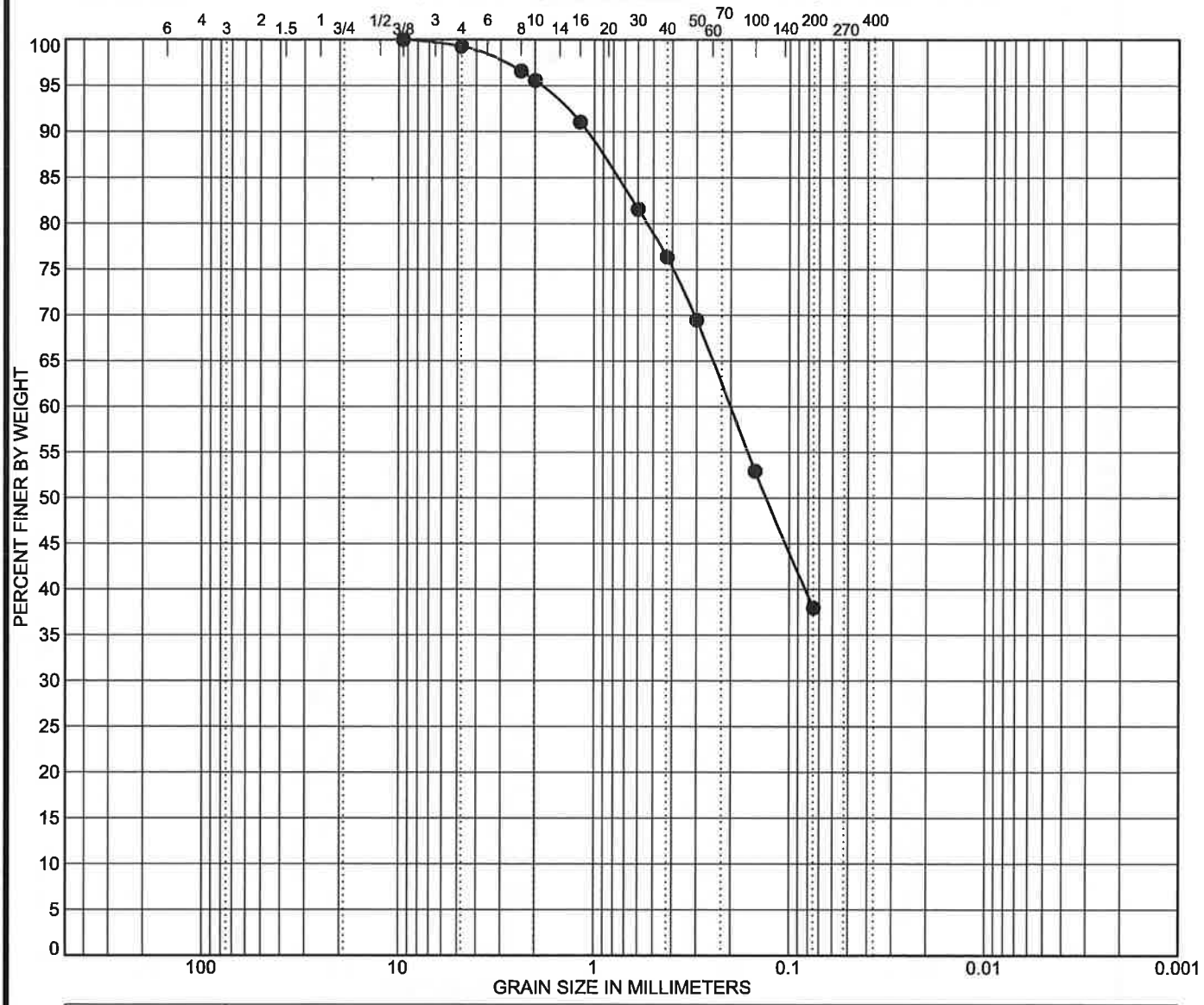
Job Number: 8947.000

Date: May 2016

PLATE A-25

LUMOS LEGEND 8947.000 KINGS CANYON.GPJ 10-23-06.GDT 5/25/16

APPENDIX B



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-6-2016								
B-01	Classification					LL	PL	PI	Cc	Cu
Depth: 0	Clayey SAND (SC)					36	23	13		
Sample Location	Comb. Samp. B-1, 2, 3, & 5 from 0'-3'									
USCS	SC									
AASHTO										

Specimen Identification								
B-01	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 0	9.5	0.202			0.8	61.3	38.0	

Natural Moisture	6.7 %		**S.E.**		**Absorption %**	
R-Value	43		**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	35

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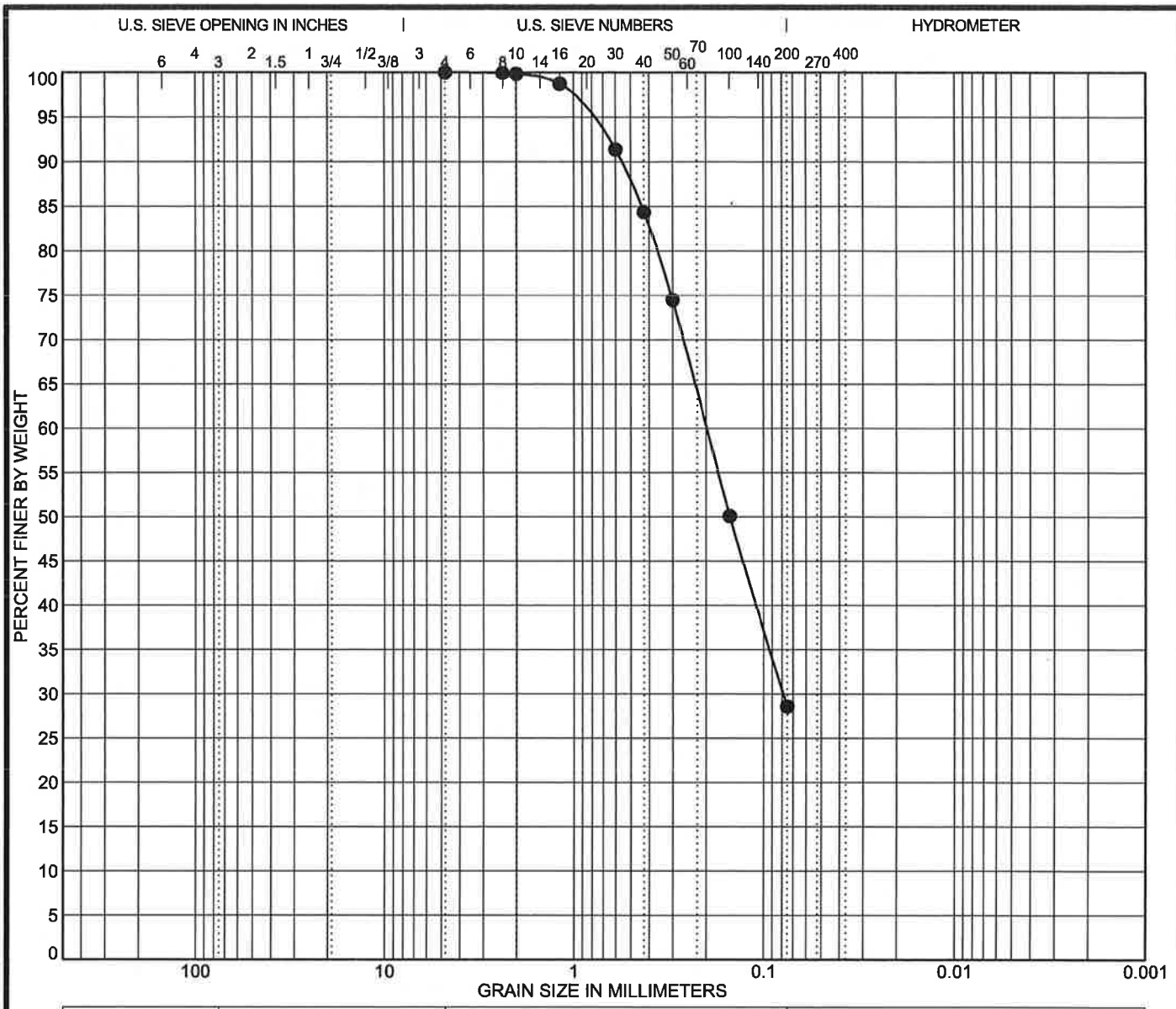
GRAIN SIZE DISTRIBUTION

Job Number: 8947.000 Date: May 2016

PLATE

B-1.1

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016							
● **B-01**	Classification				LL	PL	PI	Cc	Cu
Depth: 5	Clayey SAND (SC)				34	16	18		
Sample Location	Boring 1 from 5' - 6.5'								
USCS	SC								
AASHTO									

Specimen Identification								
● **B-01**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 5	4.75	0.199	0.079		0.0	71.4	28.6	

Natural Moisture	14.1 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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GRAIN SIZE DISTRIBUTION

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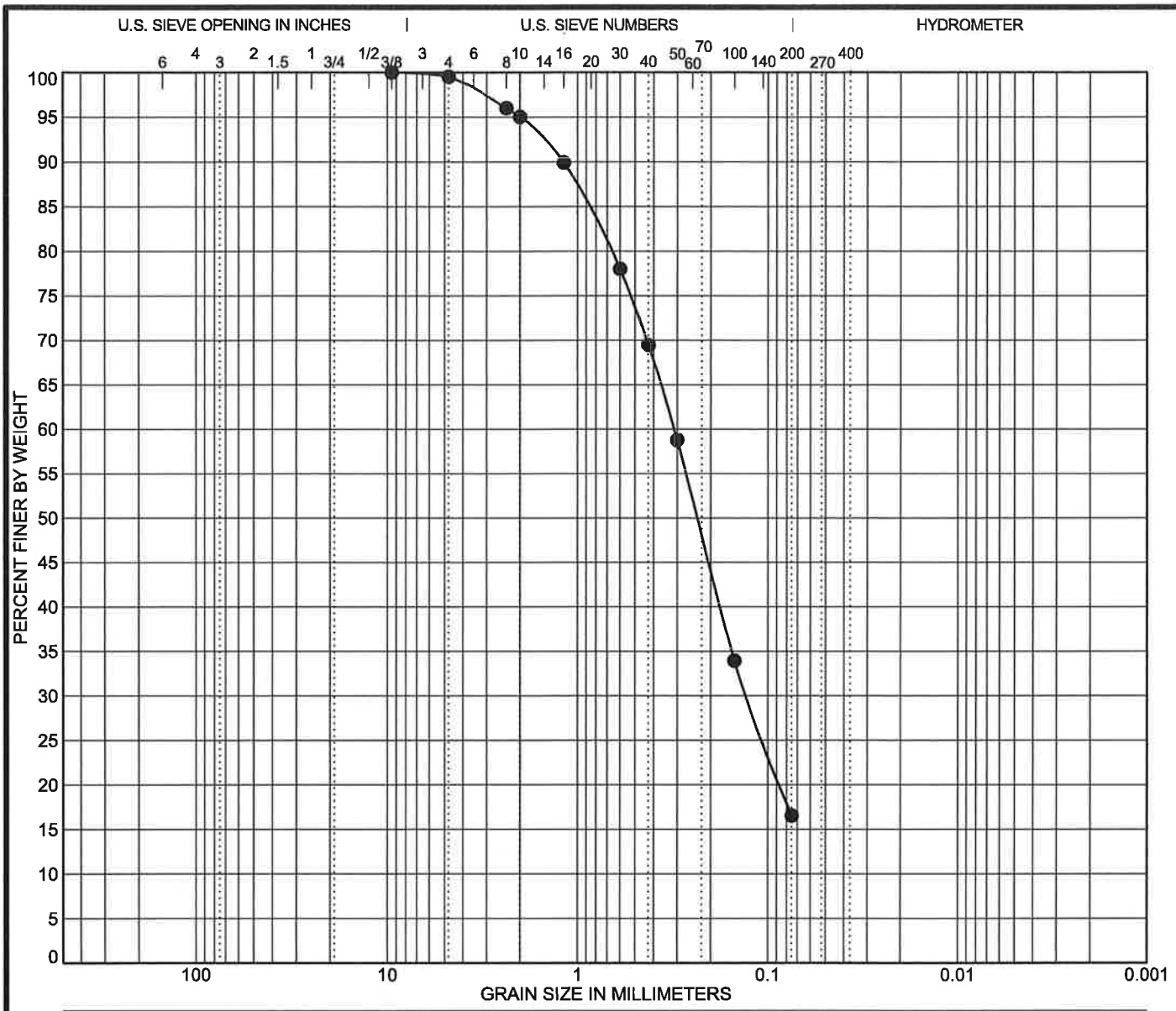
PLATE

B-1.2



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● **B-01**	Classification				LL	PL	PI	Cc	Cu
Depth: 21	Silty SAND (SM)				NP	NP	NP		
Sample Location	Boring 1 from 21' - 21.5'								
USCS	SM								
AASHTO									

Specimen Identification								
● **B-01**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 21	9.5	0.313	0.128		0.5	83.0	16.5	

Natural Moisture	17.1 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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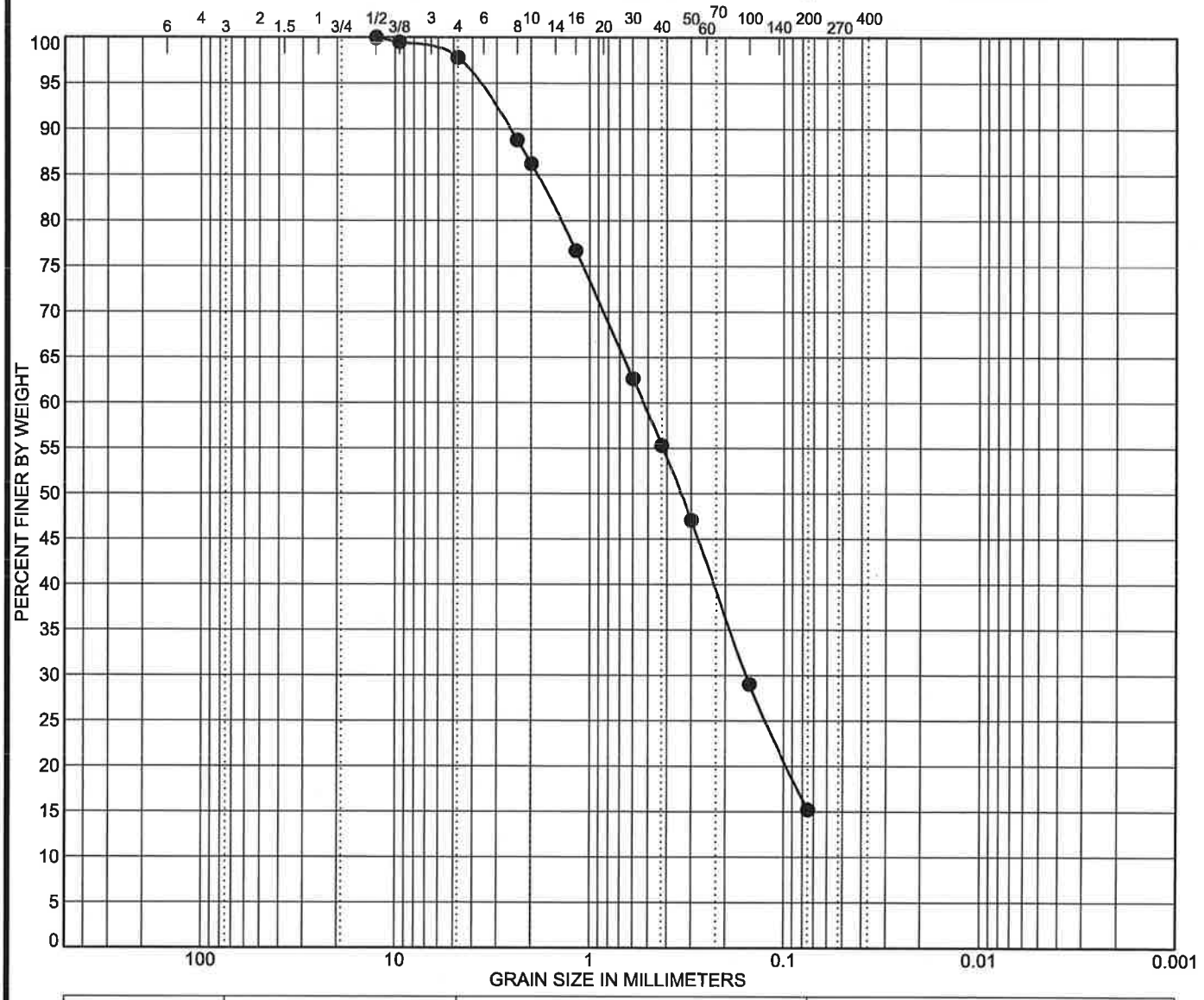
PLATE B-1.3

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016	LL	PL	PI	Cc	Cu
● B-02	Classification					
Depth: 5	Silty SAND (SM)	NP	NP	NP		
Sample Location	Boring 2 from 5' - 6.5'					
USCS	SM					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-02								
Depth: 5	12.5	0.53	0.156		2.2	82.6	15.2	

Natural Moisture	5.5 %		S.E.		Absorption %		
R-Value			Durability Index		Soundness		
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear		

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GRAIN SIZE DISTRIBUTION

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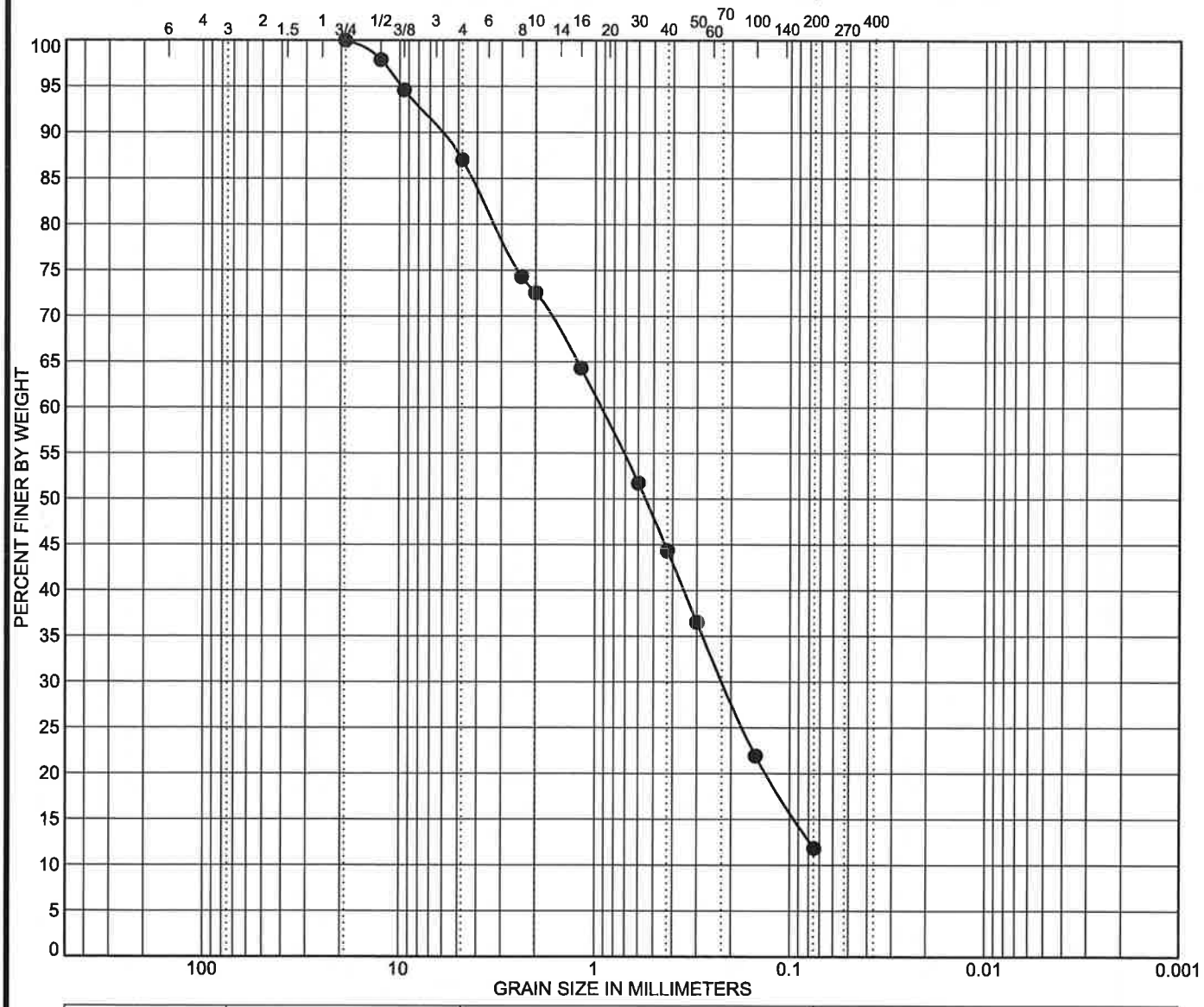
PLATE

B-1.4

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● B-03	Classification					LL	PL	PI	Cc	Cu
Depth: 30	Poorly Graded SAND w/Silt (SP-SM)					NP	NP	NP	0.8	14.2
Sample Location	Boring 3 from 30' - 31.5'									
USCS	SP-SM									
AASHTO										

Specimen Identification								
● B-03	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 30	19	0.936	0.22		13.0	75.1	11.9	

Natural Moisture	16.9 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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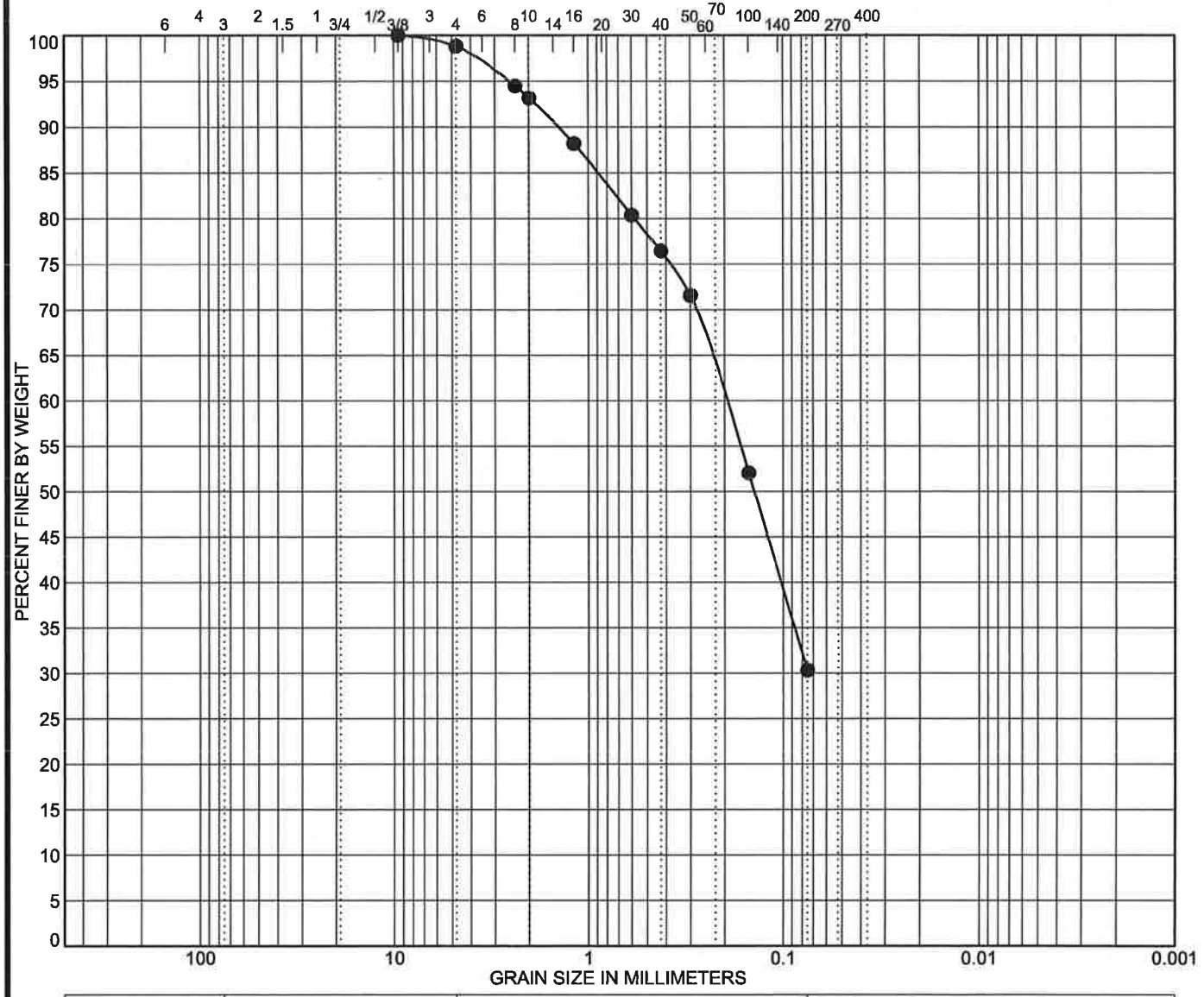
PLATE B-1.5

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016							
● **B-04**	Classification				LL	PL	PI	Cc	Cu
Depth: 10	Silty SAND (SM)				NP	NP	NP		
Sample Location	Boring 4 from 10' - 11.5'								
USCS	SM								
AASHTO									

Specimen Identification								
● **B-04**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 10	9.5	0.199			1.2	68.5	30.3	

