ATTACHMENTS

1. Drainage Calculations
2. Traffic Impact Analysis

1. DRAINAGE CALCULATIONS

BAKER-WILLIAMS ENGINEERING GROUP

TECHNICAL MEMORANDUM NO 1

Date: April 08, 2016

BY: Michael T Robertson, PE 39875

SUBJECT: Shingle Springs Village – Storm Drainage Impacts to Shingle Springs Road
SW Corner Shingle Springs Drive and HWY 50
Our file no. 14-11-053

INTRODUCTION

The project site is a 34.6 acres parcel located on the west side of shingle springs road south of HWY 50. The purpose of this technical memorandum (TM) is to analyze the potential impacts to the existing drainage improvements along the project frontage at Shingle Springs Road related to the project development.

SHED-EXISTING CONDITIONS

The upper reaches of the drainage shed area is a steep sloped terrain (20% to 40%) with heavily wooded trees and vegetation. The upper/wooded portions of the shed is intended to remain undisturbed. The lower portion of the shed is native grassland with moderate slopes ranging from 5% to 10%. The site generally drains easterly toward shingle springs road and eventuality northerly to a 48 inch corrugated steel pipe (csp) culvert under Shingle Springs Road.

The total shed area to the 48 inch csp is 47.8 acres. The shed to the 48" culvert is composed of four areas. Shed A is an offsite 5.3 ac south of the project surface draining to Shingle Springs Road. Shed B is mostly onsite area of 21.9 acres also draining toward Shingle Springs Road. Shed C is the northerly onsite 15.6 acres that drains toward an onsite ditch that flows to the 48" culvert under Shingle Springs Road. Shed D is a westerly offsite 5.0 acre area that drains to Hwy 50 then northeasterly and eventually drains into the project connecting to the onsite drainage ditch in shed C which flows to the 48" culvert at Shingle Springs Road within the Caltrans ROW then continues to flow northeasterly to an un-named tributary of Tennessee Creek then continues northern under HWY 50. (See existing shed-quad map).

The 48" culvert was analyzed for inlet control conditions and has the capacity to convey 65 cfs while flowing full without considering additional headwater above the pipe. The pipe has some additional conveyance capacity available when accounting for the headwater above pipe.

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SHED-POST PROJECT CONDITIONS.

The project is intended to be constructed in phases where phase one is at the northeasterly portion of the property which is also at the lowest portion of the 47.8 acre shed. Phase one will install storm drains that are sized for the ultimate site development including the offsite 5 acre shed area D and direct the runoff to the existing onsite ditch outfall at the phase one easterly boundary adjacent to the Caltrans ROW. The outfall ditch continues to the 48 inch csp culvert described above.
The phase one driveway will have a 24" culvert conveying the runoff from Shingle Springs Road toward the 48" csp culvert.

The projects phase two will be designed to intercept the Shed B runoff keeping it from draining to the Shingle Springs Road ditch. The phase two pipe system will convey the runoff to the phase one drain system. The 5.3 acre offsite shed area A will continue to drain toward Shingle Springs Road then continue northerly in the roadside ditch, through the phase two driveway culverts then to the phase one driveway culvert. The project will reduce the shed area draining to Shingle Spring Road ditch by over 20 acres.

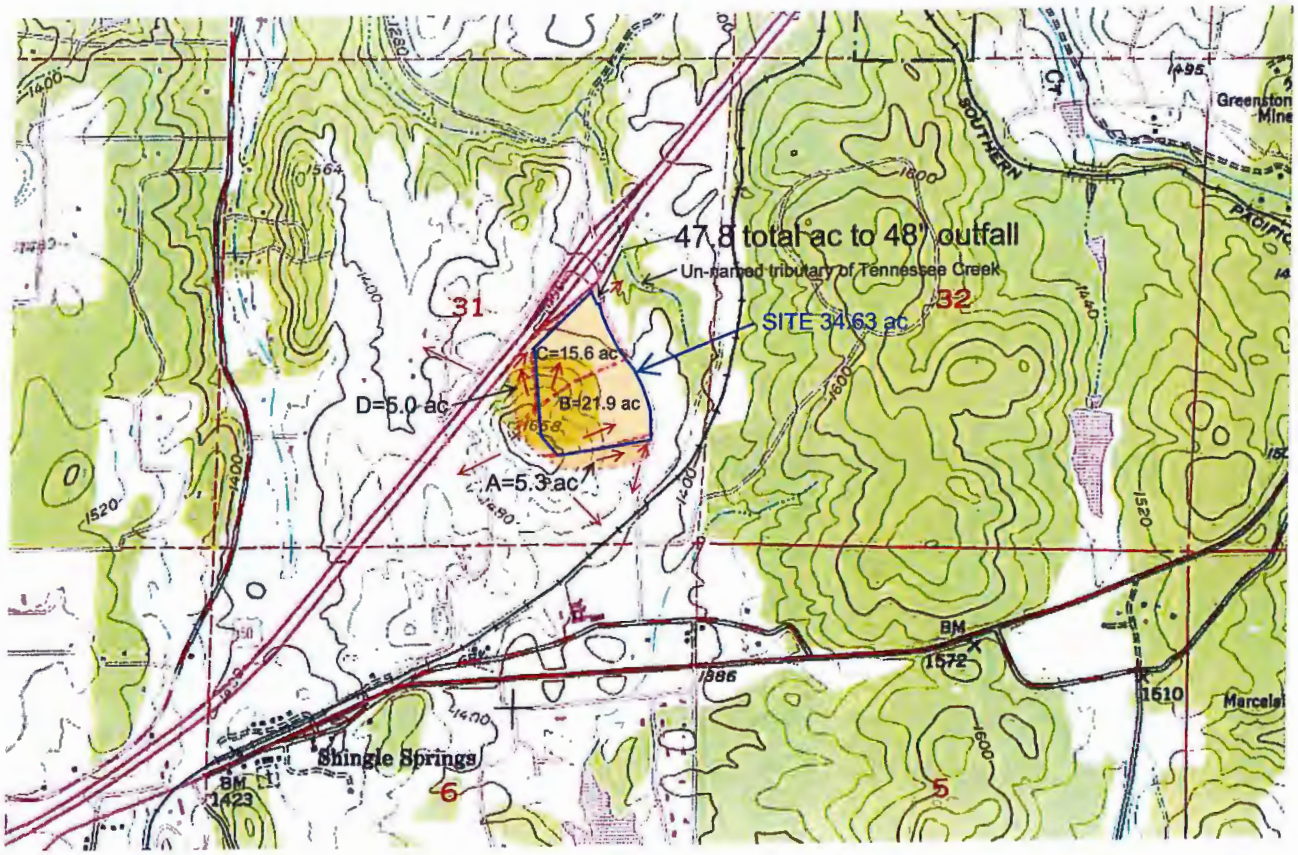
The post project drainage calculations include 10 year and 100 year flows. The post project 100 year runoff at the existing 48" culvert is estimated to be about 35.1 cfs (see project drainage shed map and calculation at node N-out). The existing capacity of the culvert is estimated at about 65 cfs, (see culvert chart 5).

Conclusion

The phase one project storm drain system was analyzed for ultimate conditions and is shown to not adversely impact the existing immediate downstream 48" culvert under Shingle Springs Road. It is also shown that the overall project development will reduce impacts to the Shingle Springs Road ditch by redirecting approximately 20 acres of the existing shed into the post project drain system.

BAKER-WILLIAMS ENGINEERING GROUP

MICHAEL T. ROBERTSON, PE39875
President



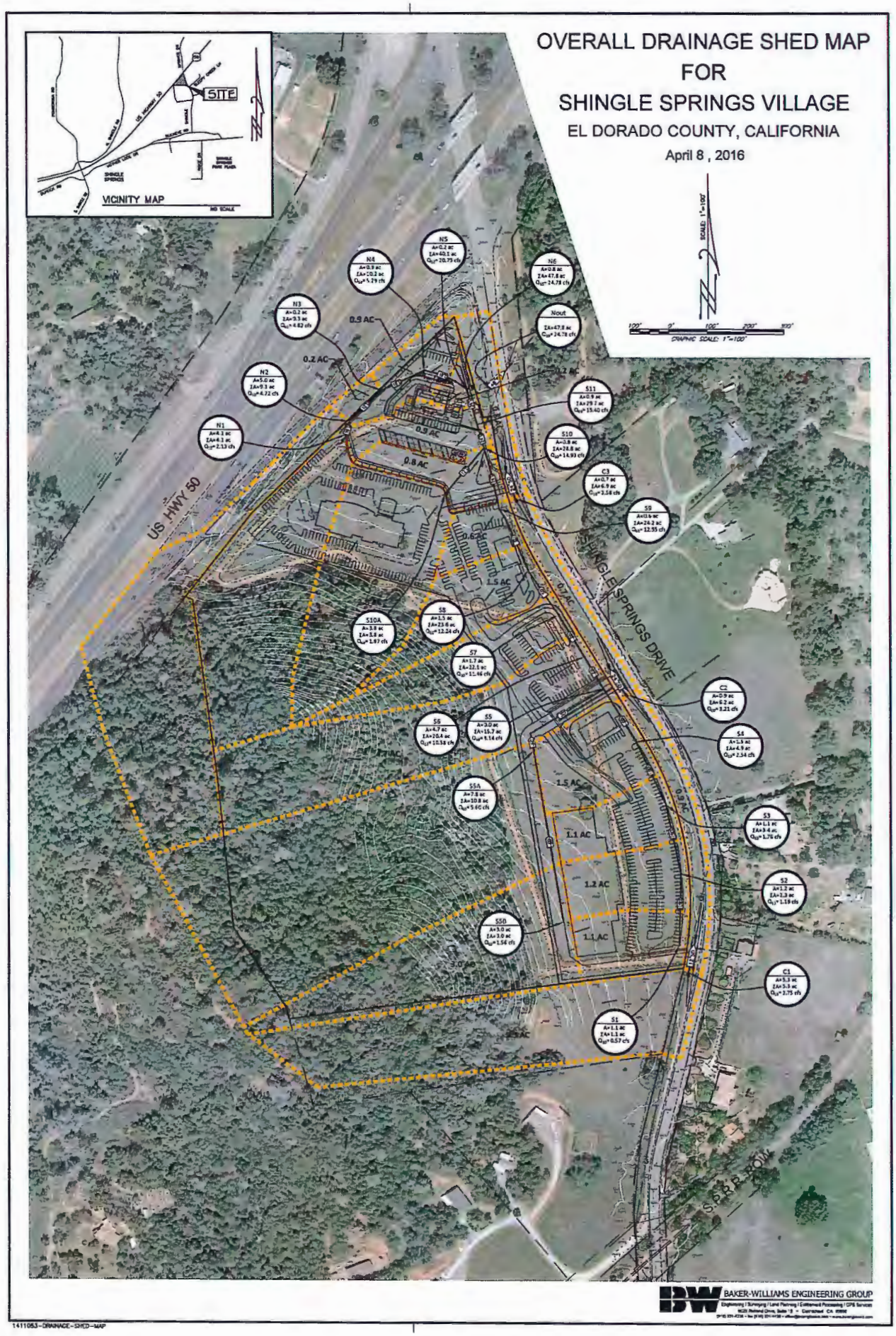
QUAD MAP FOR SHINGLE SPRINGS VILLAGE

SHINGLE SPRINGS VILLAGE
Shingle Springs, CA
Drainage Calculations

FROM	TO	AREA	CUM AREA	OVERLAND					COLLECTOR				CHANNEL							Tr_{TOTAL}	CN [7] Curve	C [7]	I_{10} [8]	I_{100} [9]	Q_{10}= C*I_{10}*A	Q_{100}= C*I_{100}*A	HGL-10 SLOPE
				L	n [1]	P_2 [2]	s	Tr [3]	L	s	v [4]	Tr	L	n	s	D	Q_2 [5]	v [6]	Tr								
				(ft)		(in)	(ft/ft)	(min)	(ft)	(ft/ft)	(ft/sec)	(min)	(ft)		(ft/ft)	(in)	cfs	(ft/s)	(min)	(min)							
N1	N2	4.1	4.1	300	0.40	3.065	0.1250	25.39	330	0.0400	4.07	1.35	35	0.013	0.0050	18	1.44	3.26	0.18	26.92	95	0.85	0.610	0.864	2.13	3.01	0.0004
N2	N3	5.0	9.1									0.00	115	0.013	0.0050	18	3.20	4.05	0.47	27.39	95	0.85	0.610	0.864	4.72	6.68	0.0020
N3	N4	0.2	9.3									0.00	120	0.013	0.0050	18	3.27	4.08	0.49	27.88	95	0.85	0.610	0.864	4.82	6.83	0.0021
N4	N5	0.9	10.2									0.00	125	0.013	0.0050	18	3.59	4.20	0.50	28.38	95	0.85	0.610	0.864	5.29	7.49	0.0025
N5	N6	0.2	40.1									0.00	15	0.013	0.0100	24	14.11	7.60	0.03	28.41	95	0.85	0.610	0.864	20.79	29.45	0.0085
N6	N OUT	0.8	47.8						50	0.0100	1.61	0.52							0.00	28.93		0.85	0.610	0.864	24.78	35.10	
N OUT																											
S1	S2	1.1	1.1	300	0.40	3.065	0.1250	25.39	330	0.0400	4.07	1.35	185	0.013	0.0050	12	0.39	2.34	1.32	28.06	95	0.85	0.610	0.864	0.57	0.81	0.0003
S2	S3	1.2	2.3										185	0.013	0.0050	12	0.81	2.86	1.08	29.14	95	0.85	0.610	0.864	1.19	1.69	0.0011
S3	S4	1.1	3.4										165	0.013	0.0050	18	1.20	3.10	0.89	30.02	95	0.85	0.610	0.864	1.75	2.50	0.0003
S4	S5	1.5	4.9										185	0.013	0.0050	18	1.72	3.43	0.90	30.92	95	0.85	0.610	0.864	2.54	3.60	0.0006
S5	S6	0.0	15.7										40	0.013	0.0050	24	5.52	4.63	0.14	31.07	95	0.85	0.610	0.864	8.14	11.53	0.0013
S6	S7	4.7	20.4										200	0.013	0.0050	24	7.18	4.96	0.67	31.74	95	0.85	0.610	0.864	10.58	14.98	0.0022
S7	S8	1.7	22.1										100	0.013	0.0050	24	7.78	5.06	0.33	32.07	95	0.85	0.610	0.864	11.46	16.23	0.0026
S8	S9	1.5	23.6										245	0.013	0.0050	24	8.30	5.14	0.79	32.86	95	0.85	0.610	0.864	12.24	17.33	0.0029
S9	S10	0.6	24.2										145	0.013	0.0050	24	8.52	5.17	0.47	33.33	95	0.85	0.610	0.864	12.55	17.77	0.0031
S10	S11	0.8	28.8										65	0.013	0.0050	24	10.13	5.39	0.20	33.53	95	0.85	0.610	0.864	14.93	21.15	0.0044
S11	N5	0.9	29.7										100	0.013	0.0050	24	10.45	5.43	0.31	33.84	95	0.85	0.610	0.864	15.40	21.81	0.0046
N5																											
S5B	S5A	3.0	3.0	300	0.40	3.065	0.1250	25.39	180	0.0200	2.87	1.04	185	0.013	0.0100	18	1.06	3.82	0.81	27.24	95	0.85	0.610	0.864	1.56	2.20	0.0002
S5A	S5	7.8	10.8										100	0.013	0.0100	18	3.80	5.48	0.30	27.54	95	0.85	0.610	0.864	5.60	7.93	0.0028
S5																											
S10A	S10	3.8	3.8	300	0.40	3.065	0.1250	25.39	250	0.0300	3.52	1.18	160	0.013	0.0050	12	1.34	3.26	0.82	27.39	95	0.85	0.610	0.864	1.97	2.79	0.0031
S10																											
C1	C2	5.3	5.3	300	0.40	3.065	0.1250	25.39	660	0.0125	1.80	6.10	80	0.013	0.0100	12	1.87	4.61	0.29	31.77	95	0.85	0.610	0.864	2.75	3.89	0.0060
C2	C3	0.9	6.2						500	0.0125	1.80	4.62	80	0.013	0.0100	24	2.18	4.56	0.29	36.69	95	0.85	0.610	0.864	3.21	4.55	0.0002
C3	N OUT	0.7	6.9						210	0.0125	1.80	1.94	80	0.013	0.0100	24	2.43	4.72	0.28	38.91	95	0.85	0.610	0.864	3.58	5.07	0.0003
N OUT																											

NOTES

1) Manning's value "n" for overland release is from Table 2.4.3 of the El Dorado County Drainage Manual.
2) The design rainfall value is based of the Mean Annual Rainfall Map of 34 inches/year in conjunction with the 2 year design rainfall table and 24 hour design storm.
3) Tr (OVERLAND) is calculated using equation 2.4.7 in the El Dorado County Drainage Manual.
4) Collector velocity is calculated using equations 2.4.8 and 2.4.9 of the El Dorado County Drainage Manual based on unpaved or paved surface, respectively.
5) The 2 year storm is used for the purposed of computing the time of concentration within the propose pipe system as outlined in the El Dorado County Drainage Manual. The C value was assumed to be 0.85 for commercial development, I_2 was assumed to be 0.414 based on the 2 year 30 minute storm.
6) Velocity in the pipe was calculated using Manning's equation for open channel flows as the 2 year storm does not fill the pipe.
7) CN Curve and C value were taken from Table2.2a in the El Dorado County Drainage Manual for a commercial development with class D soil
8) I_{10} was derived from the 10 year Design Rainfall Table in the Section 2 of the El Dorado County Drainage Manual.
9) I_{100} was derived from the 100 year Design Rainfall Table in the Section 2 of the El Dorado County Drainage Manual.
10) The design flows for both the 10 and 100 year storms were derived using the Peak Discharge Method as outlined in section 2.5 of the El Dorado County Drainage Manual.


OVERALL DRAINAGE SHED MAP
FOR
SHINGLE SPRINGS VILLAGE
EL DORADO COUNTY, CALIFORNIA
April 8 , 2016
SITE
VICINITY MAP
US HWY 50
SHINGLE SPRINGS DRIVE
S.P.R.R. ROW
BAKER-WILLIAMS ENGINEERING GROUP
1411053-DRAINAGE-SHED-MAP

Go Back to Part II

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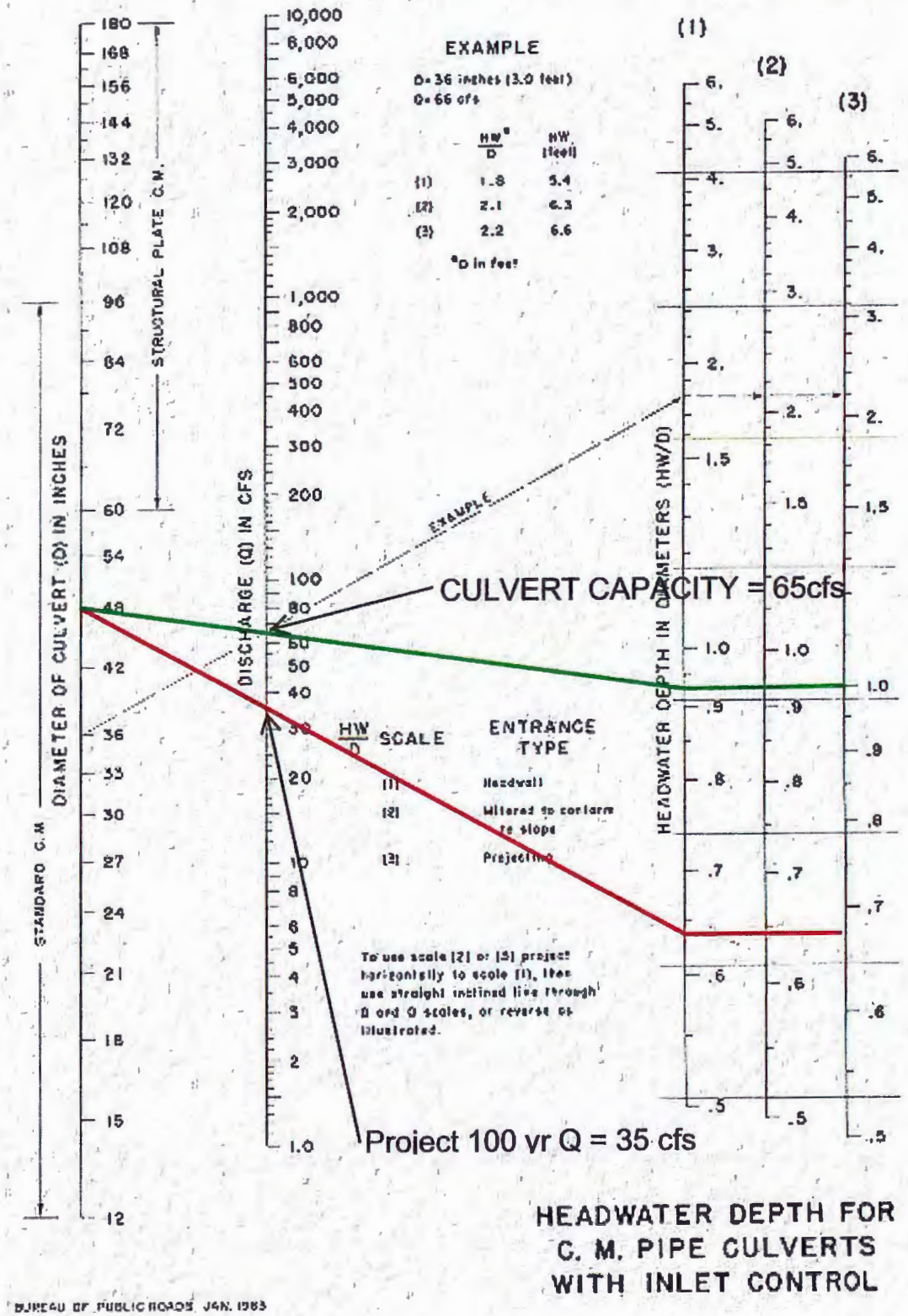
CHART 5



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

48" CULVERT AT PROJECT OUTFALL

2. TRAFFIC IMPACT ANALYSIS

TRAFFIC IMPACT ANALYSIS

FOR

SHINGLE SPRINGS VILLAGE PHASE I

Shingle Springs, El Dorado County CA

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3598-01

Shingle Springs Village.rpt

TRAFFIC IMPACT ANALYSIS FOR SHINGLE SPRINGS VILLAGE PHASE I
Shingle Springs, El Dorado County

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TRAFFIC IMPACT ANALYSIS FOR
SHINGLE SPRINGS VILLAGE PHASE I
Shingle Springs, El Dorado County

EXECUTIVE SUMMARY

- **Project Description.** This study evaluates the traffic impacts associated with the proposed convenience commercial uses planned at the US 50 / Shingle Springs Drive interchange in El Dorado County. The initial project (Phase I) consists of Gasoline Sales / Convenience Store / Car Wash on the west side of Shingle Springs Drive immediately south of the interchange. This project would generate 807 new daily trips with 54 new trips generated in the a.m. peak hour and 73 trips generated in the p.m. peak hour.

  Additional development may occur in the future, and a "Build Out" (e.g., addition of Phase II development) condition has also been evaluated for the purpose of confirming the adequacy of project access under long term conditions. Buildout development was assumed to include a hotel, two fast food restaurants and roughly 50,000 sf of retail space with two additional access points on Shingle Springs Drive.

- **Existing Conditions.** The operation of intersections on Shingle Springs Drive from US 50 to Buckeye Road and intersections on Mother Lode Drive from French Creek Road to Greenstone Road was included in this analysis. With one exception, all study intersections operate with a Level of Service that satisfies the minimum requirements of El Dorado County (i.e., LOS D in rural areas and LOS E in community areas). However, at the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** the northbound approach operates at LOS E in the a.m. peak hour, which exceeds the LOS D minimum standard. It is also important to note that short periods of congestion typically occur near schools during the periods before and after the school day. Congestion and delay can occur as a result of the constraints created by school drop-off and loading activities, even if the adjoining circulation system has the capacity to accommodate the actual traffic volumes.

  Producing a Level of Service for the northbound movement that meets the LOS D minimum standard might be accomplished in several ways:

  - ***Installing an all-way stop.*** An all-way stop would deliver an overall LOS C, but all-way stops can be problematic near schools during peak periods.
  - ***Installing a traffic signal.*** Installing a traffic signal would likely require widening Mother Lode Drive to provide separate left turn lanes, but would deliver LOS B.
  - ***Widening Mother Lode Drive to provide separate eastbound and westbound left turn lanes while retaining northbound and southbound stop signs.*** To a minor degree this treatment could allow northbound motorists to make "two-step" left turns by pausing in the eastbound left turn lane before merging into eastbound traffic. However, during peak periods before school this area is dominated by eastbound left turns. Assuming space for one waiting vehicle, this treatment would yield LOS D.

The a.m. peak hour traffic volume at the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection reaches the level that satisfies peak hour traffic signal warrants. However, because most of the traffic on the high volume southbound approach is turning right, a traffic signal is not justified at this time.

The US 50 / East Shingle Springs interchange ramps operate with Level of Service that satisfy the minimum LOS D standard. No improvements are justified today.

- **Existing Plus Project Impacts / Mitigations.** With the addition of trips generated by the proposed project all but one study area intersection will continue to operate with Level of Service that satisfies the El Dorado County minimum standards. The Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection will continue to operate at LOS E in the a.m. peak hour. However, because the intersection Level of Service exceeds the minimum standard with and without the project, the significance of impact is based on the incremental increase in traffic volume. Because the project adds fewer than 10 peak hour trips, the impact is not significant and no improvements are required.

  The project shall:

  Pay TIM Fees: The project shall contribute its fair share to the cost of regional circulation improvements via the existing countywide traffic impact mitigation (TIM) fee program.

  Improve Project Access in a manner that is consistent with the requirements of the "Build Out" condition. If the project area is built out, then a continuous Two-Way Left-Turn (TWLT) lane will be needed on Shingle Springs Drive in the vicinity of the project access. Ideally, the TWLT lane should be installed when the project proceeds, but at a minimum because this is a cumulative mitigation the project access should be positioned to accommodate construction of the TWLT lane when future development occurs.

- **Background 2025 Conditions – Improvement Recommendations.** Two intersections will operate with Levels of Service that exceed adopted El Dorado County minimum standards. The southbound approach at the **Buckeye Road / Shingle Springs Drive intersection** will operate at LOS E. This exceeds the LOS D minimum.

  Two improvements are possible. An all-way stop would deliver LOS B, which would satisfy the minimum standard. However, all-way stops can sometimes be problematic in the vicinity of schools due to the parking characteristics of school traffic. Widening the southbound approach to provide separate left turn and right turn lanes would yield LOS C.

  The northbound Holiday Lake Drive approach at the **Mother Lode Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS D minimum. Producing an adequate Level of Service for the northbound movement could be accomplished by the same improvements contemplated for existing conditions. An all-way stop would deliver an overall LOS D, but all-way stops can be problematic near schools during peak periods.

Installing a traffic signal would likely require widening Mother Lode Drive to provide separate left turn lanes, but would deliver LOS B.

- **2025 Plus Project Impacts / Mitigations.** The same two intersections that will operate with Levels of Service below standard without the project will do so if the project proceeds. At the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** the project adds eight trips to the intersection during the a.m. peak hour. As this value is less than the ten trip increment permitted under El Dorado County guidelines, the project's impact is not significant, and mitigation is not required.

  At the **Shingle Springs Drive / Buckeye Road intersection** the southbound approach will operate at LOS E in the a.m. peak hour with and without the project. At this location the project adds fourteen trips in the a.m. peak hour. As this value exceeds the ten trip increment permitted under El Dorado County guidelines, the project's impact is significant.

  Unacceptable operations at this intersection are due to increased traffic from planned development. The intersection operates at unacceptable LOS E under 2025 conditions without the project, which includes traffic growth from other foreseeable projects. Therefore the project is only responsible for its proportional share of the proposed mitigation under this scenario. Since the impact is identified under the 2025 scenario, the timing of the improvement is a function of the rate of population and employment growth.

  The significant impact at this intersection shall be mitigated with the installation of an all-way stop or widening of the southbound approach to provide separate left and right turn lanes as determined by El Dorado County.

  Appropriate mitigation, as determined by the El Dorado County Community Development Agency (CDA), includes one of the following:

  - Payment of traffic impact mitigation (TIM) fees to satisfy the project's proportional share obligation, as approved by CDA, towards the improvement if the improvement is included in the 20-Year Capital Improvement Program (CIP), OR
  - Construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others, OR
  - Payment of the project's proportional share, as approved by CDA, if the improvement is constructed by others, but not included in the 20-Year CIP.

- **Year 2035 Conditions – Improvement Recommendations.** The same two un-signalized intersections which operated with deficient Level of Service in 2025 will operate with Levels of Service that exceed the minimum standard in 2035.

  The southbound approach at the **Buckeye Road / Shingle Springs Drive intersection** will operate at LOS E. This exceeds the LOS D minimum. An all-way stop would deliver LOS C, which would satisfy the minimum standard. Separate left turn and right turn lanes on the southbound approach would deliver LOS D.

The northbound Holiday Lake Drive approach at the **Mother Lode Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS E minimum. Producing a Level of Service D for the northbound movement would require a traffic signal.

- **2035 Plus Project Phase I Impacts / Mitigations.** The same two intersections will be deficient if the project proceeds.

The **Shingle Springs Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS E standard. The project adds more than ten trips to the intersection, and its impact is significant. The same mitigation required for Year 2025 Plus project Phase I impacts is required.

Unacceptable operations at this intersection are due to increased traffic from planned development. The intersection operates at unacceptable LOS E under 2035 conditions without the project, which includes traffic growth from other foreseeable projects. Therefore the project is only responsible for its proportional share of the proposed mitigation under this scenario. Since the impact is identified under the 2035 scenario, the timing of the improvement is a function of the rate of population and employment growth.

The significant impact at this intersection shall be mitigated with the installation of an all-way stop or widening of the southbound approach to provide separate left and right turn lanes as determined by El Dorado County.

Appropriate mitigation, as determined by the El Dorado County Community Development Agency (CDA), includes one of the following:

- Payment of traffic impact mitigation (TIM) fees to satisfy the project's proportional share obligation, as approved by CDA, towards the improvement if the improvement is included in the 20-Year Capital Improvement Program (CIP), OR
- Construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others, OR
- Payment of the project's proportional share, as approved by CDA, if the improvement is constructed by others, but not included in the 20-Year CIP.

If the project proceeds, the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate with LOS E on the northbound approach in the p.m. peak hour. As LOS E exceeds the minimum LOS D standard the impact is significant under El Dorado County standards. Mitigation is required, and may include an all-way stop, TWLT lane or traffic signal as determined by El Dorado County.

Unacceptable operations at this intersection are due to increased traffic from planned development. The intersection operates at unacceptable LOS E under 2035 conditions without the project, which includes traffic growth from other foreseeable projects. Therefore the project is only responsible for its proportional share of the proposed mitigation under this

scenario. Since the impact is identified under the 2035 scenario, the timing of the improvement is a function of the rate of population and employment growth.

