



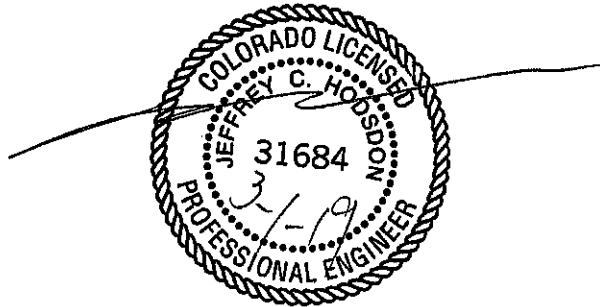
A summary of what, who and when should be identified with this. in terms of rods physically being constructed.

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Homestead at Sterling Ranch Filing 2
Traffic Technical Memorandum
(LSC #184280)
March 1, 2019

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Handwritten signature of James J. Morley

3/1/2019
Date



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March 1, 2019

Mr. Jim Morley
Morley-Bentley Investments, LLC
20 Boulder Crescent, 1st Floor
Colorado Springs, CO 80903

RE: Homestead at Sterling Ranch Filing 2
El Paso County, CO
Traffic Technical Memorandum
LSC #184280

Dear Mr. Morley:

LSC Transportation Consultants, Inc. has prepared this traffic technical memorandum for Homestead at Sterling Ranch Filing 2. As shown on Figure 1, Sterling Ranch is located east of Vollmer Road near Lochwinnoch Lane between the future extensions of Marksheffel Road and Stapleton Drive in El Paso County, Colorado. This report is intended as a site-specific, final plat traffic report for the currently proposed filing.

REPORT CONTENTS

This report presents:

- The existing roadway and traffic conditions in the site's vicinity including the roadway widths, surface conditions, lane geometries, traffic controls, and posted speed limits.
- Current traffic volume data.
- Estimates of projected intermediate-term (2025) traffic volumes.
- The projected average weekday and peak-hour vehicle-trips to be generated by the proposed development.
- The assignment of the projected site-generated traffic volumes to the area roadways.
- The projected short-term total traffic volumes on the area roadways.
- The projected levels of service at the key intersections in the vicinity of the site.
- The recommended street classifications for the internal streets within the proposed development.
- Roadway capacity of the proposed Vollmer Road interim cross section.
- An evaluation of the ability of the short-term roadway improvements to accommodate the projected short-term traffic volumes.
- The project's obligation (if any) to the County roadway improvement fee program.

PREVIOUS STERLING RANCH TRAFFIC REPORTS AND MEMORANDUM

Figure 2 shows the locations of the Sterling Ranch Phase 1 and Phase 2 developments that are either approved or currently under review. LSC prepared a traffic impact study (TIS) for the entire Sterling Ranch development dated June 5, 2008. LSC also prepared a traffic impact analysis for the first phase of the Sterling Ranch development dated March 16, 2015, a memorandum for Phases 1-3 dated October 2, 2017, and a traffic impact analysis for the Sterling Ranch Phase 2 Preliminary Plan dated December 20, 2018. The following site-specific, final plat traffic reports have also been prepared:

- Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1 dated December 19, 2017
- Sterling Ranch Filing No. 2 dated April 3, 2018
- Copper Chase at Sterling Ranch dated December 20, 2018

LAND USE AND ACCESS

The Homestead at Sterling Ranch Filing 2 site is located southeast of the future intersection of Vollmer Road and Briargate Parkway. The currently proposed filing is planned to include 104 lots for single-family homes. Access is proposed to Dines Boulevard and Wheatland Drive. The site plan is shown in Figure 2.

ROADWAY AND TRAFFIC CONDITIONS

The roadways in the site's vicinity are shown on Figure 1 and are described below.

Vollmer Road is currently a five-lane urban street within the City of Colorado Springs limits between Black Forest Road and Cowpoke Road; and a two-lane, rural, paved roadway north of Cowpoke Road extending to north of Hodgen Road. In the southbound direction, Vollmer Road has a posted speed limit of 45 miles per hour (mph). South of Cowpoke Road, Vollmer Road has a 40-mph posted speed limit. The 2040 El Paso County *Major Transportation Corridors Plan* (MTCP) and the Sterling Ranch master traffic study show Vollmer Road as a four-lane Urban Minor Arterial in the vicinity of the site. In the interim, auxiliary turn lanes will be completed on Vollmer Road as shown in the attached exhibits and as per the attached memos by LSC dated October 2, 2017 and February 2, 2019.

Marksheffel Road is a Principal Arterial extending north from the City of Fountain to Woodmen Road. Marksheffel Road is planned to ultimately be widened to six lanes and extended north and west from Woodmen Road to connect to Research Parkway at Black Forest Road. Marksheffel Road is shown as a six-lane Principal Arterial through the site on the El Paso County MTCP. Marksheffel Road is planned to be constructed north from Woodmen Road to Vollmer Road in the short-term future.

Briargate Parkway is a six-lane, Principal Arterial that extends east from I-25 to Grand Lawn Circle (about one-half mile east of Powers Boulevard). Briargate Parkway is planned to ultimately extend to Towner Drive. With the Sterling Ranch Phase 1 development, Stapleton Road is planned to be constructed as a two-lane roadway between Vollmer Road and the proposed first site access intersection 750 feet east of Vollmer (Wheatland Drive). For this report of short-term conditions, it was assumed that only this section of Briargate Parkway would be constructed in the vicinity of the site.

Sterling Ranch Road is a planned Non-Residential Collector shown extending through the Sterling Ranch development between Marksheffel Road and Stapleton Drive. Sterling Ranch Road is planned to be constructed between Marksheffel Road and Dines Boulevard as part of Sterling Ranch Filing No. 2 now under review by the County.

EXISTING TRAFFIC VOLUMES

Figure 4 shows the existing daily and peak-hour traffic volumes on Vollmer Road in the vicinity of the site. The traffic volumes are from the attached traffic counts conducted adjacent to the site in September 2017. Figure 3 also shows the average weekday traffic volumes on Vollmer Road based on 24-hour machine (tube) counts conducted in September 2017.

2025 BACKGROUND TRAFFIC

Figure 5 shows the projected 2025 background traffic volumes. Background traffic is the traffic estimated to be on the roadways without the Homestead at Sterling Ranch Filing 2 traffic. Background traffic includes the existing traffic volumes (from Figure 3) plus increases in through traffic due to regional growth plus traffic estimated to be generated by buildout of the residential portion of Sterling Ranch Phases 1 and 2 (except for traffic projected to be generated by the currently proposed filing) and the proposed Retreat at Timber Ridge development to be located generally northeast of the intersection of Vollmer Road and Poco Road. The 2025 background traffic volumes assume Marksheffel Road has been constructed between Woodmen Road and Vollmer Road but not west of Vollmer Road. The 2025 background volumes also assume only the short section of Briargate Parkway between Vollmer Road and Wheatland Drive has been constructed in the vicinity of the site.

Figure 5b also shows the lane geometry, traffic control, and level of service at the key intersections based on the short-term background volumes.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 1 shows the current trip generation estimate.

As shown in Table 1, Homestead at Sterling Ranch is projected to generate about 982 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 19 vehicles would enter and 58 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:30 and 6:30 p.m., about 65 vehicles would enter and 38 vehicles would exit the site.

SHORT-TERM DIRECTIONAL DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the street and roadway system serving the site is one of the most important factors in determining the site's traffic impacts. The specific distribution estimates are shown in Figure 6. The directional distribution estimates are based on the following factors: the location of the site with respect to the Colorado Springs metropolitan area, the planned access system for the site, the street and roadway system serving the site, and the land uses proposed for the site.

When the distribution percentages (from Figure 6) are applied to the trip generation estimates (from Table 1), the resulting site-generated traffic volumes can be determined. Figure 7 shows the short-term site-generated traffic volume estimate.

INTERMEDIATE-TERM (2025) TOTAL TRAFFIC

Figure 8a shows the projected total traffic volumes for the intermediate term. Total traffic volumes include 2025 background through traffic on Vollmer Road (from Figure 5) plus the short-term site-generated traffic volumes (from Figure 7).

LONG-TERM TRAFFIC

Please refer to the master traffic report—the June 5, 2008 Sterling Ranch Updated Traffic Impact Analysis by LSC—for the long-term peak-hour traffic volume projections and level of service analysis. The original report is for the entire Sterling Ranch Sketch Plan.

ESTIMATED VOLLMER ROAD IMPROVEMENTS/CAPACITY

Currently the MTCP indicates a capacity of existing Vollmer Road to be about 6,000 vehicles per day. The El Paso County *Engineering Criteria Manual* (ECM) indicates the average daily traffic (ADT) capacity of an ECM-standard rural minor arterial (two lanes) to be 10,000 vehicles per day. However, the proposed interim cross section is a hybrid between urban and rural cross sections and would include auxiliary turn lanes. With the addition of ECM-standard auxiliary right- and left-turn deceleration lanes, LSC estimates the capacity to be about 14,000 vehicles per day through the area of the improved cross section. This is comparable to the fee study estimate of the capacity of Fontaine Boulevard west of Marksheffel, which has a two-lane cross section and auxiliary turn lanes.

The projected intermediate-term total traffic volume as shown in Figure 8 would be 6,670 vehicles per day just south of Briargate Parkway. This volume is below the estimated capacity of 14,000 vehicles per day for a roadway of this cross section.

PROJECTED INTERSECTION LEVELS OF SERVICE

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from “A” to “F.” LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 2 shows the level of service delay ranges.

Table 2			
Intersection Levels of Service Delay Ranges			
Level of Service	Signalized Intersections		Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	V/C⁽¹⁾	Average Control Delay (seconds per vehicle)⁽²⁾
A	10.0 sec or less	less than 0.60	10.0 sec or less
B	10.1-20.0 sec	0.60-0.69	10.1-15.0 sec
C	20.1-35.0 sec	0.70-0.79	15.1-25.0 sec
D	35.1-55.0 sec	0.80-0.89	25.1-35.0 sec
E	55.1-80.0 sec	0.90-0.99	35.1-50.0 sec
F	80.1 sec or more	1.00 and greater	50.1 sec or more

(1) Source: *Transportation Research Circular 212*
 (2) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.

The key area intersections were analyzed to determine the projected levels of service for the intermediate-term background and total traffic volumes based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual 6th Edition*. Figures 5 and 8 show the level of service analysis results. The level of service reports are attached.

All of the intersections analyzed are projected to operate at a level of service B or better for all movements as stop-sign-controlled intersections.

SUBDIVISION STREET CLASSIFICATIONS

Figure 9 shows the recommended street classifications for the internal streets within Homestead at Sterling Ranch Filing No. 2.

ROADWAY IMPROVEMENTS

Vollmer Road

Based on the projected 2025 total traffic volumes, the criteria contained in the El Paso County *Engineering Criteria Manual*, and the classification of Vollmer Road as a Minor Arterial, northbound right-turn deceleration lanes and southbound left-turn lanes would **not** be required on Vollmer Road approaching Dines Boulevard and Briargate Parkway. **However, the road improvements required as part of the Subdivision Improvements Agreement (SIA) for Homestead at Sterling Ranch Filing No. 1 and Branding Iron at Sterling Ranch Filing No. 1 must be constructed. These include auxiliary turn lanes on Vollmer Road** as discussed in our October 2, 2017 and February 19, 2019 transportation memoranda. The applicant will be constructing an interim cross section for Vollmer Road between Marksheffel Road and Briargate Parkway. The interim road improvement would widen the roadway to the east side. There would continue to be one through lane in each direction, but the interim road improvements would allow for southbound left-turn and northbound right-turn lanes at the Briargate Parkway/Vollmer and Dines/Vollmer intersections. An escrow agreement requires a fair share contribution be deposited toward these improvements with each plat or replat within Sterling Ranch.

Dines Boulevard

Based on the projected 2025 total traffic volumes, the criteria contained in the El Paso County *Engineering Criteria Manual*, and the classification of Dines Boulevard as an Urban Collector, a northwest-bound right-turn deceleration lane would be required approaching Vollmer Road.

Based on the projected 2025 total traffic volumes, the criteria contained in the El Paso County *Engineering Criteria Manual* and the classification of Dines Boulevard as an Urban Collector, northbound left-turn lanes and southbound right-turn lanes would **not** be required approaching Cut Banks Drive and Wheatland Drive.

Wheatland Drive

Based on the projected 2025 total traffic volumes, the criteria contained in the El Paso County *Engineering Criteria Manual* and the classification of Wheatland Drive as an Urban Collector, a southbound left-turn lane and northbound right-turn lane would **not** be required approaching Niarada Way.

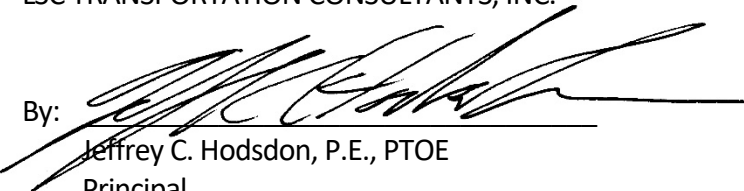
* * * * *

Please contact me if you have any questions regarding this report.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By:



Jeffrey C. Hodsdon, P.E., PTOE
Principal

JCH/KDF:bjwb

Enclosures: Table 1
Figures 1-7
Traffic Count Reports
Level of Service Reports
Sterling Ranch – Vollmer Road Street Improvement Plans
Transportation Memo dated October 2, 2017

Table 1
Trip Generation Estimate
Homestead at Sterling Ranch Filing 2

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾				Total External Trips Generated					
			Average Weekday Traffic	Morning Peak Hour		Evening Peak Hour		Average Weekday Traffic	Morning Peak Hour		Evening Peak Hour	
				In	Out	In	Out		In	Out	In	Out
210	Single-Family Detached Housing	104 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	982	19	58	65	38

Notes:
(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)
(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.



Approximate Scale
Scale: 1" = 3,000'

Figure 1
**Vicinity
Map**

Homestead Filing No. 2 at Sterling Ranch (LSC #184280)

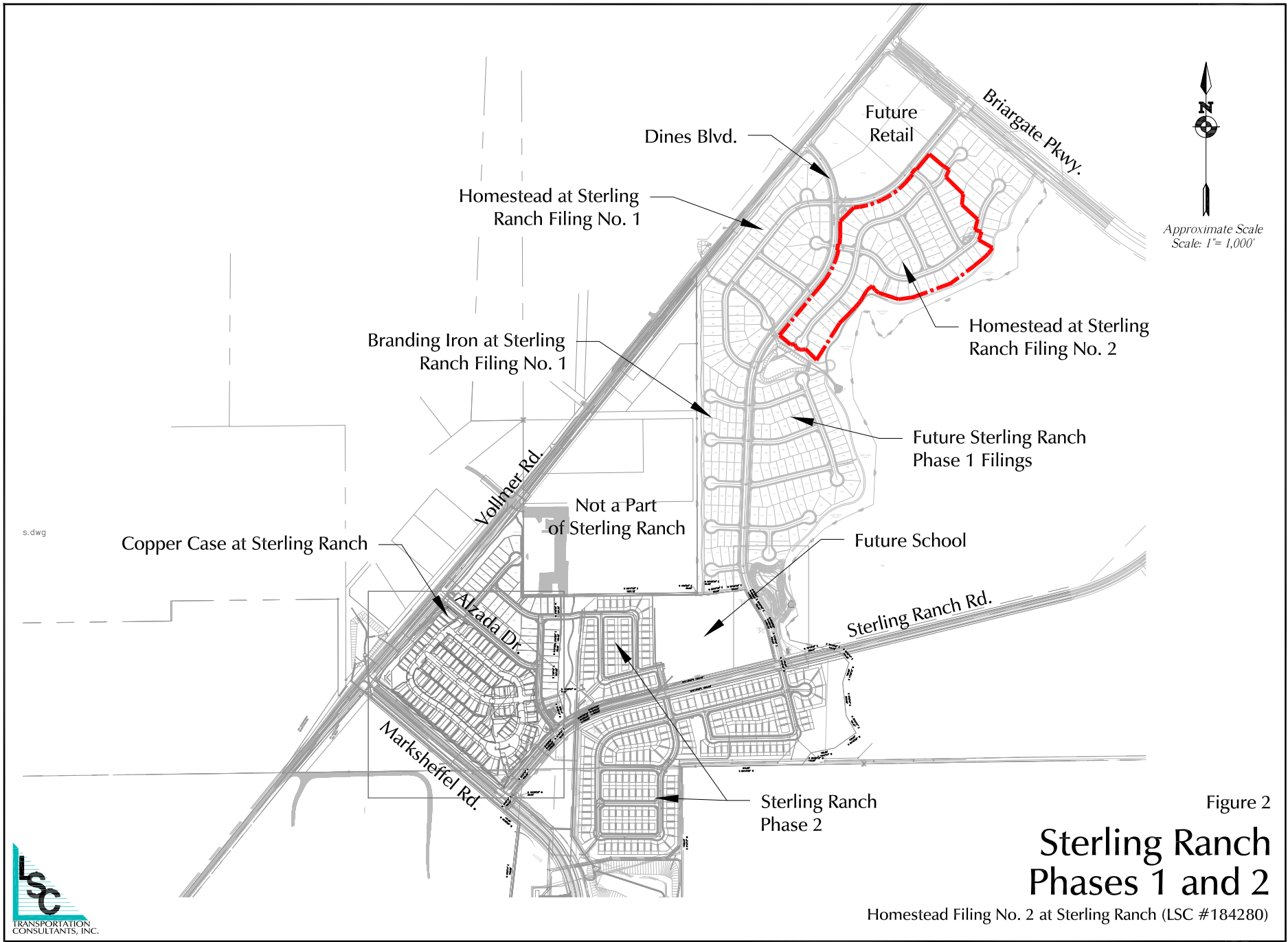


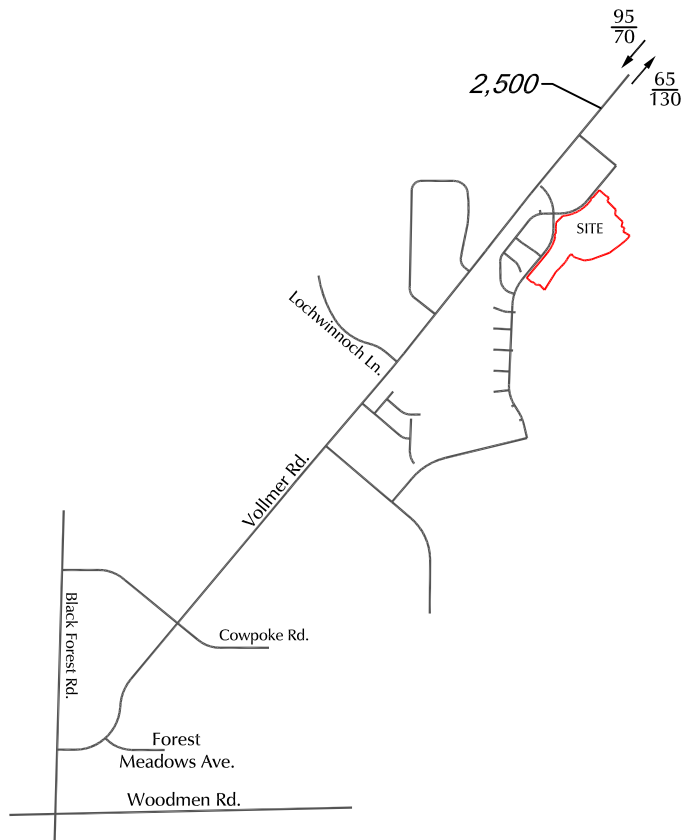
Figure 2
**Sterling Ranch
 Phases 1 and 2**
 Homestead Filing No. 2 at Sterling Ranch (LSC #184280)




Approximate Scale
Scale: 1" = 400'

Figure 3
Site Plan

Homestead Filing No. 2 at Sterling Ranch (LSC #184280)




 Approximate Scale
 Scale: 1" = 3,000'

LEGEND:

- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- XXX = Average Weekday Traffic (vehicles per day) September 2017



Figure 4
**Existing
 Traffic Volumes**

Homestead Filing No. 2 at Sterling Ranch (LSC #184280)