Natural Moisture	8.8 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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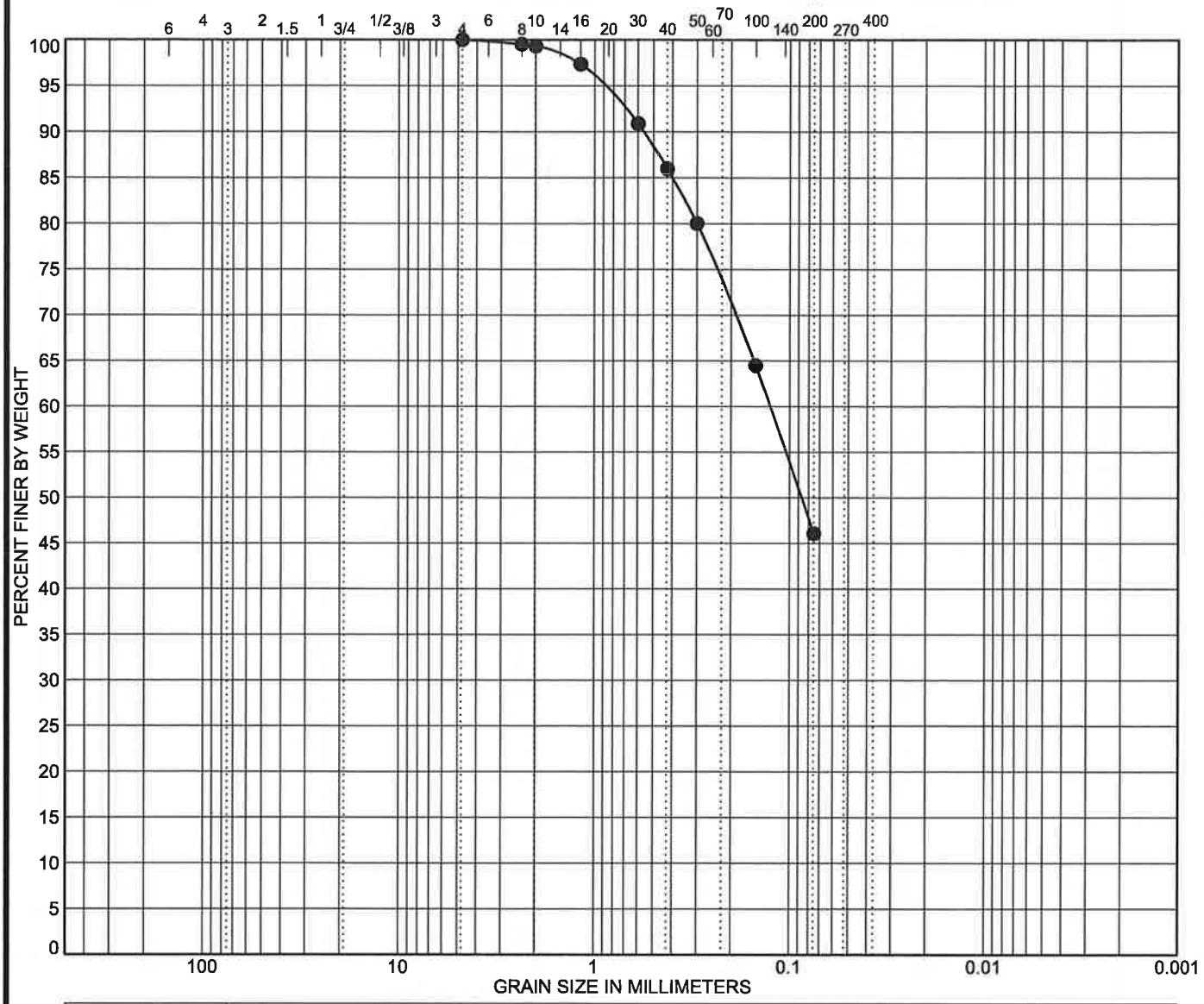
Job Number: 8947.000

Date: May 2016

PLATE

B-1.6

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● **B-04**	Classification				LL	PL	PI	Cc	Cu
Depth: 16	Clayey SAND (SC)				31	16	15		
Sample Location	Boring 4 from 16' - 16.5'								
USCS	SC								
AASHTO									

Specimen Identification								
● **B-04**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 16	4.75	0.127			0.0	53.9	46.1	

Natural Moisture	18 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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GRAIN SIZE DISTRIBUTION

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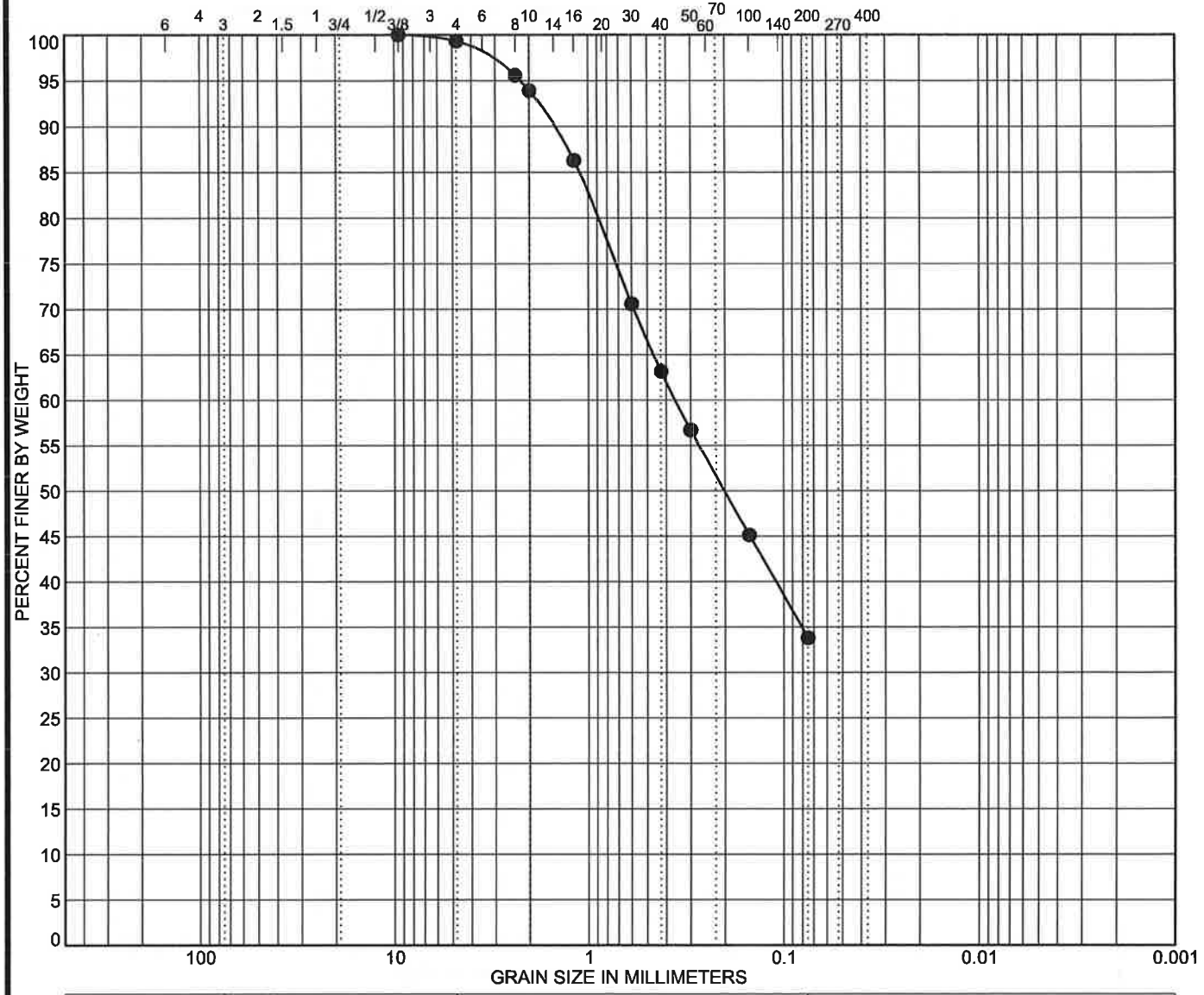
PLATE

B-1.7

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



Specimen Identification	Date: 5-2-2016							
● B-05	Classification				LL	PL	PI	Cc	Cu
Depth: 3	Clayey SAND (SC)				32	21	11		
Sample Location	Boring 5 from 3' - 3.5'								
USCS	SC								
AASHTO									

Specimen Identification								
● B-05	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 3	9.5	0.358			0.7	65.5	33.8	

Natural Moisture	11.1 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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GRAIN SIZE DISTRIBUTION

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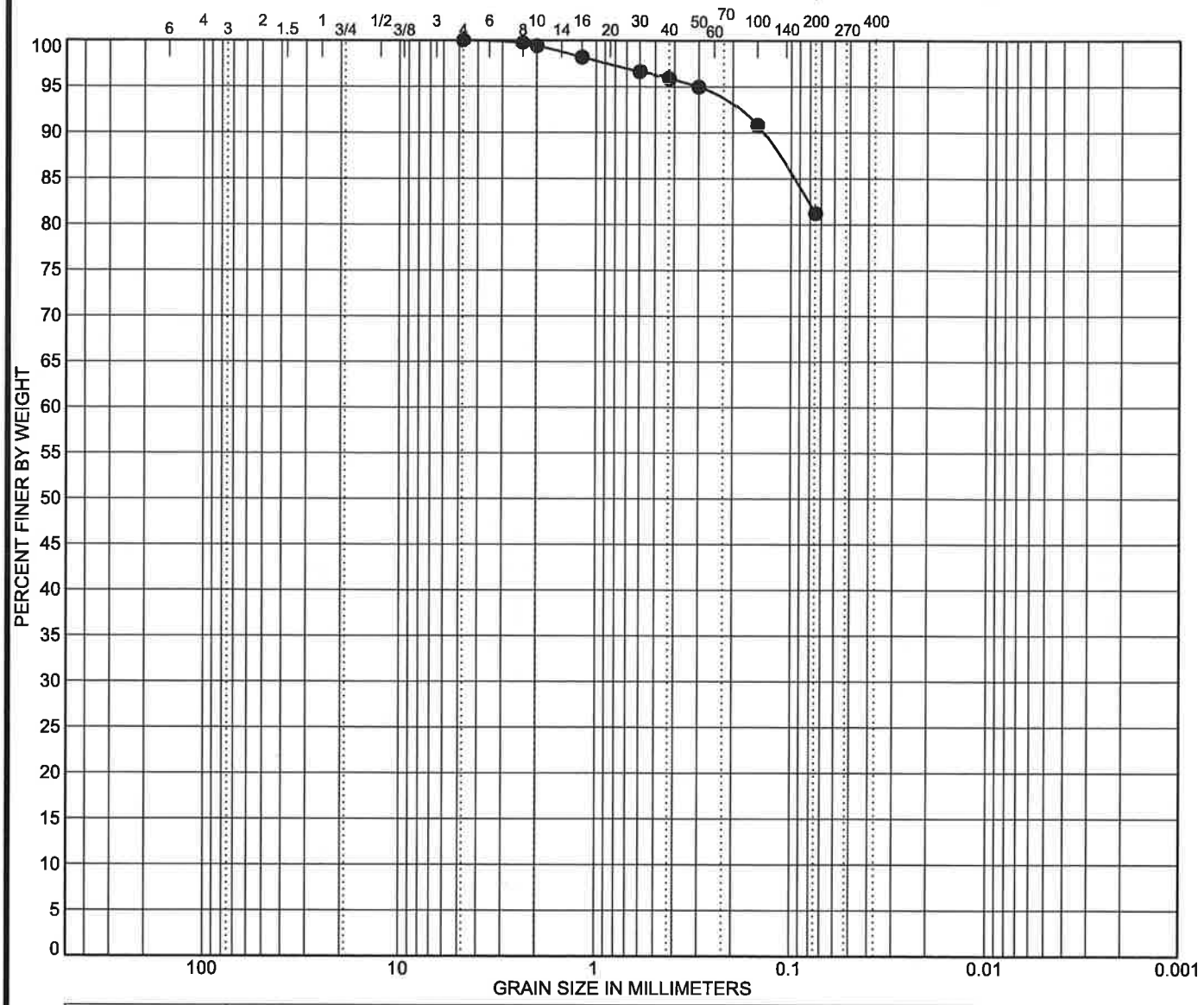
Date: May 2016

PLATE

B-1.8

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016	LL	PL	PI	Cc	Cu
● B-06	Classification					
Depth: 20	Lean CLAY with Sand (CL)	37	21	16		
Sample Location	Boring 6 from 20' - 21'					
USCS	CL					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-06								
Depth: 20	4.75				0.0	18.8	81.2	

Natural Moisture	32.2 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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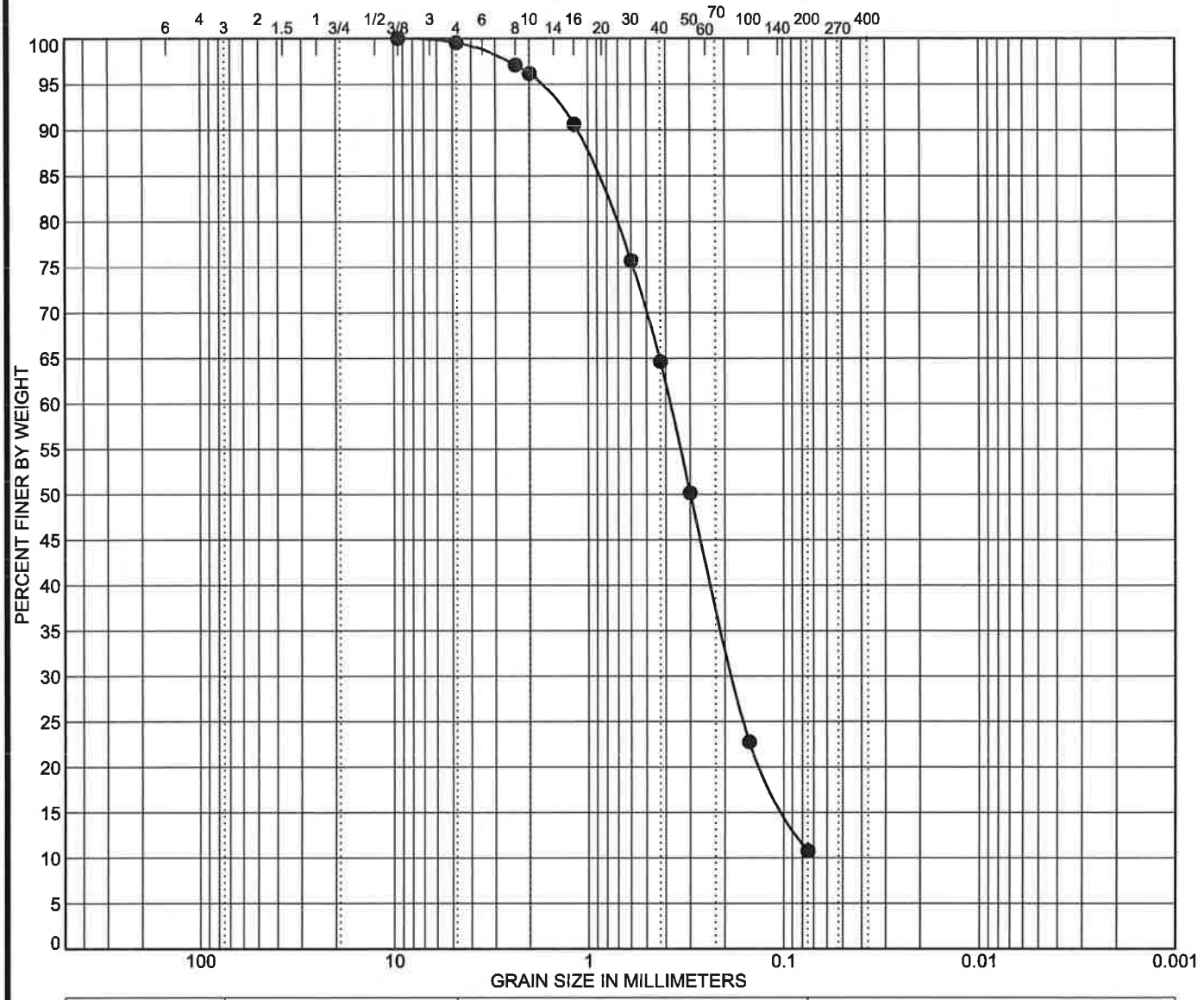
GRAIN SIZE DISTRIBUTION

Job Number: 8947.000 Date: May 2016

PLATE B-1.9

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016						
● B-07	Classification	LL	PL	PI	Cc	Cu
Depth: 11	Poorly Graded SAND w/Silt (SP-SM)	NP	NP	NP	1.2	5.3
Sample Location	Boring 7 from 11' - 11.5'					
USCS	SP-SM					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-07 Depth: 11	9.5	0.38	0.18		0.5	88.8	10.8	

Natural Moisture	4.4 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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GRAIN SIZE DISTRIBUTION

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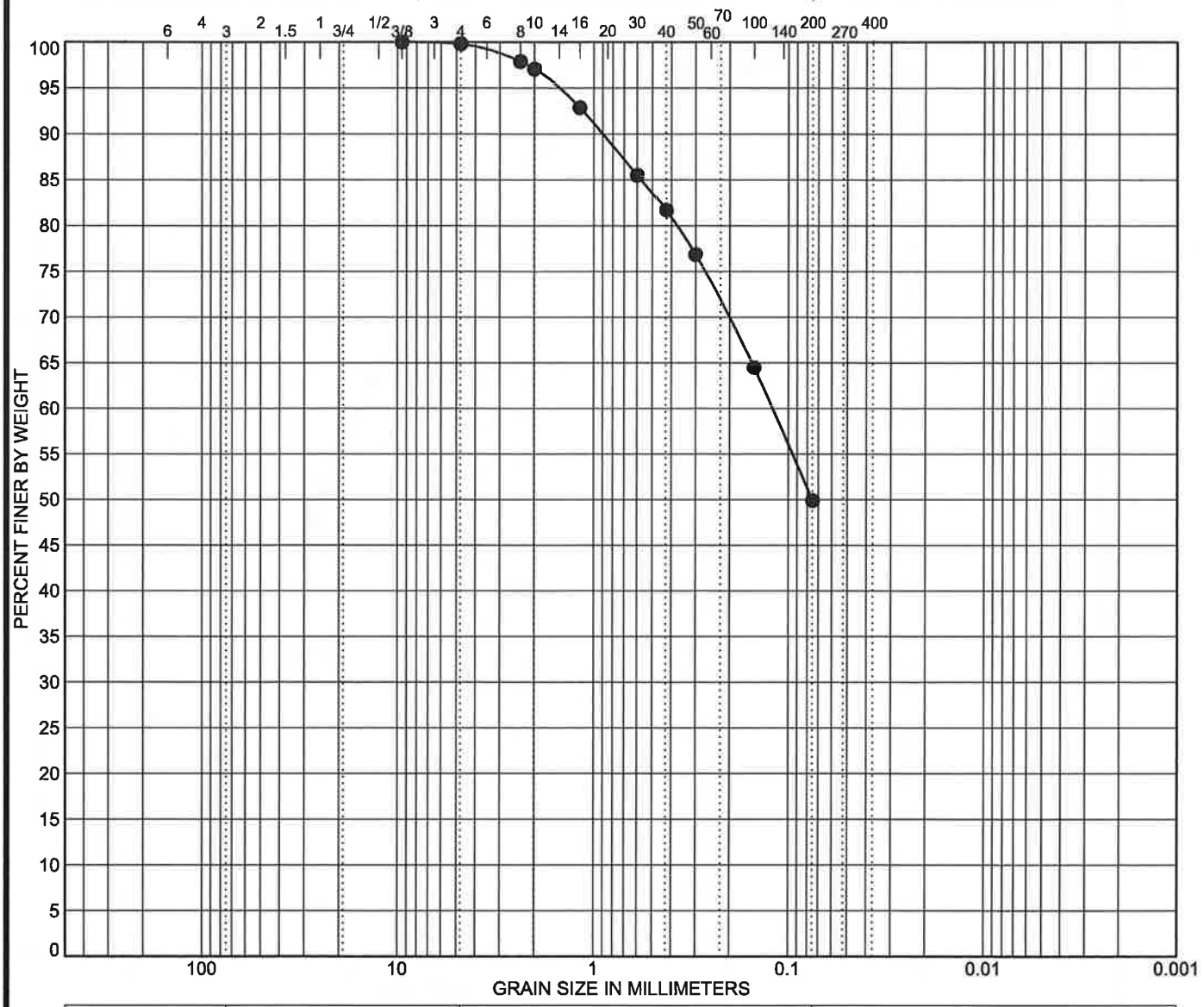
PLATE

B-1.10

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● B-08	Classification				LL	PL	PI	Cc	Cu
Depth: 5.5	Clayey SAND (SC)				45	21	24		
Sample Location	Boring 8 from 5.5' - 6'								
USCS	SC								
AASHTO									

Specimen Identification								
● B-08	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 5.5	9.5	0.121			0.2	49.9	49.9	

Natural Moisture	13.5 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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The Vintage at King's Canyon

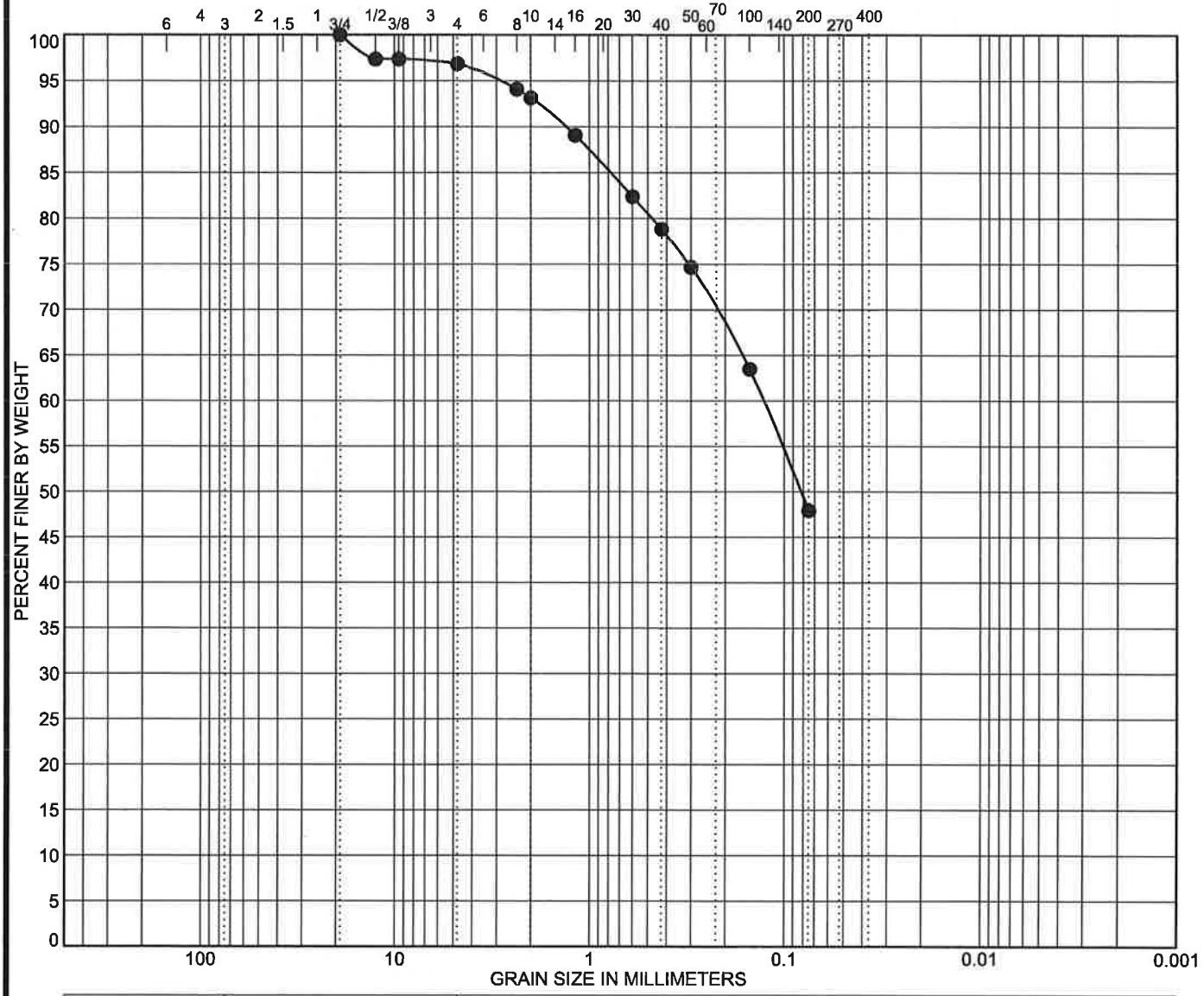
GRAIN SIZE DISTRIBUTION

Job Number: 8947.000 Date: May 2016

PLATE

B-1.11

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● B-09	Classification					LL	PL	PI	Cc	Cu
Depth: 0	Clayey SAND (SC)					40	16	24		
Sample Location	Boring 9 from 0' - 5'									
USCS	SC									
AASHTO										

Specimen Identification								
● B-09	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 0	19	0.128			3.2	48.9	47.9	

Natural Moisture	8.0 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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GRAIN SIZE DISTRIBUTION

