Public Facilities Finance Plan and Phasing Plan

Engineers Estimate of Costs

Attachment I

NorthStar Engineering Group, Inc.
620 12th Street
Modesto, CA 95354
Phone (209) 524-3525
Fax (209)524-3526

Tra Vigne (West & East)
Engineer's Estimate of Probable Cost

Summary of Total Improvements

I.	**Tra Vigne Shared Construction Cost Summary**	
A.	**Off-Site West Lane Total Street Improvements**	**$4,582,421.02**
B.	**Off-Site 8 Mile Rd Total Street Improvements**	**$4,187,535.67**
C.	**West Lane - 8 Mile Total Intersection Improvements**	**$413,688.00**
D.	**Sanitary Sewer Infrastructure**	**$872,090.00**
E.	**Potable Water System Infrastructure**	**$2,879,780.00**
F.	**West lane / Bear Creek 24" Water Crossing Infrastructure**	**$374,750.00**
G.	**Off-Site Mitigation Improvements**	**$412,928.75**
	SUB-TOTAL ===>	**$13,723,193.43**

CONSTRUCTION SUB-TOTAL ===>	**$13,723,193.43**
CONTINGENCY - 10% ===>	**$1,372,319.34**
CONSTRUCTION TOTAL ===>	**$15,095,512.78**
SOFT COSTS - 35% ===>	**$5,283,429.47**
GRAND TOTAL ===>	**$20,378,942.25**
TOTAL LOTS ===>	**1,212**
COST PER LOT ===>	**$16,814.31**

GRAND TOTAL IMPROVEMENTS AVAILABLE FOR PFF CREDITS ===>	**$2,933,499.34**
GRAND TOTAL REIMBURSABLE OFF-SITE SHARED IMPROVEMENTS ===>	**$2,136,319.93**
GRAND TOTAL PFF FEE CREDITS AND REIMBURSABLE IMPROVEMENTS ===>	**$5,069,819.27**

GRAND TOTAL OFF-SITE SHARED IMPROVEMENTS LESS REIMBURSEMENTS ===>	**$15,309,122.97**
TOTAL LOTS ===>	**1,212**
COST PER LOT ===>	**$12,631.29**

II.	**Tra Vigne West In-Tract Construction Cost Summary**	
A.	**Tra Vigne West In-Tract Major Infrastructure**	**$4,876,151.50**
B.	**Tra Vigne West Backbone In-Tract Improvements**	**$10,279,108.00**
C.	**Tra Vigne West In-Tract Improvements**	**$18,090,349.25**

SUB-TOTAL ===> $33,245,608.75

CONSTRUCTION SUB-TOTAL ===> $33,245,608.75
CONTINGENCY - 10% ===> $3,324,560.88
CONSTRUCTION TOTAL ===> $36,570,169.63

SOFT COSTS - 35% ===> $12,799,559.37
GRAND TOTAL ===> $49,369,728.99

TOTAL LOTS ===> 794
COST PER LOT ===> $62,178.50

SUB-TOTAL TRA VIGNE WEST IN-TRACT AND SHARED COSTS ===> $59,398,972.92

TOTAL LOTS ===> 794
COST PER LOT ===> $74,809.79

GRAND TOTAL IMPROVEMENTS AVAILABLE FOR PFF CREDITS ===> $4,419,771.35
GRAND TOTAL REIMBURSABLE OFF-SITE SHARED IMPROVEMENTS ===> $218,146.50
GRAND TOTAL PFF FEE CREDITS AND REIMBURSABLE IMPROVEMENTS ===> $4,637,917.85

GRAND TOTAL TRA VIGNE WEST IN-TRACT AND SHARED COSTS ===> $54,761,055.08

TOTAL LOTS ===> 794
COST PER LOT ===> $68,968.58

III.	**Tra Vigne East In-Tract Construction Cost Summary**	
A.	**Tra Vigne East In-Tract Major Infrastructure**	**$2,483,358.00**
B.	**Tra Vigne East In-Tract Improvements**	**$9,855,245.03**

SUB-TOTAL ===>	**$12,338,603.03**

CONSTRUCTION SUB-TOTAL ===>	**$12,338,603.03**
CONTINGENCY - 10% ===>	**$1,233,860.30**
CONSTRUCTION TOTAL ===>	**$13,572,463.33**
SOFT COSTS - 35% ===>	**$4,750,362.17**
GRAND TOTAL ===>	**$18,322,825.50**
TOTAL LOTS ===>	**418**
COST PER LOT ===>	**$43,834.51**

SUB-TOTAL TRA VIGNE EAST IN-TRACT AND SHARED COSTS ===>	**$23,602,704.55**
TOTAL LOTS ===>	**418**
COST PER LOT ===>	**$56,465.80**

GRAND TOTAL IMPROVEMENTS AVAILABLE FOR PFF CREDITS ===>	**$3,273,649.83**
GRAND TOTAL REIMBURSABLE OFF-SITE SHARED IMPROVEMENTS ===>	**$103,534.20**
GRAND TOTAL PFF FEE CREDITS AND REIMBURSABLE IMPROVEMENTS ===>	**$3,377,184.03**

GRAND TOTAL TRA VIGNE EAST IN-TRACT AND SHARED COSTS ===>	**$20,225,520.52**
TOTAL LOTS ===>	**418**
COST PER LOT ===>	**$48,386.41**

TABLE X.X
Infrastructure Linkage to Development Phases
Offsite, On-Site Backbond, and Other Shared Infrastructure

ITEM	DESCRIPTION	PROJECT		VERTICAL DEVELOPMENT PHASES																
				WEST													EAST			
		PHASE	MILESTONE	1	2	3	4	5	6	7	8	9	10	11	CM	MF	1	2	3	4
		EX. REF		6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	6.10	6.11	6.12	6.12	7.1	7.2	7.3	7.4
1	**Off-Site West Lane Total Street Improvements**																			
1.A	Off-Site West Lane Street Improvements from Eight Mile Road to Road "B" (Includes Road "B" Intersection)	2.1 , 2.2 2.3				X			X	X	X	X	X	X	X	X				
1.B	Off-Site West Lane Street Improvements from Road "B" to Bear Creek	2.1 , 2.2 2.3	MILESTONE	M	M	M	M	M	M	M	M	M	M	M						
1.C	Traffic Signal Improvements Only at the Intersection of West Lane and Road "B"	2.1 , 2.3	MILESTONE	M	M	M	M	M	M	M	M	M	M	M						
2	**Off-Site 8 Mile Rd Total Street Improvements**																			
2.A	Off-Site Eight Mile Road Street Improvements from West Lane to Ham Road	2.1 , 2.4 2.5												P	X	X	X	X	X	X
2.B	Off-Site Eight Mile Road Street Improvements from Ham Road to Leach Road	2.1 , 2.4 2.5															X	X	X	X
2.C	Traffic Signal Improvements Only at the Intersection of 8-Mile Road and Road "C"	2.1 , 2.5													X	X				
2.D	Traffic Signal Improvements Only at the Intersection of 8-Mile Road and Leach Road	2.1 , 2.5															X	X	X	X
2.E	RTD Bus Stop along Eight-Mile Road adjacent to Commercial Land Use	2.1 , 2.5													X	X				
3	**West Lane - 8 Mile Total Intersection Improvements**																			
3.A	West Lane and Eight Mile Road Intersection Street Improvements and Traffic Signal:	2.1 , 2.3 2.5								X	X	X	X	X	X	X				
4	**Sanitary Sewer Infrastructure**																			
4.A	24" Sewer Main from the Existing Manhole North of McNair High School east to West Lane	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4.B	24" Sewer Main along West Lane from Bear Creek to Road "A"	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
5	**Potable Water System Infrastructure**																			
5.A	12" Water Main in Eight Mile Road from Marlette Road to Lower Sacramento Road	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
5.B	24" Water Main in Eight Mile Road from Lower Sacramento Road to West Lane	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
5.C	24" Water Main in Eight Mile Road from West Lane to Ham Road	3.1													X	X	X	X	X	X
5.D	24" Water Main in Eight Mile Road from Ham Road to East End of Tra Vigne East	3.1													X	X	X	X	X	X
5.E	24" Water Main in West Lane from Eight Mile Road to Bear Creek Undercrossing	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
6	**West lane / Bear Creek 24" Water Crossing Infrastructure**																			
6.A	24" Water Main Undercrossing along West Lane under Bear Creek	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
7	**Off-Site Mitigation Improvements**																			
7.A	Part I - Morada Lane - Dedicated Right-Turn Lane	2.6		TO BE BASED ON TRAFFIC VOLUME ANALYSIS																
7.B	Part II - Lower Sacramento Road Intersection Modifications	2.6	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8	**Shared Storm Drain Pipes, Basin, and Pump Station Infrastructure**																			
8.A	Storm Drainage Base Pump Station, Infrastructure, and Treatment	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8.B	Storm Drainage Basin Construction	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8.C	Storm Drainage Basin Fencing, Landscaping and Erosion Control	3.1	MILESTONE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Engineer's Estimate of Probable Cost
Phased Infrastructure Matrix (Continued)

ITEM	DESCRIPTION	PROJECT		VERTICAL DEVELOPMENT PHASES																
				WEST													EAST			
		PHASE	MILESTONE	1	2	3	4	5	6	7	8	9	10	11	CM	MF	1	2	3	4
		EX. REF		6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	6.10	6.11	6.12	6.12	7.1	7.2	7.3	7.4
9	**Tra Vigne West Oversized Backbone Water System Improvements**																			
9.A	Oversized Water System for Road "A" - Segments (A1), (A2), and (A3)	3.1				X			X	X	X		X	X						
9.B	Oversized Water System for Road "B" - Segment (B)	3.1		X	X	X	X	X	X			X								
9.C	Oversized Water System for Road "C" - Segments (C1), (C2), (C3), (C4), and (C5)	3.1		X	X	X	X	X	X	X	X	X	X	X	X	X				
9.D	Oversized Water System for Roads "AA", "BB" AND "FF" - Segments (BB1), (BB2), (BB3), (AA), and (FF)	3.1					X	X	X			X								
10	**Tra Vigne West In-Tract Parks, Landscaping, Open Space, and Recreational Improvements**																			
10.A	In-Tract Park Landscaping Improvements (Does Not Include Major Amenities) (Per Development Agreement)	3.1 , 4.1 5.1		PER DEVELOPMENT AGREEMENT																
11	**Tra Vigne West Backbone In-Tract Improvements**																			
11.A	Total Tra Vigne West Site Mass Clearing and Rough Grading	4.1 , 5.1		X	X	X	X	X	X	X	X	X	X	X	X	X	P	P	P	P
11.B	Backbone Street Improvements for Road "A" - Segments (A1), (A2), and (A3)	4.1 , 5.1				P			P	P	P		X	X			P	P	P	P
11.C	Backbone Street Improvements for Road "B" - Segment (B)	4.1 , 5.1		X	X	X	X	X	X			X					P	P	P	P
11.D	Backbone Street Improvements for Road "C" - Segments (C1), (C2), (C3), (C4), and (C5)	4.1 , 5.1		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11.E	Backbone Street Improvements for Roads "AA", "BB" AND "FF" - Segments (BB1), (BB2), (BB3), (AA), and (FF)	4.1 , 5.1					P		P			X					P	P	P	P
11.F	Backbone Street Improvements for Road "E" - Segment (E) - East of Road "C"	4.1 , 5.1									X		X	X						
11.G	Backbone Street Improvements for Road "T" - Segment (T1) and (T2)	4.1 , 5.1		P	P	P	P	P	P	P	P	X	P	P	P	P	P	P	P	P
12	**Tra Vigne West In-Tract Improvements**																			
12.A	Phase 1 - In-Tract Improvements:	4.1 , 6.1		X	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12.B	Phase 2 - In-Tract Improvements:	4.1 , 6.2			X	P														
12.C	Phase 3 - In-Tract Improvements:	4.1 , 6.3				X														
12.D	Phase 4 - In-Tract Improvements:	4.1 , 6.4					X	P												
12.E	Phase 5 - In-Tract Improvements:	4.1 , 6.5						X												
12.F	Phase 6 - In-Tract Improvements:	4.1 , 6.6							X											
12.G	Phase 7 - In-Tract Improvements:	4.1 , 6.7								X	P									
12.H	Phase 8 - In-Tract Improvements:	4.1 , 6.8									X									
12.I	Phase 9 - In-Tract Improvements:	4.1 , 6.9										X								
12.J	Phase 10 - In-Tract Improvements:	4.1 , 6.1											X	P						
12.K	Phase 11 - In-Tract Improvements:	4.1 , 6.11												X						
12.L	Phase 12 - Commercial and Mult-Family Land Use	4.1 , 6.12												X	X	X				

Engineer's Estimate of Probable Cost
Phased Infrastructure Matrix (Continued)

ITEM	DESCRIPTION	PROJECT		VERTICAL DEVELOPMENT PHASES																
				WEST													EAST			
		PHASE	MILESTONE	1	2	3	4	5	6	7	8	9	10	11	CM	MF	1	2	3	4
		EX. REF		6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	6.10	6.11	6.12	6.12	7.1	7.2	7.3	7.4
13	**Tra Vigne East Oversized Backbone Water System Improvements**																			
13.A	Oversized Water System for Backbone Roads	3.1															X	X	X	X
14	**Tra Vigne East In-Tract Parks, Landscaping, Open Space, and Recreational Improvements**																			
14.A	In-Tract Park Landscaping Improvements (Does Not Include Major Amenities) (Per Development Agreement)	3.1 , 4.1 5.1		PER DEVELOPMENT AGREEMENT																
15	**Tra Vigne East In-Tract Improvements**																			
15.A	Backbone Street Improvements	4.1 , 5.1															X	X	X	X
15.B	Phase 1 - In-Tract Improvements	4.1 , 7.1															X			
15.C	Phase 2 - In-Tract Improvements	4.1 , 7.2																X		
15.D	Phase 3 - In-Tract Improvements	4.1 , 7.3																	X	
15.E	Phase 4 - In-Tract Improvements	4.1 , 7.4																		X

REFERENCE NOTES

[X] Denotes improvements that are required per phase of the project
[P] Denotes improvements that are patrially required per phase of the project
[M] Designates Milestone Infrastructure Improvements at Start of Project

TRA VIGNE OFF-SITE SHARED INFRASTRUCTURE IMPROVEMENTS SUMMARY

BREAKDOWN OF TOTAL OFF-SITE IMPROVEMENT COSTS, IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS, AND DETERMINATION REMAINING IMPROVEMENTS AVAILABLE FOR AREA OF BENEFIT REIMBURSEMENTS

Engineer's Estimate of Probable Cost

LAND USE AREA BREAKDOWN

TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
200.2	98	5.3	10.3	590	505.2

BREAKDOWN OF TOTAL IMPROVEMENTS, PFF REIMBURSABLE IMPROVEMENTS, AND AREA OF BENEFIT ANALYSIS

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
1	**Off-Site West Lane Total Street Improvements**											
1.A	Off-Site West Lane Street Improvements from Eight Mile Road to Road "B" (Includes Road "B" Intersection) - By Frontage [SEE NOTE 3]	**2.1 , 2.2 2.3**	$2,664,051	$238,769	$0	$2,425,282	100.0% $2,425,282	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0
1.B	Off-Site West Lane Street Improvements from Road "B" to Bear Creek - By Frontage [SEE NOTE 3]	**2.1 , 2.2 2.3**	$3,621,094	$389,879	$0	$3,231,216	100.0% $3,231,216	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0
1.C	Traffic Signal Improvements Only at the Intersection of West Lane and Road "B" - By Frontage [SEE NOTE 3]	**2.1 , 2.3**	$519,750	$0	$0	$519,750	50.0% $259,875	0.0% $0	0.0% $0	0.0% $0	50.0% $259,875	0.0% $0
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$6,804,895**	**$628,647**	**$0**	**$6,176,248**	**$5,916,373**	**$0**	**$0**	**$0**	**$259,875**	**$0**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
2	**Off-Site 8 Mile Rd Total Street Improvements [SEE NOTE 3]**											
2.A	Off-Site Eight Mile Road Street Improvements from West Lane to Ham Road - By Frontage [SEE NOTE 3]	**2.1 , 2.4 2.5**	$3,004,033	$803,563	$0	$2,200,470	100.0% $2,200,470	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0
2.B	Off-Site Eight Mile Road Street Improvements from Ham Road to Leach Road - By Frontage [SEE NOTE 3]	**2.1 , 2.4 2.5**	$2,148,970	$886,962	$0	$1,262,001	0.0% $0	55.5% $700,734	22.2% $280,634	22.2% $280,634	0.0% $0	0.0% $0
2.C	Traffic Signal Improvements Only at the Intersection of 8-Mile Road and Road "C" - By Frontage [SEE NOTE 3]	**2.1 , 2.5**	$519,750	$0	$0	$519,750	100.0% $519,750	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0
2.D	Traffic Signal Improvements Only at the Intersection of 8-Mile Road and Leach Road - By Frontage [SEE NOTE 3]	**2.1 , 2.5**	$519,750	$0	$0	$519,750	0.0% $0	100.0% $519,750	0.0% $0	0.0% $0	0.0% $0	0.0% $0
2.E	RTD Bus Stop along Eight-Mile Road adjacent to Commercial Land Use - By Area [SEE NOTE 8]	**2.1 , 2.5**	$25,988	$0	$0	$25,988	14.2% $3,692	7.0% $1,808	0.4% $98	0.7% $190	41.9% $10,882	35.9% $9,318
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$6,218,490**	**$1,690,525**	**$0**	**$4,527,959**	**$2,723,913**	**$1,222,291**	**$280,731**	**$280,824**	**$10,882**	**$9,318**

TRA VIGNE OFF-SITE SHARED INFRASTRUCTURE IMPROVEMENTS SUMMARY

BREAKDOWN OF TOTAL OFF-SITE IMPROVEMENT COSTS, IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS, AND DETERMINATION REMAINING IMPROVEMENTS AVAILABLE FOR AREA OF BENEFIT REIMBURSEMENTS

Engineer's Estimate of Probable Cost

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
3	**West Lane - 8 Mile Total Intersection Improvements**											
3.A	West Lane and Eight Mile Road Intersection Street Improvements and Traffic Signal:	**2.1 , 2.3 2.5**	$614,327	$614,327	$0	$0	14.2% $0	7.0% $0	0.4% $0	0.7% $0	41.9% $0	35.9% $0
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$614,327**	**$614,327**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
4	**Sanitary Sewer Infrastructure [SEE NOTE 4],[SEE NOTE 5]**						22.2%	10.8%	0.6%	1.1%	65.3%	0.0%
4.A	24" Sewer Main from the Existing Manhole North of McNair High School east to West Lane	**3.1**	$795,114	$0	$511,363	$283,751	$62,853	$30,767	$1,664	$3,234	$185,232	$0
4.B	24" Sewer Main along West Lane from Bear Creek to Road "A"	**3.1**	$499,940	$0	$227,008	$272,932	$60,457	$29,594	$1,601	$3,110	$178,170	$0
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$1,295,054**	**$0**	**$738,371**	**$556,683**	**$123,310**	**$60,362**	**$3,264**	**$6,344**	**$363,402**	**$0**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
5	**Potable Water System Infrastructure [SEE NOTE 4],[SEE NOTE 6]**						14.2%	7.0%	0.4%	0.7%	41.9%	35.9%
5.A	12" Water Main in Eight Mile Road from Marlette Road to Lower Sacramento Road	**3.1**	$393,035	$0	$0	$393,035	$55,845	$27,337	$1,478	$2,873	$164,578	$140,924
5.B	24" Water Main in Eight Mile Road from Lower Sacramento Road to West Lane	**3.1**	$1,146,420	$0	$368,874	$777,546	$110,479	$54,081	$2,925	$5,684	$325,587	$278,791
5.C	24" Water Main in Eight Mile Road from West Lane to Ham Road	**3.1**	$715,711	$0	$239,501	$476,210	$67,663	$33,122	$1,791	$3,481	$199,407	$170,746
5.D	24" Water Main in Eight Mile Road from Ham Road to East End of Tra Vigne East	**3.1**	$653,103	$0	$217,404	$435,699	$61,907	$30,304	$1,639	$3,185	$182,443	$156,221
5.E	24" Water Main in West Lane from Eight Mile Road to Bear Creek Undercrossing	**3.1**	$1,368,205	$0	$423,671	$944,534	$134,206	$65,695	$3,553	$6,905	$395,511	$338,665
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$4,276,473**	**$0**	**$1,249,449**	**$3,027,024**	**$430,100**	**$210,538**	**$11,386**	**$22,128**	**$1,267,526**	**$1,085,346**

