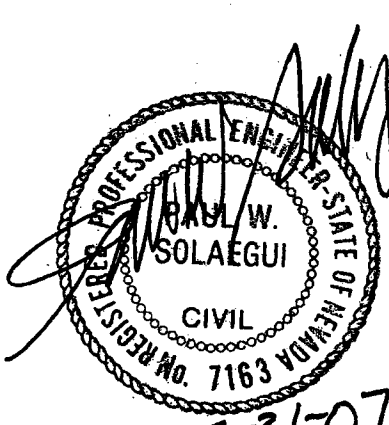
SOLAEGUI
ENGINEERS, LTD

EAST RIDGE VILLAGE

TRAFFIC ANALYSIS

MAY, 2007



5-31-07
EXP 6-30-08

Prepared by:
Solaegui Engineers, Ltd.
715 H Street
Sparks, Nevada 89431
(775) 358-1004

TABLE OF CONTENTS

EAST RIDGE VILLAGE

TRAFFIC ANALYSIS

EXECUTIVE SUMMARY

The proposed East Ridge Village development will be located in Carson City, Nevada. The project site is located east of U.S. Highway 50 and north of Flint Road. The project site is primarily undeveloped land with some existing single family dwelling units and small storage buildings. The purpose of this study is to address the project's impact upon the adjacent street network. The U.S. Highway 50/project access intersection has been identified for intersection capacity analysis for the existing, existing plus project and year 2027 background plus project scenarios.

The proposed East Ridge Village development will consist of the construction of 178 multi-family dwelling units. The project is expected to generate 1,196 average daily trips with 91 trips occurring during AM peak hour and 110 trips occurring during the PM peak hour.

Traffic generated by the proposed East Ridge Village development will have some impact on the adjacent roadways. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Nevada Department of Transportation requirements.

It is recommended that the U.S. Highway 50/project access intersection be designed to operate with full turning movements and contain separate left and right turn lanes at the east approach; one left turn lane with a minimum of 465 feet of storage/deceleration length at the north approach; and an exclusive right turn lane with a minimum of 365 feet of deceleration length at the south approach.

It is recommended that the project's interior streets and driveways be constructed per Carson City standards.

INTRODUCTION

STUDY AREA

The proposed East Ridge Village development will be located in Carson City, Nevada. The project site is located east of U.S. Highway 50 and north of Flint Road. The location of the site is shown in Figure 1. The purpose of this study is to address the project's impact upon the adjacent street network. The U.S. Highway 50/project access intersection has been identified for intersection capacity analysis for the existing, existing plus project and year 2027 background plus project scenarios.

EXISTING AND PROPOSED LAND USES

The project site is currently undeveloped land with some existing single family dwelling units and small storage buildings. It is anticipated that project developers will remove these building with construction of the project. Adjacent development includes commercial development and undeveloped land to the north and undeveloped land to the east, west and south. The development will consist of the construction of 178 multi-family dwelling units.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

U.S. Highway 50 is a five-lane roadway with two lanes in each direction and a continuous center two-way left turn lane in the vicinity of the project site. The speed limit is posted for 55 miles per hour. Roadway improvements include paved travel lanes with graded shoulders.

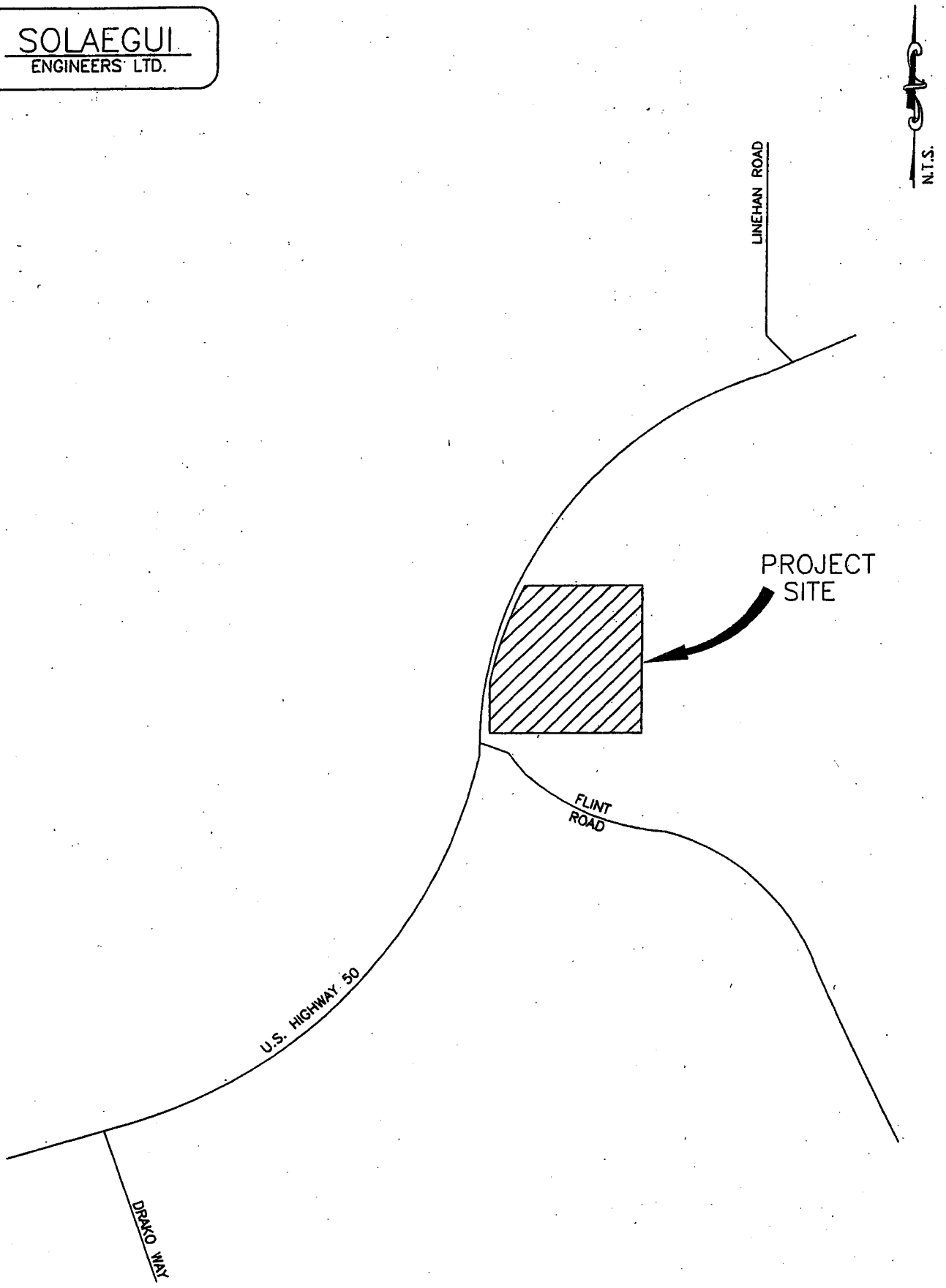
Project access will be provided from one proposed project access on U.S. Highway 50. The U.S. Highway 50/project access intersection does not currently exist but is anticipated to be an unsignalized "T" intersection with stop sign control at the east approach.

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed development on the key intersections, trip generation rates and peak hours had to be determined. Trip generation rates were based upon information taken from the Seventh Edition of *ITE Trip Generation* (2003) for Land Use 220: Apartments and Land Use 230: Residential Condominium/Townhouse.

Trips generated by the project were calculated for the peak hours between 7:00 and 9:00 AM and 4:00 and 6:00 PM, which correspond to the peak hours of adjacent street traffic. The trip generation worksheet is included in the appendix. Table 1 shows a summary of the average daily traffic (ADT) volumes and peak hour volumes generated by the project.

SOLAEGUI
ENGINEERS LTD.



EAST RIDGE VILLAGE
VICINITY MAP

TABLE 1
TRIP GENERATION

LAND USE	ADT	AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL
Apartments							
178 Dwelling Units	1,196	18	73	91	71	39	110
Residential Condominium/Townhouse							
178 Dwelling Units	1,043	12	66	78	62	30	92
RECOMMENDED VALUES	1,196	18	73	91	71	39	110

As shown in Table 1, the apartment land use generates the highest traffic volumes and therefore the trips generated by the apartment land use were used in the analysis in order to ensure conservative results.

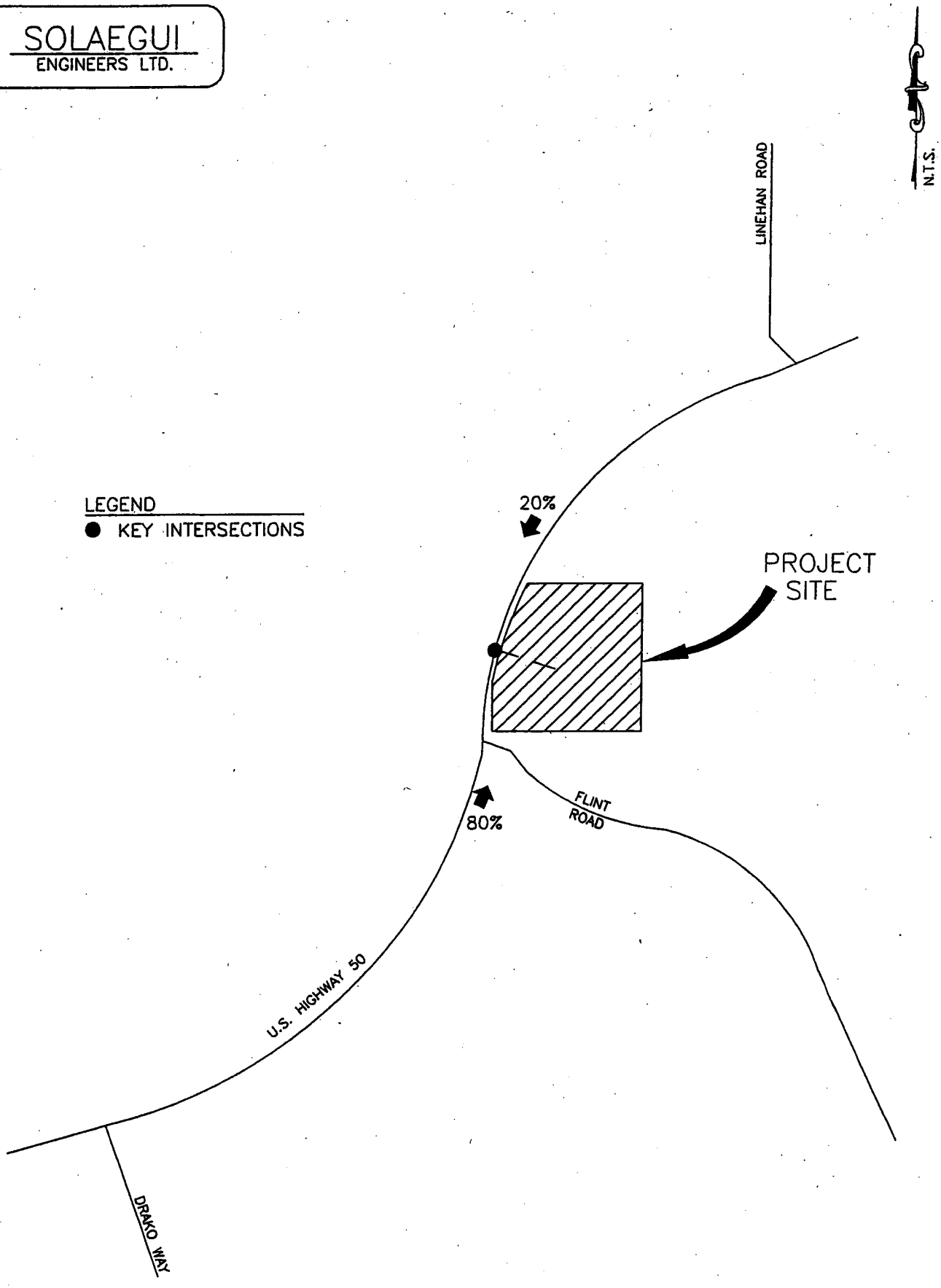
TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key intersections was based upon existing peak hour traffic patterns and the locations of attractions and productions in the area. The directions of approach are shown in Figure 2. Figure 3 shows the AM and PM peak hour project trip assignment based upon the directions of approach presented in Figure 2.

EXISTING AND PROJECTED TRAFFIC VOLUMES

The existing AM and PM peak hour traffic volumes on U.S. Highway 50 adjacent to the site were obtained from traffic counts taken during May, 2007. Figure 4 shows the existing AM and PM peak hour traffic volumes at the key intersection. Figure 5 shows the existing plus project traffic volumes at the key intersection. The existing plus project traffic volumes were obtained by adding trips generated by the project to the existing traffic volumes. Figure 6 shows the 2027 background plus project AM and PM peak hour traffic volumes at the key intersection. The 2027 background plus project traffic volumes were obtained by adding trips generated by the project to 2027 background traffic volumes. The 2027 background traffic volumes were obtained by applying an 8% AM peak hour factor and 10% PM peak hour factor to 2027 factored ADT volumes. The 2027 factored ADT volumes were estimated based on 2015 and 2025 ADT volumes obtained directly from the Carson City traffic forecasting model.

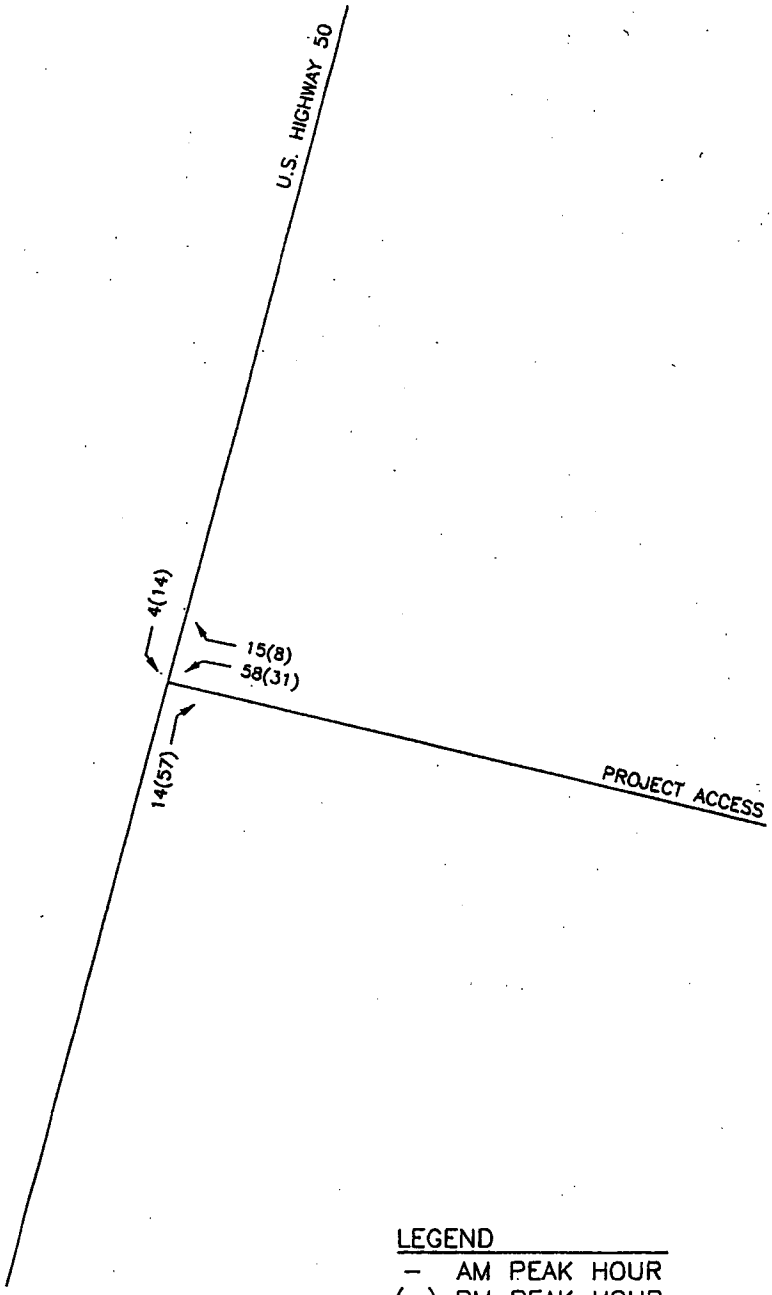
SOLAEGUI
ENGINEERS LTD.



EAST RIDGE VILLAGE
DIRECTIONS OF APPROACH

SOLAEGUI
ENGINEERS LTD.

N.T.S.



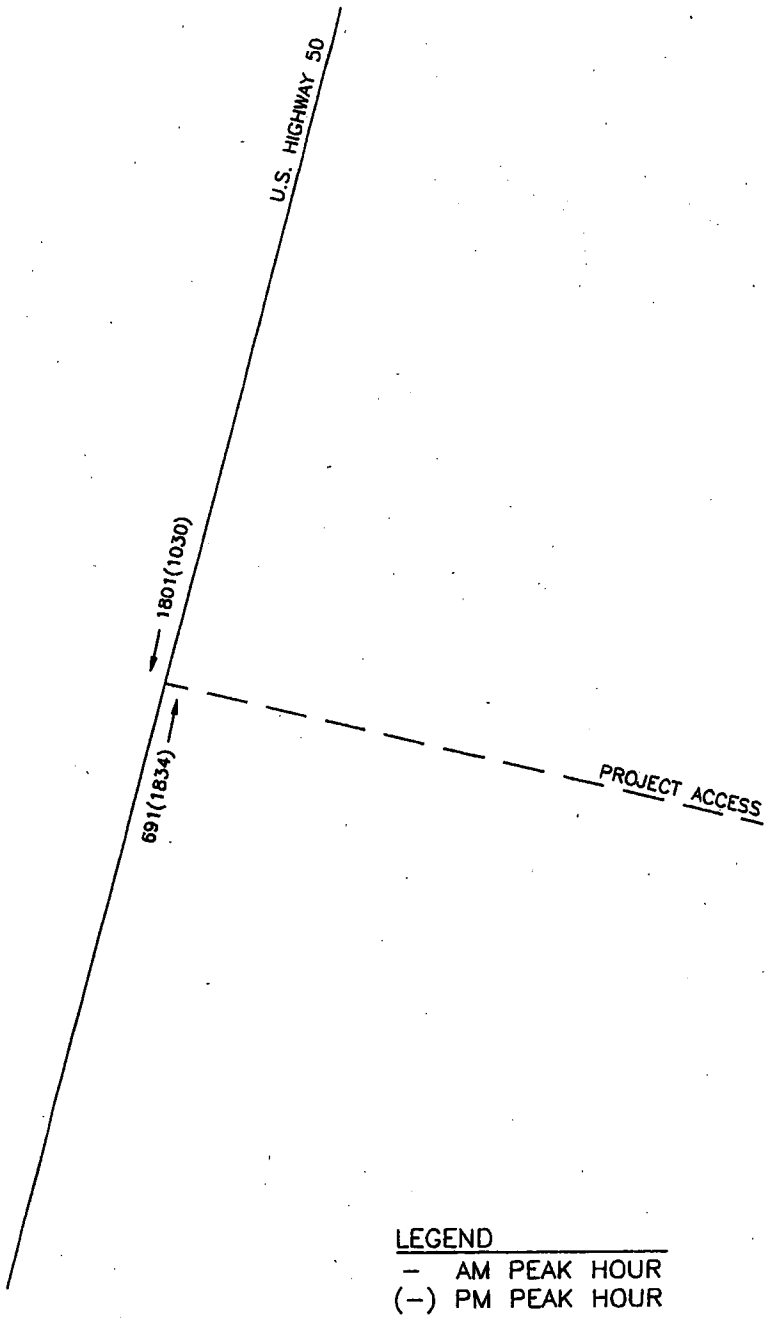
LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE

PEAK HOUR PROJECT TRIP ASSIGNMENT

SOLAEGUI
ENGINEERS LTD.

N.T.S.

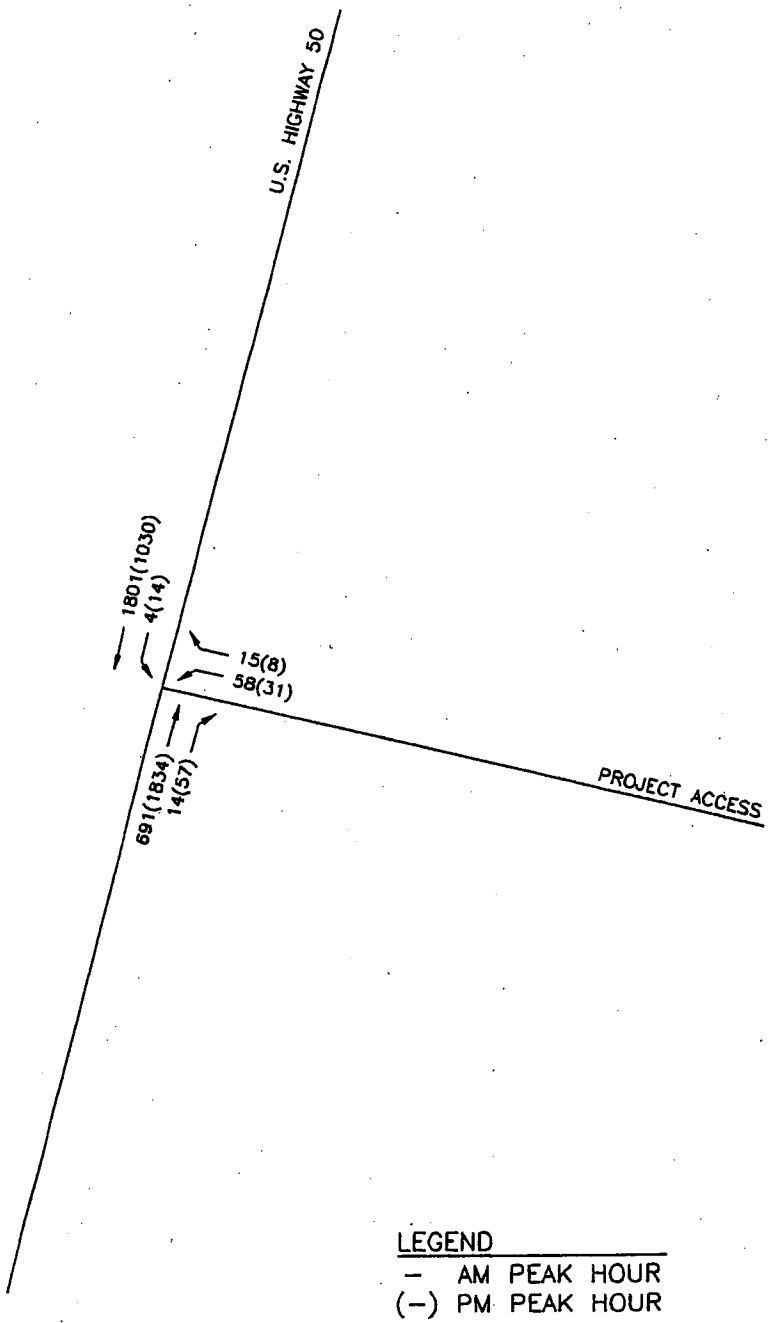


LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE
EXISTING PEAK HOUR TRAFFIC VOLUMES

SOLAEGUI
ENGINEERS LTD.

N.T.S.



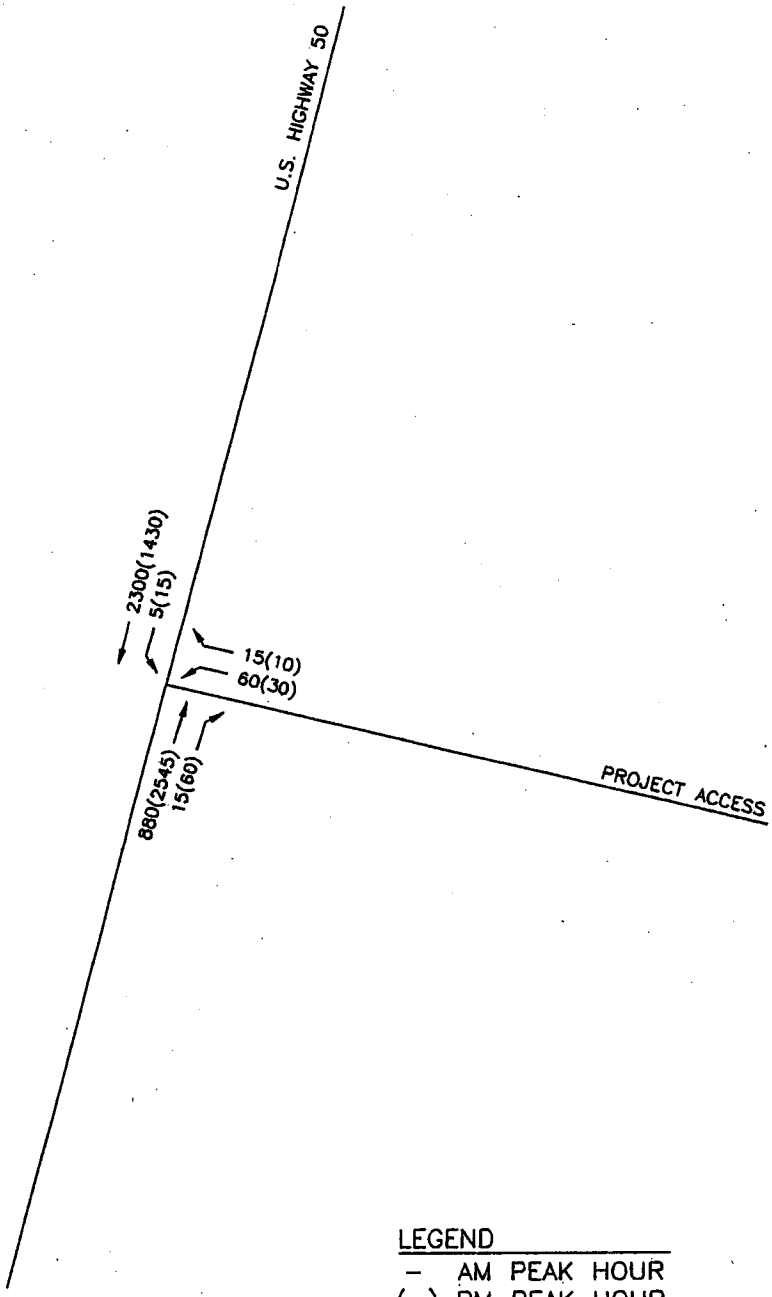
LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE

EXISTING PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES

SOLAEGUI
ENGINEERS LTD.