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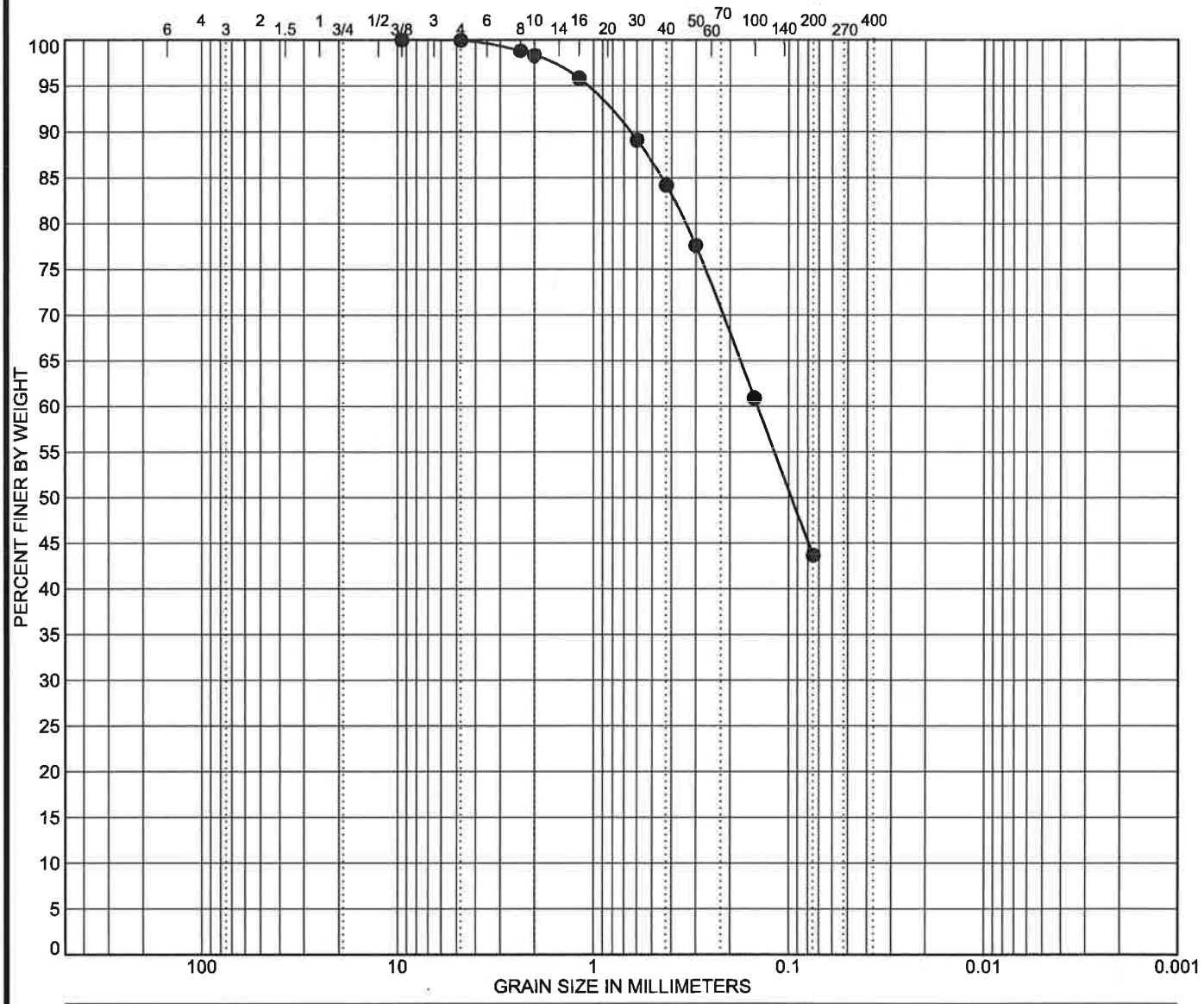
PLATE

B-1.12

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Date: 5-2-2016							
●	**B-10**	Classification				LL	PL	PI	Cc	Cu
	Depth: 8.5	Clayey SAND (SC)				26	16	10		
	Sample Location	Boring 10 from 8.5' - 9'								
	USCS	SC								
	AASHTO									

	Specimen Identification								
●	**B-10**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
	Depth: 8.5	9.5	0.145			0.1	56.3	43.7	

Natural Moisture	7.9 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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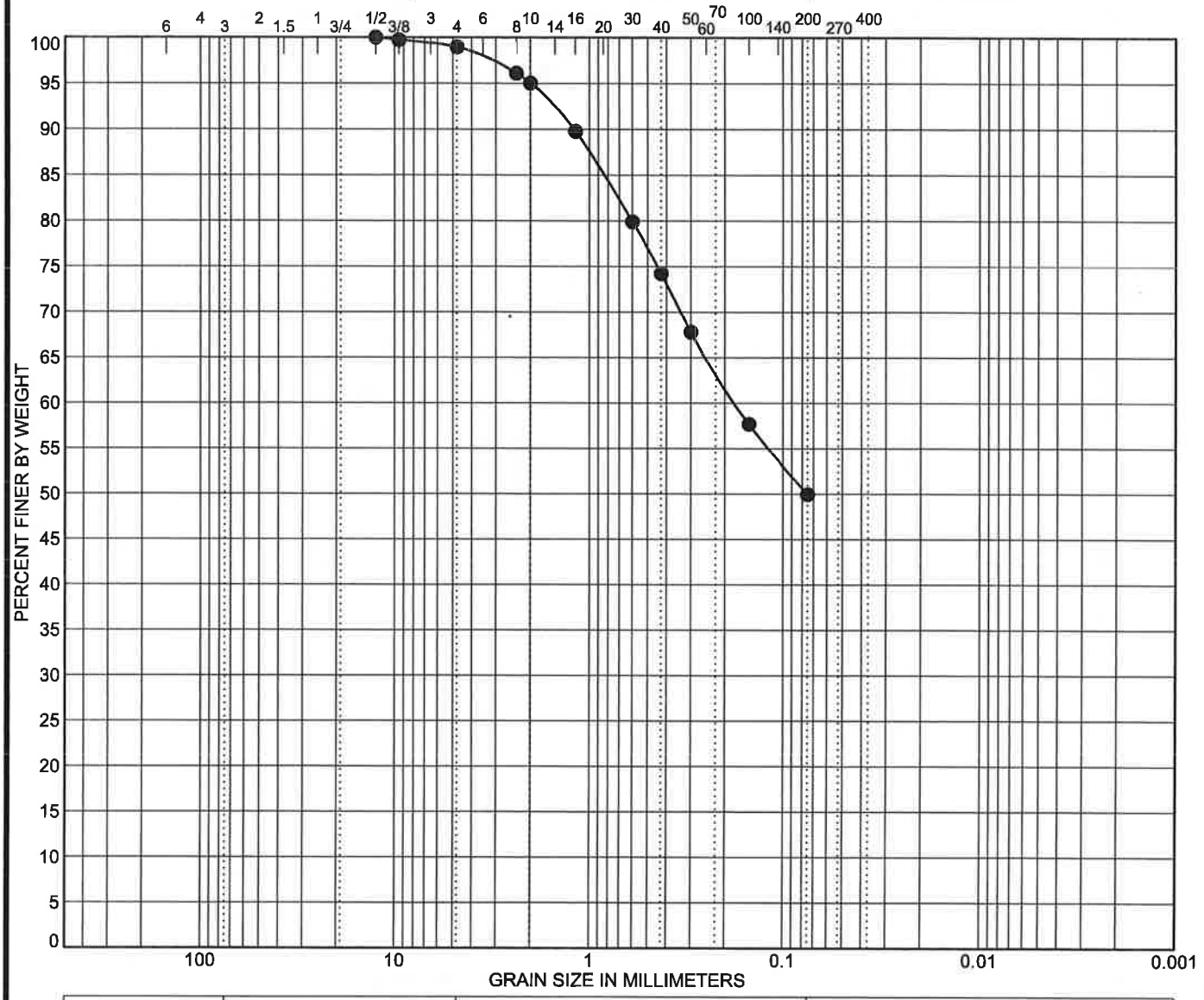
PLATE

B-1.13

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016	LL	PL	PI	Cc	Cu
● B-11	Classification					
Depth: 6	Clayey SAND (SC)	31	19	12		
Sample Location	Boring 11 from 6' - 6.5'					
USCS	SC					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-11								
Depth: 6	12.5	0.176			1.0	49.0	49.9	

Natural Moisture	7.6 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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GRAIN SIZE DISTRIBUTION

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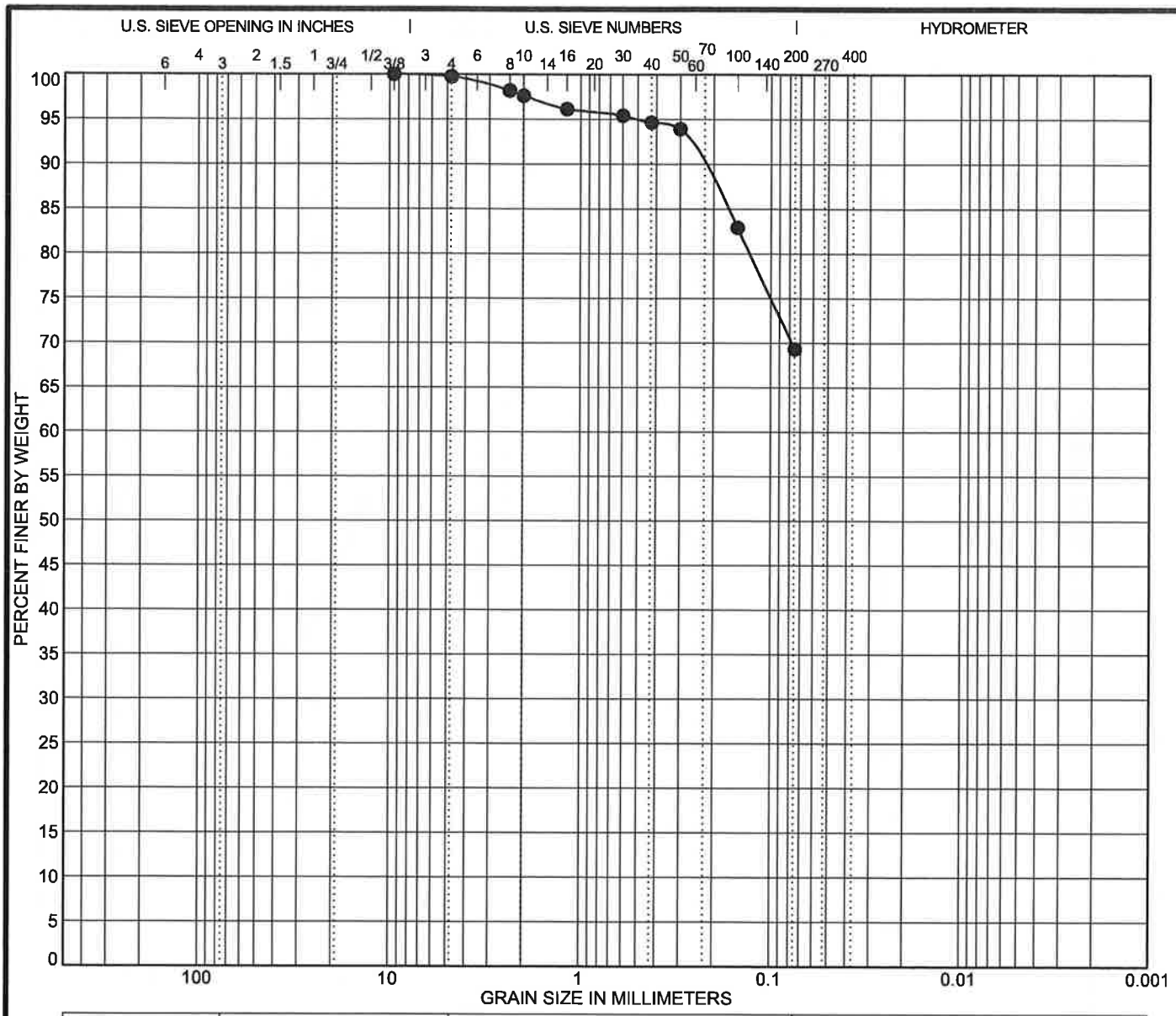
PLATE

B-1.14

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● **B-12**	Classification					LL	PL	PI	Cc	Cu
Depth: 8	Sandy SILT (ML)					38	28	10		
Sample Location	Boring 12 from 8' - 8.5'									
USCS	ML									
AASHTO										

Specimen Identification								
● **B-12**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 8	9.5				0.3	30.4	69.3	

Natural Moisture	6.6 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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GRAIN SIZE DISTRIBUTION

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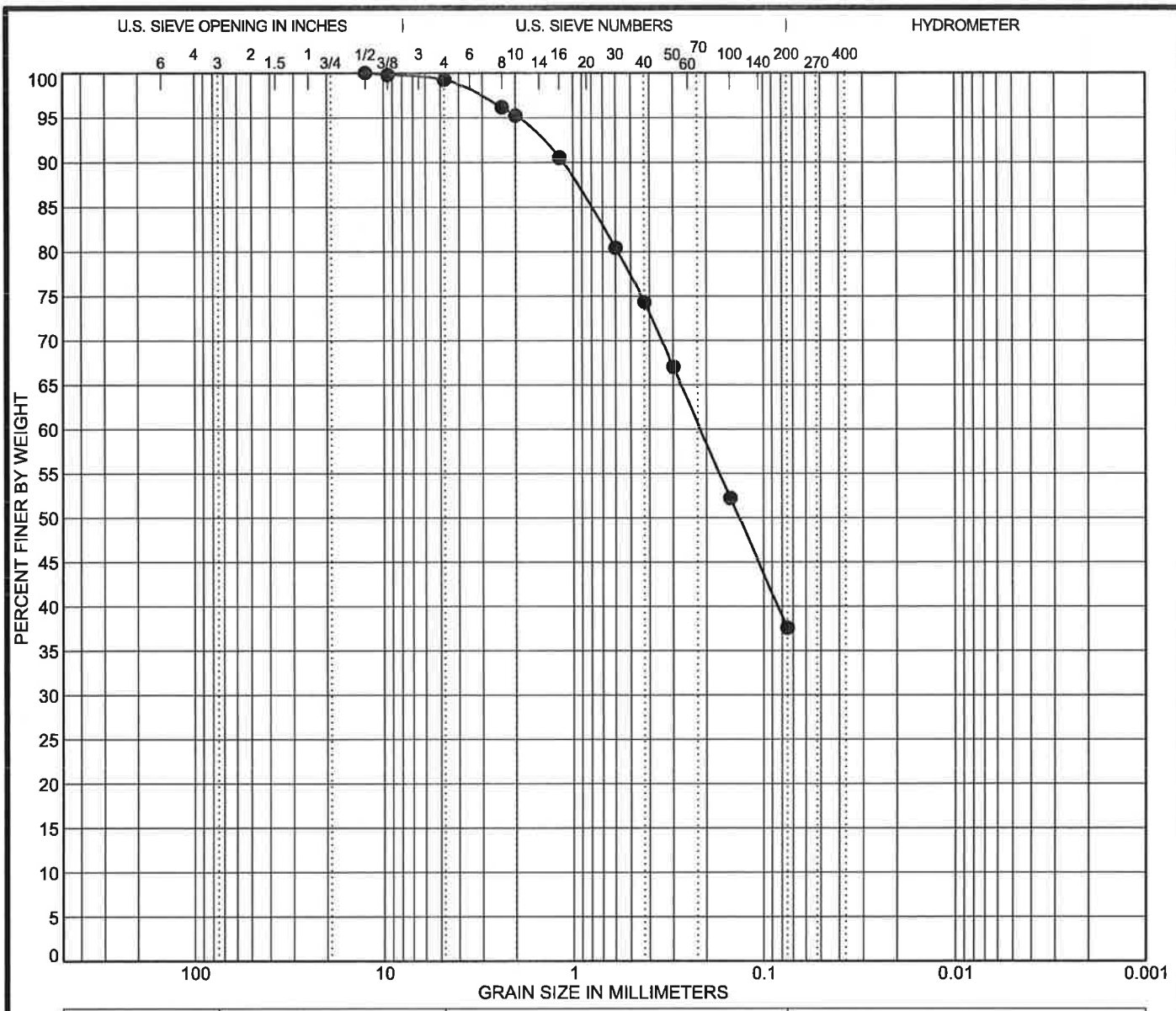
PLATE

B-1.15



Specimen Identification	Date: 5-2-2016								
● **B-13**	Classification				LL	PL	PI	Cc	Cu
Depth: 5.5	Clayey SAND (SC)				30	19	11		
Sample Location	Boring 13 from 5.5' - 6'								
USCS	SC								
AASHTO									

Specimen Identification								
● **B-13**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 5.5	12.5	0.216			0.8	61.7	37.6	

Natural Moisture	5.8 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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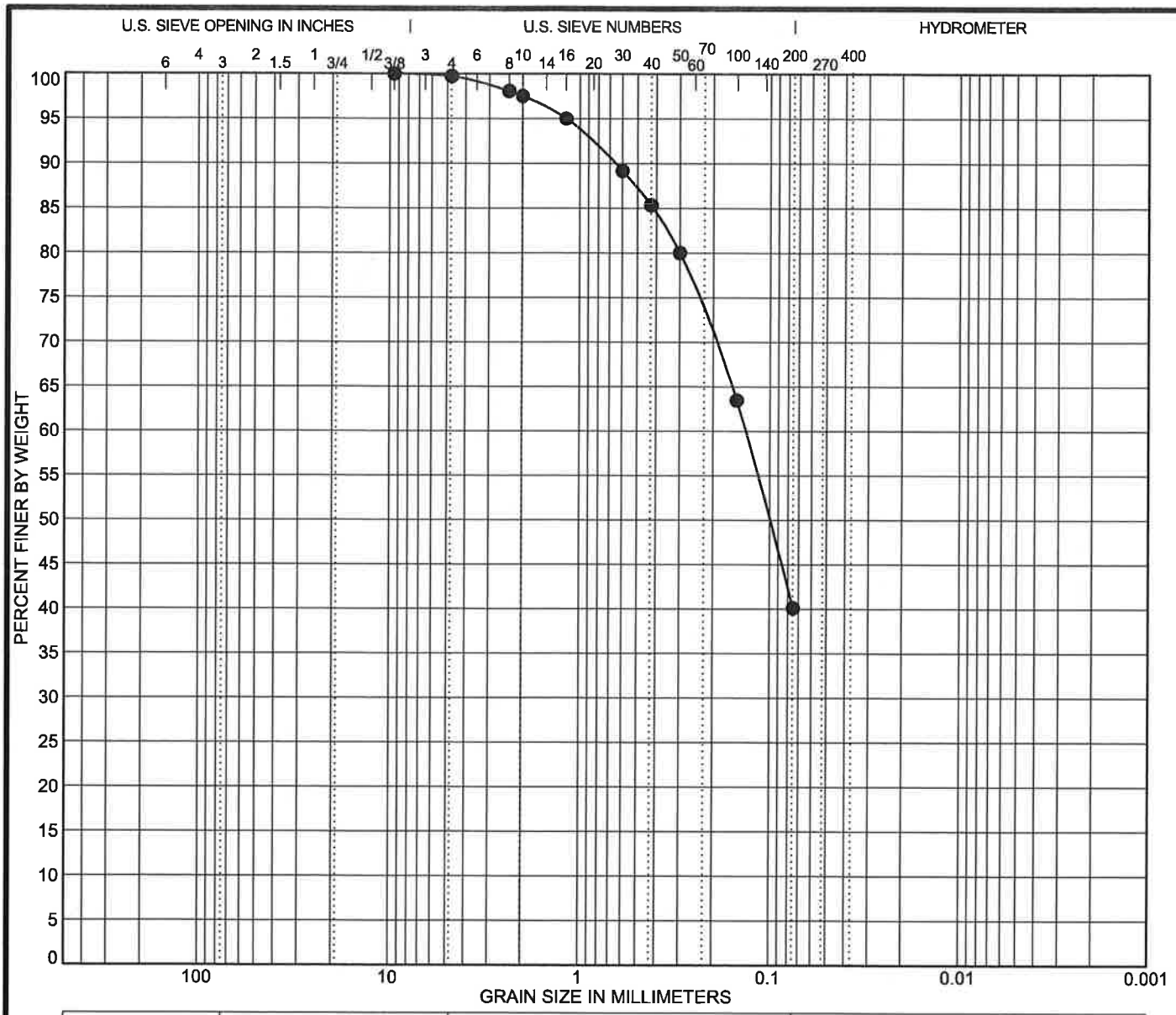
PLATE

B-1.16

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● **B-14**	Classification					LL	PL	PI	Cc	Cu
Depth: 30	Silty SAND (SM)					NP	NP	NP		
Sample Location	Boring 14 from 30' - 31.5'									
USCS	SM									
AASHTO										

Specimen Identification								
● **B-14**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 30	9.5	0.135			0.3	59.6	40.1	

Natural Moisture	19.8 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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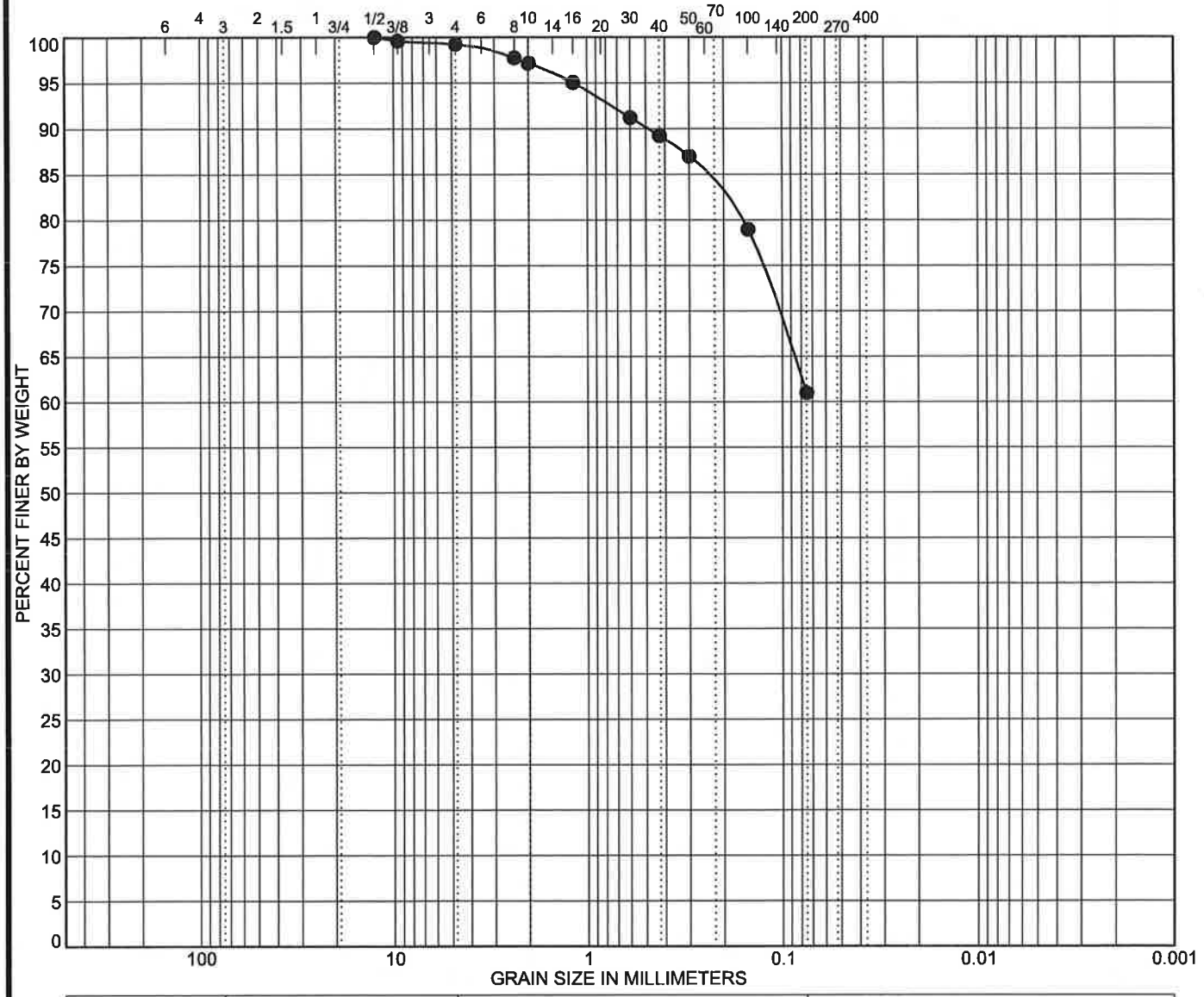
PLATE

B-1.17

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● B-15	Classification					LL	PL	PI	Cc	Cu
Depth: 3	Sandy SILT (ML)					36	29	7		
Sample Location	Boring 15 from 3' - 3.5'									
USCS	ML									
AASHTO										

Specimen Identification								
● B-15	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 3	12.5				0.8	38.3	61.0	

Natural Moisture	15.5 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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GRAIN SIZE DISTRIBUTION

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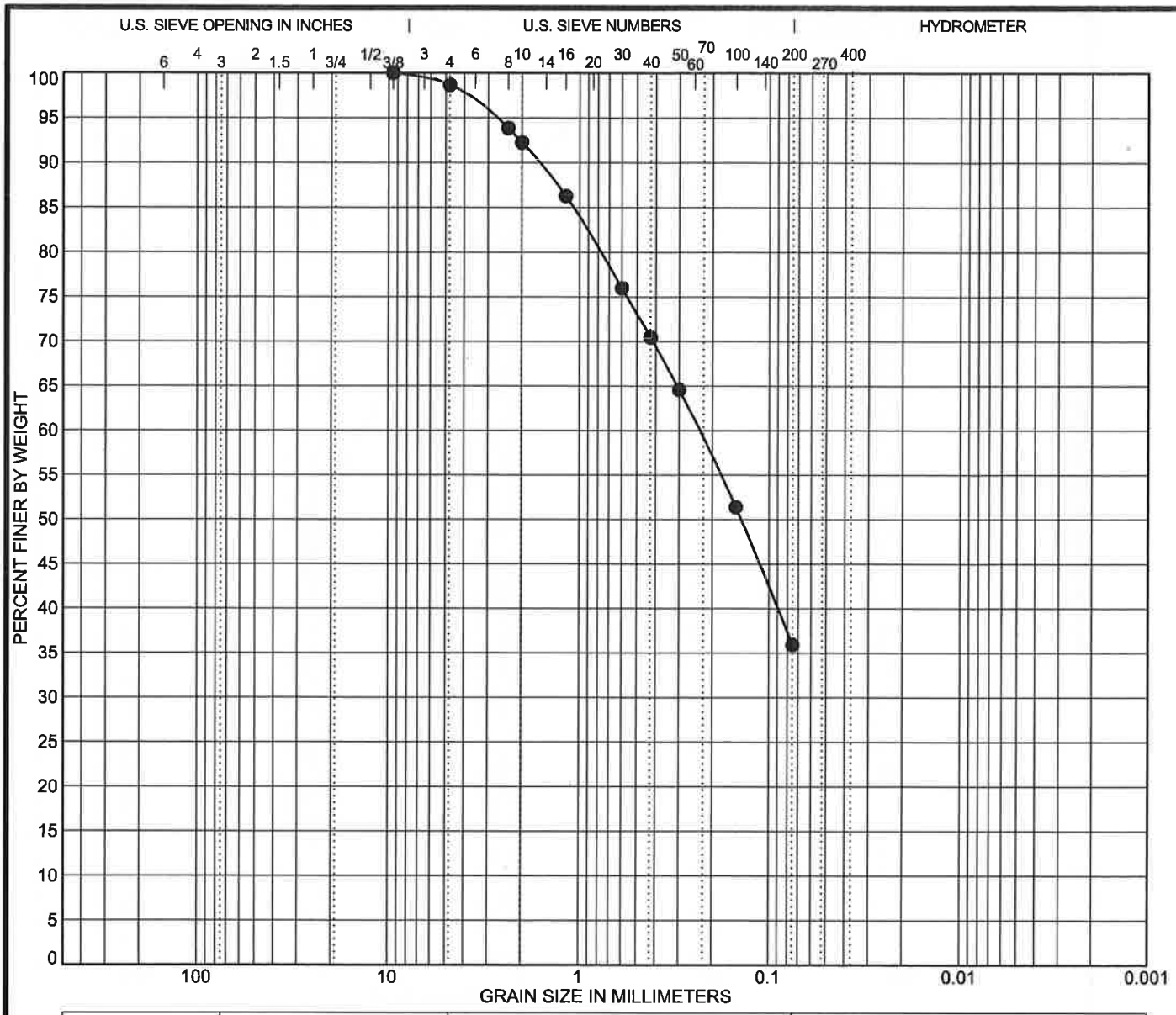
PLATE