TRA VIGNE OFF-SITE SHARED INFRASTRUCTURE IMPROVEMENTS SUMMARY

BREAKDOWN OF TOTAL OFF-SITE IMPROVEMENT COSTS, IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS, AND DETERMINATION REMAINING IMPROVEMENTS AVAILABLE FOR AREA OF BENEFIT REIMBURSEMENTS

Engineer's Estimate of Probable Cost

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
6	**West lane / Bear Creek 24" Water Crossing Infrastructure [SEE NOTE 4],[SEE NOTE 6]**						14.2%	7.0%	0.4%	0.7%	41.9%	35.9%
6.A	24" Water Main Undercrossing along West Lane under Bear Creek	**3.1**	$556,504	$0	$148,500	$408,004	$57,972	$28,378	$1,535	$2,983	$170,846	$146,291
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$556,504**	**$0**	**$148,500**	**$408,004**	**$57,972**	**$28,378**	**$1,535**	**$2,983**	**$170,846**	**$146,291**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
7	**Off-Site Mitigation Improvements [SEE NOTE 4]**						14.2%	7.0%	0.4%	0.7%	41.9%	35.9%
7.A	Part I - Morada Lane - Dedicated Right-Turn Lane	**2.6**	$330,635	$0	$0	$330,635	$46,979	$22,997	$1,244	$2,417	$138,449	$118,550
7.B	Part II - Lower Sacramento Road Intersection Modifications	**2.6**	$282,564	$0	$0	$282,564	$40,149	$19,653	$1,063	$2,066	$118,320	$101,314
	TOTALS OF SPECIFIC IMPROVEMENTS ===>		**$613,199**	**$0**	**$0**	**$613,199**	**$87,127**	**$42,650**	**$2,307**	**$4,483**	**$256,769**	**$219,864**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
-	**Totals of Project Off-Site and Shared Infrastructure**	**1.1**	**$20,378,942**	**$2,933,499**	**$2,136,320**	**$15,309,116**	**$9,338,795**	**$1,564,219**	**$299,223**	**$316,761**	**$2,329,300**	**$1,460,818**

NOTES:

[1] Above cost estimates include 10% contingency and 35% soft costs.

[2] Improvements available for PFF Fee Credit assumes that there are sufficient Fee Credits to cover 100% of the improvements that eligible for credit. If it is determined that the PFF Fee Credit will not cover the total of the improvements available for Fee Credit, than the remaining costs should be reimbursed directly from the existing PFF fund through the exection of a reimbursement agreement.

[3] Cost breakdown for proposed roadway improvements by percentage of project frontages along the said Roadway Improvements

[4] Sanitary Sewer and Water System Improvements are available for Reimbursement Agreement only and are not available for PFF Fee Credits. Reimbursements for Sanitary Sewer and Water System infrastructure is the cost difference between installing the proposed infrastructure (30" Steel Water, 24" PVC Water, and 24" PVC Sewer) versus the required infrastructure (12" PVC Water and 12" PVC Sewer) to serve the Tra Vigne project.

[5] Cost breakdown by % of Flow which equal to percentage of Land Area. For Sanitary Sewer Infrastructure Improvements breakdown does not include Bear Creek South in percentage of project area.

[6] Cost breakdown by % of Flow which equal to percentage of Land Area. For Potable Water System Infrastructure Improvements breakdown includes all Projects

[7] Cost breakdown by % of Flow which equal to percentage of Land Area. For Storm Drainage Infrastructure Improvements breakdown does not include Bear Creek West and Bear Creek South project area.

[8] Cost breakdown for proposed improvements by percentage of project area

[9] Cost breakdown by % of Flow which equal to percentage of Land Area. For In-Tract Backbone Potable Water System Infrastructure Improvements breakdown includes Tra Vigne West, East, AT&T, and Bragg Crane only.

TRA VIGNE IN-TRACT SHARED INFRASTRUCTURE IMPROVEMENTS SUMMARY

BREAKDOWN OF TOTAL OFF-SITE IMPROVEMENT COSTS, IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS, AND DETERMINATION REMAINING IMPROVEMENTS AVAILABLE FOR AREA OF BENEFIT REIMBURSEMENTS

Engineer's Estimate of Probable Cost

LAND USE AREA BREAKDOWN

TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	BEAR CREEK SOUTH
200.2	98	5.3	10.3	590	505.2

BREAKDOWN OF TOTAL IMPROVEMENTS, PFF REIMBURSABLE IMPROVEMENTS, AND AREA OF BENEFIT ANALYSIS

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	CREEK SOUTH
8	**Shared Storm Drain Pipes, Basin, and Pump Station Infrastructure**						63.8%	31.2%	1.7%	3.3%	0.0%	0.0%
8.A	Storm Drainage Base Pump Station, Infrastructure, and Treatment	**3.1**	$1,485,000	$0	$0	$1,485,000	$947,409	$463,767	$25,081	$48,743	$0	$0
8.B	Storm Drainage Basin Construction	**3.1**	$314,084	$0	$0	$314,084	$200,381	$98,089	$5,305	$10,309	$0	$0
8.C	Storm Drainage Basin Fencing, Landscaping and Erosion Control	**3.1**	$220,211	$0	$0	$220,211	$140,491	$68,772	$3,719	$7,228	$0	$0
	TOTAL IMPROVEMENT COST ===>		**$2,019,295**	**$0**	**$0**	**$2,019,295**	**$1,288,282**	**$630,627**	**$34,105**	**$66,280**	**$0**	**$0**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	CREEK SOUTH
9	**Tra Vigne West Oversized Backbone Water System Improvements**											
9.A	Oversized Water System for Road "A" - Segments (A1), (A2), and (A3)	**3.1**	$323,017	$0	$80,754	$403,772	63.8% $257,601	31.2% $126,098	1.7% $6,820	3.3% $13,253	0.0% $0	0.0% $0
9.B	Oversized Water System for Road "B" - Segment (B)	**3.1**	$128,839	$0	$42,946	$171,785	63.8% $109,596	31.2% $53,649	1.7% $2,901	3.3% $5,639	0.0% $0	0.0% $0
9.C	Oversized Water System for Road "C" - Segments (C1), (C2), (C3), (C4), and (C5)	**3.1**	$267,003	$0	$73,656	$340,659	63.8% $217,336	31.2% $106,388	1.7% $5,754	3.3% $11,182	0.0% $0	0.0% $0
9.D	Oversized Water System for Roads "AA", "BB" AND "FF" - Segments (BB1), (BB2), (BB3), (AA), and (FF)	**3.1**	$83,160	$0	$20,790	$103,950	63.8% $66,319	31.2% $32,464	1.7% $1,756	3.3% $3,412	0.0% $0	0.0% $0
	TOTAL IMPROVEMENT COST ===>		**$802,019**	**$0**	**$218,147**	**$1,020,165**	**$650,851**	**$318,598**	**$17,230**	**$33,485**	**$0**	**$0**

TRA VIGNE IN-TRACT SHARED INFRASTRUCTURE IMPROVEMENTS SUMMARY

BREAKDOWN OF TOTAL OFF-SITE IMPROVEMENT COSTS, IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS, AND DETERMINATION REMAINING IMPROVEMENTS AVAILABLE FOR AREA OF BENEFIT REIMBURSEMENTS

Engineer's Estimate of Probable Cost

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	CREEK SOUTH
10	**Tra Vigne West In-Tract Parks, Landscaping, Open Space, and Recreational Improvements**											
10.A	In-Tract Park Landscaping Improvements (Does Not Include Major Amenities)	**3.1 , 4.1 5.1**	$4,419,771	$4,419,771	$0	$0	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0
	TOTAL IMPROVEMENT COST ===>		**$4,419,771**	**$4,419,771**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	CREEK SOUTH
13	**Tra Vigne East Oversized Backbone Water System Improvements**											
13.A	Oversized Water System for Backbone Roads	**3.1**	$414,137	$0	$103,534	$310,603	0.0% $0	86.3% $267,949	4.7% $14,491	9.1% $28,162	0.0% $0	0.0% $0
	TOTAL IMPROVEMENT COST ===>		**$414,137**	**$0**	**$103,534**	**$310,603**	**$0**	**$267,949**	**$14,491**	**$28,162**	**$0**	**$0**

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	CREEK SOUTH
14	**Tra Vigne East In-Tract Parks, Landscaping, Open Space, and Recreational Improvements**											
14.A	In-Tract Park Landscaping Improvements (Does Not Include Major Amenities)	**3.1 , 4.1 5.1**	$3,273,650	$3,273,650	$0	$0	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0	0.0% $0
	TOTAL IMPROVEMENT COST ===>		**$3,273,650**	**$3,273,650**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

TRA VIGNE IN-TRACT SHARED INFRASTRUCTURE IMPROVEMENTS SUMMARY

BREAKDOWN OF TOTAL OFF-SITE IMPROVEMENT COSTS, IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS, AND DETERMINATION REMAINING IMPROVEMENTS AVAILABLE FOR AREA OF BENEFIT REIMBURSEMENTS

Engineer's Estimate of Probable Cost

ITEM	DESCRIPTION	EXHIBIT REF	TOTAL IMPROVEMENTS COST [SEE NOTE 1]	IMPROVEMENTS AVAILABLE FOR PFF FEE CREDITS [SEE NOTE 2]	IMPROVEMENTS AVAILABLE FOR REIMBURSEMENTS [SEE NOTE 4]	REMAINING IMPROVEMENTS DEVELOPER RESPONSIBILITY AND/OR AREA OF BENEFIT	BREAKDOWN OF REMAINING IMPROVEMENT THAT ARE THE RESPONSIBILITY OF THE DEVELOPER THAT ARE POTENTIALLY AVAILABLE FOR AREA OF BENEFIT ANALYSIS REIMBURSEMENT [SEE NOTES]					
							TRA VIGNE WEST	TRA VIGNE EAST	AT&T	BRAGG CRANE	BEAR CREEK WEST	CREEK SOUTH
-	**Totals of Project In-Tract and Shared Infrastructure**		**$10,928,872**	**$7,693,421**	**$321,681**	**$3,350,063**	**$1,939,133**	**$1,217,175**	**$65,827**	**$127,928**	**$0**	**$0**

NOTES:

[1] Above cost estimates include 10% contingency and 35% soft costs.

[2] Improvements available for PFF Fee Credit assumes that there are sufficient Fee Credits to cover 100% of the improvements that eligible for credit. If it is determined that the PFF Fee Credit will not cover the total of the improvements available for Fee Credit, than the remaining costs should be reimbursed directly from the existing PFF fund through the exection of a reimbursement agreement.

[3] Cost breakdown for proposed roadway improvements by percentage of project frontages along the said Roadway Improvements

[4] Sanitary Sewer and Water System Improvements are available for Reimbursement Agreement only and are not available for PFF Fee Credits. Reimbursements for Sanitary Sewer and Water System infrastructure is the cost difference between installing the proposed infrastructure (30" Steel Water, 24" PVC Water, and 24" PVC Sewer) versus the required infrastructure (12" PVC Water and 12" PVC Sewer) to serve the Tra Vigne project.

[5] Cost breakdown by % of Flow which equal to percentage of Land Area. For Sanitary Sewer Infrastructure Improvements breakdown does not include Bear Creek South in percentage of project area.

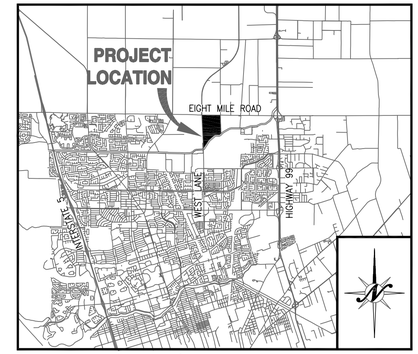
[6] Cost breakdown by % of Flow which equal to percentage of Land Area. For Potable Water System Infrastructure Improvements breakdown includes all Projects

[7] Cost breakdown by % of Flow which equal to percentage of Land Area. For Storm Drainage Infrastructure Improvements breakdown does not include Bear Creek West and Bear Creek South project area.

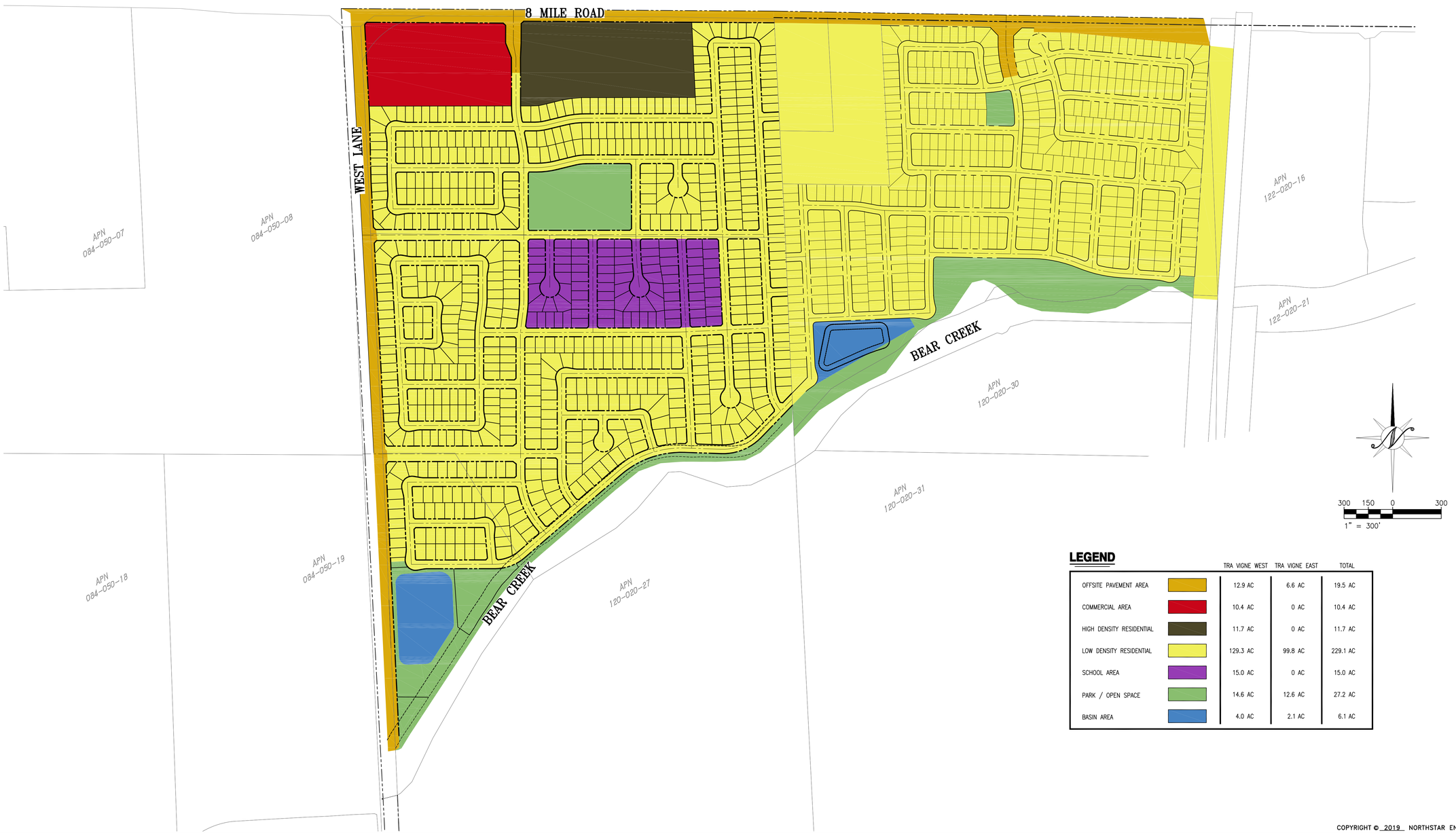
[8] Cost breakdown for proposed improvements by percentage of project area

[9] Cost breakdown by % of Flow which equal to percentage of Land Area. For In-Tract Backbone Potable Water System Infrastructure Improvements breakdown includes Tra Vigne West, East, AT&T, and Bragg Crane only.