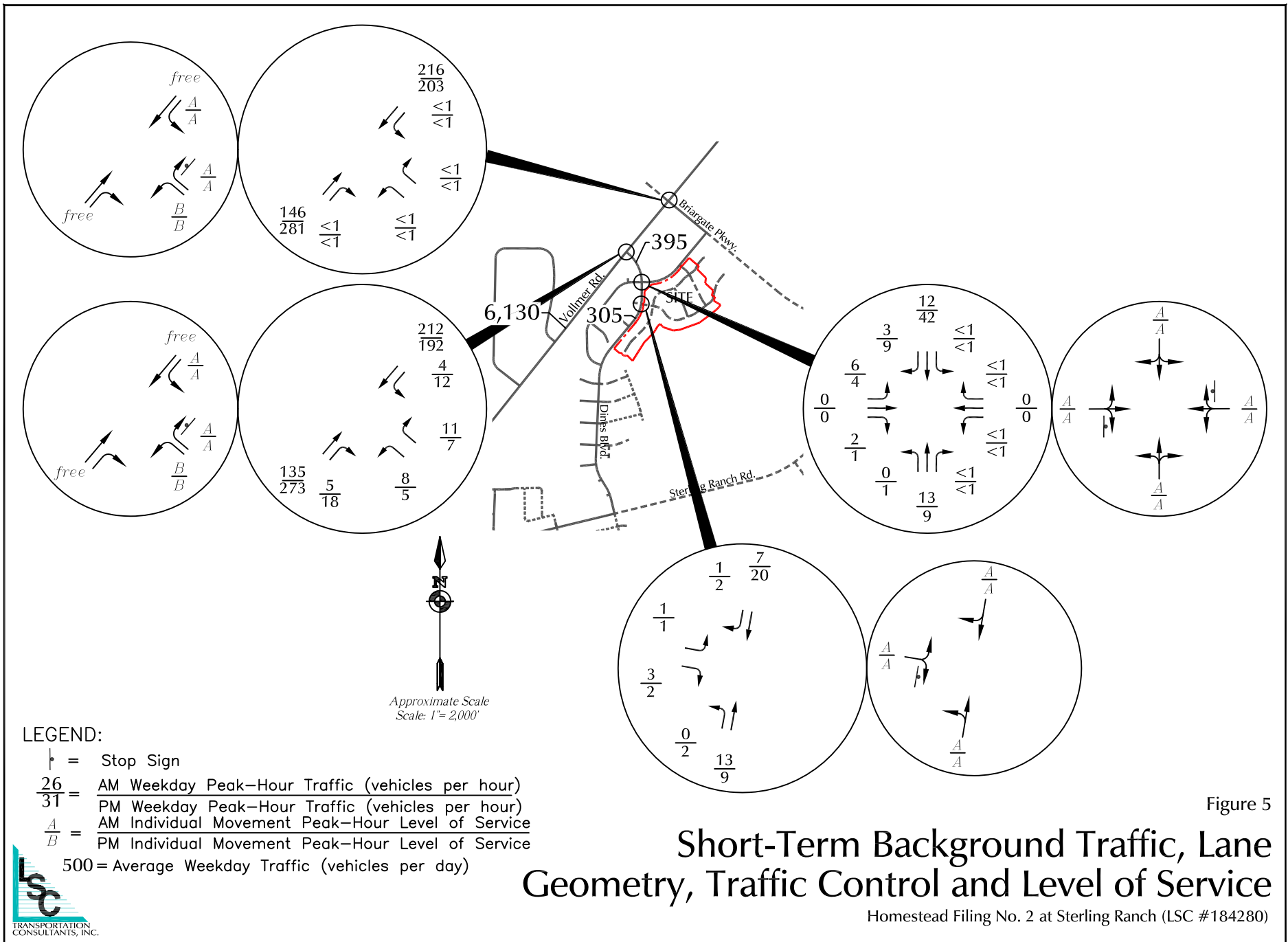
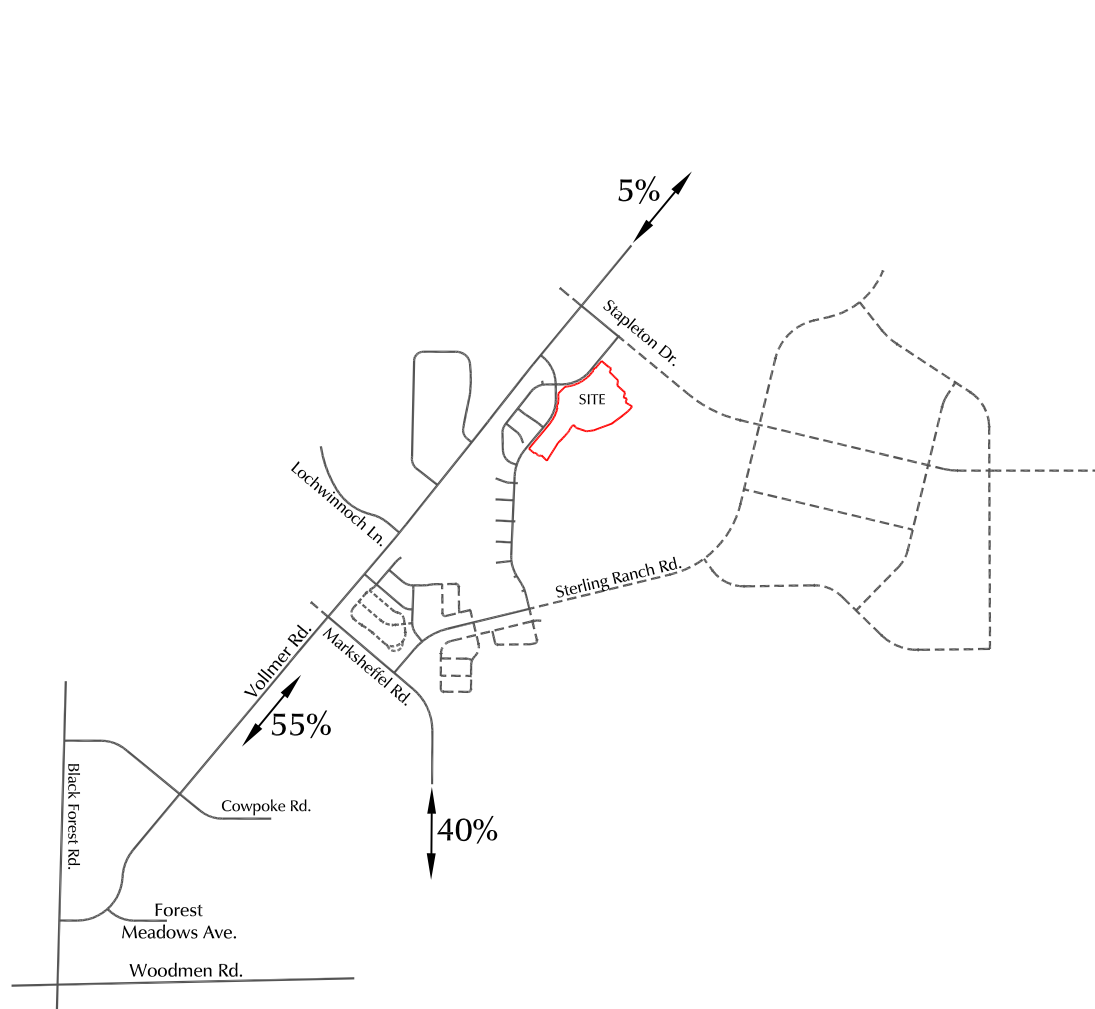



Figure 5

Short-Term Background Traffic, Lane Geometry, Traffic Control and Level of Service

Homestead Filing No. 2 at Sterling Ranch (LSC #184280)



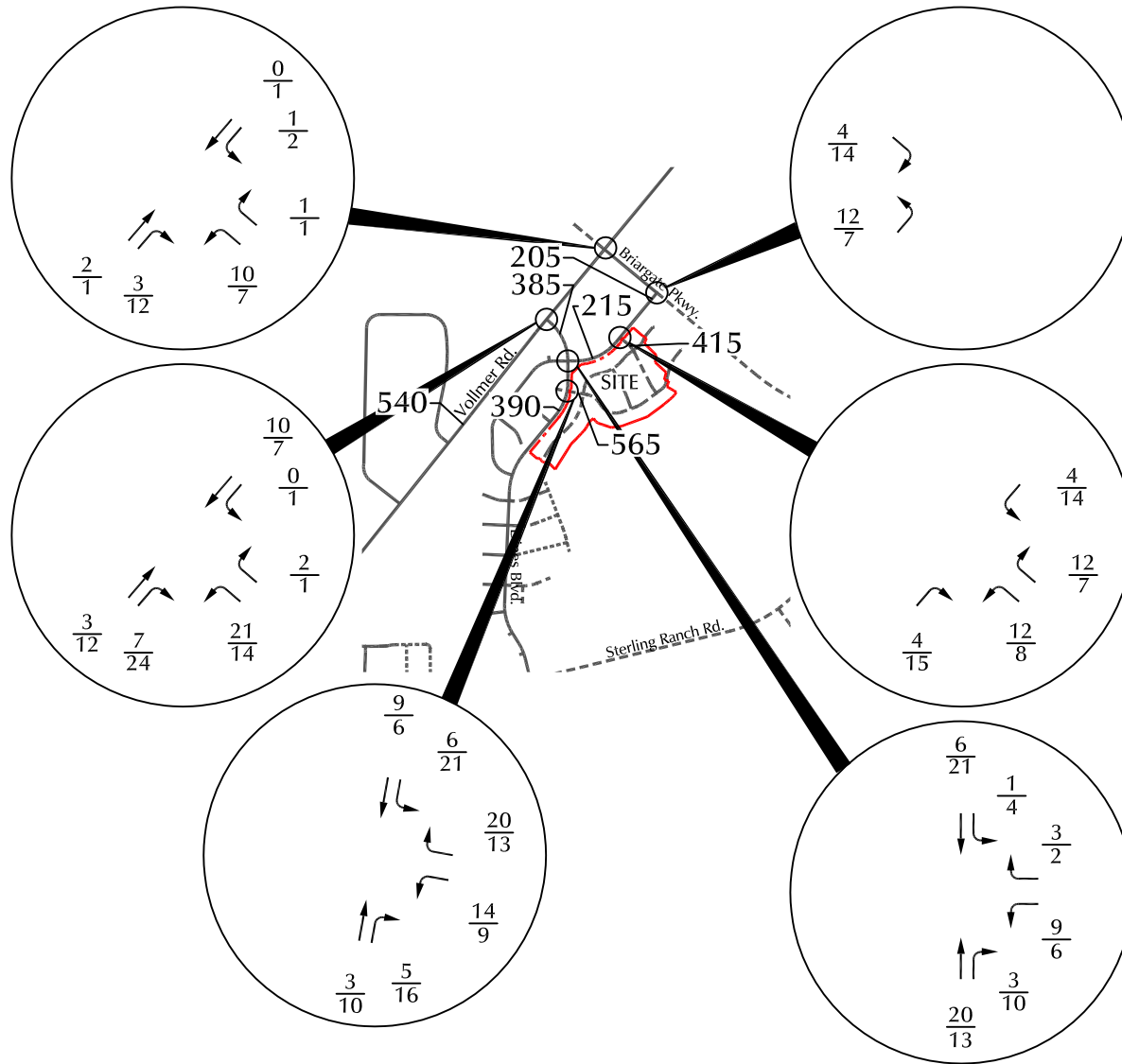



 Approximate Scale
 Scale: 1" = 3,000'

LEGEND:
 35% = Percent Directional Distribution Residential

Figure 6
**Short-Term Directional Distribution
 of Site-Generated Traffic**
 Homestead Filing No. 2 at Sterling Ranch (LSC #184280)





LEGEND:

$\frac{26}{31}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{31}{26}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

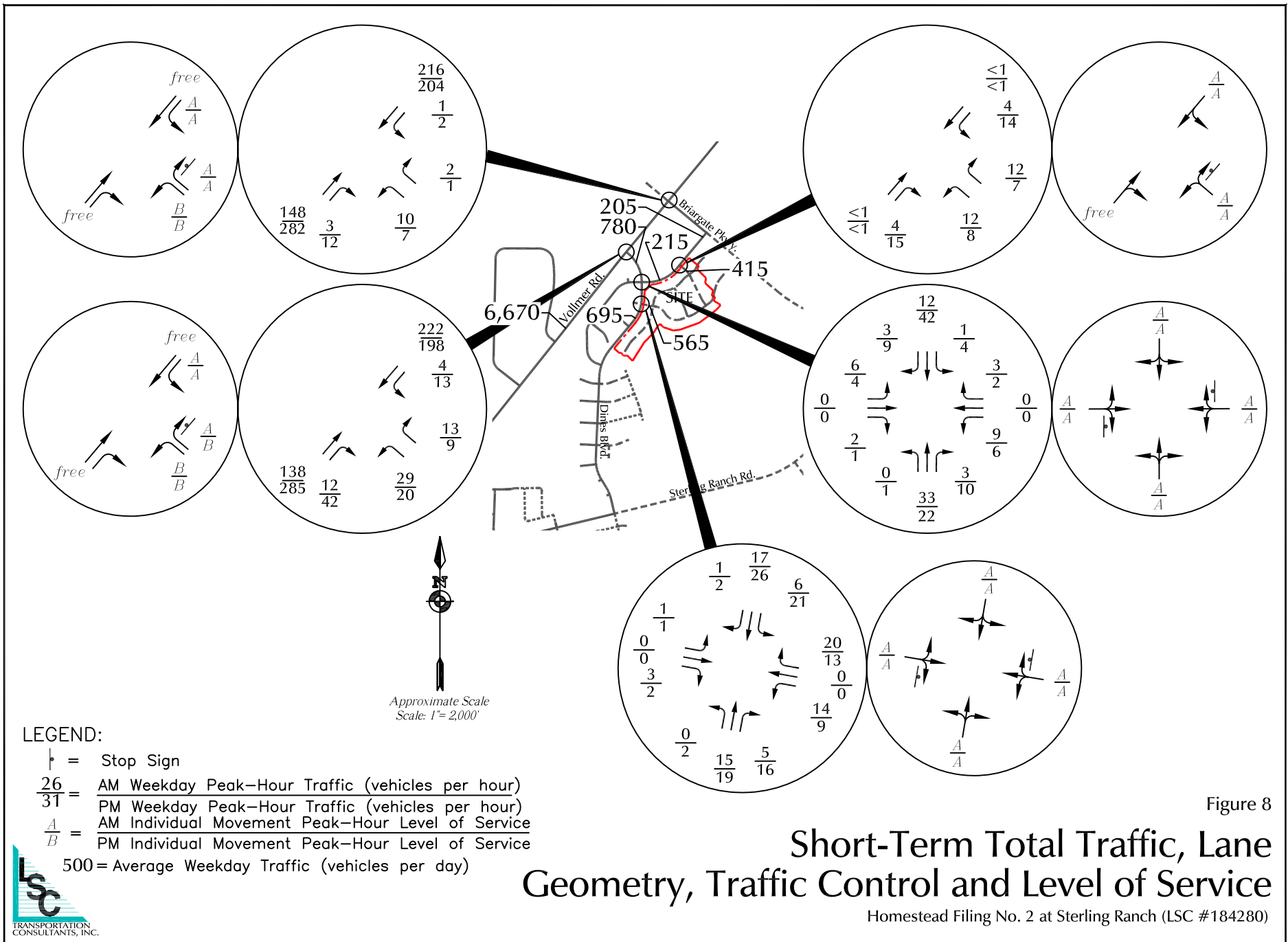
500 = Average Weekday Traffic (vehicles per day)

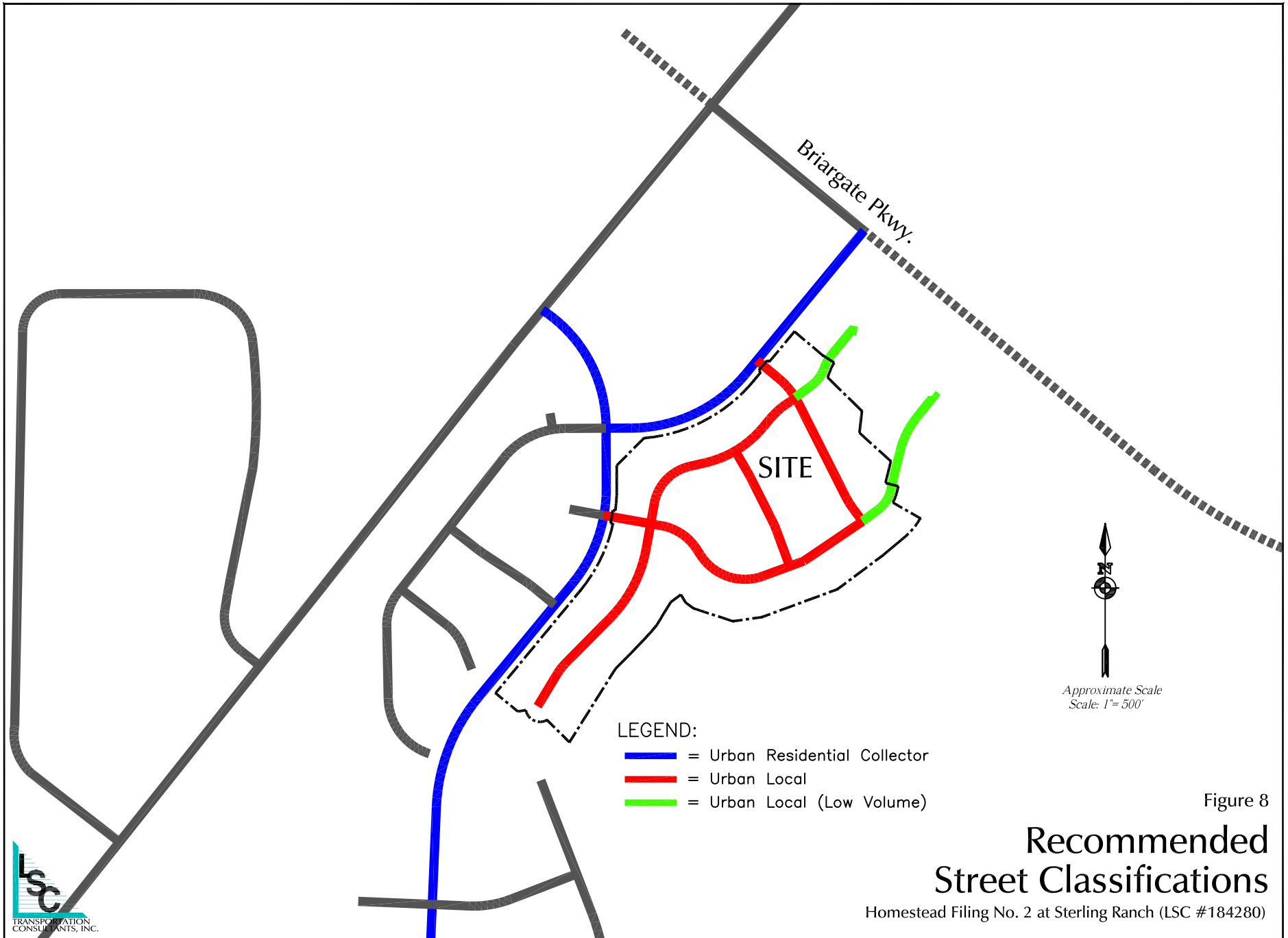


Figure 7

Assignment of Site-Generated Traffic

Homestead Filing No. 2 at Sterling Ranch (LSC #184280)





LEGEND:

- = Urban Residential Collector
- = Urban Local
- = Urban Local (Low Volume)



 Approximate Scale
 Scale: 1" = 500'

Figure 8
**Recommended
 Street Classifications**

Homestead Filing No. 2 at Sterling Ranch (LSC #184280)



Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	8	11	135	5	4	212
Future Vol, veh/h	8	11	135	5	4	212
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	205	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	12	147	5	5	262

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	419	147	0	0	152
Stage 1	147	-	-	-	-
Stage 2	272	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	591	900	-	-	1429
Stage 1	880	-	-	-	-
Stage 2	774	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	589	900	-	-	1429
Mov Cap-2 Maneuver	589	-	-	-	-
Stage 1	877	-	-	-	-
Stage 2	774	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	589	900	1429	-
HCM Lane V/C Ratio	-	-	0.015	0.013	0.003	-
HCM Control Delay (s)	-	-	11.2	9.1	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	2	0	0	0	0	13	0	0	6	3
Future Vol, veh/h	6	0	2	0	0	0	0	13	0	0	6	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	2	0	0	0	0	14	0	0	7	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	23	23	9	24	24	14	10	0	-	-	-	0
Stage 1	9	9	-	14	14	-	-	-	-	-	-	-
Stage 2	14	14	-	10	10	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	989	870	1073	987	869	1066	1610	-	0	0	-	-
Stage 1	1012	888	-	1006	884	-	-	-	0	0	-	-
Stage 2	1006	884	-	1011	887	-	-	-	0	0	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	989	870	1073	985	869	1066	1610	-	-	-	-	-
Mov Cap-2 Maneuver	989	870	-	985	869	-	-	-	-	-	-	-
Stage 1	1012	888	-	1006	884	-	-	-	-	-	-	-
Stage 2	1006	884	-	1009	887	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	1610	-	1009	-	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	0	-	8.6	0	-
HCM Lane LOS	A	-	A	A	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	1	3	0	12	7	1
Future Vol, veh/h	1	3	0	12	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	0	13	8	1

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	22	9	9	0	0
Stage 1	9	-	-	-	-
Stage 2	13	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	995	1073	1611	-	-
Stage 1	1014	-	-	-	-
Stage 2	1010	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	995	1073	1611	-	-
Mov Cap-2 Maneuver	995	-	-	-	-
Stage 1	1014	-	-	-	-
Stage 2	1010	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1611	-	1052	-	-
HCM Lane V/C Ratio	-	-	0.004	-	-
HCM Control Delay (s)	0	-	8.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	5	7	273	18	12	192
Future Vol, veh/h	5	7	273	18	12	192
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	205	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	8	297	20	15	237

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	564	297	0	0	317
Stage 1	297	-	-	-	-
Stage 2	267	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	487	742	-	-	1243
Stage 1	754	-	-	-	-
Stage 2	778	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	481	742	-	-	1243
Mov Cap-2 Maneuver	481	-	-	-	-
Stage 1	745	-	-	-	-
Stage 2	778	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	481	742	1243	-
HCM Lane V/C Ratio	-	-	0.011	0.01	0.012	-
HCM Control Delay (s)	-	-	12.6	9.9	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	1	0	0	0	1	9	0	0	21	9
Future Vol, veh/h	4	0	1	0	0	0	1	9	0	0	21	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	1	0	0	0	1	10	0	0	23	10