The significant impact at this intersection shall be mitigated with the installation of an all-way stop, widening Mother Lode Drive to provide a TWLT lane or installing a traffic signal as determined by El Dorado County.

Appropriate mitigation, as determined by the El Dorado County Community Development Agency (CDA), includes one of the following:

- Payment of traffic impact mitigation (TIM) fees to satisfy the project's proportional share obligation, as approved by CDA, towards the improvement if the improvement is included in the 20-Year Capital Improvement Program (CIP), OR
- Construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others, OR
- Payment of the project's proportional share, as approved by CDA, if the improvement is constructed by others, but not included in the 20-Year CIP.

- **2035 Plus Build Out Impacts – Mitigations.** Four intersections will operate with Level of Service that exceeds the minimum standard if the project area is built out (e.g. both Phase I and Phase II development). It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

  At the **Shingle Springs Drive / Westbound US 50 ramps intersection** motorists waiting at the off ramp are projected to experience delays that are indicative of LOS F. This exceeds the minimum LOS D standard, and is a significant impact under El Dorado County guidelines, and mitigation would be required. Installing an all-way stop would deliver LOS B in the a.m. peak hour.

  The project shall:

  Under 2035 Build Out conditions, pay for the Cost of Shingle Springs Drive / US 50 Westbound Ramps Intersection Improvements, as determined by the traffic impact study for Phase II. The project proponents shall pay the cost of installing an all-way stop or other improvements, as determined by the traffic impact study for Phase II.

  At the **Shingle Springs Drive / Phase I Project Access Driveway intersection,** motorists waiting to exit would experience delays that are indicative of LOS F. As this exceeds the minimum LOS D standard, this is a significant impact, and mitigation would be required. Shingle Springs Drive should be widened to provide a continuous TWLT lane on Shingle Springs Drive along the project frontage. Eventually the lane should extend from the US 50 interchange through the southernmost access driveway intersection. With that treatment the project access would operate at LOS D.

The project shall:

Under 2035 Build Out conditions, install A TWLT lane on Shingle Springs Drive, or other improvements as determined by the traffic impact study for Phase II. The project proponents shall install a TWLT lane on Shingle Springs Drive along the length of the project frontage or other improvements, as determined by the traffic impact study for Phase II.

The **Shingle Springs Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS D standard. In this case build out of the project area (e.g. Phase I and II) adds more than ten trips to the intersection. Therefore its impact is significant. However, the same improvements that were suggested under the No Project condition would yield an acceptable Level of Service with build out of the project.

The project shall:

Under 2035 Plus Build Out conditions, fund the cost of Shingle Springs Drive / Buckeye Road Improvements as determined by the traffic impact study for Phase II. This is the same mitigation required under Year 2025 Plus Project Phase I and Year 2035 Plus Project Phase I conditions.

If the project builds out (e.g. Phase I and Phase II), the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate with LOS F on the northbound approach in the a.m. peak hour and LOS E in the p.m. peak hour . Again, LOS F exceeds the minimum LOS E standard but the intersection Level of Service exceeds the standard with and without the project. At this location the project adds more than ten trips to the intersection in the morning peak hour, and the impact is significant under El Dorado County standards.

The project shall:

Under 2035 Plus Build Out conditions, fund the cost of Mother Lode Drive / Buckeye Road / Holiday Lake Drive Improvements, as determined by the traffic impact study for Phase II. The project proponents shall pay for an all-way stop, TWLT lane or traffic signal as determined by El Dorado County pursuant to General Plan Policy TC-Xf. This is the same mitigation required for Year 2035 Plus Phase I.

- **Site Access.** The proposed site plan provides adequate throat depth at the project driveway to ensure that arriving traffic is nor blocked by the queue of vehicles waiting to exit the site. However, a median separating entering and exiting lanes is recommended under Build Out conditions to ensure that motorists do not cut across the lanes and create a queue outside of the designated lanes.

TRAFFIC IMPACT ANALYSIS FOR
SHINGLE SPRINGS VILLAGE PHASE I
Shingle Springs, El Dorado County

INTRODUCTION

Study Purpose and Objectives

This study evaluates the traffic impacts associated with a convenience commercial development project proposed at the US 50 / East Shingle Springs interchange in the Shingle Springs area of El Dorado County. The initial project (Phase I) consists of a gasoline station / convenience store with car wash, while subsequent development in the future (Phase II) may include a hotel, fast food restaurants and ancillary retail space. The project is located on the west side of Shingle Springs immediately south of US 50, as indicated in Figure 1.

The scope of this traffic analysis has been identified through consideration of El Dorado County traffic study guidelines in consultation with El Dorado County Department of Transportation (DOT). Based on direction from DOT this study addresses the following scenarios:

1. Existing (2015) Traffic Conditions
2. Existing (2015) Plus Project Conditions
3. 2025 Traffic Conditions
4. 2025 Plus Project Conditions
5. 2035 Traffic Conditions
6. 2035 Plus Project Conditions
7. 2035 Plus Commercial Area Build Out Conditions (addition of Phase II)

The project will be accompanied by circulation system improvements on Shingle Springs Drive. The objective of this study is to identify the extent of the access improvements that will ultimately be needed in order to ensure that initial construction is consistent with the long term needs of the area. The analysis also identifies intersections and freeway ramp junctions that may be impacted by development of this project based on El Dorado County significance criteria.

It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

VICINITY MAP

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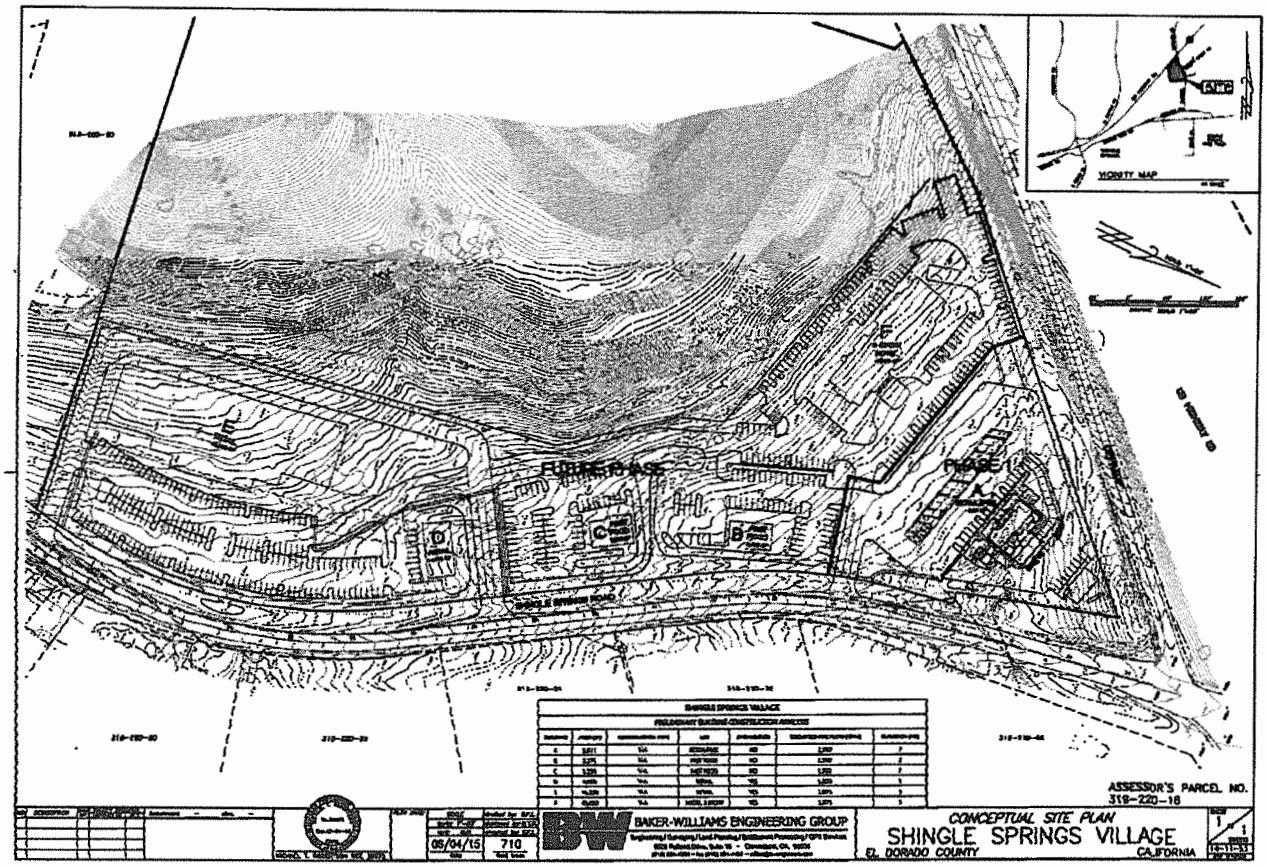
figure 1

Project Description

The development project evaluated in this report includes initial development (Phase I) and possible future construction (Phase II). The initial development (Phase I) is a gasoline station with convenience store and car wash. The gasoline station will offer 12 fueling positions, and the convenience store will be roughly 5,000 sf. As shown in Figure 2 this project will be constructed in the area immediately south of US 50, and the proposed access to the site is located roughly 550 feet south of the existing intersection of Shingle Springs Drive and the eastbound US 50 ramps.

Subsequent development (Phase II) is anticipated south of the initial project and will include two additional points of access to Shingle Springs Drive. This second phase could include two fast food restaurants, an 80 room hotel, and roughly 50 ksf of retail space. While an internal circulation system will link initial and future development, the future uses will include access to Shingle Springs Drive roughly 580 and 1,250 feet south of the initial access location.

The project will include roadway improvements to Shingle Springs Drive (e.g. access driveway), and this analysis is intended to guide the design of those improvements. The project's initial access to Shingle Springs Drive is expected to be wide enough to accommodate separate right and left turns leaving the site. For the purpose of this analysis, it has not been assumed that Shingle Springs Drive will be widened to provide ancillary turn lanes at the site access, and the assessment herein is intended to confirm the need for and design details of these potential improvements.



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SITE PLAN

figure 2

EXISTING SETTING

Study Area

This study addresses traffic conditions at intersections on El Dorado County roads and US 50. The limits of the study area were determined through discussion with El Dorado County staff and include eight (8) existing intersections along Shingle Springs Drive and Mother Lode Drive. The analysis also addresses the operation of the US 50 ramps at the East Shingle Springs interchange. The text that follows describes the roadway facilities included in this analysis.

US 50 is the main east-west transportation corridor across El Dorado County. US 50 originates at its junction with Interstate 80 in West Sacramento and continues easterly across Sacramento and El Dorado Counties to its terminus at the Nevada State line in South Lake Tahoe. In the immediate area of the project US 50 is a four lane controlled access freeway. The most recent traffic volume data published by Caltrans indicates that this portion of US 50 carried an *Annual Average Daily Traffic (AADT)* volume of 49,000 west of the East Shingle Springs interchange and 48,500 AADT east of the interchange. Trucks comprise 6% of the daily traffic on this section of US 50.

Shingle Springs Drive is a north-south collector street that extends north for three miles from its origin on Buckeye Road across US 50 to Green Valley Road. In the area of the project Shingle Springs Drive is a two lane rural road. The most recent daily traffic count collected by El Dorado County indicated 2,517 vehicles per day traveled on Shingle Springs Drive in the area of the project. The speed limit on Shingle Springs Drive is 55 mph.

Mother Lode Drive is an east-west arterial that runs generally south of and somewhat parallel to US 50 for 6½ miles from its origin on South Shingle Road to its eastern terminus on Missouri Flat Road. In the area of the project Mother Lode Drive is a two lane rural road, although auxiliary lanes have been added in the western end of the study area through the community of Shingle Springs. The most recent daily traffic count collected by El Dorado County indicated 9,031 vehicles per day traveled on Mother Lode Drive west of Pleasant Valley Road in the general area of the project. The speed limit on Mother Lode Drive is 50 mph.

Buckeye Road is an east-west local street that runs parallel to and north of Mother Lode Drive at the southern terminus of Shingle Springs Drive. This two lane rural road links Shingle Springs Drive to Mother Lode Drive. Local access to schools is a primary function of Buckeye Road, as the access to Buckeye Elementary School is located on Buckeye Road west of its intersection with Shingle Springs Drive, and California Montessori Project School is located off of Buckeye Road east of Shingle Springs Drive. A 25 mph school zone speed limit is posted on Buckeye Road.

Study Area Intersections

The quality of traffic flow is typically governed by the operation of key intersections. The physical characteristics of the study area intersections are described in the text which follows.

The **Shingle Springs Drive / Westbound US 50 ramps** intersection is controlled by a stop sign on the off ramp. All the approaches to this intersection are single lanes.

The **Shingle Springs Drive / Eastbound US 50 ramps** intersection is controlled by a stop sign on the off ramp. All of the intersection's approaches are single lanes.

The **Shingle Springs Drive / Maggie Lane** intersection provides access to a local commercial center and to rural residences east of Shingle Springs Drive. The intersection has single lane approaches and is controlled by a stop sign on the westbound Maggie Lane approach.

The **Shingle Springs Drive / Buckeye Road** intersection is a "tee" controlled by a stop sign on the southbound Shingle Springs Drive approach. Each approach is a single lane.

The **Mother Lode Drive / French Creek Road** intersection is located at the west end of the study area in the community of Shingle Springs. The "tee" intersection is controlled by a traffic signal. Auxiliary turn lanes have been provided, including a short westbound left turn lane and separate eastbound right turn lane. Crosswalks are striped across the eastern and southern legs of the intersection.

The **Mother Lode Drive / Buckeye Road / Holiday Lake Drive** intersection is controlled by stop signs on the northbound (Holiday Lake Drive) and southbound (Buckeye Road) approaches. Each approach is a single lane. A crosswalk is striped across the eastern Mother Lode Drive leg of the intersection.

The eastern **Mother Lode Drive / Buckeye Road** intersection is a "tee" controlled by a stop sign on the southbound Buckeye Road approach. The intersection's approaches are single lanes.

The **Mother Lode Drive / Greenstone Road** intersection is located at the eastern end of the study area. This "tee" intersection is controlled by a stop sign on the southbound Greenstone Road approach. Mother Lode Drive has been widened to provide a separate eastbound left turn lane and a separate westbound right turn lane.

US 50 / East Shingle Springs Interchange

The US 50 interchange adjoining the project is a conventional diamond arrangement, with an auxiliary treatment on eastbound US 50 east of the interchange. The interchange itself is a two lane crossing. Single lane on- and off-ramps are provided. The eastbound on-ramp continues into an auxiliary lane that continues to the Red Hawk Casino off-ramp. The system of eastbound on-ramp and subsequent off-ramp creates a 1,900 foot long weaving area. The westbound on-ramp is followed by a 250 foot long auxiliary lane.

Analysis Criteria

Level of Service Methodology. *Level of Service Analysis* has been employed to provide a basis for describing existing traffic conditions and for evaluating the significance of project traffic impacts. Level of Service measures the *quality* of traffic flow and is represented by letter

designations from "A" to "F", with a grade of "A" referring to the best conditions, and "F" representing the worst conditions. The guidelines and analyses used for this report follow El Dorado County standards.

Local agencies adopt minimum Level of Service standards for their facilities. El Dorado County identifies LOS E as the acceptable Level of Service on roadways and state highways within the unincorporated areas of the County in the Community Regions and LOS D in the Rural Centers and Rural Regions except as specified in the General Plan. The project is located within a Rural Region, but one study intersection is within a Community Region. The Mother Lode Drive / French Creek Road intersection is in a Community area, and LOS E is the applicable standard at these locations.

The analysis techniques presented in the *2010 Highway Capacity Manual* were used to calculate Level of Service and to provide a basis for describing existing traffic conditions and evaluating the significance of project traffic impacts.

Various software programs have been developed to assist in calculating intersection Level of Service, and the level of sophistication of each program responds to factors that affect the overall flow of traffic. In this case, Synchro software was employed to apply the techniques contained in the 2010 HCM at the isolated study intersection.

The intersection Levels of Service presented in this analysis are based on the weighted average total delay per vehicle for the intersection as a whole at signalized intersections and at locations controlled by all-way stops. The average delay experienced by motorists yielding the right of way is the basis for identification of Level of Service at locations controlled by side street stop signs. Applicable Level of Service thresholds based on average delay are shown in Table 1.

TABLE 1
LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.
Sources: 2010 Highway Capacity Manual, Transportation Research Board (TRB).			

Intersection Level of Service Thresholds of Significance. A traffic impact is considered to be significant under El Dorado County guidelines if the project causes an intersection to change from LOS D to LOS E / F or from LOS E to LOS F. Worsening of conditions at facilities already operating at unacceptable levels of service is also considered a significant impact. The County's General Plan Policy TC-Xe defines worsen as any of the following conditions:

a. a 2% increase in traffic during the a.m. peak hour, p.m. peak hour or daily trips, or
b. the addition of 100 or more daily trips, or
c. the addition of 10 or more trips during the a.m. peak hour or the p.m. peak hour.

When a project identifies an impact on the County's roadway network for a scenario with or without the project, a separate analysis must be done to identify what improvements are needed for mitigation and when the improvements must be in place. The timing of the proposed mitigation must be in compliance with General Plan Policy TC-Xf:

At the time of approval of the tentative map for a single family residential subdivision of five or more parcels that worsens (defined as a project that triggers Policy TC-Xe [A] or [B] or [C]) traffic on the County road system, the County shall do one of the following: (1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards as detailed in this Transportation and Circulation Element based on existing traffic plus traffic generated from the development plus forecasted traffic growth at 10-years from project submittal; or (2) ensure the commencement of construction of the necessary road improvements are included in the County's 10-year CIP.

For all other discretionary projects that worsen (defined as a project that triggers Policy TC-Xe [A] or [B] or [C]) traffic on the County road system, the County shall do one of the following: (1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards as detailed in this Transportation and Circulation Element; or (2) ensure the construction of the necessary road improvements are included in the County's 20-year CIP.

Projects that have impacts to Caltrans facilities shall use Caltrans LOS standards and significance thresholds in conjunction with the requirements of El Dorado County General Plan Circulation Policy TC-Xd.

Intersection Queuing Analysis. The quality of traffic flow can also be affected by queuing at signalized intersections. For this study the lengths of peak period queues have been identified at one signalized intersection and compared to available storage in order to determine whether spillover from turn lanes can affect adjoining travel or extend through adjacent intersections.

Traffic Signal Warrants. Traffic signal warrants are a series of standards which provide guidelines for determining if a traffic signal is an appropriate traffic control. Signal warrant analyses are typically conducted at intersections of uncontrolled major streets and stop sign-controlled minor streets. If one or more signal warrants are met, signalization of the intersection may be appropriate. However, a signal should typically not be installed if none of the warrants are met, since the installation of signals would increase delays on the previously-uncontrolled major street, resulting in an undesirable increase in overall vehicle delay at the intersection. Signalization may also increase the occurrence of particular types of accidents. Therefore, if signals are installed where signal warrants are not met the detriment of increased accidents and overall delay may be greater than the benefit in traffic operating conditions on movements operating below the significance threshold. Signal warrants provide an industry-standard basis for identifying when the adverse effect on the worst movement is substantial enough to warrant signalization.

The extent to which existing or projected traffic volumes may justify signalization at un-signalized intersections has been determined based on consideration of traffic signal warrant presented in the *Manual of Uniform Traffic Control Devices, 2012.* For this analysis the volume thresholds associated with Warrant 3 (Peak Hour Volume) have been assessed. For this analysis the "rural" criteria have been employed outside of the US 50 interchange based on free flow speeds in excess of 40 mph.

At unsignalized intersections, a traffic impact is considered "adverse" if the agency LOS standard is exceeded but the projected traffic does not satisfy traffic signal warrants. Under these conditions, the means to completely alleviate delays to stop controlled vehicles may be to install a traffic signal. However, the unmet signal warrants would imply that the reduction in delay for the stop-controlled vehicles may not justify the new delays that would be incurred by the major street traffic (which is currently not stopped). An alternative to a traffic signal could be installation of a roundabout.

Freeway Ramp Junction Level of Service. The operation of freeway – ramp junctions was analyzed utilizing methodology outlined in the *Highway Capacity Manual 2010.* Table 2 shows the relationship of "density" at the ramp junction, expressed in terms of passenger cars per hour per lane per mile" to Level of Service. This methodology is applicable to the simple merge-diverge maneuvers at the westbound ramps and at the eastbound off ramp. The weaving area between the eastbound onramp and Red Hawk Casino off ramp was evaluated using *Leisch Methodology*.

TABLE 2
LEVELS OF SERVICE CRITERIA – FREEWAYS

Level of Service	Ramp Junctions (Maximum Density) (pcpmpl)	Mainline Maximum Density (pcpmpl)
A	0.32	11
B	0.53	18
C	0.74	26
D	0.90	35
E	1.00	45
F	Varies	>45

Pcpmpl is *passenger car equivalent per hour per mile per lane*

Source: Transportation Research Board, Highway Capacity Manual, Washington, D.C., 2010,

Public Transit

The El Dorado County Transit Authority (EDCTA) offers local fixed route, regional commuter route, dial-a-ride and para-transit services. However, no fixed route passes the project site along Shingle Springs Drive.

Bicycle and Pedestrian Facilities

While no designated bicycle facilities are available in the area of the project, the El Dorado County Bicycle Master Plan indicates that Class II bicycle facilities (bike lanes) will eventually be developed easterly along Mother Lode Drive from their current terminus at N. Star Drive.

While there are no sidewalks along Shingle Springs Drive, the El Dorado Trail crosses Shingle Springs Drive in the area south of the project site.

Existing Traffic Operating Conditions

Traffic Volume Counts. This analysis makes use of weekday a.m. and p.m. peak hour traffic counts conducted in August 2015 when local schools were in session. Traffic volume data was collected from 7:00 to 9:00 a.m. and from 4:00 to 6:00 p.m., and the consecutive 60 minute period hour with the greatest volume within those periods was identified as the peak hour. The traffic counts are included in the Appendix, and the resulting intersection turning movements are presented in Figure 3.

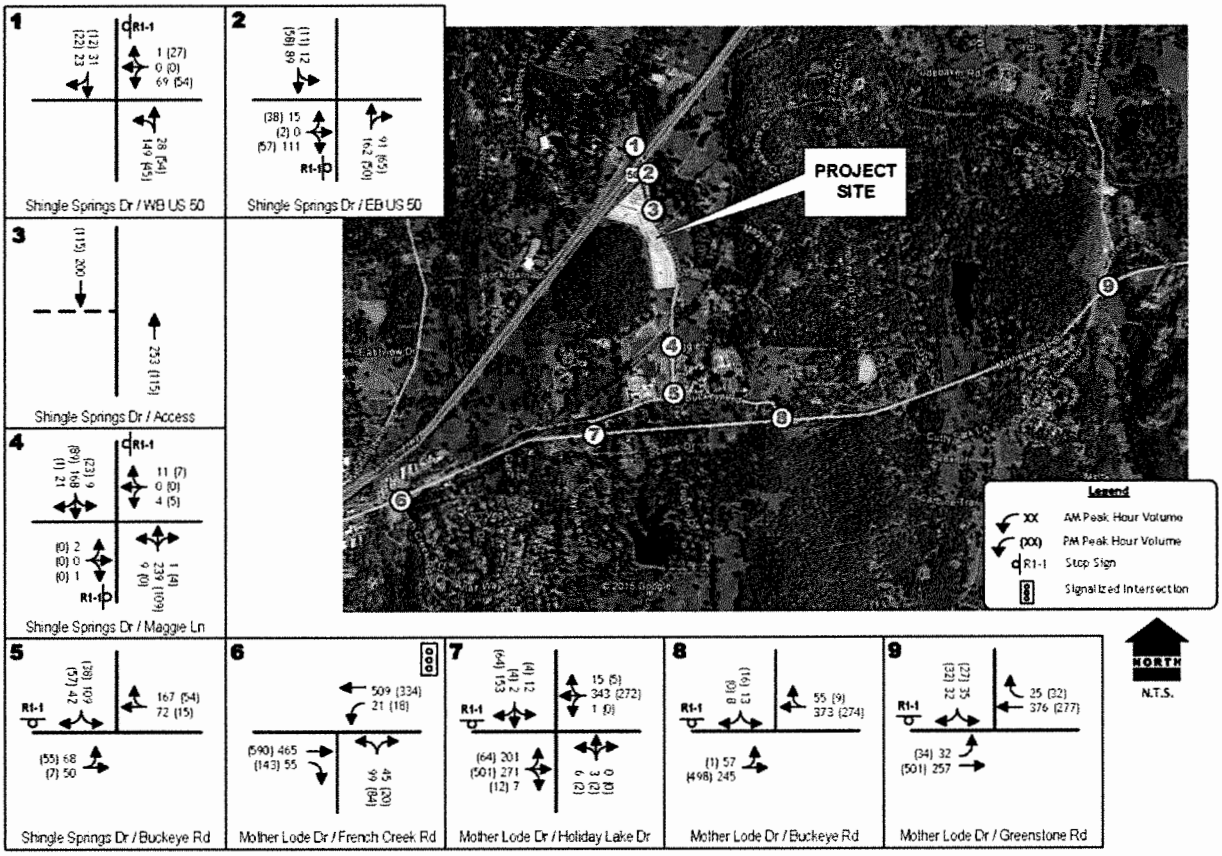
Intersection Levels of Service. Table 3 summarizes current operating Levels of Service at the study area intersections for both time periods. As indicated, the length of delays at all intersections is worse in the morning peak hour than in the p.m. peak hour. This is due to the presence of schools, which tend to concentrate their traffic into short time periods before and after the school day.

In this case, with one exception all study intersections satisfy the minimum LOS D standard or LOS E standard as applicable. At the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection motorists on the northbound Holiday Lake Drive approach experience delays that are indicative of LOS E, which exceeds the LOS D minimum standard. At other locations minimum standards are likely to be exceeded for short periods at the beginning and end of the school day.

Producing a Level of Service for the northbound movement that meets the LOS D minimum standard might be accomplished in several ways:

- ***Installing an all-way stop.*** An all-way stop would deliver an overall LOS D, but all-way stops can be problematic near schools during peak periods.
- ***Installing a traffic signal.*** Installing a traffic signal would likely require widening Mother Lode Drive to provide separate left turn lanes, but would deliver LOS B.
- ***Widening Mother Lode Drive to provide separate eastbound and westbound left turn lanes while retaining northbound and southbound stop signs.*** To a minor degree this treatment could allow northbound motorists to make "two-step" left turns by pausing in the eastbound left turn lane before merging into eastbound traffic. However, during peak periods before school this area is dominated by eastbound left turns. Assuming space for one waiting vehicle, this treatment would yield LOS D.
- ***Widening Buckeye Road to provide a separate right turn lane*** would reduce delays on that approach but would not affect the northbound approach.

Traffic Signal Warrants. The volume of traffic at study intersections was compared to peak hour volume warrants. During the a.m. and p.m. peak hour the current volume at the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection reaches the level that satisfies peak hour warrants. However, nearly all of the traffic on the southbound approach turns right (92% to 93%), and as a result the Level of Service on that approach is adequate (LOS C). Thus a traffic signal is not justified at this location.



EXISTING TRAFFIC VOLUMES
AND LANE CONFIGURATIONS

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figure 3

TABLE 3
EXISTING PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS

Location	Control	AM Peak Hour		PM Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
1. Shingle Springs Dr / WB US 50 ramps	WB Stop	C	17.8	B	10.0	No
2. Shingle Springs Dr / EB US 50 ramps	EB Stop	B	10.6	C	9.5	No
3. Shingle Springs Dr / Access	-	-	-	-	-	-
4. Shingle Springs Dr / Maggie Ln	EB Stop	B	14.5	-	-	No
	WB Stop	B	12.4	A	9.7	
5. Shingle Springs Dr / Buckeye Rd	SB Stop	D	28.2	A	9.7	No
6. Mother Lode Dr /French Creek Rd*	Signal	C	29.5	C	22.90	N/A
7. Mother Lode Dr / Holiday Lake Dr*	NB Stop	**E**	**46.5**	C	24.2	Yes
	SB Stop	C	17	B	12.3	
Add TWLT lane		D	29.5			
Signalize		B	13.1			
All-Way Stop		C	19.7			
8. Mother Lode Dr / Buckeye Rd	SB Stop	C	18.9	C	16.8	No
9. Mother Lode Dr / Greenstone Rd	SB Stop	B	14.7	B	14.7	No
(*) LOS E minimum. N/A is Not Applicable						

Intersection Queues. Table 4 presents information regarding current peak period queuing in lanes at signalized study intersections. In each case, the available storage has been presented along with current peak hour traffic volumes and the 95th percentile queue length.

The one signalized intersection has a lane storage capacity that can accommodate peak period queues.

TABLE 4
EXISTING PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Capacity (feet)	AM Peak Hour		PM Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
Mother Lode Drive / French Creek Road					
WB left turn	70	21	30	18	29
Highlighted values indicate queue length in excess of available storage					

Existing Freeway Ramp Terminal Level of Service

The Level of Service occurring in the freeway ramp areas of the US 50 / East Shingle Springs interchange area shown in Table 5. As indicated these areas operate at LOS C or better today.

TABLE 5
EXISTING US 50 RAMP LEVELS OF SERVICE

Direction	Location	Level of Service			
		Type	Peak Hour	Density (pcpmpl)	LOS
EB	Off to Shingle Springs Drive	Diverge	AM	18.7	B
			PM	25.8	C
	On from Shingle Springs Drive	Weave	AM	10.0	A
			PM	15.8	B
WB	Off to Shingle Springs Drive	Diverge	AM	21.4	C
			PM	20.2	C
	On from Shingle Springs Drive	Merge	AM	20.5	C
			PM	21.2	C

PROJECT CHARACTERISTICS

The development of this project will attract traffic to the project site. The amount of additional traffic on a particular section of the street network is dependent upon two factors:

- Trip Generation, the number of new trips generated by the project, and
- Trip Distribution and Assignment, the specific routes that the new traffic takes.

Trip generation estimates have been prepared under two scenarios. The first scenario addresses the gasoline sales/convenience store/car wash (Phase I) alone. The second scenario addresses the initial project along with build out of the balance of the project area (Phase I and II) in a manner that reflects probable interaction between future uses. It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

Trip Generation

Trip Generation Rates. Trip generation is determined by identifying the type and size of land use being developed. Recognized sources of trip generation data may then be used to calculate the total number of trip ends resulting from the day to day operation of the businesses in the project.

Table 6 identifies the trip generation rates that are applicable to the project. These rates are taken from the Institute of Transportation Engineers (ITE) publication *Trip Generation Manual, 9th Edition.* As indicated, the trip generation associated with gasoline sales / convenience store and car wash are predicated on the number of fueling positons.