B-1.18

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● **B-16**	Classification				LL	PL	PI	Cc	Cu
Depth: 0	Silty SAND (SM)				33	26	7		
Sample Location	Comb. Samp. B-16, 19, & 22 from 0'-5'								
USCS	SM								
AASHTO									

Specimen Identification								
● **B-16**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 0	9.5	0.236			1.4	62.7	35.9	

Natural Moisture	6.5 %		**S.E.**		**Absorption %**	
R-Value	21		**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	30

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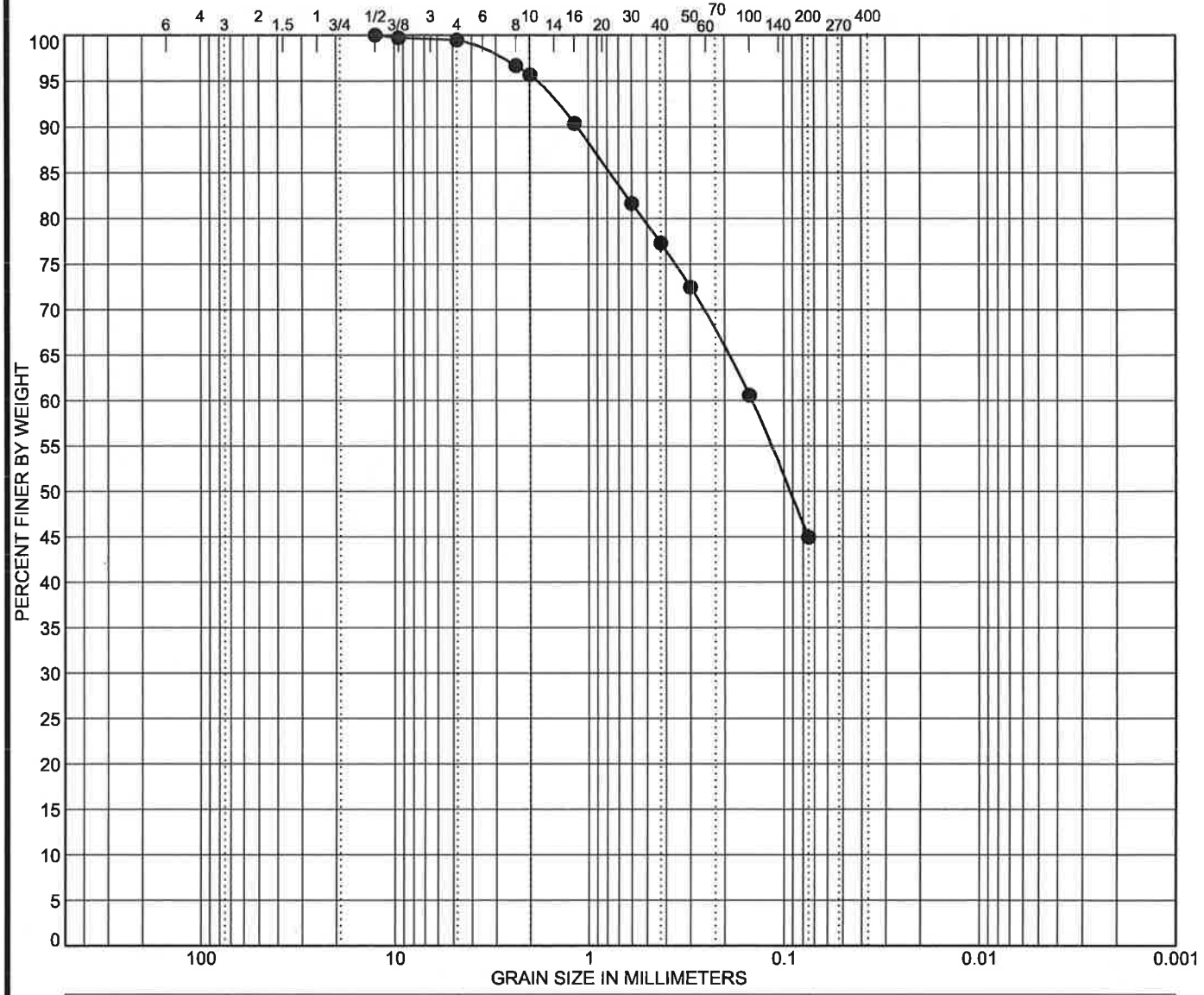
PLATE

B-1.19



Specimen Identification	Date: 5-2-2016								
● B-17	Classification				LL	PL	PI	Cc	Cu
Depth: 3	Silty SAND (SM)				30	25	5		
Sample Location	Boring 17 from 3' - 3.5'								
USCS	SM								
AASHTO									

Specimen Identification								
● B-17	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 3	12.5	0.146			0.5	54.5	44.9	

Natural Moisture	17.5 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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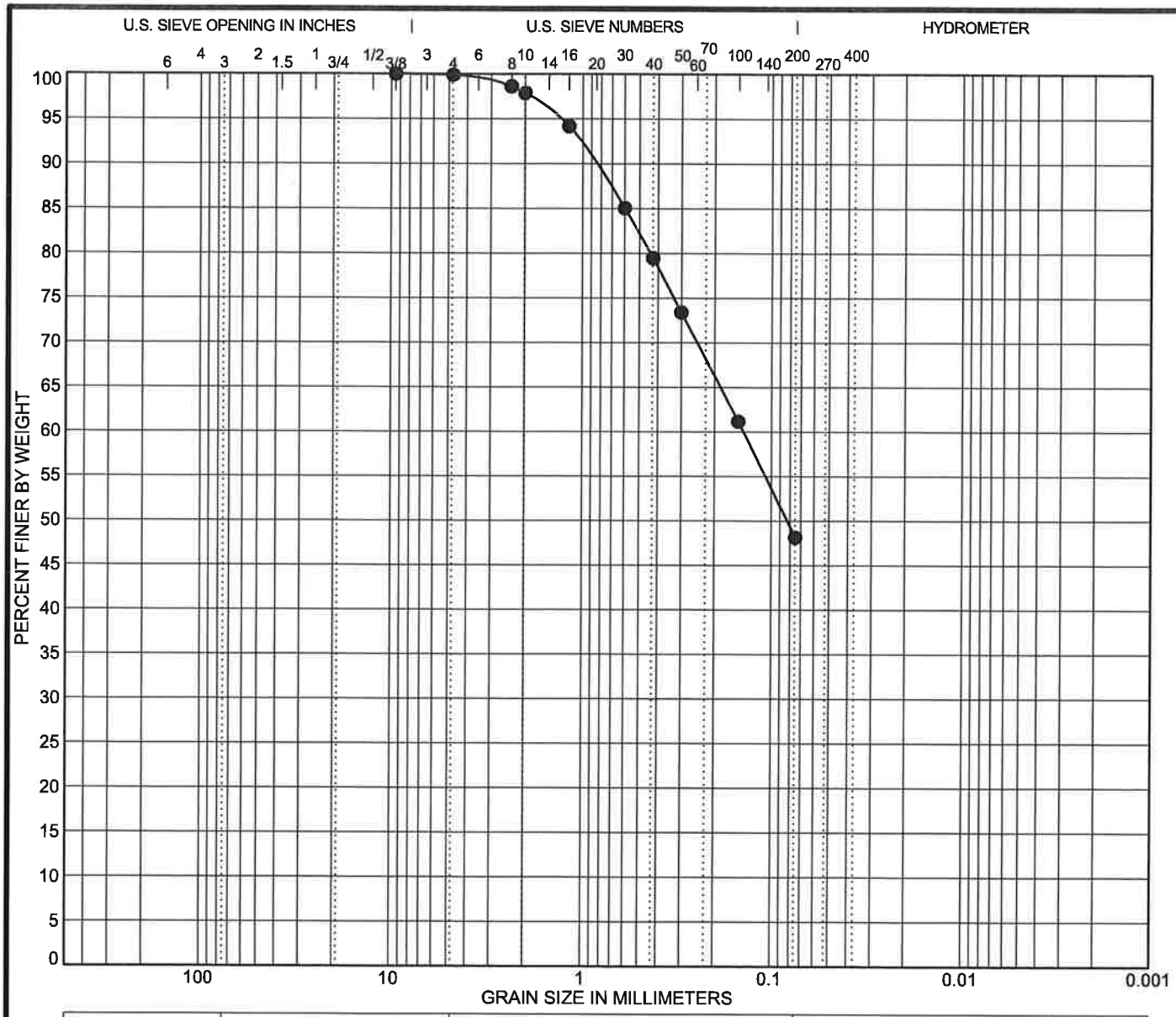
PLATE

B-1.20

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● B-18	Classification					LL	PL	PI	Cc	Cu
Depth: 11	Clayey SAND (SC)					29	19	10		
Sample Location	Boring 18 from 11' - 11.5'									
USCS	SC									
AASHTO										

Specimen Identification								
● B-18	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 11	9.5	0.141			0.1	51.7	48.1	

Natural Moisture	8.4 %	S.E.		Absorption %	
R-Value		Durability Index		Soundness	
Perctage of Wear (500 rev)	%	Specific Gravity		Direct Shear	

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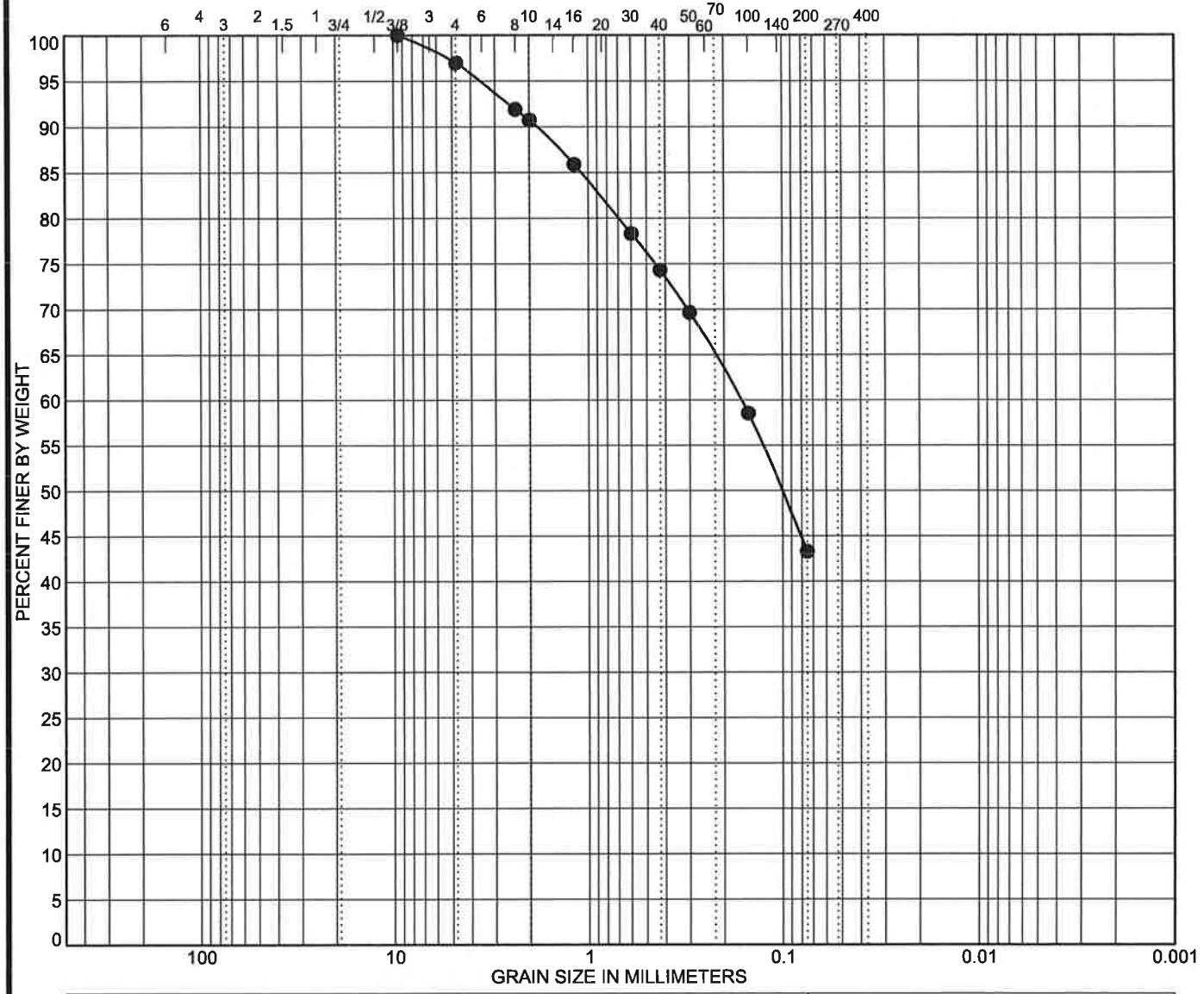
B-1.21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● B-20	Classification				LL	PL	PI	Cc	Cu
Depth: 15	Clayey SAND (SC)				32	23	9		
Sample Location	Boring 20 from 15' - 16.5'								
USCS	SC								
AASHTO									

Specimen Identification								
● B-20	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 15	9.5	0.164			3.1	53.6	43.3	

Natural Moisture	21.9 %		S.E.		Absorption %	
R-Value			Durability Index		Soundness	
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear	

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GRAIN SIZE DISTRIBUTION

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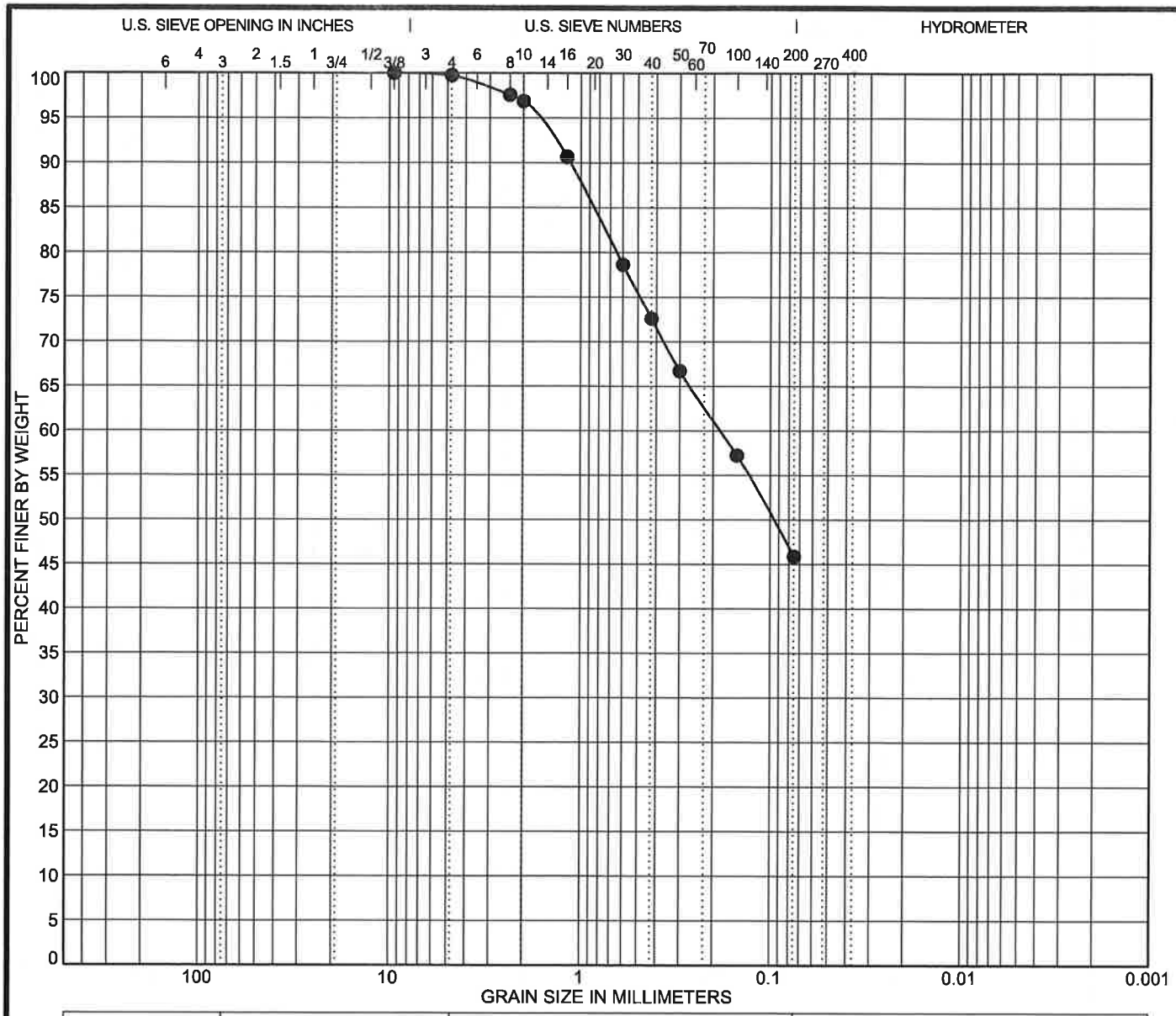
PLATE

B-1.22

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016	LL	PL	PI	Cc	Cu
● **B-21**	Classification					
Depth: 8.5	Clayey SAND (SC)	30	22	8		
Sample Location	Boring 21 from 8.5' - 9'					
USCS	SC					
AASHTO						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **B-21**								
Depth: 8.5	9.5	0.184			0.3	53.9	45.9	

Natural Moisture	6.6 %	**S.E.**		**Absorption %**		
R-Value		**Durability Index**		**Soundness**		
Perctage of Wear (500 rev)	%	**Specific Gravity**		**Direct Shear**		

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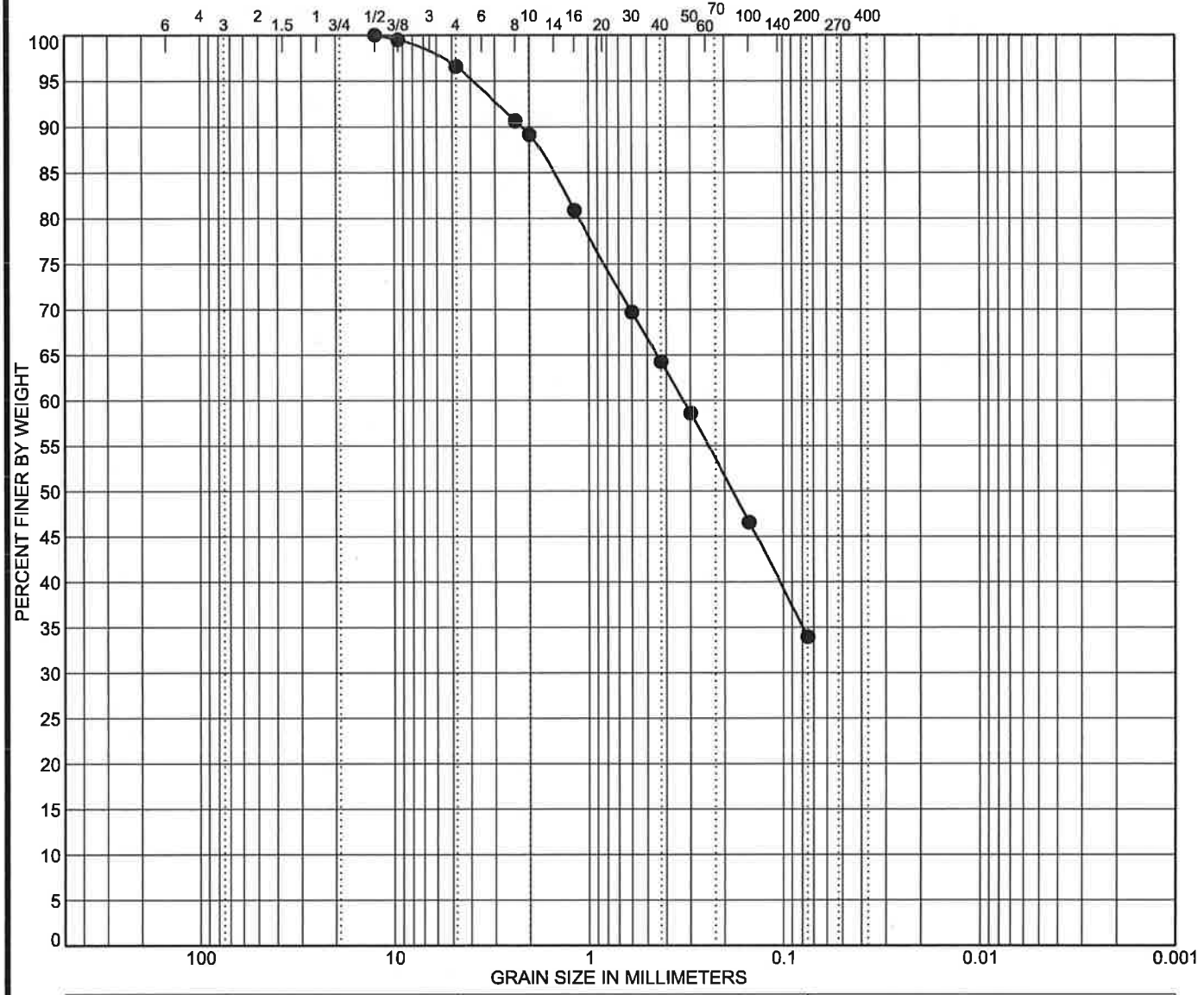
B-1.23



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016							
● B-23	Classification				LL	PL	PI	Cc	Cu
Depth: 5	Silty, Clayey SAND (SC-SM)				28	22	6		
Sample Location	Boring 23 from 5' - 5.5'								
USCS	SC-SM								
AASHTO									

Specimen Identification								
● B-23	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 5	12.5	0.327			3.4	62.6	33.9	

Natural Moisture	8.5 %		S.E.		Absorption %		
R-Value			Durability Index		Soundness		
Perctage of Wear (500 rev)	%		Specific Gravity		Direct Shear		

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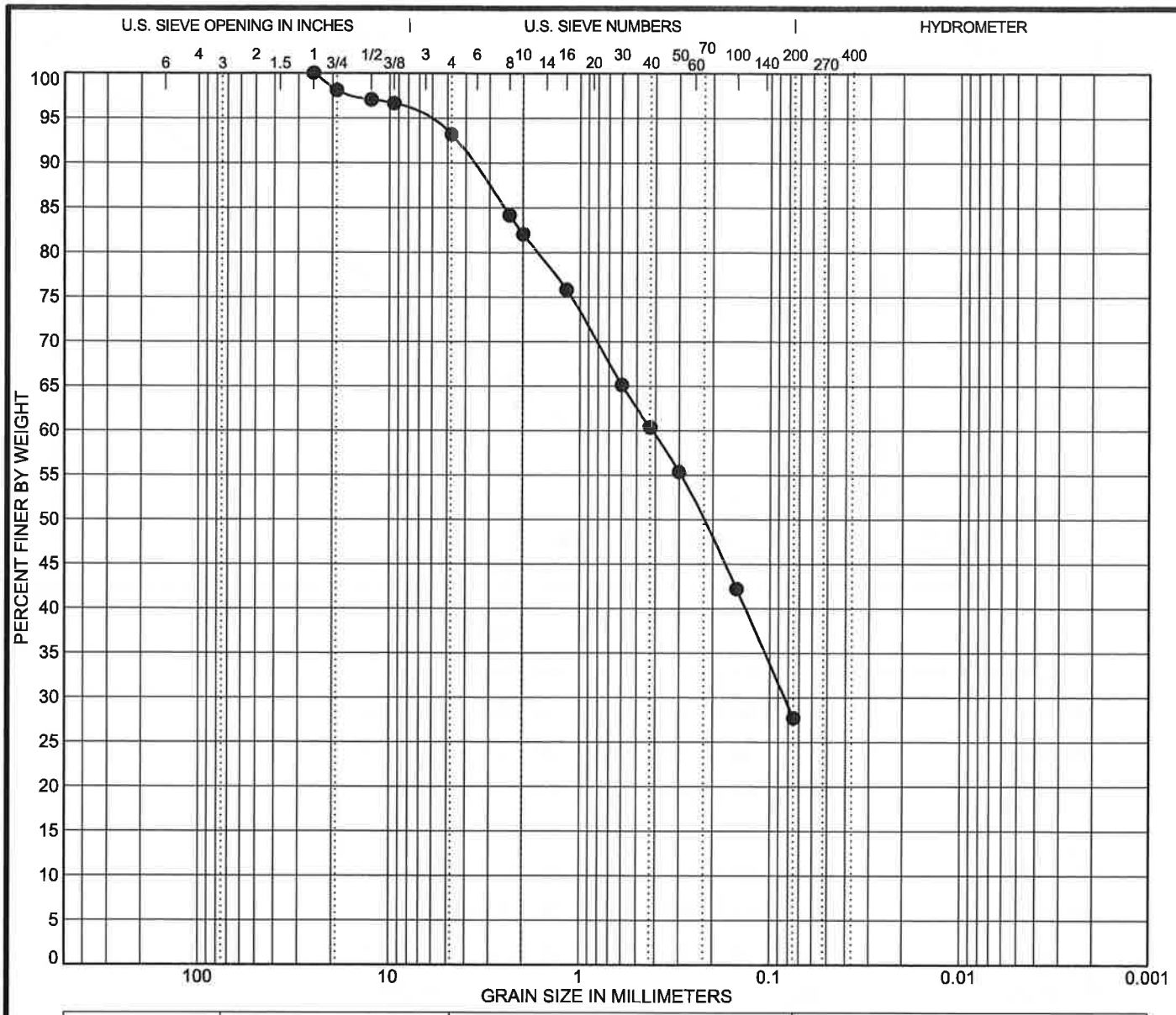
PLATE