N.T.S.



LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE

2027 BACK. + PROJECT PEAK HOUR TRAFFIC VOLUMES

FIGURE 3

INTERSECTION CAPACITY ANALYSIS

The U.S. Highway 50/project access intersection was analyzed for capacity based upon procedures presented in the *Highway Capacity Manual* (2000), prepared by the Transportation Research Board, for unsignalized intersections.

The result of capacity analysis is a level of service (LOS) rating for each unsignalized intersection minor movement. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the unsignalized intersection minor movement.

The *Highway Capacity Manual* defines "level of service" for stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the intersection as a whole. The unsignalized intersection level of service (LOS) criteria is shown in Table 2.

TABLE 2
LOS CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

A summary of "level of service" (LOS) operation for the key intersections in this study is shown in Table 3.

TABLE 3
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS

INTERSECTION	EXISTING AM	EXISTING PM	EXIST. + PROJECT AM	EXIST. + PROJECT PM	2027 BACK. + PROJECT AM	2027 BACK. + PROJECT PM
U.S. 50/Project Access Unsignalized						
SB Left	N/A	N/A	A9.2	C18.2	B10.0	D32.9
WB Left/Right	N/A	N/A	D26.7	F72.5	E42.6	F332.7

U.S. Highway 50/Project Access

The U.S. 50/project access intersection was analyzed as an unsignalized "T" intersection with stop sign control at the east approach for the existing plus project and 2027 traffic volumes. The intersection critical movements are anticipated to operate at level of service D or better during the AM peak hour and level of service F or better during the PM peak hour for the existing plus project traffic volumes. For the 2027 background plus project traffic volumes, the intersection critical movements are anticipated to operate at level of service E or better during the AM peak hour and level of service F or better during the PM peak hour. The intersection was analyzed with one left turn lane and two through lanes at the north approach; one through lane and one shared through-right turn lane at the south approach; and one shared left turn-right turn at the east approach for all scenarios.

Peak hour traffic signal warrant #3 per Figure 4C-4 of the *Manual on Uniform Traffic Control Devices, 2003 Edition* (MUTCD) was subsequently reviewed at the U.S. Highway 50/project access intersection for the existing plus project traffic volumes. The results of the warrant review indicate that the peak hour signal warrant is not met for the existing plus project traffic volumes based on the total minor street approach volume. However, it is anticipated that the peak hour signal warrant will be met with the construction of future commercial development adjacent to the project site. The spacing of the U.S. Highway 50/project access intersection with the adjacent signalized intersections meets Nevada Department of Transportation spacing requirements for signalized intersections.

SITE PLAN REVIEW

A copy of the site plan for the proposed East Ridge Village development is included in this submittal. The site plan indicates that project access will be provided from one proposed project access on U.S. Highway 50. The project access and the interior roadways are anticipated to provide adequate site circulation.

The project access on U.S. Highway 50 was subsequently reviewed for spacing based on NDOT's Access Management System and Standards, July 1999. The access management standards indicate that corner clearance for unsignalized intersections shall be a minimum of 600 feet for a speed of 55 miles per hour on U.S. Highway 50. The proposed project access on U.S. Highway 50 will be located ±940 feet north of Flint Drive and ±840 feet south of an existing driveway serving a commercial development on the east side of U.S. Highway 50. In addition, a driveway serving three single family dwelling units and small storage areas exists on the east side of U.S. Highway 50 approximately 150 feet south of the proposed project access. However, it is anticipated that this existing driveway will be removed with construction of the project. The proposed project access will therefore meet NDOT spacing requirements.

The need for a northbound right turn lane on U.S. Highway 50 at the proposed project access was reviewed based on NDOT's access management standards. The access management standards indicate that right turn lanes are required on roadways with speeds of 55 miles per hour at accesses that serve more 500 ADT.

An exclusive northbound to eastbound right turn lane with a minimum of 365 feet of deceleration length is required at the U.S. Highway 50/project access intersection based on the 55 mile per hour speed on U.S. Highway 50.

Left turn storage and deceleration requirements were reviewed for the southbound left turn movements at the U.S. Highway 50/project access intersection. Approximately 25 feet of storage length is needed at the north approach of the U.S. Highway 50/project access intersection based on the NDOT criteria of providing 3 minutes of storage for left turning vehicles. However, a minimum of 100 feet of storage length should be provided. In addition, a minimum of 365 feet of deceleration length shall be provided based on the 55 mile per hour speed on U.S. Highway 50. Currently, the north approach contains center two-way left turn lane which will serve project traffic demands.

RECOMMENDATIONS

Traffic generated by the proposed Eastridge Residential development will have some impact on the adjacent roadways. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Nevada Department of Transportation requirements.

It is recommended that the U.S. Highway 50/project access intersection be designed to operate with full turning movements and contain separate left and right turn lanes at the east approach; one left turn lane with a minimum of 465 feet of storage/deceleration length at the north approach; and an exclusive right turn lane with a minimum of 365 feet of deceleration length at the south approach.

It is recommended that the project's interior streets and driveways be constructed per Carson City standards.

APPENDIX

EASTRIDGE RESIDENTIAL DEVELOPMENT
Summary of Average Vehicle Trip Generation
For 178 Dwelling Units of Apartments
May 21, 2007

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	1196	18	73	71	39

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	1137	0	0
Sunday	1043	0	0

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 7th Edition, 2003.

TRIP GENERATION BY MICROTRANS

EASTRIDGE RESIDENTIAL DEVELOPMENT
Summary of Average Vehicle Trip Generation
For 178 Dwelling Units of Residential Condominium / Townhouse
May 21, 2007

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	1043	12	66	62	30

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	1009	45	39
Sunday	862	39	41

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 7th Edition, 2003.

TRIP GENERATION BY MICROTRANS

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	5/22/2007
Analysis Time Period:	AM Peak Hour
Intersection:	U.S. Highway 50/Project Access
Jurisdiction:	NDOT/Carson City
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	Eastridge Residential Development
East/West Street:	Project Access
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		691	14	4	1801	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Hourly Flow Rate, HFR		727	14	4	1895	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		2	0	1	2	
Configuration		T	TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	58		15			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	61		15			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		4		76				
C(m) (vph)		862		241				
v/c		0.00		0.32				
95% queue length		0.01		1.30				
Control Delay		9.2		26.7				
LOS		A		D				
Approach Delay				26.7				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 5/22/2007
Analysis Time Period: PM Peak Hour
Intersection: U.S. Highway 50/Project Access
Jurisdiction: NDOT/Carson City
Units: U. S. Customary
Analysis Year: Existing + Project
Project ID: Eastridge Residential Development
East/West Street: Project Access
North/South Street: U.S. Highway 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1834	57	14	1030	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Hourly Flow Rate, HFR		1930	60	14	1084	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		2	0	1	2	
Configuration		T	TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	31		8			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	32		8			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		14		40				
C(m) (vph)		286		91				
v/c		0.05		0.44				
95% queue length		0.15		1.83				
Control Delay		18.2		72.5				
LOS		C		F				
Approach Delay				72.5				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	5/22/2007
Analysis Time Period:	AM Peak Hour
Intersection:	U.S. Highway 50/Project Access
Jurisdiction:	NDOT/Carson City
Units: U. S. Customary	
Analysis Year:	2027 Background + Project
Project ID:	Eastridge Residential Development
East/West Street:	Project Access
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		880	15	5	2300	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Hourly Flow Rate, HFR		926	15	5	2421	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		2 0		1	2	
Configuration		T TR		L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	60		15			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	63		15			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		5		78				
C(m) (vph)		724		171				
v/c		0.01		0.46				
95% queue length		0.02		2.13				
Control Delay		10.0+		42.6				
LOS		B		E				
Approach Delay				42.6				
Approach LOS				E				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	5/22/2007
Analysis Time Period:	PM Peak Hour
Intersection:	U.S. Highway 50/Project Access
Jurisdiction:	NDOT/Carson City
Units: U. S. Customary	
Analysis Year:	2027 Background + Project
Project ID:	Eastridge Residential Development
East/West Street:	Project Access
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		2545	60	15	1430	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Hourly Flow Rate, HFR		2678	63	15	1505	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		2	0	1	2	
Configuration		T	TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	30		10			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	31		10			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

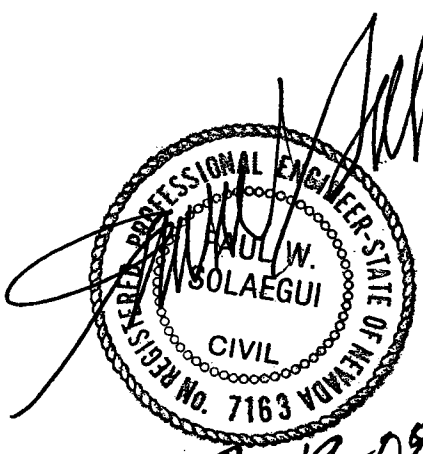
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		15		41				
C(m) (vph)		144		38				
v/c		0.10		1.08				
95% queue length		0.34		4.11				
Control Delay		32.9		332.7				
LOS		D		F				
Approach Delay				332.7				
Approach LOS				F				

SOLAEGUI
ENGINEERS, LTD

EAST RIDGE VILLAGE

TRAFFIC ANALYSIS

FEBRUARY, 2008



2-19-08
EXP 6-30-08

Prepared by:
Solaegui Engineers, Ltd.
715 H Street
Sparks, Nevada 89431
(775) 358-1004

TABLE OF CONTENTS

EAST RIDGE VILLAGE

TRAFFIC ANALYSIS

EXECUTIVE SUMMARY

The proposed East Ridge Village development will be located in Carson City, Nevada. The project site is located east of U.S. Highway 50 and north of Flint Road. The project site is primarily undeveloped land with some existing single family dwelling units and small storage buildings. The purpose of this study is to address the project's impact upon the adjacent street network. The U.S. Highway 50/Flint Road intersection and the project accesses have been identified for intersection capacity analysis for the existing, existing plus project and year 2028 background plus project scenarios.

The proposed East Ridge Village development will consist of the construction of 113 town homes and 96 apartment units. The project is expected to generate 1,307 average daily trips with 99 trips occurring during AM peak hour and 118 trips occurring during the PM peak hour.

Traffic generated by the proposed East Ridge Village development will have some impact on the adjacent roadways. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Nevada Department of Transportation and Carson City requirements.

It is recommended that a traffic signal be constructed at the U.S. Highway 50/Flint Road intersection when warranted.

It is recommended that the U.S. Highway 50/Village Drive intersection be designed to operate with right-in/right-out movements only and contain single ingress and egress lanes at the east approach; and an exclusive right turn lane with a minimum of 365 feet of deceleration length at the south approach.

It is recommended that the Flint Road/East Ridge Drive intersection be designed to operate with full turning movements and contain single ingress and egress lanes at all approaches and stop sign control at the East Ridge Drive approach.

It is recommended that the project's interior streets and accesses be constructed per Carson City standards.

INTRODUCTION

STUDY AREA

The proposed East Ridge Village development will be located in Carson City, Nevada. The project site is located east of U.S. Highway 50 and north of Flint Road. The location of the site is shown in Figure 1. The purpose of this study is to address the project's impact upon the adjacent street network. The U.S. Highway 50/Flint Road intersection and the project accesses have been identified for intersection capacity analysis for the existing, existing plus project and year 2028 background plus project scenarios.

EXISTING AND PROPOSED LAND USES

The project site is currently undeveloped land with some existing single family dwelling units and small storage buildings. It is anticipated that project developers will remove these building with construction of the project. Adjacent development includes commercial development and undeveloped land to the north and undeveloped land to the east, west and south. The development will consist of the construction of 113 town homes and 96 apartment units.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

The site plan indicates that project access will be provided from one access (Village Drive) on U.S. Highway 50 and one access (East Ridge Drive) on Flint Road.

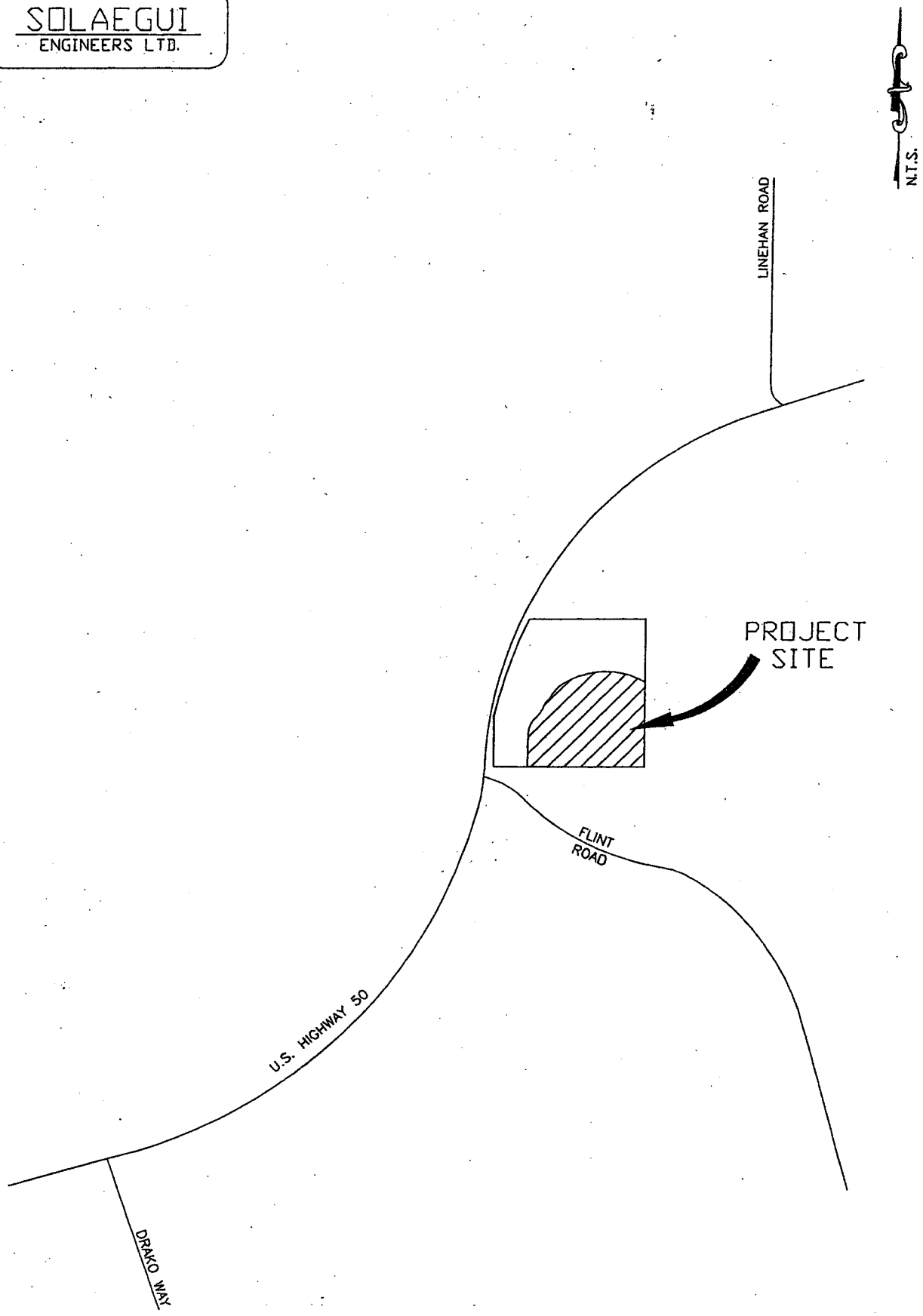
U.S. Highway 50 is a five-lane roadway with two lanes in each direction and a continuous center two-way left turn lane in the vicinity of the project site. The speed limit is posted for 55 miles per hour. Roadway improvements include paved travel lanes with graded shoulders.

Flint Road is a two-lane roadway with one lane in each direction east of U.S. Highway 50. Roadway improvements include paved travel lanes with graded shoulders.

The U.S. Highway 50/Flint Road intersection is an unsignalized "High T" intersection with stop sign control at the east approach. The north approach contains one left turn lane and two through lanes. The south approach contains two through lanes and one right turn lane. The east approach contains one shared left turn-right turn lane. An acceleration lane is provided for the westbound to southbound left turn movement.

The U.S. Highway 50/Village Drive intersection does not currently exist but is anticipated to be an unsignalized "T" intersection with stop sign control at the east approach. This intersection is anticipated to operate with limited right-in/right-out movements only.

SOLAEGUI
ENGINEERS LTD.



EAST RIDGE VILLAGE
VICINITY MAP
FIGURE 1

The Flint Road/East Ridge Drive intersection does not currently exist but is anticipated to be an unsignalized "T" intersection with stop sign control at the north approach. This intersection is anticipated to operate with full turning movements.

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed development on the key intersections, trip generation rates and peak hours had to be determined. Trip generation rates were based upon information taken from the Seventh Edition of *ITE Trip Generation* (2003) for Land Use 220: Apartments and Land Use 230: Residential Condominium/Townhouse.

Trips generated by the project were calculated for the peak hours between 7:00 and 9:00 AM and 4:00 and 6:00 PM, which correspond to the peak hours of adjacent street traffic. The trip generation Worksheets are included in the appendix. Table 1 shows a summary of the average daily traffic (ADT) volumes and peak hour volumes generated by the project.

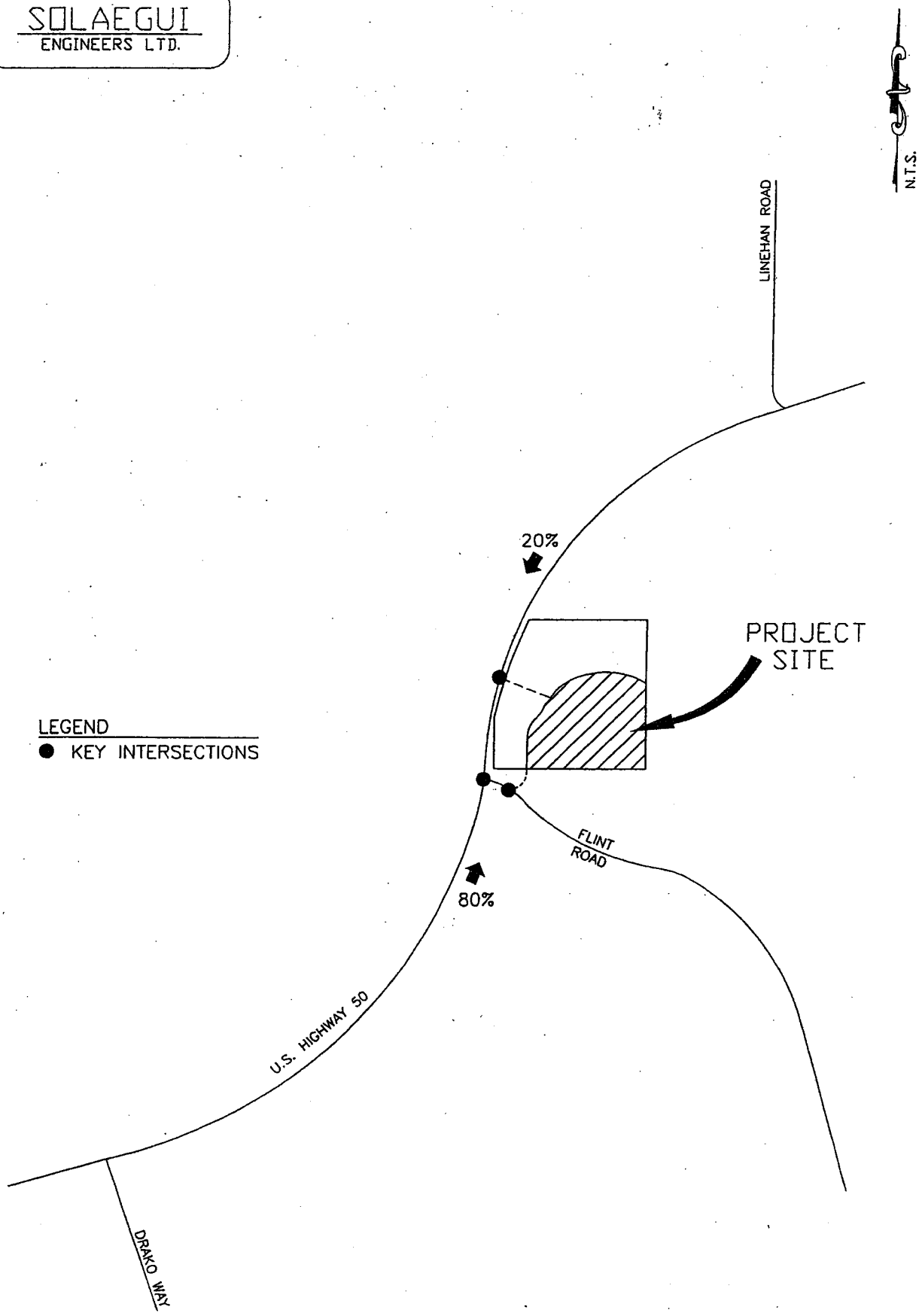
TABLE 1
TRIP GENERATION

		AM PEAK HOUR			PM PEAK HOUR		
LAND USE	ADT	IN	OUT	TOTAL	IN	OUT	TOTAL
Residential Condominium/Townhouse							
113 Dwelling Units	662	8	42	50	40	19	59
Apartments							
96 Dwelling Units	645	10	39	49	38	21	59
TOTAL	1,307	18	81	99	78	40	118

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key intersections was based upon existing peak hour traffic patterns and the locations of attractions and productions in the area. The directions of approach are shown in Figure 2. Figure 3 shows the AM and PM peak hour project trip assignment based upon the directions of approach presented in Figure 2.

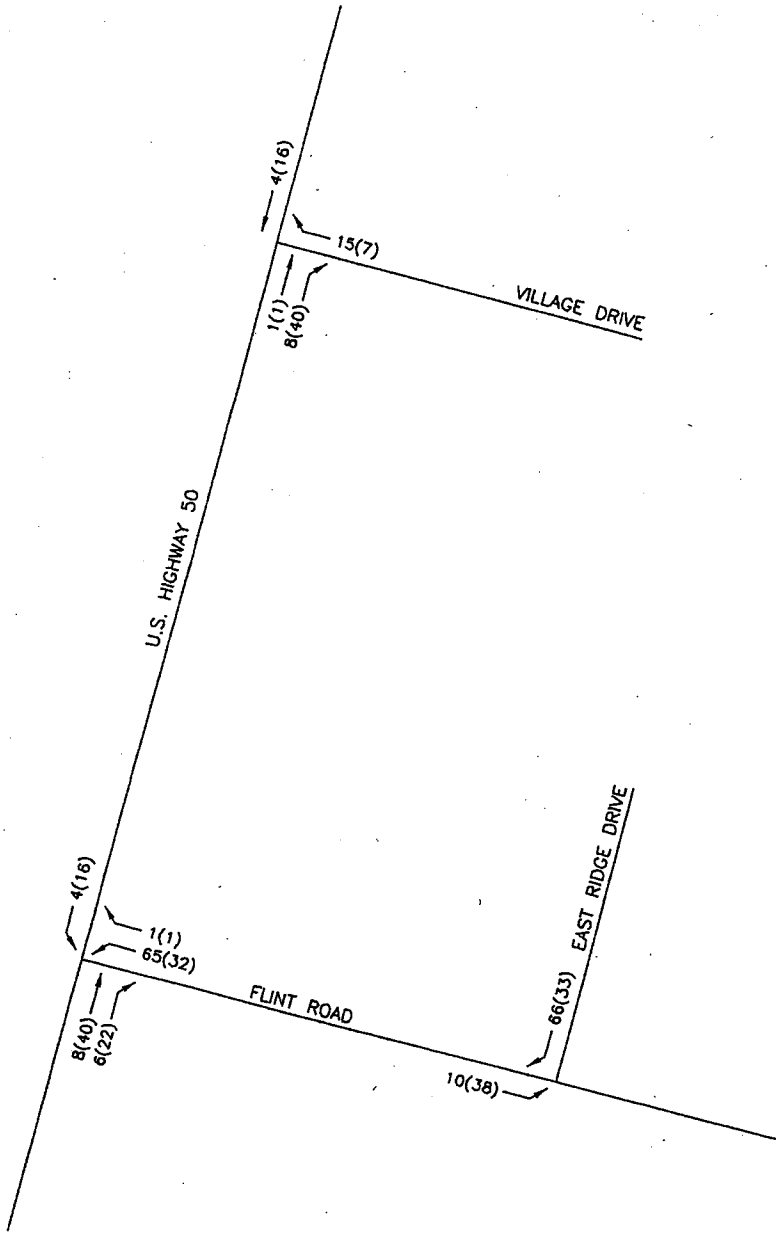
SOLAEGUI
ENGINEERS LTD.



EAST RIDGE VILLAGE
DIRECTIONS OF APPROACH
FIGURE 2

SOLAEGUI
ENGINEERS LTD.