Trip Generation Forecasts. The number of trips associated with the proposed project (Phase I) and with build out of the project area (Phase I and II) is noted in Table 7. As shown, the project itself is expected to generate 1,834 daily trips at the project's driveway, with 142 and 166 trips occurring in the a.m. and p.m. peak hour. Much of the traffic associated with this type of use is "pass-by" trips drawn from the stream of traffic already on roads near the site. After discount for "pass-by" trips, the project is expected to generate 807 new daily trips, with 54 new trips in the a.m. peak hour and 73 trips in the p.m. peak hour.

Similar estimates have been made for the "build out" (Phase I and II) condition, but in that case it is necessary to account for the interaction between the various uses that will exist on the site. After discount for internal trips that do not leave the site, the total project area, including the proposed project (Phase I) and future Phase II build out, is expected to generate 8,549 external daily trips, with 493 trips during the a.m. peak hour and 686 trips in the p.m. peak hour.

TABLE 6
TRIP GENERATION RATES

ITE Code	Description	Unit	Trips Per Unit						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
946	Gasoline Sales with Convenience Store and Car Wash	Fueling Position	152.84	51%	49%	11.84	51%	49%	13.86
Pass-by rate per Trip Generation Handbook 3rd Edition Table F. 37/38			56%			62%			56%
310	Hotel	Room	8.17	59%	41%	0.53	51%	49%	0.60
934	Fast Food Restaurant w/ Drive Thru	Ksf	496.12	51%	49%	45.42	52%	48%	32.65
Pass-by rate per Trip Generation Handbook 3rd Edition Table F. 31/32			50%			49%			50%
820	Retail (60 ksf)	Ksf	81.21	62%	38%	1.90	48%	52%	6.98
Pass-by rate per Trip Generation Handbook 2nd Edition figure 5.5 for total site ksf			45%			10%			45%

TABLE 7
TRIP GENERATION FORECASTS (8/21/2015)

ITE Code	Description	Quantity	Trips Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
	Project (Phase I)								
946	Gasoline Sales with Convenience Store and Car Wash	12 positions	1,834	72	70	142	85	81	166
	Pass-By / link diverted (56% daily, 62 % a.m., 56% p.m.)	Table F.37/38	<1,027>	<45>	<43>	<88>	<48>	<45>	<93>
	New External Trips		**807**	**27**	**27**	**54**	**37**	**36**	**73**
	Build Out (Phase II)								
310	Hotel	80 rooms	654	25	17	42	24	24	48
934	Fast Food Restaurant w/ Drive Thru	6.51 ksf	3,230	151	145	296	111	102	213
820	Retail (60 ksk)	50.25 ksf	4,081	59	36	95	168	183	351
	Balance Gross Total		7,965	235	198	433	303	309	612
	Project & Balance Gross		9,799	307	268	575	388	390	778
	Project & Build Out Internal								
	Hotel Matched to Gasoline, Fast Food, Retail	15%	196	6	6	12	7	7	14
	Retail Matched to Gasoline, Fast Food	5%	408	5	5	10	18	18	36
	Fast Food Matched to Gasoline	10%	646	30	30	60	21	21	42
	Total Internal		1,250	41	41	82	46	46	92
	External Project& Build Out		***8,549***	***266***	***227***	***493***	***342***	***344***	***686***
	Project & Build Out Pass-By								
	Gasoline External		1,419	55	53	108	70	66	136
	Gasoline (56% Daily, 62% a.m., 56% p.m.)	Table F.37/38	<795>	<34>	<33>	<67>	<39>	<37>	<76>
	Gasoline New External		624	21	20	41	31	29	60
	Hotel New External		556	22	14	36	21	20	41
	Retail External		3,833	56	33	89	157	172	329
	Retail Pass-By (45% daily, 10% a.m., 45% p.m.)	Fig 5.5	<1,725>	<6>	<3>	<9>	<71>	<77>	<148>
	Retail New External		2,108	50	30	80	86	95	181
	Fast Food External		2,742	133	127	260	94	85	179
	Fast Food Pass By (50% daily 49% a.m., 50% p.m.)	Table F.31/32	<1,371>	<65>	<62>	<127>	<47>	<42>	<89>
	Fast Food New External		1,371	68	65	133	47	43	90
	Total External		**8,549**	**266**	**227**	**493**	**342**	**344**	**686**
	Total External Pass-By		**<3,891>**	**<105>**	**<98>**	**<203>**	**<157>**	**<156>**	**<313>**
	Total New External		**4,659**	**161**	**129**	**290**	**185**	**187**	**372**

Trip Distribution & Assignment

The new and pass-by trips associated with the project will use the study area circulation system differently and their distribution patterns will also differ.

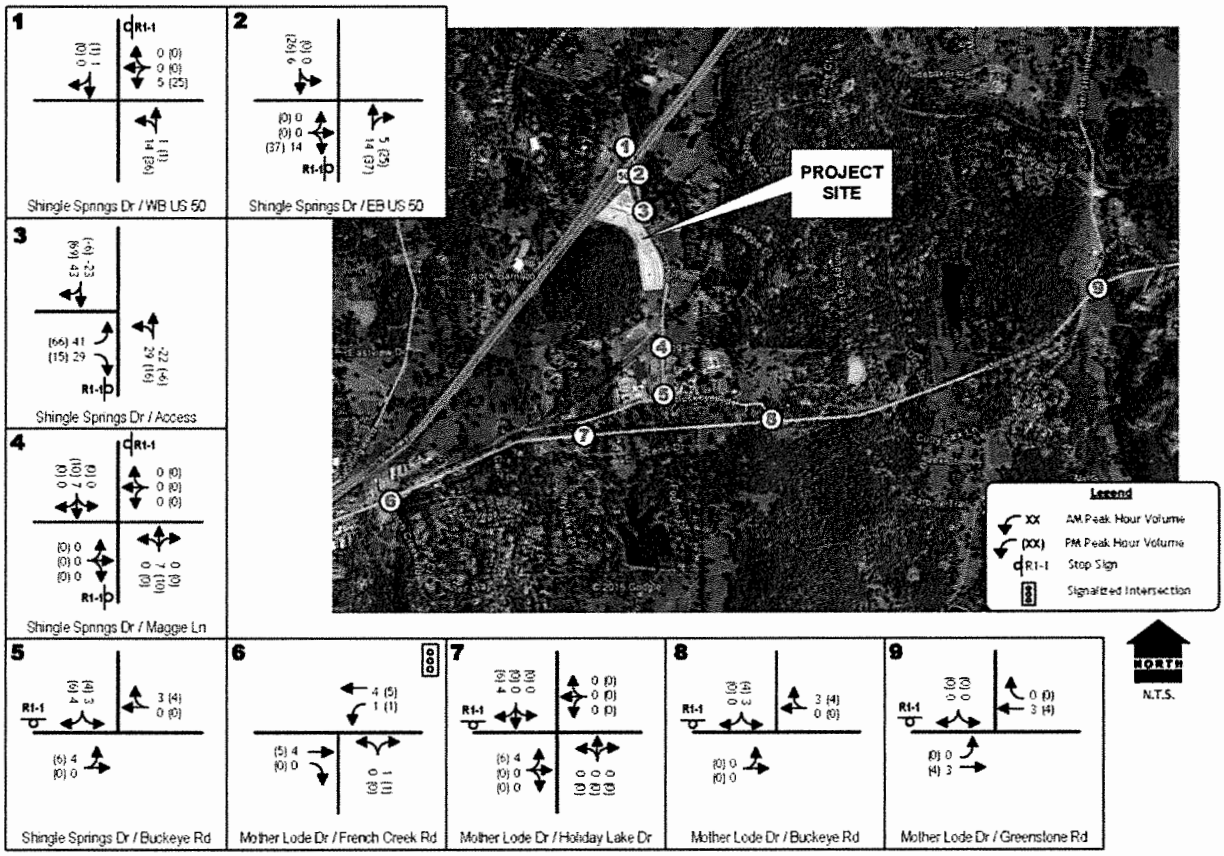
New trips would be made between the project and residences and business within the project's trade area. The pattern for these trips was identified using the "select zone" feature of the county-wide traffic model which permits tracking of the likely paths of trips originating within specific traffic analysis zones. As indicated in Table 8, the distribution of trips under site build out (Phase I and II) conditions may be slightly different based on the nature of these uses and the pattern of growth under long term conditions in the study area.

The distribution of pass-by trips will reflect the volume of background traffic occurring near the site now and in the future. Under "project only" (Phase I) conditions it has been assumed that a.m. peak hour pass-by trips will be drawn from the stream of traffic passing the site to and from area schools. Because background traffic volumes are lower in the p.m. peak hour, it has been assumed that 75% of the pass-by trips at that time will be drawn from traffic on US 50 but not already using Shingle Springs Drive. The assumptions for the p.m. peak hour would remain valid under buildout conditions, but would be different in the a.m. peak hour. For site buildout, 50% of the a.m. pass-by trips are assumed to be drawn from US 50.

TABLE 8
PROJECT NEW TRIP DISTRIBUTION

Direction	Route	Distribution Percentage	
		Project Alone (Phase I)	Build Out (Phase I and II)
North	Shingle Springs Drive beyond US 50	2%	2%
East	US 50	20%	21%
	Maggie Lane	0%	3%
	Mother Lode Drive beyond Buckeye Road	11%	11%
West	US 50	51%	48%
	Mother Lode Drive beyond French Creek Road	13%	12%
South	French Creek Road	3%	3%
	Total	100.00%	100.00%

Trip Assignment. The project's trips will access the study area circulation via the proposed Phase I driveway. Figure 4 presents the resulting project trip assignment for Phase I. Figure 5 presents the trip assignment through these intersections for project build out (Phase I and II). Additional information regarding traffic volumes at the two additional Phase II site driveways is included in the appendix.



PHASE 1 PROJECT ONLY
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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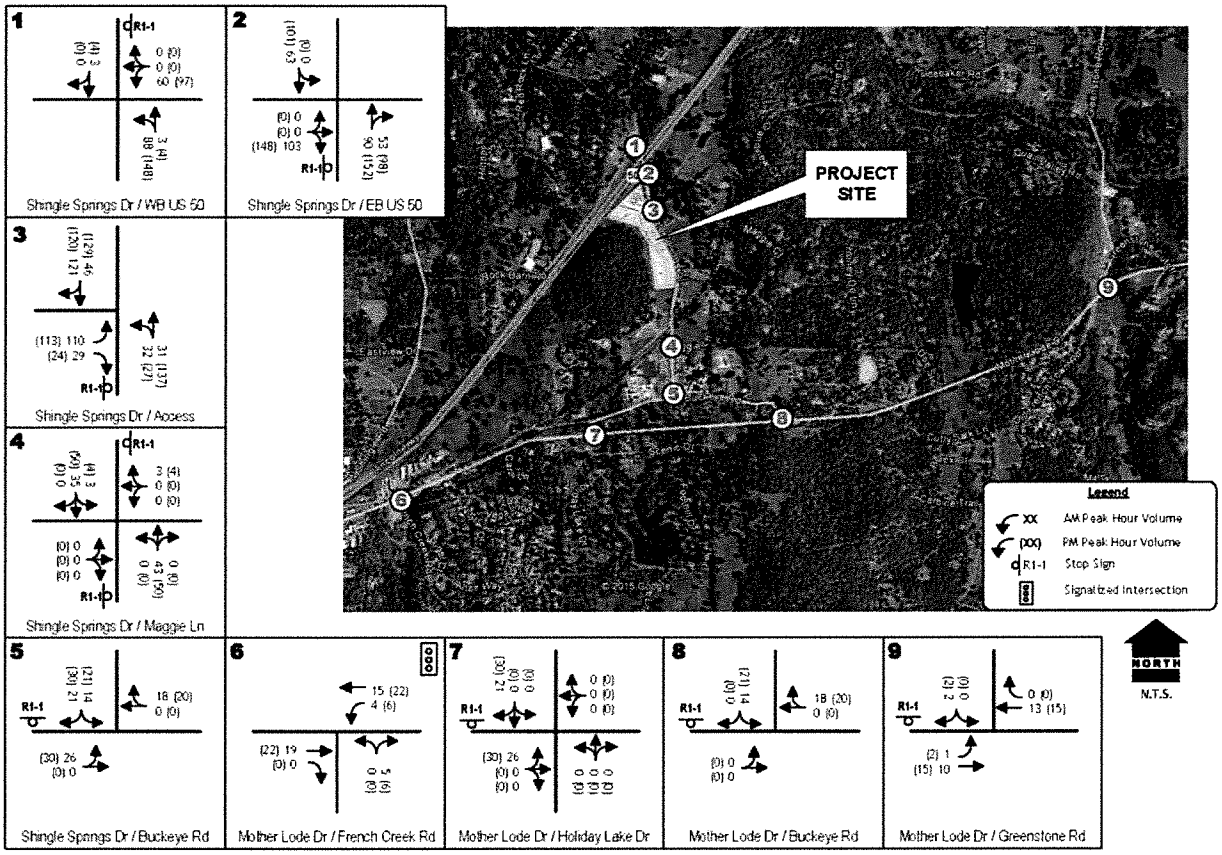
figure 4



PROJECT BUILDOUT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 5

PROJECT TRAFFIC IMPACTS

Existing Plus Project Conditions

Traffic Volumes The impacts of developing the project uses on the project site have been identified by superimposing project traffic onto existing background conditions and recalculating Level of Service. Figure 6 displays the "Existing Plus Project" traffic volumes at each study intersection in both a.m. and p.m. peak hours.

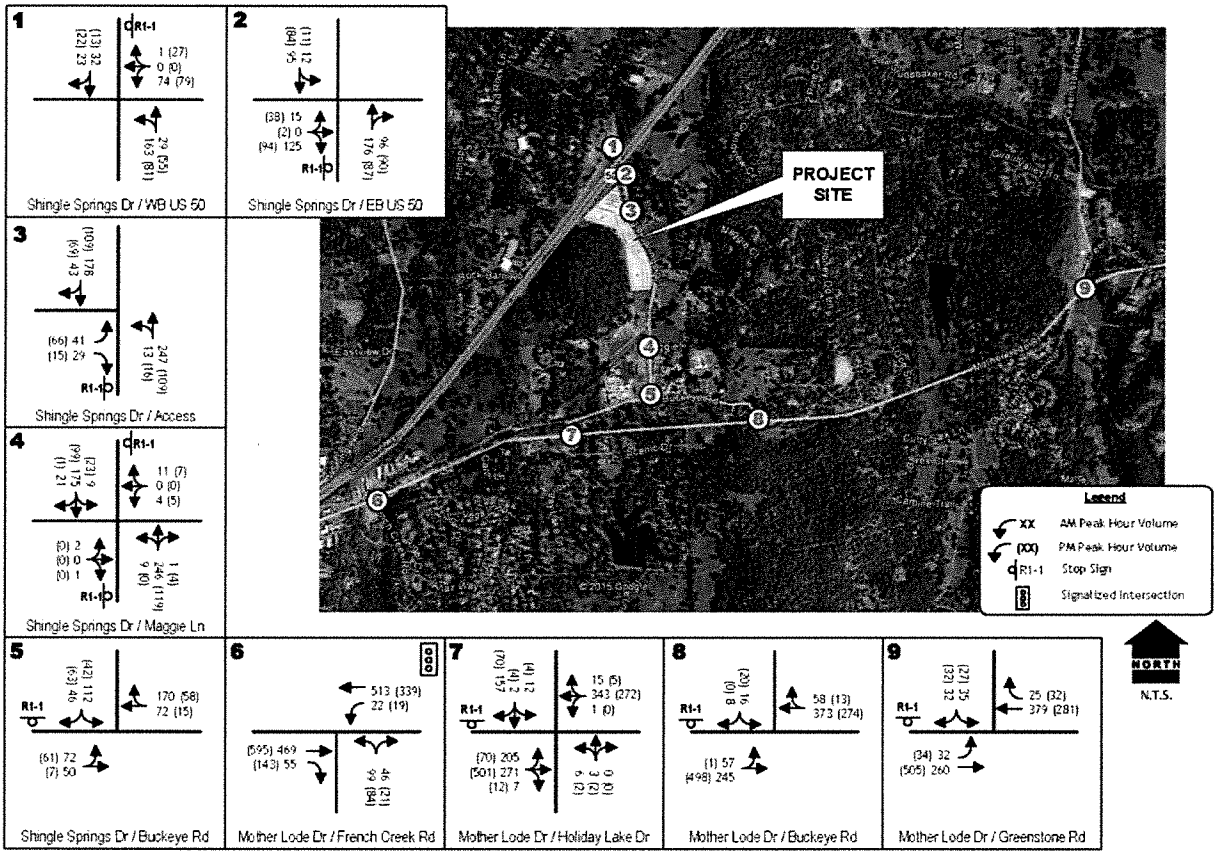
Intersection Levels of Service. Table 9 displays the peak hour Levels of Service at each study intersection comparing existing Levels of Service with those accompanying the project.

As indicated, with one exception all study intersections will continue to operate with Level of Service that satisfies the applicable minimum LOS standard. The northbound approach to the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection will continue to operate at LOS E, which exceeds the minimum LOS D standard. In this case, the significance of the project's impact is based on the volume of traffic contributed by the project. The project adds eight trips to the intersection during the a.m. peak hour. As this value is less than the ten trip increment permitted under El Dorado County guidelines, the project's impact is not significant, and mitigation is not required.

Traffic Signal Warrants. The peak hour traffic signal warrant will continue to be met during the a.m. peak hour at the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection. As is the case today, because the majority of southbound traffic turns right, the intersection operates acceptably, and a traffic signal is not justified.

Intersection Queues. Table 10 identifies peak period queues assuming the addition of project trips. The project ads relatively few trips to this intersection, and under Existing Plus Project conditions queues will not exceed the available storage.

US 50 / East Shingle Springs Interchange Ramps Level of Service. Table 11 compares the peak hour Level of Service at ramp junctions with and without the project. As indicated, the operating Level of Service will remain at LOS C or better, which meets adopted minimum standards.



EXISTING PLUS PROJECT PHASE 1
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 6

TABLE 9
PEAK HOUR INTERSECTION LEVELS OF SERVICE
EXISTING PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		Existing		Ex Plus Project		Existing		Ex Plus Project		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
1.Shingle Springs Dr / WB US 50 ramps	WB Stop	C	17.8	C	19.8	B	10.0	B	11.2	No
2.Shingle Springs Dr / EB US 50 ramps	EB Stop	B	10.6	B	10.9	C	9.5	A	9.9	No
3.Shingle Springs Dr / Access	-	-	-	B	14.7	-	-	B	10.7	No
4.Shingle Springs Dr / Maggie Ln	EB Stop	B	14.5	B	14.6	-	-	-	-	No
	WB Stop	B	12.4	B	12.4	A	9.7	A	9.8	
5.Shingle Springs Dr / Buckeye Rd	SB Stop	D	28.2	D	29.6	A	9.7	A	9.9	No
6.Mother Lode Dr /French Creek Rd*	Signal	C	29.5	C	26.2	C	22.9	C	25.1	n.a.
7.Mother Lode Dr / Holiday Lake Dr	NB Stop	**E**	**46.5**	**E**	**47.5**	C	24.2	C	24.9	Yes
	SB Stop	C	17.0	C	17.3	B	12.3	B	12.3	
8.Mother Lode Dr / Buckeye Rd	SB Stop	C	18.9	C	19.8	C	16.8	C	17.0	No
9.Mother Lode Dr / Greenstone Rd	SB Stop	B	14.7	B	14.8	B	14.7	B	14.8	No

(*) LOS E minimum **BOLD** values exceed minimum LOS. **HIGHLIGHTED** values are a significant impact

TABLE 10
EXISTING PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Capacity (feet)	AM Peak Hour				PM Peak Hour			
		Existing		Ex Plus Project		Existing		Ex Plus Project	
		VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)
Mother Lode Drive / French Creek Road WB left turn	70	21	30	22	31	18	29	19	30

Highlighted values indicate queue length in excess of available storage

TABLE 11
EXISTING PLUS PROJECT US 50 RAMP LEVELS OF SERVICE

Direction	Location	Type	Peak Hour	Level of Service			
				Existing		Existing Plus Project	
				Density (pcpmpl)	LOS	Density (pcpmpl)	LOS
EB	Off to Shingle Springs Drive	Diverge	AM	18.7	B	18.9	B
			PM	25.8	C	26.0	C
	On from Shingle Springs Drive	Weave	AM	10.0	A	10.0	A
			PM	15.8	B	15.0	B
WB	Off to Shingle Springs Drive	Diverge	AM	21.4	C	21.4	C
			PM	23.1	C	23.2	C
	On from Shingle Springs Drive	Merge	AM	20.5	C	20.6	C
			PM	21.2	C	21.5	C

NEAR TERM FUTURE CONDITIONS (2025)

The analysis of the near term future conditions (2025) is intended to consider the impact of this project within the context of the roadway facilities occurring in ten years.

Analysis Methodology

El Dorado County traffic study guidelines indicate that near term future conditions are calculated using straight line interpolation between existing traffic conditions and 2035 traffic projections. The traffic network for 2025 includes all applicable projects in the County's Ten Year CIP.

Year 2025 No Project Forecasts / Conditions

Year 2025 Lane Configurations. The near term cumulative analysis assumes regional circulation system improvements that will be completed by 2025 are identified in the County's Capital Improvement Program (CIP).

Basis for Analysis - Regional Traffic Growth. The most recent countywide regional travel demand forecasting model was used as the basis for developing future volumes forecasts in the study area. An incremental approach was taken whereby the difference between baseline and future 2035 model forecasts were applied to current volumes to create adjusted future volumes and 20 year approach growth factors. 50% of these growth factors were applied to each study intersection approach to create a ten year future condition, and the turning movement volumes at the study intersections were balanced using the 'Furness' techniques described in NCHRP Report 255.

Traffic Volume Forecasts. Figure 7 presents Year 2025 traffic volumes without the proposed project (Phase I), while Figure 8 presents volumes occurring if the Phase I project is completed in 2025. Plus project volumes were again created by superimposing project trips on the Year 2025 background volumes.

Intersection Levels of Service. The identified Year 2025 volumes were used to recalculate operating Levels of Service at the selected intersections. Table 12 displays the a.m. and p.m. peak hour Levels of Service at each study intersection in the 2025 condition.

If the proposed project does not proceed, then two un-signalized intersections will operate with Levels of Service that exceed the minimum standard. The southbound approach at the **Buckeye Road / Shingle Springs Drive intersection** will operate at LOS E. This exceeds the LOS D minimum. Improvements that may be considered include:

- **Installing an all-way stop.** An all-way stop would deliver LOS B, which would satisfy the minimum standard. However, all-way stops can sometimes be problematic in the vicinity of schools due to the parking characteristics of school traffic.
- **Widening the southbound Shingle Springs Drive approach.** Widening the southbound approach to provide separate left turn and right turn lanes would reduce the length of delay on that approach, and the approach would operate at LOS C.

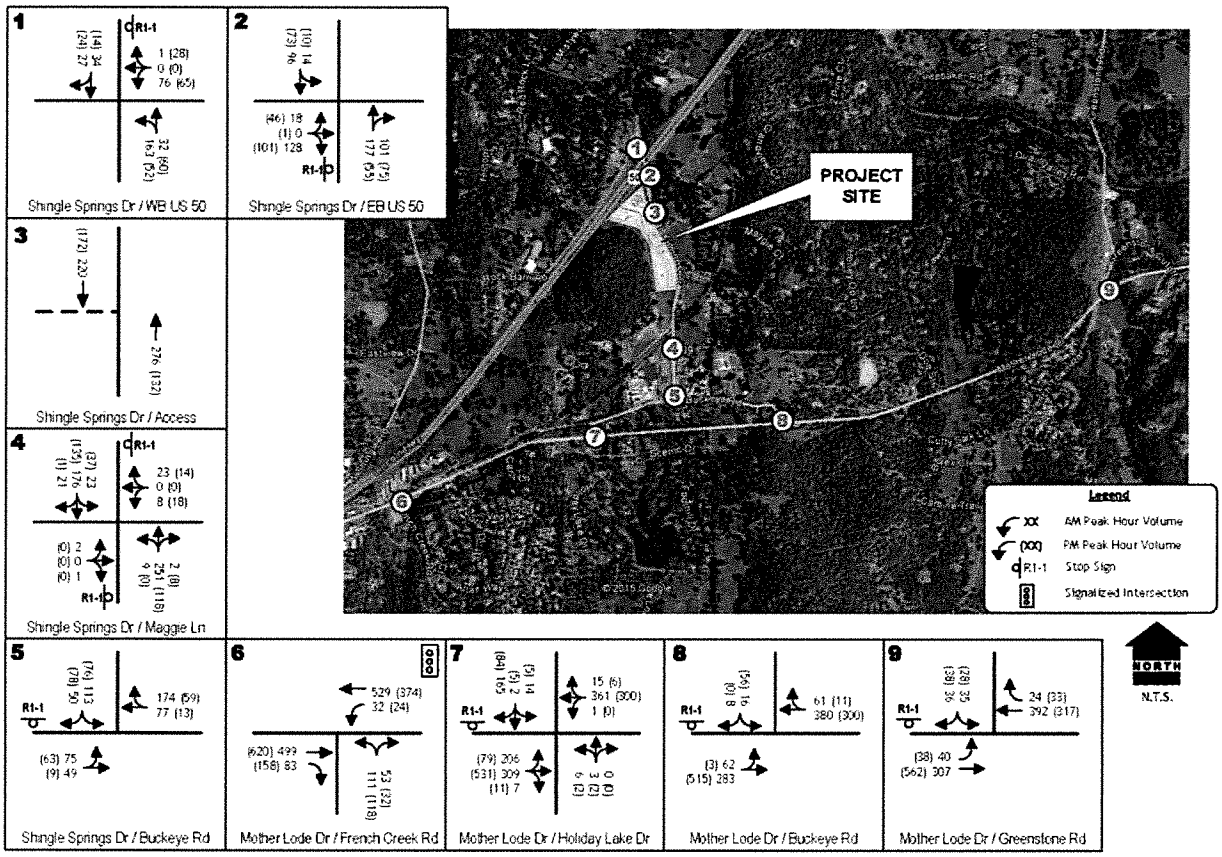
- **Widening Buckeye Road to provide eastbound and westbound left turn lanes.** This treatment could allow southbound motorists to make "two-step" left turns by pausing in the westbound left turn lane before merging into eastbound traffic. Assuming space for one waiting vehicle in the left turn lane, this treatment would yield LOS D.

The northbound Holiday Lake Drive approach at the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate at LOS F. This exceeds the LOS D minimum. Producing an adequate Level of Service for the northbound movement could be accomplished by installing an all-way stop or traffic signal. An all-way stop would deliver an overall LOS D, but all-way stops can be problematic near schools during peak periods. Installing a traffic signal would likely require widening Mother Lode Drive to provide separate left turn lanes, but would deliver LOS B.

Traffic Signal Warrants. The peak hour traffic signal warrant will continue to be met at the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection.

Intersection Queues. Table 13 identifies peak period queues under 2025 conditions. No 95th percentile queues have length that exceeds the available storage.

US 50 / East Shingle Springs Interchange Ramp Operations. Table 14 identified the Level of Service at US 50 ramps under Year 2025 conditions. As shown, all work at LOS D or better, which satisfies the minimum LOS D standard.



2025 BASE TRAFFIC VOLUMES
AND LANE CONFIGURATIONS

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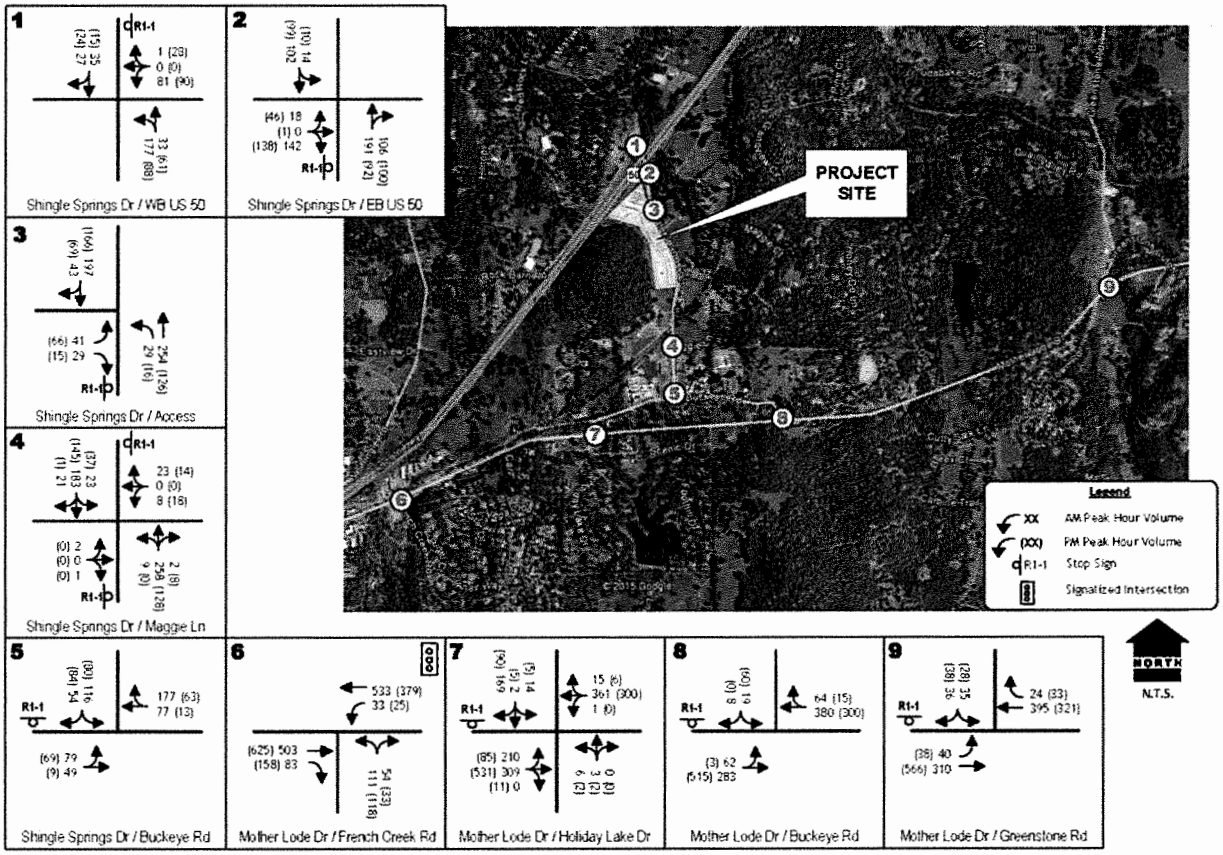
figure 7



2025 PLUS PROJECT PHASE 1
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 8

TABLE 12
PEAK HOUR INTERSECTION LEVELS OF SERVICE
2025 PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted
		2025		2025 Plus Project		2025		2025 Plus Project		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
1.Shingle Springs Dr / WB US 50 ramps	WB Stop	C	20.4	C	23.3	B	10.4	B	11.7	No
2.Shingle Springs Dr / EB US 50 ramps	EB Stop	B	11.2	B	11.5	A	9.8	B	10.4	No
3.Shingle Springs Dr / Access	-	-	-	C	16.5	-	-	B	11.5	No
4.Shingle Springs Dr / Maggie Ln	EB stop	B	14.9	C	15.3	-	-	-	-	No
	WB Stop	B	12.6	B	12.8	B	10.8	B	10.9	
5.Shingle Springs Dr / Buckeye Rd	SB Stop	**E**	**35.7**	**E**	**41.4**	B	10.7	A	9.9	No
	All-Way Stop	B	14.7	C	15.4					
	Separate SB lanes	C	24.6	D	26.7					
6.Mother Lode Dr /French Creek Rd *	Signal	B	15.7	C	20.2	C	21.8	C	25.1	N.a.
7.Mother Lode Dr / Holiday Lake Dr	NB Stop	**F**	**55.1**	**F**	**57.3**	D	28.8	D	29.6	Yes
	SB Stop	C	19.5	C	19.8	B	13.4	B	13.4	
	All-Way Stop	D	25.7							
	Signal	B	13.3							
	TWLT	D	34.6							
8.Mother Lode Dr / Buckeye Rd	SB Stop	C	21.6	C	22.6	C	20.1	C	20.5	No
9.Mother Lode Dr / Greenstone Rd	SB Stop	C	15.8	C	15.9	C	16.2	C	16.3	No

(*) LOS E minimum **BOLD** values exceed minimum LOS. **HIGHLIGHTED** values are a significant impact

TABLE 13
2025 PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Capacity (feet)	AM Peak Hour				PM Peak Hour			
		Existing		Ex Plus Project		Existing		Ex Plus Project	
		VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)
Mother Lode Drive / French Creek Road WB left turn	70	32	41	33	43	24	36	25	37

Highlighted values indicate queue length in excess of available storage

TABLE 14
2025 PLUS PROJECT US 50 RAMP LEVELS OF SERVICE

Direction	Location	Type	Peak Hour	Level of Service			
				2025		2025 plus Project	
				Density (pcpmpl)	LOS	Density (pcpmpl)	LOS
EB	Off to Shingle Springs Drive	Diverge	AM	21.6	C	21.7	C
			PM	28.8	D	29.0	D
	On from Shingle Springs Drive	Weave	AM	12.2	B	12.3	B
			PM	16.7	B	16.8	B
WB	Off to Shingle Springs Drive	Diverge	AM	24.2	C	24.2	C
			PM	25.8	C	26.0	C
	On from Shingle Springs Drive	Merge	AM	23.1	C	23.3	C
			PM	23.5	C	23.7	C

2025 Plus Project Conditions

The significance of project impacts has been determined by comparing No Project and Plus Project conditions.