B-1.24

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/25/16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 5-2-2016								
● **B-24**	Classification					LL	PL	PI	Cc	Cu
Depth: 3	Silty SAND (SM)					29	23	6		
Sample Location	Boring 24 from 3' - 3.5'									
USCS	SM									
AASHTO										

Specimen Identification								
● **B-24**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 3	25	0.414	0.084		6.8	65.5	27.7	

Natural Moisture	9.8 %		**S.E.**		**Absorption %**	
R-Value			**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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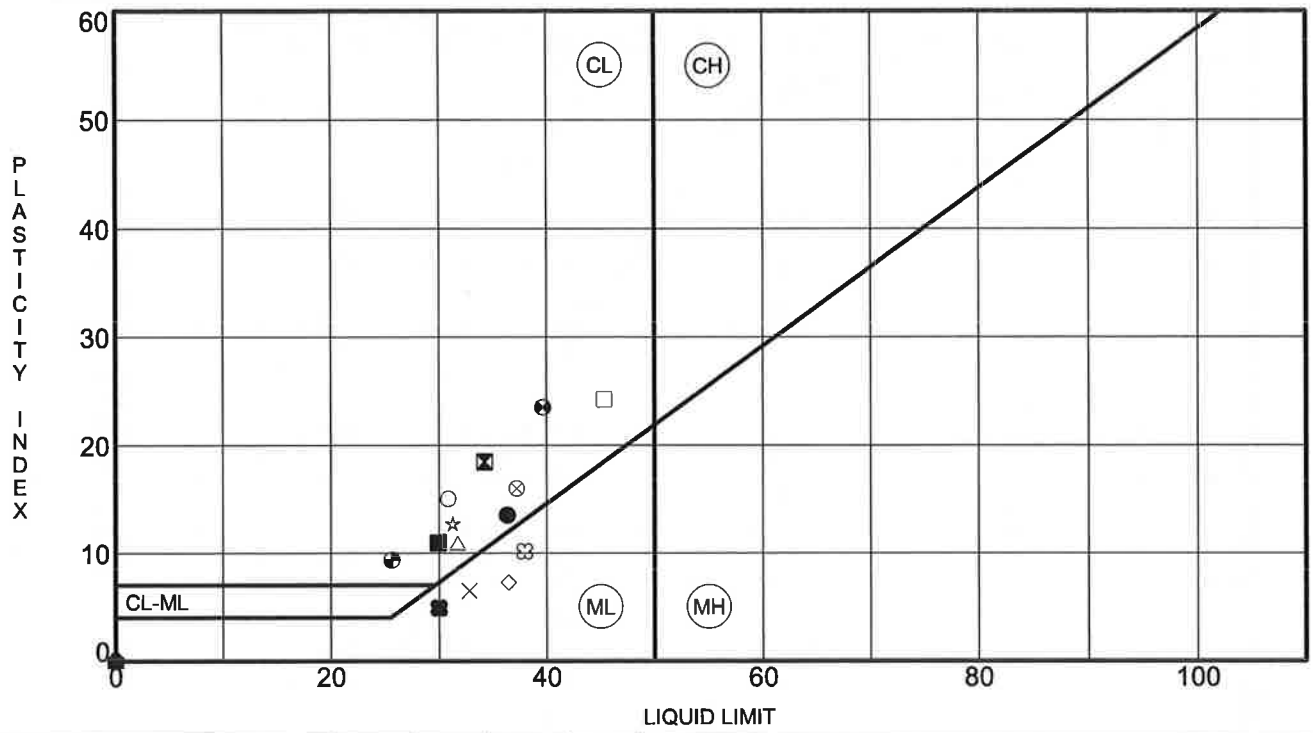
B-1.25

LUMOS GRAIN SIZE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



Specimen Identification			LL	PL	PI	Fines	Classification
●	B-01	0.0	36	23	13	38	Clayey SAND (SC)
⊠	B-01	5.0	34	16	18	29	Clayey SAND (SC)
▲	B-01	21.0	NP	NP	NP	17	Silty SAND (SM)
★	B-02	5.0	NP	NP	NP	15	Silty SAND (SM)
⊙	B-03	30.0	NP	NP	NP	12	Poorly Graded SAND w/Silt (SP-SM)
✿	B-04	10.0	NP	NP	NP	30	Silty SAND (SM)
○	B-04	16.0	31	16	15	46	Clayey SAND (SC)
△	B-05	3.0	32	21	11	34	Clayey SAND (SC)
⊗	B-06	20.0	37	21	16	81	Lean CLAY with Sand (CL)
⊕	B-07	11.0	NP	NP	NP	11	Poorly Graded SAND w/Silt (SP-SM)
□	B-08	5.5	45	21	24	50	Clayey SAND (SC)
◒	B-09	0.0	40	16	24	48	Clayey SAND (SC)
◕	B-10	8.5	26	16	10	44	Clayey SAND (SC)
☆	B-11	6.0	31	19	12	50	Clayey SAND (SC)
⊠	B-12	8.0	38	28	10	69	Sandy SILT (ML)
■	B-13	5.5	30	19	11	38	Clayey SAND (SC)
◆	B-14	30.0	NP	NP	NP	40	Silty SAND (SM)
◇	B-15	3.0	36	29	7	61	Sandy SILT (ML)
×	B-16	0.0	33	26	7	36	Silty SAND (SM)
⊠	B-17	3.0	30	25	5	45	Silty SAND (SM)

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The Vintage at King's Canyon

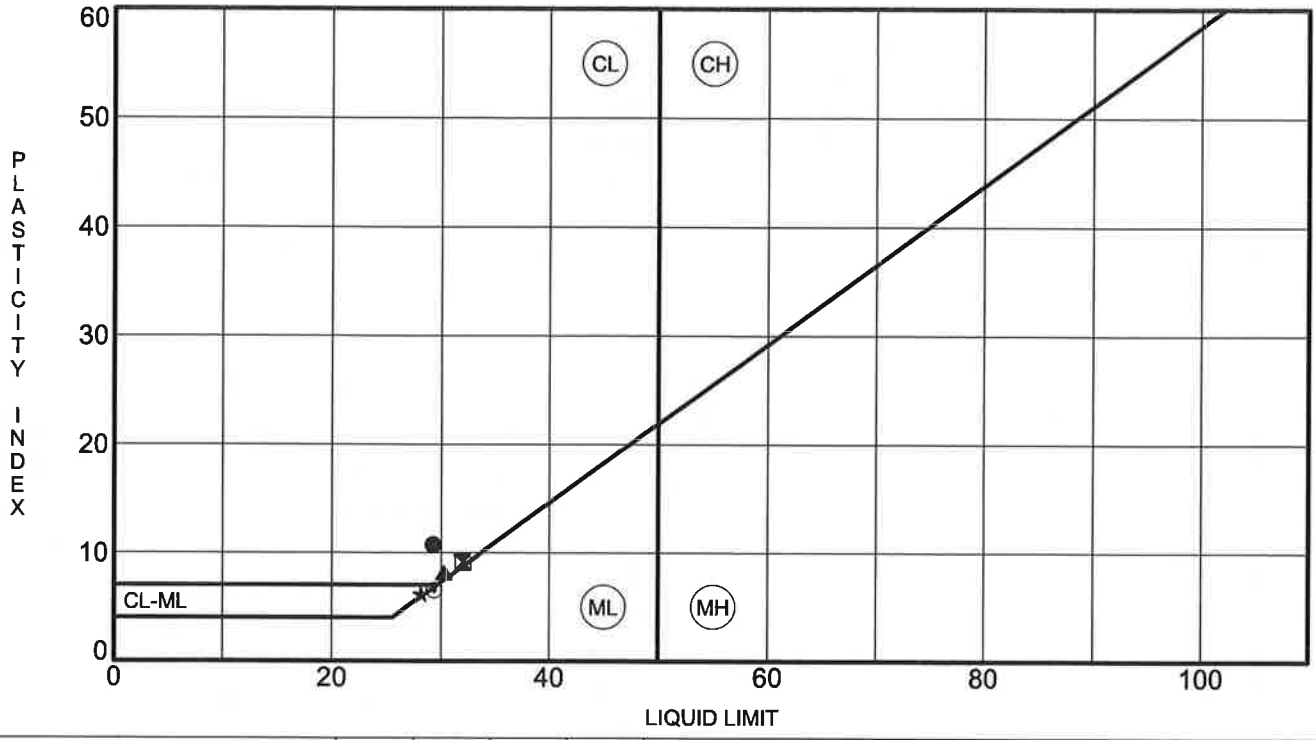
ATTERBERG LIMITS' RESULTS

Job Number: 8947.000 Date: May 2016

PLATE

B-2.1

LUMOS ATTERBERG LIMITS 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/25/16



	Specimen Identification		LL	PL	PI	Fines	Classification
●	B-18	11.0	29	19	10	48	Clayey SAND (SC)
⊠	B-20	15.0	32	23	9	43	Clayey SAND (SC)
▲	B-21	8.5	30	22	8	46	Clayey SAND (SC)
★	B-23	5.0	28	22	6	34	Silty, Clayey SAND (SC-SM)
⊙	B-24	3.0	29	23	6	28	Silty SAND (SM)

LUMOS ATTERBERG LIMITS 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16

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The Vintage at King's Canyon

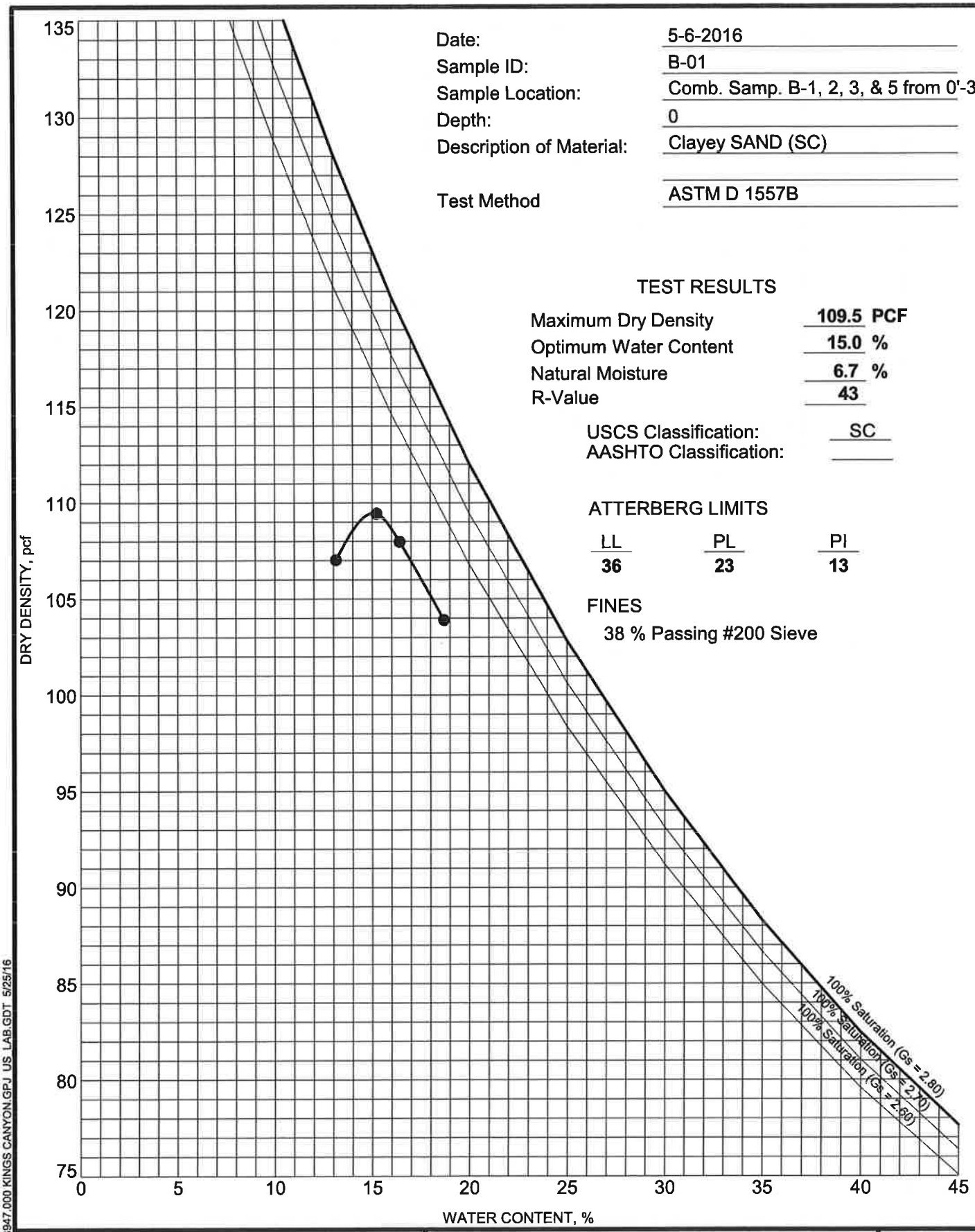
ATTERBERG LIMITS' RESULTS

Job Number: 8947.000

Date: May 2016

PLATE

B-2.2



Date: 5-6-2016
Sample ID: B-01
Sample Location: Comb. Samp. B-1, 2, 3, & 5 from 0'-3'
Depth: 0
Description of Material: Clayey SAND (SC)

Test Method: ASTM D 1557B

TEST RESULTS

Maximum Dry Density	109.5 PCF
Optimum Water Content	15.0 %
Natural Moisture	6.7 %
R-Value	43

USCS Classification: SC
AASHTO Classification:

ATTERBERG LIMITS

LL	PL	PI
36	23	13

FINES

38 % Passing #200 Sieve

LUMOS COMPACTION 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/25/16

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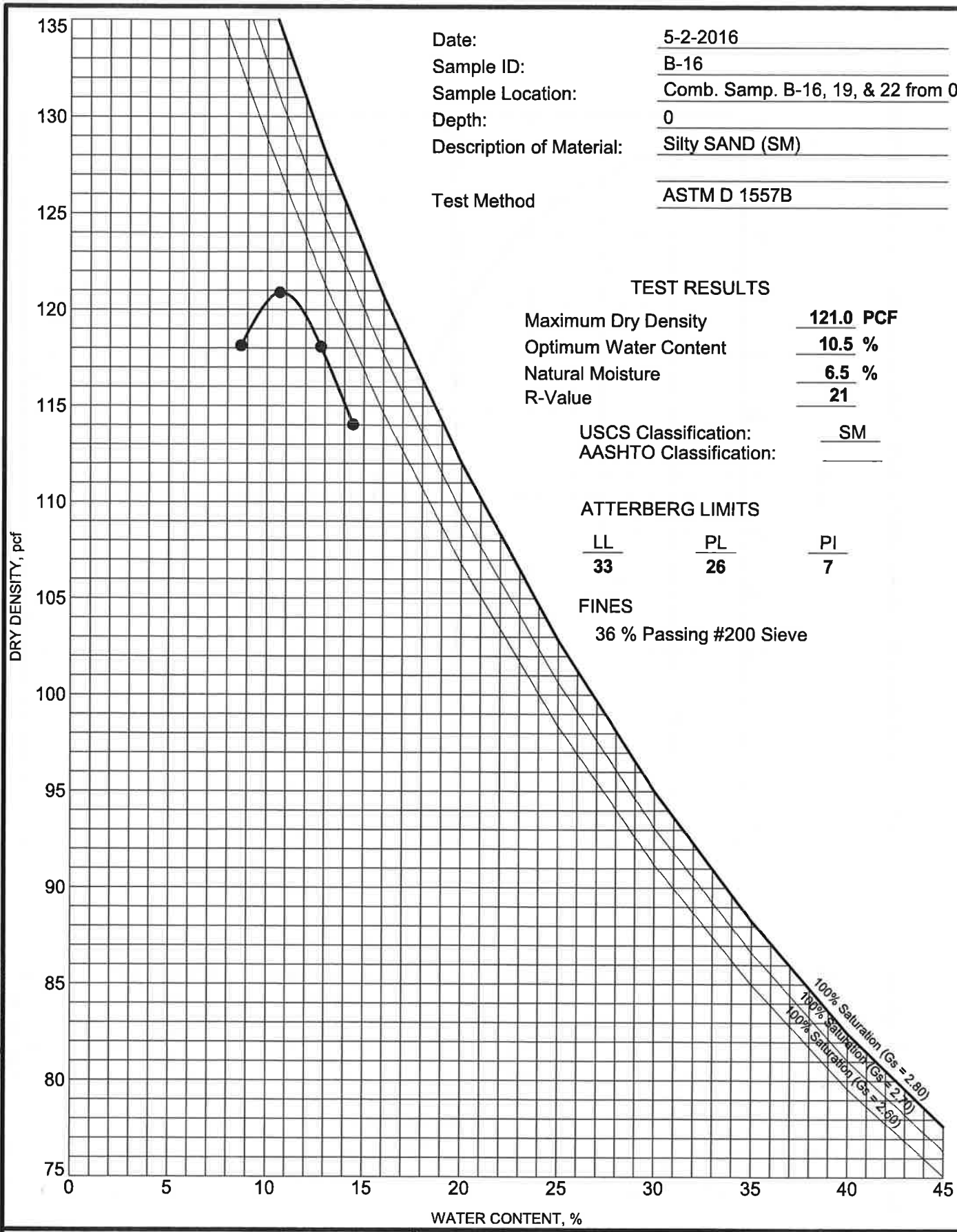
The Vintage at King's Canyon

MOISTURE-DENSITY CURVE

Job Number: 8947.000 Date: May 2016

PLATE B-3.1



Date: 5-2-2016
Sample ID: B-16
Sample Location: Comb. Samp. B-16, 19, & 22 from 0'-5'
Depth: 0
Description of Material: Silty SAND (SM)

Test Method: ASTM D 1557B

TEST RESULTS

Maximum Dry Density	121.0 PCF
Optimum Water Content	10.5 %
Natural Moisture	6.5 %
R-Value	21

USCS Classification: SM
AASHTO Classification:

ATTERBERG LIMITS

LL	PL	PI
33	26	7

FINES

36 % Passing #200 Sieve

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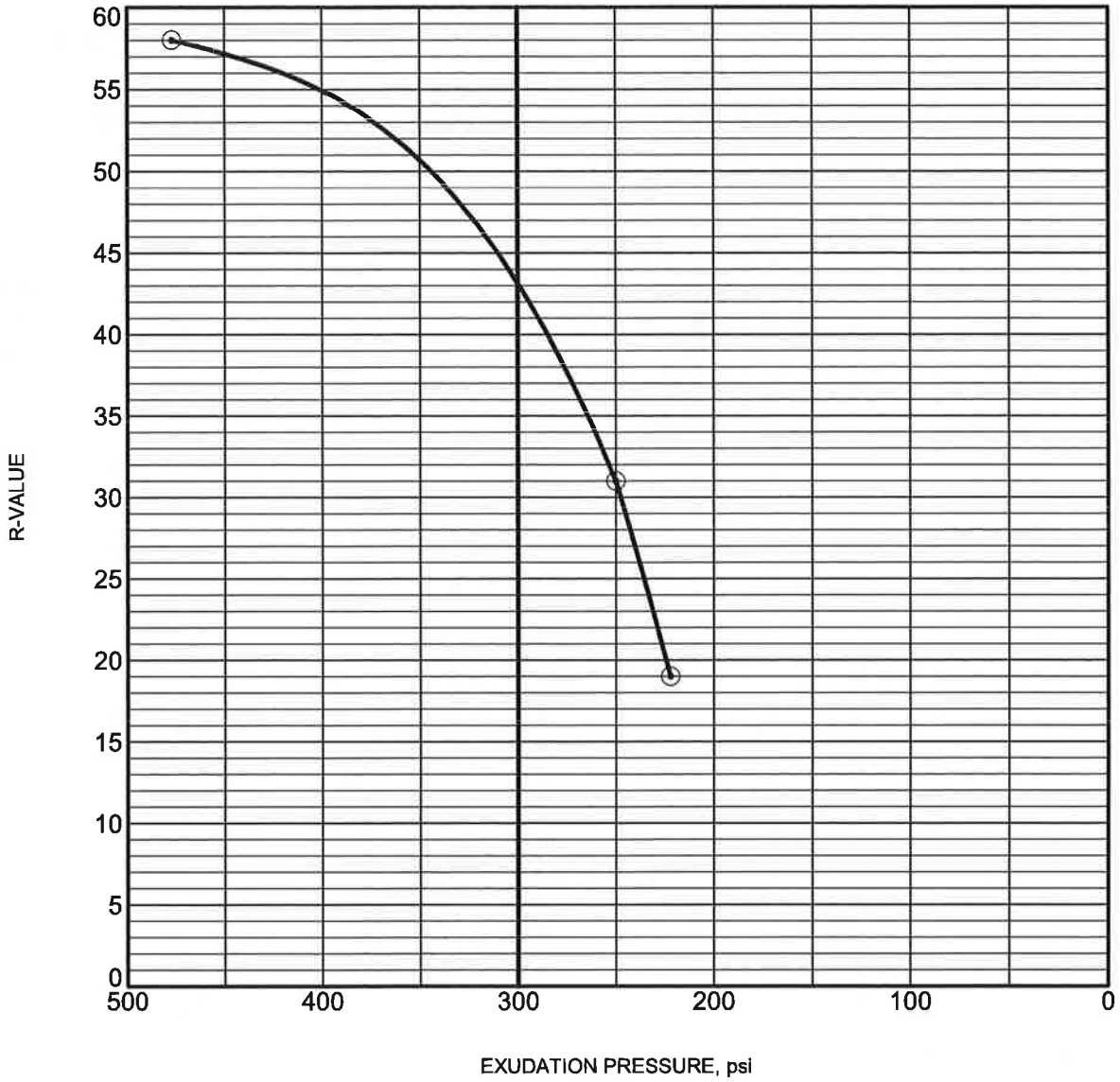
The Vintage at King's Canyon

MOISTURE-DENSITY CURVE

Job Number: 8947.000 Date: May 2016

PLATE B-3.2

LUMOS COMPACTION 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16



Test Data

Specimen No.	Water Content (%)	Dry Density (pcf)	Expansion (psf)	Exudation (psi)	Test R-Value*
1	**14.7**	**110.7**	**281.0**	**477.0**	**58.0**
2	**15.7**	**110.5**	**139.0**	**250.0**	**31.0**
3	**17.9**	**108.4**	**74.0**	**222.0**	**19.0**

* Reported values have been corrected for sample height, where required.