N.T.S.



LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE
PEAK HOUR PROJECT TRIP ASSIGNMENT
FIGURE 3

EXISTING AND PROJECTED TRAFFIC VOLUMES

The existing AM and PM peak hour traffic volumes at the U.S. Highway 50/Flint Road intersection were obtained from traffic counts taken during May, 2007. Figure 4 shows the existing AM and PM peak hour traffic volumes at the key intersections. Figure 5 shows the existing plus project traffic volumes at the key intersections. The existing plus project traffic volumes were obtained by adding trips generated by the project to the existing traffic volumes. Figure 6 shows the 2028 background plus project AM and PM peak hour traffic volumes at the key intersection. The 2028 background plus project traffic volumes were obtained by adding trips generated by the project to 2028 background traffic volumes. The 2028 background traffic volumes were obtained by applying an 8% AM peak hour factor and 10% PM peak hour factor to 2028 factored ADT volumes. The 2028 factored ADT volumes were estimated based on 2015 and 2025 ADT volumes obtained directly from the Carson City traffic forecasting model.

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual* (2000), prepared by the Transportation Research Board, for unsignalized and signalized intersections.

The result of capacity analysis is a "level of service" (LOS) rating for each signalized intersection or unsignalized intersection minor movement. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the intersection or minor movement.

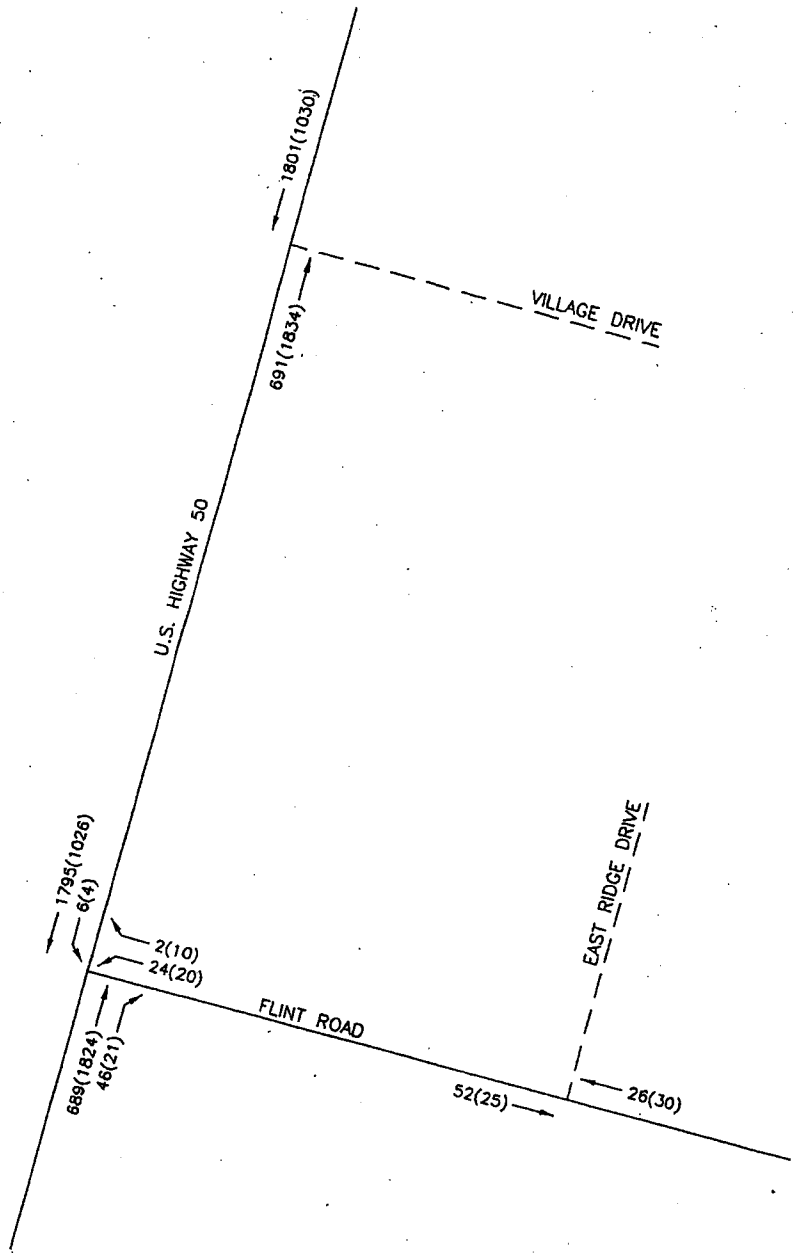
The Highway Capacity Manual defines level of service for stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the intersection as a whole. The unsignalized intersection level of service (LOS) criteria is shown in Table 2.

TABLE 2
LOS CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

SOLAEGUI
ENGINEERS LTD.

N.T.S.

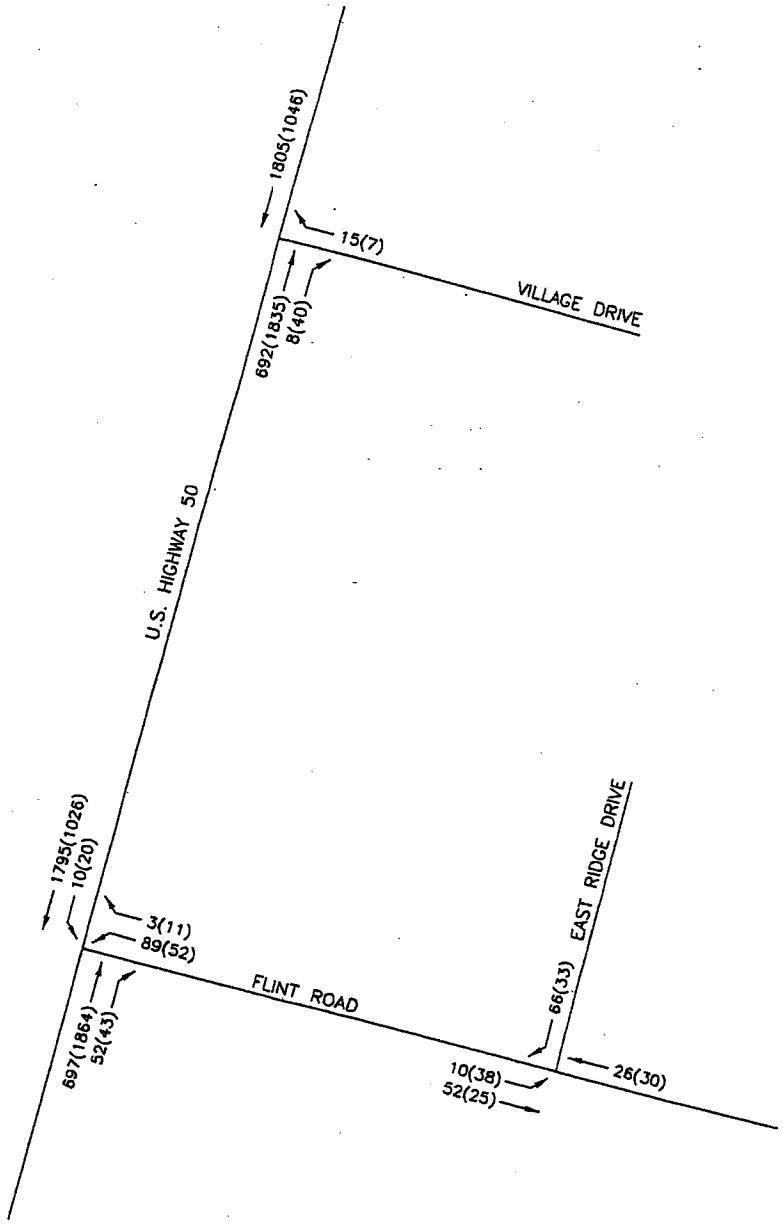


LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE
EXISTING PEAK HOUR TRAFFIC VOLUMES
FIGURE 4

SOLAEGUI
ENGINEERS LTD.

N.T.S.

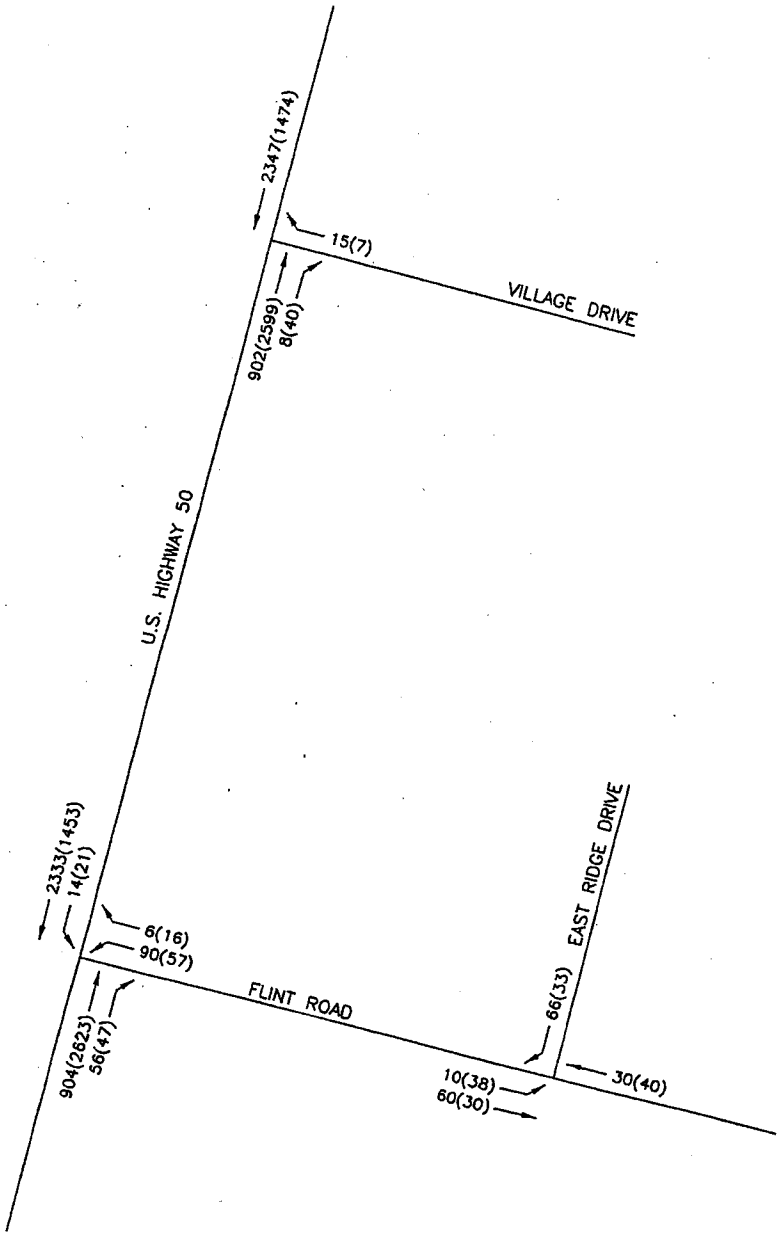


LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE
EXISTING PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES
FIGURE 5

SOLAEGUI
ENGINEERS LTD.

N.T.S.



LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

EAST RIDGE VILLAGE
YEAR 2028 BACKGROUND+PROJECT PEAK HOUR TRAFFIC
FIGURE 6

The "level of service" for signalized intersections is stated in terms of the average control delay per vehicle for a peak 15 minute analysis period. The signalized intersection level of service (LOS) criteria is shown in Table 3.

TABLE 3
LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

A summary of the level of service (LOS) operation for the key intersections in this analysis is shown in Table 4.

TABLE 4
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS

	EXISTING		EXIST. + PROJECT		2028 BACK. + PROJECT	
INTERSECTION	AM	PM	AM	PM	AM	PM
U.S. 50/Flint Road						
Unsignalized						
SB Left	A9.3	C17.1	A9.4	C18.7	B10.3	E36.2
WB Left/Right	B14.8	F59.4	C17.8	F193.4	C24.8	F1557
Signalized	N/A	N/A	A8.3	A8.2	B16.9	C25.1
U.S. 50/Village Drive						
Unsignalized						
WB Right	N/A	N/A	B10.9	C20.0	B11.9	D33.8
Flint Road/East Ridge Drive						
Unsignalized						
EB Left/Thru	N/A	N/A	A7.3	A7.3	A7.3	A7.4
SB Left/Right	N/A	N/A	A8.7	A8.6	A8.7	A8.6

U.S. Highway 50/Flint Road

The U.S. Highway 50/Flint Road intersection was analyzed as an unsignalized "High T" intersection with stop sign control at the east approach for the existing, existing plus project and year 2028 background plus project traffic volumes. The intersection critical movements currently operate at level of service C or better with the exception of the westbound left/right turn movement which operates at level of service F during the PM peak hour. With the addition of project traffic, the intersection critical movements are anticipated to operate at level of service C or better with the exception of the westbound left/right turn movement which operates at level of service F during the PM peak hour. For the year 2028 background plus project scenario, the intersection critical movements are anticipated to operate at level of service E or better with the exception of the westbound left/right turn movement which operates at level of service F during the PM peak hour. The intersection was analyzed with the existing approach lanes for all scenarios.

Peak hour traffic signal warrant #3 per Figure 4C-4 of the *Manual on Uniform Traffic Control Devices, 2003 Edition* (MUTCD) was subsequently reviewed at the U.S. Highway 50/Flint Road intersection. The peak hour warrant is met for the existing plus project traffic volumes. The U.S. Highway 50/Flint Road intersection was subsequently analyzed for capacity as a signalized intersection and will operate at level of service A for the existing plus project scenario and level of service C or better for the year 2028 background plus project scenario. The signalized intersection was analyzed with the existing approach lanes for all scenarios.

U.S. Highway 50/Village Drive

The U.S. Highway 50/Village Drive intersection was analyzed as an unsignalized "T" intersection with right-in/right-out movements only for the existing plus project and year 2028 background plus project traffic volumes. For the existing plus project scenario, the westbound right turn movement is anticipated to operate at level of service C or better during the AM and PM peak hours. For the year 2028 background plus project scenario, the westbound right turn movement is anticipated to operate at level of service D or better during the AM and PM peak hours. The intersection was analyzed with two through lanes at the north approach; one through lane and one shared through-right turn lane at the south approach; and one right turn at the east approach for all scenarios.

Flint Road/East Ridge Drive

The Flint Road/East Ridge Drive intersection was analyzed as an unsignalized "T" intersection with stop sign control at the north approach for the existing plus project and year 2028 background plus project traffic volumes. For all scenarios, the intersection critical movements are anticipated to operate at level of service A during the AM and PM peak hours. The intersection was analyzed with single lanes at the east, west and north approaches for all scenarios.

SITE PLAN REVIEW

A copy of the site plan for the proposed East Ridge Village development is included in this submittal. The site plan indicates that project access will be provided from Village Drive via U.S. Highway 50 and East Ridge Drive via Flint Road. The project accesses and the interior roadways are anticipated to provide adequate site circulation.

The project access (Village Drive) on U.S. Highway 50 was subsequently reviewed for spacing based on NDOT's Access Management System and Standards, July 1999. The access management standards indicate that corner clearance for unsignalized intersections shall be a minimum of 600 feet for a speed of 55 miles per hour on U.S. Highway 50. The proposed project access (Village Drive) on U.S. Highway 50 will be located ±940 feet north of Flint Road and ±840 feet south of an existing driveway serving a commercial development on the east side of U.S. Highway 50. In addition, a driveway serving three single family dwelling units and small storage areas exists on the east side of U.S. Highway 50 approximately 150 feet south of the proposed project access (Village Drive). However, it is anticipated that this existing driveway will be removed with construction of the project. The proposed project access (Village Drive) will therefore meet NDOT spacing requirements.

The need for a northbound right turn lane on U.S. Highway 50 at Village Drive was reviewed based on NDOT's access management standards. The access management standards indicate that right turn lanes are required on roadways with speeds of 55 miles per hour at accesses that serve more 500 ADT. An exclusive northbound to eastbound right turn lane with a minimum of 365 feet of deceleration length is required at the U.S. Highway 50/Village Drive intersection based on the 55 mile per hour speed on U.S. Highway 50.

Left turn storage and deceleration requirements were reviewed for the southbound left turn movements at the U.S. Highway 50/Flint Road intersection. Approximately 50 feet of storage length is needed at the north approach of the U.S. Highway 50/Flint Road intersection for the existing plus project and year 2028 background plus project traffic volumes based on the Poisson method for signalized intersections with a 95% confidence level and 120 second cycle length. However, a minimum of 100 feet of storage length should be provided. In addition, a minimum of 365 feet of deceleration length shall be provided based on the 55 mile per hour speed on U.S. Highway 50. Currently, the north approach contains center two-way left turn lane which will serve project traffic demands.

The need for an eastbound left turn lane on Flint Road at East Ridge Drive intersection was reviewed based on AASHTO's A Policy on Geometric Design of Highways and Streets, 2004. An exclusive left turn lane is not required for the eastbound to northbound left turn movement at the Flint Road/East Ridge Drive intersection based on the existing plus project and year 2028 background plus project traffic volumes.

RECOMMENDATIONS

Traffic generated by the proposed East Ridge Village development will have some impact on the adjacent roadways. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Nevada Department of Transportation and Carson City requirements.

It is recommended that a traffic signal be constructed at the U.S. Highway 50/Flint Road intersection when warranted.

It is recommended that the U.S. Highway 50/Village Drive intersection be designed to operate with right-in/right-out movements only and contain single ingress and egress lanes at the east approach; and an exclusive right turn lane with a minimum of 365 feet of deceleration length at the south approach.

It is recommended that the Flint Road/East Ridge Drive intersection be designed to operate with full turning movements and contain single ingress and egress lanes at all approaches and stop sign control at the East Ridge Drive approach.

It is recommended that the project's interior streets and accesses be constructed per Carson City standards.

APPENDIX

EAST RIDGE VILLAGE
Summary of Average Vehicle Trip Generation
For 113 Dwelling Units of Residential Condominium / Townhouse
February 04, 2008

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	662	8	42	40	19

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	641	28	25
Sunday	547	25	26

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 7th Edition, 2003.

TRIP GENERATION BY MICROTRANS

EAST RIDGE VILLAGE
Summary of Average Vehicle Trip Generation
For 96 Dwelling Units of Apartments
February 04, 2008

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	645	10	39	38	21

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	613	0	0
Sunday	563	0	0

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 7th Edition, 2003.

TRIP GENERATION BY MICROTRANS

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 2/5/2008
Analysis Time Period: AM Peak Hour
Intersection: U.S. Highway 50/Flint Road
Jurisdiction: NDOT
Units: U. S. Customary
Analysis Year: Existing
Project ID: Eastridge Residential Development
East/West Street: Flint Road
North/South Street: U.S. Highway 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		689	46	6		
Peak-Hour Factor, PHF		0.95	0.95	0.95		
Hourly Flow Rate, HFR		725	48	6		
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?			No			
Lanes		2	1	1		
Configuration		T	R	L		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	24		2			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	25		2			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		6		27				
C(m) (vph)		842		396				
v/c		0.01		0.07				
95% queue length		0.02		0.22				
Control Delay		9.3		14.8				
LOS		A		B				
Approach Delay				14.8				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	PM Peak Hour
Intersection:	U.S. Highway 50/Flint Road
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Existing
Project ID:	Eastridge Residential Development
East/West Street:	Flint Road
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1824	21	4		
Peak-Hour Factor, PHF		0.95	0.95	0.95		
Hourly Flow Rate, HFR		1920	22	4		
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1	1		
Configuration		T	R	L		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	20		10			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	21		10			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		4		31				
C(m) (vph)		302		96				
v/c		0.01		0.32				
95% queue length		0.04		1.24				
Control Delay		17.1		59.4				
LOS		C		F				
Approach Delay				59.4				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 2/5/2008
Analysis Time Period: AM Peak Hour
Intersection: U.S. Highway 50/Flint Road
Jurisdiction: NDOT
Units: U. S. Customary
Analysis Year: Existing + Project
Project ID: Eastridge Residential Development
East/West Street: Flint Road
North/South Street: U.S. Highway 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		697	52	10		
Peak-Hour Factor, PHF		0.95	0.95	0.95		
Hourly Flow Rate, HFR		733	54	10		
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?			No			
Lanes		2	1	1		
Configuration		T	R	L		
Upstream Signal?		No		No		

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	89		3			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	93		3			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		10		96				
C(m) (vph)		832		377				
v/c		0.01		0.25				
95% queue length		0.04		1.00				
Control Delay		9.4		17.8				
LOS		A		C				
Approach Delay				17.8				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	PM Peak Hour
Intersection:	U.S. Highway 50/Flint Road
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	Eastridge Residential Development
East/West Street:	Flint Road
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1864	43	20		
Peak-Hour Factor, PHF		0.95	0.95	0.95		
Hourly Flow Rate, HFR		1962	45	21		
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?			No			
Lanes		2	1	1		
Configuration		T	R	L		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	52		11			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	54		11			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		21		65				
C(m) (vph)		284		69				
v/c		0.07		0.94				
95% queue length		0.24		4.69				
Control Delay		18.7		193.4				
LOS		C		F				
Approach Delay				193.4				
Approach LOS				F				

HCS+: Signalized Intersections Release 5.21

Analyst: Thiva
Agency: Solaegui Engineers
Date: 2/5/2008
Period: AM Peak Hour
Project ID: Eastridge Residential Development
E/W St: Flint Road

Inter.: U.S.Highway 50/Flint Road
Area Type: All other areas
Jurisd: NDOT
Year : Existing + Project
N/S St: U.S. Highway 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	0	0	0	2	1	1	2	0
LGConfig					LR			T	R	L	T	
Volume				89		3		697	52	10	1795	
Lane Width					12.0			12.0	12.0	12.0	12.0	
RTOR Vol						1			8			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru					Thru	A			
Right					Right	A			
Peds					Peds	X			
WB Left		A			SB Left	A			
Thru					Thru	A			
Right		A			Right				
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green		15.0				65.0			
Yellow		4.0				4.0			
All Red		1.0				1.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
LR	295	1771	0.33	0.17	33.7	C	33.7	C
Northbound								
T	2562	3547	0.29	0.72	4.4	A	4.4	A
R	1114	1543	0.04	0.72	3.6	A		
Southbound								
L	487	675	0.02	0.72	3.5	A		
T	2562	3547	0.74	0.72	8.6	A	8.6	A

Intersection Delay = 8.3 (sec/veh) Intersection LOS = A

HCS+: Signalized Intersections Release 5.21

Analyst: Thiva
Agency: Solaegui Engineers
Date: 2/5/2008
Period: PM Peak Hour
Project ID: Eastridge Residential Development
E/W St: Flint Road

Inter.: U.S.Highway 50/Flint Road
Area Type: All other areas
Jurisd: NDOT
Year : Existing + Project
N/S St: U.S. Highway 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	0	0	0	2	1	1	2	0
LGConfig					LR			T	R	L	T	
Volume				52		11		1864	43	20	1026	
Lane Width					12.0			12.0	12.0	12.0	12.0	
RTOR Vol						2			6			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru	A		
Right					Right	A		
Peds					Peds	X		
WB Left		A			SB Left	A		
Thru					Thru	A		
Right		A			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		15.0				65.0		
Yellow		4.0				4.0		
All Red		1.0				1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
LR	292	1752	0.22	0.17	32.8	C	32.8	C
Northbound								
T	2562	3547	0.77	0.72	9.2	A	9.1	A
R	1114	1543	0.04	0.72	3.6	A		
Southbound								
L	83	115	0.25	0.72	5.9	A		
T	2562	3547	0.42	0.72	5.1	A	5.1	A

Intersection Delay = 8.2 (sec/veh) Intersection LOS = A

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	AM Peak Hour
Intersection:	U.S. Highway 50/Flint Road
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Year 2028 Background + Project
Project ID:	Eastridge Residential Development
East/West Street:	Flint Road
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		904	56	14		
Peak-Hour Factor, PHF		0.95	0.95	0.95		
Hourly Flow Rate, HFR		951	58	14		
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?			No			
Lanes		2	1	1		
Configuration		T	R	L		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	90		6			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	94		6			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		14		100				
C(m) (vph)		687		280				
v/c		0.02		0.36				
95% queue length		0.06		1.56				
Control Delay		10.3		24.8				
LOS		B		C				
Approach Delay				24.8				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 2/5/2008
Analysis Time Period: PM Peak Hour
Intersection: U.S. Highway 50/Flint Road
Jurisdiction: NDOT
Units: U. S. Customary
Analysis Year: Year 2028 Background + Project
Project ID: Eastridge Residential Development
East/West Street: Flint Road
North/South Street: U.S. Highway 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		2623	47	21		
Peak-Hour Factor, PHF		0.95	0.95	0.95		
Hourly Flow Rate, HFR		2761	49	22		
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?			No			
Lanes		2	1	1		
Configuration		T	R	L		
Upstream Signal?		No		No		

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	57		16			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	60		16			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		22		76				
C(m) (vph)		137		21				
v/c		0.16		3.62				
95% queue length		0.55		9.79				
Control Delay		36.2		1557				
LOS		E		F				
Approach Delay				1557				
Approach LOS				F				

HCS+: Signalized Intersections Release 5.21

Analyst: Thiva
Agency: Solaegui Engineers
Date: 2/5/2008
Period: AM Peak Hour
Project ID: Eastridge Residential Development
E/W St: Flint Road