Intersection Levels of Service. The identified Year 2025 plus Project (Phase I) volumes were used to recalculate operating Levels of Service at study intersections, and the results were presented in Table 12. As shown, the same two intersections which operated with a Level of Service in excess of minimum standard would do so with the proposed project, but no additional intersections would be affected.

At the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection**, the northbound approach would operate at LOS F with and without the project. In this case, the significance of the project's impact is based on the volume of traffic contributed by the project. The project adds eight trips to the intersection during the a.m. peak hour. As this value is less than the ten trip increment permitted under El Dorado County guidelines, the project's impact is not significant, and mitigation is not required.

At the **Shingle Springs Drive / Buckeye Road intersection** the southbound approach will operate at LOS E in the a.m. peak hour with and without the project. Again, the significance of the project's impact is based on the volume of added traffic. At this location the project adds fourteen trips in the a.m. peak hour. As this value exceeds the ten trip increment permitted under El Dorado County guidelines, the project's impact is significant.

Delivering a Level of Service that satisfied minimum standard could be accomplished using an all-way stop, and LOS C would result. However, all-way stop controls can be problematic in the vicinity of schools if queueing extends back to school entrances and interferes with local circulation during the peak periods before and after school. Widening the southbound Shingle Springs Road approach to provide separate left turn and right turn lanes would yield LOS D.

Traffic Signal Warrants. The peak hour traffic signal warrant will continue to be met at the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection with and without the project.

Intersection Queues. Table 13 identifies peak period queues under 2025 conditions with the project. No 95th percentile queues have length that exceeds the available storage.

US 50 / East Shingle Springs Interchange Ramp Operations. Table 14 identified the Level of Service at US 50 ramps under Year 2025 conditions with the project. As shown, all work at LOS D or better, which satisfies the minimum LOS D standard.

2035 CUMULATIVE TRAFFIC CONDITIONS

The analysis of the long term cumulative impact analysis is intended to consider the impact of this project within the context of conditions occurring under the El Dorado County General Plan in the Year 2035.

Background Information

Year 2035 Improvements. The cumulative Year 2035 analysis assumes that no circulation system improvements will be completed in the study area by 2035.

Year 2035 Forecasts. Year 2035 No Project traffic volumes were created using the incremental approach mandated under El Dorado County traffic study guidelines. Table 15 identifies projected daily traffic volumes derived from the traffic model and resulting growth rates to provide perspective regarding background conditions. As shown, the volume of traffic on Shingle Springs Drive is projected to increase by roughly 2½ percent annually, while the volume on Mother Lode Drive is projected to increase by 1½ percent annually.

TABLE 15
STUDY AREA TRAFFIC GROWTH TRENDS

Street	Location	Daily Traffic Volume			
		2015	2025	2035	Annual Growth Rate
Shingle Springs Drive	US 50 to Maggie Lane	2,517	3,200	3,900	2½%
Mother Lode Drive	West of Holiday Lake Drive	10,000	11,500	13,100	1½%
Mother Lode Drive	East of Buckeye Road	8,900	10,100	11,370	1½%

Year 2035 peak hour traffic volumes under the No Project condition are presented in Figure 9, and these volumes are the data source for the operational analysis which follows.

Levels of Service / Evaluation

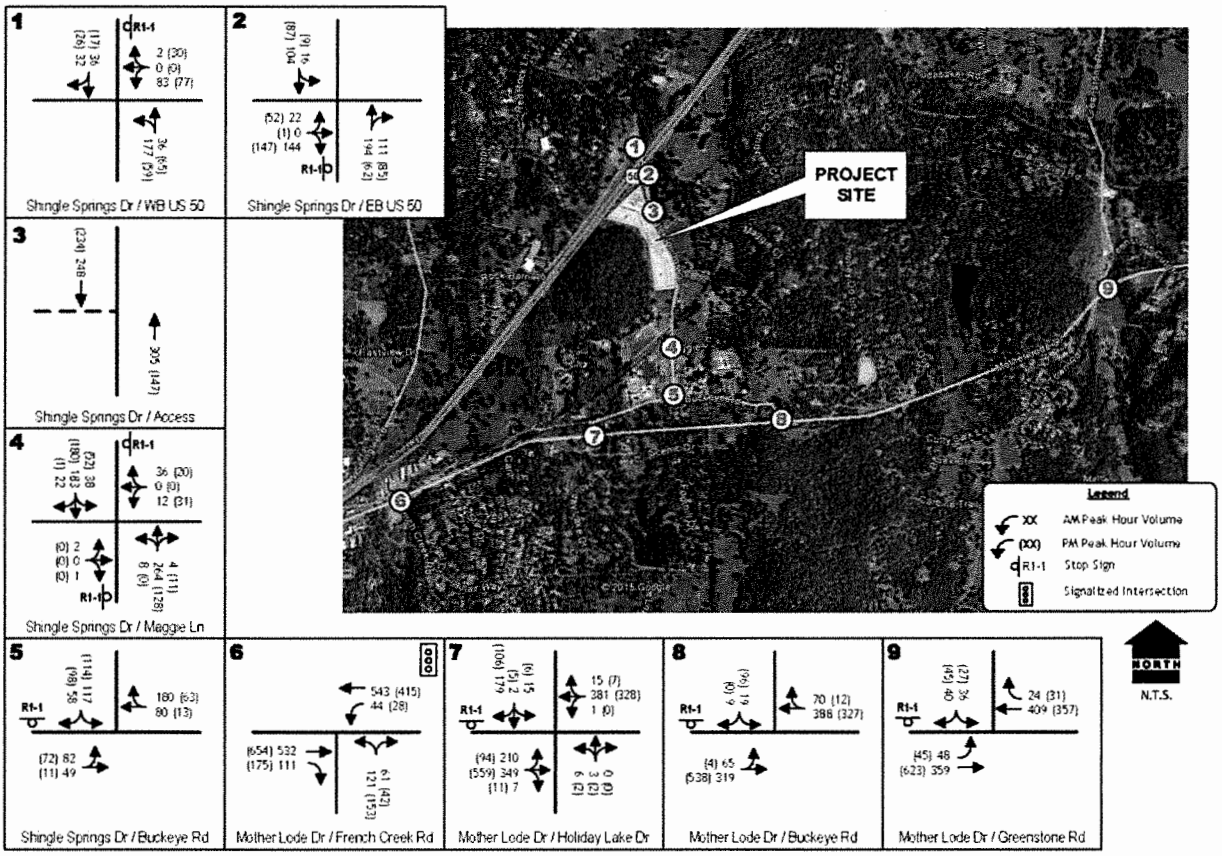
Intersection Levels of Service. The identified Year 2035 volumes were used to recalculate operating Levels of Service at the study area intersections. As shown in Tables 16 and 17, if the proposed project (Phase I) does not proceed, then two un-signalized intersections will operate with Levels of Service that exceed the minimum standard. The southbound approach at the **Buckeye Road / Shingle Springs Drive / intersection** will operate at LOS E. This exceeds the LOS D minimum. An all-way stop would deliver LOS C, which would satisfy the minimum standard. However, all-way stops can sometimes be problematic in the vicinity of schools due to the peaking characteristics of school traffic. Widening the southbound approach to provide separate left turn and right turn lanes would yield LOS D.

The northbound Holiday Lake Drive approach at the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate at LOS F. This exceeds the LOS D minimum. Under 2035 conditions producing an adequate Level of Service (i.e., LOS D or better) for the northbound movement cannot be accomplished by an all-way stop or TWLT lane. A traffic signal would improve traffic operations to LOS B. A signal would, however, require separate left turn lanes on Mother Lode Drive.

Traffic Signal Warrants. The peak hour traffic signal warrant will continue to be met at the Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection.

Intersection Queues. Table 18 identifies peak period queues under 2035 conditions. No 95th percentile queues have length that exceeds the available storage.

US 50 / East Shingle Springs Interchange Ramp Operations. Table 19 identifies the Level of Service at US 50 ramps under Year 2035 conditions. As shown, all work at LOS D or better, which satisfies the minimum standard.



2035 BASE TRAFFIC VOLUMES
AND LANE CONFIGURATIONS

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figure 9

TABLE 16
AM PEAK HOUR INTERSECTION LEVELS OF SERVICE
2035 PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour						
		2035		2035 Plus Project		2035 Plus Build Out		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	Traffic Signal Warranted?
1.Shingle Springs Dr / WB US 50	WB Stop	C	24.0	D	28.0	**F**	**193.5**	No
	All-Way Stop					B	14.7	
2.Shingle Springs Dr / EB US 50	EB Stop	B	11.9	B	12.3	C	18.0	No
3.Shingle Springs Dr / Access	EB Stop	-		C	18.4	**F**	**113.3**	No
	TWLT lane			-	-	D	28.2	
4.Shingle Springs Dr / Maggie Ln	EB Stop	C	18.4	C	18.9	C	22.0	No
	WB Stop	B	14.8	C	15.1	C	16.8	
5.Shingle Springs Dr / Buckeye Rd	SB Stop	**E**	**47.9**	**F**	**57.4**	**F**	**145.5**	No
	All-Way Stop	C	16.1	C	16.9	C	21.8	
	Separate southbound left and right turn lanes	D	28.8	D	31.8	**F**	**61.1**	
6.Mother Lode Dr / French Creek Rd *	Signal	B	14.8	B	14.8	C	15.1	N.a.
7.Mother Lode Dr / Holiday Lake Dr *	NB Stop	**F**	**68.3**	**F**	**69.4**	**F**	**85.0**	Yes
	SB Stop	C	22.7	C	23.1	D	25.7	
	All-Way Stop	**E**	**36.6**	**E**	**37.4**	**E**	**38.6**	
	TWLT lane	**E**	**43.0**	-	-	-	-	
	Signal	B	14.6	B	14.6	B	16.5	
8.Mother Lode Dr / Buckeye Rd	SB Stop	C	24.5	D	25.7	D	30.2	No
9.Mother Lode Dr / Greenstone Rd	SB Stop	C	17.4	C	17.5	C	17.8	No

(*) LOS E minimum **BOLD** values exceed minimum LOS. **HIGHLIGHTED** values are a significant impact

TABLE 17
PM PEAK HOUR INTERSECTION LEVELS OF SERVICE
2035 PLUS PROJECT CONDITIONS

Location	Control	PM Peak Hour						
		2035		2035 Plus Project		2035 Plus Build Out		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	Traffic Signal Warrant?
1.Shingle Springs Dr / WB US 50	WB Stop	B	10.8	B	12.4	D	28.0	No
2.Shingle Springs Dr / EB US 50	EB Stop	B	10.3	B	11.0	B	14.4	No
3.Shingle Springs Dr / Access	EB Stop	-		B	12.3	C	21.1	No
4.Shingle Springs Dr / Maggie Ln	WB Stop	B	12.1	B	12.3	B	13.4	No
5.Shingle Springs Dr / Buckeye Rd	SB Stop	B	11.9	B	12.3	B	14.3	No
6.Mother Lode Dr / French Creek Rd *	Signal	B	16.0	B	15.6	B	14.7	No
7.Mother Lode Dr / Buckeye Rd / Holiday Lake Dr	NB Stop	D	34.6	**E**	**35.9**	**E**	**41.5**	Yes
	SB Stop	B	14.2	B	14.6	B	14.9	
	All-way stop			**E**	**37.3**	**E**	**38.3**	
	Signal			A	8.6	A	8.8	
	TWLT lane			C	21.1	C	23.0	
8.Mother Lode Dr / Buckeye Rd	SB Stop	D	25.9	D	26.6	D	29.6	Yes **
9.Mother Lode Dr / Greenstone Rd	SB Stop	C	17.7	C	17.8	C	18.3	No

(*) LOS E minimum **BOLD** values exceed minimum LOS **HIGHLIGHTED** values are a significant impact

(**) satisfies peak hour warrants in pm peak hour under 2035 Plus Build Out conditions

TABLE 18
2035 PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Capacity (feet)	AM Peak Hour						PM Peak Hour					
		Year 2035		Plus Project		Plus Build Out		Year 2035		Plus Project		Plus Build Out	
		VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)	VPH	Queue (feet)
Mother Lode Drive / French Creek Road													
WB left turn	70	44	54	45	55	48	58	28	40	29	41	34	46

Highlighted values indicate queue length in excess of available storage

TABLE 19
2035 PLUS PROJECT US 50 RAMP LEVELS OF SERVICE

Direction	Location	Type	Peak Hour	Level of Service					
				2035		2035 plus Project		2035 Plus Build Out	
				Density (pcpmpl)	LOS	Density (pcpmpl)	LOS	Density (pcpmpl)	LOS
EB	Off to Shingle Springs Drive	Diverge	AM	24.4	C	24.6		25.2	C
			PM	31.7	D	31.8	D	32.6	D
	On from Shingle Springs Drive	Weave	AM	13.8	A	13.9	A	14.1	B
			PM	18.6	B	18.7	B	19.1	B
WB	Off to Shingle Springs Drive	Diverge	AM	26.8	C	26.8	C	27.1	C
			PM	28.5	D	28.5	D	28.8	D
	On from Shingle Springs Drive	Merge	AM	25.6	C	25.7	C	26.1	C
			PM	25.9	C	26.0	C	26.6	C

2035 PLUS PROJECT (PHASE I)

Two "plus project" conditions are presented. The first condition assumes operation of the "project" as proposed (i.e., Phase I gasoline sales / convenience store / car wash). The second scenario assumes "build out" (Phase I and II) of the balance of the site, and this scenario is addressed in the subsequent report section. It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

Year 2035 Plus Project Traffic Volumes. Figure 10 presents Year 2035 Plus Project (Phase I) peak hour traffic volumes created by superimposing project traffic onto the Year 2035 background conditions.

Levels of Service / Evaluation

Intersection Levels of Service. The identified Year 2035 Plus Project volumes were used to recalculate operating Levels of Service at study intersections, and Tables 16 and 17 presented resulting a.m. and p.m. peak hour Levels of Service in the 2035 Plus Project conditions.

If the proposed project proceeds alone, then the same two intersections which had a deficient Level of Service will continue to do so with the project. The **Shingle Springs Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS D standard. Because conditions in excess of standard are forecast with and without the project the significance of the impact is predicated on the amount of traffic added. In this case the project adds more than ten trips to the intersection, and its impact is significant. However, the same improvement (i.e., All-Way Stop or separate left and right turn lanes) that was suggested under the No Project condition would yield an acceptable Level of Service with the project.

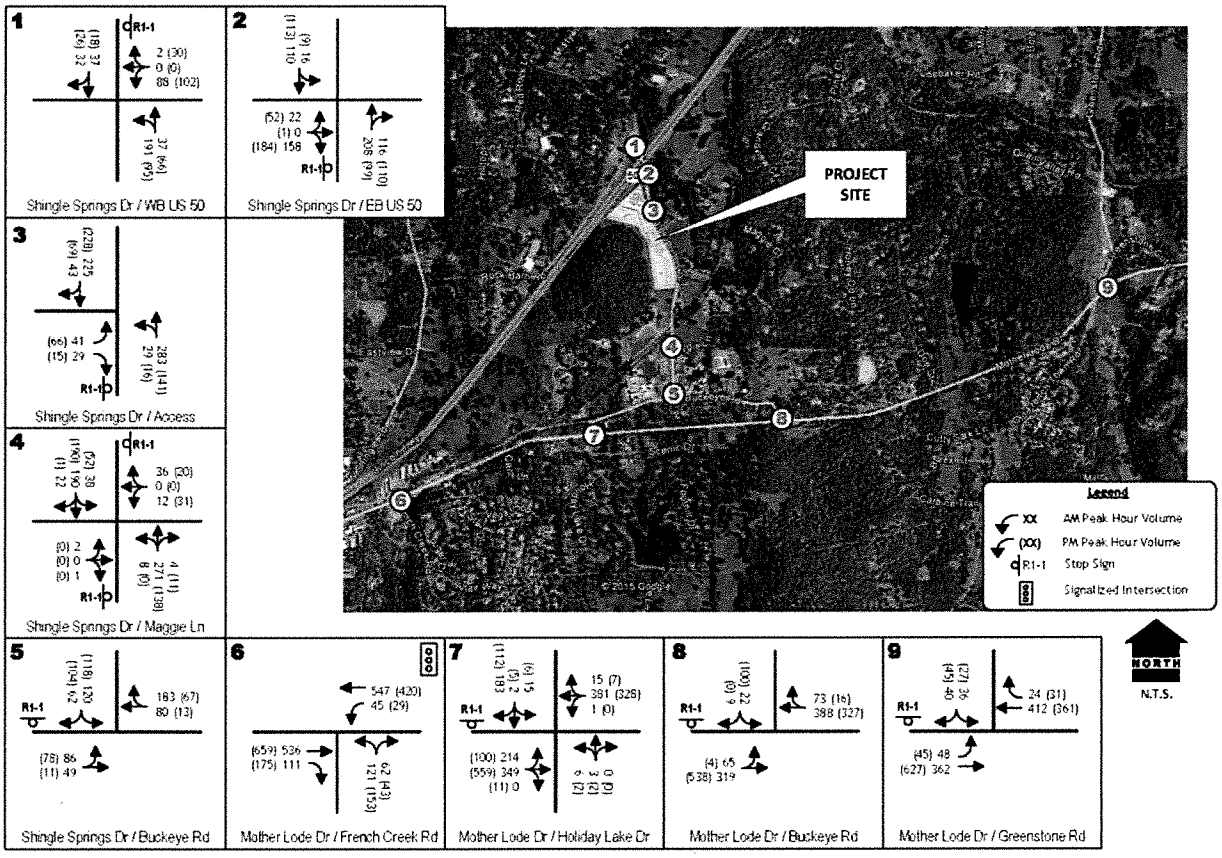
If the project proceeds alone, the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate with LOS F on the northbound approach in the a.m. peak hour and LOS E in the p.m. peak hour. LOS F and LOS E exceed the minimum LOS D standard but the intersection Level of Service exceeds the standard with and without the project. At this location the project adds fewer than ten trips to the intersection in the morning peak hour, and the impact is not significant under El Dorado County standards at that time. However, changing the Level of Service in the p.m. from LOS D to LOS E is a significant impact and mitigation is required.

Delivering satisfactory Level of Service in the p.m. peak hour could be achieved by two of the three alternative improvements previously considered (i.e., signal or TWLT lane). An All-Way stop would yield LOS E.

Traffic Signal Warrants. Under 2035 Plus Project conditions the peak hour traffic signal warrant will continue to be satisfied at the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection**.

Intersection Queues. Table 18 identifies peak period queues assuming the addition of project trips. No queues in excess of storage are projected.

US 50 / East Shingle Springs Interchange Ramp Operations. Table 19 identifies the Level of Service at US 50 ramps under Year 2035 conditions with the project. As shown, all work at LOS D or better, which satisfies the minimum standard.



YEAR 2035 PLUS PROJECT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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Transportation Engineers

1598-01 LT 3/16/2016

figure 10

2035 PLUS PROJECT AREA BUILD OUT (PHASES I AND II)

This analysis scenario assumes "build out" of the balance of the project site under the development assumptions presented earlier. It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

Year 2035 Plus Build Out Traffic Volumes. Figure 11 presents a.m. and p.m. peak hour traffic volumes at study intersections assuming that the site is built out (Phase I and II) with access as proposed. Project area trips were again superimposed onto the Year 2035 background condition to produce the traffic volumes used for analysis. Traffic volume forecasts for future access points are presented in the appendix.

Levels of Service / Evaluation

Intersection Levels of Service. The identified Year 2035 Plus Project volumes were used to recalculate operating Levels of Service at study intersections, and Tables 16 and 17 presented resulting a.m. and p.m. peak hour Levels of Service in the 2035 Plus Project Area Build Out conditions.

If the proposed project area is built out, then two additional intersections will operate with Level of Service in excess of the minimum standard, and the two intersections which already had a deficient Level of Service without the project will continue to do so with the project.

At the **Shingle Springs Drive / Westbound US 50 ramps intersection** motorists waiting at the off ramp are projected to experience delays that are indicative of LOS F. This exceeds the minimum LOS D standard, and is a significant impact under El Dorado County guidelines, and mitigation would be required. Measures to improve the Level of Service would include installing an all-way stop, which would deliver LOS B in the a.m. peak hour.

At the **Shingle Springs Drive / Phase I Project Access Driveway intersection,** motorists waiting to exit would experience delays that are indicative of LOS F. As this exceeds the minimum LOS D standard, this is a significant impact, and mitigation would be required. Measures to produce a Level of Service that satisfies the minimum standard would include widening Shingle Springs Drive to provide a continuous TWLT lane on Shingle Springs Drive along the project frontage. Eventually the lane will extend from the US 50 interchange through the southernmost access intersection. With that treatment the project access would operate at LOS D.

The **Shingle Springs Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS D standard. Because conditions in excess of standard are forecast with and without the project the significance of the impact is predicted on the amount of traffic added. In this case the project adds more than ten trips to the intersection, its impact is significant, and mitigation would be required. One of the improvements (i.e., All-Way Stop) suggested under the No Project condition would yield an acceptable Level of Service with the project (i.e., LOS C), but widening the southbound approach alone would only yield LOS F.

If the project site is built out, the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate with LOS F on the northbound approach. Again, LOS F exceeds the minimum LOS E standard but the intersection Level of Service exceeds the standard with and without the project. Under Build Out the project adds more than ten trips to the intersection in the morning peak hour, and the impact is significant under El Dorado County standards. Project build out would also take the p.m. peak hour Level of Service from an acceptable condition (LOS D) to an unacceptable level (i.e., LOS E), and this is a significant impact as well. Mitigation would be required.

Of the improvements previously considered, only a traffic signal would deliver adequate Level of Service in the a.m. peak hour (i.e., LOS B).

Traffic Signal Warrants. Under 2035 Plus Build Out conditions the peak hour traffic signal warrant will continue to be satisfied at the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** and warrants would be satisfied at the **Mother Lode Drive / Buckeye Road intersection** in the p.m. peak hour. Traffic signal warrants would be satisfied at **the Shingle Springs Road / EB ramp intersection** under "rural" conditions, but as 85% of the ramp traffic will be turning right, a traffic signal is not justified.

Intersection Queues. Table 18 identifies peak period queues assuming the addition of project trips under Build Out conditions. No queues in excess of storage are projected.

US 50 / East Shingle Springs Interchange Ramp Operations. Table 19 identifies the Level of Service at US 50 ramps under Year 2035 conditions with the project at Build Out conditions. As shown, all work at LOS D or better, which satisfies the minimum standard.

CIRCULATION / ACCESS REVIEW

The Phase I project access to Shingle Springs Road and general on-site site circulation near that access was reviewed within the context of El Dorado County traffic study guidelines.

Driveway Throat Depth

The adequacy site access design has been considered based on driveway throat depth. The driveway throat is the on-site storage area available for vehicles waiting to exit the site. Ideally, the driveway throat area should exceed the length of the anticipated queue of waiting vehicles in order to ensure that the path of arriving vehicles is not blocked.

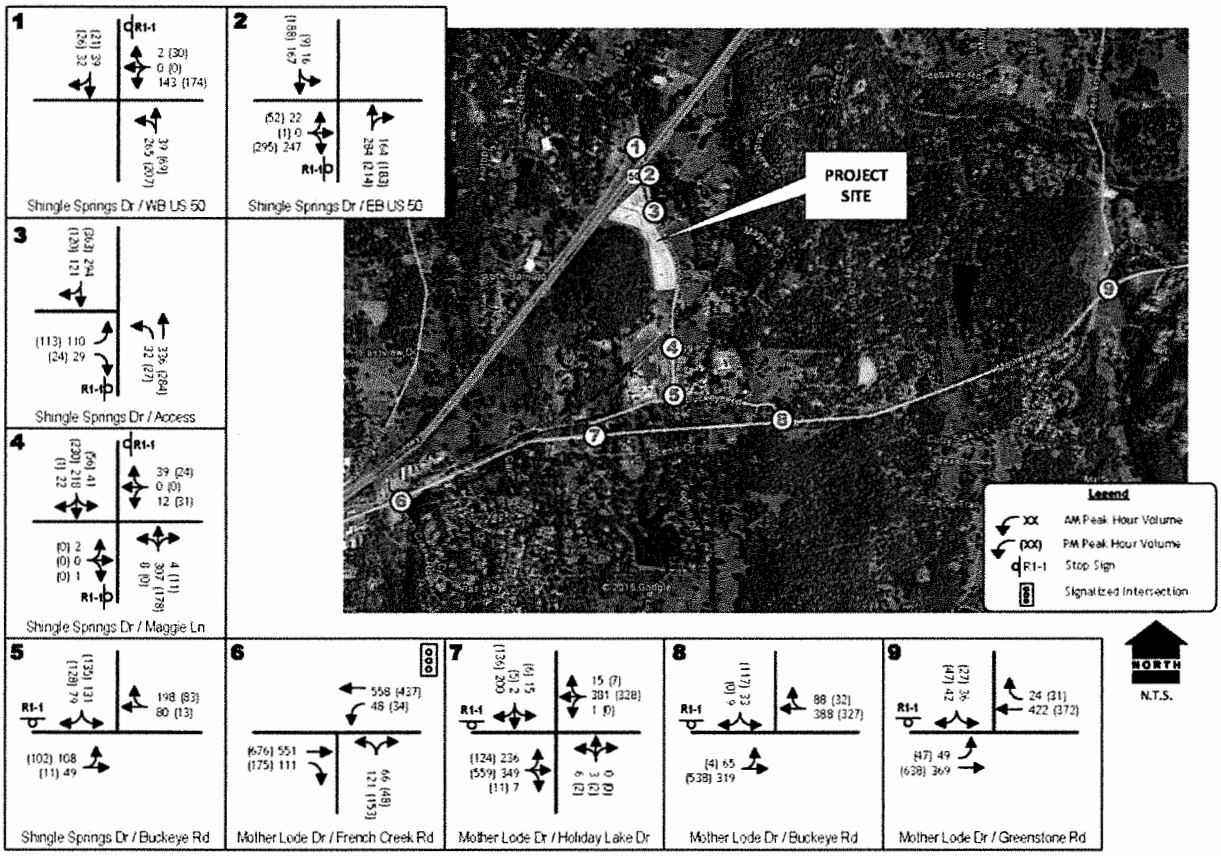
95th Percentile Queue Lengths. Table 20 identifies the available storage under the current site plan and compares that distance with projected queues. As indicated, the exit provides separate left and right turn lanes that are each 100 feet long measured from the right of way line. The 95th percentile queue in each lane has been determined as a byproduct of the Level of Service analysis for two conditions. The Year 2035 Plus Phase I analysis assumes that only Phase I has proceeded and the TWLT lane eventual required on Shingle Springs Road has not yet been implemented. The Year 2025 Plus Buildout analysis assumes that the TWLT lane is in place.

As indicated, the longest queues occur in the a.m. peak hour, primarily due to the peaking characteristics of school traffic. The longest queue will accompany Build Out. As shown, the 95th percentile queue in the left turn lane is projected to be 90 feet long and can be accommodated by the proposed throat. The queue in the right turn lane is less than 1 car (i.e., <25 feet).

Recommendation. While the anticipated queues can be accommodated in the expected turn lanes, it will be important to ensure that the circulation layout directs exiting motorists into these lanes. The layout near these lanes is relatively broad and open in order to accommodate the turning requirements of trucks. Exiting motorists could take a drive route into the exit lanes across the entry that may result in a queue that leaves the exit lanes themselves. A median to separate the inbound and outbound lanes may be desirable under Build Out conditions to ensure efficient use of the exit lanes. The adequacy of on-site truck circulation will need to be assessed as that median is designed.

TABLE 20
DRIVEWAY THROAT QUEUES

Approach	Lane	Throat Depth (feet)	Scenario	Time Period	Volume (vph)	95th Percentile Queue	
						Vehicles	Distance (feet)
Project Exit	Left Turn	100	2035 + Phase I	AM	41	1	25
				PM	66	<1	<25
			2035 – Build Out	AM	110	3.6	90
				PM	113	1.8	45
	Right Turn	100	2035 + Phase I	AM	29	<1	<25
				PM	15	<1	<25
			2035 + Build Out	AM	29	<1	<25
				PM	24	<1	<25



YEAR 2035 PLUS PROJECT (BUILD OUT)
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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Transportation Engineers

3598-01 LT 3/16/2016

figure 11

FINDINGS / RECOMMENDATIONS / MITIGATIONS

The preceding analysis has identified project impacts that may occur without improvements. The text that follows identifies a strategy for mitigating the impacts of the proposed project (Phase I), and dealing with the design requirements associate with Build Out (Phase I and II) of the entire site. Recommendations are identified for facilities that have deficiencies in the roadway network without the project. If the project causes a significant impact, mitigations are identified for the facility. It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

Mitigation responsibility will be subject to General Plan Policy TC-Xf. Under that policy if a proposed mitigation measure is included in the adopted 20 year CIP, then payment of TIM fees would cover the proposed project's fair share of that improvement. Conversely, the project applicant would be responsible for the full cost of the proposed mitigation if the mitigation is not in or added to the 20-year CIP. El Dorado County staff reports that none of the improvements discussed in the preceding sections of the analysis are currently in the CIP.