Test Result

Specimen Identification		Classification	R-Value
B-01	**0.0**	**Clayey SAND (SC)**	**43**

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The Vintage at King's Canyon

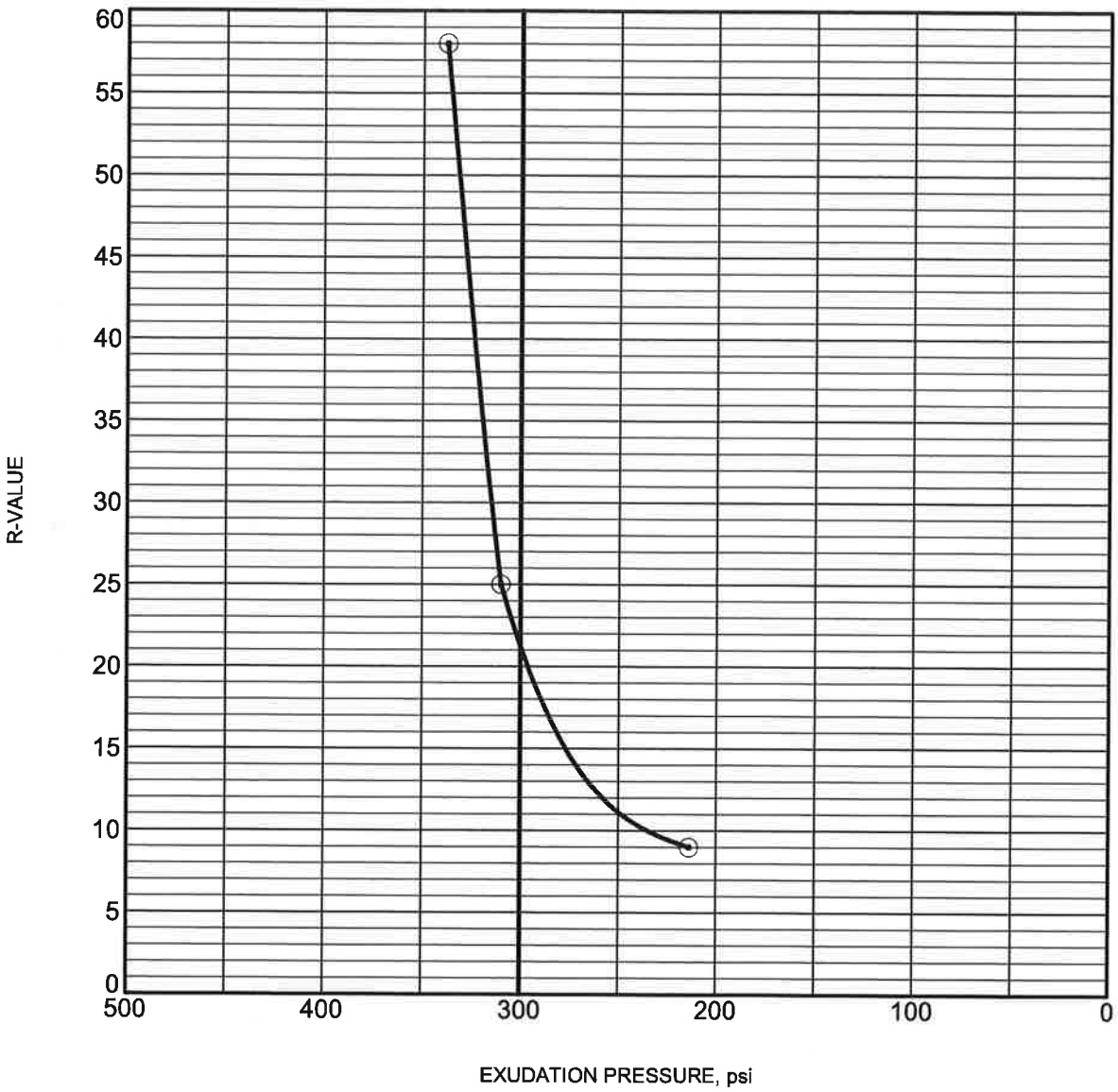
RESISTANCE VALUE TEST

Job Number: 8947.000 Date: May 2016

PLATE

B-4.1

R_VALUE 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/25/16



Test Data

Specimen No.	Water Content (%)	Dry Density (pcf)	Expansion (psf)	Exudation (psi)	Test R-Value*
1	**13.5**	**111.9**	**100.0**	**338.0**	**58.0**
2	**15.1**	**119.0**	**43.0**	**310.0**	**25.0**
3	**16.1**	**109.3**	**9.0**	**214.0**	**9.0**

* Reported values have been corrected for sample height, where required.

Test Result

Specimen Identification		Classification	R-Value
B-16	**0.0**	**Silty SAND (SM)**	**21**

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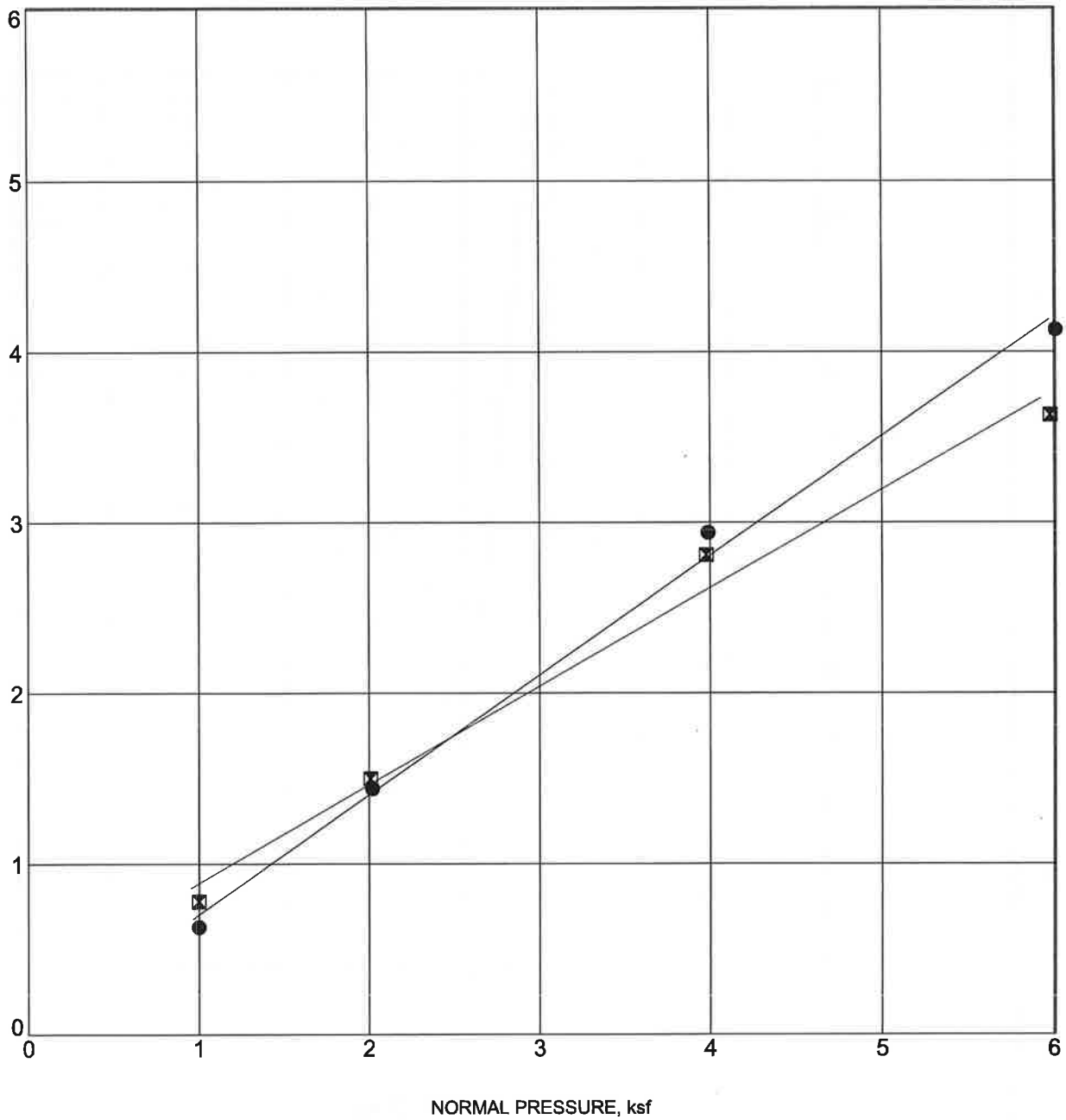
The Vintage at King's Canyon

RESISTANCE VALUE TEST

Job Number: 8947.000 Date: May 2016

PLATE B-4.2

R_VALUE 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/25/16



Specimen Identification			Classification	γ_d	MC%	c	ϕ
●	B-01	0.0	Clayey SAND (SC)	110	15	0.00	35.0
⊠	B-16	0.0	Silty SAND (SM)	121	11	0.31	30.0

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The Vintage at King's Canyon

DIRECT SHEAR TEST

Job Number: 8947.000 Date: May 2016

PLATE

B-5

LUMOS DIRECT SHEAR 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/25/16

SilverState Analytical Laboratories

Sierra Environmental Monitoring | EnviroTech

Laboratory Report
Report ID: 147874

Lumos and Associates-C.C.
Attn: Mitch Burns
800 E. College Parkway
Carson City, NV 89706

Date: 5/3/2016
Client: LUM-517
Taken by: B. Sexton
PO #: 8947.000/MB

Analysis Report

Laboratory Accreditation Number: NV-00015

Laboratory Sample ID	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S201604-1235	Comb. B-1,2,3 & 5	4/21/2016	9:00 AM	4/28/2016

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
Chloride - Ion Chromatography	SW-846 9056A	18	mg/Kg	10	Faulstich	4/29/2016	
pH - Saturated Paste	SW-846 9045D	7.84	pH Units		Bergstrom	4/29/2016	
pH - Temperature	SW-846 9045D	21.0	°C		Bergstrom	4/29/2016	
Resistivity AASHTO	AASHTO T288	3316	ohm cm		Bergstrom	5/2/2016	
Sodium ASTM	ASTM D2791	<0.01	%	0.01	Bergstrom	4/29/2016	
Sulfate SM4500	SM 4500 SO4 E	<0.01	%	0.01	Bergstrom	4/29/2016	
Total Sodium Sulfate	Calculation	<0.01	%	0.01	Bergstrom	4/29/2016	

Laboratory Accreditation Number: NV-00015

Laboratory Sample ID	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S201604-1236	B-9 from 0-5	4/20/2016	9:00 AM	4/28/2016

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
Chloride - Ion Chromatography	SW-846 9056A	<10	mg/Kg	10	Faulstich	4/30/2016	
pH - Saturated Paste	SW-846 9045D	6.34	pH Units		Bergstrom	4/29/2016	
pH - Temperature	SW-846 9045D	21.0	°C		Bergstrom	4/29/2016	
Resistivity AASHTO	AASHTO T288	2178	ohm cm		Bergstrom	5/2/2016	
Sodium ASTM	ASTM D2791	<0.01	%	0.01	Bergstrom	4/29/2016	
Sulfate SM4500	SM 4500 SO4 E	<0.01	%	0.01	Bergstrom	4/29/2016	
Total Sodium Sulfate	Calculation	<0.01	%	0.01	Bergstrom	4/29/2016	

SOLUBLE SULFATE 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/12/16

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The Vintage at King's Canyon

SOLUBLE SULFATE

Job Number: 8947.000 Date: May 2016

PLATE B-6.1

SilverState Analytical Laboratories

Sierra Environmental Monitoring | EnviroTech

Laboratory Report

Report ID: 147874

Lumos and Associates-C.C.
Attn: Mitch Burns
800 E. College Parkway
Carson City, NV 89706

Date: 5/3/2016
Client: LUM-517
Taken by: B. Sexton
PO #: 8947.000/MB

Analysis Report

Laboratory Accreditation Number: NV-00015

Laboratory Sample ID	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S201604-1237	B-20 from 5-6.5'	4/19/2016	9:00 AM	4/28/2016

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
Chloride - Ion Chromatography	SW-846 9056A	<10	mg/Kg	10	Faulstich	4/30/2016	
pH - Saturated Paste	SW-846 9045D	7.05	pH Units		Bergstrom	4/29/2016	
pH - Temperature	SW-846 9045D	21.1	°C		Bergstrom	4/29/2016	
Resistivity AASHTO	AASHTO T288	6398	ohm cm		Bergstrom	5/2/2016	
Sodium ASTM	ASTM D2791	<0.01	%	0.01	Bergstrom	4/29/2016	
Sulfate SM4500	SM 4500 SO4 E	<0.01	%	0.01	Bergstrom	4/29/2016	
Total Sodium Sulfate	Calculation	<0.01	%	0.01	Bergstrom	4/29/2016	

Data Flag Legend:

SOLUBLE SULFATE 8947.000 KINGS CANYON.GPJ US LAB.GDT 5/12/16

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The Vintage at King's Canyon

SOLUBLE SULFATE

Job Number: 8947.000 Date: May 2016

PLATE

B-6.2

APPENDIX C

Job # 8947.000
Client: Divinni NV, LLC
Description: Pavement Calculations
By: B. Sexton

R-Value for Native Silty Sand = 21
R-Value for Gravel (Type II, Class B) = 70

T.I. = 5
G_f = 2.50
GE = 0.0032(TI)(100-R)
t_{layer} = GE/G_f

GE_{AC}= 0.0032(5)(100-70) = 0.48′
t_{AC}= .48/(2.50)*(12″) = 2.3″ => **use 3″ asphalt**
$t_{AC(actual)}$= (3)(2.50)/12″ = .63′

GE_{AB}= 0.0032(5)(100-21) = 1.26′
t_{AB}= (1.26 - 0.63)(12″)/1.1 = 6.9″ => **use 8″ aggregate base**

Therefore, use 3″ of Asphalt Concrete (AC) underlain by a minimum of 8″ of Type 2 Class B Aggregate Base and underlain by a minimum of 12 inches of properly prepared subgrade soils.

PAVEMENT DESIGN 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/12/16

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The Vintage at King's Canyon

PAVEMENT DESIGN

Job Number: 8947.000 Date: May 2016

PLATE

C-1

APPENDIX D

USGS Design Maps Summary Report

User-Specified Input

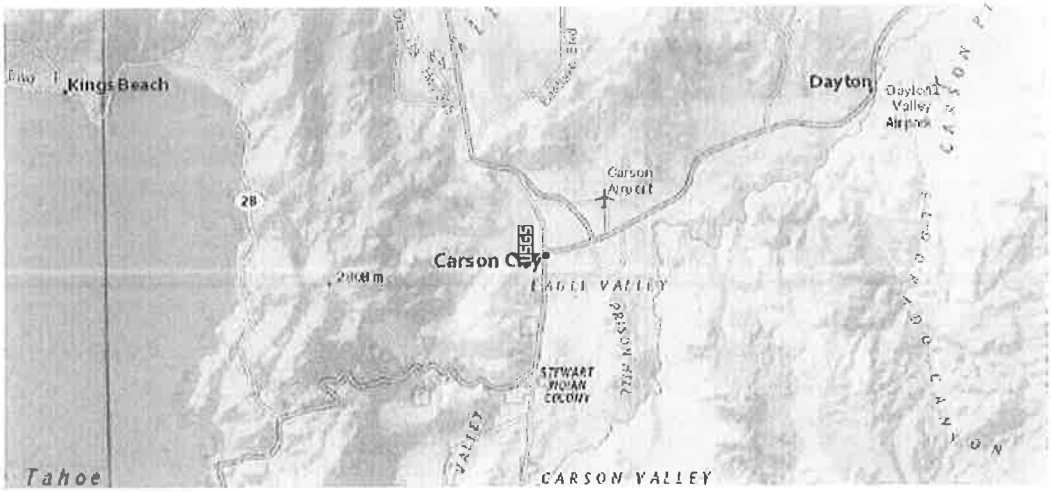
Report Title The Vintage at King's Canyon
Tue May 10, 2016 20:33:13 UTC

Building Code Reference Document 2012 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 39.1723°N, 119.7777°W

Site Soil Classification Site Class D – "Stiff Soil"

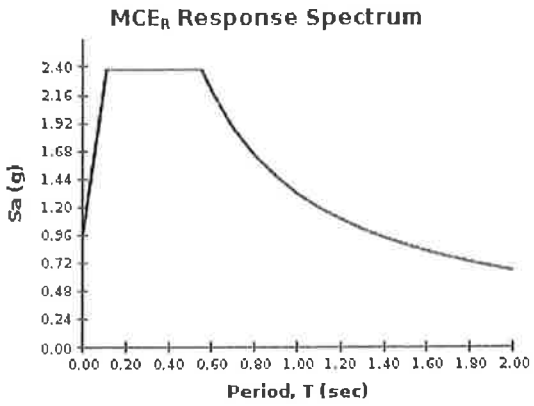
Risk Category I/II/III

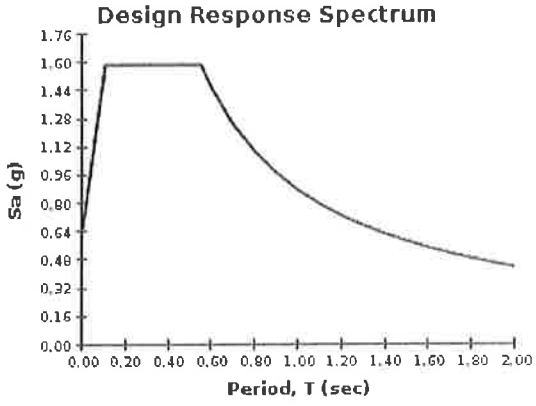


USGS-Provided Output

S_S =	2.377 g	S_{MS} =	2.377 g	S_{DS} =	1.585 g
S_1 =	0.875 g	S_{M1} =	1.312 g	S_{D1} =	0.875 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





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The Vintage at King's Canyon

DESIGN RESPONSE SPECTRUM

Job Number: 8947.000 Date: May 2016

PLATE D-1

DESIGN RESPONSE SPECTRUM 8947.000 KINGS CANYON.GPJ US_LAB.GDT 5/12/16

APPENDIX E

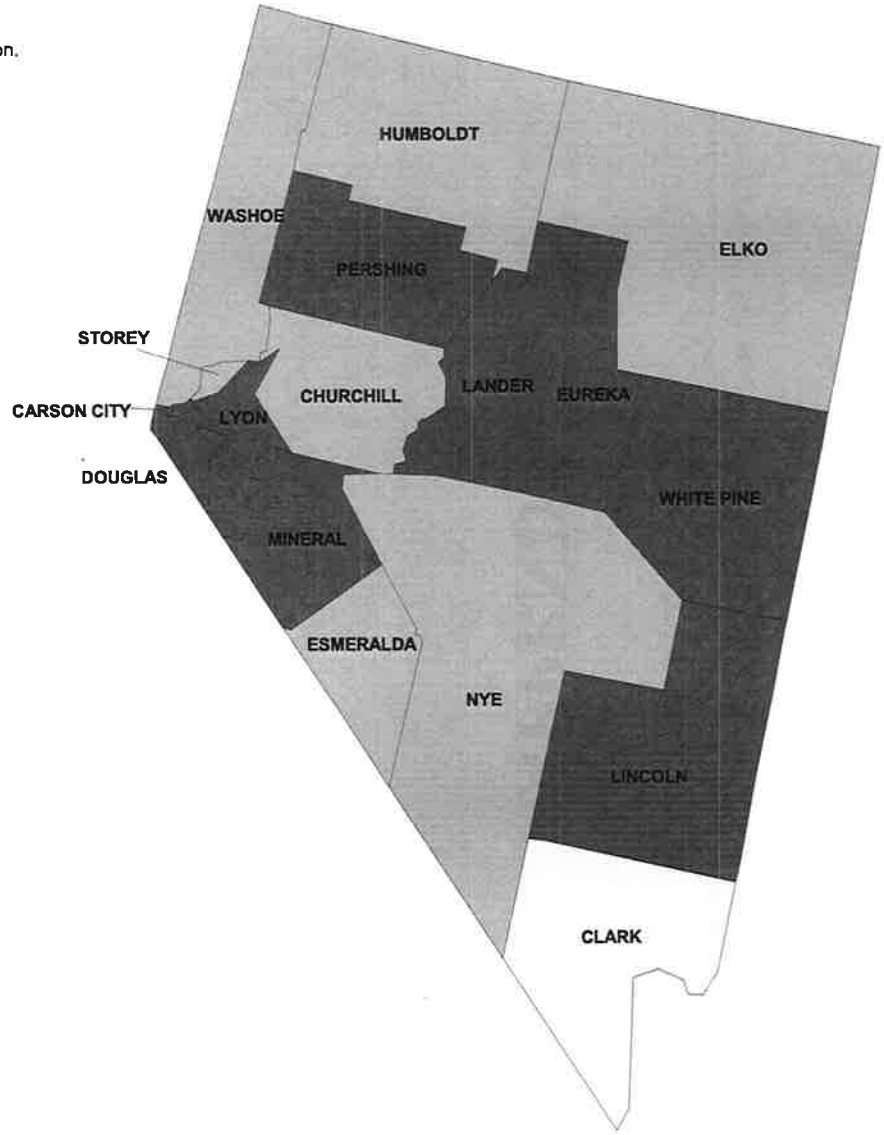
NEVADA - EPA Map of Radon Zones

http://www.epa.gov/radon/zonemap.html

The purpose of this map is to assist National, State and local organizations to target their resources and to implement radon-resistant building codes.

This map is not intended to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones.

All homes should be tested, regardless of zone designation.



IMPORTANT: Consult the publication entitled "Preliminary Geologic Radon Potential Assessment of Nevada" (USGS Open-file Report 93-292-I) before using this map. See http://energy.cr.usgs.gov/radon/grpinfo.html This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.

Zone 1 Zone 2 Zone 3

CONCEPTUAL DRAINAGE STUDY
for the

The Vintage at Kings Canyon
Carson City, Nevada

Prepared For:

The Vintage at Kings Canyon LLP

9130 Double Diamond Parkway
Reno, NV 89521

Prepared By:

LUMOS & ASSOCIATES, INC.
800 East College Parkway
Carson City, Nevada 89706
Phone: (775) 883-7077
FAX: (775) 883-7114

August, 2016
Job No. 8947.000

8-24-16

I. Introduction

A. Description of Project

This conceptual drainage report presents the finding of the preliminary drainage study for the Tentative Map Application for APNs 009-012-02 (80.66AC), 007-573-04 (23.93AC), 007-573-05 (16AC) and 001-131-01 (7.83AC) located within a portion of the South ½ of Section 7 and the North ½ of Section 18, Township 15N, Range 20E of the Mount Diablo Meridian. It identifies the existing and proposed site conditions, and the potential drainage improvements. This study has been conducted in accordance to the Carson City Municipal Code and Carson City Development Standards.

The Vintage at Kings Canyon is a Planned Unit Development that provides for a mix of housing types, including large, medium and small lot single family homes. Also included are assisted living units and extended care facilities for aging residents which are 36,000 and 18,000 square feet respectively. Two mixed use buildings of roughly 13,000 square feet are also included near the assisted living/extended care facility. The single family residential component of the project includes a clubhouse and outdoor recreation area. The project also includes a substantial open space/public amenity element that includes extension of the existing trail system, additional landscaped open areas between smaller units and the preservation of a historic farmhouse.

B. Existing Site Conditions

The project site of the Vintage at Kings Canyon PUD is 78.2 acres. APN 009-012-02 is 80.66 acres and bound on the South by W King St, on the North half to the East by N Ormsby Blvd. The remaining boundaries are by multiple single family residences to the West, the North and the Southern portion to the East. The proposed project is only going to encompass the portion of APN 009-012-02 to the north of Ash Canyon Creek which is 30.4 acres. The remaining project site is on the East side of N Ormsby Blvd and is comprised of 3 different APNs. These three APNs comprise 47.76 acres and are bound by N Ormsby Blvd on the West and Mountain St on the East. The remaining boundaries are by multiple single family residences and some open space farmland. Vicee Canyon Creek runs through the Eastern portion of the site. The site is currently covered in short grass and is used as pasture for animal grazing. The site generally slopes from the West to East with the average slope across the project being 2% to 3%.

This Conceptual Drainage Report is to accompany the PUD Tentative Map application for submittal of The Vintage at Kings Canyon PUD. The proposed PUD consists of 212 single family residences, a 10,000 square foot clubhouse, a 13,000 square foot retail space, 36,000 square foot assisted living facility and a 18,000 square foot extended care facility. The land use is as follows:

Table 1 – Proposed Land Use

Land Use	Acres	Percentage
Open Space	25.8	33.0%
Right of Way	15.94	20.4%

Single Family Lot Area	32.74	41.9%
Building Area (Non-SF Houses)	2.0	2.5%
Parking Areas	1.75	2.2%
Total	78.2	100%

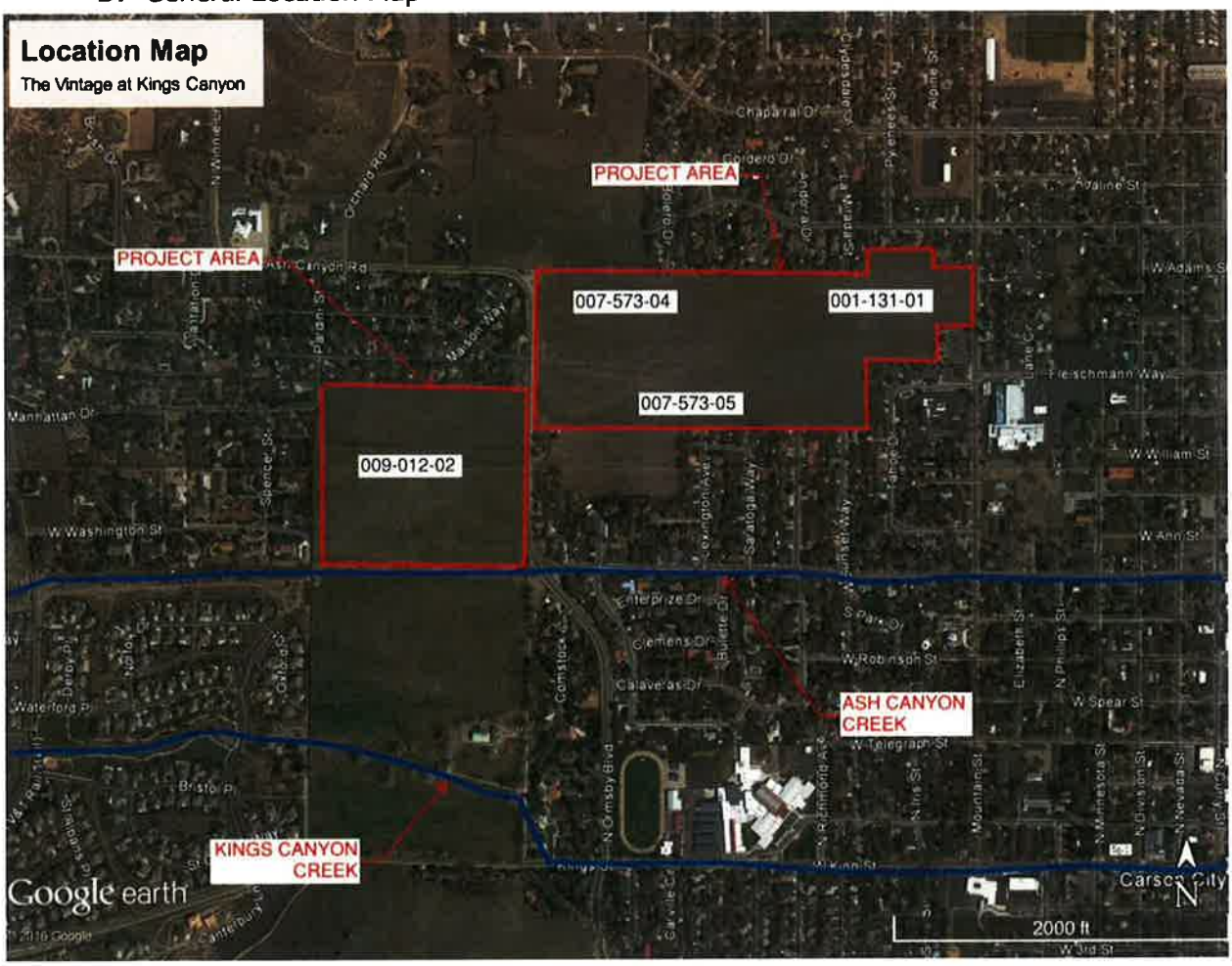
C. Other Previous Studies

The project site of The Vintage at Kings Canyon is located within the Kings Canyons Creek, Ash Canyon Creek and the Vicee Canyon Creek watersheds and has been addressed in the various studies in this area. Four major studies that performed in this area include:

1. The Hydraulic analysis US 395 Bypass Freeway Carson City, Nevada by WRC (April 1997)
2. The effective FEMA Flood Insurance Study Report by FEMA (January 16, 2009)
3. The SW Carson City Regional Hydrologic Analysis Final Report by Manhard (March 2010)
4. Hydrologic Analysis for Carson City Restudy, Flood Insurance Study by HDR (June 2010)

The Hydrologic Analysis for Carson City Restudy, Flood Insurance Study performed by HDR in June of 2010 was intended to review the hydrologic data provided to Carson City in the previous studies, make adjustments necessary and select peak discharges for 10-, 50-, 100-, and 500-year storm events to be used in the hydraulic analysis of the study reaches. This study is the most comprehensive of the four and will be used in this study for offsite baseline flows into the project area.