Inter.: U.S.Highway 50/Flint Road
Area Type: All other areas
Jurisd: NDOT
Year : Year 2028 Background + Project
N/S St: U.S. Highway 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	0	0	0	2	1	1	2	0
LGConfig					LR			T	R	L	T	
Volume				90		6		904	56	14	2333	
Lane Width					12.0			12.0	12.0	12.0	12.0	
RTOR Vol						1			8			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru	A		
Right					Right	A		
Peds					Peds	X		
WB Left		A			SB Left	A		
Thru					Thru	A		
Right		A			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		15.0				65.0		
Yellow		4.0				4.0		
All Red		1.0				1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
LR	294	1766	0.34	0.17	33.8	C	33.8	C
Northbound								
T	2562	3547	0.37	0.72	4.8	A	4.8	A
R	1114	1543	0.05	0.72	3.6	A		
Southbound								
L	376	521	0.04	0.72	3.6	A		
T	2562	3547	0.96	0.72	21.2	C	21.1	C

Intersection Delay = 16.9 (sec/veh) Intersection LOS = B

HCS+: Signalized Intersections Release 5.21

Analyst: Thiva
Agency: Solaegui Engineers
Date: 2/5/2008
Period: PM Peak Hour
Project ID: Eastridge Residential Development
E/W St: Flint Road

Inter.: U.S.Highway 50/Flint Road
Area Type: All other areas
Jurisd: NDOT
Year : Year 2028 Background + Project
N/S St: U.S. Highway 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	0	0	0	2	1	1	2	0
LGConfig					LR			T	R	L	T	
Volume				57		16		2623	47	21	1453	
Lane Width					12.0			12.0	12.0	12.0	12.0	
RTOR Vol						2			7			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru	A		
Right					Right	A		
Peds					Peds	X		
WB Left		A			SB Left	A		
Thru					Thru	A		
Right		A			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		13.0				72.0		
Yellow		4.0				4.0		
All Red		1.0				1.0		

Cycle Length: 95.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
LR	239	1743	0.31	0.14	37.7	D	37.7	D
Northbound								
T	2688	3547	1.03	0.76	36.2	D	35.7	D
R	1169	1543	0.04	0.76	2.9	A		
Southbound								
L	78	103	0.28	0.76	5.5	A		
T	2688	3547	0.57	0.76	5.2	A	5.2	A

Intersection Delay = 25.1 (sec/veh) Intersection LOS = C

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	AM Peak Hour
Intersection:	U.S. Highway 50/Village Drive
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	Eastridge Residential Development
East/West Street:	Village Drive
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		692	8		1805	
Peak-Hour Factor, PHF		0.95	0.95		0.95	
Hourly Flow Rate, HFR		728	8		1900	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		2	0		2	
Configuration		T	TR		T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			15			
Peak Hour Factor, PHF			0.95			
Hourly Flow Rate, HFR			15			
Percent Heavy Vehicles			2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					15			
C(m) (vph)					629			
v/c					0.02			
95% queue length					0.07			
Control Delay					10.9			
LOS					B			
Approach Delay				10.9				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 2/5/2008
Analysis Time Period: PM Peak Hour
Intersection: U.S. Highway 50/Village Drive
Jurisdiction: NDOT
Units: U. S. Customary
Analysis Year: Existing + Project
Project ID: Eastridge Residential Development
East/West Street: Village Drive
North/South Street: U.S. Highway 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1835	40		1046	
Peak-Hour Factor, PHF		0.95	0.95		0.95	
Hourly Flow Rate, HFR		1931	42		1101	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		2	0		2	
Configuration		T	TR		T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			7			
Peak Hour Factor, PHF			0.95			
Hourly Flow Rate, HFR			7			
Percent Heavy Vehicles			2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					7			
C(m) (vph)					247			
v/c					0.03			
95% queue length					0.09			
Control Delay					20.0			
LOS					C			
Approach Delay				20.0				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 2/5/2008
Analysis Time Period: AM Peak Hour
Intersection: U.S. Highway 50/Village Drive
Jurisdiction: NDOT
Units: U. S. Customary
Analysis Year: Year 2028 Background + Project
Project ID: Eastridge Residential Development
East/West Street: Village Drive
North/South Street: U.S. Highway 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		902	8		2347	
Peak-Hour Factor, PHF		0.95	0.95		0.95	
Hourly Flow Rate, HFR		949	8		2470	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		2	0		2	
Configuration		T	TR		T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			15			
Peak Hour Factor, PHF			0.95			
Hourly Flow Rate, HFR			15			
Percent Heavy Vehicles			2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					15			
C(m) (vph)					534			
v/c					0.03			
95% queue length					0.09			
Control Delay					11.9			
LOS					B			
Approach Delay				11.9				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	PM Peak Hour
Intersection:	U.S. Highway 50/Village Drive
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Year 2028 Background + Project
Project ID:	Eastridge Residential Development
East/West Street:	Village Drive
North/South Street:	U.S. Highway 50
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		2599	40		1474	
Peak-Hour Factor, PHF		0.95	0.95		0.95	
Hourly Flow Rate, HFR		2735	42		1551	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		2	0		2	
Configuration		T	TR		T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			7			
Peak Hour Factor, PHF			0.95			
Hourly Flow Rate, HFR			7			
Percent Heavy Vehicles			2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					7			
C(m) (vph)					132			
v/c					0.05			
95% queue length					0.17			
Control Delay					33.8			
LOS					D			
Approach Delay				33.8				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	AM Peak Hour
Intersection:	Flint Road/East Ridge Drive
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	Eastridge Residential Development
East/West Street:	Flint Road
North/South Street:	East Ridge Drive
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	52			26	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	10	54			27	0
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		66
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		69
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	10						69	
C(m) (vph)	1587						1048	
v/c	0.01						0.07	
95% queue length	0.02						0.21	
Control Delay	7.3						8.7	
LOS	A						A	
Approach Delay							8.7	
Approach LOS							A	

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: Thiva
Agency/Co.: Solaegui Engineers
Date Performed: 2/5/2008
Analysis Time Period: PM Peak Hour
Intersection: Flint Road/East Ridge Drive
Jurisdiction: NDOT
Units: U. S. Customary
Analysis Year: Existing + Project
Project ID: Eastridge Residential Development
East/West Street: Flint Road
North/South Street: East Ridge Drive
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	38	25			30	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	40	26			31	0
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		33
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		34
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	40						34	
C(m) (vph)	1582						1043	
v/c	0.03						0.03	
95% queue length	0.08						0.10	
Control Delay	7.3						8.6	
LOS	A						A	
Approach Delay							8.6	
Approach LOS							A	

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	AM Peak Hour
Intersection:	Flint Road/East Ridge Drive
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Year 2028 Background + Project
Project ID:	Eastridge Residential Development
East/West Street:	Flint Road
North/South Street:	East Ridge Drive
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	60			30	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	10	63			31	0
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		66
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		69
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	10						69	
C(m) (vph)	1582						1043	
v/c	0.01						0.07	
95% queue length	0.02						0.21	
Control Delay	7.3						8.7	
LOS	A						A	
Approach Delay							8.7	
Approach LOS							A	

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst:	Thiva
Agency/Co.:	Solaegui Engineers
Date Performed:	2/5/2008
Analysis Time Period:	PM Peak Hour
Intersection:	Flint Road/East Ridge Drive
Jurisdiction:	NDOT
Units: U. S. Customary	
Analysis Year:	Year 2028 Background + Project
Project ID:	Eastridge Residential Development
East/West Street:	Flint Road
North/South Street:	East Ridge Drive
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	38	30			40	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	40	31			42	0
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		33
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		34
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	40						34	
C(m) (vph)	1567						1029	
v/c	0.03						0.03	
95% queue length	0.08						0.10	
Control Delay	7.4						8.6	
LOS	A						A	
Approach Delay							8.6	
Approach LOS							A	

CONCEPTUAL DRAINAGE REPORT FOR

EAST RIDGE VILLAGE

MOUNDHOUSE, LYON COUNTY, NEVADA

PREPARED FOR:

MR. S. RYCKEBOSCH

APRIL 17, 2008
PROJECT #05-378

WESTERN ENGINEERING & SURVEYING SERVICES
CIVIL ENGINEERING • LAND SURVEYING • LAND USE PLANNING • SUBDIVISIONS • WATER RIGHTS
3032 SILVER SAGE DRIVE • CARSON CITY, NEVADA 89701 • (775) 884-3200 • (FAX 884-3211)

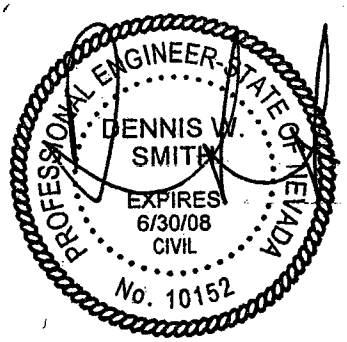
CONCEPTUAL DRAINAGE REPORT FOR EAST RIDGE VILLAGE

PREPARED BY:

B Rasmussen

BRIAN RASMUSSEN, E.I.T
APRIL 2008

REVIEWED BY:



4/16/08

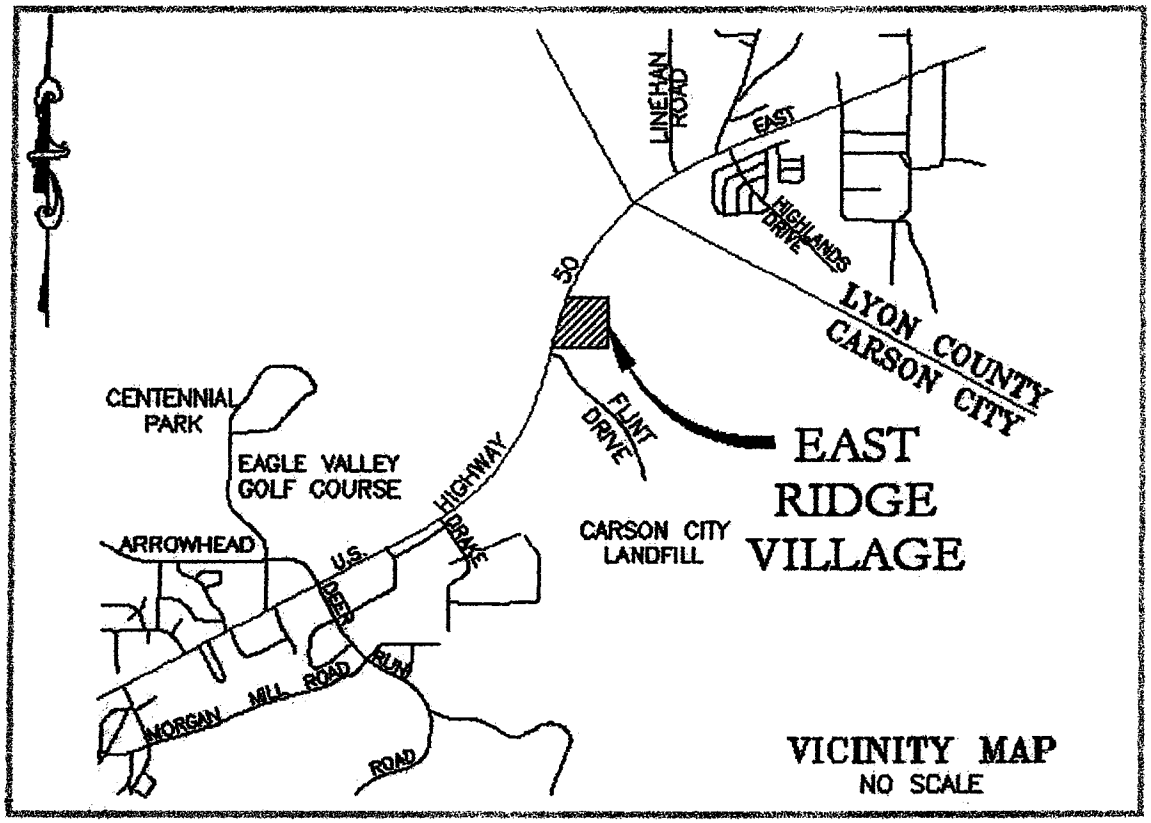
DENNIS SMITH, P.E.

INTRODUCTION

This report addresses the conceptual hydrologic conditions for the proposed East Ridge Village under the 5-year, 25-year, and 100-year, 24-hour storm events. The National Resources Conservation Service Technical Release 55 (NRCS TR-55) program was utilized for calculations.

LOCATION

East Ridge Village is a 37.3-acre site located at 7201 Highway 50 East in Moundhouse, Lyon County, Nevada (as shown below). This is located at 38.9575° north, -119.1917° west, in the southeast quarter of Section 36, Township 16 North, Range 20 East, APN numbers 008-011-88, 008-011-89, 008-011-90, 008-011-91.



PROJECT DESCRIPTION

This property is a 37.3-acre parcel that is being developed into approximately 19.4 acres of general commercial area and 17.9 acres of multi-family residential units. The residential portion will consist of owner occupied townhomes as well as rental apartments that vary from two to four stories in height. Proposed recreational amenities include meandering walking paths, a swimming pool, playground areas, and barbeque and picnic areas. The commercial portion of the project comprises the northern and western boundaries of the property. This area is currently still in planning stages.

The goal of this mixed-use residential and commercial development is to provide upscale amenities for commuters and residents along the Highway 50 corridor between Carson City and Lyon County.

EXISTING SITE CONDITIONS

The East Ridge Village site was formerly used as a rural airport. Although the 37.3-acre property is primarily undeveloped, there are several existing buildings, dirt roads, and one paved and one dirt runway, all planned for removal. However, the majority of the property is covered with native sage and scrub brush.

On average, the existing grade varies between less than one percent and approximately four percent, primarily in a westerly direction toward State Route 50. A portion of the property naturally drains southerly. At the northeast corner of the property is a hill that slopes at approximately 16%.

There are approximately 46 acres to the north and 39 acres to the northeast of offsite tributary area to the East Ridge Village property. Due to the size of these offsite watersheds, the National Resources Conservation Service Technical Release 55 (NRCS TR-55) program was used to calculate the peak runoff during the 5-year, 25-year, and 100-year, 24-hour storm events.

The East Ridge Village property is in unshaded FEMA Flood Zone X on Flood Insurance Rate Map (FIRM) FIRM 320001 0045B, as shown in the Appendix. Unshaded Zone X is outside of the 500-year floodplain.

PROPOSED CONDITIONS

The existing rural airport, including runways and existing structures, will be removed. Approximately 50% of the property (the southeastern portion) is proposed for multi-family residential units with common areas. These common areas include landscaped areas for recreational purposes, picnic areas, children's playground areas, horseshoe pits, a basketball court, and a swimming pool. The remainder of the property is still in planning stages, but the intent is to develop it as light commercial.

Proposed drainage infrastructure to mitigate increased storm water runoff due to development will involve detention basins and underground infiltration systems. This analysis assumes full build-out conditions of the East Ridge Village property.

HYDROLOGY

The primary variables for TR-55 are: watershed area, time of concentration, precipitation, and NRCS runoff curve number. These calculations utilize a Type-II storm distribution.

WATERSHED AREA

Onsite watershed delineation was based on topographic data compiled by Western Engineering and Surveying Services. Offsite tributary area (to the north and the northeast) was delineated using the 1:24,000 scale "New Empire" USGS topographic quad map (1994).

TIME OF CONCENTRATION

Time of concentration is dependent on the average overland flow velocity, which is dependent on the average slope and the land cover that overland flow travels across. Overland flow velocity was estimated using the NRCS (formerly the Soil Conservation Service) Table 701 (1985, see the Appendix). Undeveloped and offsite area flow velocities are based on "Overland Flow: Alluvial Fans – Western Mountain Regions". Time of concentration values were calculated as shown below.

Existing Condition	Travel Path Length	Average Slope	Average Overland Velocity	Time of Concentration	Tc Used	
	feet	%	feet per second	minutes	minutes	hours
Watershed A	1,330	0.8%	0.9	25	25	0.410
Watershed B	485	1.9%	1.4	6	10	0.167
Watershed C	185	4.7%	2.2	1	10	0.167
Offsite - 1	2,315	1.2%	1.5	26	26	0.429
Offsite - 2	2,935	7.8%	2.9	17	17	0.281

PRECIPITATION DATA

Precipitation data comes from the NOAA's National Weather Service Precipitation Frequency Data Server (http://hdsc.nws.noaa.gov/hdsc/pfds/sa/nv_pfds.html), which utilizes NOAA Atlas 14 data. Calculations herein assume a Type-II storm distribution.

SOILS

According to the Natural Resources Conservation Survey (NRCS), the property is overlain with Reno cobbly sandy loam and Devada-Rock outcrop complex, both of which belong to NRCS hydrologic soil type "D".

The soils map is shown in the Appendix. All soils data was obtained from the NRCS soil survey web site: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

CURVE NUMBER (CN)

Curve numbers were taken from the TR-55 manual, as shown in the Appendix. Undeveloped and offsite area assumes "sagebrush with grass understory in fair condition" (30% to 70% cover). As there are multiple land use types within each watershed, a weighted average was taken to determine a composite curve number. The calculations are shown on the next page.

Curve Number Calculation

Existing Condition	Area *(acres)*	% of Total Area	CN
Watershed A			
Undeveloped	28.2	99%	70
Dirt Road (and Dirt Runway)	2.7	9%	89
Structures	0.3	1%	98
Total:	28.5		***79***
Watershed B			
Undeveloped	4.4	51%	70
Paved Road (Runway)	1.1	13%	93
Dirt Road (and Dirt Runway)	2.1	24%	89
Structures	1.0	11%	98
Total:	8.5		***81***
Watershed C			
Undeveloped	0.6	75%	70
Dirt Road	0.1	18%	89
Structures	0.1	7%	98
Total:	0.8		***75***
Offsite - 1	46.3	100%	***70***
Offsite - 2	38.6	100%	***70***

CHANGES DUE TO DEVELOPMENT

As this site is still in planning stages, the post-development condition can only be presented conceptually. During final design, the following assumptions may change.

First, it is assumed that the watershed areas will remain the same as in the existing condition. Depending on final site grading design, the proposed hydrology calculations may change somewhat.

The curve number chosen for watershed basins B and C was 92, corresponding with the multi-family residential land use (with soil type "D"). Watershed A is currently planned as 39% multi-family residential (CN=92) and 61% commercial (CN=95). The weighted average post-development curve number for basin A is 94.

CALCULATED PEAK FLOW

The variables of watershed area, time of concentration, precipitation, and NRCS runoff curve number were entered into the NRCS TR-55 program, and the following results were calculated.

Peak Flow Calculations for the 5-year, 25-year, and 100-year, 24-hour Storms

EXISTING CONDITION	5-Year Storm		25-Year Storm	100-Year Storm
	cfs	acre-feet	cfs	cfs
Watershed A	9	0.9	21	34
Watershed B	5	0.3	10	16
Watershed C	0.2	0.02	0.6	1.1
Offsite - 1	3	0.6	14	29
Offsite - 2	3	0.5	15	31

PROPOSED CONDITION	5-Year Storm		25-Year Storm	100-Year Storm
	cfs	acre-feet	cfs	cfs
Watershed A	32	2.7	50	66
Watershed B	12	0.7	19	26
Watershed C	1	0.1	2	2
Offsite - 1	3	0.6	14	29
Offsite - 2	3	0.5	15	31

MITIGATION OF INCREASED STORMWATER RUNOFF

Storm water runoff in the post-development condition is required to be limited to the 5-year, 24-hour existing condition. The following table lists the required detention for each watershed basin. It is recommended that this detention be achieved using detention ponds and/or approved underground infiltration systems.

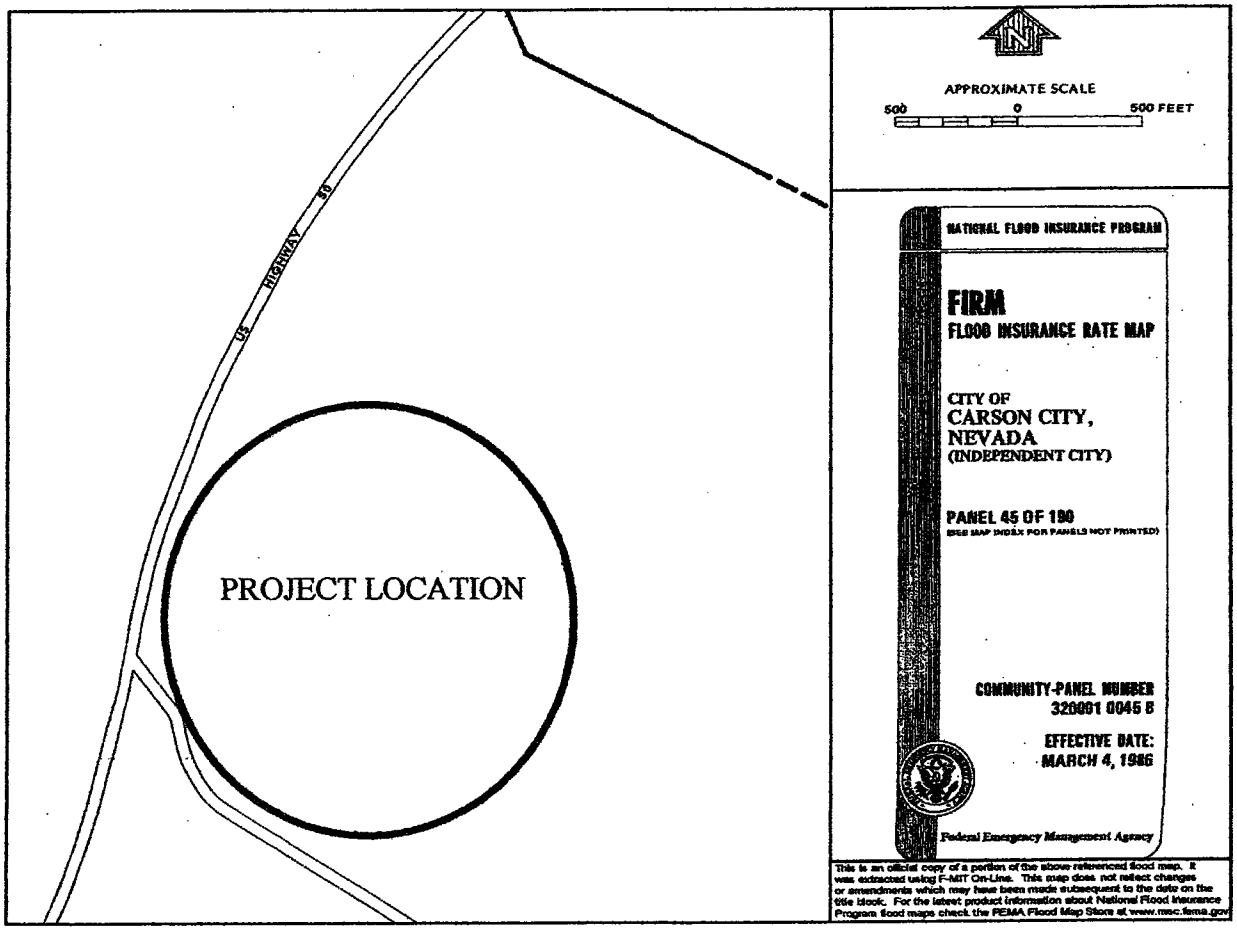
DETENTION REQUIRED	5-Year Storm		
	cfs	acre-feet	$feet^3$
Watershed A	23	1.8	80,024
Watershed B	7	0.4	17,257
Watershed C	1	0.05	2,095

CONCLUSION

This property can be developed in compliance with Carson City Development Standards. This property is not impacted by any FEMA floodplains.

APPENDIX
SUPPORTING DATA

FEMA FIRM 320001 0045B



GRAPHIC SCALE

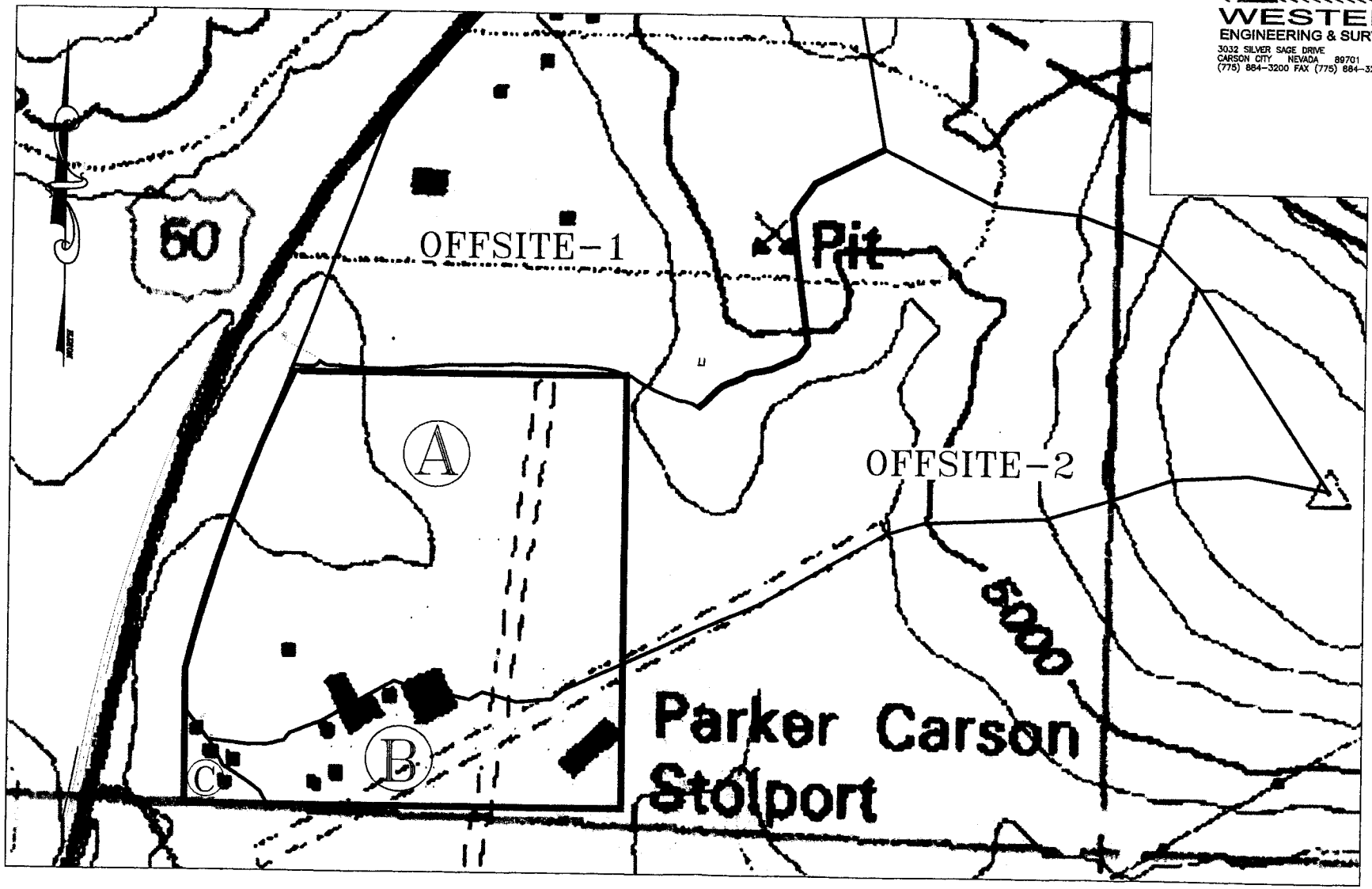
300 0 150 300 600 1200

(IN FEET)

1 inch = 300 ft.