STORM DRAINAGE TRIBUTARY AREA MAP
TRA VIGNE
STOCKTON, CALIFORNIA



VICINITY MAP
NOT TO SCALE



LEGEND

	TRA VIGNE WEST	TRA VIGNE EAST	TOTAL
OFFSITE PAVEMENT AREA	12.9 AC	6.6 AC	19.5 AC
COMMERCIAL AREA	10.4 AC	0 AC	10.4 AC
HIGH DENSITY RESIDENTIAL	11.7 AC	0 AC	11.7 AC
LOW DENSITY RESIDENTIAL	129.3 AC	99.8 AC	229.1 AC
SCHOOL AREA	15.0 AC	0 AC	15.0 AC
PARK / OPEN SPACE	14.6 AC	12.6 AC	27.2 AC
BASIN AREA	4.0 AC	2.1 AC	6.1 AC

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY P. DELLEY 61515 STATE OF CALIFORNIA

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

NO.	DESCRIPTIONS	DATE	APPROVED

STORM DRAINAGE TRIBUTARY AREA MAP
TRA VIGNE SUBDIVISION
STOCKTON, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

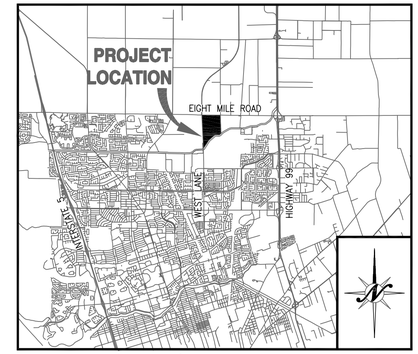
JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	CV
DESIGN:	CV
CHK'D:	APD

SHEET NUMBER

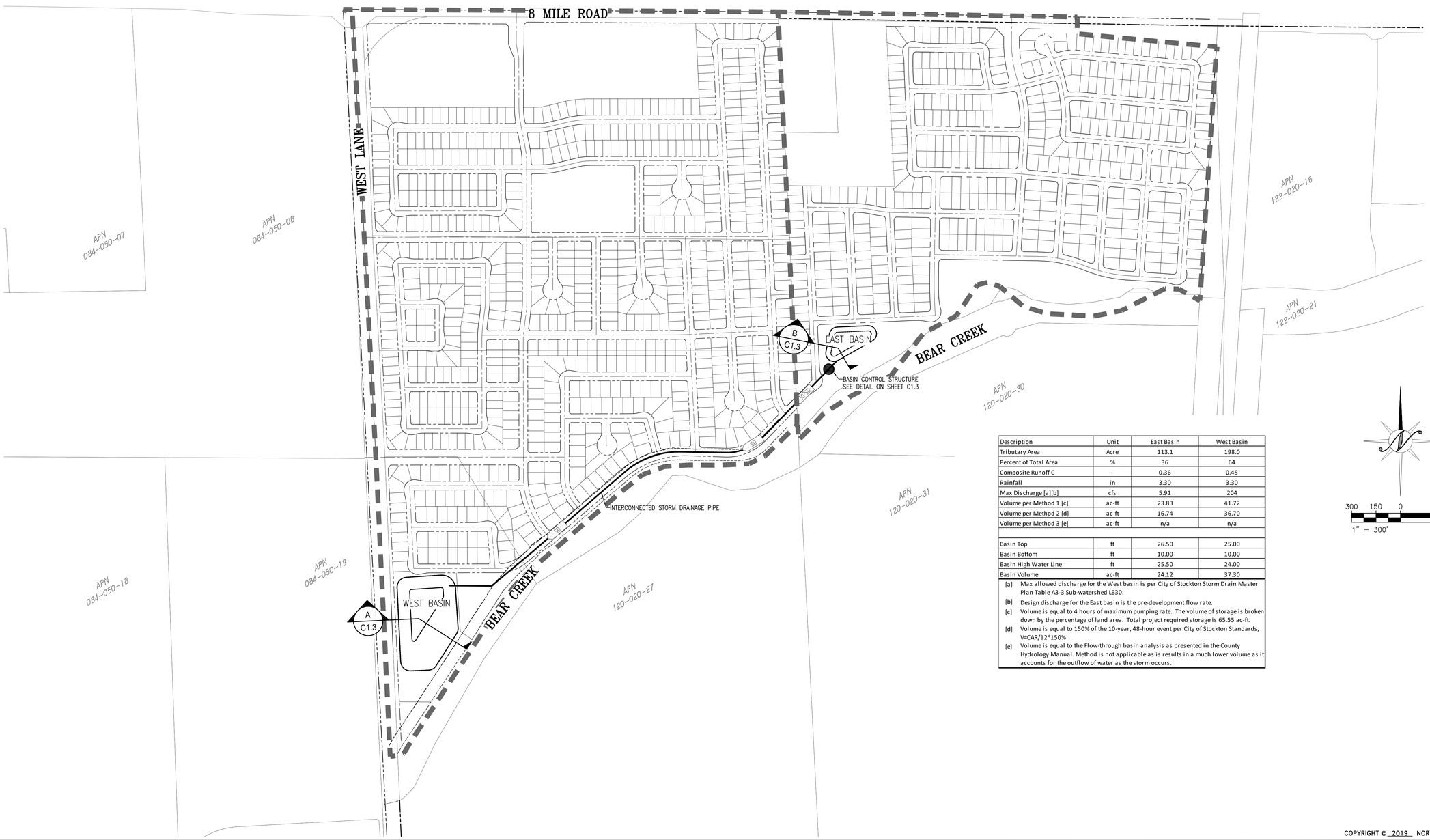
C1.1

PLOTTED: 09/06/2019 10:22 PLOTTED BY: Phurbin
DWGNAME: F:\15-1532 Bear Creek East\Civil\Calcs & Reports\Storm\UAD\2017_07-18\C1.1 Trib Areas.dwg

PRELIMINARY STORM DRAINAGE BASIN DESIGN
TRA VIGNE
STOCKTON, CALIFORNIA



VICINITY MAP
NOT TO SCALE



Description	Unit	East Basin	West Basin
Tributary Area	Acre	113.1	198.0
Percent of Total Area	%	36	64
Composite Runoff C	-	0.36	0.45
Rainfall	in	3.30	3.30
Max Discharge [a][b]	cfs	5.91	204
Volume per Method 1 [c]	ac-ft	23.83	41.72
Volume per Method 2 [d]	ac-ft	16.74	36.70
Volume per Method 3 [e]	ac-ft	n/a	n/a
Basin Top	ft	26.50	25.00
Basin Bottom	ft	10.00	10.00
Basin High Water Line	ft	25.50	24.00
Basin Volume	ac-ft	24.12	37.30

[a] Max allowed discharge for the West basin is per City of Stockton Storm Drain Master Plan Table A3-3 Sub-watershed LB30.

[b] Design discharge for the East basin is the pre-development flow rate.

[c] Volume is equal to 4 hours of maximum pumping rate. The volume of storage is broken down by the percentage of land area. Total project required storage is 65.55 ac-ft.

[d] Volume is equal to 150% of the 10-year, 48-hour event per City of Stockton Standards, V=CAR/12*150%

[e] Volume is equal to the Flow-through basin analysis as presented in the County Hydrology Manual. Method is not applicable as is results in a much lower volume as it accounts for the outflow of water as the storm occurs.

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY P. DIRUSO 61515 STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

NO.	DESCRIPTIONS	DATE	APPROVED

PRELIMINARY STORM BASIN DESIGN
TRA VIGNE SUBDIVISION
STOCKTON, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	CV
DESIGN:	CV
CHK'D:	APD

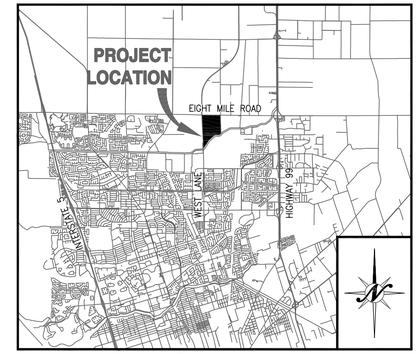
SHEET NUMBER

C1.2

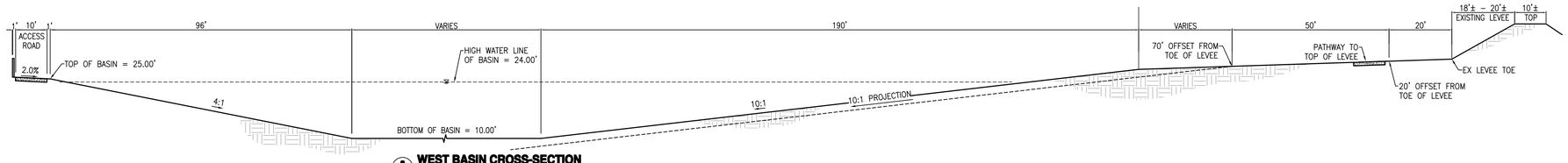
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 09/06/2019 10:25 PLOTTED BY: Rhurton
DWGNAME: F:\15-1532 Bear Creek East\Civil\Calcs & Reports\Storm\CAD\2017_07-18\C1.2 Drainage Exhibit.dwg

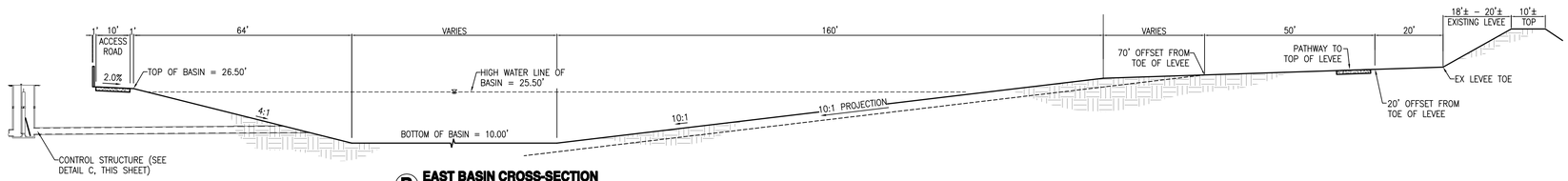
BASIN CROSS SECTIONS AND CONTROL STRUCTURE DETAIL
TRA VIGNE
STOCKTON, CALIFORNIA



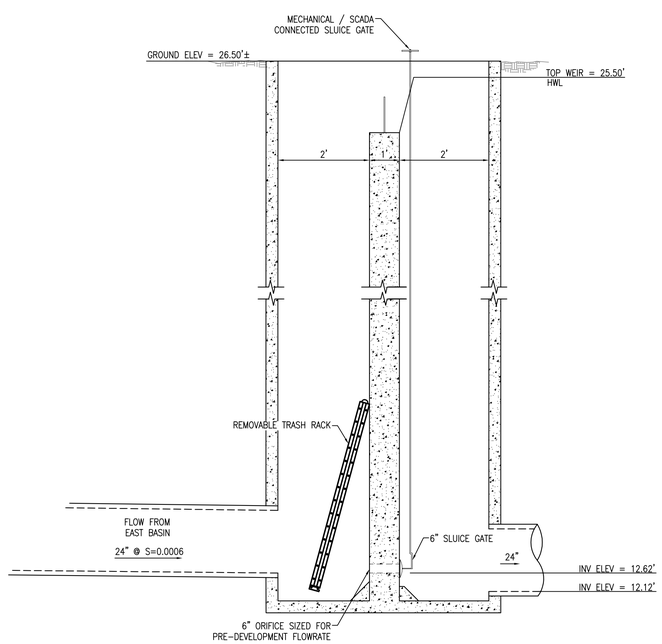
VICINITY MAP
NOT TO SCALE



A WEST BASIN CROSS-SECTION
NTS



B EAST BASIN CROSS-SECTION
NTS



C BASIN CONTROL STRUCTURE
NTS

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY P. DELLA SALA 93147 STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS			
NO.	DESCRIPTIONS	DATE	APPROVED

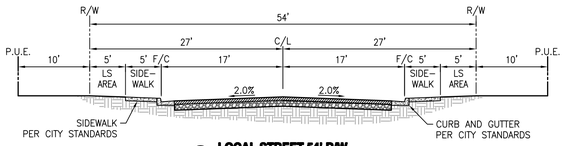
BASIN CROSS-SECTIONS AND CONTROL STRUCTURE DETAIL
TRA VIGNE SUBDIVISION
STOCKTON, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-1525 Phone (209) 524-3526 Fax

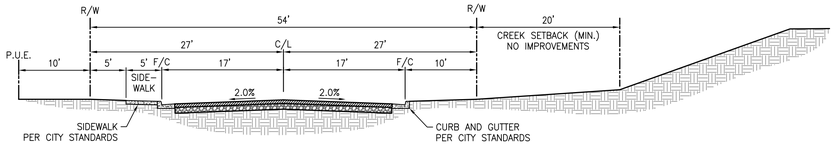
JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	CV
DESIGN:	CV
CHK'D:	APD

SHEET NUMBER
C1.3

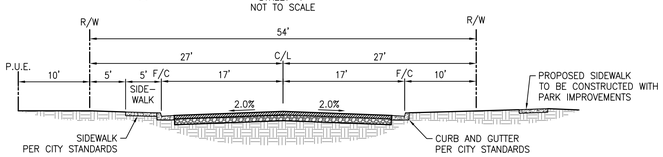
PLOTTED: 09/06/2019 10:27 PLOTTED BY: Phuthon
DWGNAME: F:\15-1532 Bear Creek East\Civil\Calcs & Reports\Storm\CAD\2017_07-18\V1.3 Drainage Exhibit.dwg



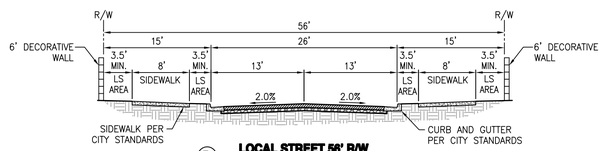
A LOCAL STREET 54' R/W
TYPICAL RESIDENTIAL STREET
NOT TO SCALE



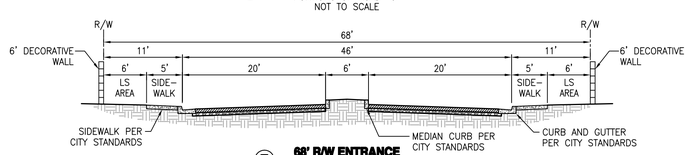
B LOCAL STREET 54' R/W AT BEAR CREEK
STREET "T"
NOT TO SCALE



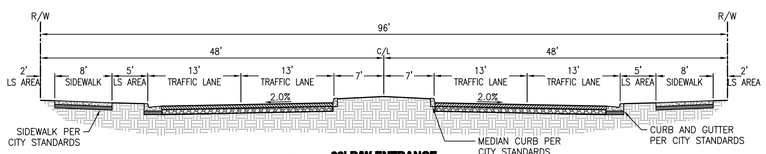
C LOCAL STREET 54' R/W AT PARKS
PORTIONS OF ROADS "A", "C", "E", AND "DD"
NOT TO SCALE



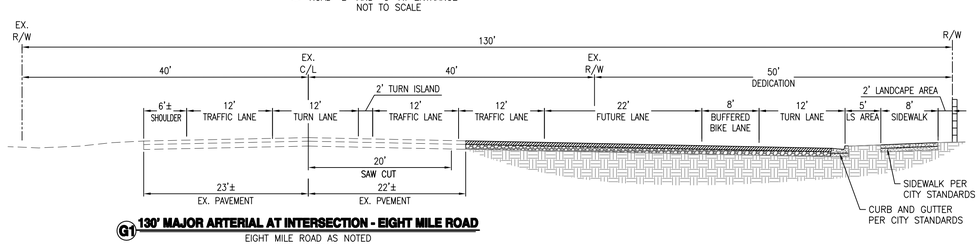
D LOCAL STREET 56' R/W
PORTIONS OF ROAD "C"
NOT TO SCALE



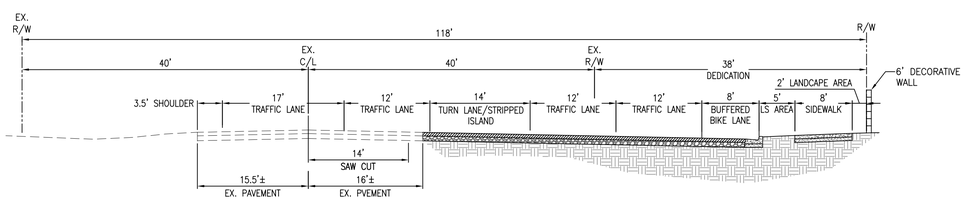
E 68' R/W ENTRANCE
ROAD "A" AT ENTRANCE
NOT TO SCALE



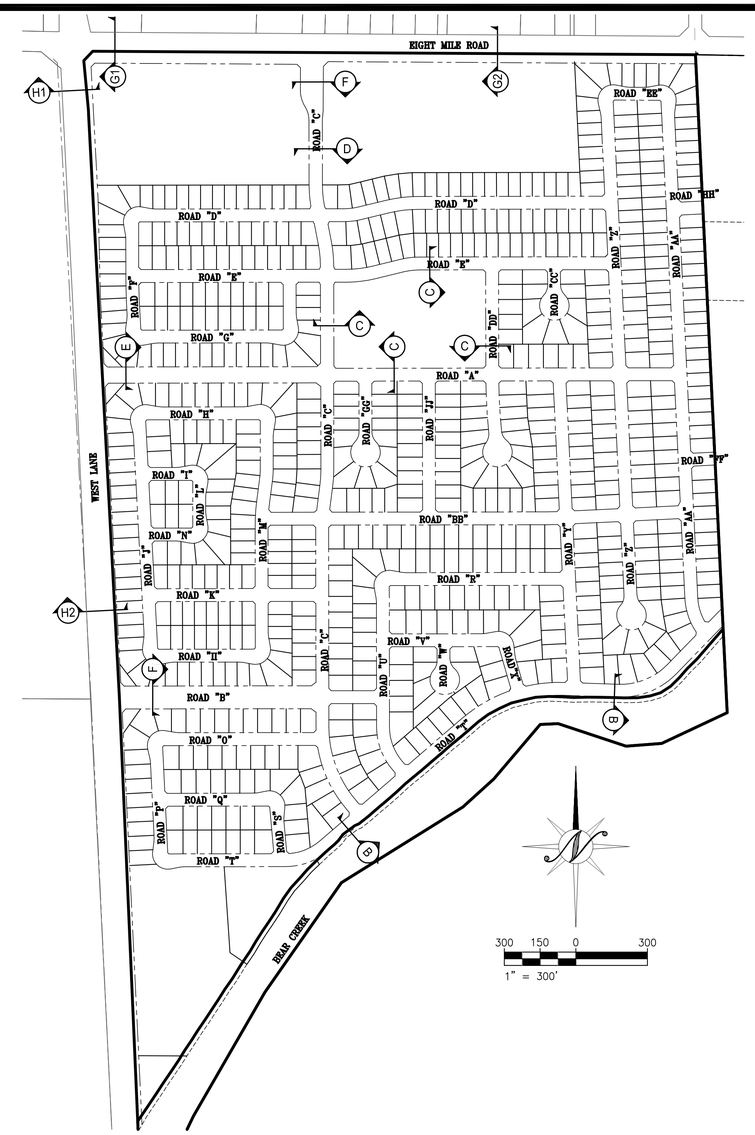
F 96' R/W ENTRANCE
ROAD "B" AND "C" AT ENTRANCE
NOT TO SCALE

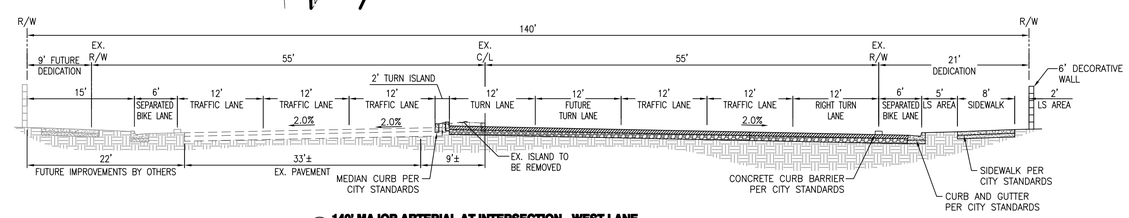


G1 130' MAJOR ARTERIAL AT INTERSECTION - EIGHT MILE ROAD
EIGHT MILE ROAD AS NOTED
NOT TO SCALE

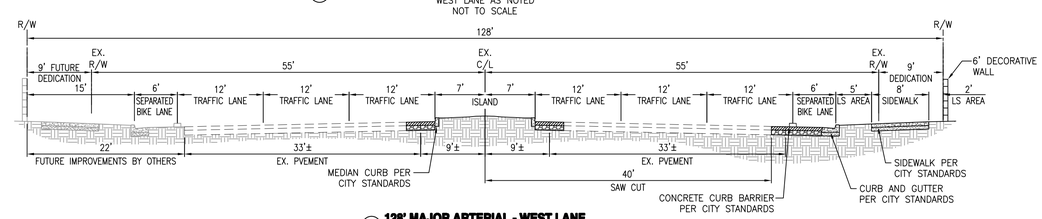


G2 118' MAJOR ARTERIAL - EIGHT MILE ROAD
EIGHT MILE ROAD AS NOTED
NOT TO SCALE





H1 140' MAJOR ARTERIAL AT INTERSECTION - WEST LANE
WEST LANE AS NOTED
NOT TO SCALE



H2 128' MAJOR ARTERIAL - WEST LANE
WEST LANE AS NOTED
NOT TO SCALE

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY M. PEDRONI 33354 STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

NO.	DESCRIPTIONS	DATE	APPROVED

KEY SHEET AND TYPICAL CROSS-SECTIONS

TENTATIVE SUBDIVISION MAP
TRA VIGNE WEST

STOCKTON, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	TBA/PMH
DESIGN:	PMH/CV/KM
CHK'D:	TPD