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	40	40	28	41	45	10	33	0	-	-	-	0
Stage 1	28	28	-	12	12	-	-	-	-	-	-	-
Stage 2	12	12	-	29	33	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	964	852	1047	963	847	1071	1579	-	0	0	-	-
Stage 1	989	872	-	1009	886	-	-	-	0	0	-	-
Stage 2	1009	886	-	988	868	-	-	-	0	0	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	963	851	1047	961	846	1071	1579	-	-	-	-	-
Mov Cap-2 Maneuver	963	851	-	961	846	-	-	-	-	-	-	-
Stage 1	988	872	-	1008	885	-	-	-	-	-	-	-
Stage 2	1008	885	-	987	868	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	0	0.7	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	1579	-	979	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.3	0	8.7	0	-
HCM Lane LOS	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	0	2	0	0	0	2	9	0	0	20	2
Future Vol, veh/h	1	0	2	0	0	0	2	9	0	0	20	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	225	-	-	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	2	0	0	0	2	10	0	0	22	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	37	37	23	38	38	10	24	0	0	10	0	0
Stage 1	23	23	-	14	14	-	-	-	-	-	-	-
Stage 2	14	14	-	24	24	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	968	855	1054	967	854	1071	1591	-	-	1610	-	-
Stage 1	995	876	-	1006	884	-	-	-	-	-	-	-
Stage 2	1006	884	-	994	875	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	967	854	1054	964	853	1071	1591	-	-	1610	-	-
Mov Cap-2 Maneuver	967	854	-	964	853	-	-	-	-	-	-	-
Stage 1	994	876	-	1005	883	-	-	-	-	-	-	-
Stage 2	1005	883	-	992	875	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	0	1.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1591	-	-	1023	-	1610	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	-	-	-	-
HCM Control Delay (s)	7.3	-	-	8.5	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	29	13	138	12	4	222
Future Vol, veh/h	29	13	138	12	4	222
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	205	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	14	150	13	5	274

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	434	150	0	0	163
Stage 1	150	-	-	-	-
Stage 2	284	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	579	896	-	-	1416
Stage 1	878	-	-	-	-
Stage 2	764	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	577	896	-	-	1416
Mov Cap-2 Maneuver	577	-	-	-	-
Stage 1	874	-	-	-	-
Stage 2	764	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	577	896	1416	-
HCM Lane V/C Ratio	-	-	0.055	0.016	0.003	-
HCM Control Delay (s)	-	-	11.6	9.1	7.6	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	0	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	10	2	148	3	1	216
Future Vol, veh/h	10	2	148	3	1	216
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	205	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	2	161	3	1	267

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	430	161	0	0	164
Stage 1	161	-	-	-	-
Stage 2	269	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	582	884	-	-	1414
Stage 1	868	-	-	-	-
Stage 2	776	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	581	884	-	-	1414
Mov Cap-2 Maneuver	581	-	-	-	-
Stage 1	867	-	-	-	-
Stage 2	776	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	581	884	1414	-
HCM Lane V/C Ratio	-	-	0.019	0.002	0.001	-
HCM Control Delay (s)	-	-	11.3	9.1	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection

Int Delay, s/veh 7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	4	4	0	12	12
Future Vol, veh/h	0	4	4	0	12	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	4	0	13	13

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	4	0	10
Stage 1	-	-	-	-	2
Stage 2	-	-	-	-	8
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1618	-	1010
Stage 1	-	-	-	-	1021
Stage 2	-	-	-	-	1015
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1618	-	1008
Mov Cap-2 Maneuver	-	-	-	-	1008
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1015

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1044	-	-	1618	-
HCM Lane V/C Ratio	0.025	-	-	0.003	-
HCM Control Delay (s)	8.5	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	2	9	0	3	0	33	3	1	12	3
Future Vol, veh/h	6	0	2	9	0	3	0	33	3	1	12	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	2	10	0	3	0	36	3	1	13	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	56	56	15	56	56	38	16	0	0	39	0	0
Stage 1	17	17	-	38	38	-	-	-	-	-	-	-
Stage 2	39	39	-	18	18	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	941	835	1065	941	835	1034	1602	-	-	1571	-	-
Stage 1	1002	881	-	977	863	-	-	-	-	-	-	-
Stage 2	976	862	-	1001	880	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	937	834	1065	938	834	1034	1602	-	-	1571	-	-
Mov Cap-2 Maneuver	937	834	-	938	834	-	-	-	-	-	-	-
Stage 1	1002	880	-	977	863	-	-	-	-	-	-	-
Stage 2	973	862	-	998	879	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	8.8	0	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1602	-	-	966	960	1571	-	-
HCM Lane V/C Ratio	-	-	-	0.009	0.014	0.001	-	-
HCM Control Delay (s)	0	-	-	8.8	8.8	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	3	14	0	20	0	15	5	6	17	1
Future Vol, veh/h	1	0	3	14	0	20	0	15	5	6	17	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	3	15	0	22	0	16	5	7	18	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	63	54	19	53	52	19	19	0	0	21	0	0
Stage 1	33	33	-	19	19	-	-	-	-	-	-	-
Stage 2	30	21	-	34	33	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	932	837	1059	946	839	1059	1597	-	-	1595	-	-
Stage 1	983	868	-	1000	880	-	-	-	-	-	-	-
Stage 2	987	878	-	982	868	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	910	834	1059	940	836	1059	1597	-	-	1595	-	-
Mov Cap-2 Maneuver	910	834	-	940	836	-	-	-	-	-	-	-
Stage 1	983	865	-	1000	880	-	-	-	-	-	-	-
Stage 2	967	878	-	975	865	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	8.7	0	1.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1597	-	-	1017	1007	1595	-	-
HCM Lane V/C Ratio	-	-	-	0.004	0.037	0.004	-	-
HCM Control Delay (s)	0	-	-	8.6	8.7	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	20	9	285	42	13	198
Future Vol, veh/h	20	9	285	42	13	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	205	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	10	310	46	16	244

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	586	310	0	0	356
Stage 1	310	-	-	-	-
Stage 2	276	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	473	730	-	-	1203
Stage 1	744	-	-	-	-
Stage 2	771	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	467	730	-	-	1203
Mov Cap-2 Maneuver	467	-	-	-	-
Stage 1	734	-	-	-	-
Stage 2	771	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	467	730	1203	-
HCM Lane V/C Ratio	-	-	0.047	0.013	0.013	-
HCM Control Delay (s)	-	-	13.1	10	8	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	7	1	282	12	2	204
Future Vol, veh/h	7	1	282	12	2	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	205	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	1	307	13	2	252

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	563	307	0	0	320
Stage 1	307	-	-	-	-
Stage 2	256	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	487	733	-	-	1240
Stage 1	746	-	-	-	-
Stage 2	787	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	486	733	-	-	1240
Mov Cap-2 Maneuver	486	-	-	-	-
Stage 1	745	-	-	-	-
Stage 2	787	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	486	733	1240	-
HCM Lane V/C Ratio	-	-	0.016	0.001	0.002	-
HCM Control Delay (s)	-	-	12.5	9.9	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection						
Int Delay, s/veh	5.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	15	14	0	8	7
Future Vol, veh/h	0	15	14	0	8	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	15	0	9	8

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	16	0	38
Stage 1	-	-	-	-	8
Stage 2	-	-	-	-	30
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1602	-	974
Stage 1	-	-	-	-	1015
Stage 2	-	-	-	-	993
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1602	-	965
Mov Cap-2 Maneuver	-	-	-	-	965
Stage 1	-	-	-	-	1006
Stage 2	-	-	-	-	993

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1013	-	-	1602	-
HCM Lane V/C Ratio	0.016	-	-	0.009	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	1	6	0	2	1	22	10	4	42	9
Future Vol, veh/h	4	0	1	6	0	2	1	22	10	4	42	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	1	7	0	2	1	24	11	4	46	10

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	92	96	51	92	96	30	56	0	0	35	0	0
Stage 1	59	59	-	32	32	-	-	-	-	-	-	-
Stage 2	33	37	-	60	64	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	892	794	1017	892	794	1044	1549	-	-	1576	-	-
Stage 1	953	846	-	984	868	-	-	-	-	-	-	-
Stage 2	983	864	-	951	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	888	791	1017	888	791	1044	1549	-	-	1576	-	-
Mov Cap-2 Maneuver	888	791	-	888	791	-	-	-	-	-	-	-
Stage 1	952	843	-	983	867	-	-	-	-	-	-	-
Stage 2	980	863	-	947	839	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9		8.9		0.2		0.5	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1549	-	-	911	922	1576	-	-
HCM Lane V/C Ratio	0.001	-	-	0.006	0.009	0.003	-	-
HCM Control Delay (s)	7.3	0	-	9	8.9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	2	9	0	13	2	19	16	21	26	2
Future Vol, veh/h	1	0	2	9	0	13	2	19	16	21	26	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	2	10	0	14	2	21	17	23	28	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	116	117	29	110	110	30	30	0	0	38	0	0
Stage 1	75	75	-	34	34	-	-	-	-	-	-	-
Stage 2	41	42	-	76	76	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	861	773	1046	868	780	1044	1583	-	-	1572	-	-
Stage 1	934	833	-	982	867	-	-	-	-	-	-	-
Stage 2	974	860	-	933	832	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	839	761	1046	856	768	1044	1583	-	-	1572	-	-
Mov Cap-2 Maneuver	839	761	-	856	768	-	-	-	-	-	-	-
Stage 1	933	821	-	981	866	-	-	-	-	-	-	-
Stage 2	960	859	-	917	820	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	8.7		8.9		0.4		3.1	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1583	-	-	967	958	1572	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	0.025	0.015	-	-
HCM Control Delay (s)	7.3	0	-	8.7	8.9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

STERLING RANCH - VOLLMER ROAD (NORTH)

STA 4+79.21 - STA 38+35.40

COUNTY OF EL PASO, STATE OF COLORADO

STREET IMPROVEMENT PLANS

INCLUDING SIGNAGE AND STRIPING PLAN

JANUARY 2018

RECEIVED VERSION

JAN 04 2018

AGENCIES

OWNER/DEVELOPER: SR LAND, LLC
20 BOULDER CRESCENT, SUITE 201
COLORADO SPRINGS, CO 80903
JIM MORLEY (719) 471-1742

CIVIL ENGINEER: M & S CIVIL CONSULTANTS, INC.
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
VIRGIL A. SANCHEZ P.E. (719) 955-5485

COUNTY ENGINEERING: EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT
2880 INTERNATIONAL CIRCLE, SUITE 110
COLORADO SPRINGS, CO 80910
JEFF RICE, P.E. (719) 520-6300

TRAFFIC ENGINEERING: EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS
3275 AKERS DRIVE
COLORADO SPRINGS, CO 80922
JENNIFER IRVINE, P.E. (719) 520-6460

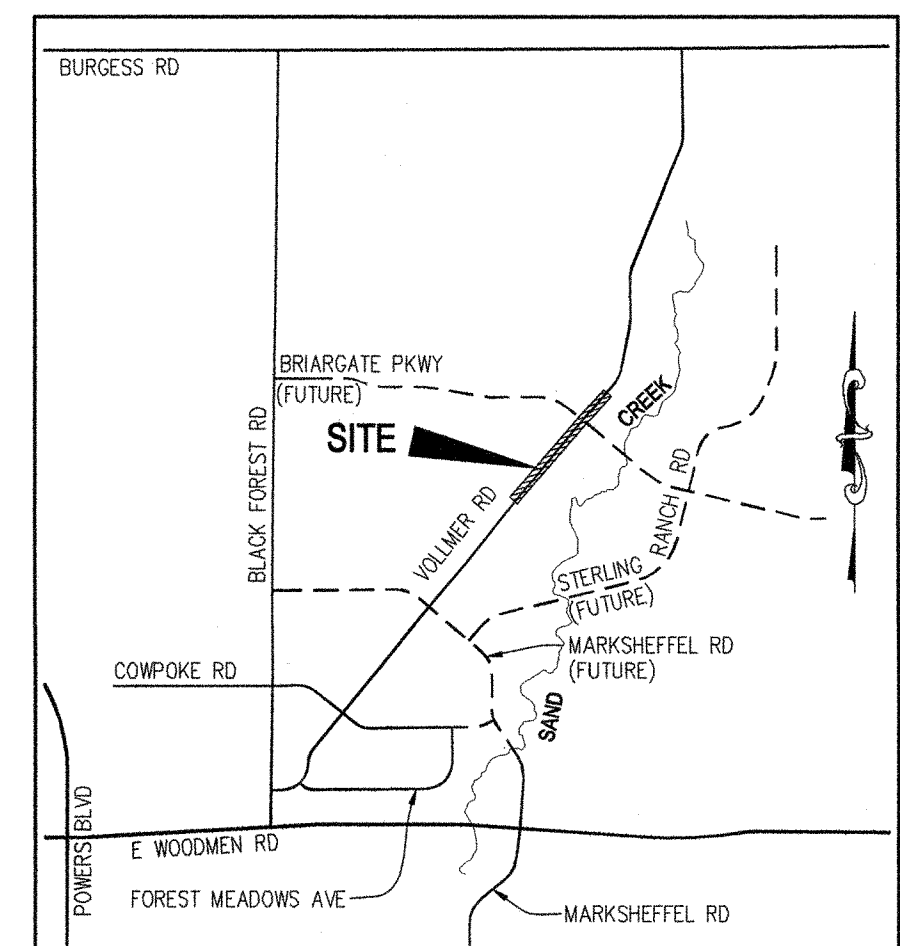
WATER RESOURCES: STERLING RANCH METRO DISTRICT ENGINEERS
JDS-HYDRO CONSULTANTS
545 E. PIKES PEAK AVE., SUITE 300
COLORADO SPRINGS, CO 80903
JOHN MCGINN (719) 668-8769

FIRE DISTRICT: BLACK FOREST FIRE PROTECTION DISTRICT
11445 TEACHOUT ROAD
COLORADO SPRINGS, CO 80908
CHIEF BRYAN JACK (719) 495-4300

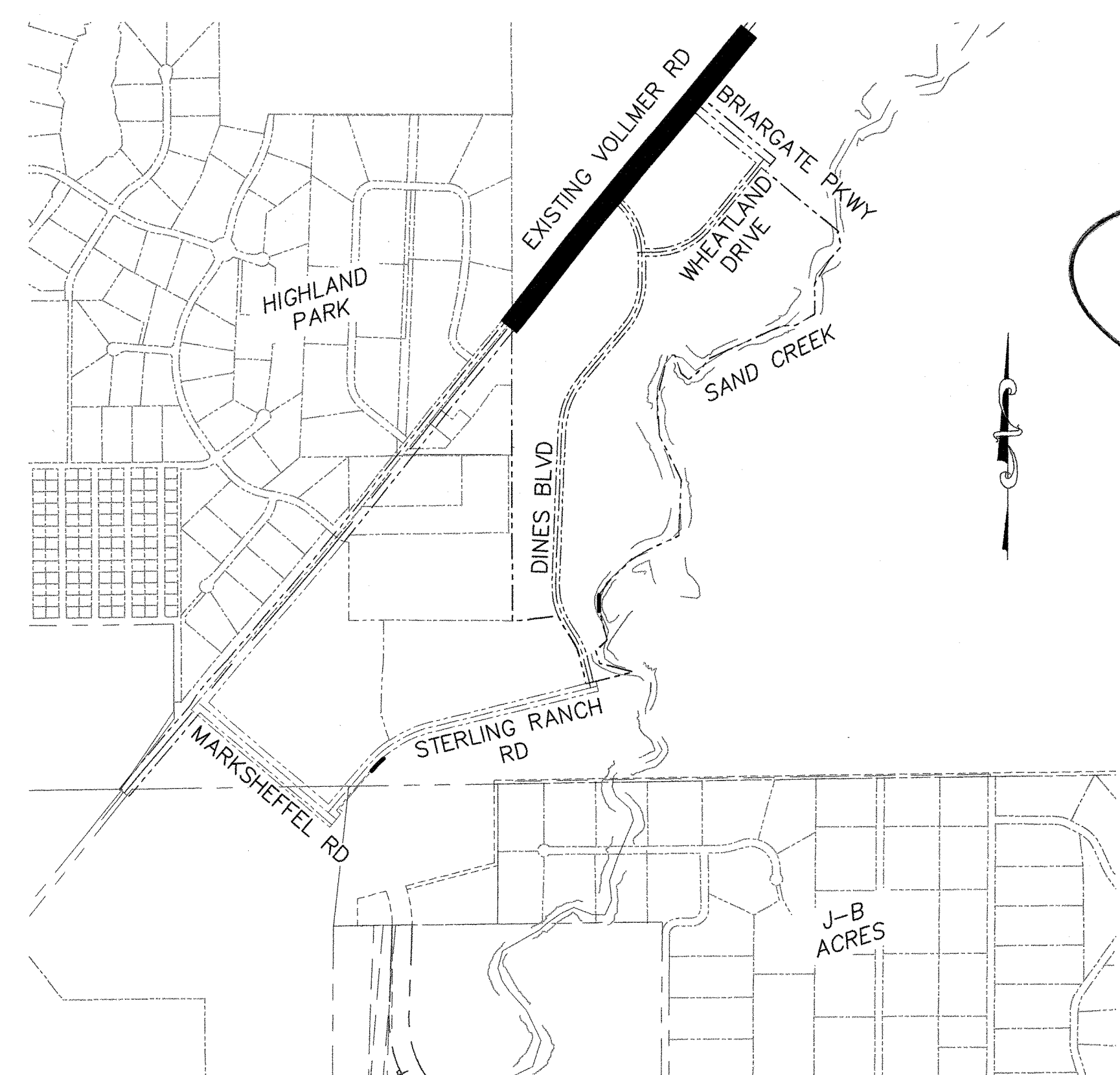
GAS DEPARTMENT: COLORADO SPRINGS UTILITIES
7710 DURANT DR.
COLORADO SPRINGS, CO 80947
TIM WENDT (719) 668-3556

ELECTRIC DEPARTMENT: MOUNTAIN VIEW ELECTRIC
11140 E. WOODMEN ROAD
FALCON, CO 80831
(719) 495-2283

COMMUNICATIONS: CENTURYLINK/COMCAST COMMUNICATIONS
(U.N.C.C. LOCATORS) (800) 922-1987
AT&T (LOCATORS) (719) 635-3674



VICINITY MAP
N.T.S.



SITE MAP
N.T.S.

BENCHMARKS:

- THE TOP OF AN ALUMINUM SURVEYORS CAP, STAMPED "9853", AT THE SOUTHEAST BOUNDARY CORNER OF BARBARICK SUBDIVISION
NORTHING = 411416.273
EASTING = 235167.071
ELEVATION = 7023.42
- THE TOP OF A RED PLASTIC SURVEYORS CAP, ILLEGIBLE, AT THE NORTHWEST BOUNDARY CORNER OF PANNEE RANCHEROS SUBDIVISION
NORTHING = 410095.404
EASTING = 235052.131
ELEVATION = 7000.40
- THE TOP OF A RED PLASTIC SURVEYORS CAP, STAMPED "38141", AT THE SOUTHWEST BOUNDARY CORNER OF BARBARICK SUBDIVISION
NORTHING = 411399.982
EASTING = 233849.817
ELEVATION = 7030.82

BASIS OF BEARINGS:

THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 34, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AS MONUMENTED AT THE SOUTHWEST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BY A 2-1/2" ALUMINUM CAP STAMPED "LS 11624" AND AT THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BY A 2-1/2" ALUMINUM CAP STAMPED "LS 11624", SAID LINE BEARS N 89°14'14" E, A DISTANCE OF 2,722.56 FEET.

ABBREVIATIONS

ACT	ACTUAL	FL	FLOW LINE	PT	POINT OF TANGENCY
BCR	BACK OF CURB RETURN	FT	FEET, FOOT	PROP	PROPOSED
BOV	BLOWOFF VALVE ASSEMBLY	FUT	FUTURE	REM	REMOVE
BRK	BREAK	GRD	GRADE	ROW	RIGHTS OF WAY
BT	BEGINNING OF TRANSITION	HRZ	HORIZONTAL	RSNTS	RESTRAINTS
CATV	CABLE TV	HPZ	HIGH POINT ELEVATION	RT	RIGHT
CL	CLASS, CENTERLINE	INT	INTERSECTION	SAN	SANITARY SEWER
CLR	CLEARANCE	LP	LOW POINT ELEVATION	SD	STANDARD DETAIL
CONST	CONSTRUCT	LT	LEFT	STM	STORM
CSU	COLORADO SPRINGS UTILITIES	LOC	LOCATION	COB	CORNER OF BOX
EOR	END CURB RETURN	MIN	MINIMUM	TELE	TELEPHONE
EL	ELEVATION	N.S.E.W	NORTH,SOUTH,EAST,WEST	TYP	TYPICAL
EOA	EDGE OF ASPHALT	NTS	NOT TO SCALE	UNK	UNKNOWN
EOP	END OF PAVEMENT	PCC	POINT OF COMPOUND CURVE	@	UNDERGROUND POWER
EPC	EL PASO COUNTY	PCR	POINT OF CURB RETURN	UTL	UTILITY
ESMT	EASMENT	PL	PROPERTY LINE	VERT	VERTICAL
ET	END TRANSITION	PRC	POINT OF REVERSE CURVE	WTR	WATER LINE
EX, EXIST	EXISTING	PUB	PUBLIC	XING	CROSSING
GB	GRADE BREAK	PVI	POINT OF VERTICAL INTERSECTION	YD	YARD (CUBIC)
		PVC	POINT OF VERTICAL CURVE		
		PVT	POINT OF VERTICAL TANGENT		

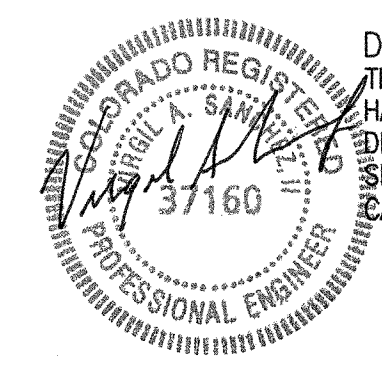
LEGEND

	PROPOSED GAS		PROPOSED SANITARY SEWER
	PROPOSED WATER		RIGHT-OF-WAY
	PROPERTY LINE		CENTERLINE
	FIRE HYDRANT (EXISTING)		FIRE HYDRANT (PROPOSED)
	STORM DRAIN		VALVE (PROPOSED)
	VALVE (EXISTING)		BLOWOFF ASSY. (PROPOSED)
	BLOWOFF ASSY. (EXISTING)		PLUG (PROPOSED)
	PLUG (EXISTING)		

APPROVALS:

ENGINEER'S STATEMENT:

DETAILED IMPROVEMENT PLANS AND SPECIFICATIONS ENGINEER'S STATEMENT: THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID DETAILED PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED DRAINAGE PLANS AND SPECIFICATIONS, AND SAID DETAILED PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH THE MASTER PLAN OF THE DRAINAGE BASIN. SAID DETAILED DRAINAGE PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR DRAINAGE FACILITY(S) IS DESIGNED. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS, OR OMISSIONS ON MY PART IN PREPARATION OF THE DETAILED IMPROVEMENT PLANS AND SPECIFICATIONS.