EXISTING CONDITIONS WATERSHED MAP

WESTERN
ENGINEERING & SURVEYING SERVICES
3032 SILVER SAGE DRIVE
CARSON CITY NEVADA 89701
(775) 884-3200 FAX (775) 884-3211



GRAPHIC SCALE

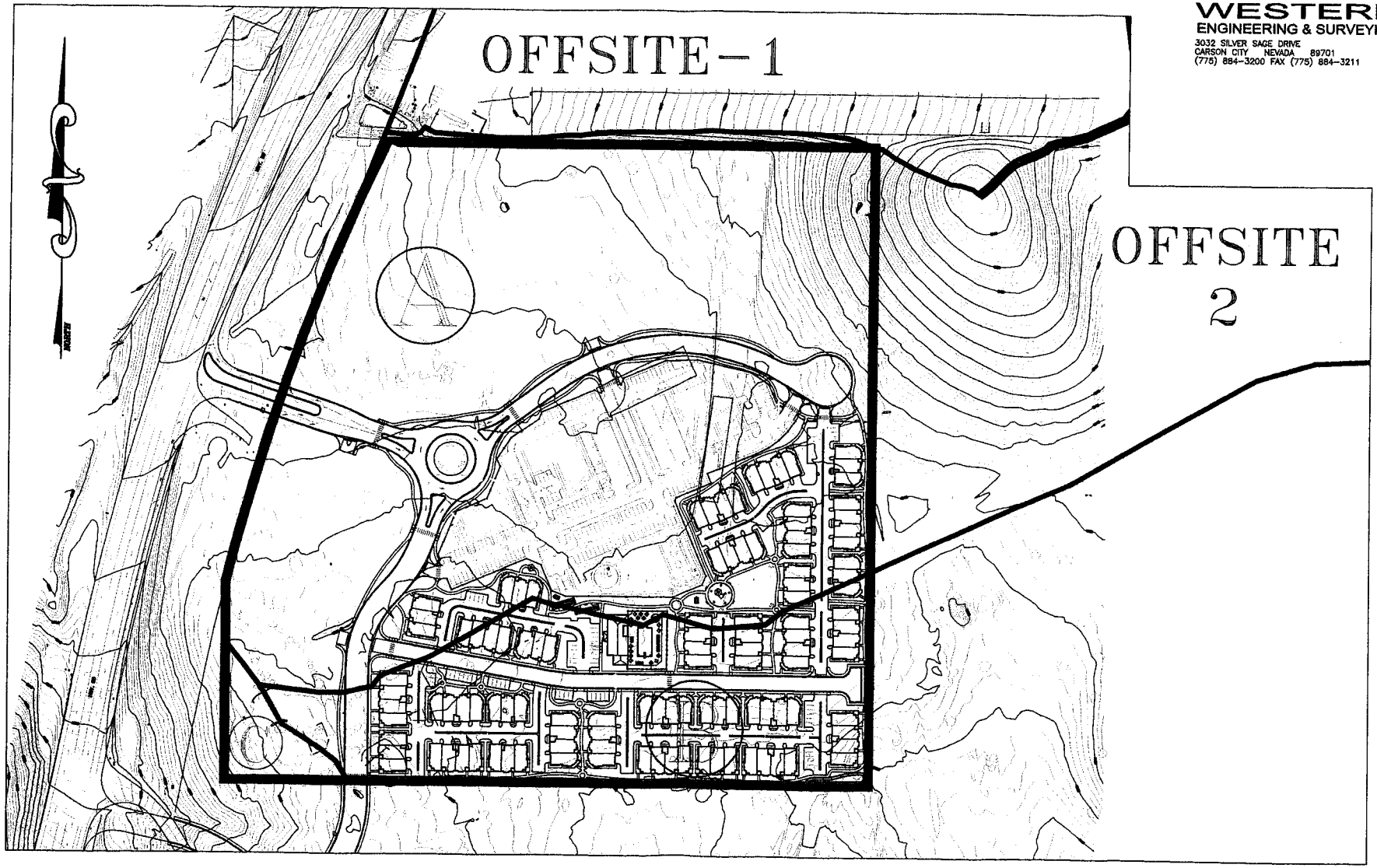
300 0 150 300 600 1200

(IN FEET)

1 inch = 300 ft.

POST-DEVELOPMENT CONDITIONS WATERSHED MAP

WESTERN
ENGINEERING & SURVEYING SERVICES
3032 SILVER SAGE DRIVE
CARSON CITY NEVADA 89701
(775) 884-3200 FAX (775) 884-3211



POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Nevada 39.202969 N 119.685711 W 4983 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Tue Nov 6 2007

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Help | Docs | U.S. Map

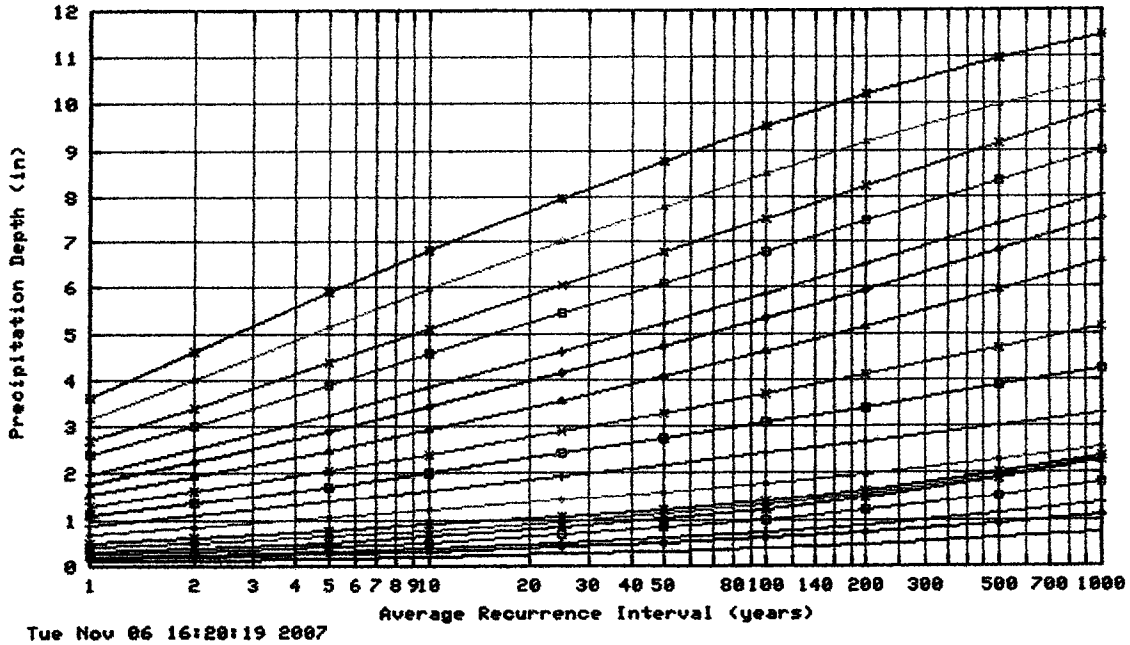
Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.10	0.15	0.18	0.25	0.31	0.41	0.49	0.67	0.88	1.10	1.30	1.54	1.79	1.98	2.39	2.69	3.17	3.63
2	0.12	0.18	0.23	0.31	0.38	0.51	0.61	0.84	1.11	1.38	1.62	1.94	2.26	2.52	3.02	3.41	4.01	4.62
5	0.16	0.25	0.31	0.41	0.51	0.65	0.77	1.05	1.40	1.73	2.06	2.49	2.91	3.25	3.90	4.37	5.15	5.91
10	0.20	0.31	0.38	0.51	0.64	0.78	0.90	1.21	1.63	2.02	2.41	2.93	3.43	3.83	4.56	5.09	5.97	6.83
25	0.27	0.40	0.50	0.67	0.83	0.97	1.08	1.43	1.94	2.42	2.89	3.56	4.15	4.62	5.45	6.06	7.02	7.97
50	0.32	0.49	0.61	0.82	1.02	1.13	1.24	1.61	2.18	2.74	3.28	4.06	4.72	5.23	6.11	6.78	7.77	8.77
100	0.39	0.60	0.74	0.99	1.23	1.32	1.41	1.78	2.42	3.07	3.68	4.60	5.32	5.86	6.79	7.50	8.49	9.52
200	0.47	0.72	0.89	1.20	1.49	1.56	1.64	1.99	2.67	3.41	4.10	5.16	5.95	6.50	7.46	8.22	9.17	10.20
500	0.60	0.92	1.14	1.53	1.90	1.95	2.01	2.30	3.00	3.88	4.67	5.96	6.81	7.38	8.34	9.16	9.99	10.98
1000	0.72	1.10	1.36	1.83	2.27	2.31	2.35	2.57	3.27	4.24	5.13	6.60	7.49	8.05	9.00	9.85	10.53	11.47

Text version of table

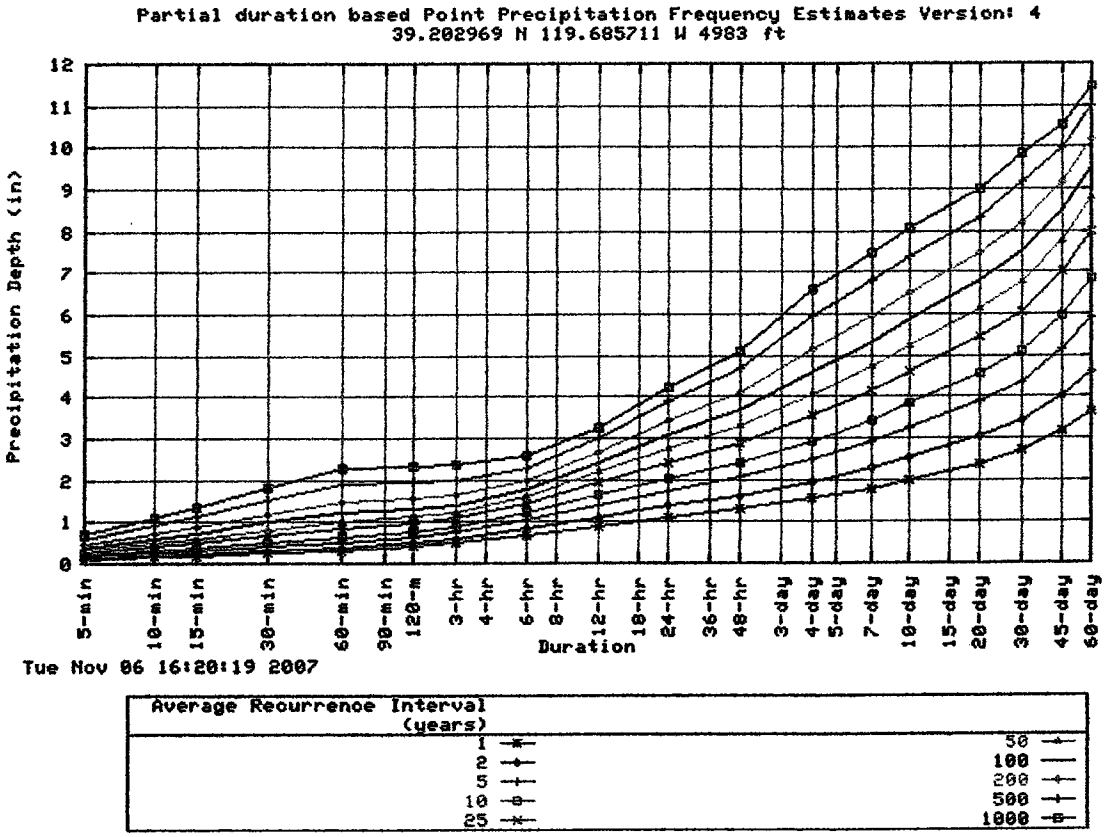
* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.

Partial duration based Point Precipitation Frequency Estimates Version: 4
39.202969 N 119.685711 W 4983 ft



Tue Nov 06 16:20:19 2007

Duration			
5-min	120-m	48-hr	30-day
10-min	3-hr	4-day	45-day
15-min	6-hr	7-day	60-day
30-min	12-hr	10-day	
60-min	24-hr	20-day	



Confidence Limits -

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)																		
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.12	0.18	0.22	0.29	0.36	0.48	0.56	0.76	1.00	1.22	1.45	1.73	2.02	2.24	2.67	3.00	3.51	4.03
2	0.14	0.22	0.27	0.37	0.46	0.59	0.70	0.95	1.26	1.52	1.82	2.18	2.55	2.84	3.39	3.81	4.45	5.13
5	0.20	0.30	0.37	0.49	0.61	0.76	0.88	1.19	1.59	1.92	2.30	2.79	3.28	3.66	4.35	4.87	5.68	6.55
10	0.24	0.36	0.45	0.61	0.76	0.90	1.02	1.37	1.85	2.23	2.69	3.29	3.86	4.31	5.09	5.67	6.58	7.55
25	0.32	0.48	0.60	0.80	0.99	1.12	1.24	1.63	2.21	2.68	3.25	4.00	4.68	5.20	6.08	6.75	7.74	8.80
50	0.39	0.59	0.73	0.99	1.22	1.33	1.43	1.84	2.50	3.03	3.69	4.58	5.34	5.90	6.84	7.58	8.59	9.72
100	0.47	0.72	0.90	1.21	1.49	1.57	1.65	2.06	2.81	3.42	4.17	5.20	6.04	6.63	7.63	8.42	9.41	10.57
200	0.58	0.89	1.10	1.48	1.84	1.87	1.94	2.33	3.14	3.81	4.68	5.87	6.78	7.41	8.42	9.28	10.19	11.35
500	0.76	1.16	1.44	1.94	2.40	2.41	2.43	2.74	3.60	4.37	5.40	6.85	7.85	8.49	9.50	10.44	11.17	12.28
1000	0.93	1.41	1.75	2.36	2.92	2.95	2.98	3.11	3.98	4.83	6.00	7.66	8.72	9.35	10.35	11.32	11.85	12.90

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than.
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

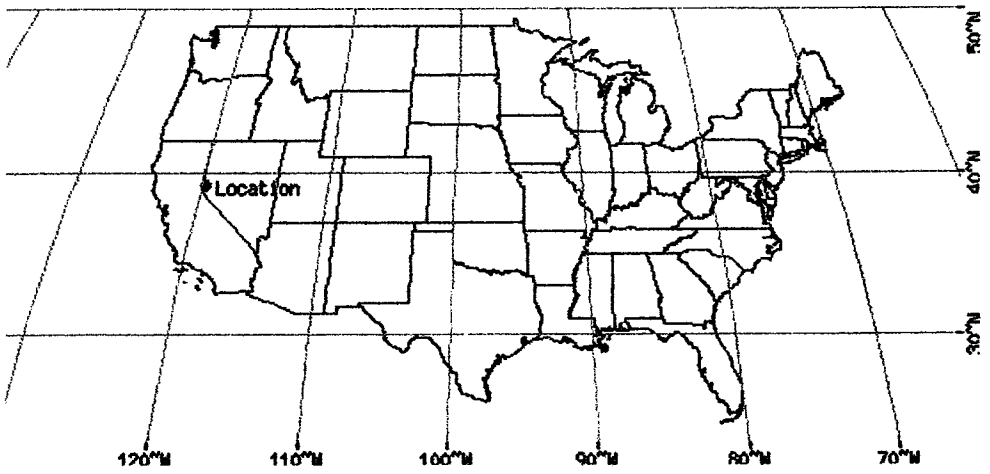
* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)																		
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.08	0.13	0.16	0.21	0.26	0.36	0.43	0.60	0.78	1.00	1.17	1.38	1.60	1.77	2.14	2.41	2.85	3.26
2	0.10	0.16	0.20	0.27	0.33	0.45	0.55	0.75	0.98	1.25	1.46	1.74	2.02	2.24	2.71	3.06	3.61	4.14
5	0.14	0.21	0.26	0.35	0.44	0.57	0.68	0.93	1.24	1.58	1.85	2.23	2.60	2.90	3.50	3.92	4.63	5.31
10	0.17	0.26	0.32	0.43	0.54	0.67	0.79	1.07	1.43	1.83	2.16	2.62	3.06	3.40	4.08	4.57	5.36	6.12

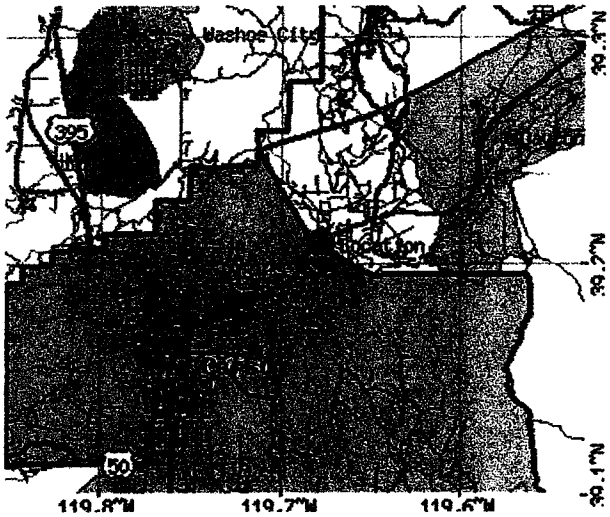
25	0.22	0.33	0.41	0.55	0.68	0.81	0.93	1.25	1.68	2.18	2.57	3.15	3.67	4.07	4.84	5.40	6.28	7.13
50	0.26	0.39	0.48	0.65	0.81	0.93	1.05	1.38	1.86	2.45	2.90	3.56	4.15	4.58	5.41	6.01	6.94	7.83
100	0.30	0.46	0.57	0.76	0.94	1.06	1.17	1.50	2.04	2.72	3.22	3.99	4.63	5.10	5.97	6.61	7.56	8.47
200	0.35	0.53	0.66	0.89	1.10	1.21	1.33	1.64	2.20	2.99	3.56	4.43	5.13	5.60	6.51	7.18	8.14	9.05
500	0.42	0.64	0.79	1.06	1.32	1.44	1.58	1.84	2.41	3.35	3.98	5.02	5.78	6.28	7.20	7.91	8.81	9.72
1000	0.48	0.73	0.90	1.21	1.50	1.65	1.80	2.02	2.58	3.62	4.31	5.47	6.28	6.77	7.69	8.44	9.25	10.14

* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.
** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Maps -





These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

Please read disclaimer for more information.

LEGEND

- State
- County
- Indian Resv
- Lake/Pond/Ocean
- Street
- Expressway
- Highway
- Connector
- Stream
- Military Area
- National Park
- Other Park
- City
- County

Scale 1:226583 *average--true scale depends on monitor resolution

0 2 4 6 8 mi
0 2 4 6 8 10 km

Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the USGS for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study, please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (39.202969/-119.685711). Digital ASCII data can be obtained directly from **NCDC**.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the **Western Regional Climate Center's state-specific SNOTEL station maps**.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

Disclaimer


267800
268000
268200
268400
268600
268800
269000
4343400
4343200
4343000
4342800
4342600
4342400
4342200
N
Meters
0
100
200
400
600
Feet
0
500
1,000
2,000
3,000

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 11N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Carson City Area, Nevada
Survey Area Data: Version 3, Dec 11, 2006

Date(s) aerial images were photographed: 9/6/1999

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group—Summary by Map Unit — Carson City Area, Nevada				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
33	Holbrook variant-Rock outcrop complex, 30 to 75 percent slopes	C	0.3	0.2%
86	Devada-Rock outcrop complex, 4 to 15 percent slopes	D	70.7	45.9%
99	Reno cobbly sandy loam, 4 to 15 percent slopes	D	83.1	53.9%
Totals for Area of Interest (AOI)			154.2	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Table 2-2a.—Runoff curve numbers for urban areas[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1]Average runoff condition, and $I_a = 0.2S$.
[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious area are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
[4]Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
[5]Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2d.—Runoff curve numbers for arid and semiarid rangelands[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

[1]Average runoff condition, and $I_a = 0.2S$. For range in humid regions, use table 2-2c.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

East Ridge Village
Existing Conditions
Lyon County, Nevada

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 5-Yr (cfs) (hr)	25-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS			
Offsite 1	2.86 12.25	14.02 12.19	29.47 12.17
Offsite 2	3.11 12.15	15.20 12.11	31.36 12.09
Basin A	8.79 12.17	20.91 12.14	34.23 12.15
Basin B	4.91 12.02	10.34 12.00	16.14 12.00
Basin C	0.22 12.05	0.61 12.03	1.06 12.01
Post-Dev A	32.17 12.12	49.66 12.13	66.04 12.13
Post-Dev B	11.77 11.98	18.86 11.98	25.62 11.98
Post-Dev C	1.08 11.98	1.73 11.98	2.35 11.98
REACHES			
OUTLET	56.86	117.47	187.06

WinTR-55 Current Data Description

--- Identification Data ---

User: BR
Project: East Ridge Village
SubTitle: Existing Conditions
State: Nevada
County: Lyon
Filename: N:\Ryckebosch Steve\05-378 East Ridge Village\TR-55\East Ridge Village.w55

Date: 4/7/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Offsite 1	North of the property	Outlet	46.28	70	0.429
Offsite 2	East of the property	Outlet	38.57	70	0.280
Basin A	(Onsite)	Outlet	28.5	79	0.410
Basin B	(Onsite)	Outlet	8.53	81	0.167
Basin C	(Onsite)	Outlet	0.78	75	0.167
Post-Dev A	Developed Onsite A	Outlet	28.5	94	0.200
Post-Dev B	Developed Onsite B	Outlet	8.53	92	0.167
Post-Dev C	Developed Onsite C	Outlet	0.78	92	0.167

Total area: 160.47 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	500-Yr (in)
1.38	1.73	2.02	2.42	2.74	3.07	3.88

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

DENSITIES OF THE RESIDENTIAL MFA USE WITHIN EAST RIDGE VILLAGE:

DWELLING UNITS:

1200 SQ FT FOR 1 BEDROOM UNITS
1500 SQ FT FOR 2 BEDROOM UNITS
PROPOSING 113 DWELLING UNITS

PARKING REQUIREMENTS:

TWO SPACES PER DWELLING UNIT
REQUIRED 2.0 X 113 = 226 SPACES
PROVIDING 296 SPACES (INCLUDES 2 HANDICAP SPACES)

OPEN SPACE:

150 SQ FT PER DU = COMMON
100 SQ FT PER DU = RECREATION AREA
100 SQ FT PER DU = PRIVATE OR COMMON
350 SQ FT PER DU

THEREFORE THE REQUIRED OPEN SPACE IS
350 SQ FT X 113 DU'S = 39,550 SQ FT (.90 ACRES)
PROVIDING 4.95 ACRES COMMON OPEN SPACE

- THE FRONT AND STREET SIDE SETBACK AREAS ARE NOT INCLUDED IN MEETING THIS OPEN SPACE REQUIREMENT.
- THERE WILL BE 10-FEET BETWEEN STRUCTURES.
- OPEN SPACE LANDSCAPE AREAS WILL NOT BE LESS THAN 15-FEET WIDE.
- OPEN SPACE AREAS FOR PICNICING OR PLAY AREAS WILL NOT BE LESS THAN 25-FEET WIDE.

Development Schedule:

The schedule for development of the entire site is to begin with the initial construction of the Residential portion of the project. This will include the residential site improvements and the required improvements for access from Hwy 50 at the main entry and at Flint Road. The development will occur approximately over a one to three year period. This information is reflected in the Phasing Plan provided with this application. There are to be four phases:

Phase One: is to include all Nevada Department of Transportation Improvements, the realignment and reconstruction of Flint Drive; the construction of Valley Drive, East Ridge Drive and a portion of Brookhaven Court (a Private Road); lots three through 36 to be constructed.

Phase Two: shall consist of the construction of the Club House and Pool Area and lots 37 through 70 constructed. Also the improvements of Brookhaven Court (A private Road) completed.

Phase Three: will be the construction of lots 71 through 115.

Phase Four: will be the construction and improvements of lot One.