SHEET NUMBER

TM 1.2

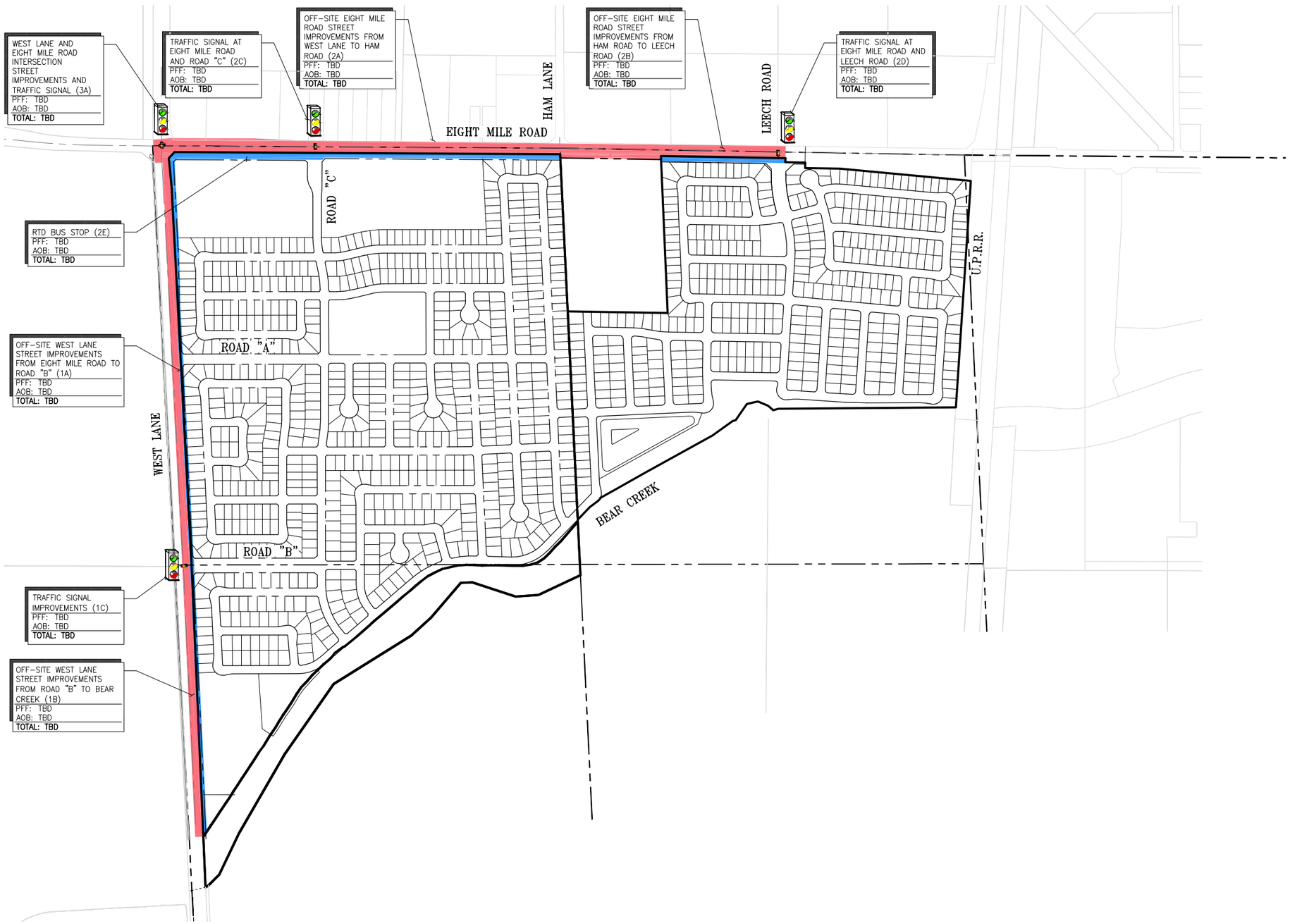
PLOTTED: 09/16/2019 14:47 PLOTTED BY: Phuthon
DWGNAME: F:\15-1532 Bear Creek East\Planning\Tentative Map\TM 1.2-KEY-SEC.dwg

EX 2.1

OFF-SITE WEST LANE AND EIGHT MILE ROAD STREET IMPROVEMENTS
PFF & AOB REFERENCE EXHIBIT

SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



700 350 0 700

1" = 700'

LEGEND

- PFF REIMBURSABLE IMPROVEMENTS (SEE EX 2.2 – 2.5)
- DEVELOPER RESPONSIBLE PORTION AVAILABLE FOR AOB REIMBURSEMENT

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 9/12/2019 8:38 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Infrastructure and Phasing Exhibits\Offsite Street Infrastructure PFF & AOB Exhibit.dwg

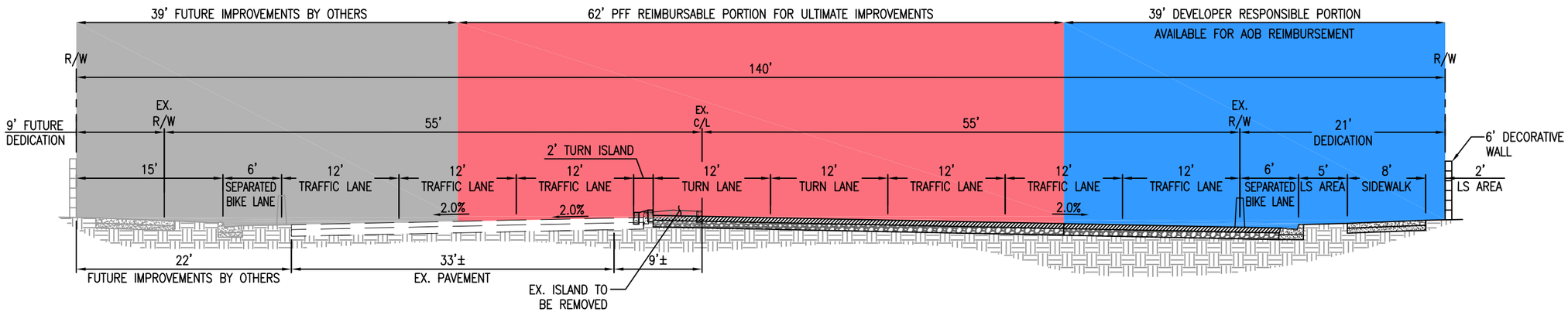
EX 2.2

WEST LANE

TYPICAL CROSS SECTIONS

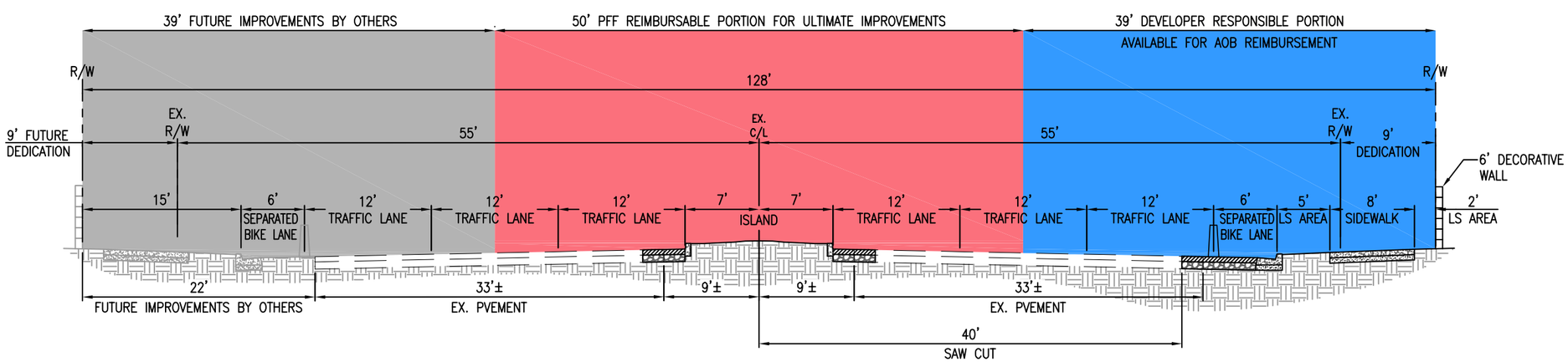
SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



140' WEST LANE AT
EIGHT MILE ROAD INTERSECTION

NTS



128' WEST LANE

NTS

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

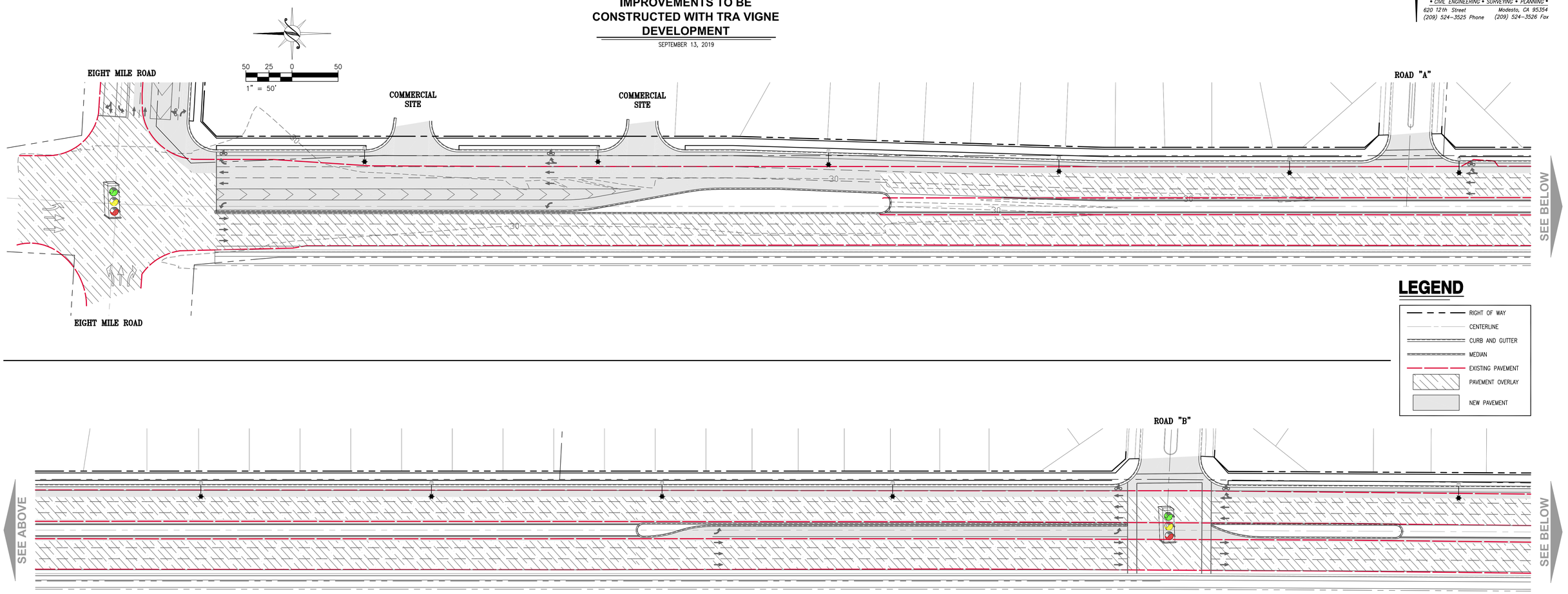
PLOTTED: 9/6/2019 12:56 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Eight Mile and West Lane Geometrics Exhibit\Eight Mile and West Lane Geometrics Exhibit.dwg

EX2.3

WEST LANE PROPOSED STREET IMPROVEMENTS TO BE CONSTRUCTED WITH TRA VIGNE DEVELOPMENT

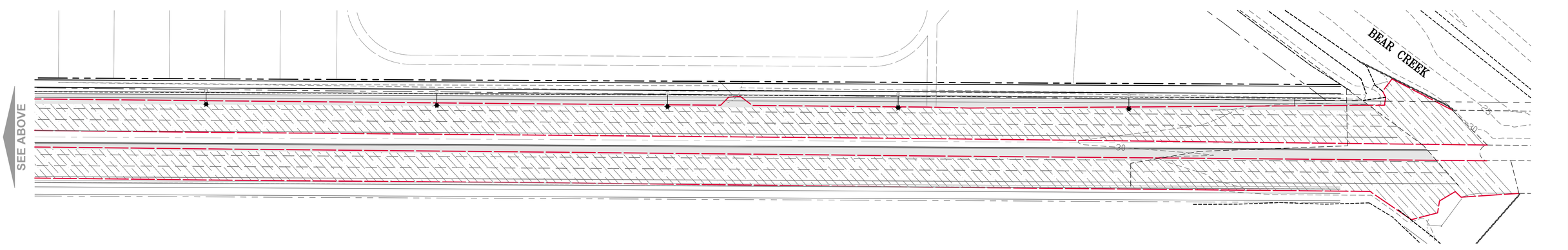
SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
* CIVIL ENGINEERING * SURVEYING * PLANNING *
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



LEGEND

- RIGHT OF WAY
- CENTERLINE
- CURB AND GUTTER
- MEDIAN
- EXISTING PAVEMENT
- PAVEMENT OVERLAY
- NEW PAVEMENT



COPYRIGHT © _2019_NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 9/10/2019 3:26 PM PLOTTED BY: Phurbon
WORKAGE: F:\15-1532 Bear Creek Eps\Versions\Exhibits\Eight Mile and West Lane Geometrics Exhibit.dwg

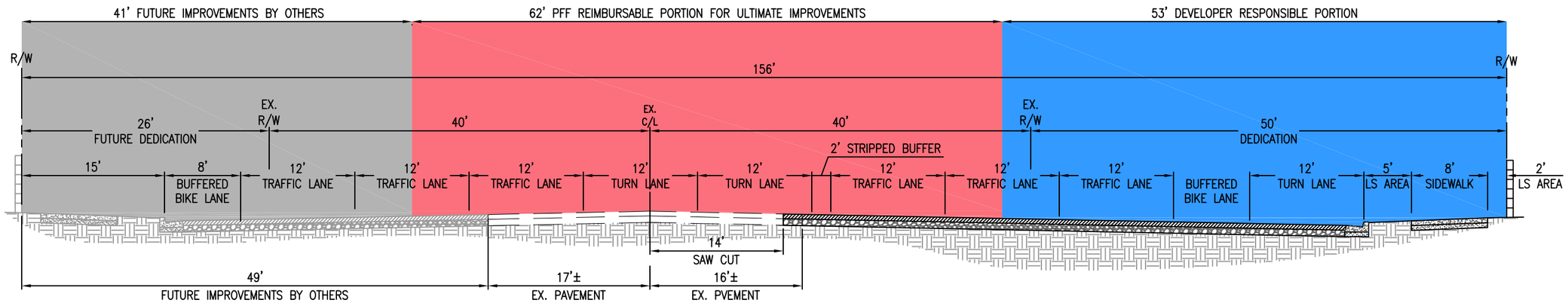
EX 2.4

EIGHT MILE ROAD

TYPICAL ROAD CROSS SECTIONS

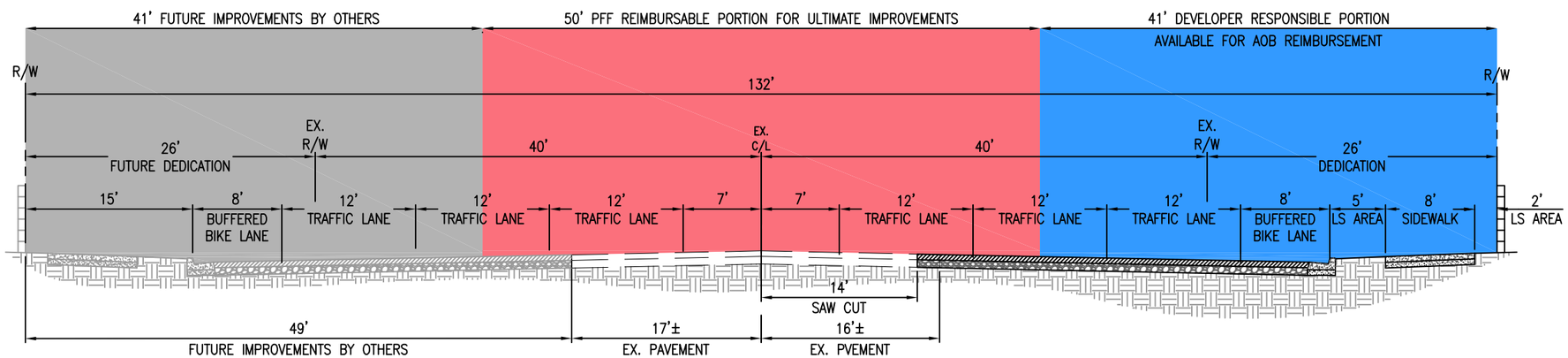
SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



156' EIGHT MILE ROAD AT WEST LANE INTERSECTION

NTS



132' EIGHT MILE ROAD

NTS

PLOTTED: 9/6/2019 12:57 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Eight Mile and West Lane Geometrics Exhibit\Eight Mile and West Lane Geometrics Exhibit.dwg

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

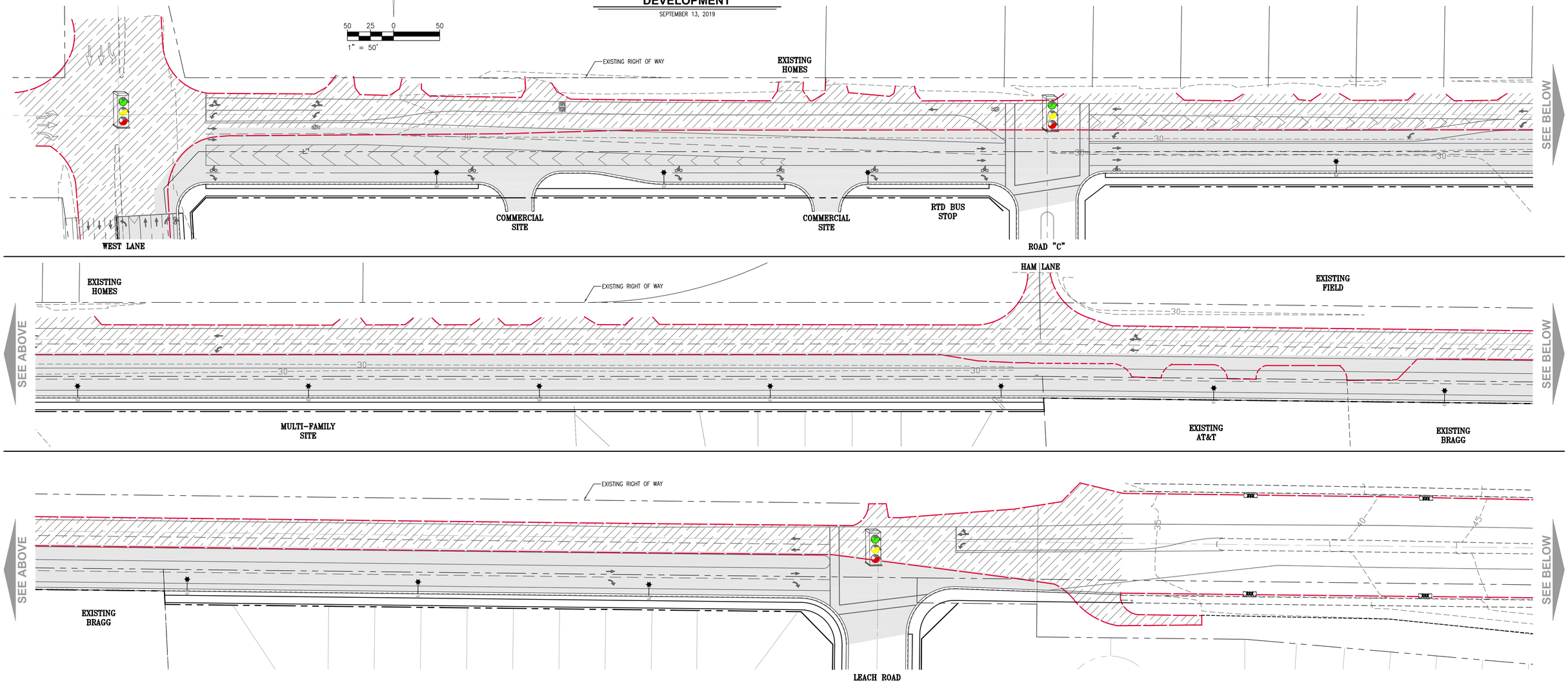
EX 2.5

EIGHT MILE ROAD PROPOSED STREET IMPROVEMENTS TO BE CONSTRUCTED WITH TRA VIGNE DEVELOPMENT

SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
* CIVIL ENGINEERING * SURVEYING * PLANNING *
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