VIRGIL A SANCHEZ, COLORADO P.E. NO. 37160
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.
DATE: 1-4-18

OWNER/DEVELOPER STATEMENT:

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

Jim Morley
SR LAND, LLC
DATE: 1-4-18

EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

Jennifer Irvine
JENNIFER IRVINE, P.E.
COUNTY ENGINEER/ECM ADMINISTRATOR
DATE: 30 JAN 18

STERLING RANCH METROPOLITAN DISTRICT:

THESE DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR STORM DRAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION.

Virgil Sanchez
FOR AND ON BEHALF OF THE STERLING RANCH METRO. DISTRICT
DATE: 1-4-18

SHEET INDEX

SHEET 1	TITLE SHEET
SHEET 2	NOTES & DETAILS SHEET
SHEET 3	PLAN & PROFILE - STA 4+79.21 - STA 14+50
SHEET 4	PLAN & PROFILE - STA 14+50 - STA 25+00
SHEET 5	PLAN & PROFILE - STA 25+00 - STA 38+35.40
SHEET 6	SIGNAGE & STRIPING
SHEET 7	SIGNAGE & STRIPING



STERLING RANCH - VOLLMER ROAD (NORTH)

PROJECT NO. 09-002

DATE: 01/03/2018

SCALE: HORIZONTAL: N/A VERTICAL: N/A

DESIGNED BY: VAS

DRAWN BY: ELY

CHECKED BY: GW

SHEET 1 OF 7

S101

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.4485

M&S CIVIL CONSULTANTS, INC.

VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

REVISIONS:

NO.	DATE	BY	DESCRIPTION

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION

GENERAL CONSTRUCTION NOTES:

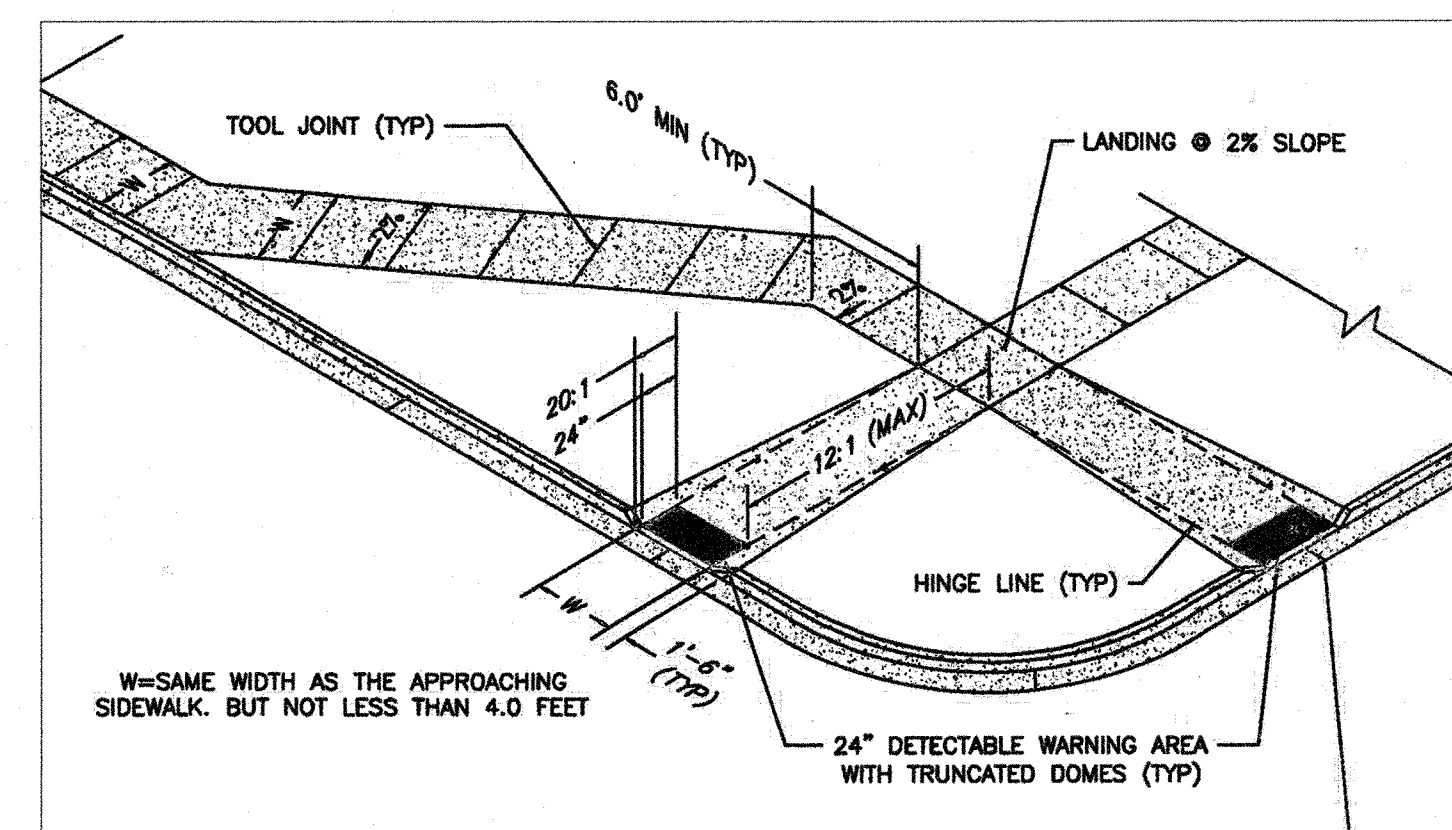
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
- THE CONTRACTOR WILL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE, AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
- ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
- ALL BACKFILL, SUB-BASE, AND/OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED PER THE SOILS ENGINEER'S RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DIVISION.
- ALL STATIONING IS CENTERLINE OF IMPROVEMENTS UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE INDICATED AS TOP BACK OF CURB (TBC), ASPHALT (ASP), OR TOP OF INLET OR BOX (TOB).
- ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO EPC ECM APPENDIX K - 1.2C.
- ALL INTERSECTION ACCESSES TO BE CONSTRUCTED WITH A 25 FOOT SIGHT VISIBILITY TRIANGLES EXCEPT BRAIRGATE PARKWAY AND VOLLMER ROAD WHICH ARE ARTERIALS AND A 50 FOOT SIGHT VISIBILITY TRIANGLE IS REQUIRED AND THERE SHALL BE NO OBSTRUCTIONS GREATER THAN 18" VERTICAL IN THIS AREA.
- ALL CULVERTS AND STORM DRAIN PIPES SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE (HDPE), REINFORCED CONCRETE PIPE (RCP). ALL CULVERTS SHALL BE PLACED COMPLETE WITH FLARED END SECTIONS. ADEQUACY OF MATERIAL THICKNESS FOR ANY CSP INSTALLED SHALL BE VERIFIED BY OWNER'S GEOTECHNICAL ENGINEER TO SUPPORT MINIMUM 50 YEAR DESIGN LIFE. CULVERTS MUST CONFORM TO EPC ECM SECTION 3.32 - CULVERTS.
- ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED) FOR ROADS SHALL BE PER DESIGN REPORT BY OWNER'S GEOTECHNICAL ENGINEER. OWNER'S GEOTECHNICAL ENGINEER TO BE ON SITE AT THE TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DIVISION PRIOR TO CONSTRUCTION.

SIGNING AND STRIPING NOTES:

- ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
- ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DIVISION.
- ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
- STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
- ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
- ALL STREET NAME SIGNS SHALL HAVE "D" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4" UPPER-LOWER CASE LETTERING ON 8" BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6" LETTERING, UPPER-LOWER CASE ON 12" BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8" UPPER-LOWER CASE LETTERING ON 18" BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
- ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
- ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75" X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
- ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100" MINIMUM THICKNESS.
- ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24" IN WIDTH. CROSSWALKS LINES SHALL BE 12" WIDE AND 8" LONG PER CDOT S-627-1.
- ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
- THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
- THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS PRIOR TO ANY WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY, INCLUDING SIGNAGE OR STRIPING.

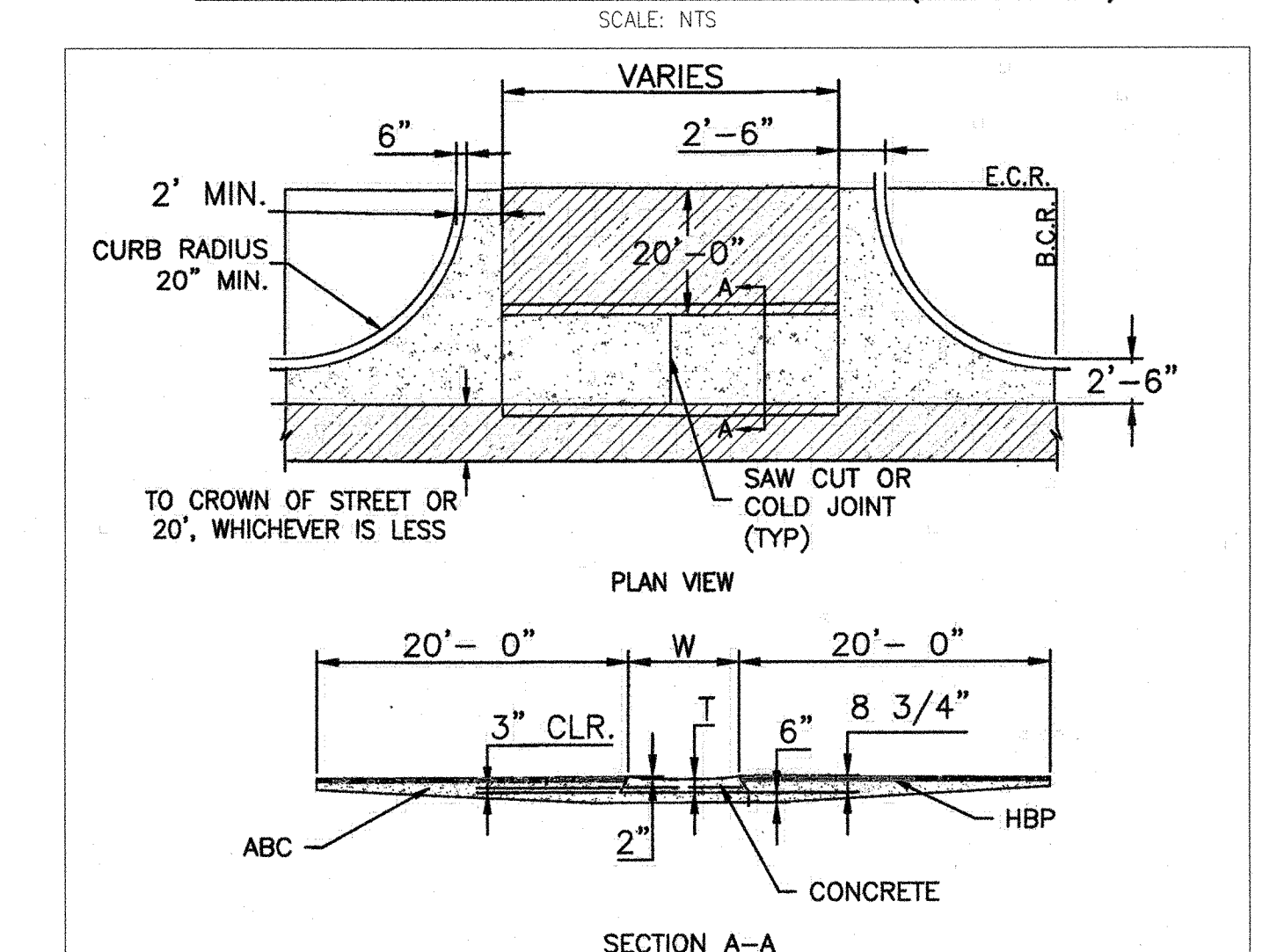
STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

- ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
- CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
 - EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
 - CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
 - COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
 - CDOT M & S STANDARDS
- NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
- IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
- CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT - INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
- CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND DEPARTMENT OF PUBLIC WORKS. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
- ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
- ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
- SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES VERTICAL ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
- SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA.
- CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DEPARTMENT PUBLIC WORKS, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
- THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.



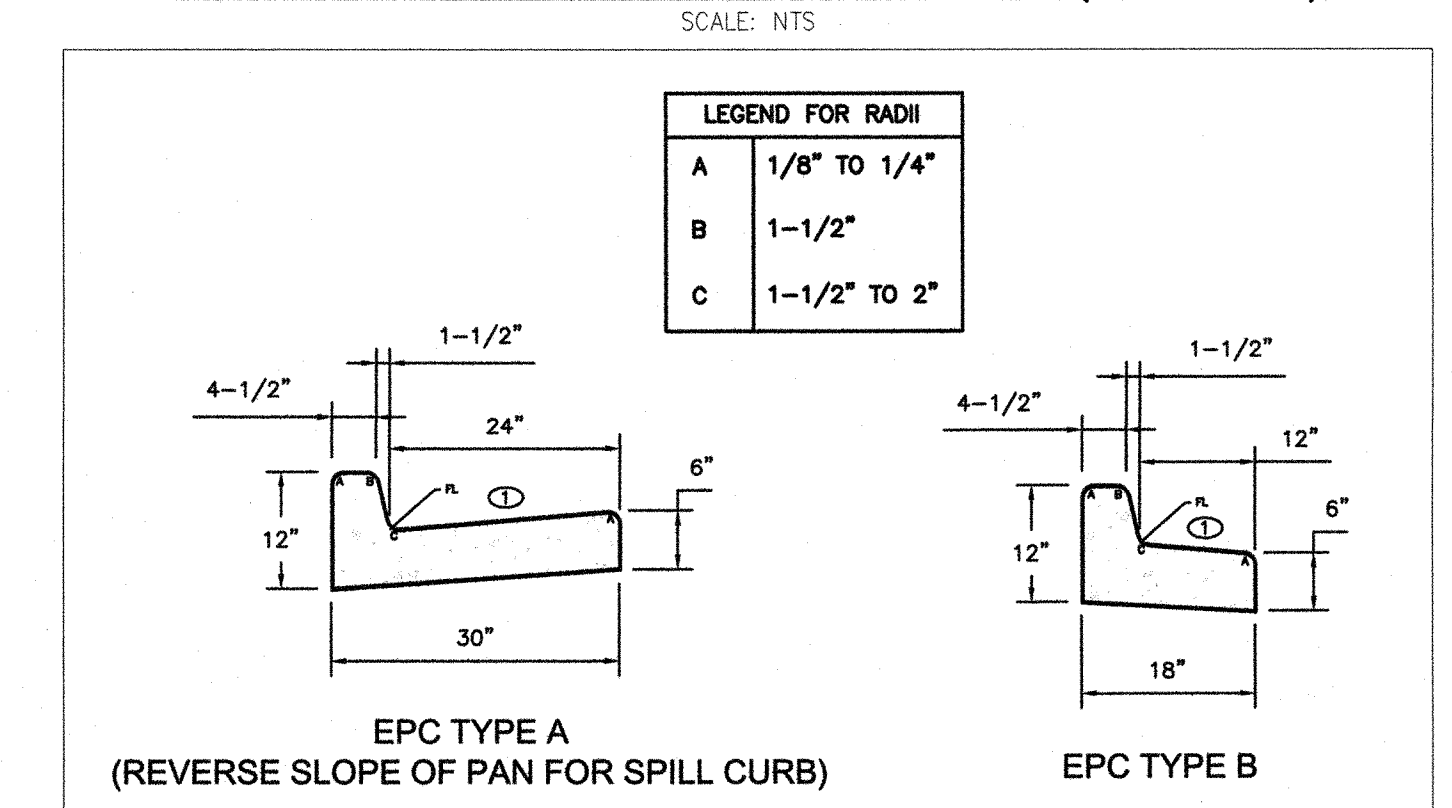
- PEDESTRIAN RAMP NOTES**
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT ENGINEERING CRITERIA MANUAL AND ADA REQUIREMENTS.
 - CONTRACTOR TO NOTIFY ENGINEERING DIVISION INSPECTION STAFF 48 HOURS PRIOR TO CONCRETE PLACEMENT.
 - PEDESTRIAN RAMP CONSTRUCTION SHALL BE A MINIMUM 4,500 PSI CONCRETE, MINIMUM 4" THICK, NON-COLORED, NON-SOURED, COARSE BROOM FINISH.
 - RAMP LOCATION AND LENGTH MAY REQUIRE MODIFICATION TO MAINTAIN THE 1:21 MAXIMUM RUNNING RAMP SLOPE AND 20:1 DETECTABLE WARNING AREA DUE TO STREET INTERSECTION GRADES AND/OR ADJUSTMENTS.
 - DETECTABLE WARNING AREA SHALL START A MINIMUM OF 8" BUT NOT MORE THAN 8" FROM THE FLOWLINE OF THE CURB AT ANY POINT.
 - DETECTABLE WARNING AREA SHALL BE PREFABRICATED, REDDISH INTERNALLY COLORED, TRUNCATED-DOME, FRAGERS, THERMOPLASTIC TRUNCATED DOMES WILL NOT BE ACCEPTED.
 - THE DETECTABLE WARNING AREA SHALL BE 24" IN LENGTH AND THE FULL WIDTH OF THE RAMP.
 - RAMP WIDTH REQUIRED IS SAME AS APPROACHING SIDEWALK, 4" MINIMUM.
 - ALL RAMP SHALL BE PERPENDICULAR TO TRAFFIC WITH THE EXCEPTION OF HIGH-BLOCK OR TERNAL RAMP WHICH MAY BE PARALLEL, SUBJECT TO APPROVAL.
 - AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL/SIGNAGE, UTILITIES/JUNCTION BOXES, OR OTHER OBSTRUCTIONS WITHIN PROPOSED RAMP AREA.
- LAYOUT CURB SECTIONS SO THAT AT LEAST ONE TOOL JOINT IS WITHIN RAMP THROAT**
- GENERAL NOTES**
- WHERE THE 1"-6" FLARED SIDE(S) OF A PERPENDICULAR CURB RAMP IS (ARE) CONTIGUOUS WITH A PEDESTRIAN OR HARD SURFACE AREA, THE MAXIMUM FLARE SLOPE SHALL NOT EXCEED 1:6:1.
 - PEDESTRIAN WALKWAY AND/OR LOCATION OF EXISTING OR FUTURE PEDESTRIAN RAMPS ON OPPOSITE CORNERS SHALL BE REVIEWED BEFORE CONSTRUCTING NEW RAMPS.
 - AT MARKED PEDESTRIAN CROSSINGS, THE BOTTOM OF THE RAMPS, EXCLUSIVE OF THE FLARE SIDES, SHALL BE TOTALLY CONTAINED WITHIN THE MARKINGS.