Existing Conditions – Improvement Recommendations

With one exception, all study intersections operate with a Level of Service that satisfies the minimum requirements of El Dorado County. However, it is important to note that short periods of congestion typically occur near schools during the periods before and after the school day. Congestion and delay can occur as a result of the constraints created by school drop-off and loading activities, even if the adjoining circulation system has the capacity to accommodate the actual traffic volumes.

The northbound approach to the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** operates at LOS E and the intersection volume reaches the level that satisfies peak hour traffic signal warrants. However, because most of the traffic on the southbound approach is turning right, a traffic signal is not justified at this time. Widening Mother Lode Drive to provide a continuous Two-Way Left Turn (TWLT) lane through the intersection would improve the Level of Service on the northbound approach to LOS D.

TABLE 21
EXISTING CONDITIONS PEAK HOUR LEVELS OF SERVICE
WITH IMPROVEMENTS

Location	Control	AM Peak Hour		PM Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
Mother Lode Dr / Holiday Lake Dr / Buckeye Rd	NB Stop	**E**	**46.5**	C	24.2	Yes
	SB Stop	C	17	B	12.3	
Add TWLT lane		D	29.5			
Signalize		B	13.1			
All-Way Stop		C	19.7			

The US 50 / East Shingle Springs interchange ramps operate with Level of Service that satisfy the minimum LOS D standard. No improvements are justified.

Existing Plus Project Conditions - Mitigations

With the addition of trips generated by the proposed project all but one study area intersection will continue to operate with Levels of Service that satisfy the El Dorado County minimum standards. The **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will continue to operate with LOS E on the northbound approach. In this case the significance of the project's impact is determined based on the amount of added traffic. The project adds 8 trips which is less than the permissible 10 trip increment under County guidelines. The project's impact is not significant and no improvements are required.

However, the project shall:

Pay TIM Fees: The project shall contribute its fair share to the cost of regional circulation improvements via the existing countywide traffic impact mitigation (TIM) fee program.

Improve Project Access in a manner that is consistent with the requirements of the "Build Out" condition. If the project area is built out, then a continuous TWLT lane will be needed on Shingle Springs Drive in the vicinity of the project access. Ideally, the TWLT lane should be installed when the project proceeds, but at a minimum because this is a cumulative mitigation the project access should be positioned to accommodate construction of the TWLT lane when future development occurs.

Background 2025 Conditions – Improvement Recommendations

In the year 2025 two intersections will operate with Levels of Service that exceed adopted El Dorado County minimum standards.

The southbound approach at the **Buckeye Road / Shingle Springs Drive intersection** will operate at LOS E. This exceeds the LOS D minimum. An all-way stop would deliver LOS B, which would satisfy the minimum standard. However, all-way stops can sometimes be problematic in the vicinity of schools due to the parking characteristics of school traffic. Widening the southbound approach to provide separate left turn and right turn lanes would improve the Level of Service on that approach to LOS D, which would satisfy the minimum standard.

The northbound Holiday Lake Drive approach at the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate at LOS F. This exceeds the LOS D minimum. Producing an adequate Level of Service for the northbound movement could be accomplished by installing an all-way stop or traffic signal or by widening Mother Lode Drive to provide a TWLT lane. An all-way stop would deliver an overall LOS D, but all-way stops can be problematic near schools during peak periods. Installing a traffic signal would likely require widening Mother Lode Drive to provide separate left turn lanes, but would deliver LOS B. A TWLT lane would reduce delays for the northbound approach and LOS D would result.

TABLE 22
PEAK HOUR INTERSECTION LEVELS OF SERVICE
MITIGATED 2025 PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted
		2025		2025 Plus Project		2025		2025 Plus Project		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
5.Shingle Springs Dr / Buckeye Rd	SB Stop	**E**	**35.7**	**E**	**41.4**	B	10.7	A	9.9	No
	All-Way Stop	B	14.7	C	15.4					
	Separate SB lanes	C	24.6	D	26.7					
7.Mother Lode Dr / Holiday Lake Dr	NB Stop	**F**	**55.1**	**F**	**57.3**	D	28.8	D	29.6	Yes
	SB Stop	C	19.5	C	19.8	B	13.4	B	13.4	
	All-Way Stop	D	25.7							
	Signal	B	13.3							
	TWLT	D	34.6							

(*) LOS E minimum **BOLD** values exceed minimum LOS. **HIGHLIGHTED** values are a significant impact

2025 Plus Project Conditions - Mitigations

The same two intersections that will operate with Level of Service below standard without the project will do so if the project proceeds.

At the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection**, the northbound approach would operate at LOS F with and without the project. LOS F exceeds the LOS D minimum. In this case, the significance of the project's impact is based on the volume of traffic contributed by the project. The project adds eight trips to the intersection during the a.m. peak hour. As this value is less than the ten trip increment permitted under El Dorado County guidelines, the project's impact is not significant, and mitigation is not required.

At the **Shingle Springs Drive / Buckeye Road intersection** the southbound approach will operate at LOS E in the a.m. peak hour with and without the project. Again, the significance of the project's impact is based on the volume of added traffic. At this location the project adds fourteen trips in the a.m. peak hour. As this value exceeds the ten trip increment permitted under El Dorado County guidelines, the project's impact is significant.

Delivering a Level of Service that satisfied minimum standard could be accomplished using an all-way stop, and LOS C would result. However, all-way stop controls can be problematic in the vicinity of schools if queueing extends back to school entrances and interferes with local circulation during the peak periods before and after school. Alternatively widening the southbound Shingle Springs Drive approach to provide separate left and right turn lanes would deliver LOS C.

Unacceptable operations at this intersection are due to increased traffic from planned development. The intersection operates at unacceptable LOS E under 2025 conditions without the project, which includes traffic growth from other foreseeable projects. Therefore the project is only responsible for its proportional share of the proposed mitigation under this scenario. Since the impact is identified under the 2025 scenario, the timing of the improvement is a function of the rate of population and employment growth.

The significant impact at this intersection shall be mitigated with the installation of an all-way stop or widening of the southbound approach to provide separate left and right turn lanes as determined by El Dorado County.

Appropriate mitigation, as determined by the El Dorado County Community Development Agency (CDA), includes one of the following:

- Payment of traffic impact mitigation (TIM) fees to satisfy the project's proportional share obligation, as approved by CDA, towards the improvement if the improvement is included in the 20-Year Capital Improvement Program (CIP), OR
- Construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others, OR
- Payment of the project's proportional share, as approved by CDA, if the improvement is constructed by others, but not included in the 20-Year CIP.

2035 Conditions – Improvement Recommendations

The two un-signalized intersections which operated with deficient Level of Service in 2025 will operate with Levels of Service that exceed the minimum standard in 2035.

The southbound approach at the **Buckeye Road / Shingle Springs Drive intersection** will operate at LOS E. This exceeds the LOS D minimum. An all-way stop would deliver LOS C, which would satisfy the minimum standard. However, all-way stops can sometimes be problematic in the vicinity of schools due to the parking characteristics of school traffic. Widening the southbound approach to provide separate left and right turn lanes would deliver LOS D.

The northbound Holiday Lake Drive approach at the **Mother Lode Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS E minimum. Producing an adequate Level of Service for the northbound movement could be accomplished by an all-way stop. Alternatively, installing a traffic signal would improve traffic operations. A signal would, however, require separate left turn lanes on Mother Lode Drive.

TABLE 23
AM PEAK HOUR INTERSECTION LEVELS OF SERVICE
MITIGATED 2035 PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour						
		2035		2035 Plus Project		2035 Plus Build Out		
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	Traffic Signal Warranted?
3.Shingle Springs Dr / Access	EB Stop	-		C	18.4	F	113.3	No
	TWLT lane			-	-	D	28.2	
5.Shingle Springs Dr / Buckeye Rd	SB Stop	E	47.9	F	57.4	F	145.5	No
	All-Way Stop	C	16.1	C	16.9	C	21.8	
	Separate southbound left and right turn lanes	D	28.8	D	31.8	F	61.1	
7.Mother Lode Dr / Holiday Lake Dr *	NB Stop	F	68.3	F	69.4	F	85.0	
	SB Stop	C	22.7	C	23.1	D	25.7	Yes
	All-Way Stop	E	36.6	E	37.4	E	38.6	
	TWLT lane	E	43.0	-	-	-	-	
	signal	B	14.6	B	14.6	B	16.5	

(*) LOS E minimum **BOLD** values exceed minimum LOS. **HIGHLIGHTED** values are a significant impact

TABLE 24
PM PEAK HOUR INTERSECTION LEVELS OF SERVICE
MITIGATED 2035 PLUS PROJECT CONDITIONS

Location	Control	PM Peak Hour						
		2035		2035 Plus Project		2035 Plus Build Out		Traffic Signal Warrant?
		LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	
7.Mother Lode Dr / Buckeye Rd / Holiday Lake Dr	NB Stop	D	34.6	**E**	**35.9**	**E**	**41.5**	
	SB Stop	B	14.2	B	14.6	B	14.9	No
	All-way stop			**E**	**37.3**	**E**	**38.3**	
	Signal			A	8.6	A	8.8	
	TWLT lane			C	21.1	C	23.0	

(*) LOS E minimum **BOLD** values exceed minimum LOS. **HIGHLIGHTED** values are a significant impact

2035 Plus Project (Phase I) Conditions - Mitigations

The same two intersections will be deficient if the project proceeds.

The **Shingle Springs Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS D standard. Because conditions in excess of standard are forecast with and without the project the significance of the impact is predicated on the amount of traffic added. In this case the project adds more than ten trips to the intersection, its impact is significant. However, the same improvements (i.e., All-Way Stop or separate southbound lanes) that were suggested under the No Project condition and required for Year 2025 impacts would yield an acceptable Level of Service with the project.

Unacceptable operations at this intersection are due to increased traffic from planned development. The intersection operates at unacceptable LOS E under 2035 conditions without the project, which includes traffic growth from other foreseeable projects. Therefore the project is only responsible for its proportional share of the proposed mitigation under this scenario. Since the impact is identified under the 2035 scenario, the timing of the improvement is a function of the rate of population and employment growth.

The significant impact at this intersection shall be mitigated with the installation of an all-way stop or widening of the southbound approach to provide separate left and right turn lanes as determined by El Dorado County.

Appropriate mitigation, as determined by the El Dorado County Community Development Agency (CDA), includes one of the following:

- Payment of traffic impact mitigation (TIM) fees to satisfy the project's proportional share obligation, as approved by CDA, towards the improvement if the improvement is included in the 20-Year Capital Improvement Program (CIP), OR
- Construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others, OR
- Payment of the project's proportional share, as approved by CDA, if the improvement is constructed by others, but not included in the 20-Year CIP.

The **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate with LOS F on the northbound approach in the a.m. peak hour and LOS E in the p.m. peak hour. LOS F and LOS E exceed the minimum LOS D standard but the intersection Level of Service exceeds the standard with and without the project. At this location the project adds fewer than ten trips to the intersection in the morning peak hour, and the impact is not significant under El Dorado County standards at that time. However, changing the Level of Service in the p.m. from LOS D to LOS E is a significant impact and mitigation is required.

Unacceptable operations at this intersection are due to increased traffic from planned development. The intersection operates at unacceptable LOS E under 2035 conditions without the project, which includes traffic growth from other foreseeable projects. Therefore the project is only responsible for its proportional share of the proposed mitigation under this scenario. Since the impact is identified under the 2035 scenario, the timing of the improvement is a function of the rate of population and employment growth.

The significant impact at this intersection shall be mitigated with the installation of an all-way stop, widening Mother Lode Drive to provide a TWLT lane or installing a traffic signal as determined by El Dorado County.

Appropriate mitigation, as determined by the El Dorado County Community Development Agency (CDA), includes one of the following:

- Payment of traffic impact mitigation (TIM) fees to satisfy the project's proportional share obligation, as approved by CDA, towards the improvement if the improvement is included in the 20-Year Capital Improvement Program (CIP), OR
- Construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others, OR
- Payment of the project's proportional share, as approved by CDA, if the improvement is constructed by others, but not included in the 20-Year CIP.

2035 Plus Build Out Conditions - Mitigations

Four intersections will operate with Level of Service that exceeds the minimum standard if the project area is build out (e.g. both Phase I and II development). It is important to note, however, that a project specific traffic analysis will be required by El Dorado County when the balance of the project proceeds to identify the actual mitigation requirements for the build out condition.

At the **Shingle Springs Drive / Westbound US 50 ramps intersection** motorists waiting at the off ramp are projected to experience delays that are indicative of LOS F. This exceeds the minimum LOS D standard, and is a significant impact under El Dorado County guidelines, and mitigation would be required. Installing an all-way stop would deliver LOS B in the a.m. peak hour.

The project shall:

Under 2035 Plus Build Out conditions, pay for the Cost of Shingle Springs Drive / US 50 Westbound Ramps Intersection Improvements, as determined by the traffic impact study for Phase II. The project proponents shall pay the cost of installing an all-way stop or other improvements, as determined by the traffic impact study for Phase II.

At the **Shingle Springs Drive / Phase I Project Access Driveway intersection,** motorists waiting to exit would experience delays that are indicative of LOS F. As this exceeds the minimum LOS D standard, this is a significant impact, and mitigation would be required. Shingle Springs Drive should be widened to provide a continuous TWLT lane on Shingle Springs Drive along the project frontage. Eventually the lane should extend from the US 50 interchange through the southernmost access driveway. With that treatment the project access would operate at LOS D.

The project shall:

Under 2035 Plus Build Out conditions, install A TWLT Lane on Shingle Springs Drive, or other improvements as determined by the traffic impact study for Phase II. The project proponents shall install a TWLT lane on Shingle Springs Drive along the length of the entire project frontage or other improvements, as determined by the traffic impact study for Phase II.

The **Shingle Springs Drive / Buckeye Road intersection** will operate at LOS F. This exceeds the LOS D standard. Because conditions in excess of standard are forecast with and without the project the significance of the impact is predicated on the amount of traffic added. In this case the project (Phase I and II) adds more than ten trips to the intersection, and therefore its impact is significant. However, the same improvement (i.e., All-Way Stop, TWLT lane or traffic signal) that was suggested for Phase I would yield an acceptable Level of Service with the build out of the project.

The project shall:

Under 2035 Plus Build Out conditions, fund the cost of Shingle Springs Drive / Buckeye Road Improvements as determined by the traffic impact study for Phase II. This is the same mitigation required under Year 2025 Plus Project Phase I and Year 2035 Plus Project Phase I conditions.

If the project builds out (e.g. Phase I and II), the **Mother Lode Drive / Buckeye Road / Holiday Lake Drive intersection** will operate with LOS F on the northbound approach in the a.m. peak hour and LOS E in the p.m. peak hour. Again, LOS F exceeds the minimum LOS E standard but the intersection Level of Service exceeds the standard with and without the project. At this location the project adds more than ten trips to the intersection in the morning peak hour, and the impact is significant under El Dorado County standards.

The project shall:

Under 2035 Plus Build Out conditions, fund the cost of Mother Lode Drive / Buckeye Road / Holiday Lake Drive Improvements as determined by the traffic impact study for Phase II. The project proponents shall pay for an all-way stop, TWLT lane or traffic signal as

determined by El Dorado County pursuant to General Plan Policy TC-Xf. This is the same mitigation required for Year 2035 Plus Phase I

Site Access

The proposed site plan provides adequate throat depth at the project driveway to ensure that arriving traffic is not blocked by the queue of vehicles waiting to exit the site. However, a median separating entering and exiting lanes is recommended under Build Out conditions to ensure that motorists do not cut across the lanes and create a queue outside of the designated lanes.

REFERENCES

1. Transportation Research Board, *Highway Capacity Manual*, 2010
2. Caltrans *Highway Design Manual*, 2012
3. California *Manual of Uniform Traffic Control Devices*, 2012
4. Institute of Transportation Engineers. 2012. *Trip Generation*, 9th Edition. Washington, D.C.
5. El Dorado County Bicycle Transportation Plan 2010

APPENDICES

EXHIBITS

1. Location Map
2. General Plan Land Use Map
3. Zoning Map
4. Aerial Photo
5. Improvement Plans
6. Special Status Wildlife Species
7. Special Status Plant Species
8. Soils Map

Exhibit 1. Location Map

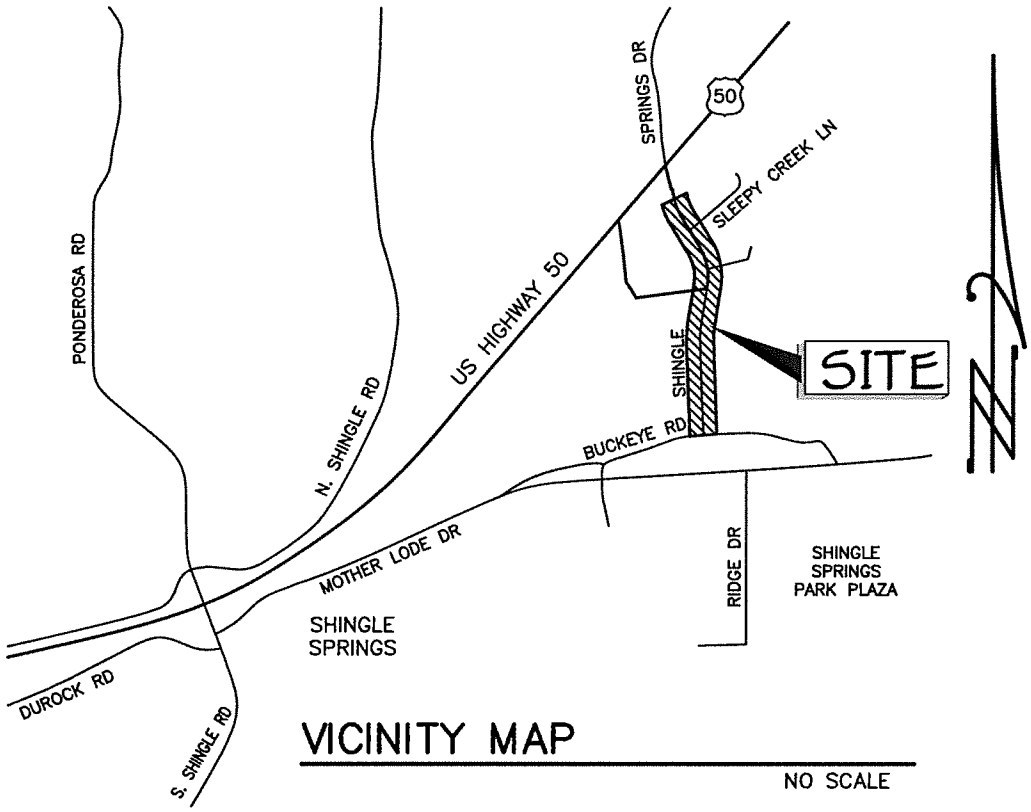


Exhibit 2. General Plan Land Use Map

Shingle Springs Village Improvements
Site Plan Review SPR15-0003

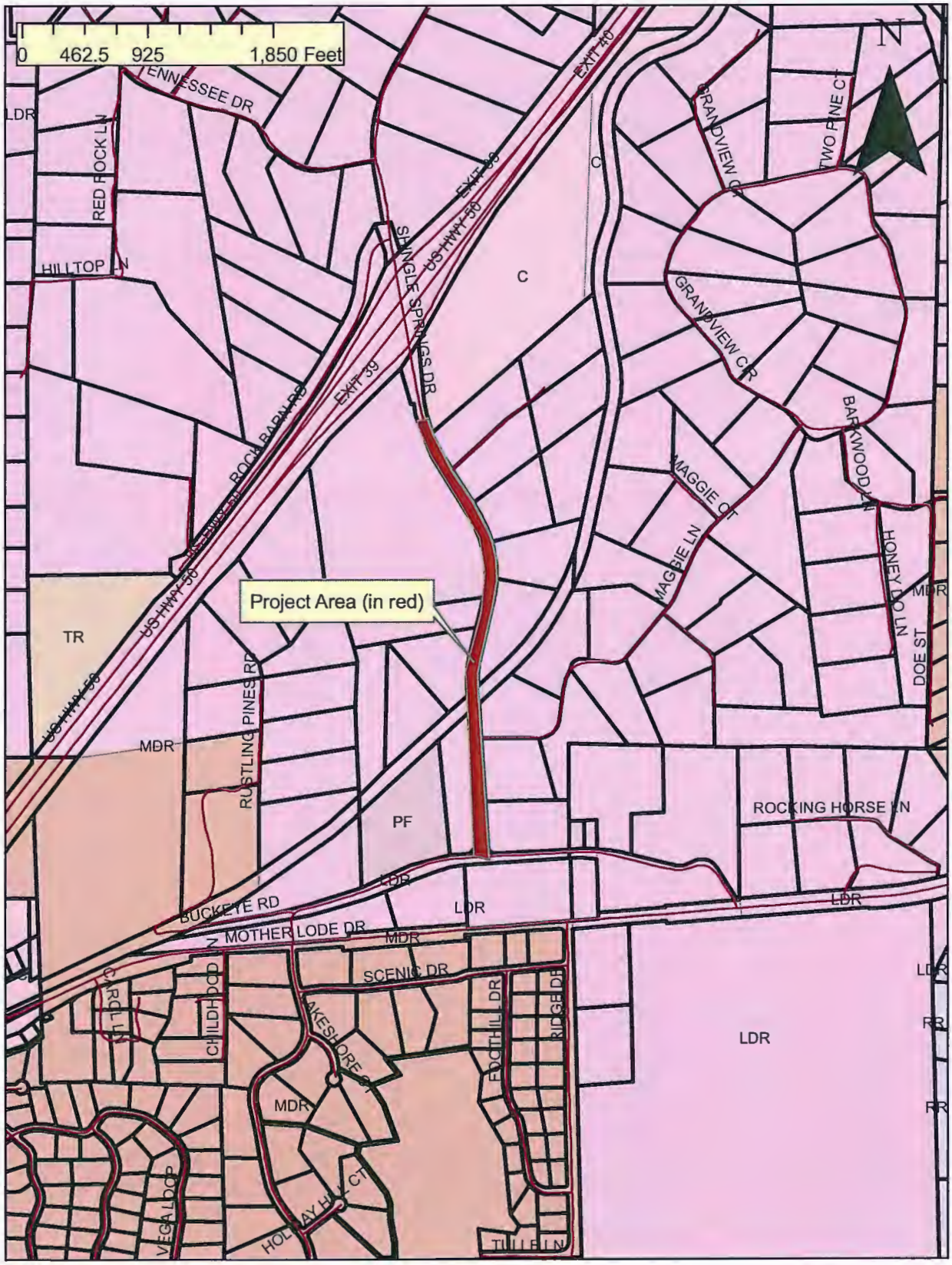


Exhibit 2- General Plan Land Use Map

Exhibit 3. Zoning Map

Shingle Springs Village Improvements
Site Plan Review SPR15-0003

Exhibit 3- Zoning Map

Exhibit 4. Aerial View of Project Area

Shingle Springs Village Improvements
Site Plan Review SPR15-0003

Exhibit 4- Aerial View of Project Area

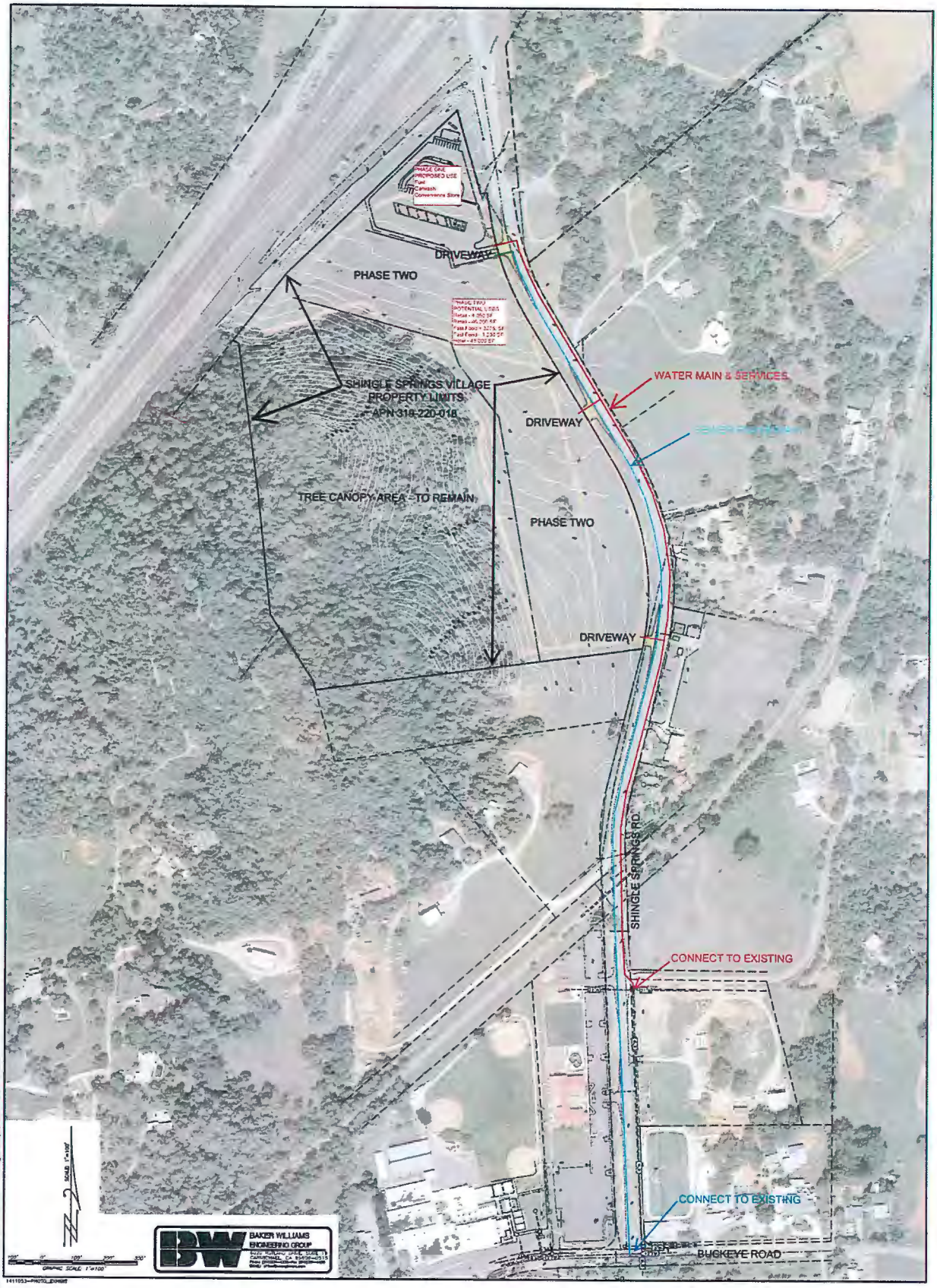
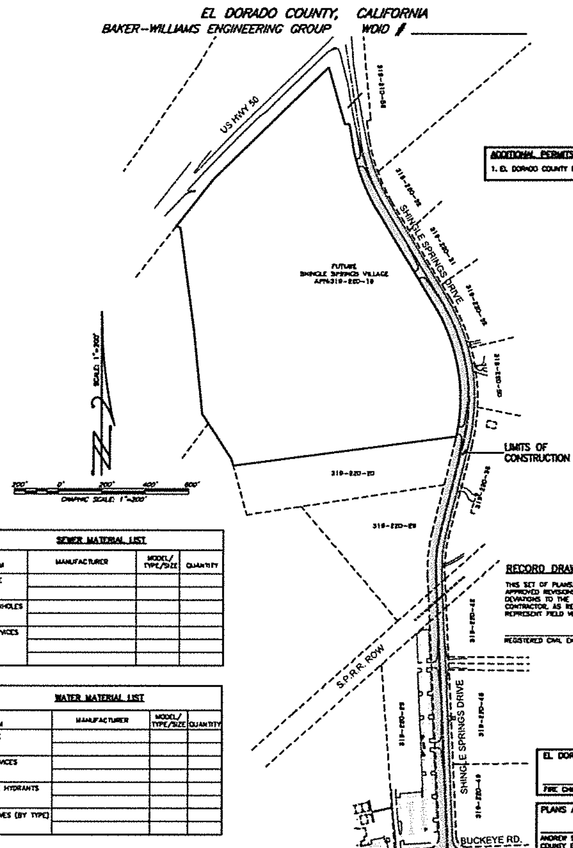

DRIVEWAY
PHASE TWO
SHINGLE SPRINGS VILLAGE
PROPERTY LIMITS
APN 319-220-018
WATER MAIN & SERVICES
DRIVEWAY
TREE CANOPY AREA - TO REMAIN
PHASE TWO
DRIVEWAY
SHINGLE SPRINGS RD.
CONNECT TO EXISTING
CONNECT TO EXISTING
BUCKEYE ROAD
BAKER WILLIAMS
ENGINEERING GROUP

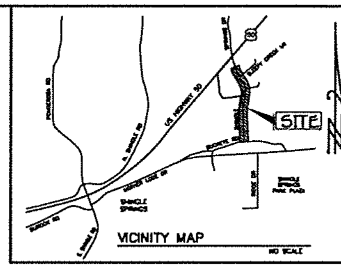
Exhibit 5. Improvement Plans

IMPROVEMENT PLANS FOR:
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION

EL DORADO COUNTY, CALIFORNIA

BAKER–WILLIAMS ENGINEERING GROUP WOID # ________





ADDITIONAL PERMITS REQUIRED:
1. EL DORADO COUNTY ENCROACHMENT PERMIT

LIST OF ABBREVIATIONS:

AC ASPHALTIC CONCRETE
AB AGGREGATE SUBBASE
ANG. PT. ANGLE POINT
ARV AIR RELEASE VALVE
BB BOTTOM OF BERM
BNDY. BOUNDARY
BO BLOW OFF VALVE
BOC BACK OF CURB
BOW BACK OF WALK
BRW BOTTOM OF RETAINING WALL
BSW BOTTOM SOUND WALL
BV BUTTERFLY VALVE
BVC BEGIN VERTICAL CURVE
BWV BACKWATER VALVE
CAW CALIFORNIA AMERICAN WATER
CH CHORD
CL CLASS
CLR. CLEAR
CO CLEANOUT
COMB. COMBINATION
C/L CENTERLINE
CONC. CONCRETE
CONST. CONSTRUCT
CR CURVE RETURN
CSP CORRUGATED STEEL PIPE
CT COURT
CTS CORROSION TEST STATION
C&G CURB AND GUTTER
DEL DELTA
DET DETAIL
DIA. DIAMETER
DI DROP INLET
D.I.P. DUCTILE IRON PIPE
DR DRIVE
D/W DRIVEWAY
(E) – EX – EXIST EXISTING
ELEV. ELEVATION
EP EDGE OF PAVEMENT
ESMT EASEMENT
EVC END VERTICAL CURVE
FC FACE OF CURB
FF FINISHED FLOOR ELEVATION
FG FINISH GRADE
FH FIRE HYDRANT
F/L FLOWLINE
FO FIBER OPTIC
GALV. GALVANIZED
GB GRADE BREAK
G.I.P. GALVANIZED IRON PIPE
GR GRATE
GSL GRAVITY SEWER LIMITS
GM GAS MAIN
GV GATE VALVE
HGL HYDRAULIC GRADE LINE
HP HIGH POINT
INV. INVERT
I.P. IRON PIPE
IRR IRRIGATION
INTR INTERSECTION
JT JOINT TRENCH
JP JOINT POLE
L LENGTH
LF LINEAR FEET
LN LANE
LP LOW POINT
LT LEFT
MAX. MAXIMUM
MH MANHOLE
MIN. MINIMUM
M MAIL BOX
N.A.P.O.T.C. NOT A PART OF THIS CONTRACT
O.C. ON CENTER
O.D. OUTSIDE DIAMETER
PAC. BELL PACIFIC TELEPHONE
P.G.&E PACIFIC GAS AND ELECTRIC
PVI POINT OF VERTICAL INTERSECTION
P/L PROPERTY LINE
PRC POINT OF REVERSE CURVE
PR – PROP PROPOSED
P.S.I. POUNDS per SQUARE INCH
PT POINT
PVC POLYVINYL CHLORIDE PIPE
R RADIUS
RCP REINFORCED CONCRETE PIPE
RD ROAD OR ROOF DRAIN
RL RESTRAINED LENGTH
RT RIGHT
R/W RIGHT OF WAY
RW RAW WATER
S SLOPE
SD – (D) STORM DRAIN
SHGL SLOPE HYDRAULIC GRADE LINE
SMUD SACRAMENTO MUNICIPAL UTILITY DISTRICT
S.O. SIDE OPENING
SS – (S) SANITARY SEWER
SSFM SANITARY SEWER FORCE MAIN
ST STREET
STA. STATION
SUBD. SUBDIVISION
TBC TOP BACK OF CURB
TC TOP CURB
TFM TOP OF FORCE MAIN
TRW TOP OF RETAINING WALL
TSW TOP SOUND WALL
TWM TOP OF WATER MAIN
TW TOP OF WALK
T TRANSFORMER
TP TOP OF PAVEMENT
TYP. TYPICAL
VC VERTICAL CURVE
W WATER
W/ WITH
WM WATER MAIN

WATER LEGEND

LEGEND:

PROP. SANITARY SEWER FORCE MAIN
EXIST. SANITARY SEWER FORCE MAIN
PROP. FLUSHER BRANCH
EXIST. FLUSHER BRANCH
PROP. SEWER SERVICE
EXIST. SEWER SERVICE
PROP. MANHOLE
EXIST. MANHOLE
PROP. STORM DRAIN
EXIST. STORM DRAIN
PROP. DROP INLET
EXIST. DROP INLET
PROP. WATER MAIN
EXIST. WATER MAIN
PROP. FIRE HYDRANT ASSEMBLY
EXIST. FIRE HYDRANT ASSEMBLY
PROP. AIR RELEASE VALVE
EXIST. AIR RELEASE VALVE

SEWER MATERIAL LIST

ITEM	MANUFACTURER	MODEL/ TYPE/SIZE	QUANTITY
PIPE			
MANHOLES			
SERVICES			

WATER MATERIAL LIST

ITEM	MANUFACTURER	MODEL/ TYPE/SIZE	QUANTITY
PIPE			
SERVICES			
FIRE HYDRANTS			
VALVES (BY TYPE)			

SHEET INDEX:

WATER SERVICE CERTIFICATION

I HEREBY CERTIFY THAT THE WATER SYSTEM AS SHOWN ON DRAWING NUMBER ______, SHEETS 1 THROUGH 11 HAS BEEN DESIGNED TO PROVIDE EACH FACILITY OF THIS PROJECT WITH ADEQUATE WATER PRESSURE AND FIRE FLOW AS OF THE DATE SHOWN, BASED ON CRITERIA SUPPLIED BY THE EL DORADO IRRIGATION DISTRICT.