50 25 0 50
1" = 50'



LEGEND

- RIGHT OF WAY
- CENTERLINE
- CURB AND GUTTER
- MEDIAN
- EXISTING PAVEMENT
- PAVEMENT OVERLAY
- NEW PAVEMENT

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

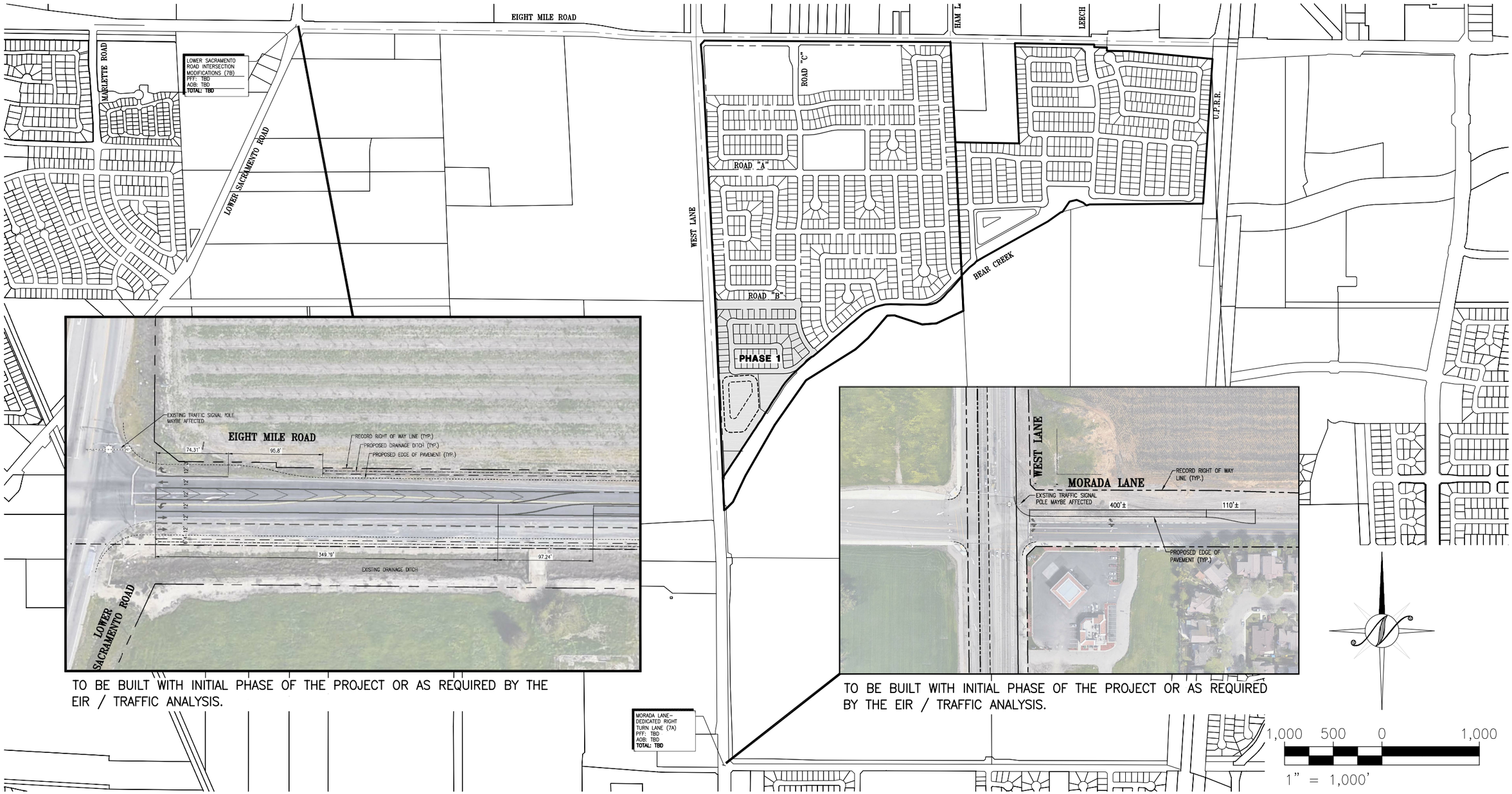
PLOTTED: 9/10/2019 3:27 PM PLOTTED BY: Phurbon
FILENAME: F:\15-1553 Bear Creek East\Planning\Exhibits\Eight Mile and West Lane Geometrics Exhibit\Eight Mile and West Lane Geometrics Exhibit.dwg

EX 2.6

OFF-SITE INTERSECTION IMPROVEMENT PER EIR MITIGATION
AOB EXHIBIT

SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

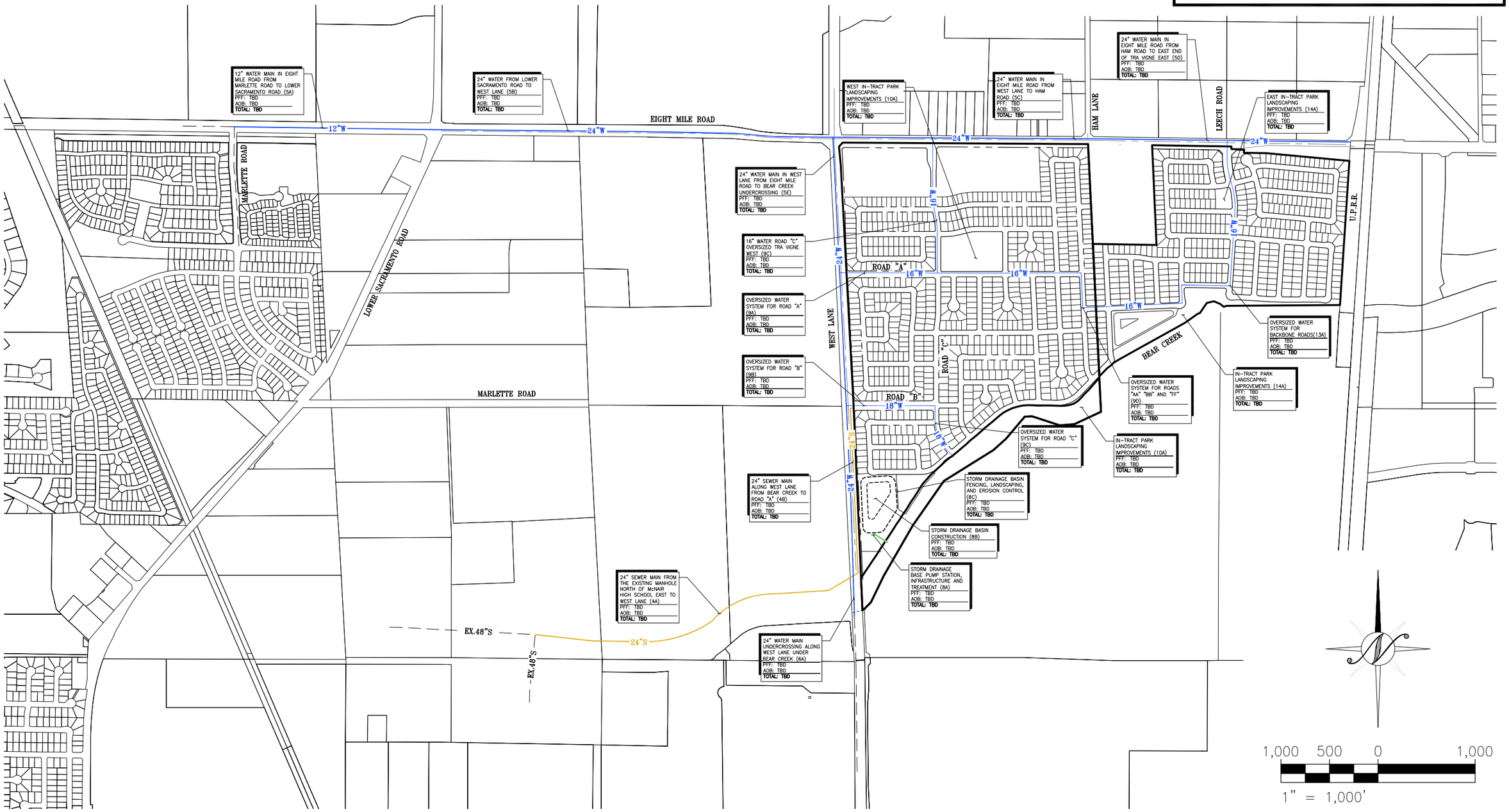
PLOTTED: 9/6/2019 1:03 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Infrastructure and Phasing Exhibits\Offsite Intersection Infrastructure PFF & AOB Exhibit.dwg

EX 3.1

OFF-SITE AND ON-SITE UTILITY INFRASTRUCTURE REIMBURSEMENT AND AOB EXHIBIT

SEPTEMBER 13, 2019

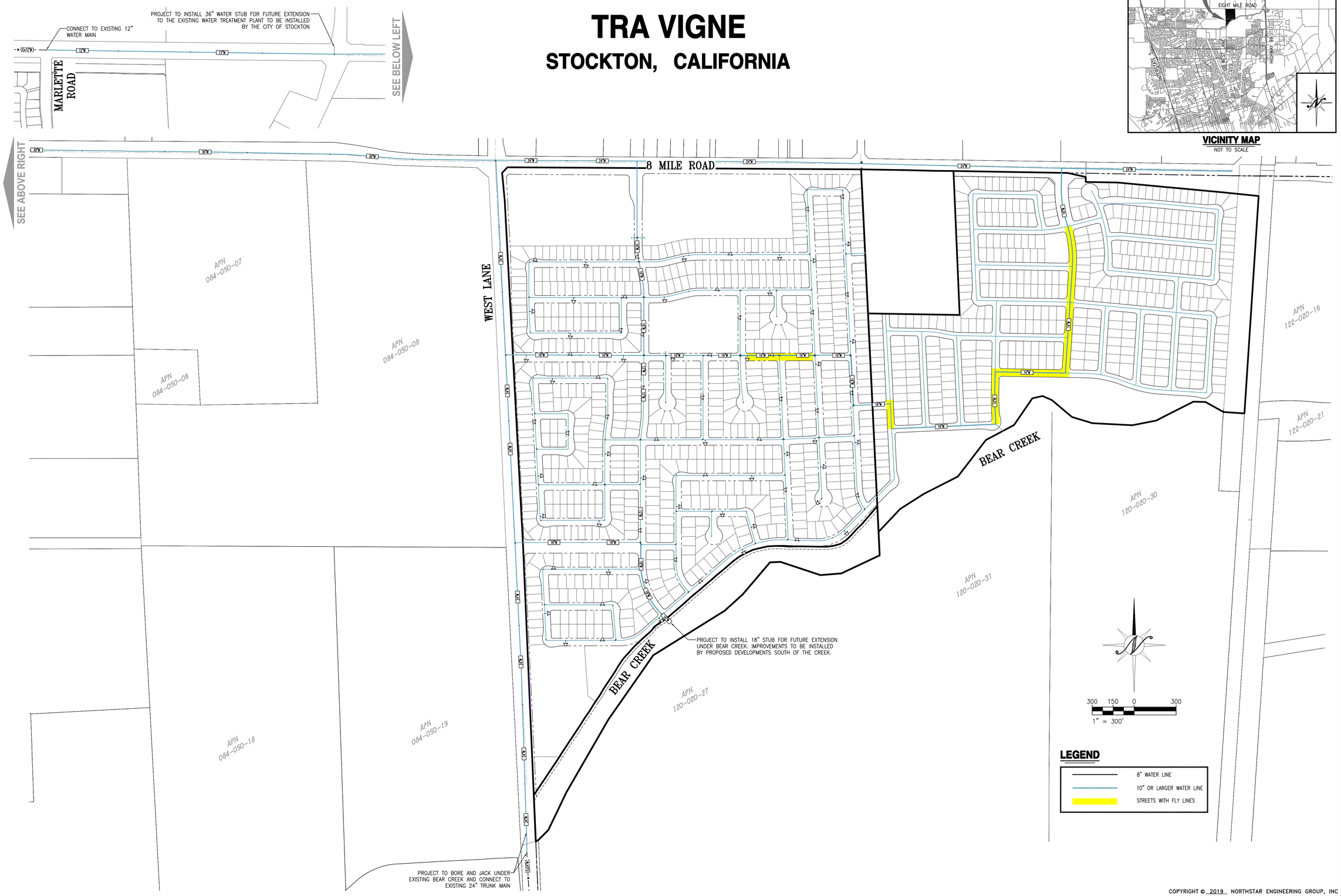
NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 9/6/2019 1:04 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Infrastructure and Phasing Exhibits\Offsite Infrastructure PFF & AOB Exhibit.dwg

PRELIMINARY MAJOR WATER INFRASTRUCTURE SYSTEM
TRA VIGNE
STOCKTON, CALIFORNIA



COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 09/06/2019 10:52 PLOTTED BY: Phuthon
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Utility Exhibits\W1.1 Water Exhibit.dwg

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY P. DELEY STATE OF CALIFORNIA

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS			
NO.	DESCRIPTIONS	DATE	APPROVED

PRELIMINARY MAJOR WATER INFRASTRUCTURE SYSTEM

TRA VIGNE SUBDIVISION

STOCKTON, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-1525 Phone (209) 524-3526 Fax

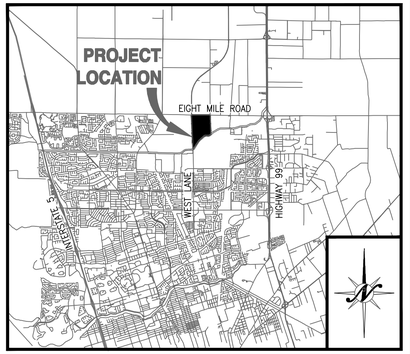
JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	CV/PMH
DESIGN:	CV
CHK'D:	APD

SHEET NUMBER

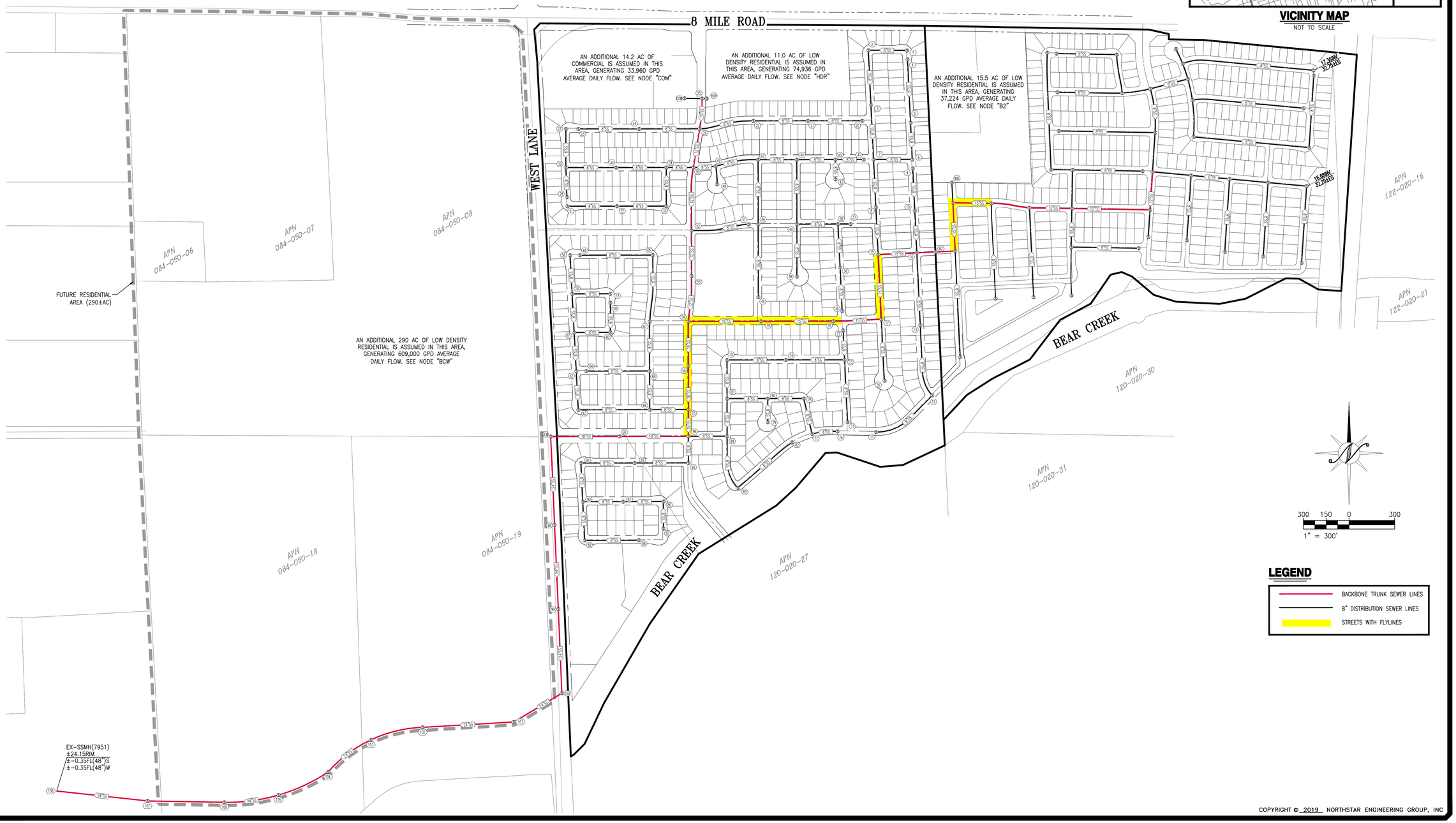
W1.1

Attachment I

PRELIMINARY MAJOR SEWER INFRASTRUCTURE SYSTEM
TRA VIGNE
STOCKTON, CALIFORNIA



VICINITY MAP
NOT TO SCALE



LEGEND

- BACKBONE TRUNK SEWER LINES
- 8" DISTRIBUTION SEWER LINES
- STREETS WITH FLYLINES

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 09/13/2019 09:31 PLOTTED BY: Phuphan
DWGNAME: F:\15-1532 Bear Creek East\Civil\Calcs & Reports\Sewer\DWG\2017_04-24\A1.1 Sewer Exhibit.dwg

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY P. DIAZ C 71331 STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS			
NO.	DESCRIPTIONS	DATE	APPROVED

PRELIMINARY MAJOR SEWER INFRASTRUCTURE SYSTEM
TRA VIGNE SUBDIVISION
STOCKTON, CALIFORNIA

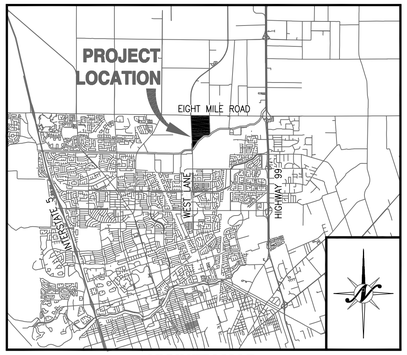
NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	CV/PMH
DESIGN:	CV
CHK'D:	APD