PEDESTRIAN INTERSECTION RAMP (SD 2-41)

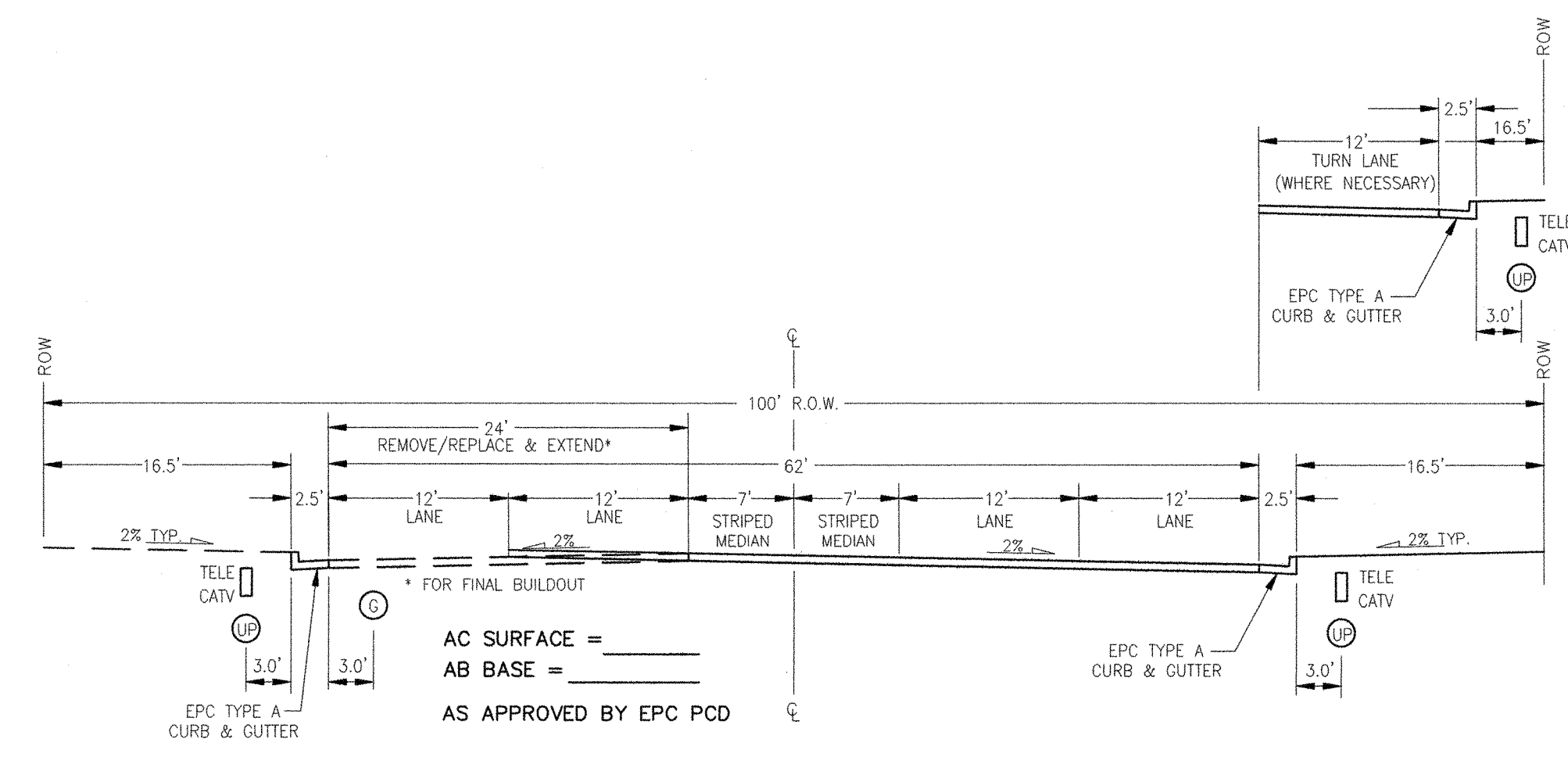


- NOTES**
- W - WIDTH SHALL BE 6' FOR LOCAL, 8' FOR COLLECTORS, AND 10' FOR ARTERIAL ROADS.
 - T - SQUARED-OFF RETURN TO BE POURED MONOLITHICALLY, 8" PCC FOR LOCAL ROADS, 9" FOR COLLECTORS WITH 6x6 - 4.4 W.W.F. OR #4 REINFORCING BAR @ 18" EACH WAY.
 - 3" = 3" MINIMUM ASPHALT DEPTH (2 LIFTS).
 - DESIGN TO SPECIFY ELEVATIONS AT PI AND PCR.

TYPICAL CROSS PAN LAYOUT DETAIL (SD 2-26)



TYPICAL CURB & GUTTER DETAILS DETAIL (SD 2-20)



ULTIMATE VOLLMER ROAD (MODIFIED) URBAN MINOR ARTERIAL CROSS SECTION

SCALE: NTS
DESIGN SPEED = 50 MPH
POSTED SPEED = 45 MPH

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FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION 48 HRS BEFORE YOU DIG CALL 1-800-922-1987

STERLING RANCH - VOLLMER ROAD (NORTH)

NOTES & DETAILS SHEET

PROJECT NO. 09-002 DATE: 01/03/2018

SCALE: HORIZONTAL: N/A VERTICAL: N/A

DESIGNED BY: VAS DRAWN BY: ELY CHECKED BY: GW

20 BOULDER CRESCENT, SUITE 110 COLORADO SPRINGS, CO 80903 PHONE: 719.555.5485

CIVIL CONSULTANTS, INC.

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

MIRCEL A. SANCHEZ, COLORADO P.E. NO. 37160

REVISIONS:


NO.	DATE	BY	DESCRIPTION

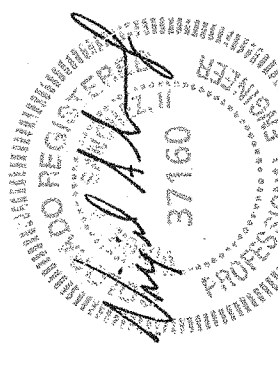
THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
**FOR BURIED UTILITY INFORMATION
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 CALL 1-800-922-1987**

STERLING RANCH - VOLLMER ROAD (NORTH)
P&P - STA 4+79.21 TO STA 14+50.00
 PROJECT NO. 09-002 DATE: 01/03/2018
 SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=5'
 DESIGNED BY: WAS
 DRAWN BY: ELY
 CHECKED BY: GW
SHEET 3 OF 7
S103

20 BOULDER CRESCENT, SUITE 110
 COLORADO SPRINGS, CO 80903
 PHONE: 719.555.5465

M&S CIVIL CONSULTANTS, INC.

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

 VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160
 PROFESSIONAL ENGINEER

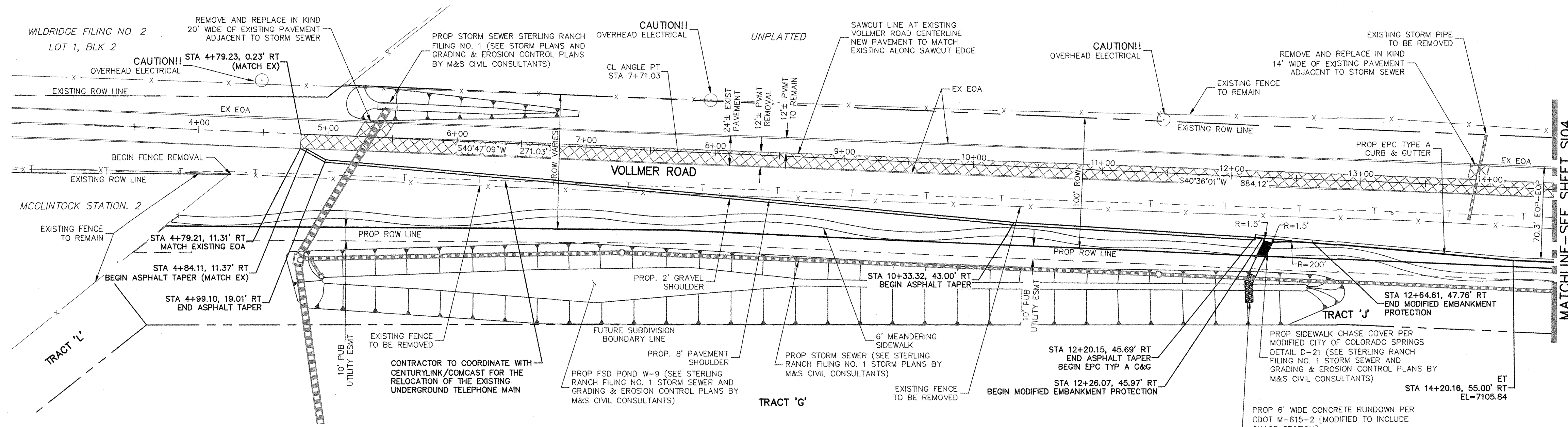
REVISIONS:

NO.	DATE	BY	DESCRIPTION

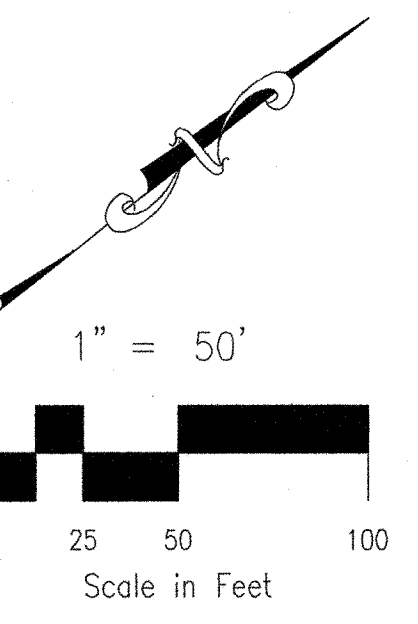
APPROV'D. BY: _____ DATE: _____

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CAUTION

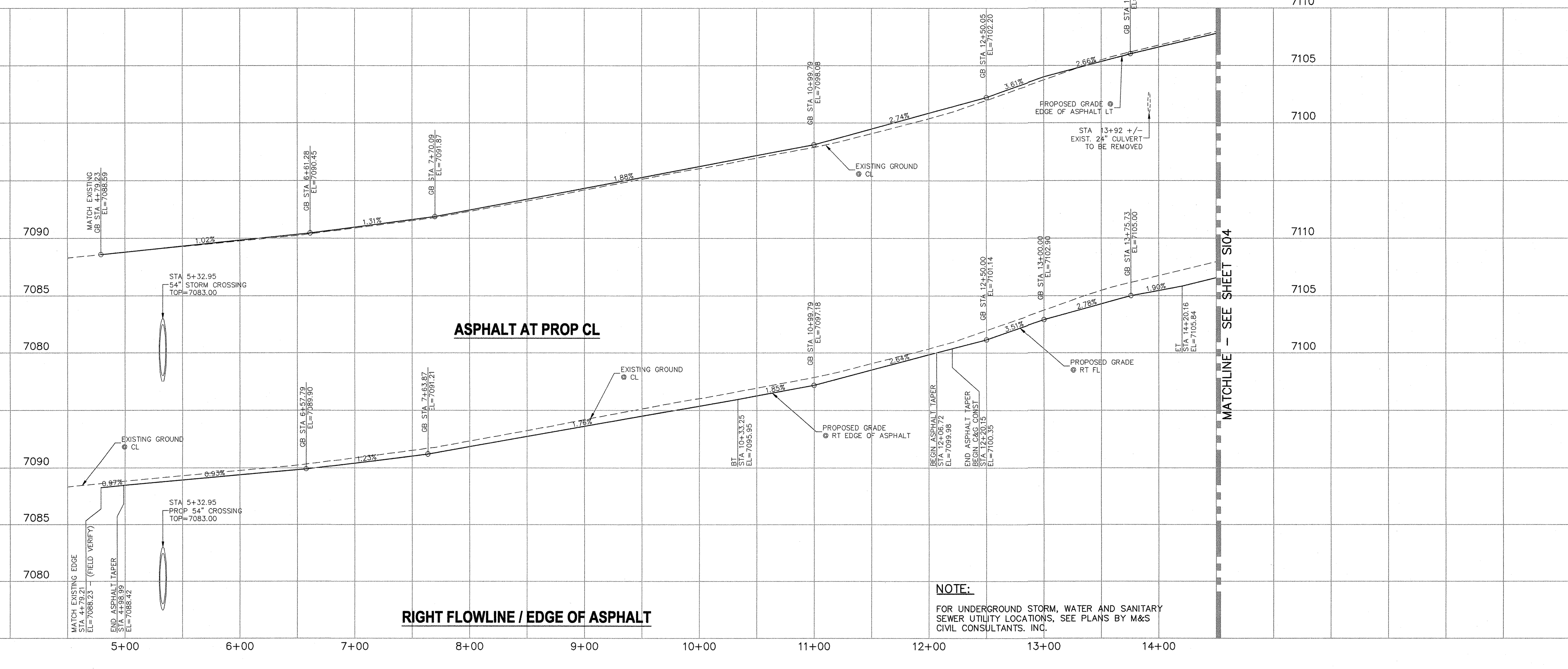
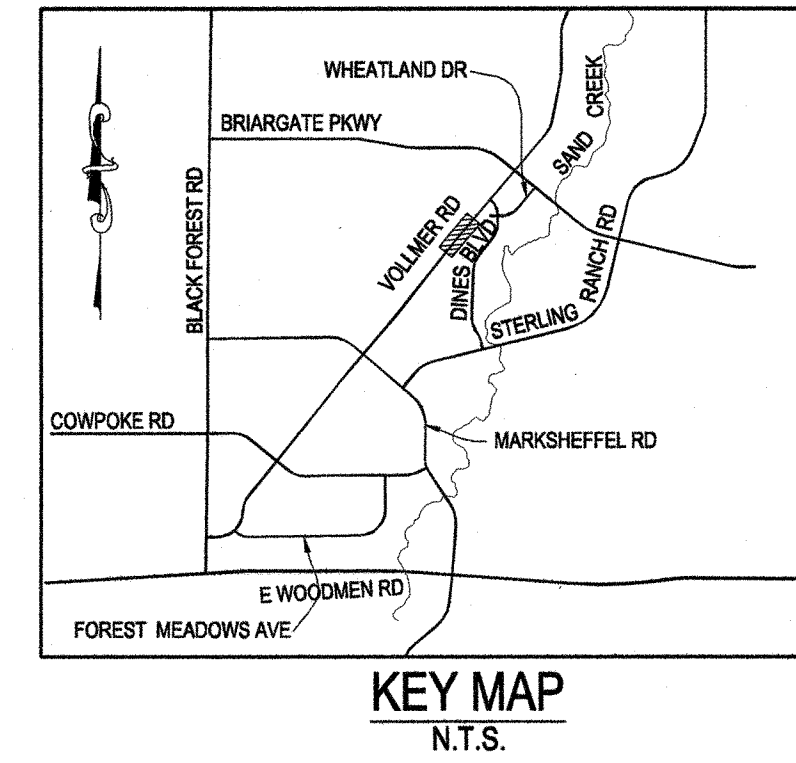


VOLLMER ROAD

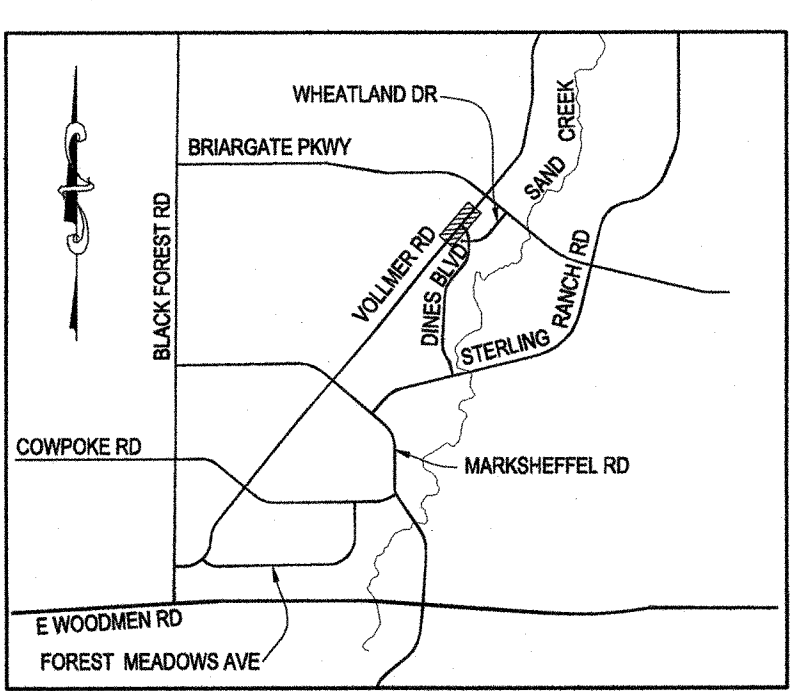
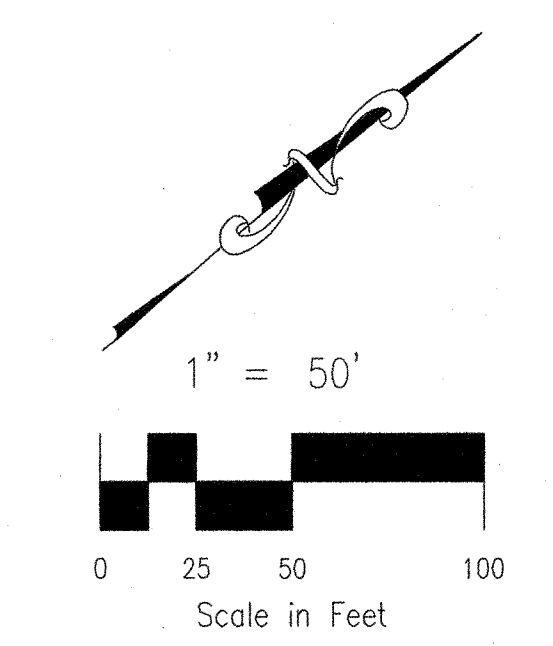
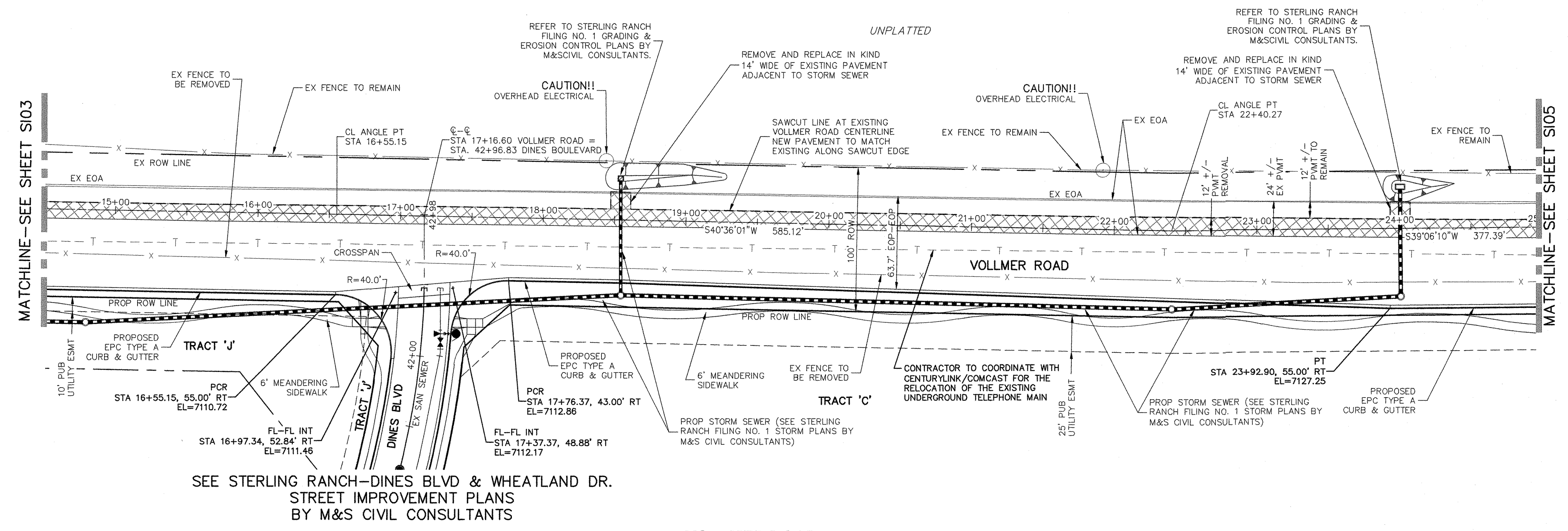


EX ASPHALT TO BE REMOVED

NOTE:
 CONTRACTOR TO VERIFY ALL UNDERGROUND UTILITIES LOCATION AND ELEVATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

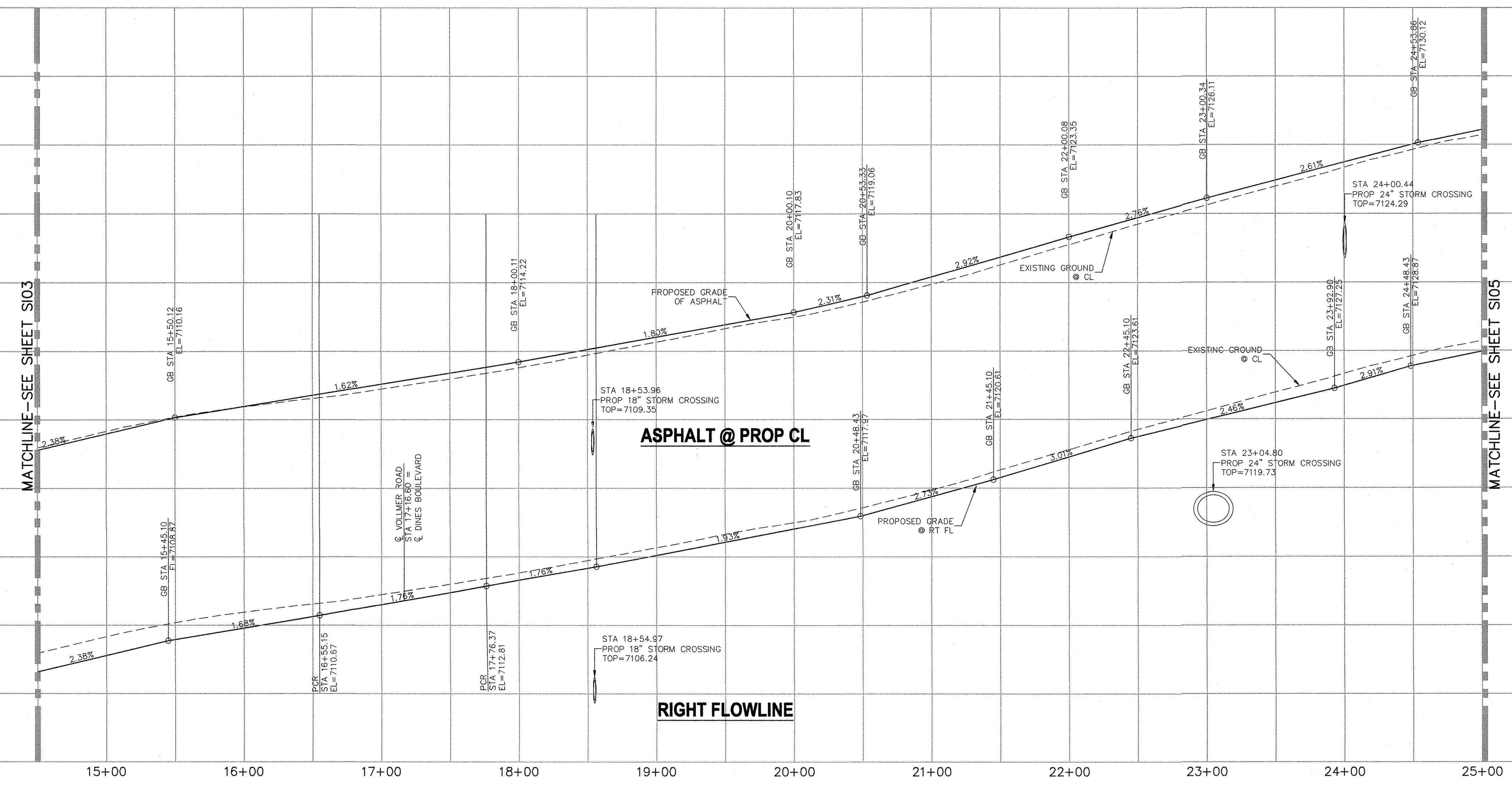


FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
 FOR BURIED UTILITY INFORMATION
 48 HRS BEFORE YOU DIG
 CALL 1-800-922-1987



KEY MAP
N.T.S.