REGISTERED CIVIL ENGINEER ______ RCE NO. ______ DATE ______

SEWER SERVICE CERTIFICATION

I HEREBY CERTIFY THAT THE SEWER SYSTEM AS SHOWN ON DRAWING NUMBER ______, SHEETS 1 THROUGH 11 HAS BEEN DESIGNED TO PROVIDE EACH FACILITY OF THIS PROJECT WITH SEWER SERVICE AS OF THE DATE SHOWN, BASED ON CRITERIA SUPPLIED BY THE EL DORADO IRRIGATION DISTRICT.

REGISTERED CIVIL ENGINEER ______ RCE NO. ______ DATE ______

RECORD DRAWING CERTIFICATE

THIS SET OF PLANS, HAVING BEEN REVIEWED BY ME, REFLECT ALL APPROVED REVISIONS TO THE PROJECT KNOWN TO ME, AND ALL FIELD DEVIATIONS TO THE PLANNED IMPROVEMENTS BY THE CONSTRUCTION CONTRACTOR, AS REPORTED TO ME AS OF ______. IT DOES NOT REPRESENT FIELD VERIFICATION OF PLANNED IMPROVEMENTS BY ME.

REGISTERED CIVIL ENGINEER ______ RCE NO. ______ DATE ______

UTILITY REPRESENTATIVES

UTILITY	REPRESENTATIVE	TELEPHONE
GAS N/A		
ELECTRICITY PG&E	Jennifer Donovan	530 621-7228
TELEPHONE AT&T	Darren Mortensen	530 621-8828
WATER EL DORADO IRRIGATION DISTRICT	Mike Brink	530 642-4054
FIRE EL DORADO COUNTY FIRE DISTRICT	Brandon McKay	530 644-9630
SEWER EL DORADO IRRIGATION DISTRICT	Mike Brink	530 642-4054
DRAINAGE EL DORADO COUNTY	ENCROACHMENT PERMIT Sheri Woodford	530 642-3641
CABLE COMCAST	Kerry Waters	916 584-5773
U.S.A.		1-800 227-2600

EL DORADO COUNTY FIRE DISTRICT

FIRE CHIEF ______ DATE ______

PLANS APPROVED BY:

ANDREW S. GABER RCE#45187 ______ DATE ______
COUNTY ENGINEER
EL DORADO COUNTY DEPT. OF TRANSPORTATION

EL DORADO IRRIGATION DISTRICT

APPROVED FOR CONSTRUCTION ______ DATE ______

PROJECT No.	WORK ORDER No.	DRAWING No.
2266 DEV	718296	

NO.	DESCRIPTION			

MICHAEL T ROBERSTON RPE#39675

PLOT DATE: 06-30-15, 09-18-15, 01-13-16

SCALE	
horiz: 1"=300'	drafted by: S.F.L.
vert: N/A	designed by: M.T.R.
	checked by: S.F.L.
06/2015 date	710 field book

BAKER-WILLIAMS ENGINEERING GROUP
Engineering / Surveying / Land Planning / Entitlement Processing / GPS Services
6020 Rutland Drive, Suite 19 – Carmichael, CA 95608

COVER SHEET
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY CALIFORNIA

SHEET 1 of 11 SHEETS
14-11-53 JOB NUMBER

EL DORADO COUNTY COMMERCIAL GENERAL NOTES:

1. ALL IMPROVEMENTS SHALL CONFORM TO THE COUNTY OF EL DORADO "DESIGN AND IMPROVEMENT STANDARDS MANUAL", THE "GRADING, EROSION AND SEDIMENT CONTROL ORDINANCE", THE DRAINAGE MANUAL", THE OFF-STREET PARKING AND LOADING ORDINANCE, AND THE STATE OF CALIFORNIA HANDICAPPED ACCESSIBILITY STANDARDS.
2. ALL REFERENCE TO "STANDARD SPECIFICATIONS" SHALL MEAN THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, JULY 1992. ALL REFERENCE TO "COUNTY" SHALL MEAN THE COUNTY OF EL DORADO.
3. CLEARING AND GRUBBING SHALL CONFORM TO THE PROVISIONS OF SECTION 16 OF THE STANDARD SPECIFICATIONS.
4. THE CONTRACTOR SHALL CONTACT THE EL DORADO COUNTY RESOURCE CONSERVATION DISTRICT PRIOR TO COMMENCING WORK ON REVEGETATION. REVEGETATION SHALL BE ACCOMPLISHED BETWEEN SEPTEMBER 15 AND OCTOBER 15 AND IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATION OF THE EL DORADO COUNTY RESOURCE CONSERVATION DISTRICT.
5. IF GRADING ACTIVITIES ARE NOT COMPLETED BY SEPTEMBER, THE DEVELOPER SHALL IMPLEMENT A TEMPORARY GRADING AND EROSION PLAN. SUCH TEMPORARY PLANS SHALL BE SUBMITTED TO SOIL CONSERVATION SERVICE FOR THEIR REVIEW AND FORWARDING OF RECOMMENDATIONS TO THE DEPARTMENT OF TRANSPORTATION. TRANSPORTATION DEPARTMENT SHALL APPROVE OR CONDITIONALLY APPROVE SUCH PLANS AND CAUSE THE DEVELOPER TO IMPLEMENT SAID PLAN ON OR BEFORE OCTOBER 15. ALL AREAS GRADED DURING THE RAINY SEASON (OCTOBER 15–MAY 15) SHALL BE REVEGETATED WITHIN 15 DAYS UPON COMPLETION.
6. ALL EXCAVATION, EMBANKMENT, AND BACKFILL SHALL CONFORM TO THE PROVISIONS IN SECTION 19, "EARTHWORK", OF THE STANDARD SPECIFICATIONS EXCEPT AS MODIFIED BELOW. TRENCH BACKFILL WITHIN ROADWAY SHALL BE "3 MIXES AND COMPACTED IN ACCORDANCE WITH COUNTY STANDARD PLAN 119.
7. ALL MATERIALS, INCLUDING CULVERT PIPE, CLASS A CONCRETE AND …

GENERAL WATER NOTES:

GENERAL SEWER NOTES:

EARTHWORK AND GRADING:

FUGITIVE DUST PREVENTION AND CONTROL AND ASBESTOS HAZARD DUST MITIGATION NOTES:

BAKER-WILLIAMS CIVIL ENGINEERING NOTES:

NO.	DESCRIPTION			Benchmark:	
				(SEE SHEET NO.1)	

MICHAEL T ROBERTSON RPE 39875

PLOT DATE: 06-30-15, 09-18-15, 01-13-16

SCALE horiz: N/A vert: N/A — 06/2015 date — 710 field book — drafted by: S.F.L. designed by: M.T.R. checked by: S.F.L.

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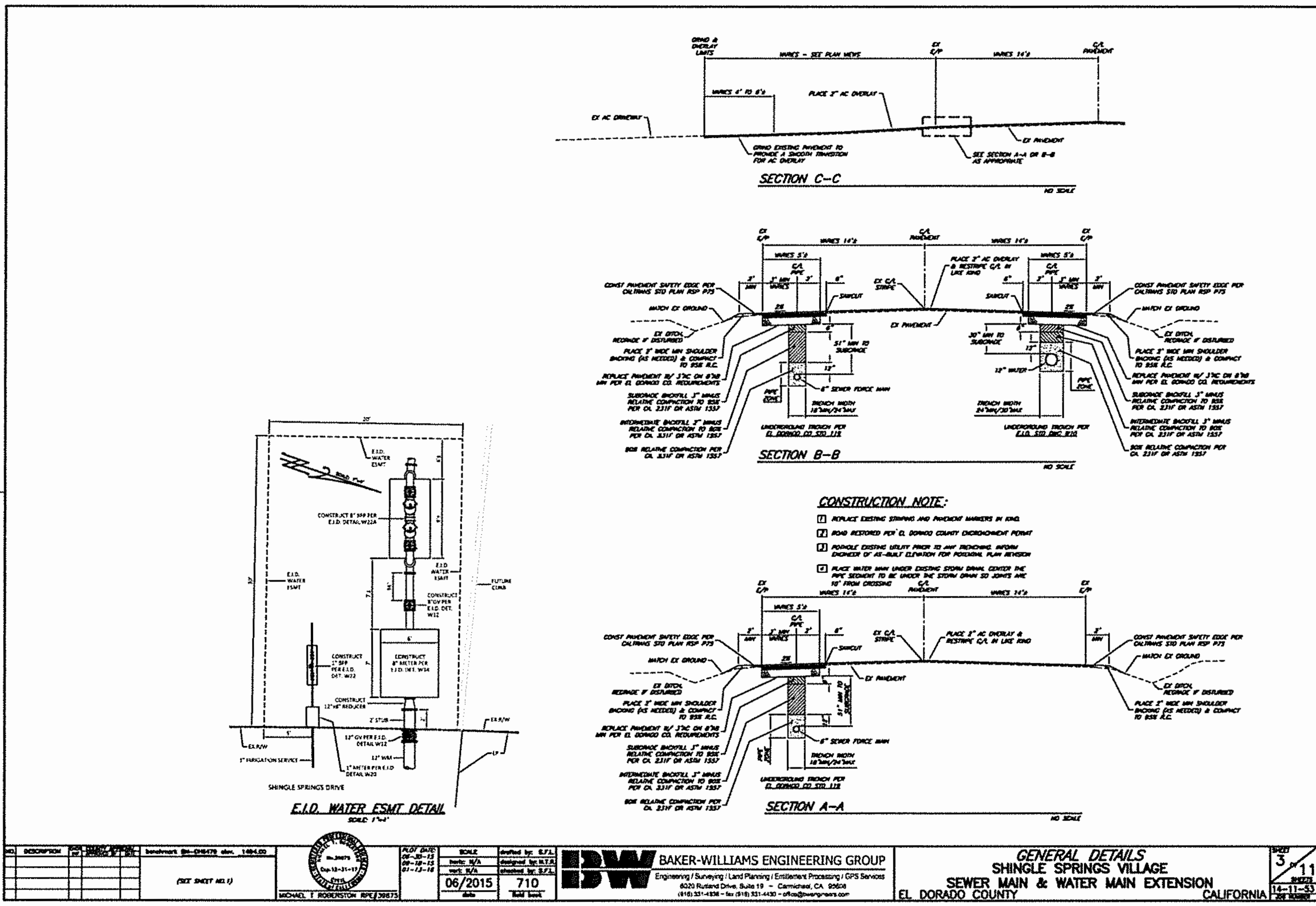
6020 Rutland Drive, Suite 19 - Carmichael, CA 95608
(916) 331-4336 - fax (916) 331-4430 - office@bwengineers.com

GENERAL NOTES & DETAILS
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY CALIFORNIA

SHEET 2 of 11 — 14-11-53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NO SCALE
SECTION B–B
NO SCALE
CONSTRUCTION NOTE:
SECTION A–A
NO SCALE
E.I.D. WATER ESMT DETAIL
SHINGLE SPRINGS DRIVE
BAKER-WILLIAMS ENGINEERING GROUP
Engineering / Surveying / Land Planning / Entitlement Processing / GPS Services
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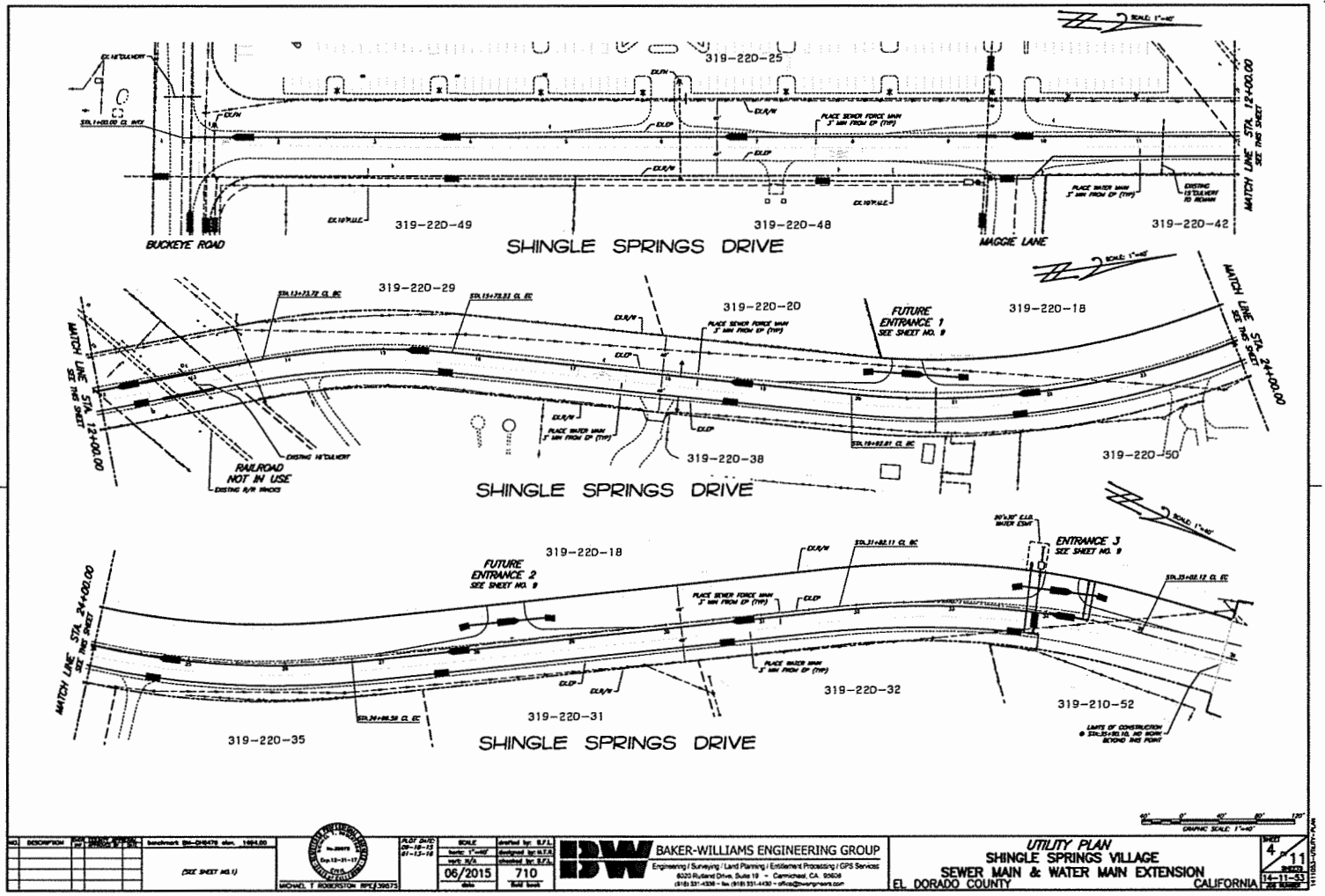
GENERAL DETAILS
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY
CALIFORNIA
3 of 11
14-11-53
06/2015
710
MICHAEL T. ROBERSTON RPE 39675



NO	DESCRIPTION	BY	DATE

benchmark BM-DH0478 elev. 1994.00

(SEE SHEET NO.1)

MICHAEL T. ROBERTSON RPE# 39675

PLOT DATE: 09-18-15, 01-13-16

SCALE: horiz. 1"=40' vert. N/A

06/2015 date

710 field book

drafted by: S.F.L.
designed by: S.F.L.
checked by: S.F.L.

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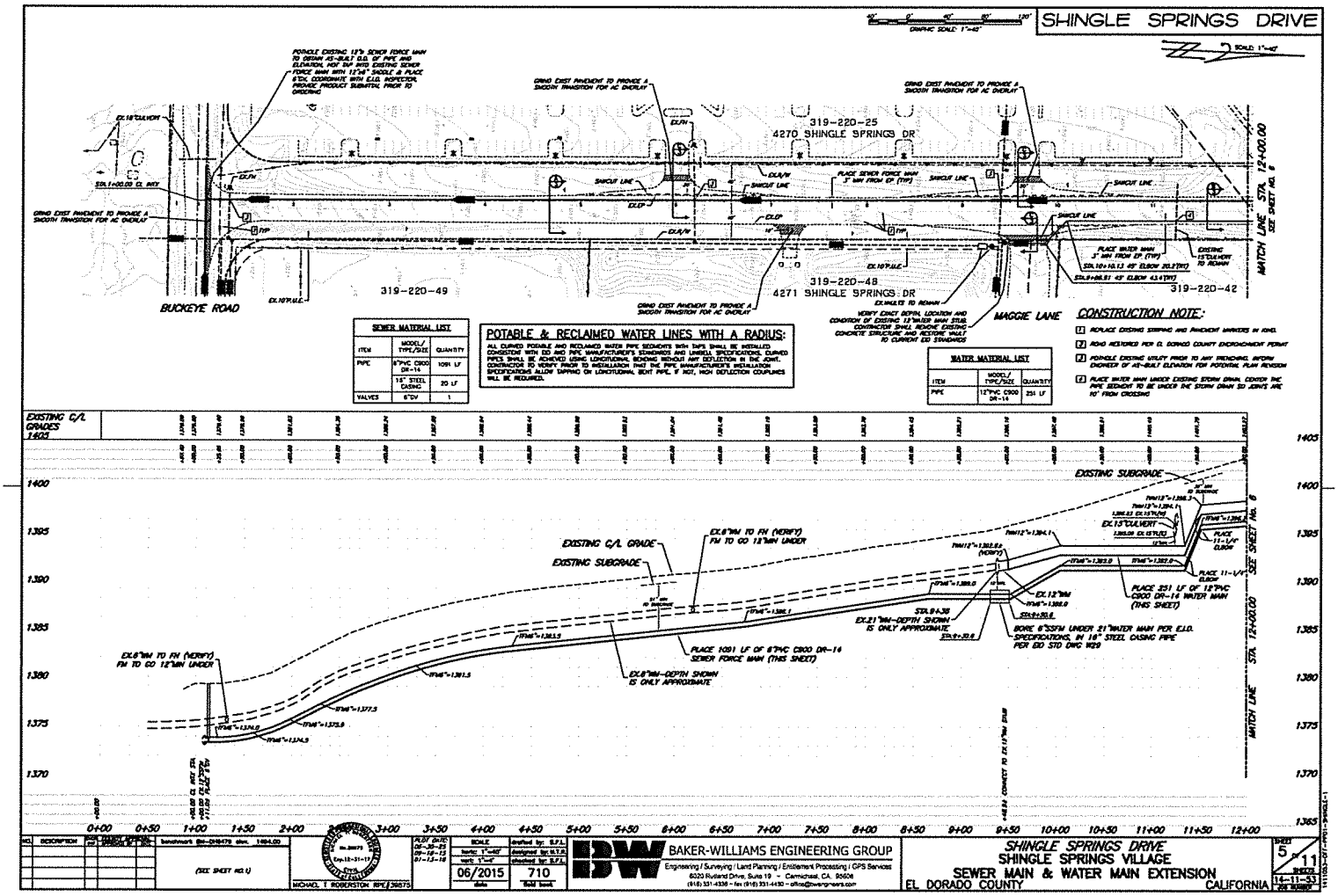
UTILITY PLAN
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY CALIFORNIA

SHEET 4 OF 11 SHEETS
14-11-53 JOB NUMBER



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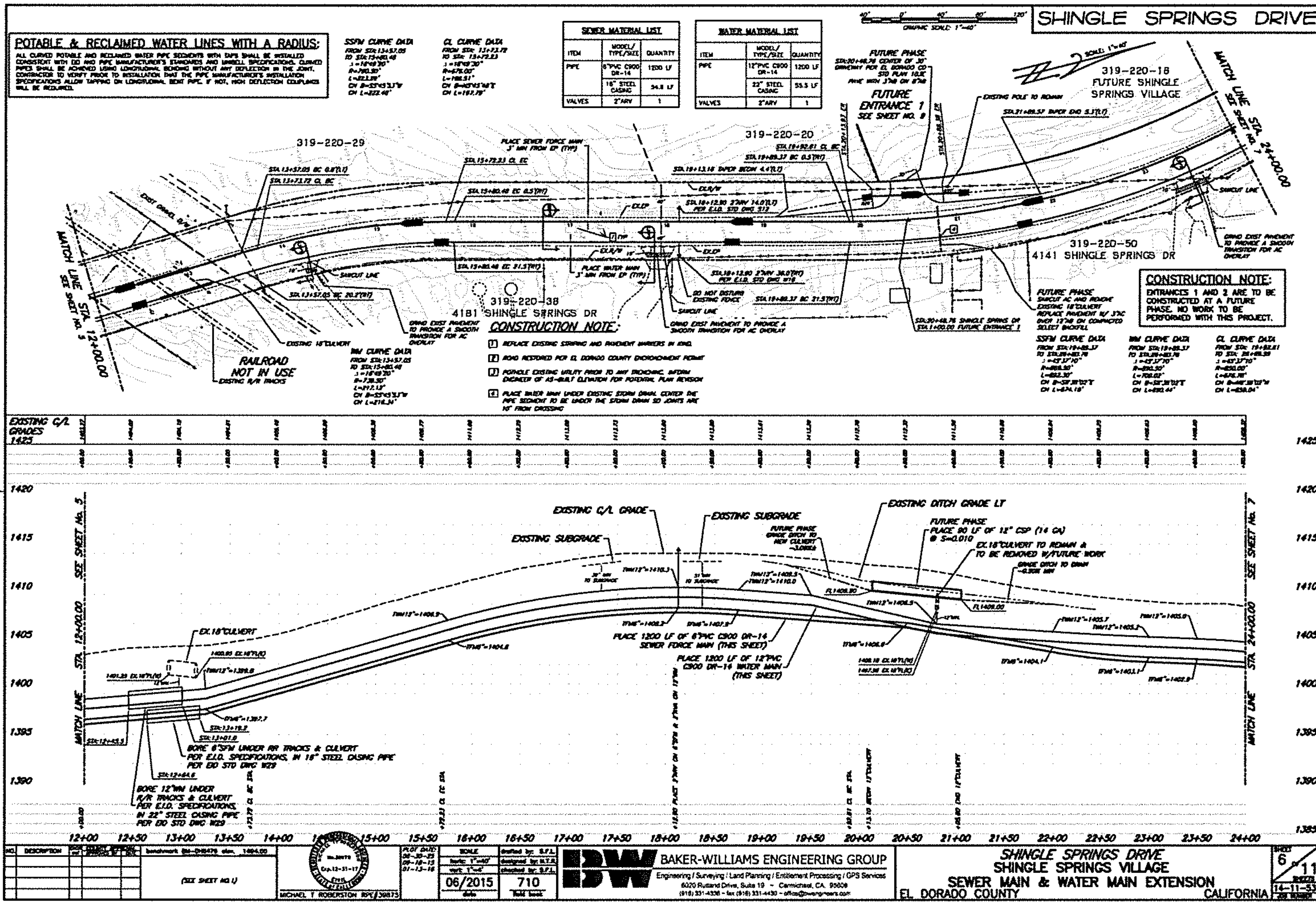
(916) 331-4330 ~ fax (916) 331-4430 ~ office@bwengineers.com

SHINGLE SPRINGS DRIVE
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY CALIFORNIA

SCALE: horiz. 1"=40' vert. 1"=4'
06/2015 date
710 field book
drafted by: B.F.L.
designed by: M.T.R.
checked by: B.F.L.
14-11-33 job number
SHEET 5 OF 11 SHEETS

MICHAEL T. ROBERTSON RCE 39575


SHINGLE SPRINGS DRIVE
POTABLE & RECLAIMED WATER LINES WITH A RADIUS:
SSFM CURVE DATA
CL CURVE DATA
WM CURVE DATA
319-220-29
319-220-20
319-220-18
FUTURE SHINGLE SPRINGS VILLAGE
319-220-50
4141 SHINGLE SPRINGS DR
319-220-38
4181 SHINGLE SPRINGS DR
FUTURE ENTRANCE 1
SEE SHEET NO. 8
MATCH LINE STA. 12+00.00
SEE SHEET NO. 5
MATCH LINE STA. 24+00.00
SEE SHEET NO. 7
RAILROAD NOT IN USE
CONSTRUCTION NOTE:
CONSTRUCTION NOTE:
ENTRANCES 1 AND 2 ARE TO BE CONSTRUCTED AT A FUTURE PHASE. NO WORK TO BE PERFORMED WITH THIS PROJECT.
EXISTING C/L GRADES
EXISTING C/L GRADE
EXISTING SUBGRADE
EXISTING DITCH GRADE LT
EX.18"CULVERT
1425
1420
1415
1410
1405
1400
1395
1390
1385
12+00
12+50
13+00
13+50
14+00
14+50
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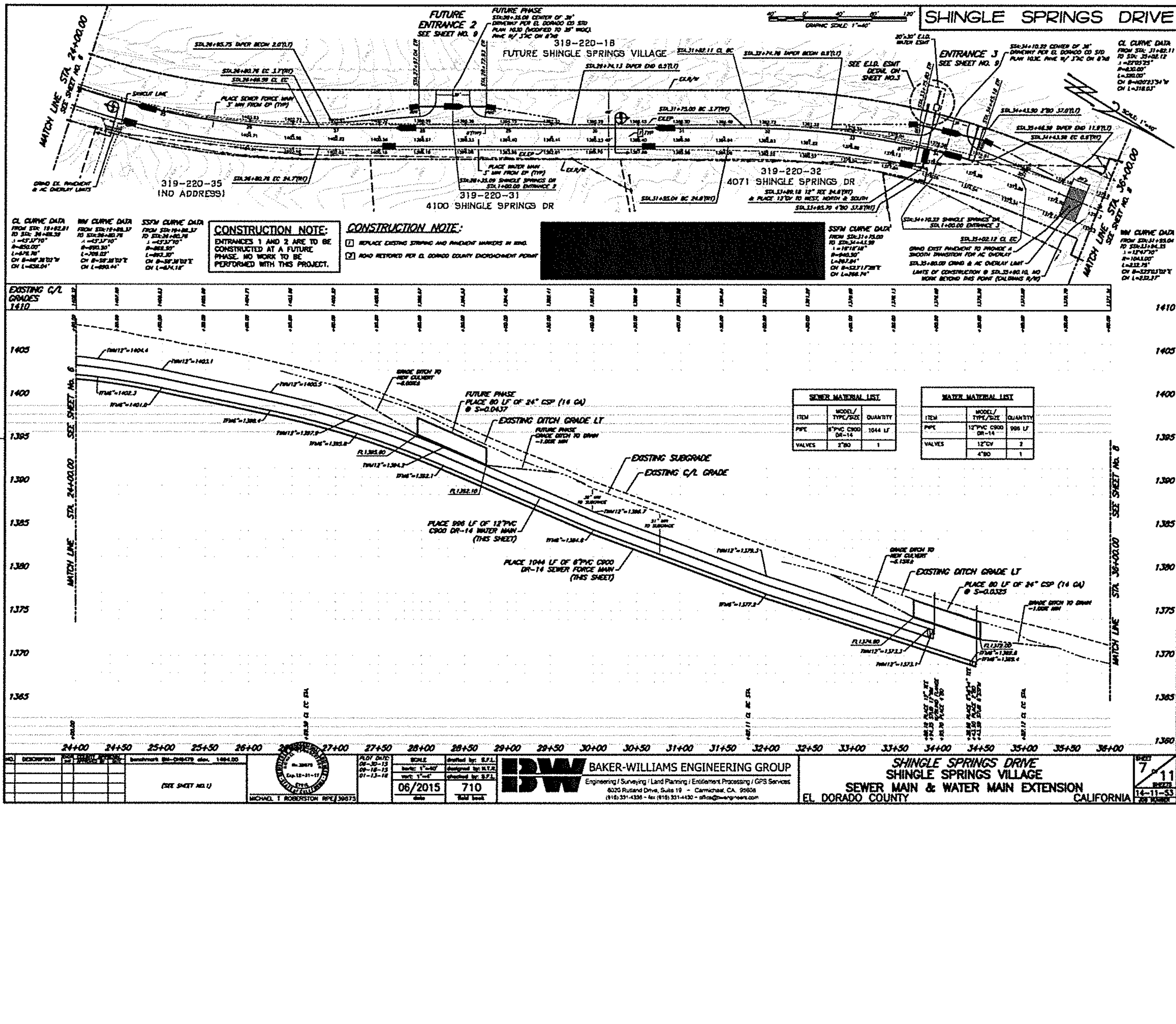
BAKER-WILLIAMS ENGINEERING GROUP
MICHAEL T ROBERSTON RPE 39875
06/2015
710
SHINGLE SPRINGS DRIVE
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY
CALIFORNIA
6 of 11
14-11-53