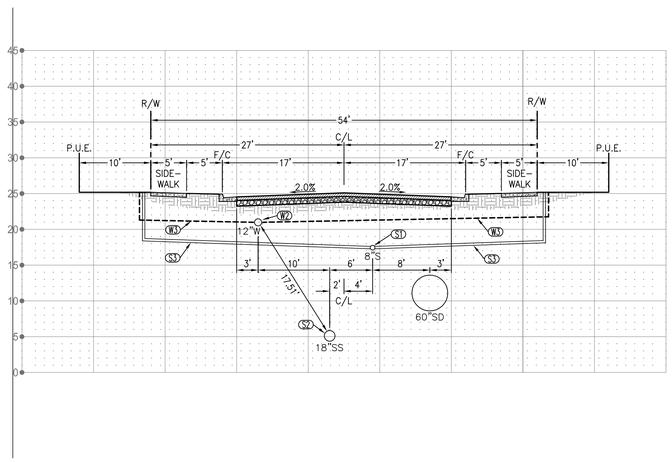
SHEET NUMBER

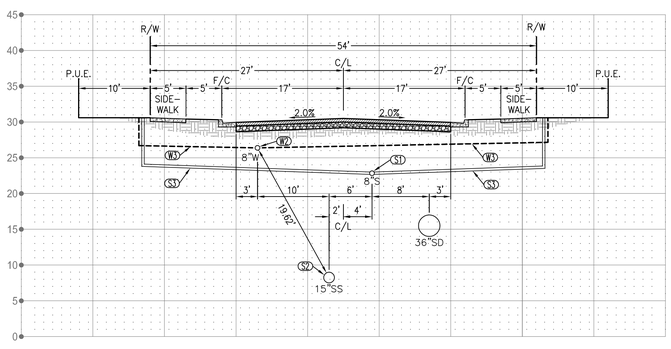
A1.1

PRELIMINARY MAJOR SEWER INFRASTRUCTURE SYSTEM
TRA VIGNE
STOCKTON, CALIFORNIA



VICINITY MAP
NOT TO SCALE





LEGEND

- W1 WATER SERVICE (FLY) LINE
- W2 WATER TRUNK LINE
- W3 WATER LATERAL
- S1 SEWER SERVICE (FLY) LINE
- S2 SEWER TRUNK LINE
- S3 SEWER LATERAL
- STREETS WITH (FLY) LINES

300 150 0 300
1" = 300'

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

CALL BEFORE YOU DIG 800-227-2600

REGISTERED PROFESSIONAL ENGINEER ANTHONY P. DIAZ STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTIONS	DATE	APPROVED

REVISIONS

PRELIMINARY MAJOR SEWER INFRASTRUCTURE SYSTEM
TRA VIGNE SUBDIVISION
STOCKTON, CALIFORNIA

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-1525 Phone (209) 524-3526 Fax

JOB #:	15-1532
DATE:	09/13/2019
SCALE:	AS SHOWN
DRAWN:	CV/PMH
DESIGN:	CV
CHK'D:	APD

SHEET NUMBER

A1.2

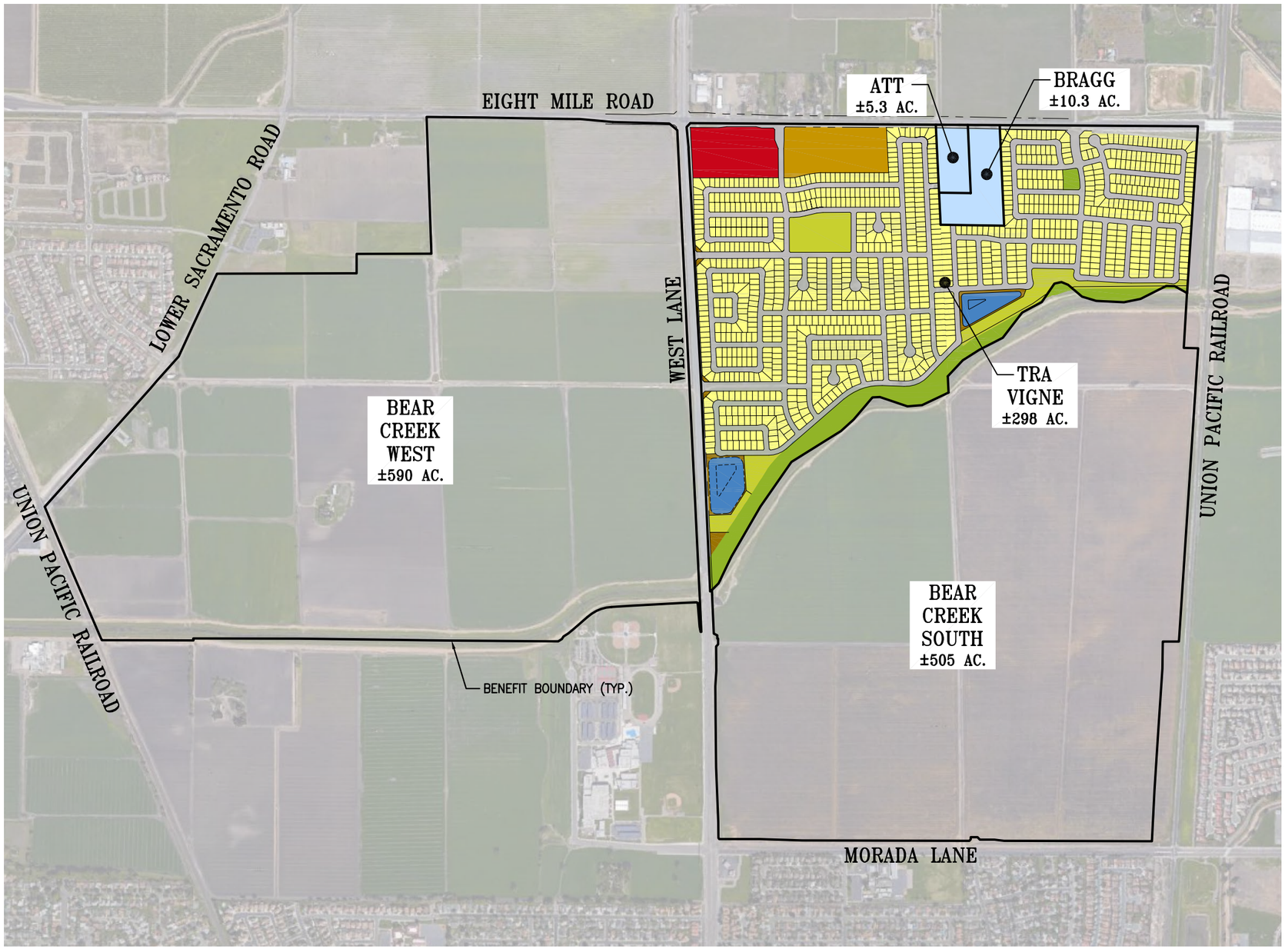
PLOTTED: 09/06/2019 09:58 PLOTTED BY: Phuthon
DWGNAME: F:\15-1532 Bear Creek East\Civil\Calcs & Reports\Sewer\CAD\2017_04-24\A1.2 Sewer Cross Section Exhibit.dwg

EX 1.1

PROJECT REFERENCE MAP
FOR AREA OF BENEFIT ANALYSIS

FEBRUARY 27, 2019

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax



SHEET INDEX

1. EX1.1 AREA OF BENEFIT EXHIBIT WITH TABLE OF CONTENTS
2. EX2.1 OFFSITE STREET INFRASTRUCTURE PFF & AOB EXHIBIT
3. EX2.2 WEST LANE CROSS SECTION EXHIBIT
4. EX2.3 WEST LANE GEOMETRICS EXHIBIT
5. EX2.4 EIGHT MILE ROAD CROSS SECTION EXHIBIT
6. EX2.5 EIGHT MILE ROAD GEOMETRICS EXHIBIT
7. EX2.6 OFFSITE INTERSECTION INFRASTRUCTURE PFF & AOB EXHIBIT
8. EX3.1 OFF-SITE AND ON-SITE INFRASTRUCTURE REIMBURSMENT AND AOB EXHIBIT
9. EX4.1 TRA VIGNE IN-TRACT PHASING PLAN
10. EX5.1 ONSITE BACKBONE COST ESTIMATE EXHIBIT
11. EX6.1 TRA VIGNE PHASE 1 INFRASTRUCTURE
12. EX6.2 TRA VIGNE PHASE 2 INFRASTRUCTURE
13. EX6.3 TRA VIGNE PHASE 3 INFRASTRUCTURE
14. EX6.4 TRA VIGNE PHASE 4 INFRASTRUCTURE
15. EX6.5 TRA VIGNE PHASE 5 INFRASTRUCTURE
16. EX6.6 TRA VIGNE PHASE 6 INFRASTRUCTURE
17. EX6.7 TRA VIGNE PHASE 7 INFRASTRUCTURE
18. EX6.8 TRA VIGNE PHASE 8 INFRASTRUCTURE
19. EX6.9 TRA VIGNE PHASE 9 INFRASTRUCTURE
20. EX6.10 TRA VIGNE PHASE 10 INFRASTRUCTURE
21. EX6.11 TRA VIGNE PHASE 11 INFRASTRUCTURE
22. EX6.12 TRA VIGNE PHASE 12 INFRASTRUCTURE
23. EX7.1 TRA VIGNE EAST PHASE 1 INFRASTRUCTURE
24. EX7.2 TRA VIGNE EAST PHASE 2 INFRASTRUCTURE
25. EX7.3 TRA VIGNE EAST PHASE 3 INFRASTRUCTURE
26. EX7.4 TRA VIGNE EAST PHASE 4 INFRASTRUCTURE

1,200 600 0 1,200

1" = 1,200'

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 3:51 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Area of Benefit Exhibits\Area of Benefit Exhibit.dwg

Attachment I

NorthStar Engineering Group, Inc.
* CIVIL ENGINEERING * SURVEYING * PLANNING *
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 4.1

LOT LAYOUT EXHIBIT
SCENARIO 43.a.2 PHASING
NO BRIDGE, NO SCHOOL
SEPTEMBER 13, 2019

300 150 0 300 600
1" = 300'

LAND USE LEGEND-WEST SIDE

	COMMERCIAL	10.4 ACRES
	TRADITIONAL PARK AREA	7.9 ACRES
	NON-TRADITIONAL PARK AREA	13.75 ACRES
	TOTAL RL LOTS	747
	TOTAL HD UNITS	340

LAND USE LEGEND-EAST SIDE

	TRADITIONAL PARK AREA	5.57 ACRES
	NON-TRADITIONAL PARK AREA	6.61 ACRES
	TOTAL RL LOTS	418

LAND USE LEGEND-TOTAL

	COMMERCIAL	10.4 ACRES
	TRADITIONAL PARK AREA	13.5 ACRES
	NON-TRADITIONAL PARK AREA	20.36 ACRES
	TOTAL RL LOTS	1,165
	TOTAL HD UNITS	340

PLOTTED: 9/16/2019 1:11 PM PLOTTED BY: Phuhsin
PATHNAME: R:\N2-252 Bear Creek East\Planning\Models\Site Plans\Bear Creek East Phasing Site Plan Exhibit Scenario 43.a.2 No Bridge No School.dwg

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 5.1
IN-TRACT BACKBONE IMPROVEMENTS

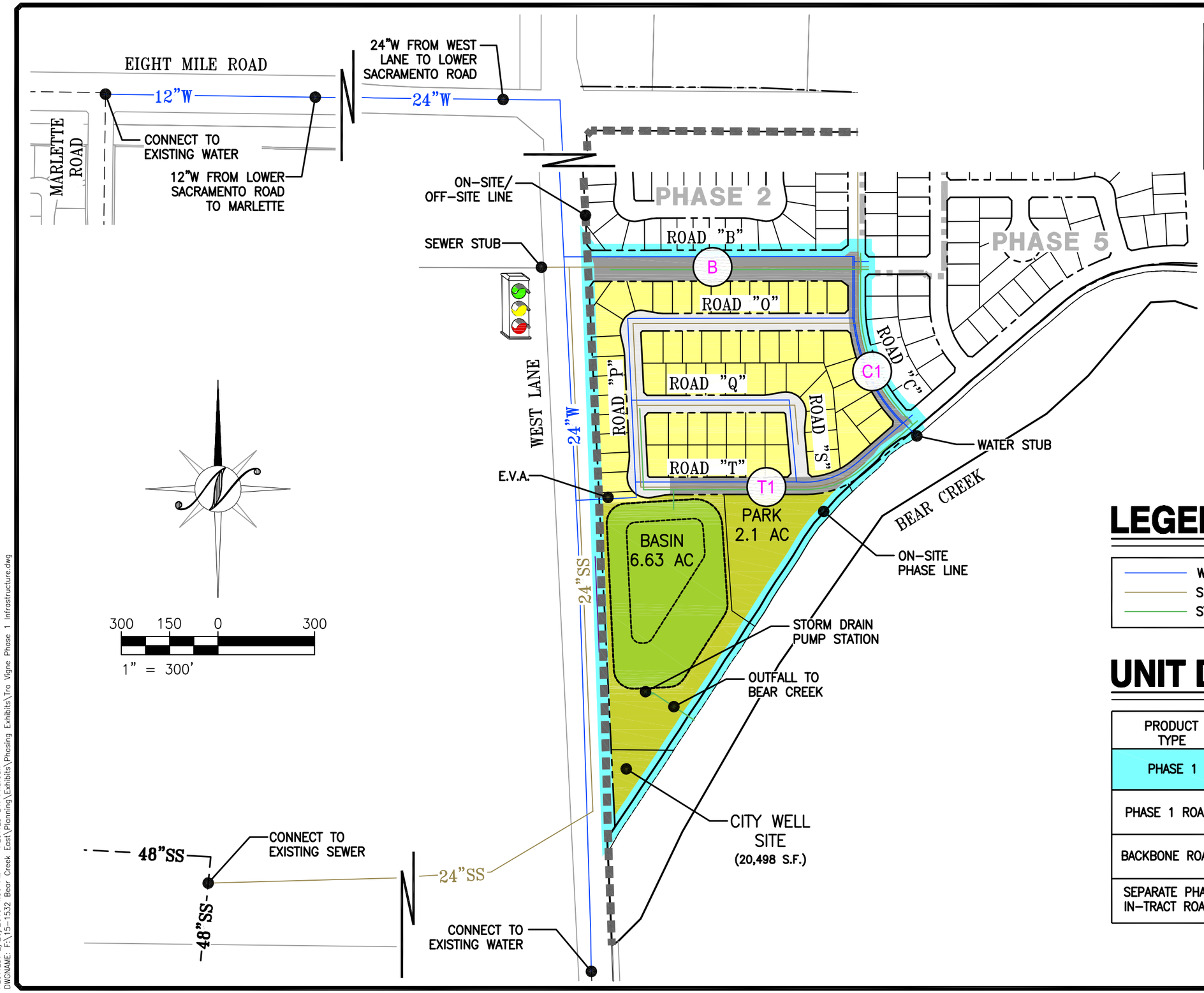
SEPTEMBER 13, 2019

LEGEND

- ROAD "A"– SEGMENTS (A1), (A2), AND (A3)
- ROAD "B"– SEGMENT (B)
- ROAD "C"– SEGMENTS (C1), (C2), (C3), (C4), AND (C5)
- ROADS "AA", "BB", AND "FF"– SEGMENTS (BB1), (BB2), (BB3), (AA), AND (FF)
- ROAD "E"– SEGMENT (E)–EAST OF ROAD "C"
- ROAD "T"– SEGMENT (T)
- IN–TRACT PARKS, LANDSCAPING, OPEN SPACE, AND RECREATIONAL IMPROVEMENTS– WEST PARK A
- IN–TRACT PARKS, LANDSCAPING, OPEN SPACE, AND RECREATIONAL IMPROVEMENTS– WEST PARK B
- IN–TRACT PARKS, LANDSCAPING, OPEN SPACE, AND RECREATIONAL IMPROVEMENTS– EAST
- IN–TRACT PARKS, LANDSCAPING, OPEN SPACE, AND RECREATIONAL IMPROVEMENTS– BEAR CREEK OPEN SPACE
- TRA VIGNE EAST (E1) AND (E2)

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 9/10/2019 3:42 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Infrastructure and Phasing Exhibits\Onsite Backbone Cost Estimate Exhibit.dwg



NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.1

TRA VIGNE PHASE 1 INFRASTRUCTURE

FEBRUARY 27, 2019

LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 1	–	–	62	62
PHASE 1 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

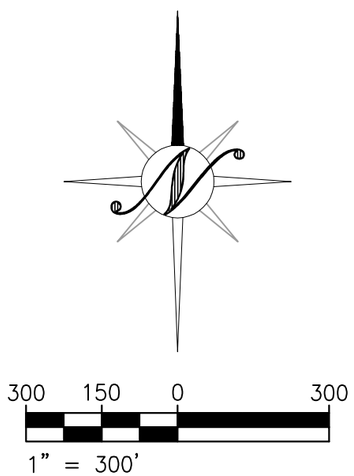
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/26/2019 4:56 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 1 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.2
TRA VIGNE PHASE 2 INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 2	66	–	–	66
PHASE 2 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/26/2019 4:57 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 2 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.3
TRA VIGNE PHASE 3 INFRASTRUCTURE

FEBRUARY 27, 2019

LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 3	–	76	–	76
PHASE 3 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS	SEE EXHIBIT 6.2			

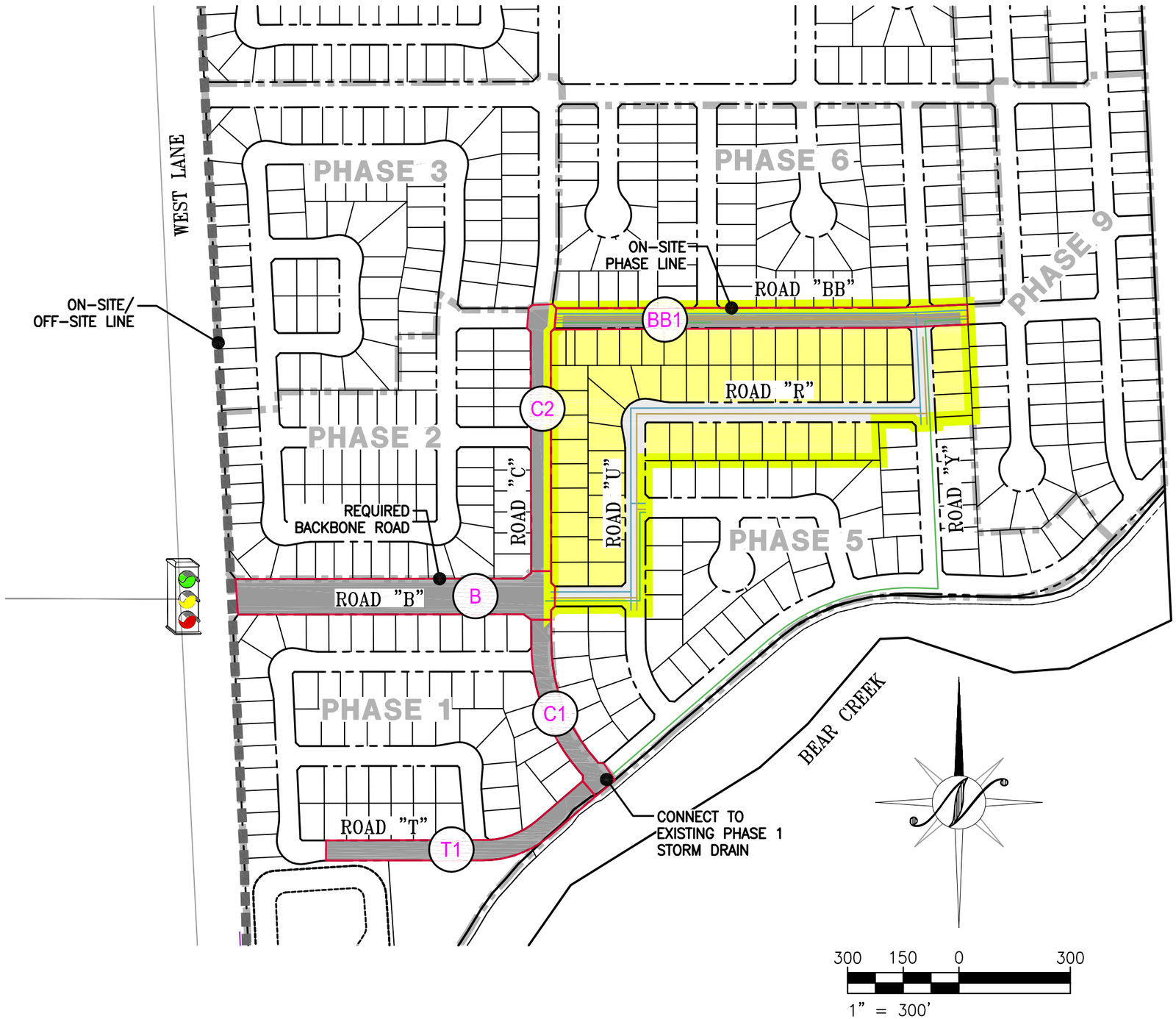
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 7:55 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 3 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.4
TRA VIGNE
PHASE 4
INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 4	–	–	60	60
PHASE 4 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