NOTE:
 CONTRACTOR TO VERIFY ALL UNDERGROUND UTILITIES LOCATION AND ELEVATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.



NOTE:
 FOR UNDERGROUND STORM, WATER AND SANITARY SEWER UTILITY LOCATIONS, SEE PLANS BY M&S CIVIL CONSULTANTS, INC.

STERLING RANCH - VOLLMER ROAD (NORTH)
 P&P - STA 14+50 TO STA 25+00
 PROJECT NO. 09-002
 DATE: 01/03/2018
 SCALE: 1"=50'
 HORIZONTAL: 1"=50'
 VERTICAL: 1"=5'
 DESIGNED BY: VAS
 DRAWN BY: ELY
 CHECKED BY: GW
 SHEET 4 OF 7
 S104

20 BOULDER CRESCENT, SUITE 110
 COLORADO SPRINGS, CO 80903
 PHONE 719.555.5485

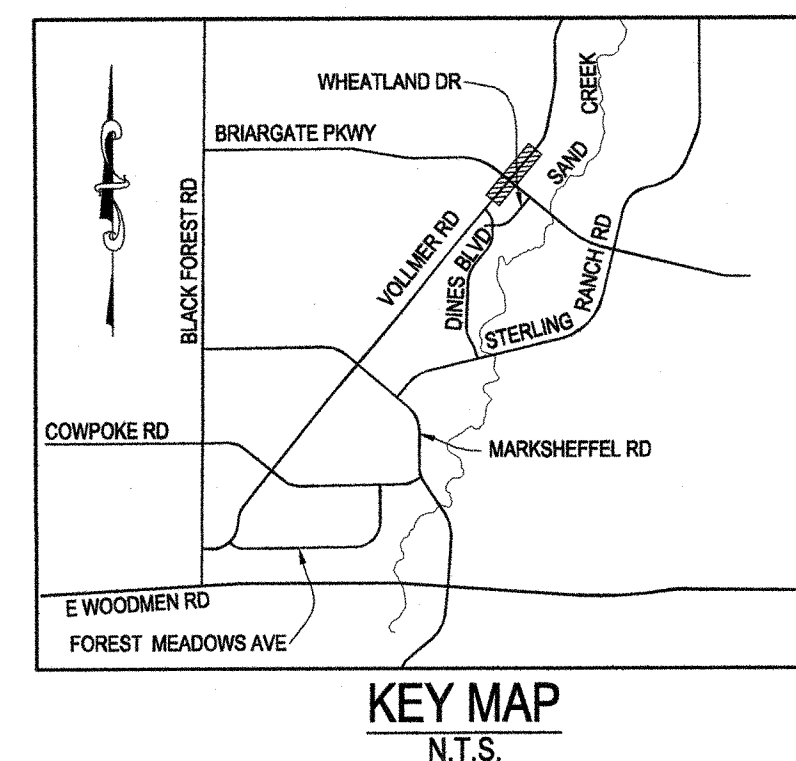
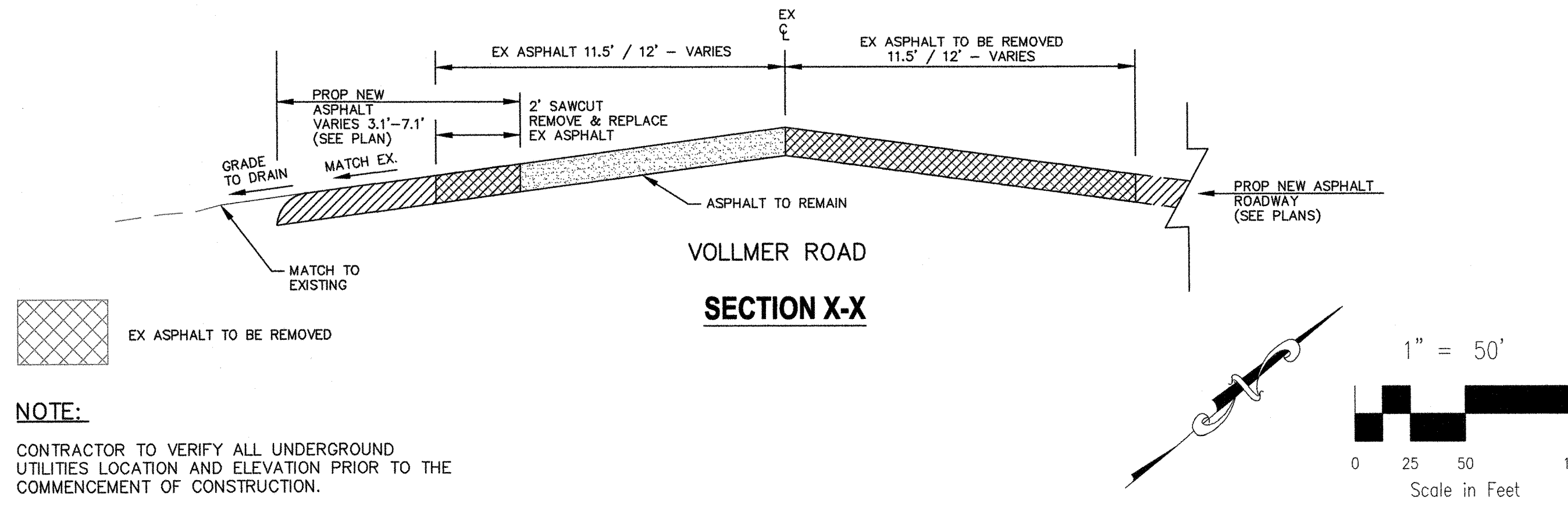
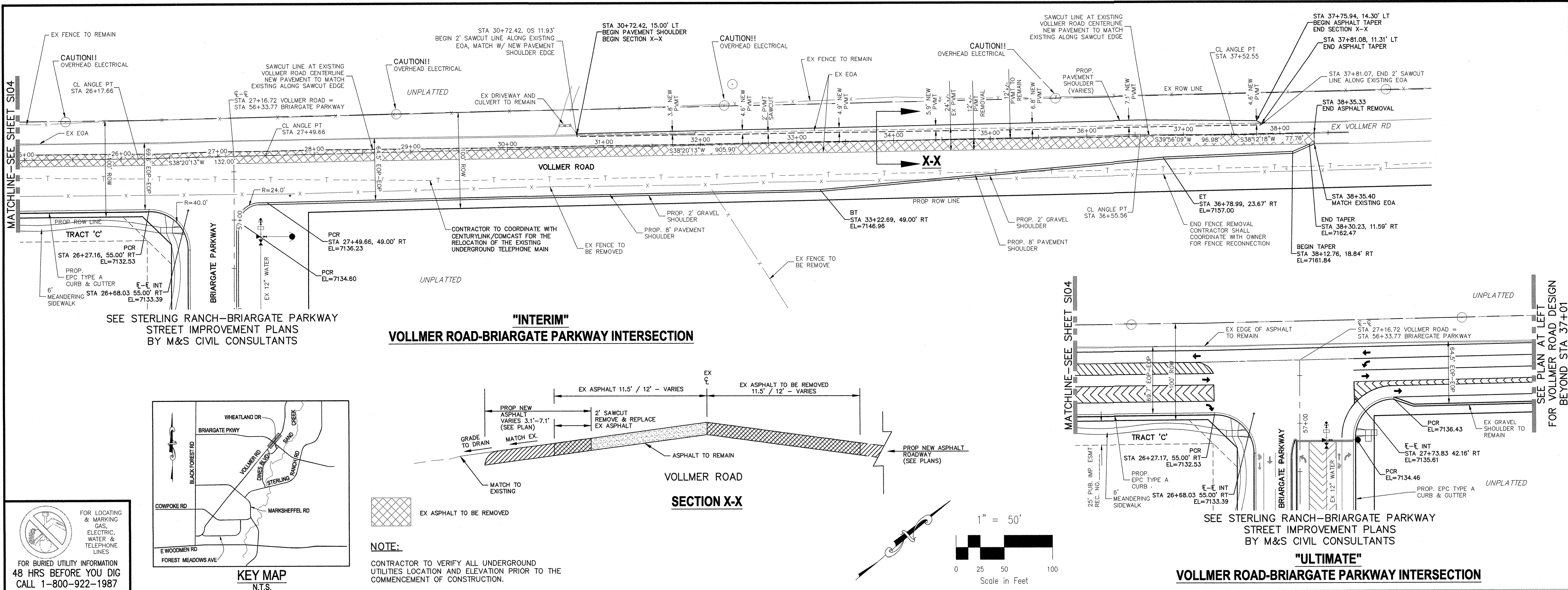
M&S CIVIL CONSULTANTS, INC.

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

Virgil A. Sanchez

NO.	DATE	BY	DESCRIPTION

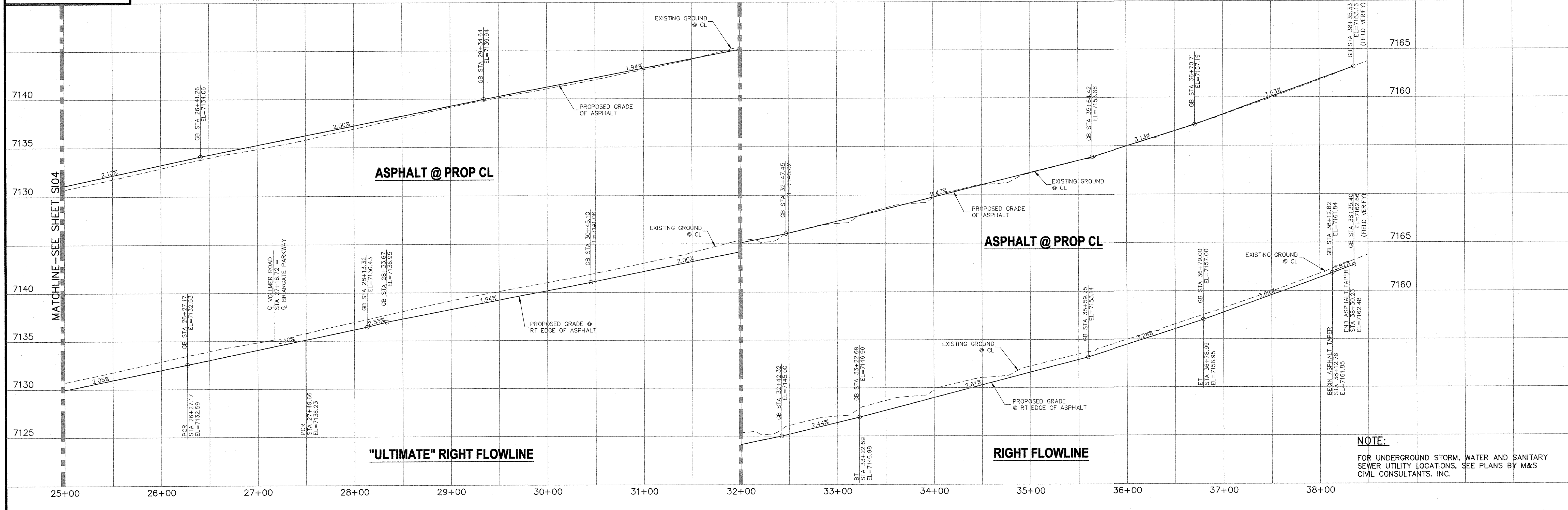
CAUTION



FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION 48 HRS BEFORE YOU DIG CALL 1-800-922-1987

NOTE:
CONTRACTOR TO VERIFY ALL UNDERGROUND UTILITIES LOCATION AND ELEVATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.



STERLING RANCH - VOLLMER ROAD (NORTH)

STREET IMPROVEMENT PLANS

PROJECT NO. 09-002 DATE: 01/03/2018

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=5'

DESIGNED BY: VAS DRAWN BY: ELY CHECKED BY: GW

SHEET 5 OF 7 S105

20 BOULDER CIRCUIT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

M&S CIVIL CONSULTANTS, INC.

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC.

PROFESSIONAL SEAL: VIRGIL A. SANCHEZ, COLORADO P.E. NO. 37160

APPROVED BY: DATE:

REVISIONS: NO. DATE: BY: DESCRIPTION:

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION

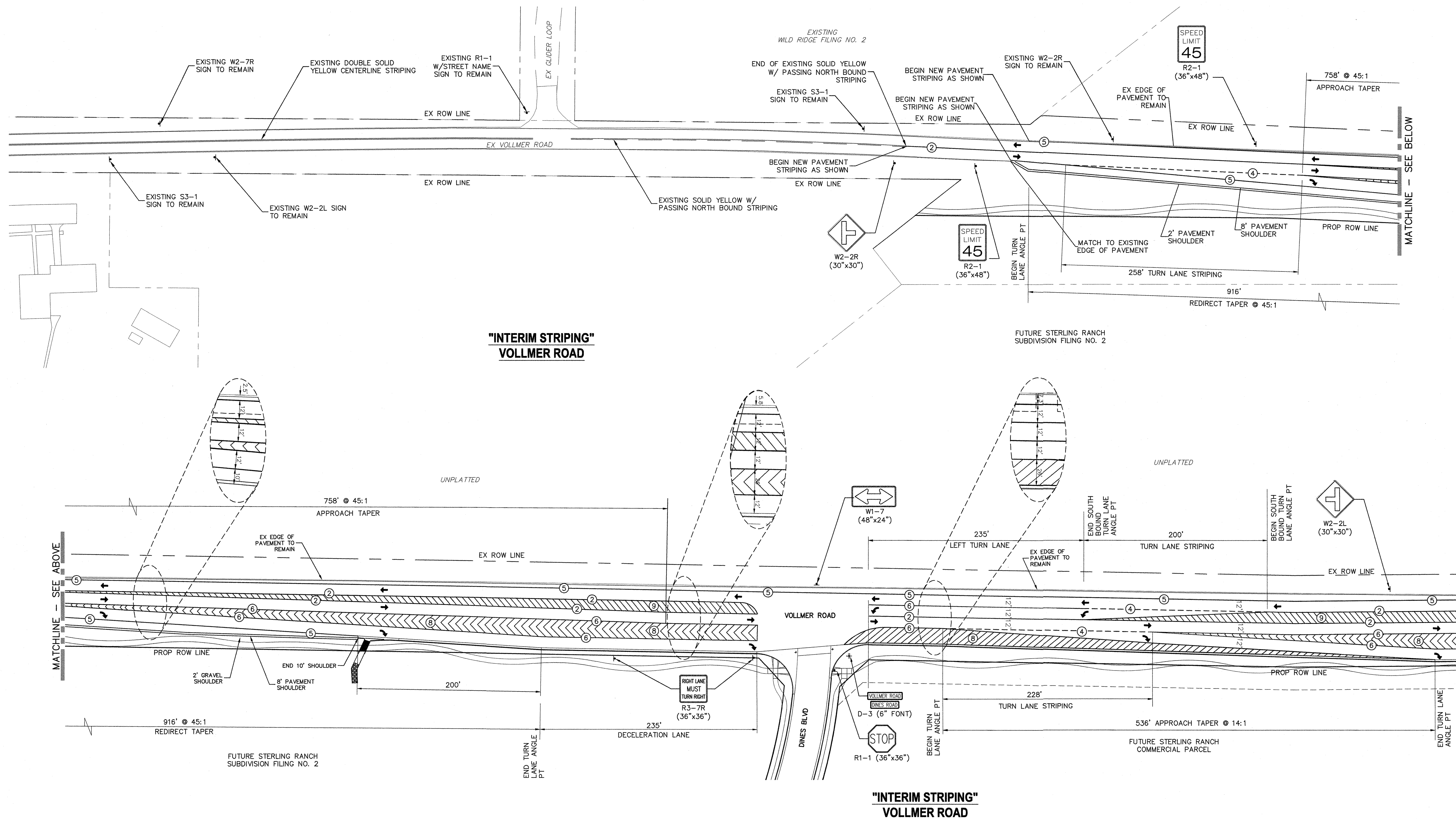
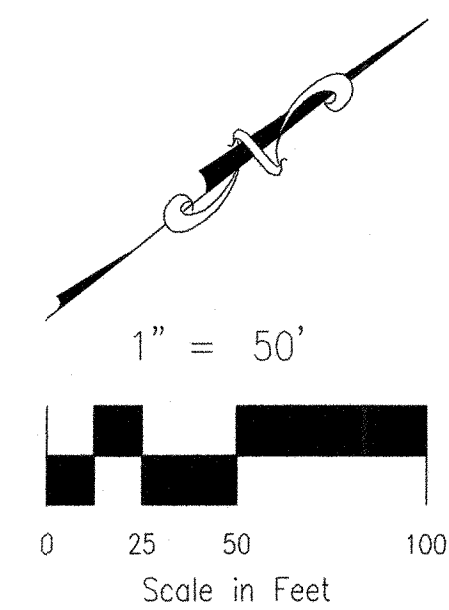
STRIPE	PAVEMENT MARKINGS	MARKING DESCRIPTION
1	2-WAY LEFT TURN LANE MARKINGS (EPOXY)	OUTSIDE: SOLID YELLOW, 4" WIDE, INSIDE: BROKEN YELLOW, 4" WIDE, 10' SEGMENTS WITH 30" GAPS
2	2-WAY CENTERLINE LANE MARKINGS (EPOXY)	PARALLEL SOLID YELLOW, 4" WIDE, 12" APART
3	LANE LINES (EPOXY)	BROKEN YELLOW, 4" WIDE, 10' SEGMENTS WITH 30" GAPS
4	BROKEN EDGE/BIKE LANE LINES (EPOXY)	BROKEN WHITE, 4" WIDE, 5' SEGMENTS WITH 15" GAPS
5	EDGE/BIKE LANE LINES (EPOXY)	SOLID WHITE, 4" WIDE
6	CHANNELIZING LINES (EPOXY)	SOLID WHITE, 8" WIDE
7	STOP LINES (THERMO PLASTIC)	SOLID WHITE, 24" WIDE
8	CROSS HATCHING LINES (EPOXY)	SOLID WHITE, 8" WIDE
9	CROSS HATCHING LINES (EPOXY)	SOLID YELLOW, 8" WIDE

NOTE TO CONTRACTOR:

- ALL 4" AND 8" SOLID OR SKIP PAVEMENT MARKINGS ARE TO BE EPOXY.
- SIGNS AND POLES SHALL BE PER CDOT STANDARDS S-614-8, S-1614-2, AND S-614-3, LATEST REVISION.
- ALL SIGNAGE INSTALLATION IS TO BE IN COMPLIANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

NOTE: ALL STRIPING INSTALLATION SHALL BE PER COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) "M&S STANDARDS" STANDARD PLAN NO. S-627-1.

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
 FOR BURIED UTILITY INFORMATION
 48 HRS BEFORE YOU DIG
 CALL 1-800-922-1987



STERLING RANCH - VOLLMER ROAD (NORTH)

SIGNAGE AND STRIPING PLAN

PROJECT NO. 09-002 DATE: 01/03/2018
 SCALE: HORIZONTAL: 1"=50' VERTICAL: N/A
 DESIGNED BY: WAS CHECKED BY: GW
 DRAWN BY:

20 BOULDER CRESCENT, SUITE 110
 COLORADO SPRINGS, CO 80903
 PHONE: 719.555.5465

M&S

CIVIL CONSULTANTS, INC.

FOR AND ON BEHALF OF
 M&S CIVIL CONSULTANTS, INC.