WESTERN
ENGINEERING & SURVEYING SERVICES

EAST RIDGE VILLAGE PHASE 1

FOR

PHASING PLAN

JOB NUMBER:	05-379
DRAWN BY:	WTD
CHECKED BY:	DWS
DATE:	APRIL 2006
SHEET No.	8
OF	9 SHEET

PHASE 1

PHASE 1 INCLUDES ALL NEVADA DEPARTMENT OF TRANSPORTATION IMPROVEMENTS, THE REALIGNMENT AND RECONSTRUCTION OF FLINT DRIVE, THE CONSTRUCTION OF VALLEY DRIVE, EAST RIDGE DRIVE AND A PORTION OF BROOKHAVEN COURT (A PRIVATE ROAD), LOTS 3 THRU 36 TO BE CONSTRUCTED.

PHASE 2

PHASE 2 INCLUDES THE CONSTRUCTION OF THE CLUB HOUSE AND POOL AREA AND LOTS 37 THRU 70 CONSTRUCTED. ALSO BROOKHAVEN COURT (A PRIVATE ROAD) COMPLETED.

PHASE 3

PHASE 3 IS THE CONSTRUCTION OF LOTS 71 THRU 115.

PHASE 4

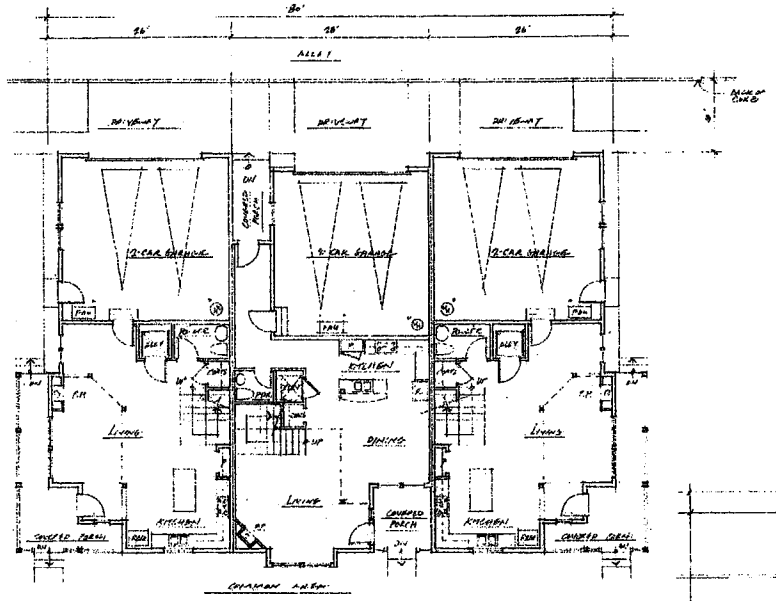
PHASE 4 THE APARTMENTS TO BE CONSTRUCTED.

REAR ELEVATION

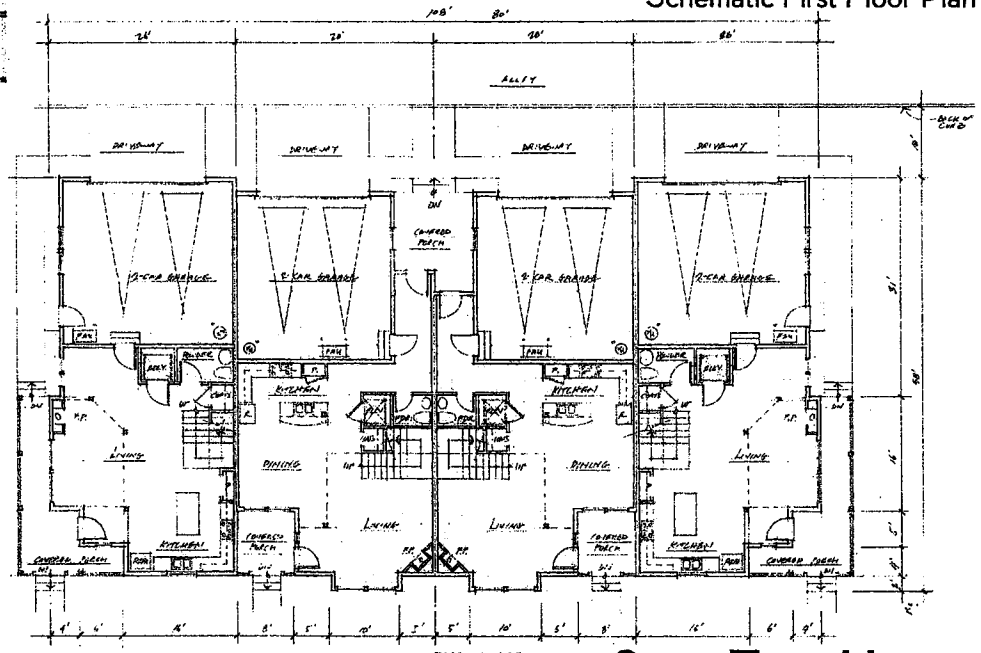
SIDE ELEVATION

FRONT ELEVATION

CONCEPTUAL RENDERINGS OF TWO STORY RESIDENTIAL



Schematic First Floor Plan



0 8 16 24 32

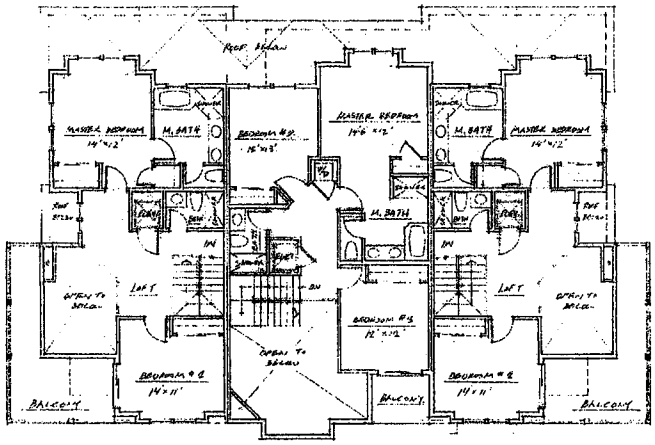
1/16" = 1'-0"

2-Story Town Homes

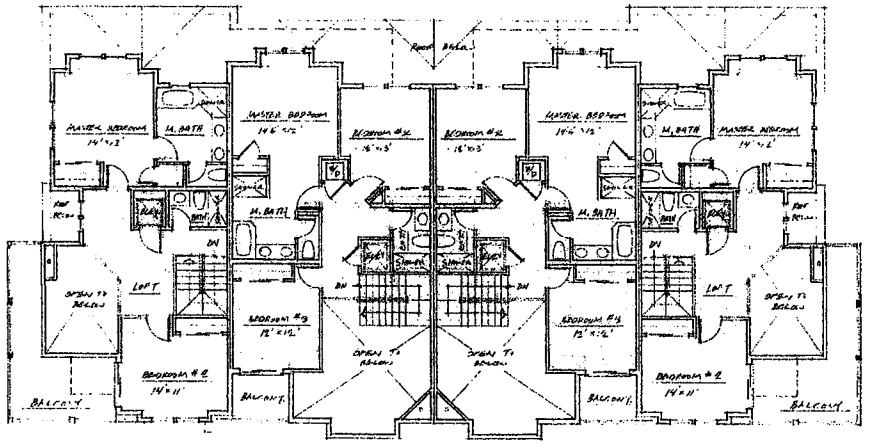
cathexes
unexpectedarchitecture

EAST RIDGE VILLAGE
7200 Highway 50 East, Carson City, Nevada

CONCEPTUAL FLOOR PLAN OF TWO STORY RESIDENTIAL UNITS



Schematic Second Floor Plan



0 8 16 24 32

1/16" = 1'-0"

2-Story Town Homes

cathexes
unexpectedarchitecture

EAST RIDGE VILLAGE
7200 Highway 50 East, Carson City, Nevada

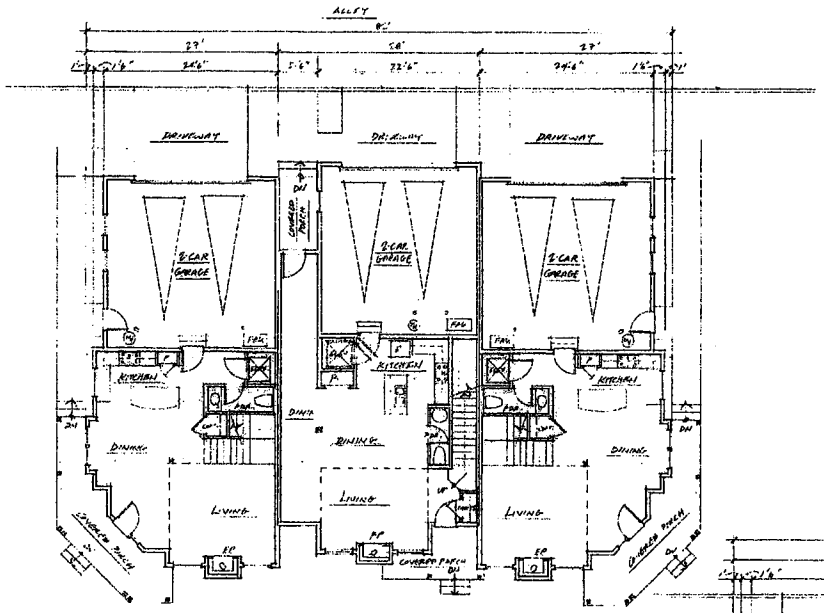
CONCEPTUAL FLOOR PLAN OF TWO STORY RESIDENTIAL UNITS

REAR ELEVATION

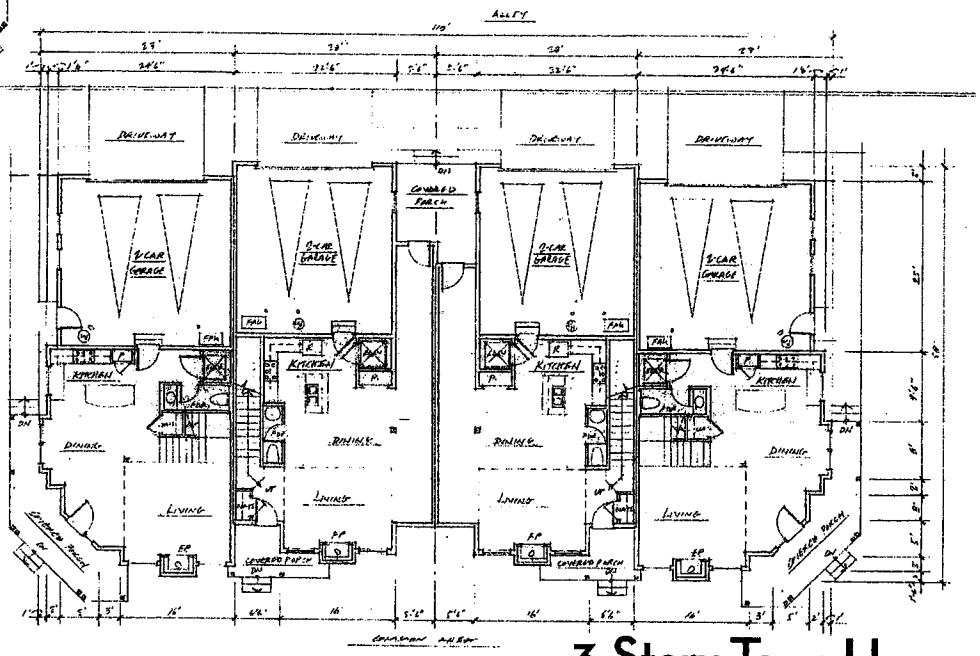
SIDE ELEVATION

FRONT ELEVATION

CONCEPTUAL RENDERINGS OF THREE STORY RESIDENTIAL



Schematic First Floor Plan



0 8 16 24 32

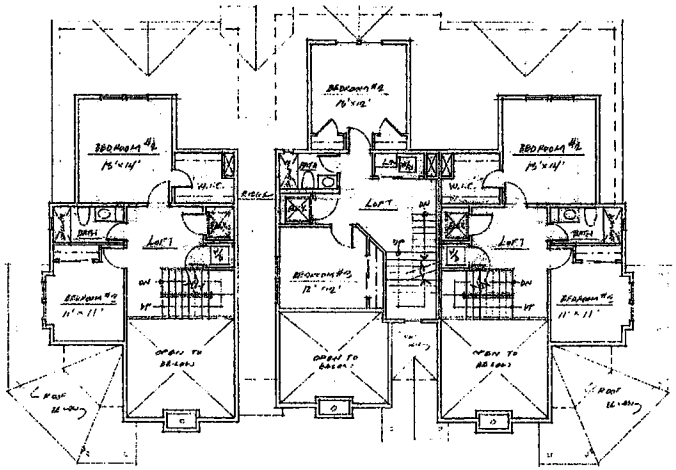
1/16" = 1'-0"

3-Story Town Homes

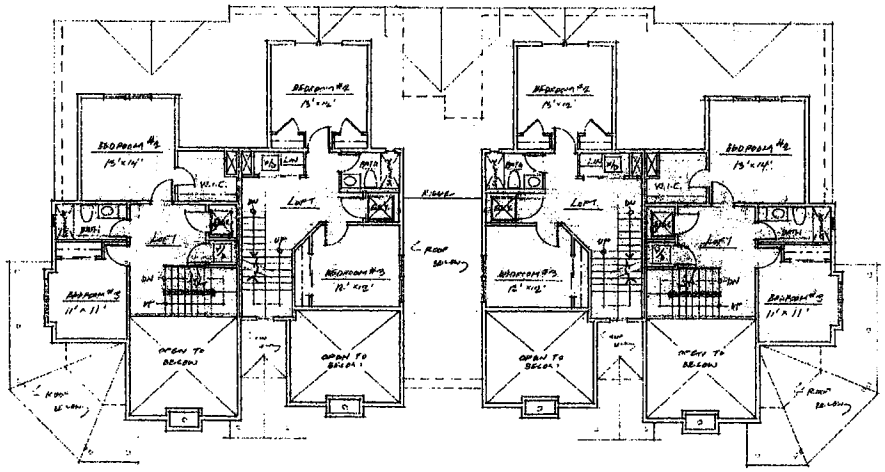
cathexes
unexpectedarchitecture

EAST RIDGE VILLAGE
7200 Highway 50 East, Carson City, Nevada

CONCEPTUAL FLOOR PLAN OF THREE STORY RESIDENTIAL UNITS



Schematic Second Floor Plan



0 8 16 24 32

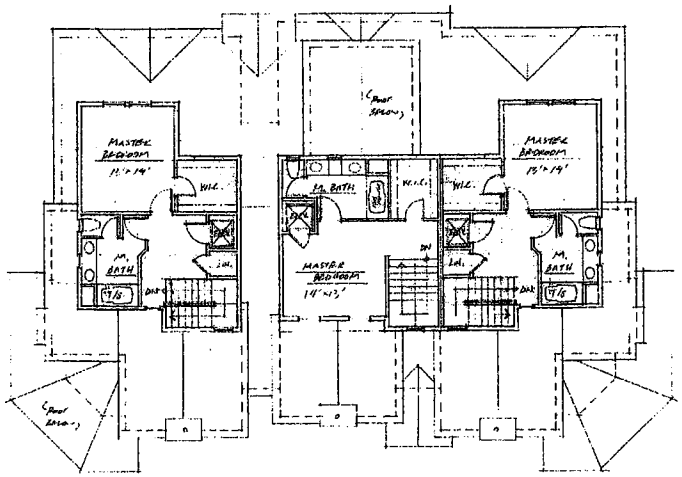
1/16" = 1'-0"

3-Story Town Homes

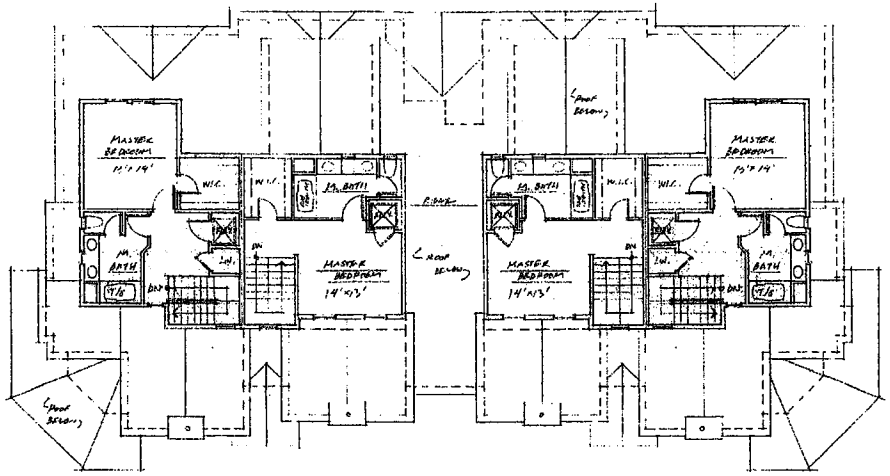
cathexes
unexpected architecture

EAST RIDGE VILLAGE
7200 Highway 50 East, Carson City, Nevada

CONCEPTUAL FLOOR PLAN OF THREE STORY RESIDENTIAL UNITS



Schematic Third Floor Plan



0 8 16 24 32

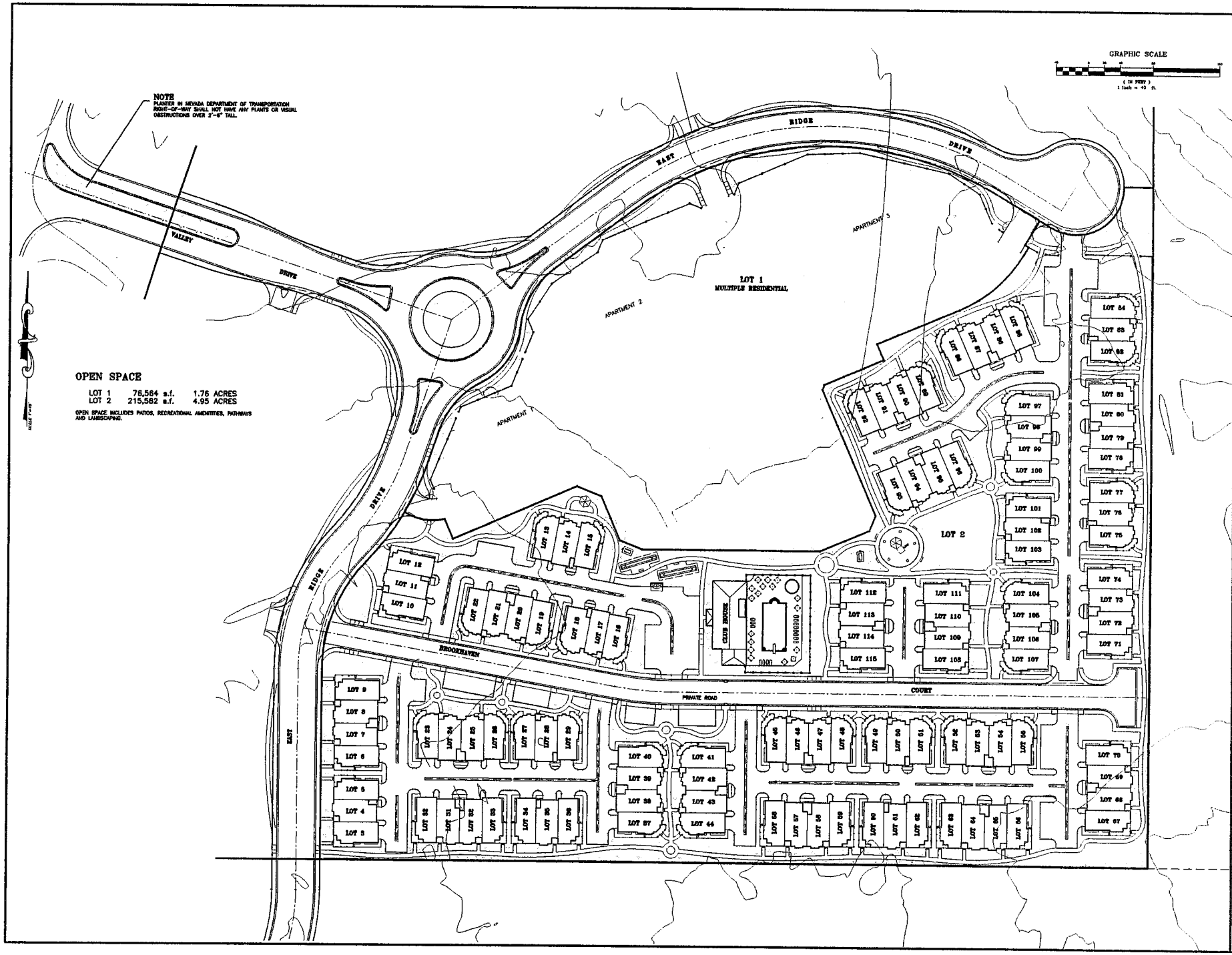
1/16" = 1'-0"

3-Story Town Homes

cathexes
unexpected architecture

EAST RIDGE VILLAGE
7200 Highway 50 East, Carson City, Nevada

CONCEPTUAL FLOOR PLAN OF THREE STORY RESIDENTIAL UNITS



WESTERN
ENGINEERING & SURVEYING SERVICES

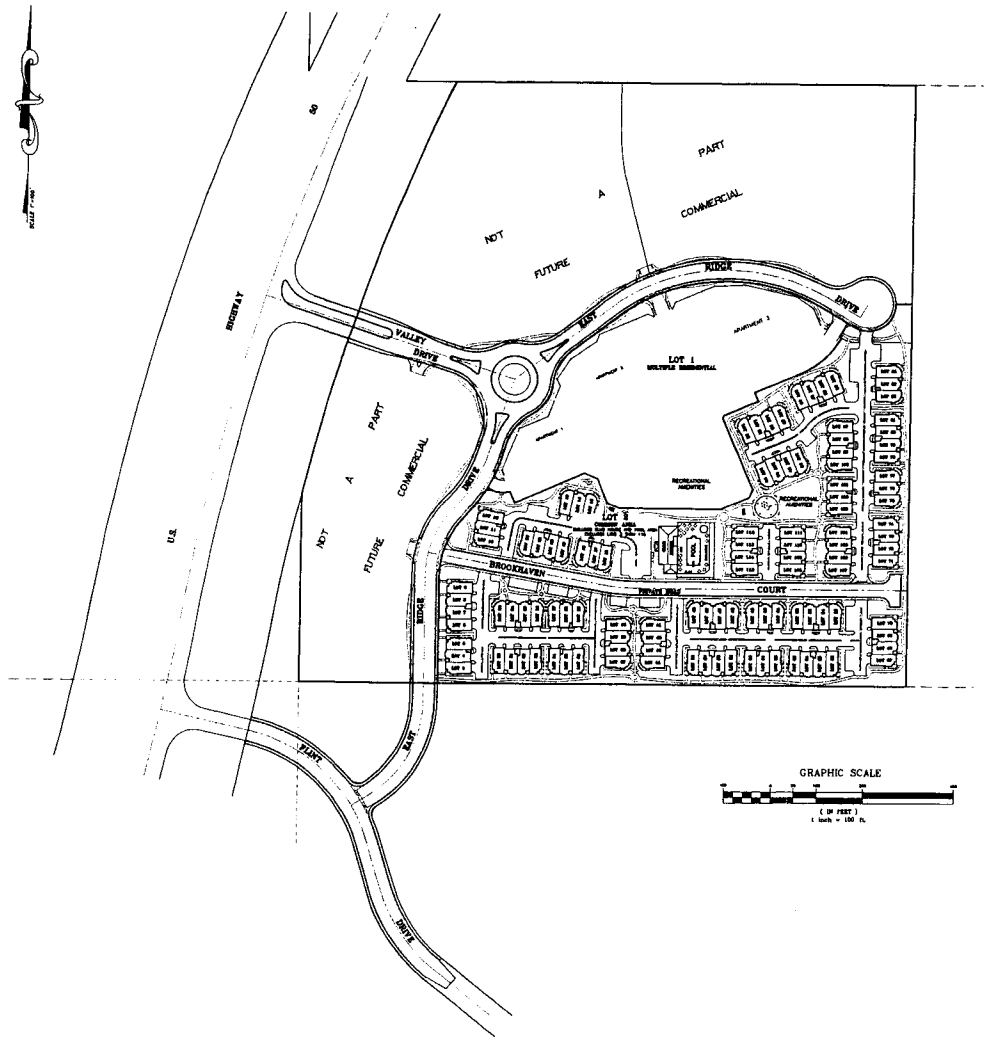
CONCEPTUAL LANDSCAPING PLAN
FOR
EAST RIDGE VILLAGE PHASE 1

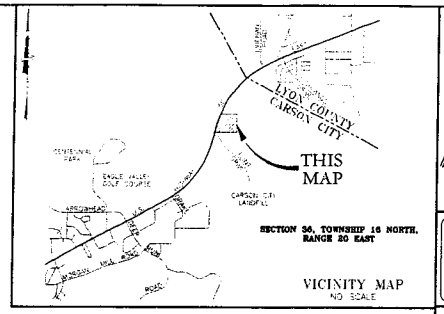
JOB NUMBER:	05-378
DRAWN BY:	WTG
CHECKED BY:	DWS
DATE:	APRIL 2008
SHEET No.	7

OF 9 SHEET

The goal of this mixed use residential and commercial development project is to provide upscale amenities for commuters and residents along this corridor of Hwy 50, the gateway between Carson City and Lyon County. The proposed MFA and common open space development is designed to provide a variety of housing types, provide common open spaces that will provide recreational amenities, such as meandering walking paths, swimming pool and recreation buildings. In addition, play ground areas, with barbecue and picnic areas. This residential development provides an abundance of landscaping and natural vegetation that has been designed to take advantage of the natural terrain and hillside environment. This project is designed as a clear definition in meeting the MUC master plan and MFA zoning district. The project incorporates all the required elements, such as residential densities, preservation of the common open space areas for the residents to utilize; It takes into consideration the proximity of the V&T Railroad Gateway, as to design structures per the height and setback requirements set forth in the MFA zoning district. The architecture for the town house units has been designed to provide a distinct elevation for all four sides. Thus providing unique views, instead of mundane building elevations to passer's by. The developer has been working with city staff to provide a unique, detailed and quality project for the city of Carson.