D. General Location Map



II. Existing and Proposed Hydrology

A. Existing and Proposed Drainage Basin Boundaries

There are three offsite drainage basins that flow onto the project area:

Table 2 – Drainage Basins and Areas (Manhard 2010)

Basin	Area (mi^2)
Vicee Canyon	1.57
Ash Canyon	5.48
Kings Canyon	4.99

A reservoir built for Vicee Canyon Creek contains all of the runoff for a 100-year storm event with approximately 9 feet of freeboard (HDR 2010). The reservoir is

upstream of the Project site. The drainage basin that actually drains onto the project area is much smaller, approximately 0.18mi^2. The basin map from the HDR 2010 report is provided in Appendix B.

B. Design Storm and 100-year, 24-Hour Storm Flow Calculations

Offsite flows onto the project site are:

Table 3 – Existing Off-Site Flow (HDR 2010)

Watershed	Peak Flows (cfs)		
	10% Annual Chance	2% Annual Chance	1% Annual Chance
Vicee Canyon Creek (into retention basin)	96	265	370
Vicee Canyon Creek (outflow from retention basin)	0	0	0
Vicee Canyon Creek (from sub-basin VC03C)	12.65	12.55	12.55
Ash Canyon Creek (AC08C)	269	762	1,065
Kings Canyon Creek (KC14C2)	280	816	1,071

The nodes for the Ash Canyon and Kings Canyon offsite flows were chosen from the sub-basins directly upstream from the project site.

The 5-year, 24-hour and 100-year, 24-hour onsite storm flows are as follows:

Table 4 – On-Site Flow Pre and Post-Development

Basin	Pre-Development		Post-Development	
	5-year	100-year	5-year	100-year
West	2.6	6.9	11.0	24.1
East	4.4	11.6	18.4	40.2

The design period for the project per Carson City Ordinance is a 5-year, 24-hour duration. This results in an increase of 22.4 cfs and a volume of 4.6 acre-feet.

For onsite flows, HEC-HMS version 4.1 was used to determine the existing and post development runoff conditions. The rainfall data was obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Retrieved from the Hydrometeorlogical Design Studies Center – Precipitation Frequency Data Server. The Design Storm events considered were 5 and 100-year storm events (see Appendix A). Onsite pre-development and post-development storm runoff

C. Existing Drainage Problems

There are no known existing drainage problems

D. On-site and Downstream Drainage

Currently on-site flows drain into the two creeks that transverse the project site. The Eastern portion of the project site drains to the Southeast and discharges from the site into the neighborhood to the East. The Western portion of the project area is divided into three different basins. The Southern basin discharges from the Southeast corner onto King St. and then flows onto N Ormsby Blvd to 5th St. and then towards Carson St. The middle basin discharges onto Glenbrook Cir. and then joins the flow from the Southern basin on N Ormsby Blvd. The Northern basin discharges into Ash Canyon Creek which discharges from the project site onto E Washinton St. and flows Easterly towards Carson St.

E. Floodplain

According to FEMA Flood Insurance Rate Maps (FIRM) for the project location the western portion of the project is located entirely in FEMA zone AE with flood depths of less than 1 foot. The eastern portion of the project is approximately ¼ in FEMA zone AO with depths of 1'. However, Lumos has looked at the HEC-RAS modeling that was performed for the FIRM map and we believe the model has compounds which need to be explored with Carson City in order to ensure the model utilized going forward is as accurate as possible. The HEC-RAS model for Ash Canyon Creek has a lateral weir on the south side of it that crosses N. Ormsby Blvd. This lateral weir appears to be artificially raising the base flood elevation (BFE) for the area to the west of N. Ormsby Blvd. and skewing the floodplain on the east side.

The cross section for the Ash Canyon Creek near N. Ormsby Blvd. (cross section A on FIRM panel 3200010091F) show that the lateral weir is holding back almost 1.5 feet of water. Additionally, the topography outside of the cross section to the south shows that some of the runoff will most likely flow south into the neighborhood and onto N. Ormsby Blvd. instead of crossing it. This reduced flow that does cross N. Ormsby will reduce the footprint of the BFE on the east side. We propose to coordinate these items with Carson City staff as part of future flood modeling efforts.

F. Existing Irrigation

There is periodic existing irrigation on the project site from the creeks with existing surface water. This irrigation will cease with the development.

G. Tributary Exhibit

The tributary exhibit is shown on the basin map provided by HDR, located in Appendix B.

III. Proposed Drainage Facilities (on-site and off-site)

A. Routing of flow in and/or around site, downstream, and location of drainage facilities.

On-Site Flow

Onsite flow will be routed via curb and gutter and underground storm drainage into retention basins located around the project location. The retention basins will be sized in order to contain the difference between the pre-development and post-development 5-year, 24-hour storm runoff as required by Carson City Code.

Off-Site Flow

Off-site flow that enters the project location will also be collected and routed to retention basins via an underground storm drainage system. The retention basins will be sized so that the discharge from the project location will not exceed the existing discharge flow.

B. Mitigation Measures

Best Management Practices techniques should be implemented to manage the quantity and improve the quality of stormwater runoff, minimize local erosion and potential discharges to adjacent properties.

C. Floodplain Modifications

The Vintage at Kings Canyon PUD will be constructed as to not impact the floodplain volume by adhering to 1:1 cut/fill grading required for floodplain. The housing pads will be placed at 2' above the BFE while streets and open space areas will be lowered.

D. Exhibit

A copy of the PUD tentative map showing proposed retention basin locations and the FEMA Firmettes for the project location are provided in Appendix C.

IV. Conclusions

The Vintage at Kings Canyon PUD will be designed in accordance with Carson City Municipal Code and Carson City Development Standards. The project will not have a detrimental effect on surrounding properties. There will be on-site retention that will mitigate any increase in storm runoff and help control on and off-site flows.

Appendix A

Project: Vintage at Kings Canyon Simulation Run: 5-year, 24-hour Pre

Start of Run: 01Jan2016, 00:00 Basin Model: Vintage Pre
End of Run: 02Jan2016, 00:00 Meteorologic Model: 5 Year
Compute Time: 25Aug2016, 14:16:31 Control Specifications: 24-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
West Basin	0.046	2.6	01Jan2016, 12:34	0.31
East Basin	0.074	4.4	01Jan2016, 12:32	0.31

Project: Vintage at Kings Canyon Simulation Run: 5-year, 24-hour Post

Start of Run: 01Jan2016, 00:00 Basin Model: Vintage Post
End of Run: 02Jan2016, 00:00 Meteorologic Model: 5 Year
Compute Time: 25Aug2016, 14:16:14 Control Specifications: 24-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
West Basin	0.046	11.0	01Jan2016, 12:30	1.01
East Basin	0.074	18.4	01Jan2016, 12:28	1.01

Project: Vintage at Kings Canyon Simulation Run: 100-year. 24-hour Pre

Start of Run: 01Jan2016, 00:00 Basin Model: Vintage Pre
End of Run: 02Jan2016, 00:00 Meteorologic Model: 100 Year
Compute Time: 25Aug2016, 14:16:03 Control Specifications: 24-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
West Basin	0.046	6.9	01Jan2016, 08:32	0.46
East Basin	0.074	11.6	01Jan2016, 08:30	0.46

Project: Vintage at Kings Canyon Simulation Run: 100-year, 24-hour post

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 25Aug2016, 14:14:32

Basin Model: Vintage Post
Meteorologic Model: 100 Year
Control Specifications: 24-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
West Basin	0.046	24.1	01Jan2016, 08:26	3.1
East Basin	0.074	40.2	01Jan2016, 08:24	5.0

NOAA Atlas 14, Volume 1, Version 5
Location name: Carson City, Nevada, US*
Latitude: 39.1656°, Longitude: -119.7820°
Elevation: 4755 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.18 (1.02-1.39)	1.46 (1.27-1.74)	1.96 (1.68-2.32)	2.42 (2.06-2.87)	3.19 (2.63-3.78)	3.90 (3.11-4.64)	4.73 (3.65-5.70)	5.74 (4.25-7.02)	7.33 (5.12-9.18)	8.77 (5.84-11.2)
10-min	0.900 (0.774-1.06)	1.12 (0.972-1.32)	1.49 (1.28-1.76)	1.85 (1.57-2.18)	2.43 (2.00-2.88)	2.96 (2.36-3.53)	3.60 (2.78-4.34)	4.36 (3.23-5.35)	5.57 (3.90-6.98)	6.68 (4.45-8.51)
15-min	0.744 (0.640-0.876)	0.924 (0.800-1.09)	1.23 (1.06-1.46)	1.53 (1.30-1.80)	2.01 (1.66-2.38)	2.45 (1.96-2.92)	2.98 (2.30-3.59)	3.60 (2.67-4.42)	4.61 (3.22-5.77)	5.52 (3.68-7.04)
30-min	0.500 (0.430-0.588)	0.622 (0.538-0.736)	0.828 (0.710-0.982)	1.03 (0.874-1.22)	1.35 (1.12-1.60)	1.65 (1.32-1.97)	2.00 (1.55-2.42)	2.43 (1.80-2.98)	3.10 (2.17-3.89)	3.72 (2.47-4.74)
60-min	0.309 (0.266-0.364)	0.384 (0.334-0.455)	0.513 (0.440-0.608)	0.636 (0.541-0.752)	0.837 (0.690-0.992)	1.02 (0.815-1.22)	1.24 (0.957-1.50)	1.50 (1.11-1.84)	1.92 (1.34-2.40)	2.30 (1.53-2.93)
2-hr	0.210 (0.188-0.240)	0.261 (0.232-0.298)	0.332 (0.294-0.378)	0.395 (0.346-0.450)	0.490 (0.418-0.560)	0.574 (0.478-0.664)	0.670 (0.544-0.785)	0.787 (0.617-0.934)	0.988 (0.740-1.21)	1.17 (0.850-1.48)
3-hr	0.168 (0.151-0.189)	0.210 (0.189-0.236)	0.262 (0.235-0.295)	0.305 (0.271-0.343)	0.366 (0.320-0.414)	0.419 (0.359-0.478)	0.478 (0.401-0.550)	0.553 (0.455-0.646)	0.676 (0.539-0.815)	0.794 (0.616-0.996)
6-hr	0.119 (0.107-0.132)	0.148 (0.133-0.166)	0.183 (0.164-0.204)	0.211 (0.188-0.235)	0.249 (0.218-0.279)	0.278 (0.241-0.314)	0.308 (0.262-0.351)	0.342 (0.286-0.395)	0.393 (0.319-0.461)	0.437 (0.348-0.522)
12-hr	0.079 (0.070-0.088)	0.099 (0.088-0.111)	0.124 (0.110-0.139)	0.144 (0.127-0.162)	0.171 (0.149-0.193)	0.191 (0.165-0.217)	0.212 (0.180-0.244)	0.234 (0.194-0.272)	0.262 (0.213-0.311)	0.285 (0.226-0.343)
24-hr	0.053 (0.048-0.058)	0.066 (0.060-0.073)	0.083 (0.076-0.092)	0.097 (0.088-0.107)	0.117 (0.105-0.129)	0.132 (0.118-0.146)	0.148 (0.131-0.165)	0.165 (0.145-0.184)	0.188 (0.163-0.211)	0.206 (0.176-0.233)
2-day	0.032 (0.028-0.036)	0.040 (0.036-0.045)	0.051 (0.046-0.057)	0.060 (0.054-0.068)	0.073 (0.064-0.082)	0.083 (0.073-0.094)	0.093 (0.081-0.106)	0.105 (0.090-0.120)	0.120 (0.102-0.139)	0.133 (0.111-0.155)
3-day	0.023 (0.021-0.026)	0.030 (0.026-0.033)	0.038 (0.034-0.043)	0.045 (0.040-0.051)	0.055 (0.048-0.062)	0.062 (0.054-0.071)	0.071 (0.061-0.081)	0.080 (0.068-0.091)	0.092 (0.077-0.106)	0.102 (0.084-0.119)
4-day	0.019 (0.017-0.022)	0.024 (0.022-0.028)	0.031 (0.028-0.036)	0.037 (0.033-0.042)	0.046 (0.040-0.052)	0.052 (0.045-0.060)	0.059 (0.051-0.068)	0.067 (0.057-0.077)	0.078 (0.065-0.090)	0.086 (0.071-0.101)
7-day	0.013 (0.011-0.015)	0.016 (0.014-0.018)	0.021 (0.019-0.024)	0.025 (0.022-0.028)	0.031 (0.027-0.035)	0.035 (0.030-0.040)	0.040 (0.034-0.045)	0.045 (0.038-0.051)	0.051 (0.043-0.059)	0.057 (0.047-0.066)
10-day	0.010 (0.009-0.011)	0.013 (0.011-0.014)	0.017 (0.015-0.019)	0.020 (0.017-0.022)	0.024 (0.021-0.027)	0.027 (0.023-0.031)	0.030 (0.026-0.035)	0.034 (0.029-0.039)	0.039 (0.033-0.045)	0.042 (0.035-0.049)
20-day	0.006 (0.006-0.007)	0.008 (0.007-0.009)	0.010 (0.009-0.011)	0.012 (0.011-0.013)	0.014 (0.013-0.016)	0.016 (0.014-0.018)	0.018 (0.016-0.020)	0.020 (0.017-0.023)	0.022 (0.019-0.026)	0.024 (0.021-0.028)
30-day	0.005 (0.004-0.005)	0.006 (0.005-0.007)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.011 (0.010-0.012)	0.012 (0.011-0.014)	0.014 (0.012-0.015)	0.015 (0.013-0.017)	0.017 (0.014-0.019)	0.018 (0.016-0.021)
45-day	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.009 (0.008-0.009)	0.010 (0.008-0.011)	0.011 (0.009-0.012)	0.011 (0.010-0.013)	0.013 (0.011-0.014)	0.014 (0.012-0.015)
60-day	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.009 (0.008-0.011)	0.010 (0.009-0.012)	0.011 (0.010-0.012)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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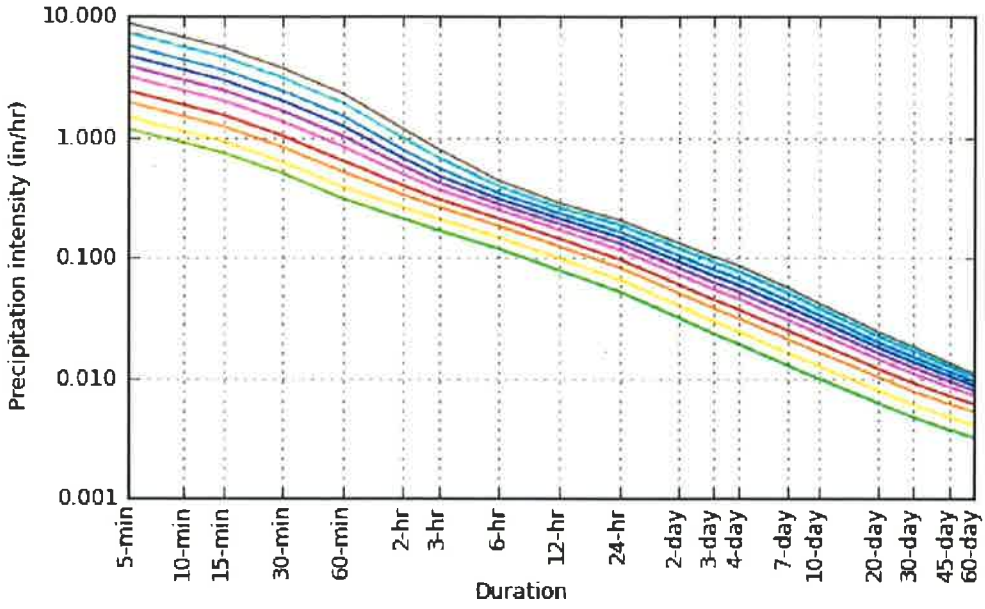
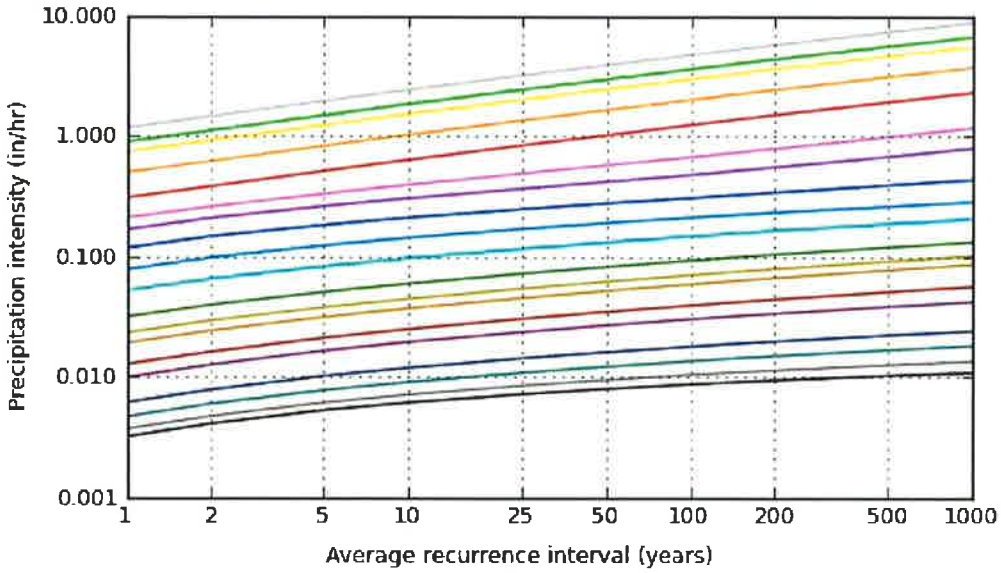
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 39.1656°, Longitude: -119.7820°





NOAA Atlas 14, Volume 1, Version 5

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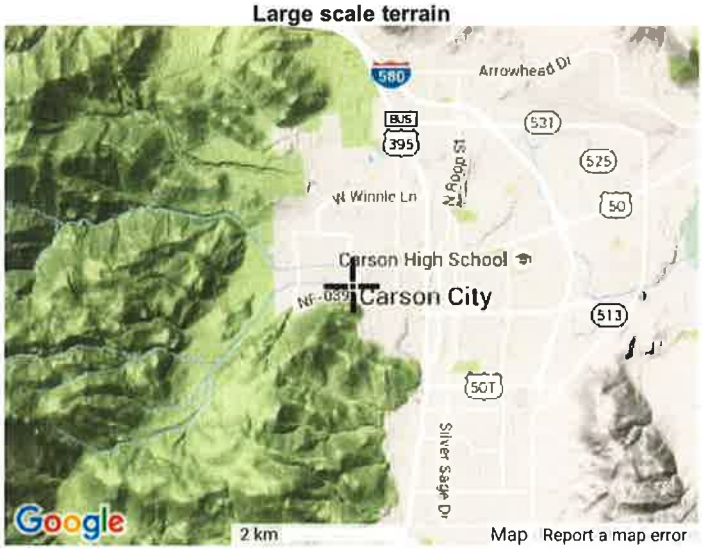
Maps & aerials