SEWER MATERIAL LIST

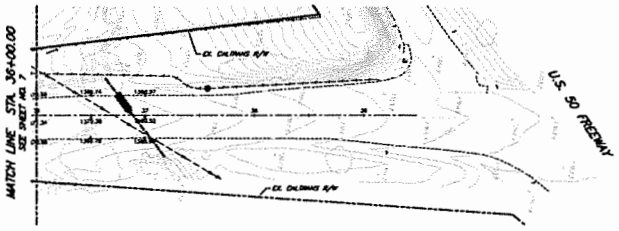
ITEM	MODEL/ TYPE/SIZE	QUANTITY
PIPE	8"PVC C900 DR-14	1200 LF
	16" STEEL CASING	34.8 LF
VALVES	2"ARV	1

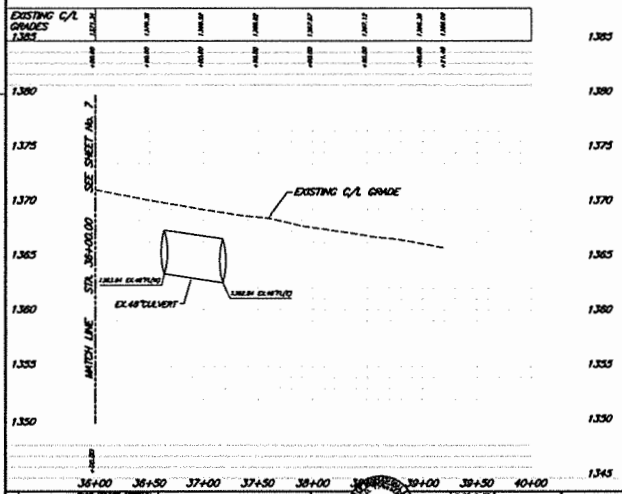
WATER MATERIAL LIST

ITEM	MODEL/ TYPE/SIZE	QUANTITY
PIPE	12"PVC C900 DR-14	1200 LF
	22" STEEL CASING	55.5 LF
VALVES	2"ARV	1


SHINGLE SPRINGS DRIVE
FUTURE ENTRANCE 2
SEE SHEET NO. 9
319-220-18
FUTURE SHINGLE SPRINGS VILLAGE
ENTRANCE 3
SEE SHEET NO. 9
319-220-35
(NO ADDRESS)
319-220-31
4100 SHINGLE SPRINGS DR
319-220-32
4071 SHINGLE SPRINGS DR
MATCH LINE STA. 24+00.00
MATCH LINE STA. 36+00.00
CONSTRUCTION NOTE:
ENTRANCES 1 AND 2 ARE TO BE CONSTRUCTED AT A FUTURE PHASE. NO WORK TO BE PERFORMED WITH THIS PROJECT.
CONSTRUCTION NOTE:
[redacted]
EXISTING C/L GRADES
FUTURE PHASE PLACE 80 LF OF 24" CSP (14 GA) @ S=0.0437
EXISTING DITCH GRADE LT
EXISTING SUBGRADE
EXISTING C/L GRADE
PLACE 996 LF OF 12"PVC C900 DR-14 WATER MAIN (THIS SHEET)
PLACE 1044 LF OF 8"PVC C900 DR-14 SEWER FORCE MAIN (THIS SHEET)
PLACE 80 LF OF 24" CSP (14 GA) @ S=0.0325
SEWER MATERIAL LIST
WATER MATERIAL LIST
06/2015
710
MICHAEL T ROBERTSON RPE 39575
BAKER-WILLIAMS ENGINEERING GROUP
SHINGLE SPRINGS DRIVE
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY
CALIFORNIA
7 of 11

SHINGLE SPRINGS DRIVE





NO.	DESCRIPTION	BOOK	SHEET	APPROVED	DATE

benchmark BM-DHB479 elev. 1464.00

(SEE SHEET NO. 1)

MICHAEL T. ROBERTSON RPE/ 30675

PLOT DATE: 06-30-15, 09-16-15, 01-12-16

SCALE		
horiz. 1"=40'	designed by: B.F.L.	
vert. 1"=4'	checked by: B.F.L.	
06/2015	710	
date	field book	

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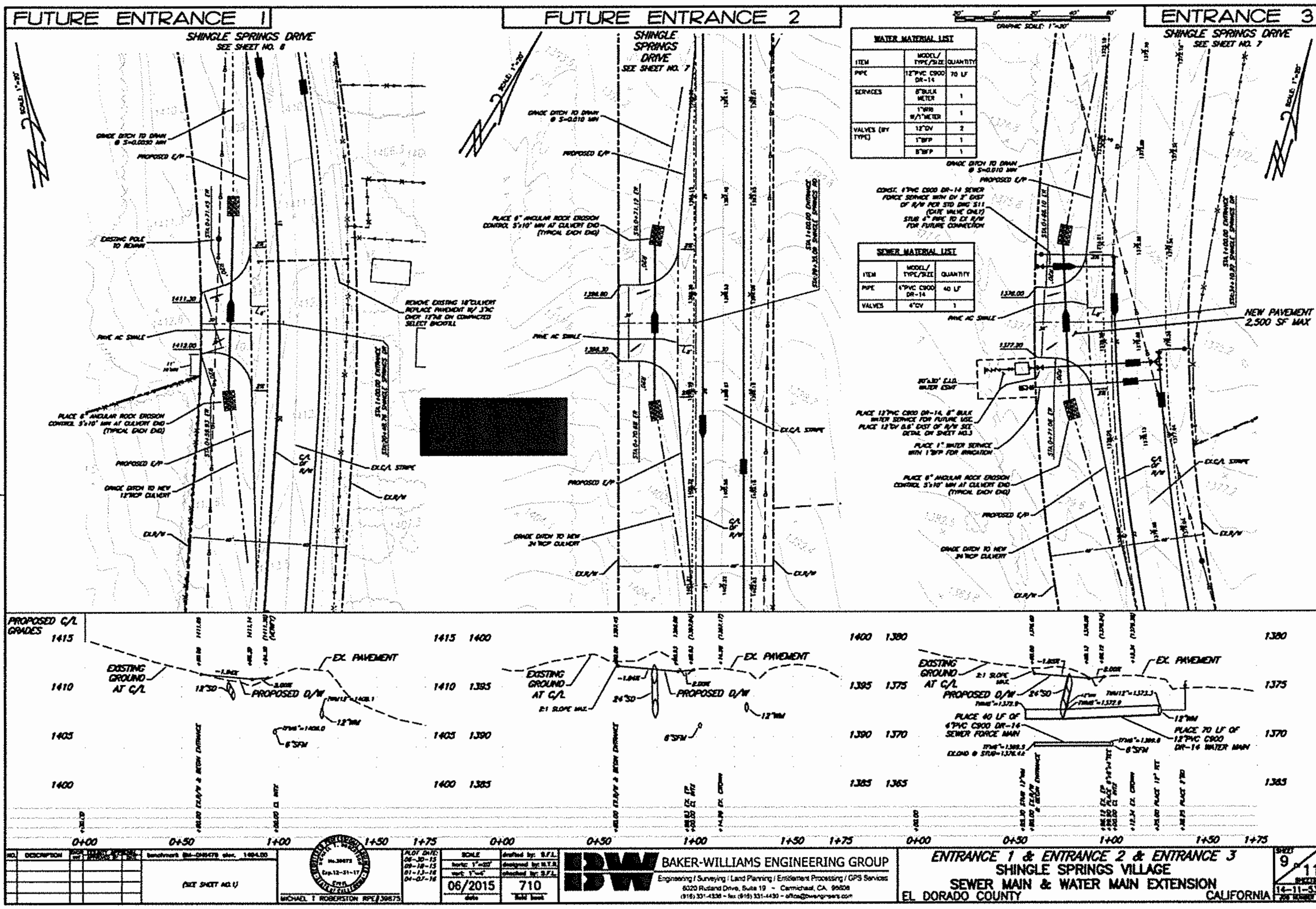
SHINGLE SPRINGS DRIVE
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY CALIFORNIA

SHEET 8 OF 11 SHEETS
14-11-53
JOB NUMBER


FUTURE ENTRANCE 1
FUTURE ENTRANCE 2
ENTRANCE 3
SHINGLE SPRINGS DRIVE
SEE SHEET NO. 8
SEE SHEET NO. 7
WATER MATERIAL LIST
SEWER MATERIAL LIST
NEW PAVEMENT 2,500 SF MAX
PROPOSED C/L GRADES
EXISTING GROUND AT C/L
PROPOSED D/W
EX. PAVEMENT
BAKER-WILLIAMS ENGINEERING GROUP
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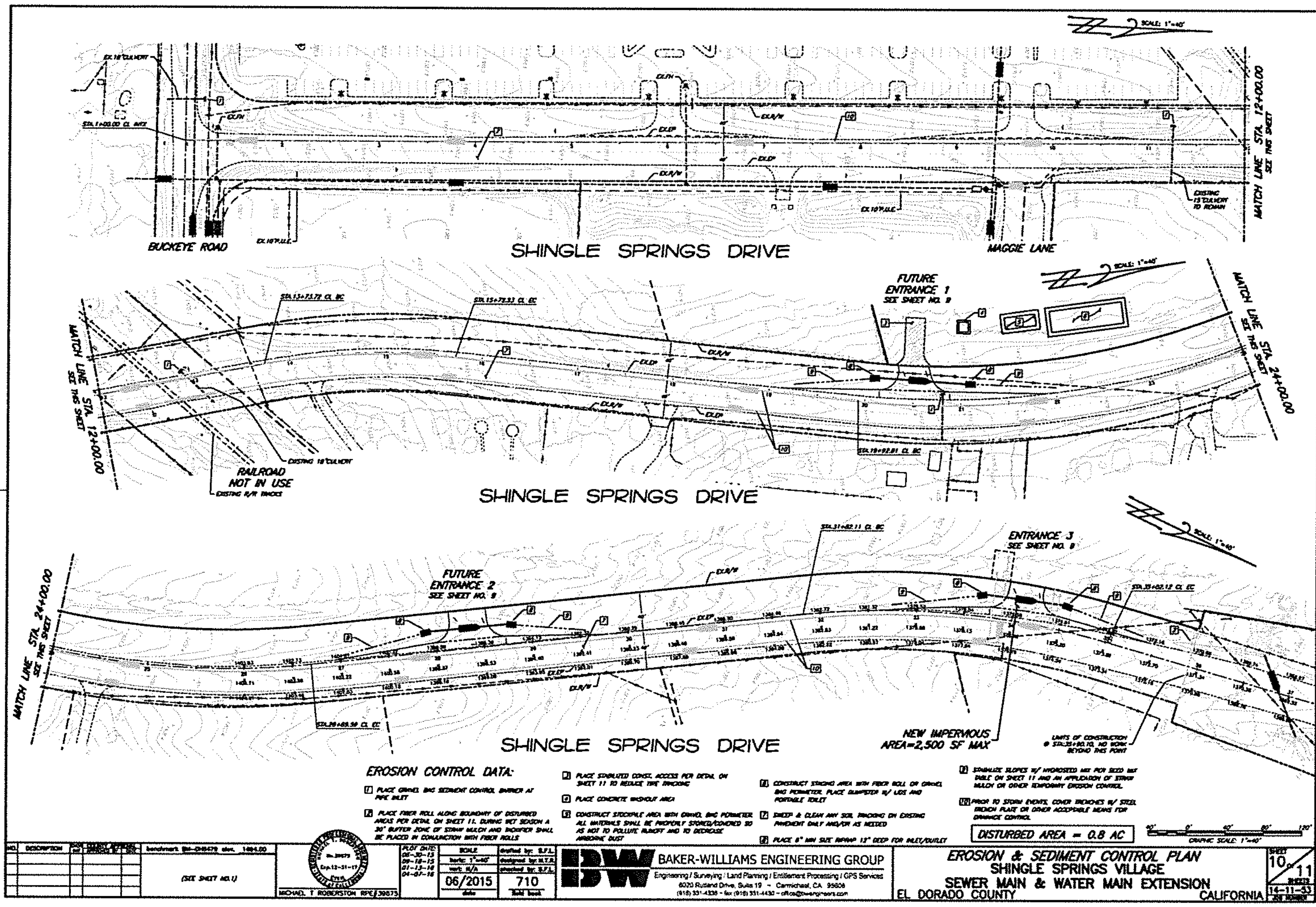
ENTRANCE 1 & ENTRANCE 2 & ENTRANCE 3
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY
CALIFORNIA
MICHAEL T ROBERSTON RPE 39675
06/2015
710
9 of 11
14-11-53


SHINGLE SPRINGS DRIVE
BUCKEYE ROAD
MAGGIE LANE
MATCH LINE STA. 12+00.00 SEE THIS SHEET
FUTURE ENTRANCE 1 SEE SHEET NO. 9
MATCH LINE STA. 24+00.00 SEE THIS SHEET
RAILROAD NOT IN USE
SHINGLE SPRINGS DRIVE
FUTURE ENTRANCE 2 SEE SHEET NO. 9
ENTRANCE 3 SEE SHEET NO. 9
NEW IMPERVIOUS AREA=2,500 SF MAX
SHINGLE SPRINGS DRIVE
EROSION CONTROL DATA:
1 PLACE GRAVEL BAG SEDIMENT CONTROL BARRIER AT PIPE INLET
2 PLACE FIBER ROLL ALONG BOUNDARY OF DISTURBED AREAS PER DETAIL ON SHEET 11. DURING WET SEASON A 30" BUFFER ZONE OF STRAW MULCH AND TACKIFIER SHALL BE PLACED IN CONJUNCTION WITH FIBER ROLLS
3 PLACE STABILIZED CONST. ACCESS PER DETAIL ON SHEET 11 TO REDUCE TIRE TRACKING
4 PLACE CONCRETE WASHOUT AREA
5 CONSTRUCT STOCKPILE AREA WITH GRAVEL BAG PERIMETER. ALL MATERIALS SHALL BE PROPERLY STORED/COVERED SO AS NOT TO POLLUTE RUNOFF AND TO DECREASE AIRBORNE DUST
6 CONSTRUCT STAGING AREA WITH FIBER ROLL OR GRAVEL BAG PERIMETER. PLACE DUMPSTER W/ LIDS AND PORTABLE TOILET
7 SWEEP & CLEAN ANY SOIL TRACKING ON EXISTING PAVEMENT DAILY AND/OR AS NEEDED
8 PLACE 6" MIN SIZE RIPRAP 12" DEEP FOR INLET/OUTLET
9 STABILIZE SLOPES W/ HYDROSEED MIX PER SEED MIX TABLE ON SHEET 11 AND AN APPLICATION OF STRAW MULCH OR OTHER TEMPORARY EROSION CONTROL
10 PRIOR TO STORM EVENTS, COVER TRENCHES W/ STEEL TRENCH PLATE OR OTHER ACCEPTABLE MEANS FOR DRAINAGE CONTROL
DISTURBED AREA = 0.8 AC
GRAPHIC SCALE: 1"=40'
MICHAEL T ROBERSTON RPE 39875
06/2015
710
BAKER-WILLIAMS ENGINEERING GROUP
Engineering / Surveying / Land Planning / Entitlement Processing / GPS Services
6020 Rutland Drive, Suite 19 ~ Carmichael, CA 95608
EROSION & SEDIMENT CONTROL PLAN
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY
CALIFORNIA
SHEET 10 of 11 SHEETS
14-11-53

Erosion and Sediment Control General Notes:

Subdivisions, Parcel Maps, Commercial and General Grading Permits
March 2000

The Contractor's attention is directed to section 7-1.01G, Water Pollution of the Standard Specifications.

The project Erosion and Sediment Control (ESC) features are intended to ensure compliance with the National Pollutant Discharge Elimination System (NPDES) provisions of the Clean Water Act (CWA) under the State of California Statewide General Permit for Construction Discharges.

To this end, the Contractor shall:

Make himself aware of the requirements of said General Permit and the provisions of the Storm Water Pollution Prevention Plan (SWPPP). SWPPPs are required for all construction activities with soil disturbances of five(5) acres or more in size.

Implement the ESC features and Best Management Practices (BMPs) contained in the Improvement Plans and the SWPPP, and otherwise diligently pursue compliance with the CWA.

Assist the Owner, Engineer, and SDF in the assessment of the functionality of and modifications to the features and practices implemented and proposed.

Meet with the Engineer, Owner, the Resource Conservation District (RCD), and SDF by August 15th to determine and discuss the status of the project, construction schedule, and any modifications and/or additions to the ESC features and/or SWPPP in order to diligently pursue compliance with the CWA.

Document any and maintain, replacement, inspection, modifications or additions to the project ESC features, and notify the Engineer, Owner and SDF of any required modifications or additions to the ESC practices and features. All disturbed areas must be either protected or otherwise permanently stabilized within 15 days of completion of the finished grades. Post construction completed between October 15 and May 1, documentation of inspection and maintenance of all ESC features will be completed on a weekly basis and prior to starting work after the completion of all storm events.

Subdivisions, Parcel Maps, Commercial and General Grading Permits
March 2000

Contact the RCD @ 530.621.5520 a minimum of forty-eight (48) hours prior to commencing work on re-vegetation. Re-vegetation must be accomplished in accordance with the requirements and specifications of the RCD.

Maintain an inventory of ESC materials (fabric bales, I.S. - 31 silver erosion mat, fiber rolls, silt fence, rock bags, etc.) on site for emergency use as directed by the Engineer, Owner, or the Department of Transportation.

If grading activities are not complete by October 15, the Contractor shall implement any modifications or additions to the ESC plans and features as directed by the Engineer, Owner or Department of Transportation in order to "winterize" the project. Such subcontractor may include restrictions on the types and scheduling of work to be completed between October 15th and May 1st, and/or installation of additional features in order to comply with the CWA.

It is expressly understood that approval of the project Grading, ESC, or Improvement Plans shall not relieve the Developer, Engineer, or Contractor of any responsibilities under the permit, agreement, or ordinance for the successful implementation of implementation services to comply with the requirements of the County, State and Federal Construction, Grading, Encroachment Permits, Agreements or Plans.

The ESC features, as outlined below, shall be provided at the associated stage of development in the ESC plan. The ESC plan shall be maintained and revised, as necessary, through the completion of the project. The High Sierra BMP Guidebook (October 1991) shall be utilized as the BMPs in the implementation of the following ESC features:

Stage 1 - Initial perimeter ESC features to be placed prior to the commencement of work hereon but are not limited to the following: silt fences, fiber rolls, storm drains, sediment/desilt basins, earthwork berms.

Stage 2 - Intermediate ESC features to be placed after initial disturbances of soil surface hereon but are not limited to the following:

- After clearing and grubbing: diversion ditches with channel lining if necessary, sediment traps and basins at all boundary exit flats.

During rough grading, placement of underground facilities, and roadway construction: temporary channel lining, inlet/outlet protection lining, temporary slope drains, temporary and permanent seeding/mulching or hydro seeding, permanent ESC blankets, matting structures, temporary and permanent check dams, sediment traps and basins in depressions, relevant energizers, and the placement of any other permanent ESC features.

Stage 3 - Final ESC features to final stabilization - to be placed prior to final sign off of improvement hereon but are not limited to the following:

Placement of seeding/mulching, hydro seeding, permanent turf on all unpaved/exist and surface, removal of debris from all drainage facilities, removal of any temporary ESC features (if necessary), and the placement of any other permanent ESC features.

Alternatives for the placement of ESC Features for Construction activities during Stage 1 - October 15.

For construction activities during Stage 1 - October 15, the plan checker/inspector may consider the alternative of only requiring the silt-ing of ESC features on-site for sites with gentle slopes, isolated grading, and no adjacent existing drainage facilities. This alternative requires immediate (same working day) installation of ESC features to prevent sediment discharges, to be accomplished by the contractor, the placement of final ESC features is required on all projects.

NOTE:
SUBSTITUTION OF EARTHCARD FOR STRAW MULCH ON ALL DISTURBED AREAS IS ACCEPTABLE FOR TEMPORARY EROSION CONTROL MEASURES. APPLICATION AND MAINTENANCE PER MANUFACTURER RECOMMENDATIONS IS REQUIRED. DISTURBED AREAS, AFTER EARTHCARD BROADCAST, WILL REQUIRE A RE-APPLICATION TO ASSURE ADEQUATE COVERAGE TO REDUCE EROSION.

EL DORADO COUNTY RESOURCE CONSERVATION DISTRICT EROSION CONTROL REQUIREMENTS AND SPECIFICATIONS (JULY 2004)

1. EXPOSED CONSTRUCTION SHALL USE STORM WATER MANAGEMENT PRACTICES (SCM) STORM WATER MANAGEMENT PRACTICES DESCRIBED BELOW ARE THE MINIMUM ACCEPTABLE LEVEL OF EROSION PROTECTION & SEDIMENT CONTROL FOR ALL CONSTRUCTION SITES. STORM WATER IN EL DORADO COUNTY IS REGULATED BY THE CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD. ADDITIONAL MEASURES MAY BE REQUIRED DURING SPECIFIC SEASONS, AND ALL MEASURES SHOWN ON THE APPROVED PLANS SHALL BE IMPLEMENTED DURING THE APPROPRIATE SEASON(S). SUPPLEMENTAL BMP'S MAY BE REQUIRED BY THE EROSION PROTECTION REQUIREMENTS. THE CONTRACTOR IS EXPECTED TO DEPLOY RESOURCES SUFFICIENT TO ACHIEVE COMPLIANCE WITH THE COUNTY'S GRADING ORDINANCE AND, AS APPLICABLE (PROJECTS WHICH INVOLVE ONE ACRE OR MORE OF DISTURBED SOIL OR ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT THAT ENCOMPASSES ONE ACRE OR MORE OF DISTURBED SOIL), WITH THE STATE WATER RESOURCES CONTROL BOARD'S (SWRCB) NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.

A. SCHEDULING
CONSTRUCTION SHALL BE SCHEDULED TO MINIMIZE CONSTRUCTION ACTIVITIES IN HIGH-RISK AREAS AND THE AMOUNT OF ACTIVE DISTURBED SOIL AREAS DURING THE WINTER SEASON (OCT. 15TH TO MAY 1ST). HIGH-RISK AREAS INCLUDE THOSE AREAS WITHIN 50 FEET OF LAKES, WATERCOURSES, 100-YEAR FLOOD PLAINS, ASSOCIATED WETLANDS, AND WHERE SLOPES EXCEED 10%.
UNLESS SPECIFICALLY AUTHORIZED BY THE COUNTY'S ON-SITE REPRESENTATIVE, DURING THE WINTER SEASON THE CONTRACTOR SHALL NOT WORK MORE THAN ONE ACRE OF DISTURBED SOIL AREAS ON SCHEDULE TO HAVE MORE THAN 5 ACRES OF ACTIVE DISTURBED SOILS.
EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES SHALL BE IN PLACE DURING ALL PRECIPITATION EVENTS.

B. PRESERVATION OF NATURAL RESOURCES
PRIOR TO THE START OF ANY GRADING OR LAND DISTURBING ACTIVITIES, AREAS OF EXISTING VEGETATION THAT ARE TO REMAIN AND ENVIRONMENTALLY SENSITIVE AREAS SUCH AS WETLANDS, PROTECTED MARSHES, ETC. SHALL BE FENCED FOR PROTECTION. IN GENERAL, USE BENEFICIAL EXISTING VEGETATION WHENEVER POSSIBLE TO MINIMIZE EFFORT REQUIRED AND MAXIMIZE CONSERVATION. EXISTING TREES, SHRUBS, AND OTHER VEGETATION SHALL BE PROTECTED (AND PROTECTED BY FENCING) FOR AS LONG AS POSSIBLE TO MINIMIZE EROSION.

C. EXISTING DRAINAGE CONVEYANCE SYSTEMS
EXISTING STORM/DRAINAGE SHALL BE PROTECTED, AND IF SHOWING, INVALIDED AS A PERMANENT SOLUTION, TO BE THE SYSTEM FEASIBLE. ALL CONCENTRATED WATER FLOWS SHALL BE CHANNELIZED AWAY FROM DISTURBED SOIL AREAS. STOCKPILED DISTURBED SOILS AND TEMPORARY DRAINAGE SWALES SHALL BE CONNECTED BY A NON-EROSIVE METHOD.

D. STOCKPILE MANAGEMENT
STOCKPILE SHALL BE MANAGED AS FOLLOWS:
1. SOIL STOCKPILES
   - EROSION
   - STOCKPILE TO BE PROTECTED WITH SOIL STABILIZATION MEASURES & PERIMETER SEDIMENT BARRIERS
   - NON-STORM EROSION
   - COVERED OR PROTECTED WITH PERIMETER SEDIMENT BARRIERS
2. CONSTRUCTION/HAUL ROUTE AND AGGREGATE BASE/SUB-BASE
   - COVERED OR PROTECTED WITH PERIMETER SEDIMENT BARRIERS
3. TOOLS AND EQUIPMENT
   - COVERED

E. SEDIMENT TRACKING CONTROL
APPROPRIATE MEASURES SHALL BE IMPLEMENTED TO MINIMIZE AMT/ TRACKING OF SEDIMENT BY VEHICLES AND/OR EQUIPMENT. PAVED AREAS REQUIRED INCLUDE STABILIZED CONSTRUCTION ENTRANCE/EXITS AND, PLACE CHECKS AND EROSION CONTROL BLANKETS (REF. DETAIL SHEET # EC-7).

F. NON-STORM WATER MANAGEMENT
NON-STORM WATER MANAGEMENT PRACTICES SHALL BE IMPLEMENTED TO THE EXTENT FEASIBLE. SEDIMENT LADEN NON-STORM WATER IS REQUIRED TO BE FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT BEFORE BEING DISCHARGED. ACCIDENTS RELEASES TO ANIMAL NON-STORM WATER DISCHARGES MATERIAL SPILL PREVENTION PROCESS, MONITOR/EQUIPMENT MAINTENANCE AND SPILL PREVENTION/CONTROL MEASURES.