TENTATIVE SUBDIVISION MAP
FOR
EAST RIDGE VILLAGE
PHASE 1
SECTION 36, TOWNSHIP 16 NORTH, RANGE 20 EAST





LEGEND

OWNER \ DEVELOPER
EAGLE TECH INDUSTRIAL PARK, L.L.C.
STEVE RYCHEROSCH, MANAGING MEMBER
3891 WARREN WAY
RENO, NEVADA 89509

ENGINEERING \ SURVEYOR
WESTERN ENGINEERING AND SURVEYING SERVICES
DENNIS W. SMITH, P.E.
3032 SILVER SAGE DRIVE
CARSON CITY, NEVADA 89701
(775) 884-3200 ph
(775) 884-3211 fax
email: TKinsley@westernengineering.us

SITE ADDRESS
7201 HIGHWAY 50 EAST
CARSON CITY, NEVADA 89701

LEGAL DESCRIPTION
BEING PARCEL D-1 OF THE RECORD OF SURVEY TO SUPPORT A BOUNDARY LINE ADJUSTMENT FOR EAGLE TECH INDUSTRIAL PARK, L.L.C., RECORDED AS FILE NUMBER 387441, OFFICIAL RECORDS OF CARSON CITY, NEVADA.
(08-011-91)

ZONING AND MASTER PLAN DESIGNATION
ZONING – MFA (MULTI-FAMILY APARTMENTS)
MASTER PLAN – MIXED USE COMMERCIAL

EASEMENTS
A BLANKET UTILITY EASEMENT WILL BE RECORDED FOR THIS PROJECT, EXCLUDING BUILDING ENVELOPES, FOR THE PURPOSE OF INSTALLING ALL UTILITIES, INCLUDING PUBLIC AND PRIVATE. IF CARSON CITY UTILITIES REQUIRES ANY OTHER EASEMENTS, THEY WILL BE GRANTED AT THAT TIME.

TOPOGRAPHY
CONTOURS SHOWN ON THIS PLAT COME FROM AN AERIAL SURVEY PERFORMED BY NORTH AMERICAN MAPPING, FLOWN ON MAY 21, 2005, NAM PROJECT NUMBER R50509.
CONTOUR INTERVAL: 1'

FLOOD ZONE
THE FLOOD ZONE DESIGNATION FOR THIS PROJECT IS ZONE "C" (UNSHADED) PER THE FIRM PANEL 320001 0045 B, DATED MARCH 4, 1986. AREAS OF MINIMAL FLOODING, (NO SHADING).

PROJECT TABULATION

AREA BREAKDOWN

LOT 1 MULTIPLE RESIDENTIAL

APARTMENTS	96 UNITS		
TOTAL AREA	231,623 s.f.	5.32 ACRES	

LOT 2 (COMMON AREA)

CLUB HOUSE	4,068 s.f.	0.09 ACRES	1.1%
HARD SCAPE	158,003 s.f.	3.63 ACRES	41.6%
OPEN SPACE	215,582 s.f.	4.95 ACRES	57.1%
TOTAL AREA	377,653 s.f.	8.67 ACRES	

TOWNHOUSES

LOT 3	1350 s.f.	0.03 Ac	LOT 4	1418 s.f.	0.04 Ac	LOT 5	1350 s.f.	0.03 Ac			
LOT 6	1350 s.f.	0.03 Ac	LOT 7	1350 s.f.	0.03 Ac	LOT 8	1421 s.f.	0.03 Ac			
LOT 9	1350 s.f.	0.03 Ac	LOT 10	1350 s.f.	0.03 Ac	LOT 11	1418 s.f.	0.03 Ac			
LOT 12	1350 s.f.	0.03 Ac	LOT 13	1348 s.f.	0.03 Ac	LOT 14	1418 s.f.	0.03 Ac			
LOT 15	1348 s.f.	0.03 Ac	LOT 16	1348 s.f.	0.03 Ac	LOT 17	1208 s.f.	0.03 Ac			
LOT 18	1564 s.f.	0.04 Ac	LOT 19	1348 s.f.	0.03 Ac	LOT 20	1408 s.f.	0.03 Ac			
LOT 21	1425 s.f.	0.03 Ac	LOT 22	1348 s.f.	0.03 Ac	LOT 23	1348 s.f.	0.03 Ac			
LOT 24	1425 s.f.	0.04 Ac	LOT 25	1408 s.f.	0.04 Ac	LOT 26	1348 s.f.	0.03 Ac			
LOT 27	1348 s.f.	0.03 Ac	LOT 28	1425 s.f.	0.04 Ac	LOT 29	1348 s.f.	0.03 Ac			
LOT 30	1350 s.f.	0.03 Ac	LOT 31	1421 s.f.	0.03 Ac	LOT 32	1350 s.f.	0.03 Ac			
LOT 33	1350 s.f.	0.03 Ac	LOT 34	1350 s.f.	0.03 Ac	LOT 35	1418 s.f.	0.03 Ac			
LOT 36	1350 s.f.	0.03 Ac	LOT 37	1348 s.f.	0.03 Ac	LOT 38	1425 s.f.	0.04 Ac			
LOT 39	1408 s.f.	0.03 Ac	LOT 40	1348 s.f.	0.03 Ac	LOT 41	1348 s.f.	0.03 Ac			
LOT 42	1425 s.f.	0.04 Ac	LOT 43	1408 s.f.	0.04 Ac	LOT 44	1348 s.f.	0.03 Ac			
LOT 45	1348 s.f.	0.03 Ac	LOT 46	1408 s.f.	0.03 Ac	LOT 47	1425 s.f.	0.04 Ac			
LOT 48	1348 s.f.	0.03 Ac	LOT 49	1348 s.f.	0.03 Ac	LOT 50	1425 s.f.	0.04 Ac			
LOT 51	1348 s.f.	0.03 Ac	LOT 52	1348 s.f.	0.03 Ac	LOT 53	1348 s.f.	0.03 Ac			
LOT 54	1423 s.f.	0.04 Ac	LOT 55	1348 s.f.	0.03 Ac	LOT 56	1350 s.f.	0.03 Ac			
LOT 57	1421 s.f.	0.03 Ac	LOT 58	1348 s.f.	0.03 Ac	LOT 59	1350 s.f.	0.03 Ac			
LOT 60	1350 s.f.	0.03 Ac	LOT 61	1418 s.f.	0.03 Ac	LOT 62	1350 s.f.	0.03 Ac			
LOT 63	1350 s.f.	0.03 Ac	LOT 64	1421 s.f.	0.03 Ac	LOT 65	1350 s.f.	0.03 Ac			
LOT 66	1350 s.f.	0.03 Ac	LOT 67	1350 s.f.	0.03 Ac	LOT 68	1421 s.f.	0.03 Ac			
LOT 69	1350 s.f.	0.03 Ac	LOT 70	1350 s.f.	0.03 Ac	LOT 71	1350 s.f.	0.03 Ac			
LOT 72	1421 s.f.	0.03 Ac	LOT 73	1380 s.f.	0.03 Ac	LOT 74	1350 s.f.	0.03 Ac			
LOT 75	1348 s.f.	0.03 Ac	LOT 76	1423 s.f.	0.04 Ac	LOT 77	1348 s.f.	0.03 Ac			
LOT 78	1350 s.f.	0.03 Ac	LOT 79	1421 s.f.	0.03 Ac	LOT 80	1380 s.f.	0.03 Ac			
LOT 81	1350 s.f.	0.03 Ac	LOT 82	1348 s.f.	0.03 Ac	LOT 83	1425 s.f.	0.04 Ac			
LOT 84	1348 s.f.	0.03 Ac	LOT 85	1348 s.f.	0.03 Ac	LOT 86	1425 s.f.	0.04 Ac			
LOT 87	1408 s.f.	0.03 Ac	LOT 88	1348 s.f.	0.03 Ac	LOT 89	1348 s.f.	0.03 Ac			
LOT 90	1425 s.f.	0.04 Ac	LOT 91	1408 s.f.	0.03 Ac	LOT 92	1348 s.f.	0.03 Ac			
LOT 93	1348 s.f.	0.03 Ac	LOT 94	1423 s.f.	0.03 Ac	LOT 95	1408 s.f.	0.03 Ac			
LOT 96	1348 s.f.	0.03 Ac	LOT 97	1348 s.f.	0.03 Ac	LOT 98	1425 s.f.	0.04 Ac			
LOT 99	1408 s.f.	0.03 Ac	LOT 100	1348 s.f.	0.03 Ac	LOT 101	1350 s.f.	0.03 Ac			
LOT 102	1418 s.f.	0.03 Ac	LOT 103	1350 s.f.	0.03 Ac	LOT 104	1348 s.f.	0.03 Ac			
LOT 105	1423 s.f.	0.04 Ac	LOT 106	1408 s.f.	0.03 Ac	LOT 107	1348 s.f.	0.03 Ac			
LOT 108	1350 s.f.	0.03 Ac	LOT 109	1421 s.f.	0.03 Ac	LOT 110	1350 s.f.	0.03 Ac			
LOT 111	1350 s.f.	0.03 Ac	LOT 112	1350 s.f.	0.03 Ac	LOT 113	1421 s.f.	0.03 Ac			
LOT 114	1390 s.f.	0.03 Ac	LOT 115	1350 s.f.	0.03 Ac						
TOTALS	52,392 s.f.	1.20 Ac		52,299 s.f.	1.20 Ac		50,976 s.f.	1.17 Ac			

TOWNHOUSE TOTAL AREA	155,667 s.f.	3.57 ACRES

TOTALS

LOT 1	231,623 s.f.	5.32 ACRES	30.3%
LOT 2	377,653 s.f.	8.67 ACRES	49.4%
LOT 3	155,667 s.f.	3.57 ACRES	20.3%
TOTAL AREA	764,943 s.f.	17.56 ACRES	

PARKING

TOWNHOUSE PARKING (LOTS 2 THRU 115)

SPACES REQUIRED: 1.5 SPACES PER DWELLING UNIT (1.5 X 113 = 170 SPACES)	
TOWNHOUSE PARKING 2 CAR GARAGE	2 X 113 = 226 SPACES
GUEST AND OTHER PARKING SHOWN	= 70 SPACES (INCLUDES 2 HANDICAP SPACES)
TOTAL SPACES SHOWN	= 296 SPACES

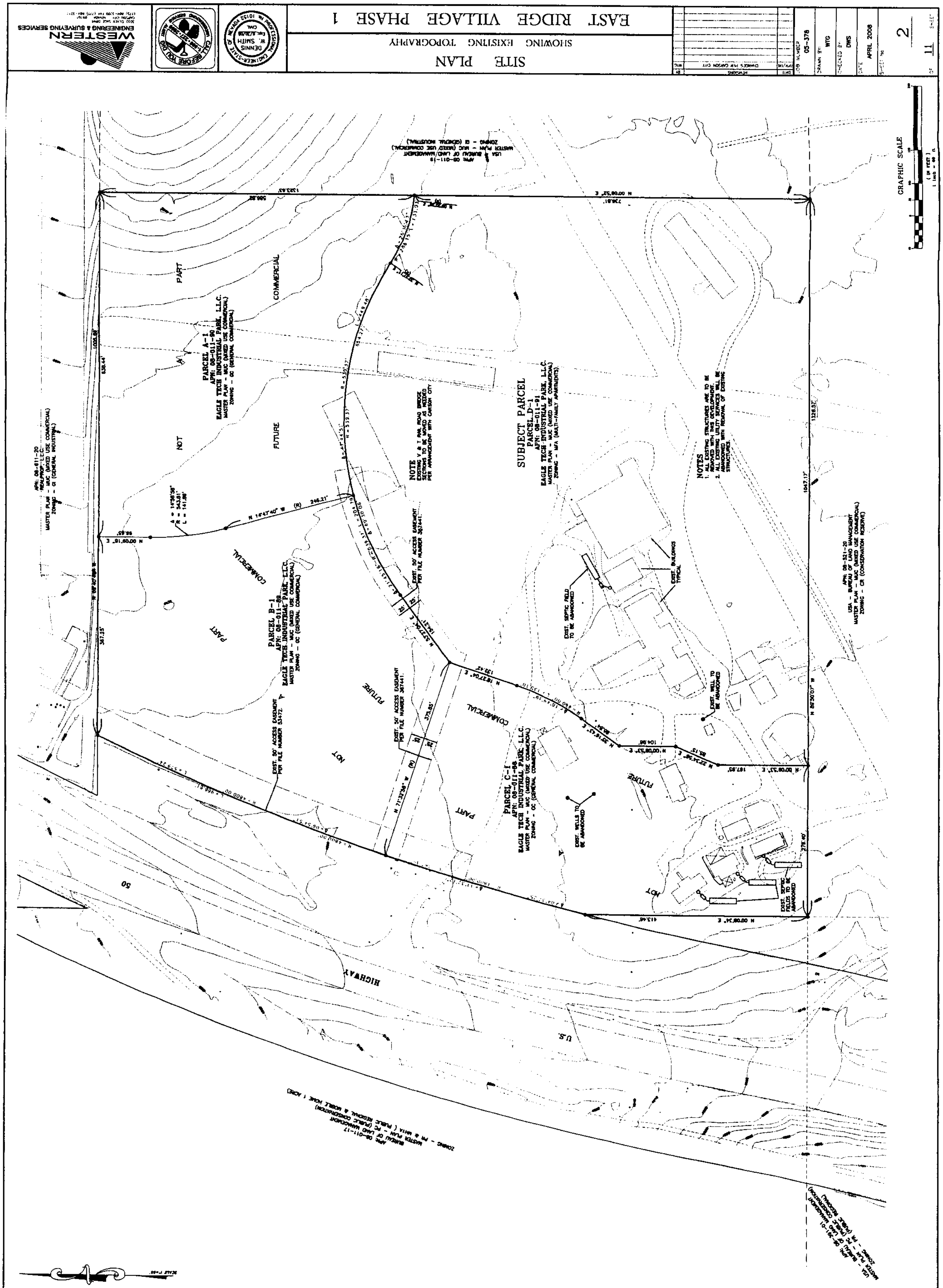
WESTERN ENGINEERING & SURVEYING SERVICES

COVER SHEET
FOR
EAST RIDGE VILLAGE PHASE 1

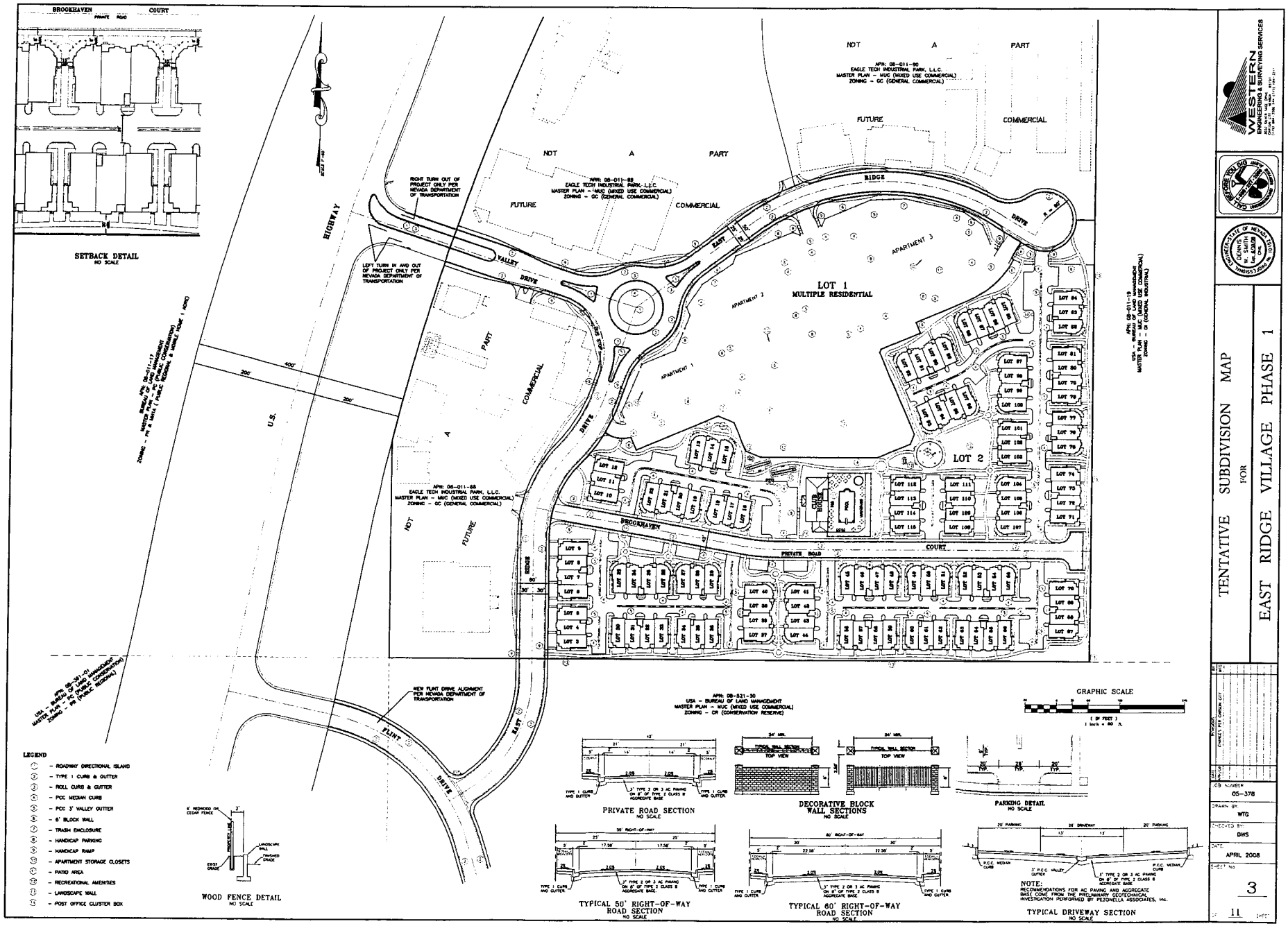
JOB NUMBER	05-378
DRAWN BY	WTG
CHECKED BY	DWS
DATE	APRIL 2008
SHEET No.	1
OF	11 SHEETS

TSM - 08 - 043

RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION



TSM - 0 8 - 0 4 3



TSM - 08 - 043

RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION

WESTERN
ENGINEERING & SURVEYING SERVICES

TENTATIVE SUBDIVISION MAP
FOR
EAST RIDGE VILLAGE PHASE 1

JOB NUMBER	05-378
DRAWN BY	WTG
CHECKED BY	DWS
DATE	APRIL 2008
SHEET NO	3
OF	11 SHEETS

EAST RIDGE VILLAGE PHASE 1

SITE PLAN

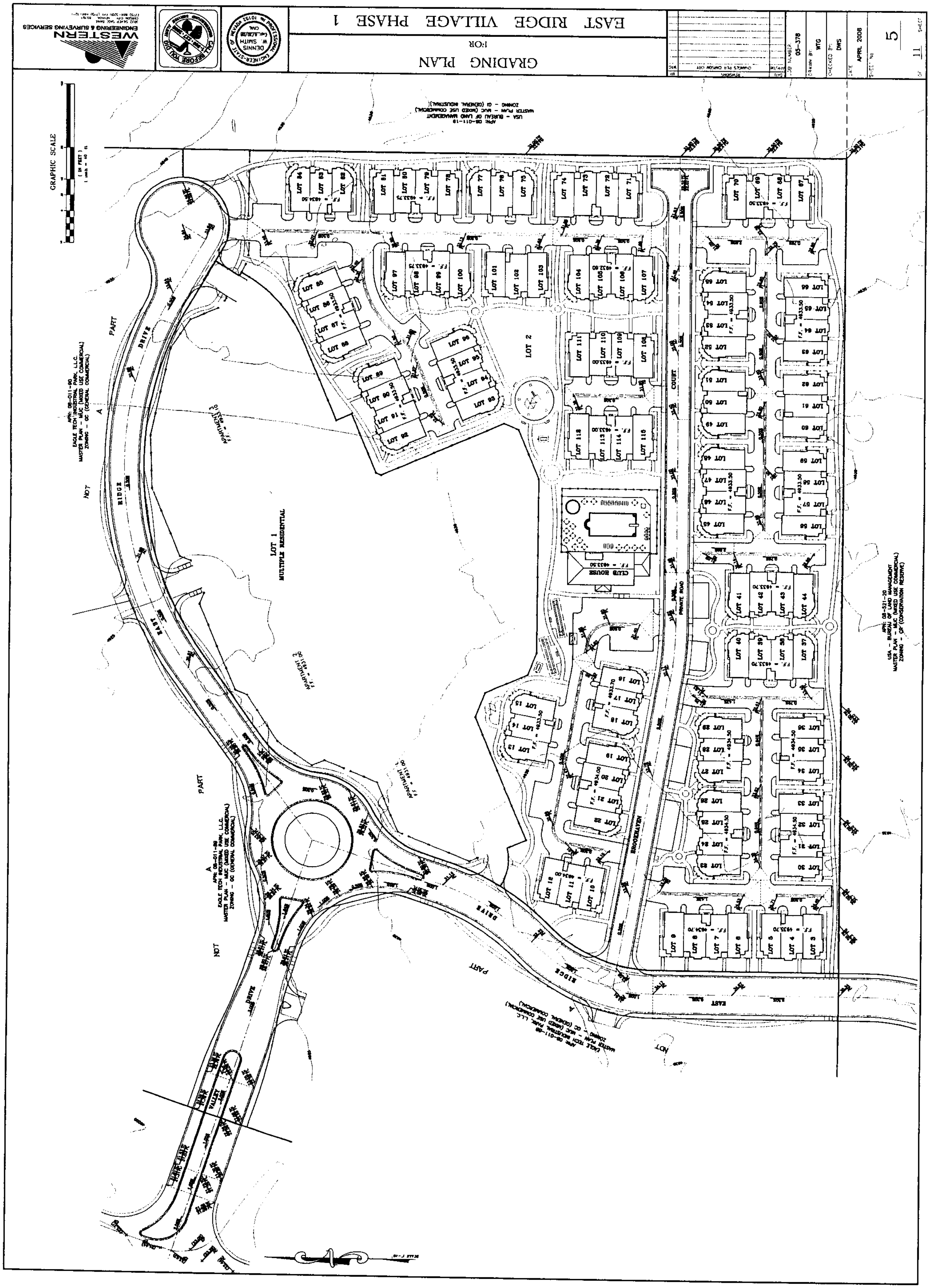
SHOWING UTILITY LAYOUT

JOB NUMBER	05-378
DRAWN BY	WTG
CHECKED BY	DMS
DATE	APRIL 2008
SHEET NO	4
OF	11

WESTERN ENGINEERING & SURVEYING SERVICES

RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION

TSM - 08 - 043



TSM - 08 - 043

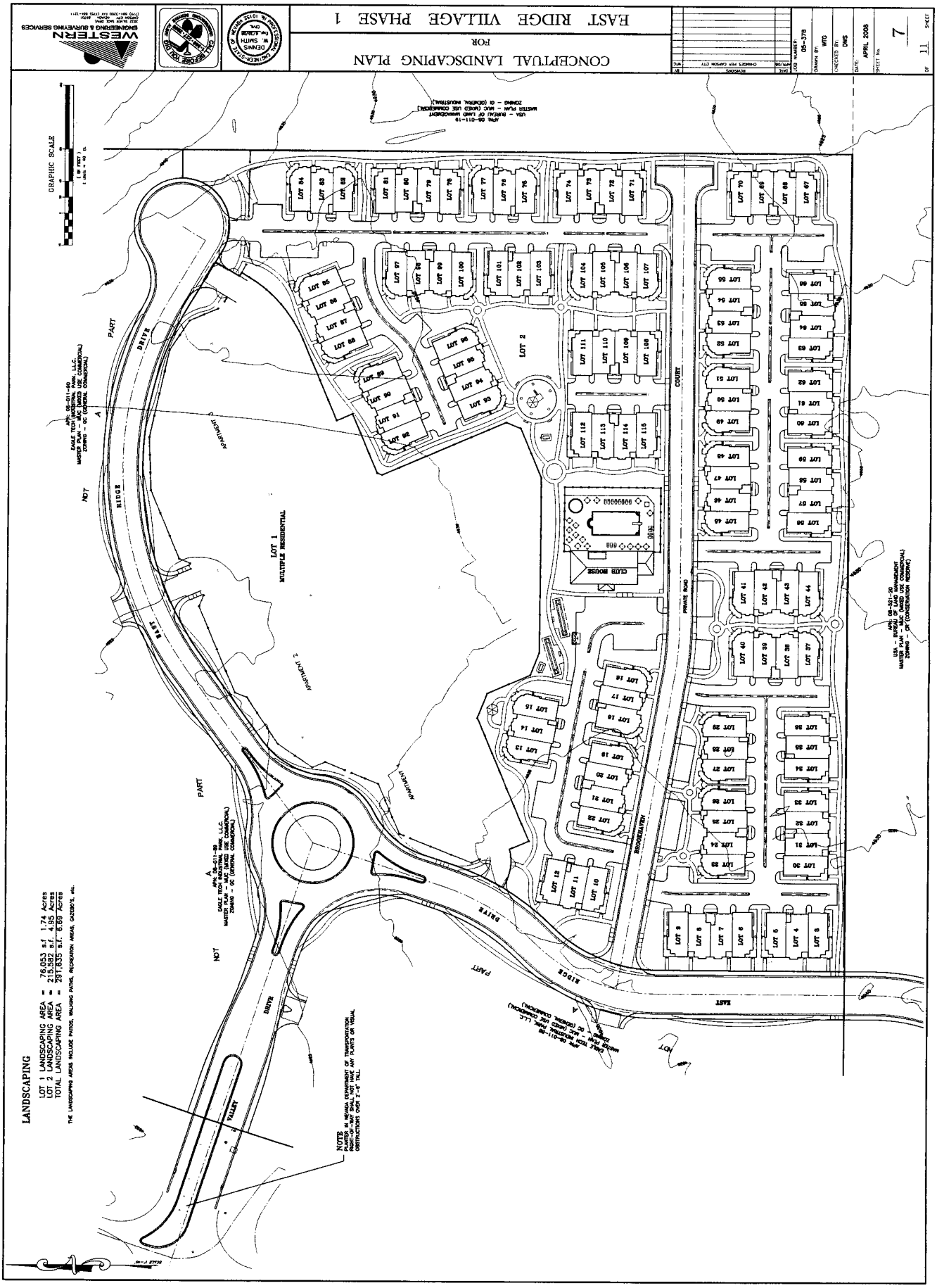
OFF-SITE SEWER AND WATER
FOR
EAST RIDGE VILLAGE PHASE 1

JOB NUMBER	05-378	
DRAWN BY	WTG	
CHECKED BY	DWS	
DATE	APRIL 2008	
SHEET No.	6	
SHEETS	11	

WESTERN ENGINEERING & SURVEYING SERVICES

RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION

TSM - 08 - 043



RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION

TSM - 08 - 043

TSM - 08 - 043

EAST RIDGE VILLAGE PHASE 1

PHASING PLAN

FOR

JOB NUMBER	05-378
DRAWN BY	WTG
CHECKED BY	DWS
DATE	APRIL 2008
SHEET No	9
OF	11

PHASE 1

PHASE 1 INCLUDES ALL NEVADA DEPARTMENT OF TRANSPORTATION IMPROVEMENTS, TRUE RIDGE DRIVE AND CONSTRUCTION OF THE CONSTRUCTION OF VALLEY DRIVE, EAST RIDGE DRIVE AND A PORTION OF BROOKHAVEN COURT (A PRIVATE ROAD), LOTS 3 THRU 36 TO BE CONSTRUCTED.