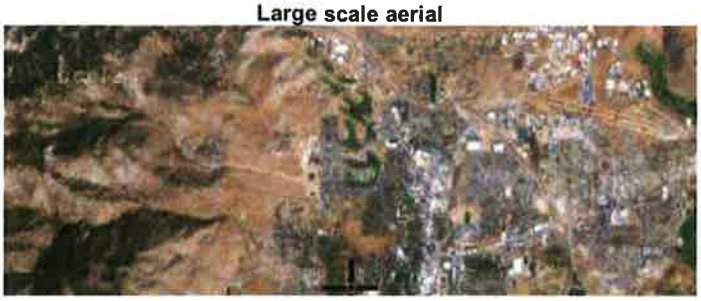
Small scale terrain

Large scale terrain



Large scale map

Large scale aerial



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National Oceanic and Atmospheric Administration
National Weather Service
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1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 1, Version 5
Location name: Carson City, Nevada, US*
Latitude: 39.1656°, Longitude: -119.7820°
Elevation: 4755 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.098 (0.085-0.116)	0.122 (0.106-0.145)	0.163 (0.140-0.193)	0.202 (0.172-0.239)	0.266 (0.219-0.315)	0.325 (0.259-0.387)	0.394 (0.304-0.475)	0.478 (0.354-0.585)	0.611 (0.427-0.765)	0.731 (0.487-0.932)
10-min	0.150 (0.129-0.176)	0.186 (0.162-0.220)	0.248 (0.213-0.294)	0.308 (0.262-0.364)	0.405 (0.334-0.480)	0.494 (0.394-0.589)	0.600 (0.463-0.724)	0.727 (0.539-0.892)	0.929 (0.650-1.16)	1.11 (0.741-1.42)
15-min	0.186 (0.160-0.219)	0.231 (0.200-0.273)	0.308 (0.264-0.365)	0.382 (0.324-0.451)	0.502 (0.414-0.595)	0.613 (0.489-0.731)	0.744 (0.574-0.897)	0.901 (0.668-1.10)	1.15 (0.806-1.44)	1.38 (0.919-1.76)
30-min	0.250 (0.215-0.294)	0.311 (0.269-0.368)	0.414 (0.355-0.491)	0.514 (0.437-0.608)	0.676 (0.558-0.801)	0.825 (0.659-0.984)	1.00 (0.773-1.21)	1.21 (0.900-1.49)	1.55 (1.08-1.94)	1.86 (1.24-2.37)
60-min	0.309 (0.266-0.364)	0.384 (0.334-0.455)	0.513 (0.440-0.608)	0.636 (0.541-0.752)	0.837 (0.690-0.992)	1.02 (0.815-1.22)	1.24 (0.957-1.50)	1.50 (1.11-1.84)	1.92 (1.34-2.40)	2.30 (1.53-2.93)
2-hr	0.421 (0.376-0.481)	0.522 (0.464-0.597)	0.664 (0.587-0.757)	0.790 (0.691-0.900)	0.979 (0.835-1.12)	1.15 (0.957-1.33)	1.34 (1.09-1.57)	1.57 (1.23-1.87)	1.98 (1.48-2.42)	2.35 (1.70-2.96)
3-hr	0.506 (0.454-0.569)	0.630 (0.569-0.710)	0.788 (0.705-0.886)	0.917 (0.814-1.03)	1.10 (0.961-1.24)	1.26 (1.08-1.43)	1.43 (1.20-1.65)	1.66 (1.36-1.94)	2.03 (1.62-2.45)	2.38 (1.85-2.99)
6-hr	0.711 (0.639-0.792)	0.886 (0.797-0.992)	1.10 (0.982-1.22)	1.26 (1.13-1.41)	1.49 (1.31-1.67)	1.67 (1.44-1.88)	1.84 (1.57-2.10)	2.05 (1.71-2.37)	2.35 (1.91-2.76)	2.62 (2.08-3.12)
12-hr	0.949 (0.847-1.06)	1.19 (1.06-1.34)	1.50 (1.33-1.68)	1.74 (1.53-1.95)	2.06 (1.79-2.32)	2.30 (1.99-2.62)	2.56 (2.17-2.94)	2.81 (2.34-3.27)	3.16 (2.56-3.75)	3.43 (2.73-4.13)
24-hr	1.26 (1.14-1.39)	1.58 (1.44-1.75)	2.00 (1.81-2.21)	2.34 (2.11-2.58)	2.80 (2.52-3.10)	3.18 (2.83-3.50)	3.56 (3.15-3.95)	3.96 (3.48-4.41)	4.52 (3.90-5.06)	4.95 (4.22-5.60)
2-day	1.53 (1.37-1.72)	1.92 (1.72-2.16)	2.45 (2.19-2.76)	2.88 (2.57-3.24)	3.49 (3.09-3.94)	3.98 (3.49-4.50)	4.49 (3.91-5.10)	5.03 (4.33-5.76)	5.78 (4.90-6.68)	6.38 (5.33-7.45)
3-day	1.69 (1.50-1.91)	2.13 (1.90-2.41)	2.74 (2.43-3.10)	3.23 (2.87-3.66)	3.94 (3.46-4.47)	4.50 (3.92-5.12)	5.10 (4.41-5.82)	5.73 (4.90-6.58)	6.62 (5.56-7.67)	7.34 (6.08-8.58)
4-day	1.85 (1.64-2.10)	2.34 (2.07-2.65)	3.02 (2.67-3.44)	3.59 (3.16-4.08)	4.38 (3.83-4.99)	5.02 (4.35-5.73)	5.71 (4.90-6.54)	6.44 (5.46-7.39)	7.47 (6.23-8.65)	8.30 (6.82-9.71)
7-day	2.16 (1.92-2.44)	2.74 (2.43-3.10)	3.56 (3.15-4.03)	4.21 (3.72-4.78)	5.14 (4.51-5.84)	5.88 (5.12-6.69)	6.66 (5.74-7.61)	7.48 (6.40-8.57)	8.62 (7.26-9.98)	9.54 (7.92-11.1)
10-day	2.40 (2.13-2.71)	3.06 (2.71-3.46)	3.98 (3.52-4.50)	4.70 (4.14-5.32)	5.69 (4.99-6.45)	6.47 (5.64-7.35)	7.29 (6.29-8.29)	8.13 (6.96-9.28)	9.28 (7.85-10.7)	10.2 (8.51-11.8)
20-day	2.98 (2.66-3.34)	3.79 (3.38-4.26)	4.91 (4.38-5.50)	5.76 (5.12-6.45)	6.90 (6.10-7.74)	7.77 (6.82-8.72)	8.66 (7.55-9.76)	9.54 (8.27-10.8)	10.7 (9.19-12.3)	11.6 (9.85-13.4)
30-day	3.42 (3.06-3.82)	4.35 (3.89-4.86)	5.62 (5.03-6.28)	6.58 (5.87-7.34)	7.87 (6.98-8.79)	8.85 (7.79-9.90)	9.85 (8.61-11.1)	10.8 (9.40-12.2)	12.2 (10.4-13.9)	13.2 (11.2-15.1)
45-day	4.04 (3.63-4.50)	5.16 (4.62-5.74)	6.66 (5.96-7.40)	7.77 (6.95-8.63)	9.21 (8.20-10.3)	10.3 (9.11-11.5)	11.3 (10.0-12.7)	12.4 (10.9-13.9)	13.7 (11.9-15.5)	14.7 (12.7-16.7)
60-day	4.66 (4.17-5.19)	5.95 (5.33-6.64)	7.67 (6.87-8.54)	8.90 (7.96-9.91)	10.4 (9.30-11.6)	11.6 (10.3-12.9)	12.6 (11.2-14.2)	13.7 (12.0-15.3)	14.9 (13.1-16.8)	15.8 (13.8-17.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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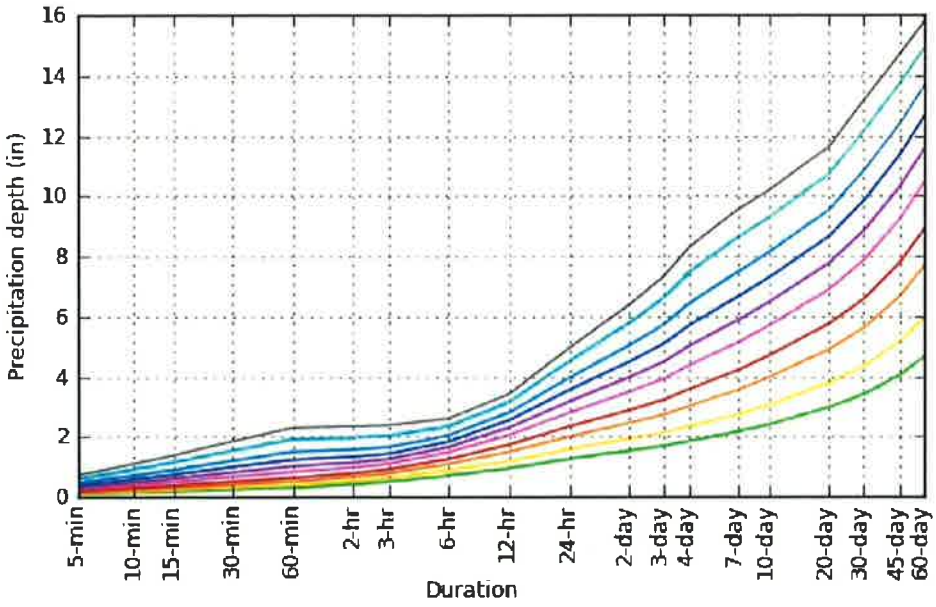
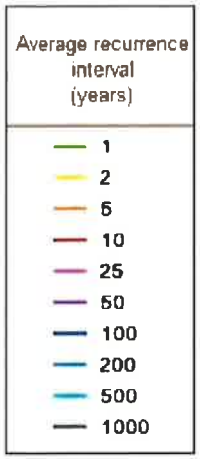
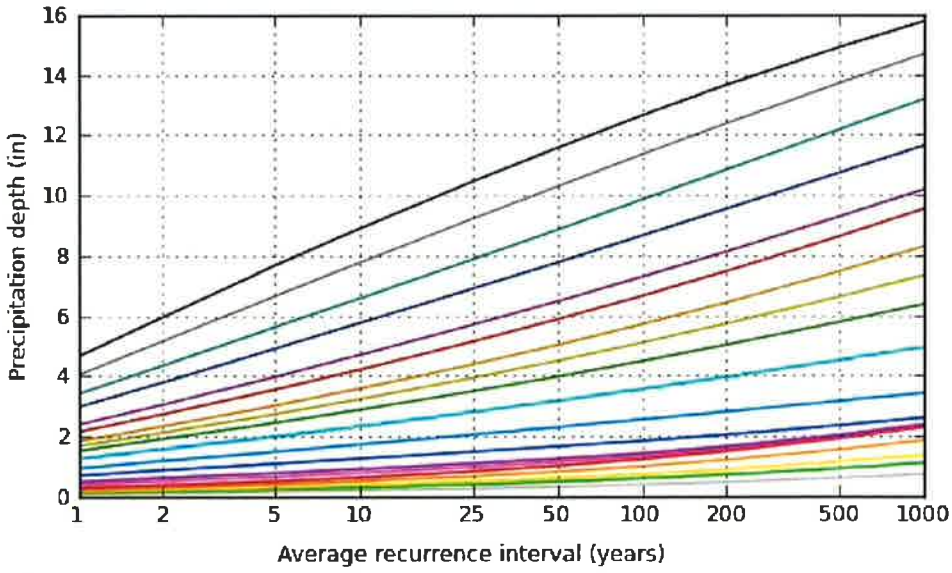
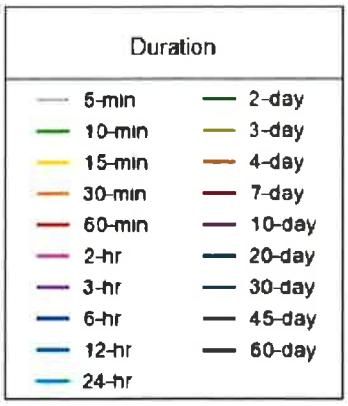
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 39.1656°, Longitude: -119.7820°









NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Fri Jan 22 17:21:29 2016

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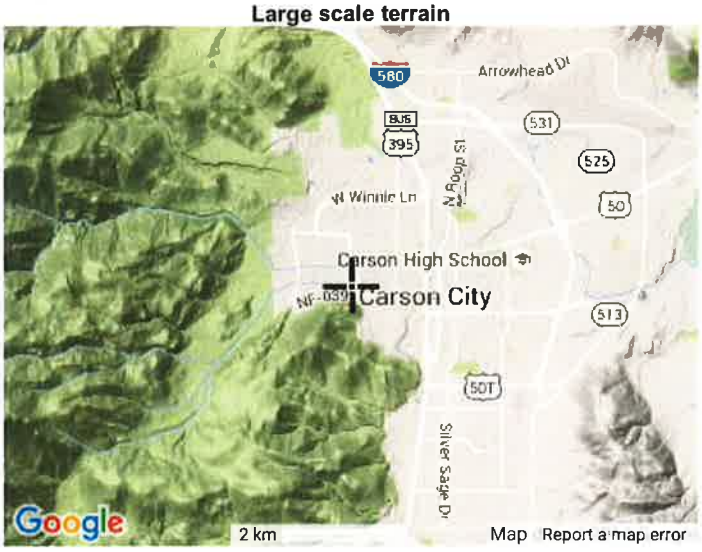
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map

Large scale aerial

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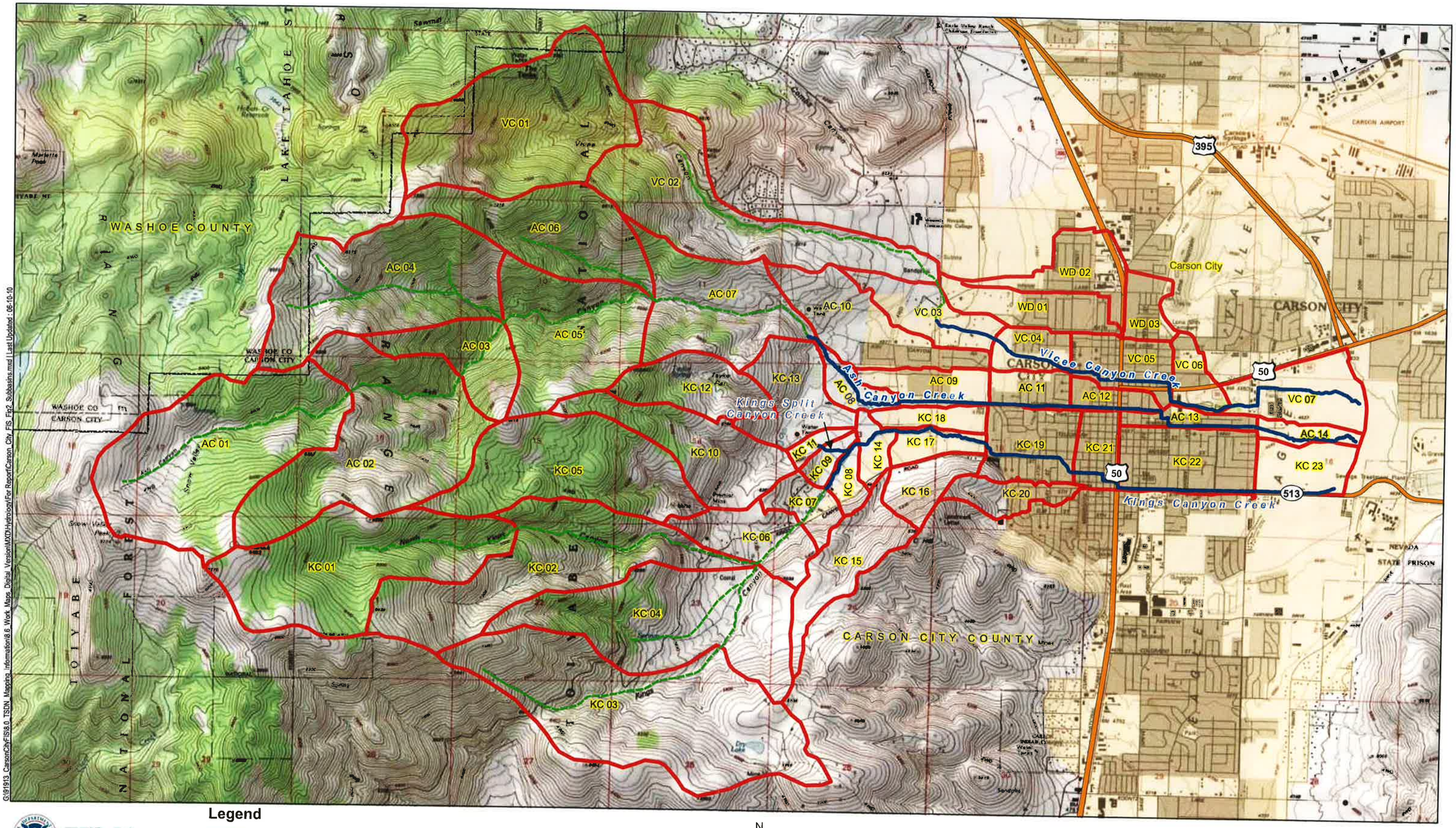
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix B



G:\91913_CarsonCityFIS\8.0_TSDN_Mapping_information\8.6_Work_Maps_Digital_Version\MXD\Hydrology\For Report\Carson_City_FIS_Fig2_Subbasins.mxd | Last Updated : 06-10-10

FEMA

HDR
ONE COMPANY | *Many Solutions*™

Legend

- Sub-basins
- Stream Reaches Study Area
- Stream Reaches (Non Study)
- Major Roads
- Urbanized Area
- Counties *

* Carson City **County** and **City** boundaries coincide

N

1 inch = 3,000 feet

0 1,500 3,000 6,000 9,000 12,000 Feet

Carson City Restudy - Sub-basins

Figure 2

Image Source: NGS_Topo_US_2D, 2009
Horizontal Datum: NAD 1983
Vertical Datum: NAVD 1988
Date: 06-10-10

Flood Insurance Study for Carson City, NV | Project # 91913, T.O. 36

Appendix C

MAP SCALE 1" = 500'

250 0 500 1000 FEET

50 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0091F

FIRM
FLOOD INSURANCE RATE MAP

CARSON CITY, NEVADA
INDEPENDENT CITY

PANEL 91 OF 275
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CARSON CITY	320001	0091	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
3200010091F

MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

JOINS PANEL 0091

N

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 M

1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN STREET

ZONE AO (DEPTH 1')

ZONE AO (DEPTH 2')

KR0985

KR0986

KR0987

17

18

Kings Canyon Creek

NFIP

PANEL 0092F

FIRM

FLOOD INSURANCE RATE MAP

CARSON CITY, NEVADA
INDEPENDENT CITY

PANEL 92 OF 275

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

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NATIONAL FLOOD INSURANCE PROGRAM

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3200010092F

MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

LUMOS
& ASSOCIATES

August 18, 2016

Mr. Lee Plemel, Director
Carson City Community Development
108 E. Proctor Street
Carson City, NV 89703

RE: The Vintage at Kings Canyon

Dear Lee:

Pursuant to the Carson City requirements, Lumos and Associates has prepared the following water and sewer impact report to support the Tentative Map submittal. The proposed project is PUD with 212 active senior single family residences and 96 assisted living/independent living units. The units are apartment type units without individual kitchens. The PUD is located on approximately 78.2 acres and is split by N. Ormsby Blvd. in Carson City.

WATER

There are three components to the water demand analysis for the proposed project. There are the single family (SF) residences, the assisted living facility and the open space irrigation. The SF demand per 10 State Standards is 0.6 ac-ft/yr per unit under 12,000 square feet or 535 gallons per day. That translates into an average demand of .37 gpm per SF unit or 78.76 gpm for all 212 SF units. The assisted living facility falls under the Commercial/Industrial standard for the 10 State Standards and demand is estimated at 1 ac-ft/yr per acre. The entire assisted living facility encompasses approximately 5.6 acres. This translates into a demand of 5,000 gallons per day or 3.47 gpm. This flow is in accordance with historical demand for similar facility types in the area. Lastly, the landscaping demand can be estimated at 4 ac-ft/yr per acre. Current estimates for landscaped area that will be irrigated is approximately 11.8 acres. This results in a demand of 42,137 gallons per day or 29.3 gpm.

Based on discussions with Tom Grundy at Carson City Public Works, the existing water system has the capacity to serve this development. Looping will be required to the south per the conceptual map review letter prepared by Carson City Staff.

FIRE FLOW ANALYSIS

Fire flow analysis was also performed by Mr. Grundy. His fire flow analysis is attached. Fire hydrant testing near the west side on N. Ormsby St. determined an available fire flow of 4,800 gpm. Fire hydrant testing on N. Mountain St. on the east side determined an available fire flow of 4,300 pgm.

In summary, it is Mr. Grundy's and our opinions that the project will have no appreciable impact on the performance of the water system.

The Vintage at Kings Canyon
Water and Sewer Impact

August 18, 2016

SANITARY SEWER CAPACITY

The proposed project will connect to the City's sewer system for collection and treatment. The developer is proposing a gravity system that will include expanded use of the existing connections to the existing gravity mains in N. Ormsby Blvd. and N. Mountain St.

The west side of the project will connect to the existing main in N. Ormsby Blvd. which is an 8" ACP which runs south and then turns east along Washington St. During field investigations during peak flow hours it was determined that the southernmost pipe along Ormsby Blvd before turning down Washington Street was flowing at 0.20 cfs and 23.5% capacity. The average daily residential EDU rate is 250 gallons per day, which equates to .0004 cfs average. Using a peaking factor of 3.0, the peak flow per household would be .0012 cfs. With 59 homes planned on the west side, the increase in flow is .07 cfs, putting the 8" main in Mountain Street around 32% of its capacity.

The east side of the project will connect to the existing main in N. Mountain St. which is an 8" PCV that was recently installed. The main that runs from north to south on N. Mountain St. turns east and connects to the existing main located in Fleischman St. Field investigations during peak flow hours on the southernmost section of main before turning down Fleischman determined that the peak flow in the pipe was approximately 0.07 cfs and 5.4% of capacity. Using the same estimated flows and peaking factor the increase in peak flow is 0.13 cfs for the 153 homes on the east side. The assisted living/independent living based on approximate water usage discussed about would add an additional 0.024 cfs peak flow. The total east side of the development is estimated at 0.16 cfs putting the 8" main in Mountain Street around 23% of its capacity.

The proposed project overall usage is in accordance with the master plan for which the sewer mains were analyzed. Since the proposed project is within these tolerances, it is assumed that the sewer system as design has the available capacity to convey the sewage for the proposed infrastructure.

In summary, we feel that the proposed project has a nominal impact on the existing flow capacity for the sewer mains within the direct area of the proposed development, however, the sewer mains were designed in order to support the proposed project.

If you have any questions, do not hesitate to give me a call at 883-7077.

Sincerely,

Rebecca Bernier, P.E.
Project Manager

Fire Flow Test Data Sheet

Location of Test (Street and Cross Street): Ormsby Blvd. and W. Washington St.

Address Nearest Residual Hydrant: 1600 W. Washington

Test Date: 8/17/2016 Test Time: 0900

Testing Personnel: KA, KJR,, LE

Pressure Zone: 4880 Main Size: 12"

Comments:

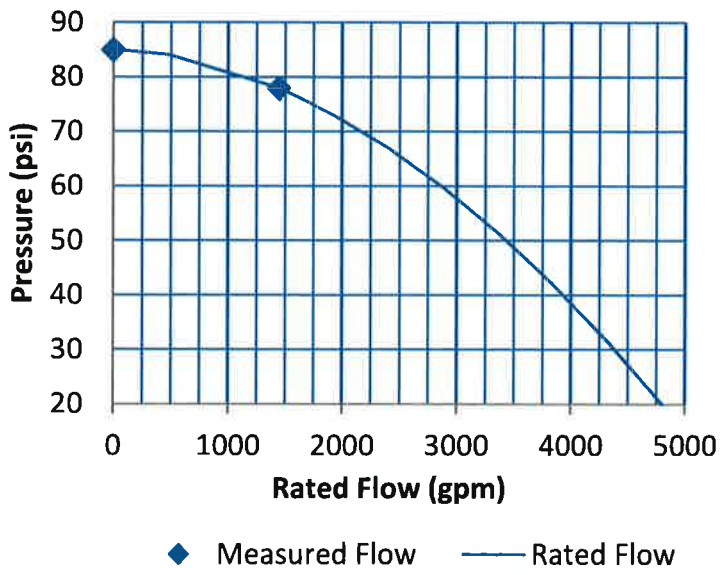
Test Results:

Residual Hydrant	
Static:	85 psi
Residual:	78 psi
Pressure Drop:	7 psi
	8 %

	Flow Hydrant(s)				
	Hydrant Tester	Pitot Pressure (psi)	Discharge Diameter (in)	Outlet Coeff. (c)	Pitot Flow (gpm)
Flow 1	HM1	24	2	1.307	764
Flow 2	HM2	19	2	1.307	680
Flow 3					
				Total	1444

Area Map

Rated Flow



Rated Pressure (for Rated Capacity Calculation) 20 psi

Rated Capacity at 20 psi residual pressure. 4,800 gpm

Based on NFPA 291 - 2016 Edition and APWA Manual 17 - Fourth Edition

Pursuant to NFPA 291, fire flow test data over five years old should not be used.

Hydrant OBJECTID: 2184 FD Runbook Page: 108X00

Data Sheet File Name: Ormsby-Washington.pdf

Fire Flow Test Data Sheet

Location of Test (Street and Cross Street): Mountain St. and Fleischmann St.

Address Nearest Residual Hydrant: 1319 Mountain St.

Test Date: 8/17/2016 Test Time: 0925

Testing Personnel: KA, KJR, LE

Pressure Zone: 4880 Main Size: 8"

Comments:

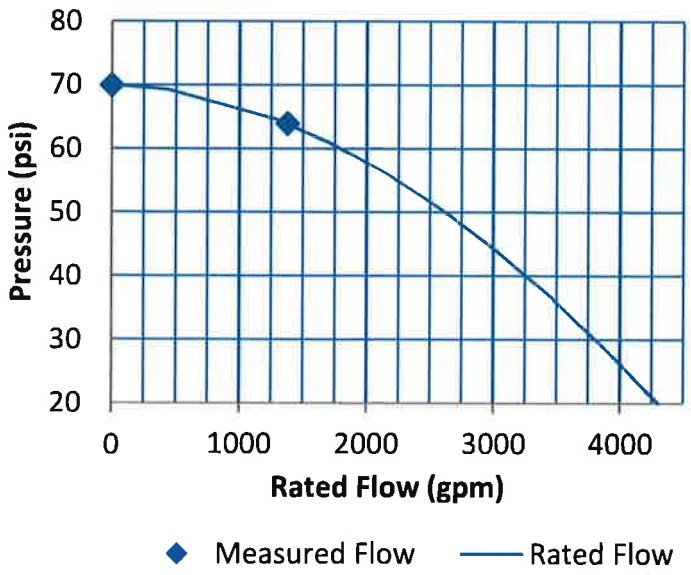
Test Results:

Residual Hydrant	
Static:	70 psi
Residual:	64 psi
Pressure Drop:	6 psi
	9 %

Flow Hydrant(s)	Hydrant Tester	Pitot Pressure (psi)	Discharge Diameter (in)	Outlet Coeff. (c)	Pitot Flow (gpm)
Flow 1	HM1	20	2	1.307	698
Flow 2	HM2	19	2	1.307	680
Flow 3					
				Total	1378

Area Map

Rated Flow



Rated Pressure (for Rated Capacity Calculation) 20 psi

Rated Capacity at 20 psi residual pressure. 4,300 gpm

Based on NFPA 291 - 2016 Edition and APWA Manual 17 - Fourth Edition

Pursuant to NFPA 291, fire flow test data over five years old should not be used.

Hydrant OBJECTID: 3262 FD Runbook Page: 109X00

Data Sheet File Name: Mountain-Fleischmann.pdf

Worksheet for Mountain Street Existing

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.00807	ft/ft
Normal Depth	0.10	ft
Diameter	0.67	ft

Results

Discharge	0.07	ft^3/s
Flow Area	0.03	ft^2
Wetted Perimeter	0.53	ft
Hydraulic Radius	0.06	ft
Top Width	0.48	ft
Critical Depth	0.12	ft
Percent Full	15.0	%
Critical Slope	0.00400	ft/ft
Velocity	2.09	ft/s
Velocity Head	0.07	ft
Specific Energy	0.17	ft
Froude Number	1.40	
Maximum Discharge	1.52	ft^3/s
Discharge Full	1.41	ft^3/s
Slope Full	0.00002	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	14.99	%
Downstream Velocity	Infinity	ft/s

Worksheet for Mountain Street Existing

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.10	ft
Critical Depth	0.12	ft
Channel Slope	0.00807	ft/ft
Critical Slope	0.00400	ft/ft

Worksheet for Mountain Street D=.75D

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.00807	ft/ft
Normal Depth	0.50	ft
Diameter	0.67	ft

Results

Discharge	1.29	ft^3/s
Flow Area	0.28	ft^2
Wetted Perimeter	1.40	ft
Hydraulic Radius	0.20	ft
Top Width	0.58	ft
Critical Depth	0.54	ft
Percent Full	75.0	%
Critical Slope	0.00695	ft/ft
Velocity	4.58	ft/s
Velocity Head	0.33	ft
Specific Energy	0.83	ft
Froude Number	1.16	
Maximum Discharge	1.52	ft^3/s
Discharge Full	1.41	ft^3/s
Slope Full	0.00670	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	74.96	%
Downstream Velocity	Infinity	ft/s

Worksheet for Mountain Street D=.75D

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.54	ft
Channel Slope	0.00807	ft/ft
Critical Slope	0.00695	ft/ft

Worksheet for N. Ormsby Existing

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00570	ft/ft
Normal Depth	0.21	ft
Diameter	0.67	ft

Results

Discharge	0.20	ft^3/s
Flow Area	0.09	ft^2
Wetted Perimeter	0.79	ft
Hydraulic Radius	0.12	ft
Top Width	0.62	ft
Critical Depth	0.20	ft
Percent Full	31.5	%
Critical Slope	0.00642	ft/ft
Velocity	2.08	ft/s
Velocity Head	0.07	ft
Specific Energy	0.28	ft
Froude Number	0.94	
Maximum Discharge	0.98	ft^3/s
Discharge Full	0.91	ft^3/s
Slope Full	0.00026	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	31.48	%
Downstream Velocity	Infinity	ft/s

Worksheet for N. Ormsby Existing

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.21	ft
Critical Depth	0.20	ft
Channel Slope	0.00570	ft/ft
Critical Slope	0.00642	ft/ft

Worksheet for N. Ormsby Blvd D=.75D

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00570	ft/ft
Normal Depth	0.51	ft
Diameter	0.67	ft

Results

Discharge	0.85	ft^3/s
Flow Area	0.29	ft^2
Wetted Perimeter	1.42	ft
Hydraulic Radius	0.20	ft
Top Width	0.57	ft
Critical Depth	0.44	ft
Percent Full	76.5	%
Critical Slope	0.00846	ft/ft
Velocity	2.97	ft/s
Velocity Head	0.14	ft
Specific Energy	0.65	ft
Froude Number	0.74	
Maximum Discharge	0.98	ft^3/s
Discharge Full	0.91	ft^3/s
Slope Full	0.00495	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	76.46	%
Downstream Velocity	Infinity	ft/s

Worksheet for N. Ormsby Blvd D=.75D

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.51	ft
Critical Depth	0.44	ft
Channel Slope	0.00570	ft/ft
Critical Slope	0.00846	ft/ft