MARCIL A. SANCHEZ, COLORADO P.E. NO. 37160

NO.	DATE	DESCRIPTION	APPROVED BY	DATE

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CAUTION

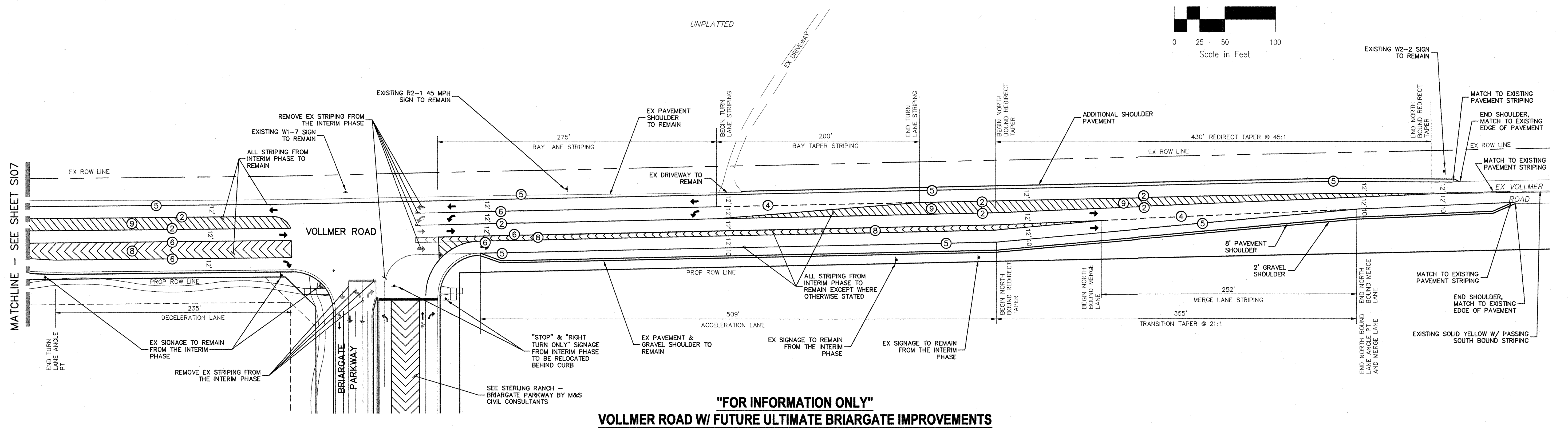
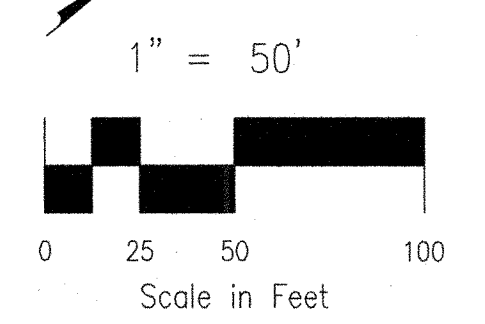
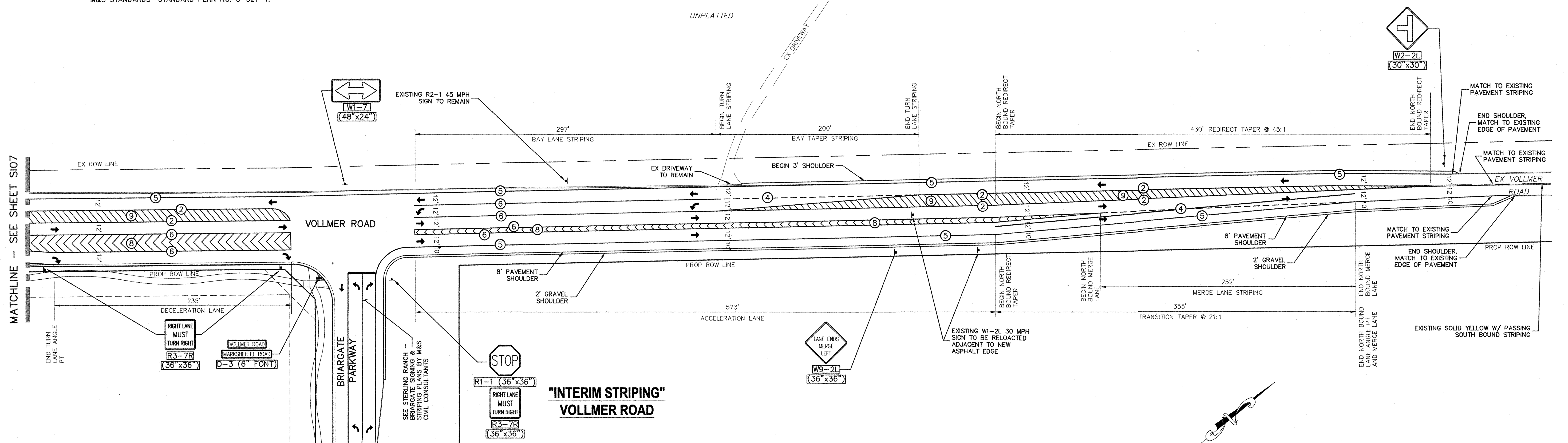
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STRIPING LEGEND		
STRIPE	PAVEMENT MARKINGS	MARKING DESCRIPTION
1	2-WAY LEFT TURN LANE MARKINGS (EPOXY)	OUTSIDE: SOLID YELLOW, 4" WIDE, INSIDE: BROKEN YELLOW, 4" WIDE, 10' SEGMENTS WITH 30" GAPS
2	2-WAY CENTERLINE LANE MARKINGS (EPOXY)	PARALLEL SOLID YELLOW, 4" WIDE, 12" APART
3	LANE LANES (EPOXY)	BROKEN WHITE, 4" WIDE, 10' SEGMENTS WITH 30" GAPS
4	BROKEN EDGE/BIKE LANE LINES (EPOXY)	BROKEN WHITE, 4" WIDE, 5' SEGMENTS WITH 15" GAPS
5	EDGE/BIKE LANE LINES (EPOXY)	SOLID WHITE, 4" WIDE
6	CHANNELIZING LINES (EPOXY)	SOLID WHITE, 8" WIDE
7	STOP LINES (THERMO PLASTIC)	SOLID WHITE, 24" WIDE
8	CROSS HATCHING LINES (EPOXY)	SOLID WHITE, 8" WIDE
9	CROSS HATCHING LINES (EPOXY)	SOLID YELLOW, 8" WIDE

NOTE: ALL STRIPING INSTALLATION SHALL BE PER COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) "M&S STANDARDS" STANDARD PLAN NO. S-627-1.

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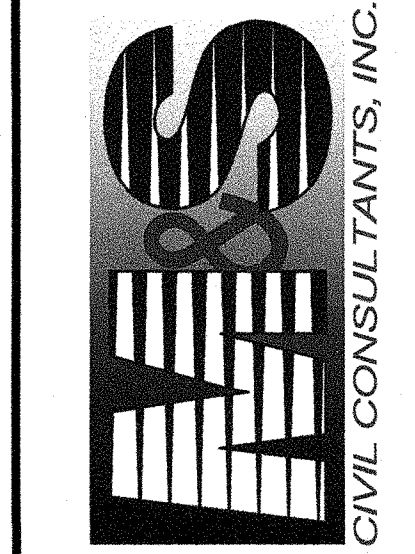
STERLING RANCH - VOLLMER ROAD (NORTH)
 SIGNAGE AND STRIPING PLAN
 PROJECT NO. 09-002
 SCALE: HORIZONTAL: 1"=50' VERTICAL: N/A
 DESIGNED BY: WAS
 DRAWN BY: ELY
 CHECKED BY: GW
 DATE: 01/03/2018
 SHEET 7 OF 7
 S107



"FOR INFORMATION ONLY"
VOLLMER ROAD W/ FUTURE ULTIMATE BRIARGATE IMPROVEMENTS

File: 0:\09002A\Strling Ranch District\Map\Const_Dwg\Street\Vollmer RA\S107.dwg PlotDate: 1/23/2018 1:10 PM

20 BOULDER CRESCENT, SUITE 110
 COLORADO SPRINGS, CO 80903
 PHONE: 719.555.5465



FOR AND ON BEHALF OF
 M&S CIVIL CONSULTANTS, INC.
 MICHELLE A. SANCHEZ, COLORADO P.E. NO. 37160
 PROFESSIONAL SEAL

NO.	DATE	BY	DESCRIPTION

THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

CAUTION



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October 2, 2017

Mr. Jim Morley
Morley-Bentley Investments, LLC
20 Boulder Crescent, 1st Floor
Colorado Springs, CO 80903

RE: Sterling Ranch Phases 1-3
El Paso County, CO
Traffic Technical Memorandum
LSC #144010

Dear Mr. Morley:

LSC Transportation Consultants, Inc. has prepared this traffic technical memorandum for Phases 1-3 of the Sterling Ranch development. As shown on Figure 1, the site is located east of Vollmer Road near Lochwinnoch Lane between the future extensions of Marksheffel Road and Stapleton Drive in El Paso County, Colorado.

This memorandum has been prepared to address the proposed interim cross section of Vollmer Road (please refer to attached exhibits). Due to current constraints on the west side of Vollmer Road, the applicant is proposing an interim cross section along the frontage of Sterling Ranch Phase 1. This interim cross section and proposed laneage is attached. The proposed interim road improvement would widen the roadway to the east side. There would continue to be one through lane in each direction but the interim road improvements would allow for southbound left-turn and northbound right-turn lanes at the Briargate Parkway/Vollmer and Dines/Vollmer intersections (both access points to Sterling Ranch Phase 1).

REPORT CONTENTS

This report presents:

- Current traffic volume data
- Estimates of projected “intermediate-term” (2025) traffic volumes
- Roadway capacity of this interim cross section
- An evaluation of the ability of the short-term roadway improvements to accommodate the projected short-term traffic volumes.

LAND USE AND ACCESS

The site plan figure from the July 2, 2014 traffic report for Sterling Ranch is attached for reference. That traffic report assumed 672 lots in the area shown but no commercial development in the short term at the southeast corner of Vollmer/Briargate Parkway. The analysis in this memo assumes buildout of 719 lots, reflecting a minor increase over the previously anticipated 672-lot count.

EXISTING TRAFFIC VOLUMES

Figure 2 shows the existing daily and peak-hour traffic volumes on Vollmer Road adjacent to the site. The traffic volumes are from the attached traffic counts conducted adjacent to the site in September 2017. Figure 2 also shows the average weekday traffic volumes on Vollmer Road based on 24-hour machine (tube) counts conducted in September 2017.

2025 BACKGROUND TRAFFIC

Volumes in Figure 3 represent eight years of growth in current Vollmer Road traffic volumes (out to 2025) at 5.4 percent per year. This is the growth rate of volumes projected in the 2016 *Major Transportation Corridors Plan (MTCP) Update*. Note: It is our understanding that the Marksheffel extension southeast across Sand Creek will occur in the short term, however no timing is available from the City of Colorado Springs.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 9th Edition, 2012* by the Institute of Transportation Engineers (ITE). Table 1 shows the current trip generation estimate.

SHORT-TERM DIRECTIONAL DISTRIBUTION

Figure 4 shows the short-term directional distribution estimates. This figure has been taken from the July 2, 2014 Sterling Ranch traffic report. Note: It is our understanding that the Marksheffel extension northwest across Sand Creek to Vollmer Road is anticipated to occur in the short term, however no timing of this connection is available from the City of Colorado Springs.

INTERMEDIATE-TERM (2025) SITE-GENERATED TRAFFIC

Figure 5 shows the projected site-generated traffic volume for 719 lots. The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 4) to the trip generation estimates (from Table 1).

INTERMEDIATE-TERM (2025) TOTAL TRAFFIC

Figure 6 shows the projected total traffic volumes for the intermediate term. Total traffic volumes include 2025 background through traffic on Vollmer Road (from Figure 3) plus Phase 1 site-generated traffic volumes (from Figure 5).

ESTIMATED VOLLMER ROAD CAPACITY

Currently the MTCP indicates a capacity of existing Vollmer Road to be about 6,000 vehicles per day. The ECM indicates the ADT capacity of an ECM-standard rural minor arterial (two lanes) to be 10,000 vehicles per day. However, the proposed interim cross section is a hybrid between urban and rural cross sections and would include auxiliary turn lanes. With the addition of ECM-standard auxiliary right- and left-turn deceleration lanes, LSC estimates the capacity to be about 14,000 vehicles per day through the area of the improved cross section. This is comparable to the fee study estimate of the capacity of Fontaine Boulevard west of Marksheffel, which has a two-lane cross section and auxiliary turn lanes.

The projected intermediate-term total traffic volume as shown in Figure 6 would be 5,300 vehicles per day—well below the estimated capacity of 14,000 vehicles per day for a roadway of this cross section. The projected volume would also be below the estimated existing capacity of 6,000 vehicles per day.

PROJECTED INTERSECTION LEVELS OF SERVICE

The intersections of Marksheffel Road/Vollmer Road and Stapleton Drive/Vollmer Road, and the two full-movement site access intersections to Vollmer Road were analyzed to determine the projected levels of service for the intermediate-term total traffic volumes based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual*. Figure 6 shows the level of service analysis results. The level of service reports are attached.

As shown on the figures, all the intersections analyzed are projected to operate at a level of service B as stop-sign-controlled intersections.

* * * * *

Please contact me if you have any questions regarding this report.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By _____
Jeffrey C. Hodsdon, P.E., PTOE
Principal



JCH:bjwb

Enclosures: Table 1
Figures 1-6
Cross Section and Laneage Exhibits
Site Plan Exhibit from July 2, 2014 Report
Traffic Count Reports
Level of Service Reports

**Table 1
Trip Generation Estimate
Sterling Ranch Phases 1-3**

TAZ ⁽²⁾	Parcel	Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾				Total External Trips Generated						
					Average Weekday Traffic	Morning Peak Hour		Evening Peak Hour		Average Weekday Traffic	Morning Peak Hour		Evening Peak Hour		
						In	Out	In	Out		In	Out	In	Out	
October 2017 Currently Anticipated Sterling Ranch Phases 1-3 (Residential Trip Generation Only)															
2, 4, 5, 6, & 7	A1-A4; B1-B3	210	Single-Family Detached Housing	719 DU ⁽³⁾	9.52	0.19	0.56	0.63	0.37	6,845	135	404	453	266	
Sterling Ranch Phases 1-3 Traffic Impact Analysis July 2, 2014															
Phase 1															
7	A1	210	Single-Family Detached Housing	100 DU	9.52	0.19	0.56	0.63	0.37	952	19	56	63	37	
2	A2	210	Single-Family Detached Housing	100 DU	9.52	0.19	0.56	0.63	0.37	952	19	56	63	37	
4	A3	---	Sanitary Lift Station	-----	---	---	---	---	---	---	---	---	---	---	
				Total Phase 2	200 DU					1,904	38	112	126	74	
Phase 2															
7	A1	210	Single-Family Detached Housing	60 DU	9.52	0.19	0.56	0.63	0.37	571	11	34	38	22	
2	A2	210	Single-Family Detached Housing	92 DU	9.52	0.19	0.56	0.63	0.37	876	17	52	58	34	
6	A4	210	Single-Family Detached Housing	7 DU	9.52	0.19	0.56	0.63	0.37	67	1	4	4	3	
				Total Phase 2	159 DU					1,514	29	90	100	59	
2, 4, 5, 6, & 7				Total Phases 1 & 2	359 DU					3,418	67	202	226	133	
Phase 3															
7	B1	210	Single-Family Detached Housing	34 DU	9.52	0.19	0.56	0.63	0.37	324	6	19	21	13	
	B2	210	Single-Family Detached Housing	133 DU	9.52	0.19	0.56	0.63	0.37	1,266	25	75	84	49	
5 & 6	B3	210	Single-Family Detached Housing	146 DU	9.52	0.19	0.56	0.63	0.37	1,390	27	82	92	54	
				Total Phase 3	313 DU					2,980	58	176	197	116	
2, 4, 5, 6, & 7				Total Phases 1, 2, & 3	672 DU					6,398	125	378	423	249	
Sterling Ranch Updated Traffic Impact Analysis June 5, 2008															
4	---	220	Apartment	89 DU	6.72	0.10	0.41	0.40	0.22	598	9	36	36	19	
2	---	210	Single-Family Detached Housing	234 DU	9.57	0.19	0.56	0.64	0.37	2,239	44	132	149	87	
5	---	210	Single-Family Detached Housing	82 DU	9.52	0.19	0.56	0.63	0.37	781	15	46	52	30	
6	---	210	Single-Family Detached Housing	103 DU	9.52	0.19	0.56	0.63	0.37	981	19	58	65	38	
7	---	210	Single-Family Detached Housing	611 DU	9.52	0.19	0.56	0.63	0.37	5,817	115	344	385	226	
				Total TAZs 2, 5, 6, & 7	1,030 DU					9,818	193	580	651	381	
Difference in Estimated Trip Generation TAZs 2, 5, 6 & 7				-311 DU						-2,973	-58	-176	-198	-115	

Notes:

- (1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)
- (2) TAZ = Traffic Analysis Zone from Sterling Ranch Updated Traffic Impact Analysis by LSC June 5, 2008
- (3) DU = dwelling unit

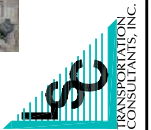


Approximate Scale
Scale: 1" = 3,000'



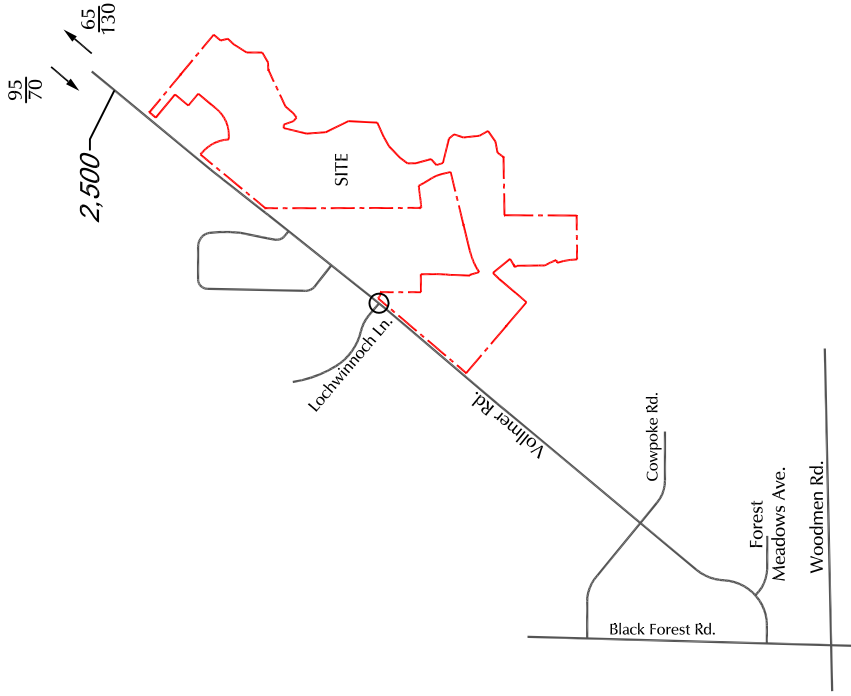
Figure 1
Vicinity
Map

Sterling Ranch (LSC #144010)





Approximate Scale
Scale: 1" = 3,000'



LEGEND:

⊥ = Stop Sign

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

X,XXX = Average Weekday Traffic (vehicles per day) September 2017

*Based on counts conducted September 2017

Figure 2

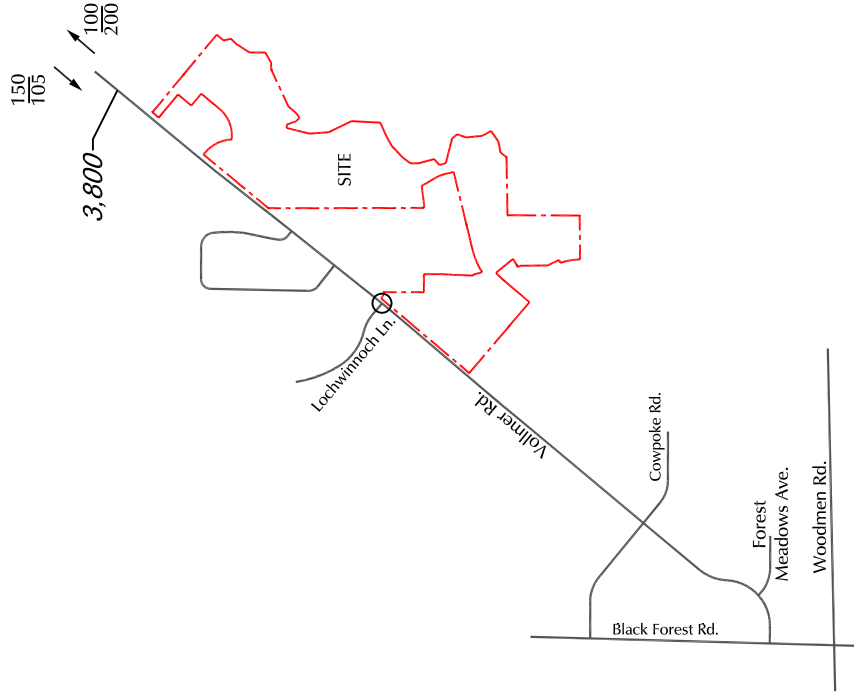
Existing Traffic Volumes

Sterling Ranch (LSC #144010)





Approximate Scale
Scale: 1" = 3,000'



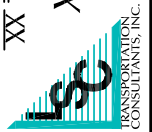
LEGEND:

- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- X,XXX = Average Weekday Traffic (vehicles per day)

Figure 3

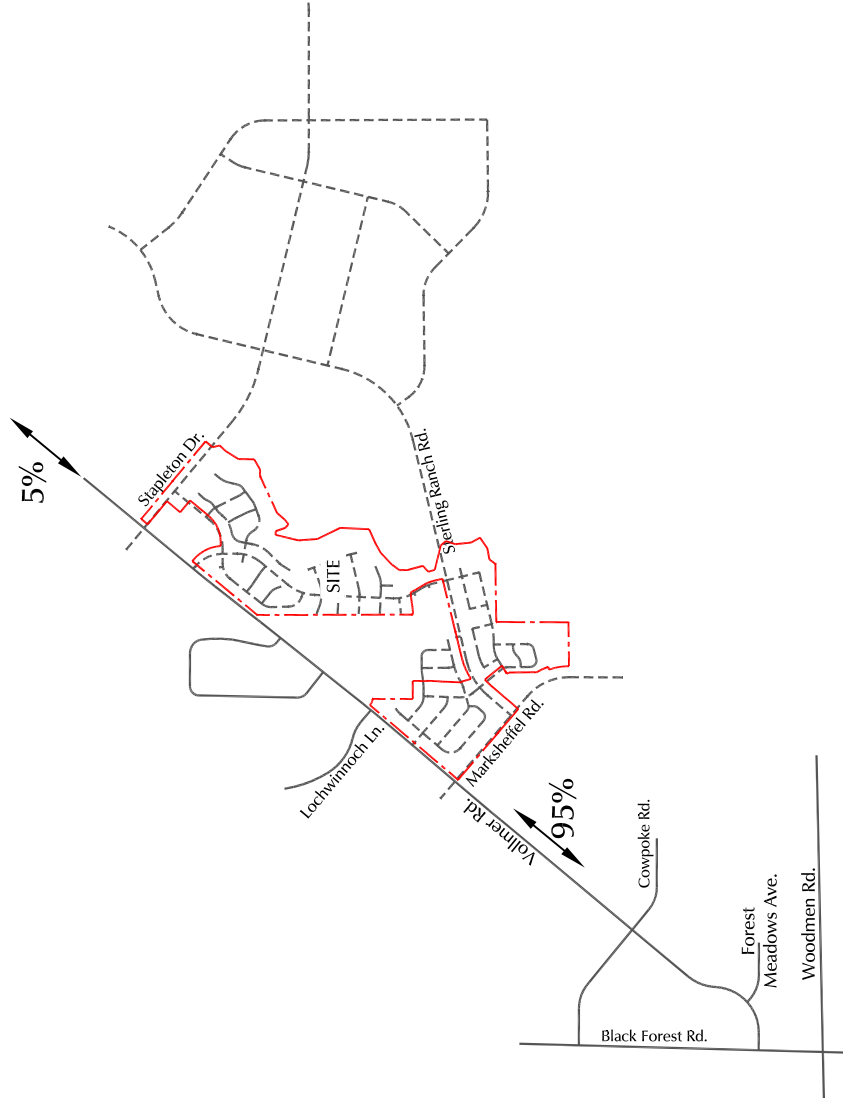
2025 Background Traffic

Sterling Ranch (LSC #144010)