G. EROSION CONTROL REQUIREMENTS
DISTURBED SOIL AREAS (DSA) SHALL BE PROTECTED WITH AN EFFECTIVE COMBINATION OF INDIVIDUAL SOIL STABILIZATION, SEDIMENT BARRIERS AND BASINS (/ RHO'S, THERE MAY BE SITUATIONS WHERE A SEDIMENT BARRIER OR BASIN ALONE MAY BE SUFFICIENT). AS A MINIMUM, THE FOLLOWING REQUIREMENTS SHALL BE IMPLEMENTED TO THE EXTENT FEASIBLE DURING THE CONSTRUCTION PERIOD. STORM WATER DISCHARGES FROM THE CONSTRUCTION SITE SHALL NOT EXCEED AN EQUIVALENT SEDIMENT LOAD.
1. SOIL STABILIZATION MEASURES INCLUDE:
   - HYDROMULCH, MULCH (REF. DETAIL SHEET # EC-3)
   - HYDROSEEDING (REF. DETAIL SHEET # EC-4)
   - BONDED FIBER MATRIX (REF. DETAIL SHEET # WOOD / ORGANIC MULCH (REF. DETAIL SHEET # EC-5 & EC-6)
   - REVEGETATION, PLASTIC COVERS AND EROSION CONTROL BLANKETS (REF. DETAIL SHEET # EC-7)
   - STABILIZED CONSTRUCTION ENTRANCE (REF. DETAIL SHEET # EC-8)
2. SEDIMENT BARRIERS INCLUDE:
   - SILT FENCES (REF. DETAIL SHEET # EC-1)
   - GRAVEL BAG BARRIER (REF. DETAIL SHEET # EC-2 & EC-4 & EC-6)
   - STRAW BALE BARRIERS (REF. DETAIL SHEET # EC-5)
   - FIBER ROLLS (REF. DETAIL SHEET # EC-6)
3. STORM WATER INLETS INCLUDE:
   - CHECK/DAM BARRIER (REF. CALTRANS SHEET)
   - INLET PROTECTION (REF. DETAIL SHEET # EC-9)
4. ON SITES WITH SLOPE LENGTHS GREATER THAN 150 FEET, THE FOLLOWING ADDITIONAL MEASURES SHALL BE IMPLEMENTED:
   A. SHEET FLOWS (NOT TO EXCEED TOTAL 1.00 (1/4), SOIL STABILIZATION
      - ON SLOPES EQUAL TO OR FLATTER THAN 1.00 (1/4), SOIL STABILIZATION
      - ON SLOPES STEEPER THAN 1.00 (1/4), SOIL STABILIZATION AND SEDIMENT BARRIERS
   ACTIVE AREAS (ANY DISTURBING ACTIVITIES FOR 21 OR MORE DAYS)
      - ON SLOPES STEEPER THAN 1.00 (1/4), SEDIMENT BARRIERS
      - ON SLOPES STEEPER THAN 1.00 (1/4) WITH SLOPE LENGTHS GREATER THAN 30 FEET: SOIL STABILIZATION, SEDIMENT BARRIERS AND BASINS / TRAPS
   B. NON-SHEET FLOWS
   ACTIVE AREAS (ANY DISTURBING ACTIVITIES FOR 21 OR MORE DAYS)
      - ON SLOPES STEEPER THAN 1.0 (1/4), SEDIMENT BARRIERS
5. GENERAL
   - PROTECTION SHALL BE DEPLOYED ON NON-ACTIVE AREAS WITHIN 14 DAYS SINCE THE CESSATION OF SOIL-DISTURBING ACTIVITIES OR ONE DAY PRIOR TO THE PREDICTED (100 OR MORE CHANCE) ONSET OF SIGNIFICANT PRECIPITATION.
   - SEDIMENT CONTROLS SHALL BE DEPLOYED ON ACTIVE AREAS PRIOR TO THE PREDICTED (100 OR MORE CHANCE) ONSET OF SIGNIFICANT PRECIPITATION.
   - REMARKS: FOR CUT SLOPES UP TO 40 FEET IN HEIGHT, REMARKS AT LEAST 6 FEET (1.4 METERS) IN WIDTH SHALL BE ESTABLISHED AT MID-POINT (FROM TOP-TO-TOE) (1.2 METERS) VERTICAL INTERVALS ON ALL CUT SLOPES TO CONTROL SURFACE DRAINAGE AND EROSION, EXCEPT THAT WHERE DAILY RAIN ASSURANCE IS RETAINED, IT SHALL BE AT MIDSLOPE. FOR CUT SLOPES GREATER THAN 40 FEET (12 METERS) AND UP TO 100 FEET (30 METERS) IN VERTICAL HEIGHT, ONE ADDITIONAL REMARKS AT APPROXIMATELY MIDSLOPE SHALL BE 12 FEET (3.6 METERS) IN WIDTH. TERRACES SHALL SLOPE A MINIMUM OF 5 PERCENT (20:1) TOWARD THE HILLSIDE. REMARKS, WORKS AND SPACING FOR CUT SLOPES GREATER THAN 120 FEET (36 METERS) IN HEIGHT SHALL BE DESIGNED BY A CIVIL ENGINEER AND APPROVED BY THE DIRECTOR. SUITABLE ACCESS SHALL BE PROVIDED TO PERMIT PROPER CLEANING AND MAINTENANCE.
   - STORM DRAIN SYSTEMS SHOW WITH A CAPACITY EQUIVALENT TO AT LEAST 3000 CUBIC FEET OF STORAGE (85 MEASURED FROM THE LOWEST POINT OF THE BASIN TO THE PERCENTAGE OUTLET) PER ACRE DRAINING INTO THE BASIN. THE LENGTH OF THE BASIN SHALL BE AT LEAST TWICE THE WIDTH. THE CAPACITY IS DETERMINED BY MEASURING THE DISTANCE BETWEEN THE OUTLET AND THE TOP OF THE EMBANKMENT AT 5% BELOW THE OUTLET BUT NO LESS THAN THREE FEET FOR BASINS LESS THAN THREE FEET.
   - SEDIMENT IS TO BE REMOVED FROM BASINS WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY 50%. ALL REMOVED SEDIMENT SHALL BE DISPOSED OF IN A MANNER NOT SUBJECT TO EROSION.
   - BASINS SHALL BE PROTECTED TO PREVENT PROJECT DISTURBANCE BY HUMANS AND FREE FROM RODENTS. BASINS SHALL BE MAINTAINED TO PROVIDE FOR THE DESIGN STORAGE VOLUME AND SEDIMENT REMOVAL.

H. EROSION CONTROL SEEDING (Seeding Specifications)

I. SODDING
   - SOD SHALL BE INSTALLED ON THE GROOVED CONTOURS WHERE USE AREAS ARE OF EROSION POTENTIAL, AS PURPOSE OF SOD STABILIZES THE SOIL, ELIMINATES THE POSSIBILITY FROM BLOWING AND RUNOFF TO DOWNGRADE AREAS, PROTECT WILDLIFE HABITAT, AND
   - AREAS TO BE SEEDED, PRIOR TO SEEDING, COMPLETE DESCRIPTION OF ALL DISTURBED SOILS, BERM SHOWN AND OUTSIDE COUNTY PERMITTED USE ONLY SHALL BE ACCOMPLISHED WITH PROPOSED AMOUNTS AND TYPES OF VEGETATIVE SPECIES, MULCH AND FERTILIZER MATERIAL. SEE MAJOR LAND INTRODUCE AREA CONTROLS AS IN 2.3.2000 (1).
   - ALL EROSION AND SEDIMENT CONTROL PRACTICES PERFORMED AFTER OCTOBER 15, SHALL FOLLOW STORM EROSION SPECIFICATIONS SUBMITTED BY THE STORM WATER MANAGEMENT PRACTICES.

J. MULCH
   1. MULCH - MULCH SHALL BE ONE OF THE FOLLOWING MATERIALS AS SPECIFIED ON THE PLANS OR AS APPROVED BY THE ENGINEER:
   2A. STRAW - STRAW SHALL BE WILD STRAW GRAINED FROM RICE, WHEAT, OATS, OR BARLEY AND SHALL BE FREE FROM NOXIOUS WEED SEED. STRAW SHALL BE PURCHASED IN THE FORM OF BALES. EMERGENCY SHALL BE DELIVERED IN UNBROKEN BALES AND SHALL BE STORED IN A MANNER APPROVED FROM THE COUNTY AGRICULTURAL COMMISSIONER, AS REQUIRED BY LAW. BEFORE DELIVERY TO THE SITE, THE STRAW SHALL BE INSPECTED TO BE USED IF DELIVERED TO THE SITE IN THE WORK.
   2B. WOOD CELLULOSE FIBER - WOOD CELLULOSE FIBER MULCH SHALL BE A WOOD CELLULOSE FIBER MULCH, LABELED IN ACCORDANCE WITH APPLICABLE STATE REGULATIONS, AND FREE FROM GROWTH OR GERMINATION INHIBITING INGREDIENTS. IT SHALL BE PROCESSED SO THAT IN A WATER SLURRY, UNDER AGITATION, IT WILL FORM A HOMOGENEOUS SLURRY.
   3. MULCH MUST BE FREE OF PROPERTY TO BE FREELY DISPOSED AND DISPERSED WHEN APPLIED IN WATER.

K. SEEDING REQUIREMENTS
   A. GENERAL - ALL SEEDING, FERTILIZER AND MULCHING OPERATIONS SHALL BEGIN, WHEN ATTAINABLE, AS SOON AS THE ATMOSPHERIC COUNTY ENGINEER OR CONSERVATION DISTRICT REPRESENTATIVE.
   A. SEEDING PREPARATION - ALL AREAS TO BE SEEDED SHALL BE REASONABLY SMOOTH AND CONFORM TO THE DESIRED SHAPE BEFORE ACTUAL SEEDING PREPARATION IS BEGUN AND DEBRIS WHICH WOULD INTERFERE WITH SEEDING, GROWTH OR MAINTENANCE OF THE VEGETATIVE COVER SHALL BE REMOVED. DO NOT ADD TO OR REMOVE TOPSOIL FROM AREAS TO BE SEEDED WHICH HAS BEEN TREATED WITH SOIL STERILANTS.
   A. FERTILIZER - FERTILIZER SHALL BE APPLIED AT A RATE OF NOT LESS THAN FOUR POUNDS (1.8 - 1.) PER IMPLEMENT SHALL BE USED THAT WILL UNIFORMLY INCORPORATE THE FERTILIZER UNIFORMLY WITH THE SOIL TO A DEPTH OF THREE INCHES (3") OR GREATER. IMMEDIATELY AFTER SEEDING, THE AREA SHALL BE MULCHED AT THE RATE OF ONE AND ONE-HALF TONS PER ACRE (1.5 TONS/ACRE) OF DRY STRAW MULCH. SEEDED AREAS MAY BE MULCHED AT ANY TIME THAT WILL RESULT IN UNIFORM DISTRIBUTION. THE FERTILIZER SHALL BE INCORPORATED INTO THE SOIL.
   A. SEEDING - SEEDS SHALL BE BROADCAST BY SMALL MECHANICAL HAND SEEDERS, OR BY HYDROSEEDING. SEEDS SHALL BE PLANTED BY APPROVED EQUIPMENT. SEED SHALL HAVE A SOIL COVER OF NOT MORE THAN ONE INCH (1") AND SHALL BE COVERED BY USING DRAG OR OTHER APPROVED METHOD.
   - HYDROSEEDING - SEEDS SHALL NOT EXCEED ONE-HALF INCH (1/2") COVER. SEEDS SHALL BE APPLIED BY USING A SLURRY OF WOOD CELLULOSE FIBER DISTRIBUTED UNIFORMLY AT THE PRESCRIBED RATE (NOT LESS THAN 1,500 POUNDS PER ACRE). WOOD CELLULOSE FIBER, THE APPLICATION UNIT USED FOR WOOD MULCH SHALL BE EQUIPPED WITH AN AGITATOR TO MAINTAIN THE SEED AND MULCH IN SUSPENSION WHEN THE UNIT IS USED. MIXED IMMEDIATELY PRIOR TO USE AND SHALL BE APPLIED UNIFORMLY. WHERE EMERGENCY TREATMENT OF EXPOSED SOILS EXTENDS BEYOND OCTOBER 15, DIRECT MULCHING WITHOUT SEED WILL BE PERFORMED IN ACCORDANCE WITH SOIL STABILIZATION AND SEDIMENT BARRIERS.

SEEDING MIXES A MINIMUM RATE SEED HYDROMULCH MIX AT LEAST 1" GROWTH MUST BE OBTAINED BY DECEMBER 15TH, OR MIX MUST BE COVERED WITH STRAW MULCH. (SECTION K-1)

SEED MIX FOR ELEVATIONS BELOW PLACERVILLE

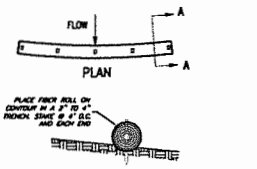
PERIOD	METHOD	TYPE OF SEED	AMOUNT PER ACRE	AMOUNT PER 1,000 S.F.	TYPE MULCH
7/15 to 11/15	Hydroseed	Annual Brome and other Hydroseed Mix w/ Wetting Agent	12 lb/ac 6 lbs/ac	0.2 lbs 0.1 lbs	Straw or Wood Fiber
7/15 to 11/15	Broadcast	Annual Brome and other Mix	12 lb/ac 6 lbs/ac	0.2 lbs 0.2 lbs	Straw or Wood Fiber
11/16 to 3/14	Hydroseed	Annual Brome and Wheat Mixed w/ 50 lb/ac Hydroseed Fertilizer	24 lb/ac 12 lb/ac	0.5 lbs 0.4 lbs	Straw (1 ton)
11/16 to 3/14	Broadcast	Annual Brome and Wheat Mix	24 lb/ac 12 lbs	0.5 lbs 0.4 lbs	Straw (1 ton)

A MULCH COVING SHALL BE APPLIED OVER THE SURFACE OF THE SEEDED AREA. MULCHING SHALL FOLLOW IMMEDIATELY AFTER SEEDING UNLESS OTHERWISE DIRECTED. MULCH WILL BE OF THE MATERIAL INDICATED

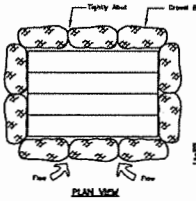
SEED MIX FOR ELEVATIONS ABOVE PLACERVILLE

PERIOD	METHOD	TYPE OF SEED	AMOUNT PER ACRE	AMOUNT PER 1,000 S.F.	TYPE MULCH
7/15 to 11/15	Hydroseed w/ Wetting Agent	Subterranean Clover/Brome w/ Lana Purple/Wild Annual Mix and Hydroseed Fertilizer	20 lb/ac 10 lb/ac 10 lb/ac 5 lb/ac	0.5 lbs 0.2 lbs 0.2 lbs 0.1 lbs	Straw (1 ton)
11/16 to 3/14	Hydroseed	Perennial Grass/Legume w/ Lana Purple/Wild Annual Mix and Hydroseed Fertilizer	40 lb/ac 10 lb/ac 10 lb/ac 10 lb/ac	0.9 lbs 0.2 lbs 0.2 lbs 0.2 lbs	Straw (1 ton)

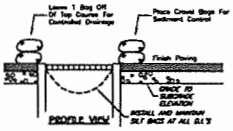
A MULCH COVING SHALL BE APPLIED OVER THE SURFACE OF THE SEEDED AREA. MULCHING SHALL FOLLOW IMMEDIATELY AFTER SEEDING UNLESS OTHERWISE DIRECTED. MULCH WILL BE OF THE MATERIAL INDICATED

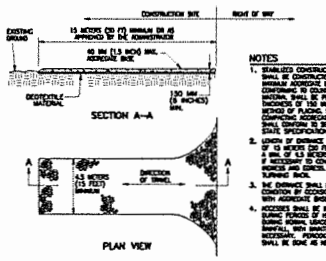


STRAW WATTLE DETAIL
NO SCALE



GRAVEL BAG SEDIMENT BARRIER
N.T.S.





NOTES
1. STABILIZED CONSTRUCTION SITE ACCESS SHALL BE CONSTRUCTED AT 40 MM (1.5 INCH) MINIMUM AGGREGATE BASE MATERIAL CONFORMING TO COUNTY STANDARDS. MATERIAL SHALL BE PLACED TO A MINIMUM THICKNESS OF 120 MM (5 INCHES), THE METHOD OF PLACING, SPREADING AND COMPACTING AGGREGATE BASE MATERIAL SHALL CONFORM TO SECTION 26 OF THE STATE SPECIFICATIONS.
2. LENGTH OF ENTRANCE SHALL BE A MINIMUM OF 15 METERS (50 FEET), WIDTH SHALL BE A MIN. OF 4.5 METERS (15 FT) OR GREATER IF NECESSARY TO CONFORM TO VEHICLE TURNING RADIUS AND SCHOOL BUS/TRUCK ROUTE.
3. THE ENTRANCE SHALL BE KEPT IN GOOD CONDITION BY REGRADING TOP DRESSING WITH AGGREGATE BASE MATERIAL.
4. ACCESS TO BE REMOVED INITIALLY DURING PERIODS OF DRY SOILS, MONTHLY DURING PERIODS OF EXTENDED WET SOILS, AND AFTER RAINFALL. WITH MAINTENANCE PROVIDED AS NECESSARY. REMOVAL OF THE ENTRANCE SHALL BE DONE AS NEEDED.

STABILIZED CONSTRUCTION SITE ACCESS (EC-8)

NO.	DESCRIPTION	DATE	APPROVED BY	benchmark BM-GHS479 elev. 1494.00
				(SEE SHEET NO. 1)

MICHAEL T. ROBERTSON RCE 39875

PLOT DATE	SCALE	drafted by: S.F.L.
09-30-13 09-16-15 01-13-16	horiz: N/A vert: N/A	designed by: M.T.R. checked by: S.F.L.
06/2015	710	"Gold Book"
date		

BAKER-WILLIAMS ENGINEERING GROUP
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GRADING & EROSION CONTROL NOTES & DETAILS
SHINGLE SPRINGS VILLAGE
SEWER MAIN & WATER MAIN EXTENSION
EL DORADO COUNTY CALIFORNIA

SHEET 11 OF 11 SHEETS
14-11-33 Job Number

Exhibit 6. Special Status Wildlife Species

Scientific Name Common Name	Status*	Habitat Description	Potential to Occur in the Project Site & County ROW (MND Study Area)
AMPHIBIANS and REPTILES			
Emys marmorata western pond turtle	SSC	Requires permanent or nearly permanent bodies of water and protected areas for basking such as partially submerged rocks or logs, floating vegetation mats or open mud banks. Females may travel some distance from water for egg-laying, moving as much as 0.8 km (1/2 mile) away from and up to 90 m (300 ft) above the nearest source of water, but most nests are with 90 m (300 ft) of water.	Not Expected. No permanent or semi-permanent bodies of water are present.
Phrynosoma blainvillii coast horned lizard	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, & abundant supply of ants & other insects.	Low. May occur in grasslands and edges of chaparral on project site. Limited cover present and compacted clay soils are not suitable for burial.
Rana draytonii California red-legged frog	FT	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development.	Not Expected. No perennial wetlands or waterbodies are present that would provide sufficient period of inundation for larval development.
Rana boylii foothill yellow-legged frog	FT	Inhabits partially shaded, rocky streams at low to moderate elevations, in areas of chaparral, open woodland, and forest.	Not Expected. Seasonal wetland in the project site which drains into culverted ephemeral stream in County ROW does not support suitable habitat; likewise, downstream ephemeral reach of Tennessee Creek also does not support suitable habitat for this species.
Thamnophis gigas giant garter snake	FT/ST	Prefers freshwater marsh and low gradient streams. Also, adapted to drainage canals and irrigation ditches.	Not Expected. No suitable freshwater marsh or perennial irrigation ditches present.
BIRDS			
Accipiter gentilis Northern goshawk	SSC	Occurs within and in vicinity of mature coniferous forest. Uses old nests and maintains alternate sites. Usually nests on north slopes, near water. Dense stands of mature red fir, lodge pole pine, Jeffrey pine, and	Not Expected. No mature montane coniferous forest habitat or nest sites present; site elevation is below where this specie typically inhabits in the Sierra Nevada region.

Scientific Name Common Name	Status*	Habitat Description	Potential to Occur in the Project Site & County ROW (MND Study Area)
		aspens characterize nest tree sites in the Sierra Nevada region. Suitable nest sites typically require large trees, snags, downed logs, dense canopy cover, and open understories.	
Agelaius tricolor tricolored blackbird	SSC	Nests in freshwater marshes of cattails, tule, bulrushes and sedges. Forages in open cultivated fields and pastures in winter and migration.	Not Expected. No suitable nesting habitat present on or near the site.
Ammodramus savannarum grasshopper sparrow	SSC	Dense grasslands on rolling hills, lowland plains, and in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs, and scattered shrubs. Loosely colonial when nesting.	Moderate. Potentially suitable habitat present; may nest in shrubs surrounding the development area.
Aquila chrysaetos Golden eagle	Cwl Cfp (nesting and wintering)	Generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions, in areas with sufficient mammalian prey base and near suitable nesting sites. Nests are most often on rock ledges of cliffs but sometimes in large trees on steep hillsides, or on the ground. Nesting cliffs may face any direction and may be close to or distant from water.	Low. Limited suitable nesting habitat may be present in large mature trees surrounding the development site. May occasionally forage over the site.
Ardea alba great egret	* (rookery site)	Variety of habitats, including marshes, tidal estuaries, lagoons, streams, lakes, and ponds. Nests primarily in tall trees near water.	Not Expected. No suitable marsh habitat is located in close proximity to mature trees onsite.
Ardea herodias great blue heron	* (rookery site)	Variety of habitats, including freshwater and brackish marshes, lakes, rivers, bays, lagoons, beaches, fields, and meadows. Nests commonly high in trees in close proximity to perennial emergent wetlands, rivers and streams, and lake margins.	Not Expected. No suitable marsh habitat is located in close proximity to mature trees onsite.
Athene cunicularia burrowing owl	SSC (burrow	Open grasslands, especially prairie, plains, and savanna,	Low. No suitable small mammal burrows found. May occasionally forage

Scientific Name Common Name	Status*	Habitat Description	Potential to Occur in the Project Site & County ROW (MND Study Area)
	sites and some wintering sites)	sometimes in open areas such as vacant lots near human habitation or airports, nesting and roosting in burrow dug by a mammal or by owl (rarely).	over grasslands.
Buteo swainsoni Swainson's hawk	ST	Requires large, open grasslands with abundant prey in association with suitable nesting habitat, which includes mature riparian forest, lone trees, groves of oaks or other trees in agricultural fields, and mature roadside trees.	Low. No documented nest sites within 10 miles of the project site. However, mature oaks and other roadside trees may provide suitable nesting habitat.
Elanus leucurus white-tailed kite	CFP (nesting)	Occurs in marshes, meadows, grasslands, and cultivated fields. Nests on the ground, commonly near low shrubs, in tall weeds or reeds.	Low. Limited suitable nesting habitat present; however, species may forage over grasslands onsite.
Haliaetus leucocephalus Bald eagle	SE	Use ocean shorelines, lake margins, and river courses for both nesting and wintering. Most nests are within 1 mile of water, in large trees with open branches. Roost communally in winter.	Low. Nearest wintering site is located 5.5 mi west of the project site at Bass Lake. Although mature pines and oaks are present, bald eagle is not expected to nest or winter on or adjacent to the project site.
Riparia riparia bank swallow	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Not Expected. No suitable nesting habitat present on or adjacent to the project site.
MAMMALS			
Lasionycteris noctivagans Silver-haired bat	WBWG-M	Primarily a coastal & montane forest dweller feeding over streams, ponds & open brushy areas. Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes & rarely under rocks. Needs drinking water.	Low. Unlikely to roost in exfoliating bark of mature roadside oak trees. Furthermore, nearby ephemeral reach of Tennessee Creek provides limited foraging opportunities.
Myotis yumanensis Yuma myotis	SSC, WBWG-H	Optimal environments include open forests and woodlands in proximity to bodies of water used for foraging; maternity colonies in caves, mines, crevices, and buildings.	Low. No suitable foraging habitat located within proximity to the site. Roost sites may be available in mature roadside trees adjacent to the site in the County ROW.
Taxidea taxus American badger	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient	Not Expected. Although Project site provides generally suitable habitat, no friable soils, dens or burrows were observed during the site reconnaissance.

Scientific Name Common Name	Status*	Habitat Description	Potential to Occur in the Project Site & County ROW (MND Study Area)
		food, friable soils & open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	
INVERTEBRATES			
Banksula californica Alabaster Cave harvestman	*	Limestone caves. Known only from the type locality, Alabaster Cave, El Dorado County. The type locality has been partly destroyed by mining and the species may be extinct.	Not Expected. No suitable habitat present on or adjacent to project site.
Branchinecta lynchi vernal pool fairy shrimp	FT	Inhabits vernal pools and similar ephemeral wetlands. Most commonly found in grassed or mud bottomed pools or basalt flow depressions pools in unplowed grasslands.	Not Expected. No suitable habitat present on or adjacent to project site.
Andrena blennospermatis Blennosperma vernal pool andrenid bee	*	This bee is oligolectic on vernal pool blennosperma. Bees nest in the uplands around vernal pools.	Not Expected. No suitable habitat present on or adjacent to project site.
Cosumnoperla hypocrena Cosumnes stripetail	*	Aquatic. Found in intermittent streams on western slope of central Sierra Nevada foothills in American & Cosumnes river basins.	Not Expected. No suitable habitat present on or adjacent to project site.
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT	Found only in the Central Valley of California, this beetle is completely dependent on elderberry (*Sambucus* sp.) shrubs for larval development, and to a lesser degree, adult feeding. Typical habitat is characterized as large stands of mature elderberry shrubs in riparian or floodplain areas. Prefers to lay eggs in elderberries 2 to 8 inches in diameter; some preference shown for "stressed" elderberries.	Not Expected. No host plants (elderberry) present on or adjacent to project site.
Hydrochara ricksecker Ricksecker's water scavenger beetle	*	Aquatic.	Not Expected. No suitable habitat present on or adjacent to project site.
***STATUS KEY** Federal (USFWS) FE: Federally-listed Endangered			

Scientific Name Common Name	Status*	Habitat Description	Potential to Occur in the Project Site & County ROW (MND Study Area)

FT: Federally-listed Threatened
FD: Federally-delisted
FC: Candidate federal listing

State (CDFW)
SE: State-listed Endangered
ST: State-listed Threatened
SCE: State Candidate Endangered
SSC: State Species of Special Concern
Cfp: California Fully Protected Species
Cwl: California Watch List
*: California Special Animal (species with no official federal or state status, but are included on the CDFW's Special Animal List due to limited distribution or previous state or federal status).

Western Bat Working Group
WBWG-H = Designated as High Priority by the Western Bat Working Group
WBWG-M = Designated as Medium Priority by the Western Bat Working Group

SOURCES:

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Exhibit 7. Special Status Plant Species

SCIENTIFIC NAME COMMON NAME	STATUS*	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	
			In MND Study Area (Outside of Proposed Development Area)	In Phase 1 and Potential Future Development Area
Allium jepsonii Jepson's onion	Rank 1B.2	Chaparral, cismontane woodland, lower montane coniferous forest. On serpentine soils in Sierra foothills, volcanic soil on Table Mtn. On slopes and flats; usually in an open area. 355-1130 m. Blooms Apr-Aug.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. Site does not support serpentine soils typically inhabited by this species. In addition, high cover of non-native and/or invasive grasses and forbs is expected to preclude the occurrence of this species in the Phase 1 and potential future development areas.
Arctostaphylos nissenana Nissenan manzanita	Rank 1B.2	Closed-cone coniferous forest, chaparral. Usually on metamorphics, associated w/ other chaparral species. 450-1100 m. Blooms Feb-Mar.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Balsamorhiza macrolepis big-scale balsamroot	Rank 1B.2	Chaparral, valley and foothill grassland, cismontane woodland. Sometimes on serpentine. 90-1555 m. Blooms Mar-Jun.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. Site does not support serpentine soils typically inhabited by this species. In addition, high cover of non-native and/or invasive grasses and forbs is expected to preclude the occurrence of this species in the Phase 1 and potential future development areas.
Calystegia stebbinsii Stebbins' morning-glory	FE/SE/ Rank 1B.1	Chaparral, cismontane woodland. On red clay soils of the Pine Hill formation; gabbro or serpentine; open areas. 300-725 m. Blooms Apr-Jul.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed

SCIENTIFIC NAME COMMON NAME	STATUS*	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	
			In MND Study Area (Outside of Proposed Development Area)	In Phase 1 and Potential Future Development Area
				development.
Calystegia vanzuukiae Van Zuuk's morning-glory	Rank 1B.3	Chaparral, cismontane woodland. Gabbro, serpentinite. 500-1180 m. Blooms May-Aug.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. Site does not support serpentine soils typically inhabited by this species. In addition, high cover of non-native and/or invasive grasses and forbs is expected to preclude the occurrence of this species in the Phase 1 and potential future development areas. There is a low probability that this species could occur near the perimeter of the proposed development.
Ceanothus roderickii Pine Hill ceanothus	FE/SR/ Rank 1B.2	Chaparral, cismontane woodland. Gabbroic or serpentine soils; often in "historically disturbed" areas with an ensemble of other rare plants. 260-630 m. Blooms Apr-Jun.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Site does not support serpentine soils typically inhabited by this species. In addition, high cover of non-native and/or invasive grasses and forbs is expected to preclude the occurrence of this species in the Phase 1 and potential future development areas.
Chlorogalum grandiflorum Red Hills soaproot	Rank 1B.2	Cismontane woodland, chaparral, lower montane coniferous forest. Occurs frequently on serpentine or gabbro, but also on non-ultramafic substrates; often on "historically disturbed" sites. 245-1240 m. Blooms May-Jun.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Clarkia biloba ssp. brandegeeae Brandegee's clarkia	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest. Often in road	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-

SCIENTIFIC NAME COMMON NAME	STATUS*	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	
			In MND Study Area (Outside of Proposed Development Area)	In Phase 1 and Potential Future Development Area
		cuts. 75-915 m. Blooms May-Jul.		native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Crocanthemum suffrutescens Bisbee Peak rush-rose	Rank 3.2	Chaparral. Often on serpentine, gabbroic, or Ione formation soils; in openings in chaparral. 45-840 m. Blooms Apr-Aug.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas and site does not support suitable substrate. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Eryngium pinnatisectum Tuolumne button-celery	Rank 1B.2	Vernal pools, cismontane woodland, lower montane coniferous forest. Volcanic soils; vernal pools and mesic sites within other natural communities. 70-915 m. Blooms May-Aug.	None. No suitable habitat and area is regularly disked for fire suppression.	None. No suitable vernal pool habitat is present.
Fremontodendron decumbens Pine Hill flannelbush	FE/SR/ Rank 1B.2	Chaparral, cismontane woodland. Rocky ridges; gabbro or serpentine endemic; often among rocks and boulders. 425-760 m. Blooms Apr-Jul.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas and suitable soils or rocky outcrops are not present. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Galium californicum ssp. sierrae El Dorado bedstraw	FE/SR/ Rank 1B.2	Cismontane woodland, chaparral, lower montane coniferous forest. More often in pine-oak woodland than in chaparral; restricted to gabbroic soils. 100-585 m. Blooms May-Jun.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.

SCIENTIFIC NAME COMMON NAME	STATUS*	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	
			In MND Study Area (Outside of Proposed Development Area)	In Phase 1 and Potential Future Development Area
Horkelia parryi Parry's horkelia	Rank 1B.2	Chaparral, cismontane woodland. Openings in chaparral or woodland; especially known from the Ione formation in Amador County. 80-1070 m. Blooms Apr-Sep.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Packera layneae Layne's ragwort	FT/SR/ Rank 1B.2	Chaparral, cismontane woodland. Ultramafic soil (serpentine or gabbro); occasionally along streams. 200-1085 m. Blooms Apr-Aug.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Sagittaria sanfordii Sanford's arrowhead	Rank 1B.2	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-650 m. Blooms May-Oct (Nov).	None. No suitable habitat and area is regularly disked for fire suppression.	None. No perennial wetland habitat is present.
Viburnum ellipticum oval-leaved viburnum	Rank 2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1400 m. Blooms May-Jun.	None. No suitable habitat and area is regularly disked for fire suppression.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.
Wyethia reticulata El Dorado County mule ears	Rank 1B.2	Chaparral, cismontane woodland, lower montane coniferous forest. Stony red clay and gabbroic soils; often in openings in gabbro chaparral. 185-630 m.	None. No suitable habitat and area is regularly disked for fire suppression. Blooms Apr-Aug.	Low. No development is proposed in chaparral or woodland areas. Due to high cover of non-native species, there is a low probability that this species could occur near the perimeter of the proposed development.

SCIENTIFIC NAME COMMON NAME	STATUS*	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	
			In MND Study Area (Outside of Proposed Development Area)	In Phase 1 and Potential Future Development Area

***STATUS KEY:**

Federal

FE: Federally-listed Endangered
FT: Federally-listed Threatened
FC: Federal candidate for listing

State

SE: State-listed Endangered
ST: State -listed Threatened
SR: State -listed Rare

California Native Plant Society (CNPS):

Rank 1A – Presumed extinct in California
Rank 1B – Rare, threatened, or endangered in California and elsewhere
Rank 2A: Plants presumed extirpated in California, but more common elsewhere; Rank 2B: Rare, threatened, or endangered in California, but more common elsewhere
Rank 3 – Plants for which more information is needed – A review list
Rank 4 – Plants of limited distribution – A watch list
Additional threat ranks endangerment codes are assigned to each taxon or group as follows:
.1 – Seriously endangered in California (over 80% of occurrences threatened/high degree of immediacy of threat).
.2 – Fairly endangered in California (20-80% occurrences threatened).
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known).

SOURCES:

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Exhibit 8. Soils Map

Soil Map—El Dorado Area, California
(Shingle Springs Village Project)