PHASE 2

PHASE 2 INCLUDES THE CONSTRUCTION OF THE CLUB HOUSE AND POOL AREA AND LOTS 37 THRU 70 CONSTRUCTED. ALSO BROOKHAVEN COURT (A PRIVATE ROAD) COMPLETED

PHASE 3

PHASE 3 IS THE CONSTRUCTION OF LOTS 71 THRU 115.

PHASE 4

PHASE 4 THE APARTMENTS TO BE CONSTRUCTED.

TSM - 08 - 043

RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION

EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPS)

SC-1: STABILIZED CONSTRUCTION ENTRANCE

- A SEPARATION GEOTEXTILE SHALL BE PLACED UNDER THE SPALLS TO PREVENT FINE SEDIMENT FROM PUMPING UP INTO THE ROCK PAD. THE GEOTEXTILE SHALL MEET THE FOLLOWING STANDARDS:
  - GRAB TENSILE STRENGTH (ASTM D4751) 200 PSI MIN
  - GRAB TENSILE ELONGATION (ASTM D4632) 30% MAX
  - MULLEN BURST STRENGTH (ASTM D3786-80A) 400 PSI MIN
  - AOS (ASTM D4751) 20-45 (U.S. STANDARD SIEVE SIZE)
- THE ENTRANCE SHALL BE CONSTRUCTED ON A FIRM, COMPACTED SUBGRADE (SEE EC-6).
- ANY SEDIMENT THAT IS TRACKED ONTO PAVEMENT SHALL BE REMOVED WITHIN 24 HOURS BY SHOVELING OR STREET SWEEPING. THE SEDIMENT COLLECTED BY SWEEPING SHALL BE REMOVED OR STABILIZED ON SITE. THE PAVEMENT SHALL NOT BE CLEANED BY WASHING DOWN THE STREET.
- IF VEHICLES ARE ENTERING OR EXITING THE SITE AT POINTS OTHER THAN THE CONSTRUCTION ENTRANCE(S), FENCING (SEE BMP EC-4) SHALL BE INSTALLED TO CONTROL TRAFFIC
- REMOVE STABILIZED CONSTRUCTION ENTRANCE AT COMPLETION OF CONSTRUCTION

EC-6: CONSTRUCTION ROAD/PARKING AREA STABILIZATION

WHENEVER POSSIBLE, CONSTRUCTION ROADS AND PARKING AREAS SHALL BE PLACED ON A FIRM, COMPACTED SUBGRADE. A 6-INCH DEPTH OF 2- TO 4-INCH CRUSHED ROCK, GRAVEL BASE, OR CRUSHED SURFACING BASE COURSE SHALL BE APPLIED IMMEDIATELY AFTER GRADING OR UTILITY INSTALLATION. A 4-INCH COURSE OF ASPHALT TREATED BASE (ATB) MAY ALSO BE USED, OR THE ROAD/PARKING AREA MAY BE PAVED.

- TEMPORARY ROAD GRADIENTS SHALL NOT EXCEED 15%. ROADWAYS SHALL BE CAREFULLY GRADED TO DRAIN. DRAINAGE DITCHES SHALL BE PROVIDED ON EACH SIDE OF THE ROADWAY IN THE CASE OF A CROWNED SECTION, OR ON ONE SIDE IN THE CASE OF A SUPER-ELEVATED SECTION. DRAINAGE DITCHES SHALL BE DIRECTED TO A SEDIMENT CONTROL BMP
- STORM DRAIN INLETS SHALL BE PROTECTED TO PREVENT SEDIMENT-LADEN WATER ENTERING THE STORM DRAIN SYSTEM (SEE BMP SC-4)

MAINTENANCE STANDARDS.

- INSPECT STABILIZED AREAS REGULARLY, ESPECIALLY AFTER LARGE STORM EVENTS
- CRUSHED ROCK, GRAVEL BASE, ETC. SHALL BE ADDED AS REQUIRED TO MAINTAIN A STABLE DRIVING SURFACE AND TO STABILIZE ANY AREAS THAT HAVE ERODED
- FOLLOWING CONSTRUCTION, THESE AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION OR BETTER TO PREVENT FUTURE EROSION

BMP SC-2: WHEEL WASH

- PRESSURE WASHING COMBINED WITH AN ADEQUATELY SIZED AND SURFACED PAD WITH DIRECT DRAINAGE TO A LARGE 10-FOOT X 10-FOOT SUMP CAN BE VERY EFFECTIVE DESIGN AND INSTALLATION SPECIFICATIONS.
- A MINIMUM OF 6 INCHES OF ASPHALT TREATED BASE (ATB) OVER CRUSHED BASE MATERIAL OR 8 INCHES OVER A GOOD SUBGRADE IS RECOMMENDED TO PAVE THE WHEEL WASH. USE A LOW CLEARANCE TRUCK TO TEST THE WHEEL WASH BEFORE PAVING. EITHER A BELLY DUMP OR LOWBOY WILL WORK WELL TO TEST CLEARANCE
- KEEP THE WATER LEVEL FROM 12 TO 14 INCHES DEEP TO AVOID DAMAGE TO TRUCK HUBS AND FILLING THE TRUCK TONGUES WITH WATER
- WHEEL WASH SYSTEMS SHOULD BE DESIGNED WITH A SMALL GRADE CHANGE, 6 TO 12 INCHES FOR A 10-FOOT-WIDE POND, TO ALLOW SEDIMENT TO FLOW TO THE LOW SIDE OF POND TO HELP PREVENT RE-SUSPENSION OF SEDIMENT
- A DRAINPIPE WITH A 2- TO 3-FOOT RISER SHOULD BE INSTALLED ON THE LOW SIDE OF THE POND TO ALLOW FOR EASY CLEANING AND REFILLING

WHEEL WASH MAINTENANCE STANDARDS:

- THE WHEEL WASH SHOULD START OUT THE DAY WITH FRESH WATER
- THE WASH WATER SHOULD BE CHANGED A MINIMUM OF ONCE PER DAY. ON LARGE EARTHWORK JOBS WHERE MORE THAN 10-20 TRUCKS PER HOUR ARE EXPECTED, THE WASH WATER WILL NEED TO BE CHANGED MORE OFTEN
- WHEEL WASH OR TIRE BATH WASTEWATER SHALL BE DISCHARGED TO A SEPARATE ON-SITE TREATMENT SYSTEM, SUCH AS CLOSED-LOOP RECIRCULATION OR LAND APPLICATION, OR TO THE SANITARY SEWER WITH PROPER APPROVAL

SC-5: SANDBAG CURB INLET SEDIMENT BARRIER

PLACE AROUND EASH DRAIN INLET

- SANDBAG CURB INLET SEDIMENT BARRIERS ARE DESIGNED TO KEEP SEDIMENT OUT OF THE STORM DRAIN SYSTEM WHEN THE ROADS ARE ALREADY PAVED
- THE SANDBAG SHOULD BE OF PLASTIC WOVEN MATERIAL RATHER THAN BURLAP. BURLAP BAGS ROT AND DETERIORATE, AND AS A RESULT, CAN CAUSE MORE PROBLEMS IF BROKEN
- CLEAN WASHED SAND SHOULD BE USED TO FILL THE BAGS
- THE SANDBAGS SHOULD BE PLACED IN A CURVED ROW FROM THE TOP OF THE CURB TO AT LEAST 3 FEET INTO THE STREET
- THE ROW SHOULD BE AT LEAST 6 FEET FROM THE INLET AND CURVED AT THE ENDS, WHICH SHOULD BE POINTING UPHILL
- SEVERAL LAYERS OF BAGS SHOULD BE OVERLAPPED AND PACKED TIGHTLY TOGETHER IN ORDER TO ELIMINATE ANY SPACES BETWEEN THE BAGS
- LEAVE A 6-INCH GAP IN THE MIDDLE OF THE TOP ROW OF SANDBAGS TO SERVE AS THE SPILLWAY

MAINTENANCE STANDARDS.

- INSPECT BMPS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED RAIN EVENTS, AFTER RAIN EVENTS, WEEKLY DURING THE RAINY SEASON, AND AT TWO-WEEK INTERVALS DURING THE NON-RAINY SEASON
- SANDBAGS EXPOSED TO SUNLIGHT WILL NEED TO BE REPLACED EVERY TWO TO THREE MONTHS DUE TO DEGRADATION OF THE BAGS
- RESHAPE AND REPLACE SANDBAGS AS NEEDED, AND REPAIR WASHOUTS OR OTHER DAMAGE
- ACCUMULATED SEDIMENT SHOULD BE REMOVED AND PLACED WHERE IT WILL NOT ENTER THE STORM DRAIN. SEDIMENT SHOULD BE REMOVED WHEN THE SEDIMENT ACCUMULATION REACHES ONE-THIRD OF THE BARRIER HEIGHT. SEDIMENT REMOVED DURING MAINTENANCE MAY BE INCORPORATED INTO EARTHWORK ON THE SITE OR DISPOSED AT AN APPROPRIATE LOCATION
- REMOVE SANDBAGS WHEN NO LONGER NEEDED. REMOVE SEDIMENT ACCUMULATION, AND CLEAN, REGRADE AND STABILIZE THE AREA

SC-7: SILT FENCE

PLACE SILT FENCE TO SLOW AND DETAIN SEDIMENT LADEN SHEET FLOW FROM DISTURBED AREAS AND TO ALLOW SETTLEMENT OF SEDIMENT PRIOR TO DISCHARGE TO STORM DRAINS.

- PLACE ALONG THE DOWN SLOPE SIDES OF THE CONSTRUCTION SITE PERIMETER BEING DISTURBED.
- PLACE AROUND ALL TEMPORARY STOCKPILES.
- FENCING MUST BE LOCATED WHERE WATERS MAY TEMPORARILY POND AND SEDIMENTS CAN BE DEPOSITED.
- THE LAST 8 FEET OF FENCE SHOULD BE ANGLED UPSLOPE IN A J OR L SHAPE TO ALLOW FOR PONDING.
- SILT FENCE MATERIAL SHALL BE WOVEN NYLON REINFORCED POLYPROPYLENE WITH A BUILT IN TOP CHORD RUNNING ALONG THE TOP OF THE FABRIC.
- MINIMUM REQUIREMENTS OF FABRIC ARE: TENSILE STRENGTH (ASTM D4632) OF 90 LBS, PUNCTURE RATING (ASTM 4833) OF 60 LBS, AND MULLEN BURST RATING (ASTM D3786) OF 280 PSI.
- FENCE POSTS SHOULD BE FREE FROM DECAY, SPLITS, OR CRACKS, HAVE A MINIMUM THICKNESS OF 2 INCHES, HAVE A MINIMUM LENGTH OF 4 FEET, SHOULD BE INSTALLED A MINIMUM DISTANCE OF 12 INCHES INTO THE GROUND, AND SHOULD HAVE A MAXIMUM SPACING OF 8 FEET. STEEL FENCE POSTS MAY ALSO BE USED. AREAS PRONE TO HIGH WINDS WILL REQUIRE CLOSER SPACING OF FENCE POSTS. FENCE POSTS SHALL BE LOCATED ON THE DOWNSTREAM SIDE OF THE FABRIC AND MESH. FABRIC MUST BE STAPLED OR WIRED TO THE POSTS.
- LOCATE A 6-INCH X 6-INCH TRENCH ON THE UPSTREAM SIDE OF THE FENCE. OVERLAP AT LEAST 6 INCHES OF FABRIC INTO THE TRENCH. KEY IN THE BOTTOM OF THE FENCE. FILL THE TRENCH WITH TAMPED NATIVE SOIL OR WASHED GRAVEL.
- INSPECT BEFORE AND AFTER EACH RAIN EVENT. REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION (UNDERCUTTING OF THE FENCE, SPLIT, TORN, AND WEATHERED FABRICS, OR SLUMPING OF THE FENCE).
- FABRICS MAY HAVE TO BE REPLACED EVERY 5-8 MONTHS.
- REMOVE SILT WHEN THE DEPTH OF THE DEPOSIT REACHES ONE-THIRD THE FENCE HEIGHT.□□FROM MAY THROUGH OCTOBER, WATER SHOULD NOT BE ALLOWED TO POND BEHIND SILT FENCES FOR MORE THAN 7 DAYS.
- REMOVE FENCING AT THE COMPLETION OF THE CONSTRUCTION PROJECT OR WHEN THE SITE HAS BEEN STABILIZED. BACKFILL ANY HOLES OR DEPRESSIONS CAUSED BY THE REMOVAL OF THE SILT FENCE.

EC-7: DUST AND WIND EROSION CONTROL

DUST CONTROL CONSISTS OF APPLYING WATER OR OTHER DUST PALLIATIVES AS NECESSARY TO PREVENT OR ALLEVIATE DUST NUISANCE GENERATED BY CONSTRUCTION ACTIVITIES. COVERING SMALL STOCKPILES OR AREAS IS AN ALTERNATIVE TO APPLYING WATER OR OTHER DUST PALLIATIVES.

- WATER PREVENTS DUST ONLY FOR A SHORT PERIOD AND SHOULD BE APPLIED DAILY (OR MORE OFTEN) TO BE EFFECTIVE. OVER WATERING MAY CAUSE EROSION
- OIL OR OIL-TREATED SUBGRADE SHOULD NOT BE USED FOR DUST CONTROL BECAUSE THE OIL MAY MIGRATE INTO DRAINAGE WAYS AND/OR SEEP INTO THE SOIL
- CHEMICALLY TREATED SUBGRADES MAY MAKE THE SOIL WATER REPELLANT, INTERFERING WITH LONG-TERM INFILTRATION AND THE VEGETATION/RE-VEGETATION OF THE SITE. SOME CHEMICAL DUST SUPPRESSANTS MAY BE SUBJECT TO FREEZING, MAY CONTAIN SOLVENTS, AND SHOULD BE HANDLED PROPERLY

EC-10: PLASTIC COVERING

- PLASTIC COVERING MAY BE USED ON DISTURBED AREAS THAT REQUIRE COVER MEASURES FOR LESS THAN 30 DAYS, EXCEPT AS STATED BELOW. PLASTIC IS PARTICULARLY USEFUL FOR PROTECTING CUT AND FILL SLOPES AND STOCKPILES.
- NOTE: THE RELATIVELY RAPID BREAKDOWN OF MOST POLYETHYLENE SHEETING MAKES IT UNSUITABLE FOR LONG-TERM (GREATER THAN SIX MONTHS) APPLICATIONS
- DUE TO RAPID RUNOFF CAUSED BY PLASTIC SHEETING, THIS METHOD SHALL NOT BE USED UPSLOPE OF AREAS THAT MIGHT BE ADVERSELY IMPACTED BY CONCENTRATED RUNOFF. SUCH AREAS INCLUDE STEEP AND/OR UNSTABLE SLOPES
- WHENEVER PLASTIC IS USED TO PROTECT SLOPES, WATER COLLECTION MEASURES MUST BE INSTALLED AT THE BASE OF THE SLOPE. THESE MEASURES INCLUDE PLASTIC-COVERED BERMS, CHANNELS, AND PIPES USED TO CONVEY CLEAN RAINWATER AWAY FROM BARE SOIL AND DISTURBED AREAS. AT NO TIME IS CLEAN RUNOFF FROM A PLASTIC COVERED SLOPE TO BE MIXED WITH DIRTY RUNOFF FROM A PROJECT
- OTHER USES FOR PLASTIC INCLUDE:

1. TEMPORARY DITCH LINER.
2. POND LINER IN TEMPORARY SEDIMENT POND.
3. LINER FOR BERMED TEMPORARY FUEL STORAGE AREA IF PLASTIC IS NOT REACTIVE TO THE TYPE OF FUEL BEING STORED.
4. EMERGENCY SLOPE PROTECTION DURING HEAVY RAINS

DESIGN AND INSTALLATION SPECIFICATIONS:

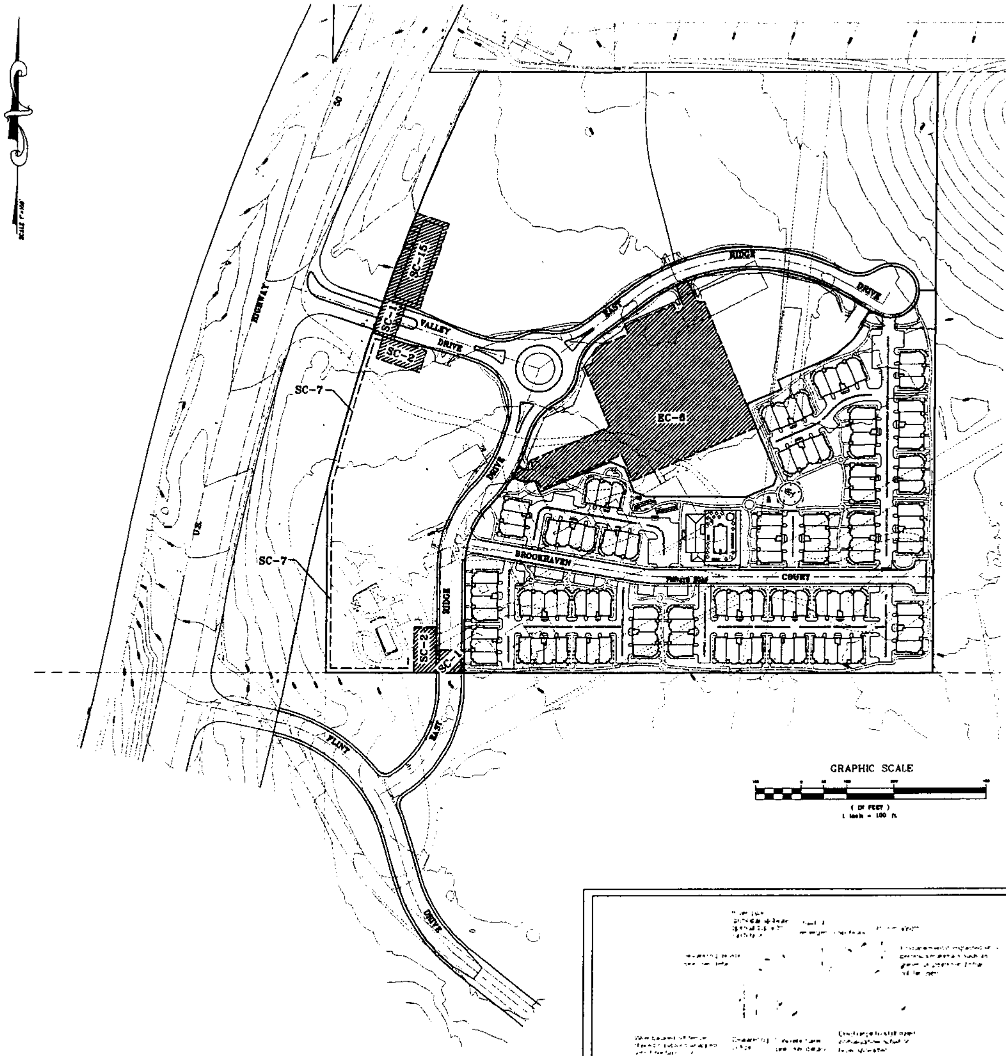
- PLASTIC SLOPE COVER MUST BE INSTALLED AS FOLLOWS:

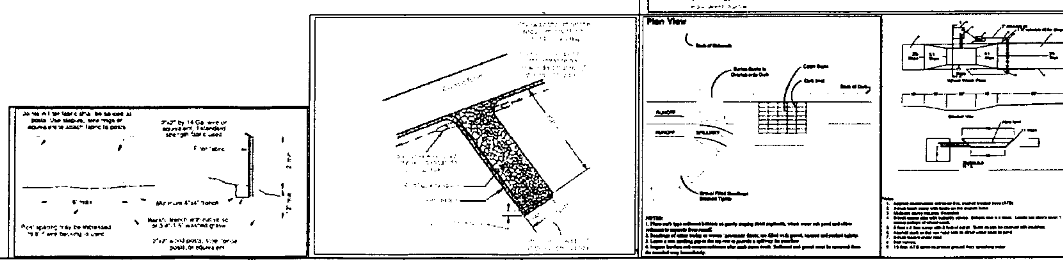
1. RUN PLASTIC UP AND DOWN SLOPE, NOT ACROSS SLOPE.
2. PLASTIC MAY BE INSTALLED PERPENDICULAR TO A SLOPE IF THE SLOPE LENGTH IS LESS THAN 10 FEET.
3. MINIMUM OF 8-INCH OVERLAP AT SEAMS.
4. ON LONG OR WIDE SLOPES, OR SLOPES SUBJECT TO WIND, ALL SEAMS SHOULD BE TAPED.
5. PLACE PLASTIC INTO A SMALL (12-INCH WIDE BY 6-INCH DEEP) SLOT TRENCH AT THE TOP OF THE SLOPE AND BACKFILL WITH SOIL TO KEEP WATER FROM FLOWING UNDERNEATH.
6. PLACE SAND FILLED BURLAP OR GEOTEXTILE BAGS EVERY 3 TO 6 FEET ALONG SEAMS AND POUND A WOODEN STAKE THROUGH EACH TO HOLD THEM IN PLACE.
7. INSPECT PLASTIC FOR RIPS, TEARS, AND OPEN SEAMS REGULARLY AND REPAIR IMMEDIATELY. THIS PREVENTS HIGH VELOCITY RUNOFF FROM CONTACTING BARE SOIL THAT CAUSES EXTREME EROSION.
8. SANDBAGS MAY BE LOWERED INTO PLACE TIED TO ROPES. HOWEVER, ALL SANDBAGS MUST BE STAKED IN PLACE.

- PLASTIC SHEETING SHALL HAVE A MINIMUM THICKNESS OF 0.06 MILLIMETERS (2.5 MILS)
- IF EROSION AT THE TOE OF A SLOPE IS LIKELY, A GRAVEL BERM, RIPRAP, OR OTHER SUITABLE PROTECTION SHALL BE INSTALLED AT THE TOE OF THE SLOPE IN ORDER TO REDUCE THE VELOCITY OF RUNOFF

MAINTENANCE STANDARDS.

- TORN SHEETS MUST BE REPLACED AND OPEN SEAMS REPAIRED
- IF THE PLASTIC BEGINS TO DETERIORATE DUE TO ULTRAVIOLET RADIATION; IT MUST BE COMPLETELY REMOVED AND REPLACED
- WHEN THE PLASTIC IS NO LONGER NEEDED IT SHALL BE COMPLETELY REMOVED





EROSION CONTROL PLAN

FOR

EAST RIDGE VILLAGE PHASE 1

JOB NUMBER	05-378
DRAWN BY:	WTG
CHECKED BY:	DWS
DATE:	APRIL 2008
SHEET No.	10
OF	11 SHEETS

WESTERN ENGINEERING & SURVEYING SERVICES

DENNIS W. SMITH

CALL BEFORE YOU DIG

TSM - 0 8 - 0 4 3

CROSS SECTIONS
FOR
EAST RIDGE VILLAGE PHASE 1

WESTERN ENGINEERING & SURVEYING SERVICES

JOB NUMBER	05-378
DRAWN BY	WTG
CHECKED BY	DMS
DATE	APRIL 2008
SHEET NO.	11 OF 11

SECTION A-A
ALONG SOUTHERLY PROPERTY LINE
SCALE 1" = 30'

SECTION B-B
ALONG WESTERLY SIDE OF PROJECT
SCALE 1" = 30'

RECEIVED
JUN 09 2008
CARSON CITY
PLANNING DIVISION

TSM - 08 - 043