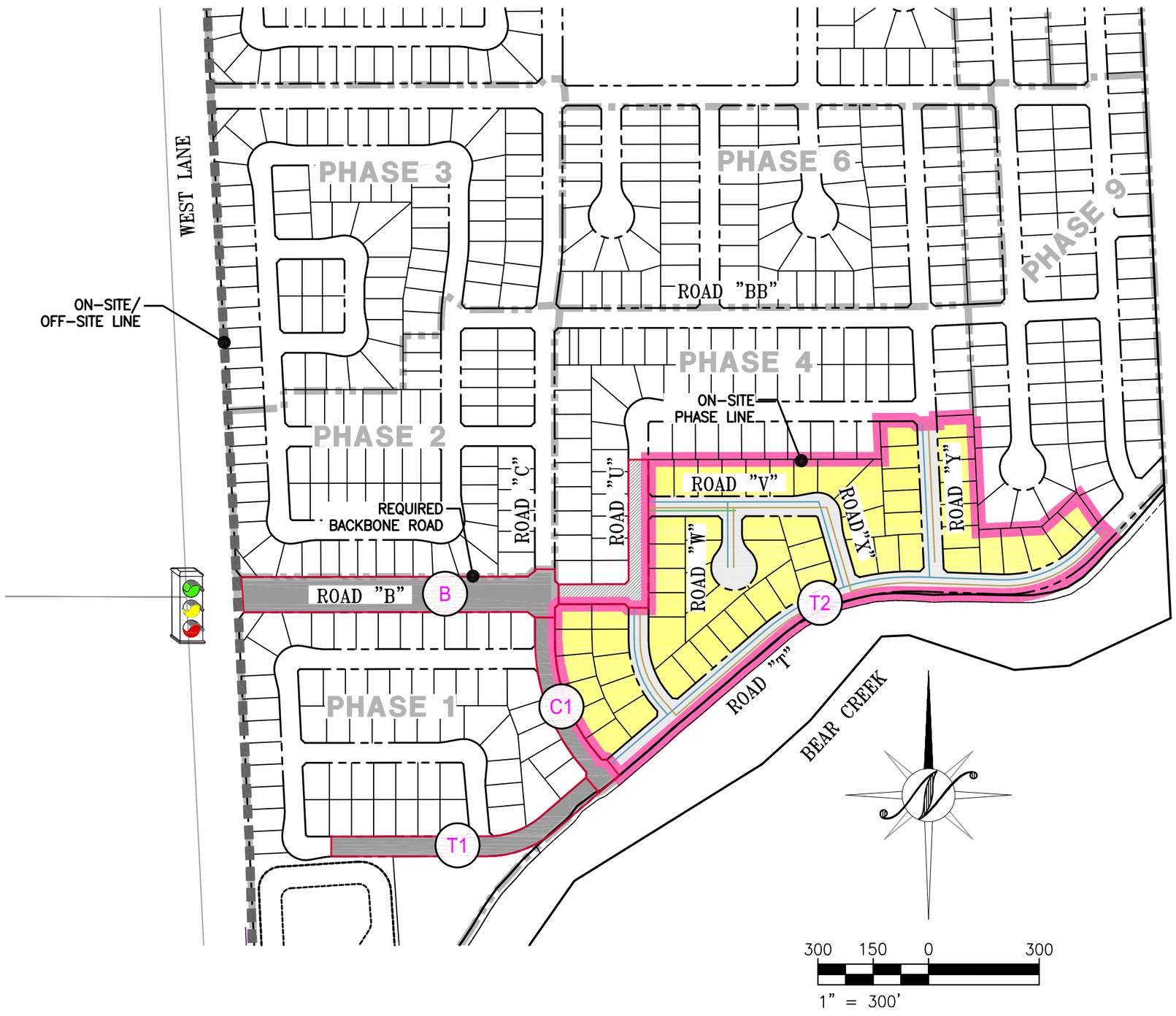
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 8:48 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 4 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.5
TRA VIGNE
PHASE 5
INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 5	–	–	57	57
PHASE 5 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS	SEE EXHIBIT 6.4			

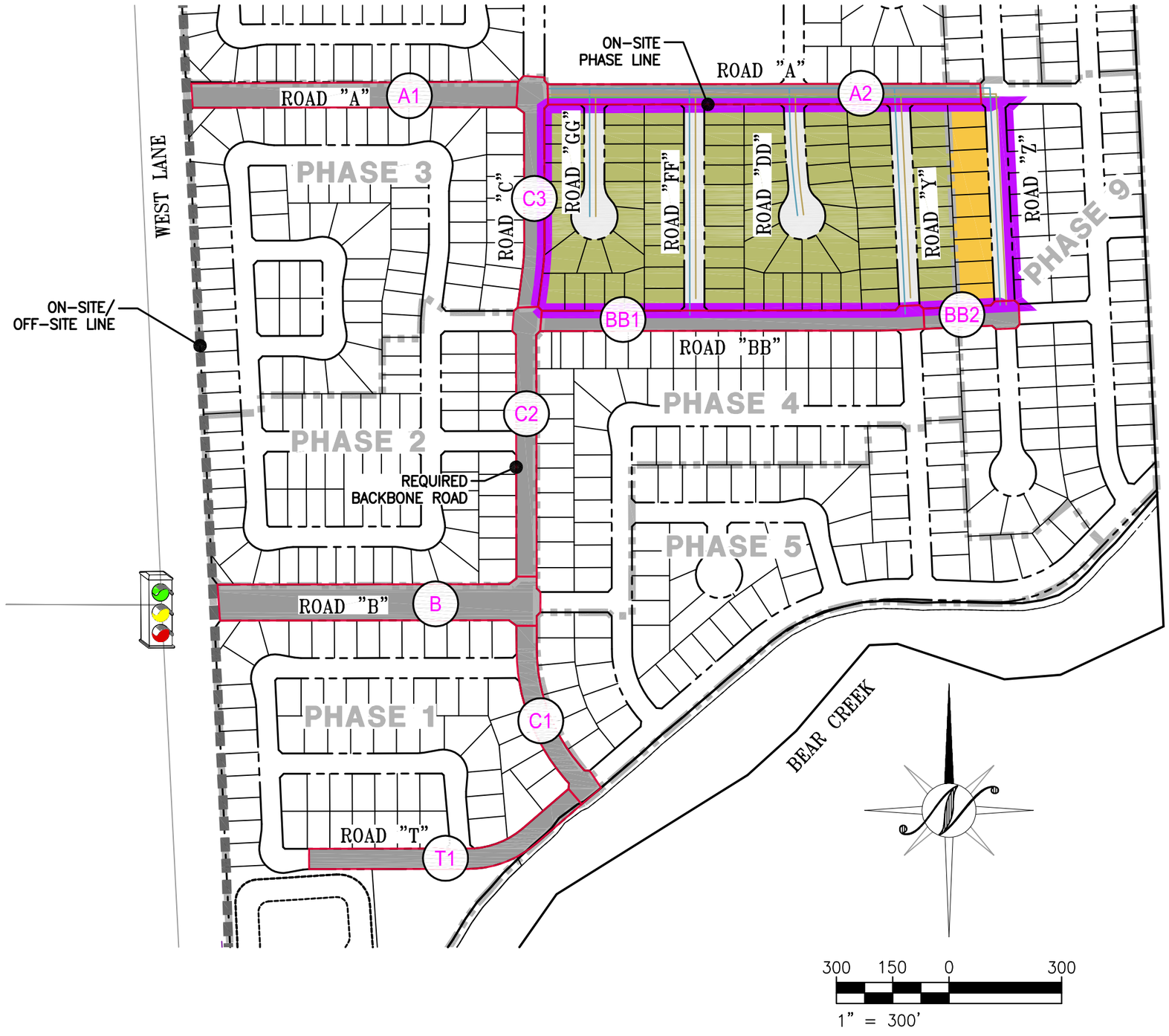
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 8:13 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 5 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.6
TRA VIGNE
PHASE 6
INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 6	82	–	–	82
PHASE 6a	–	9	–	9
PHASE 6 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

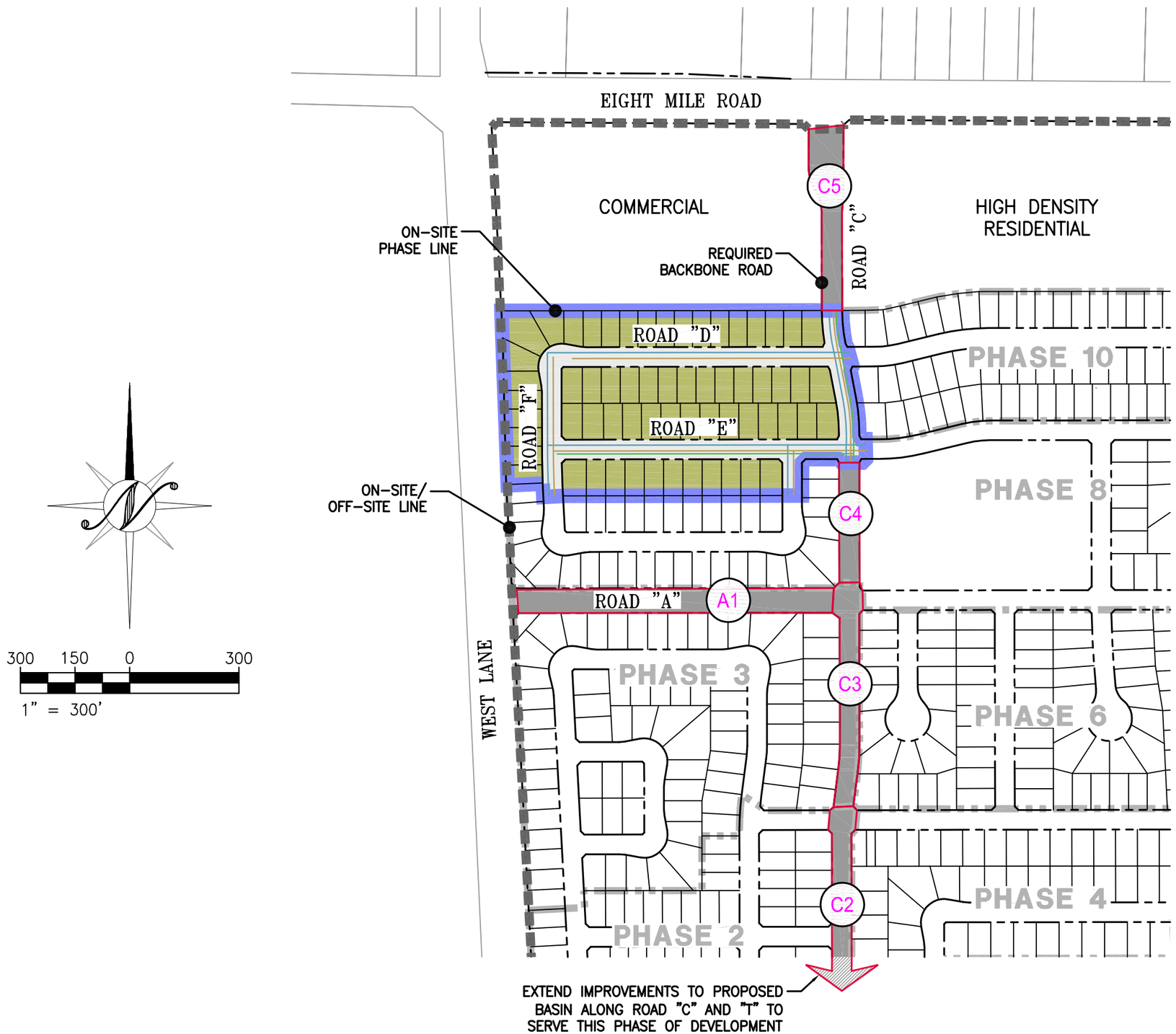
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 8:24 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 6 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.7
TRA VIGNE PHASE 7 INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 7	62	–	–	62
PHASE 7 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

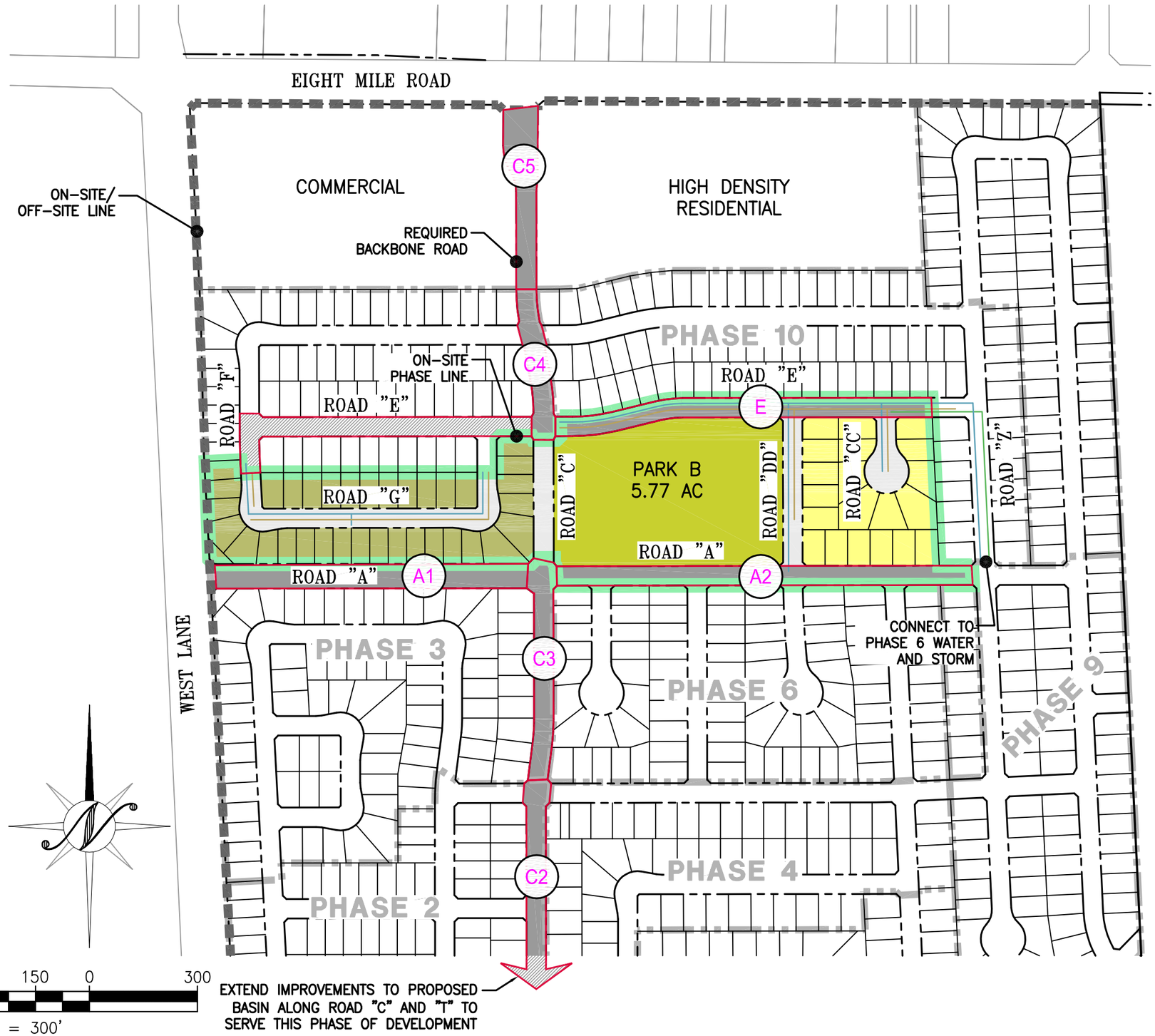
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 8:27 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 7 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.8
TRA VIGNE PHASE 8 INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 8	34	–	20	54
PHASE 8 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS	SEE EXHIBIT 6.7			

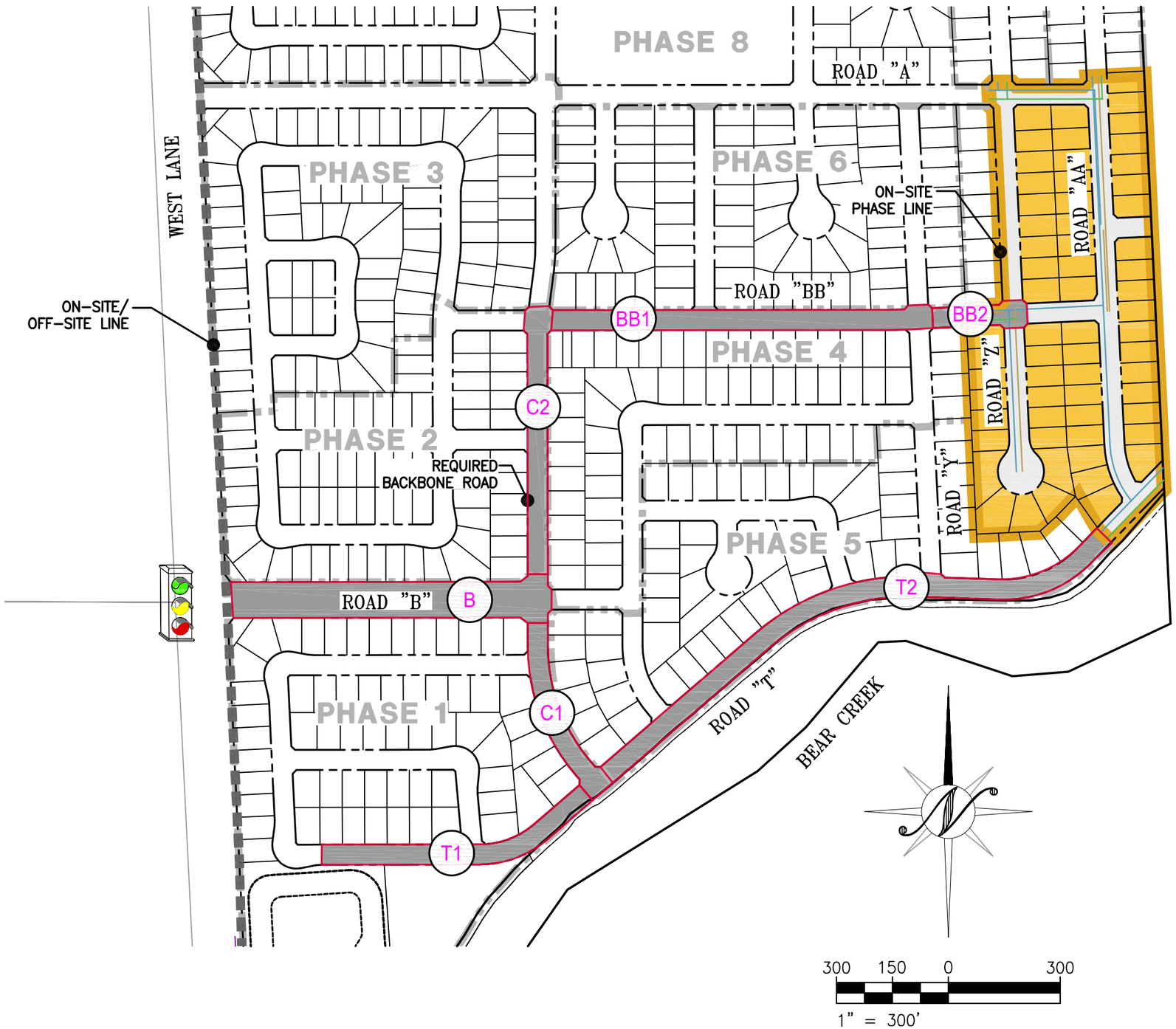
PLOTTED: 2/27/2019 8:50 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 8 Infrastructure.dwg