Approximate Scale
Scale: 1" = 3,000'



LEGEND:

↔ 35%

= Percent Directional Distribution

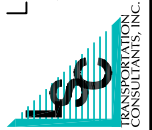


Figure 4

Short-Term Directional Distribution of Site-Generated Traffic

Sterling Ranch (LSC #144010)

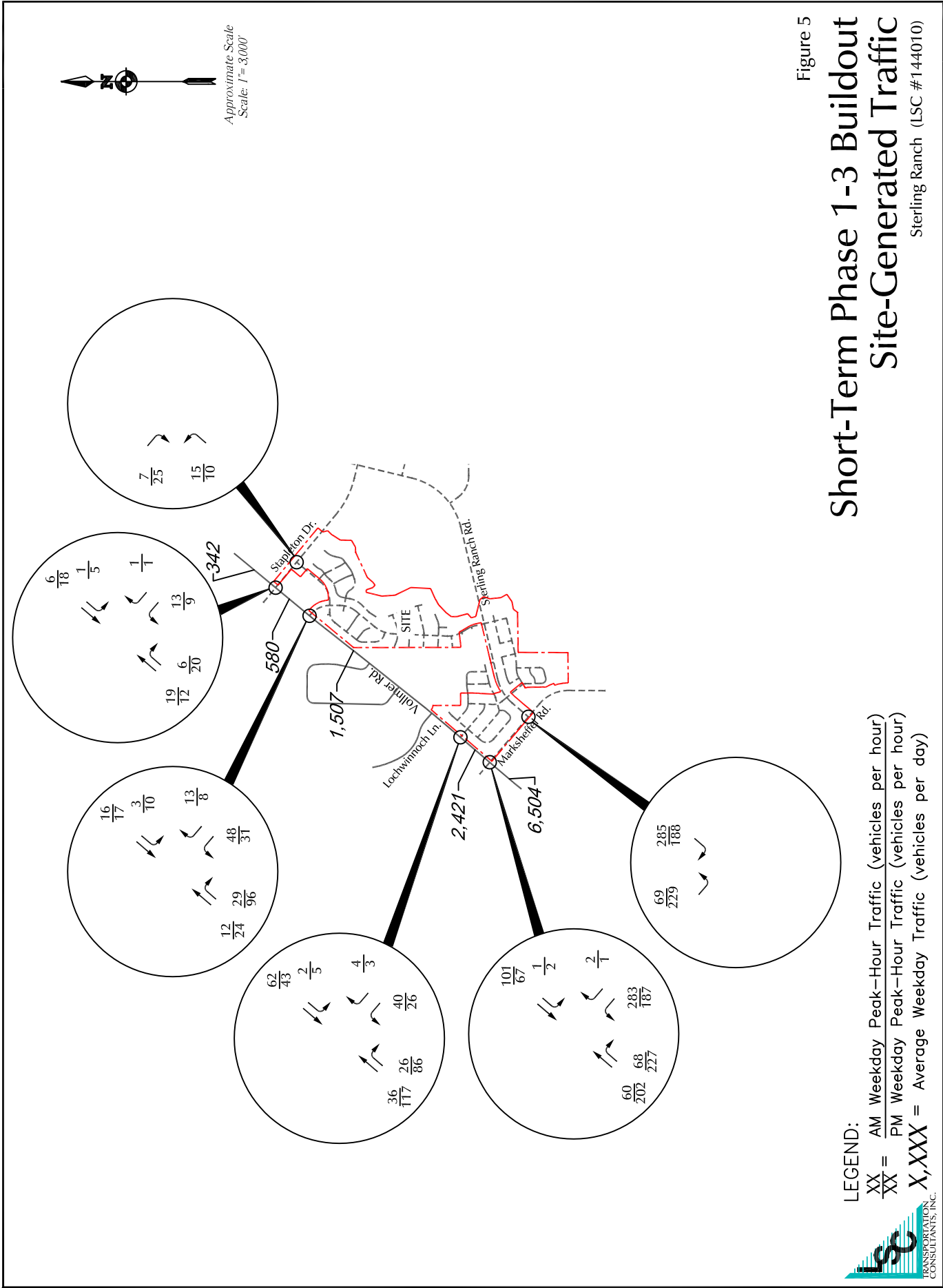
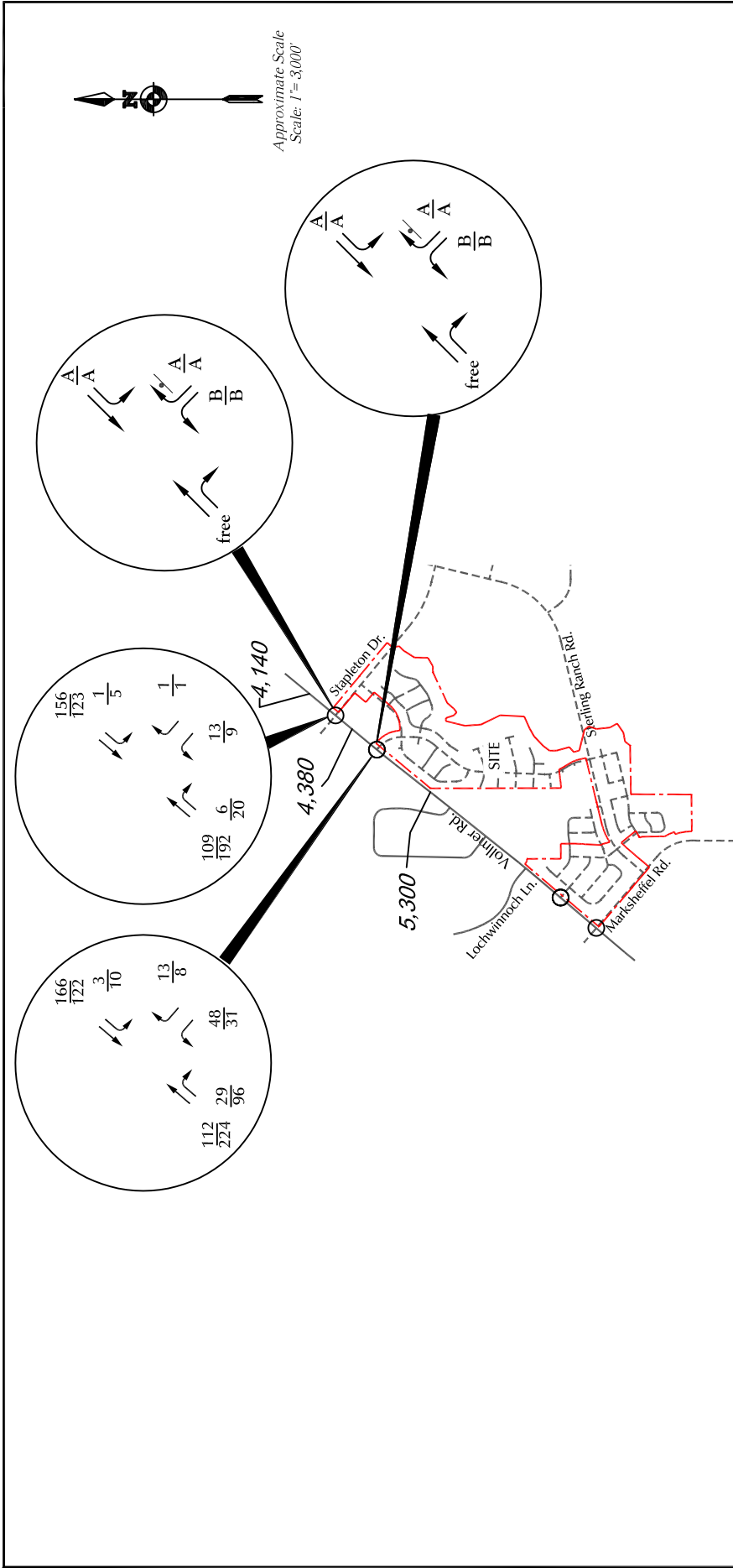


Figure 5
Short-Term Phase 1-3 Buildout
Site-Generated Traffic
 Sterling Ranch (LSC #144010)



LEGEND:

↑ = Stop Sign

$\frac{26}{31}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 PM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
 PM Individual Movement Peak-Hour Level of Service
 LSC 500 = Average Weekday Traffic (vehicles per day)

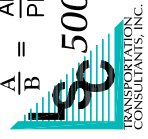
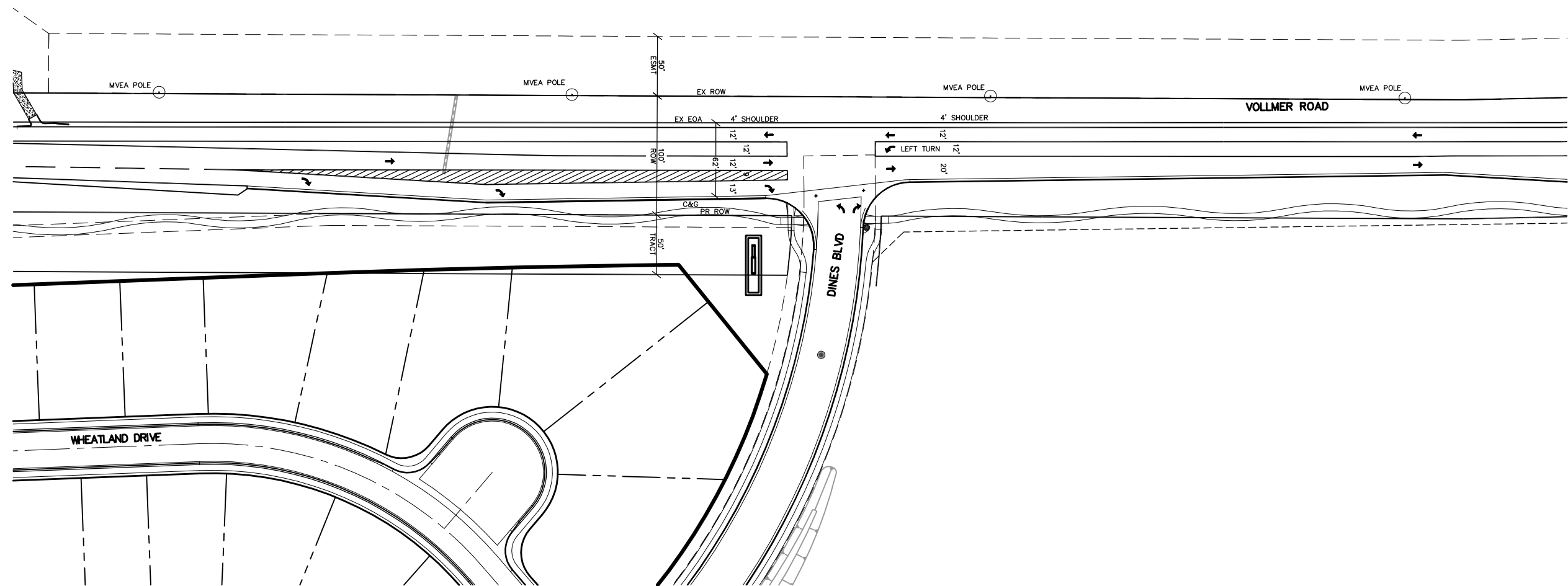
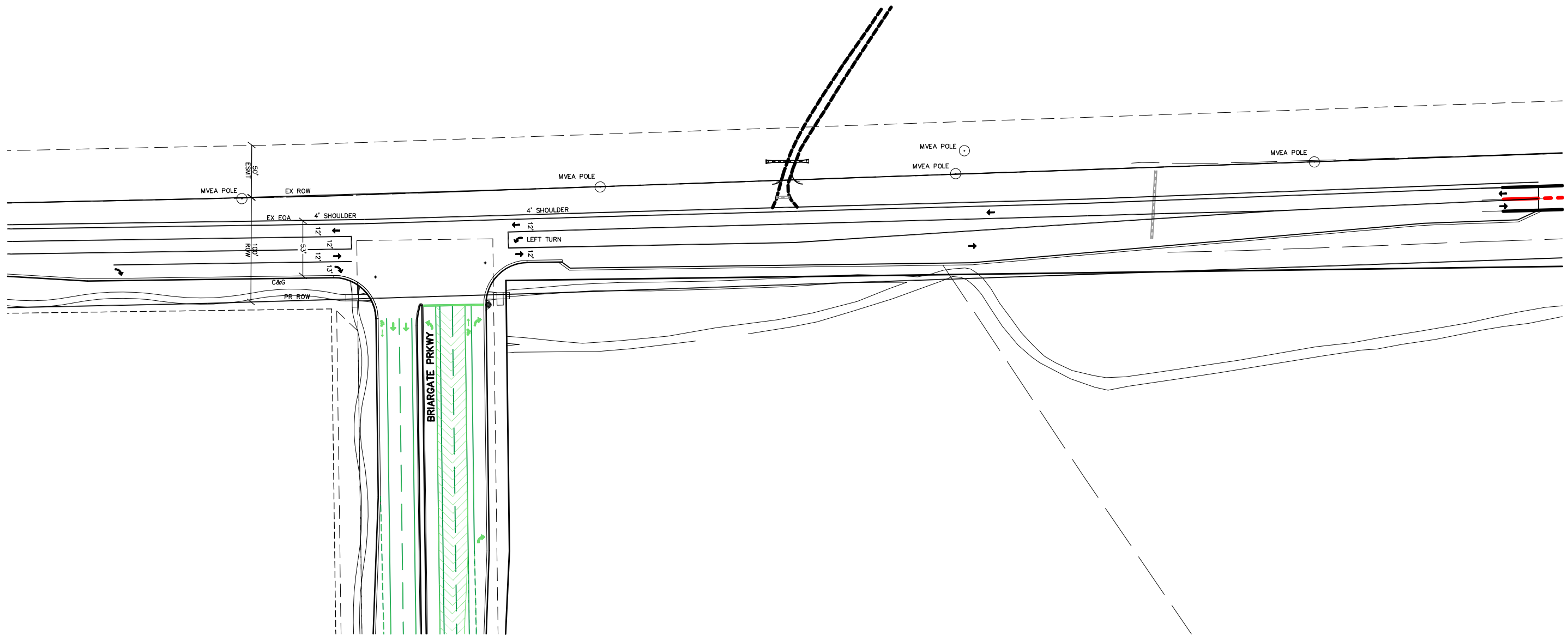
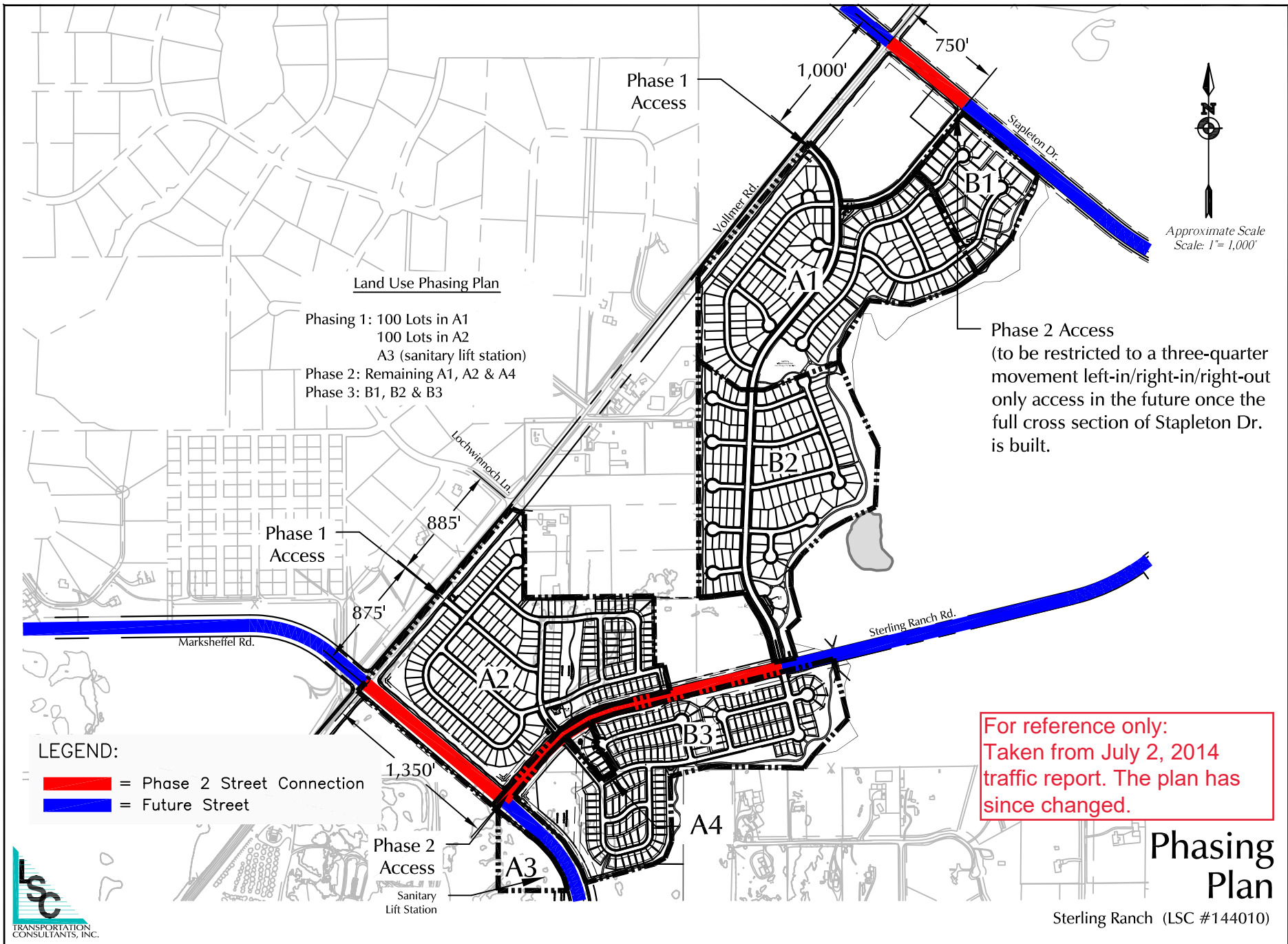


Figure 6
 Year 2025 Total
 Traffic & Intersection Analysis
 Sterling Ranch (LSC #144010)







Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	48	13	112	29	3	166
Future Vol, veh/h	48	13	112	29	3	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	14	122	32	4	205

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	335	122	0	0	154
Stage 1	122	-	-	-	-
Stage 2	213	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	660	929	-	-	1426
Stage 1	903	-	-	-	-
Stage 2	823	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	658	929	-	-	1426
Mov Cap-2 Maneuver	658	-	-	-	-
Stage 1	900	-	-	-	-
Stage 2	823	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	658	929	1426
HCM Lane V/C Ratio	-	-	0.079	0.015	0.003
HCM Control Delay (s)	-	-	10.9	8.9	7.5
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	0

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	13	1	119	6	1	156
Future Vol, veh/h	13	1	119	6	1	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	1	129	7	1	193

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	324	129	0	0	136	0
Stage 1	129	-	-	-	-	-
Stage 2	195	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	670	921	-	-	1448	-
Stage 1	897	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	669	921	-	-	1448	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	669	921	1448
HCM Lane V/C Ratio	-	-	0.021	0.001	0.001
HCM Control Delay (s)	-	-	10.5	8.9	7.5
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	0

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	31	8	224	96	10	122
Future Vol, veh/h	31	8	224	96	10	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	93	93	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	9	241	103	10	127

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	388	241	0	0	344	0
Stage 1	241	-	-	-	-	-
Stage 2	147	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	616	798	-	-	1215	-
Stage 1	799	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	611	798	-	-	1215	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	611	798	1215
HCM Lane V/C Ratio	-	-	0.055	0.011	0.009
HCM Control Delay (s)	-	-	11.2	9.6	8
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	0

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	9	1	212	20	5	123
Future Vol, veh/h	9	1	212	20	5	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	235	285	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	93	93	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	1	228	22	5	128

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	366	228	0	0	250	0
Stage 1	228	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	634	811	-	-	1316	-
Stage 1	810	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	631	811	-	-	1316	-
Mov Cap-2 Maneuver	631	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	889	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	631	811	1316
HCM Lane V/C Ratio	-	-	0.016	0.001	0.004
HCM Control Delay (s)	-	-	10.8	9.4	7.7
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	0