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.9
TRA VIGNE
PHASE 9
INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 9	–	62	–	62
PHASE 9 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

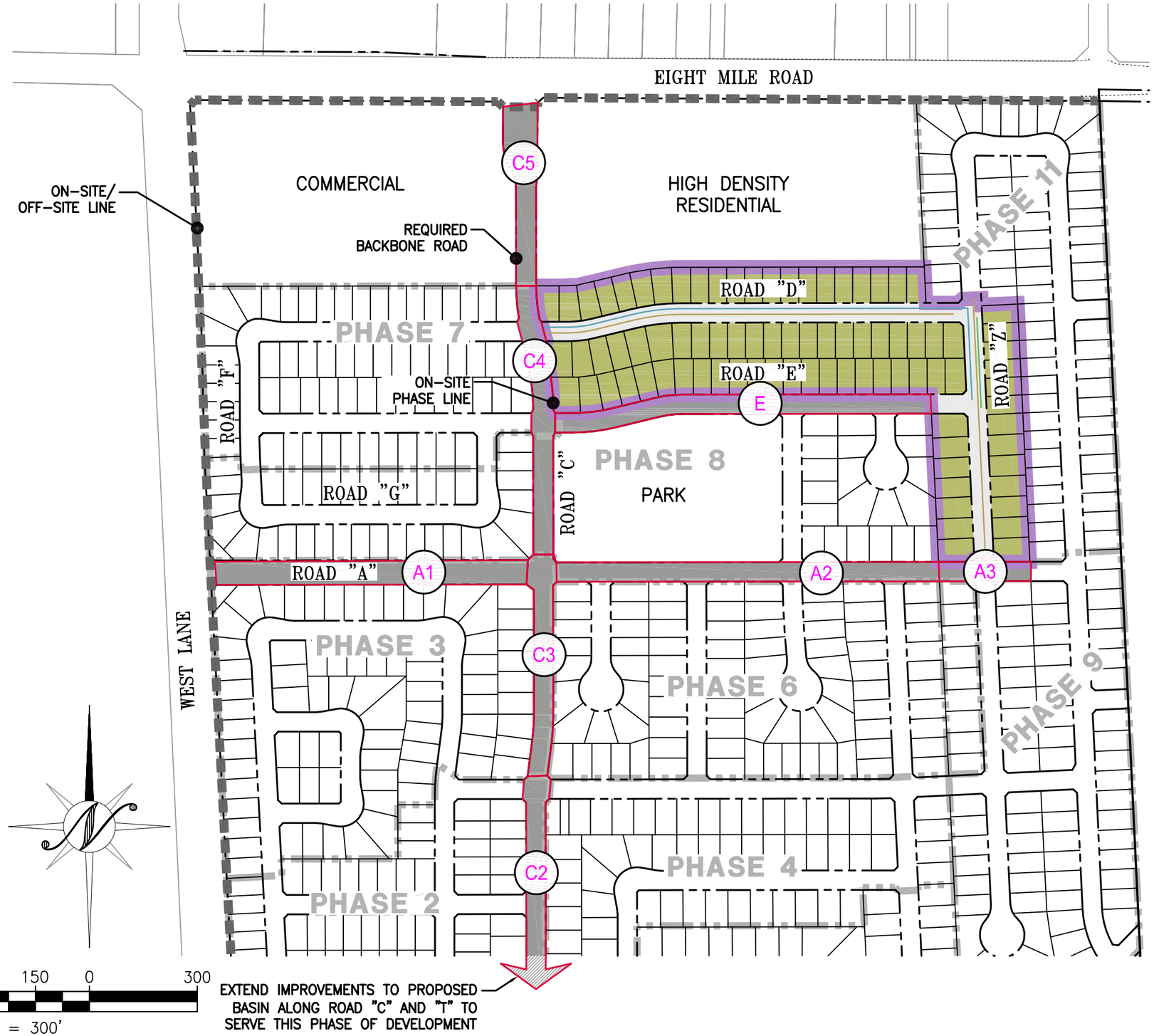
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 8:37 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Beor Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 9 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.10
TRA VIGNE PHASE 10 INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 10	85	–	–	85
PHASE 10 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS				

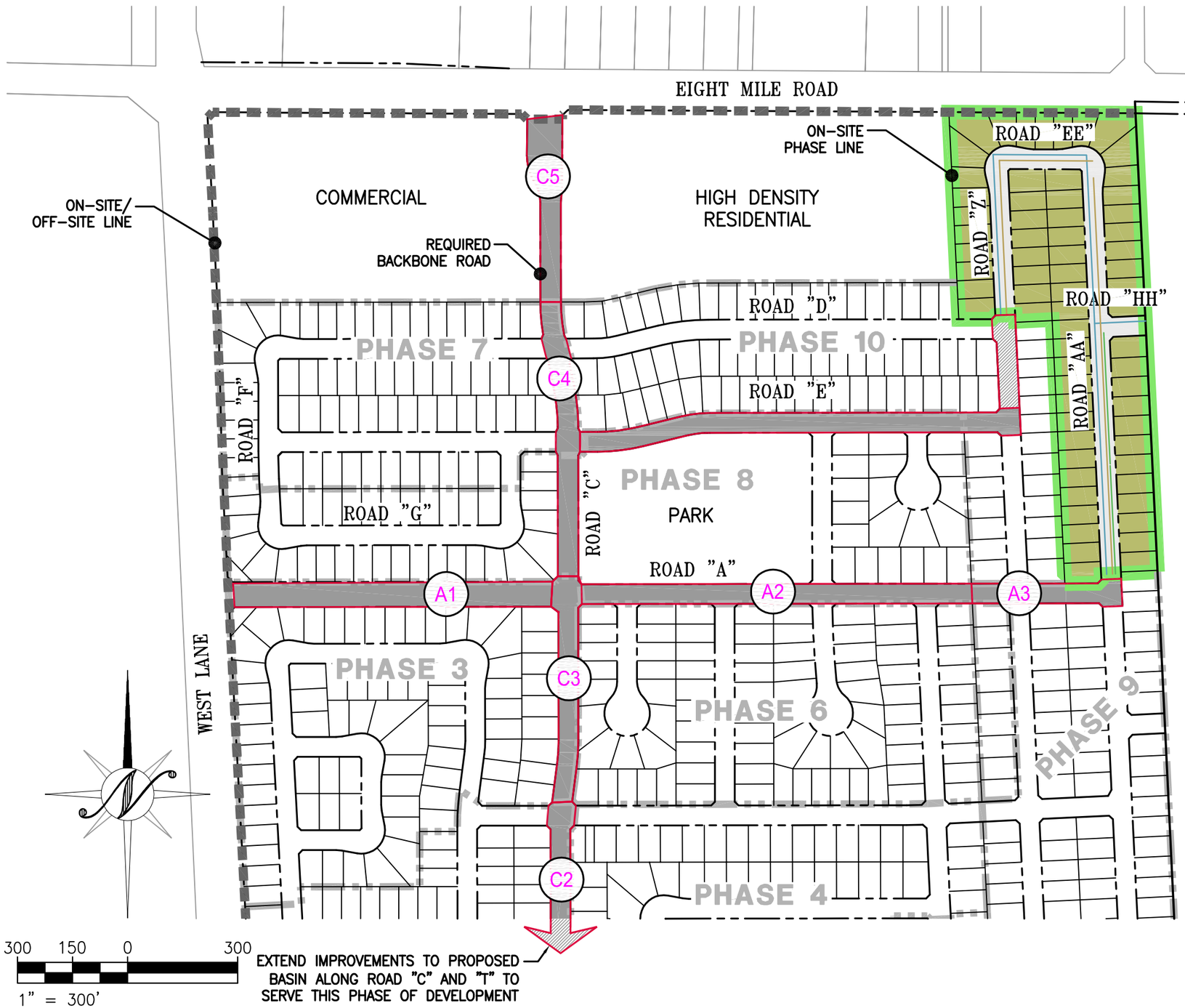
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 8:41 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 10 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.11
TRA VIGNE PHASE 11 INFRASTRUCTURE

FEBRUARY 27, 2019



LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 11	67	–	–	67
PHASE 11 ROADS				
BACKBONE ROADS	T1 SEE EXHIBIT 5.1			
SEPARATE PHASE IN-TRACT ROADS	SEE EXHIBIT 6.10			

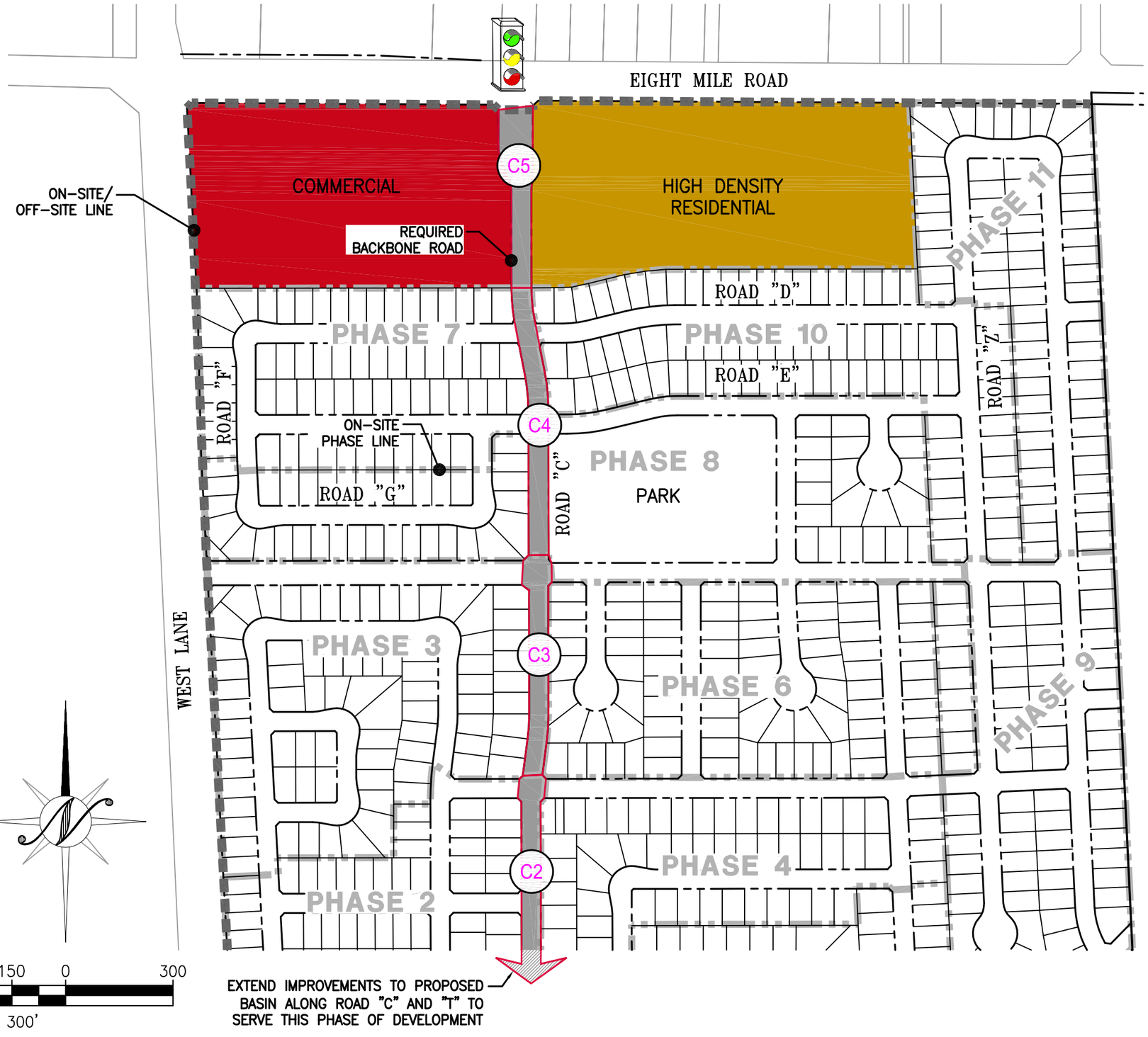
PLOTTED: 2/27/2019 8:44 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 11 Infrastructure.dwg

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 6.12
TRA VIGNE
PHASE 12
INFRASTRUCTURE

FEBRUARY 27, 2019



NOTE

IF MULTI-FAMILY/ COMMERCIAL SITES ARE DEVELOPED FIRST, NECESSARY EIGHT MILE ROAD AND WEST LANE ROADWAY AND INFRASTRUCTURE IMPROVEMENTS ARE REQUIRED.

LAND DISTRIBUTION

PRODUCT TYPE	COMMERCIAL (CM)	MULTI-FAMILY (MF)
UNIT COUNT		340
BACKBONE ROADS	T1 SEE EXHIBIT 5.1	
SEPARATE PHASE IN-TRACT ROADS		

PLOTTED: 2/27/2019 8:47 AM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne Phase 12 Infrastructure.dwg

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 7.1

TRA VIGNE EAST PHASE 1 INFRASTRUCTURE

FEBRUARY 27, 2019

LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 1	109	–	–	109
PHASE 1 ROADS				
BACKBONE ROADS	E1	SEE EXHIBIT 5.1		
SEPARATE PHASE IN-TRACT ROADS				

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 3:22 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne East\Tra Vigne East Phase 1 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 7.2

TRA VIGNE EAST PHASE 2 INFRASTRUCTURE

FEBRUARY 27, 2019

LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 2	–	102	–	102
PHASE 2 ROADS				
BACKBONE ROADS	E1	SEE EXHIBIT 5.1		
SEPARATE PHASE IN-TRACT ROADS				

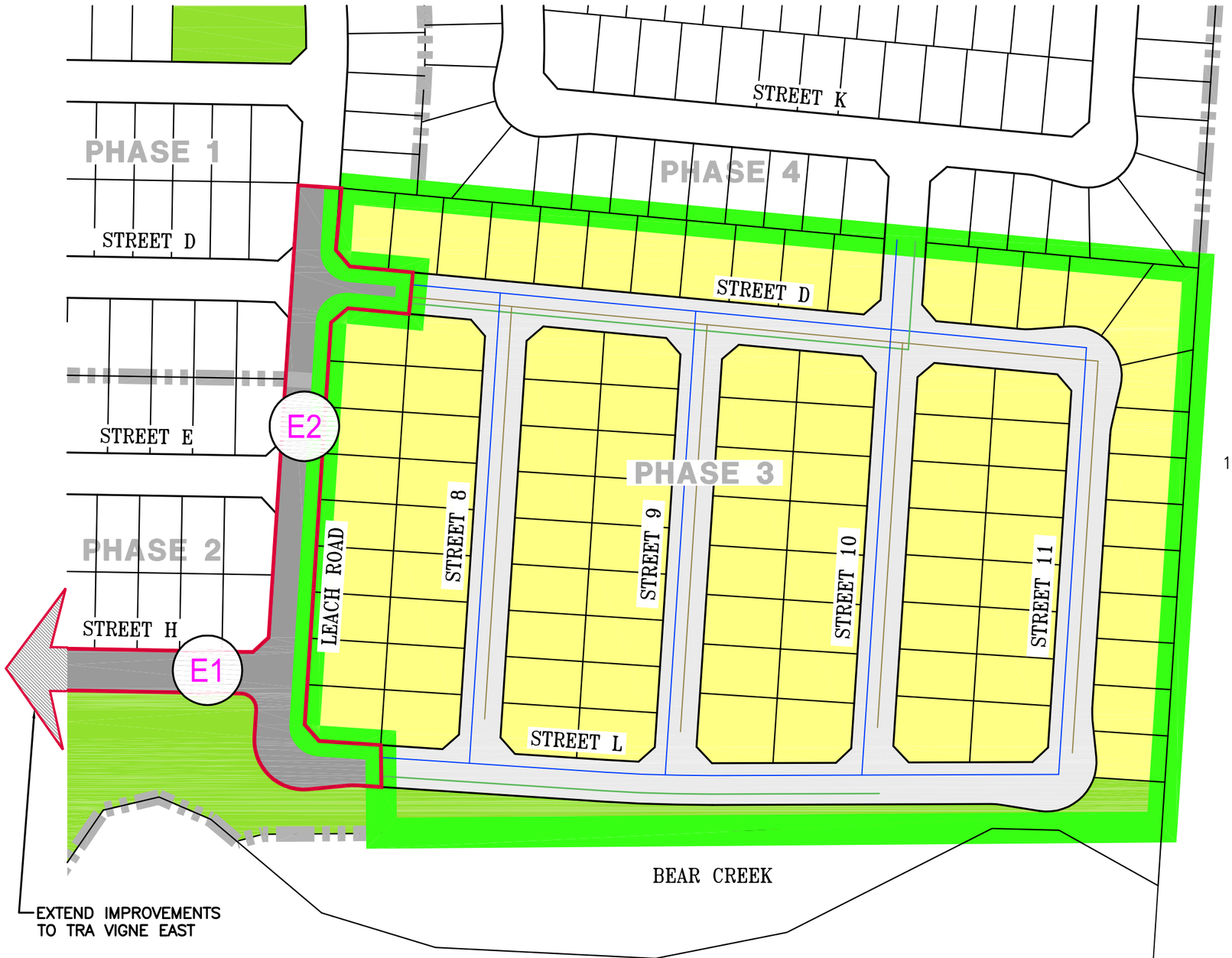
COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 3:27 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne East\Tra Vigne East Phase 2 Infrastructure.dwg

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 7.3
TRA VIGNE EAST PHASE 3 INFRASTRUCTURE

FEBRUARY 27, 2019



150 75 0 150

1" = 150'

LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 3	–	–	93	93
PHASE 3 ROADS				
BACKBONE ROADS	E1	SEE EXHIBIT 5.1		
SEPARATE PHASE IN-TRACT ROADS				

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 3:36 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne East\Tra Vigne East Phase 3 Infrastructure.dwg

NorthStar
Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phone (209) 524-3526 Fax

EX 7.4
TRA VIGNE EAST
PHASE 4
INFRASTRUCTURE

FEBRUARY 27, 2019

150 75 0 150
1" = 150'

LEGEND

- WATER MAIN
- SEWER MAIN
- STORM MAIN

UNIT DISTRIBUTION

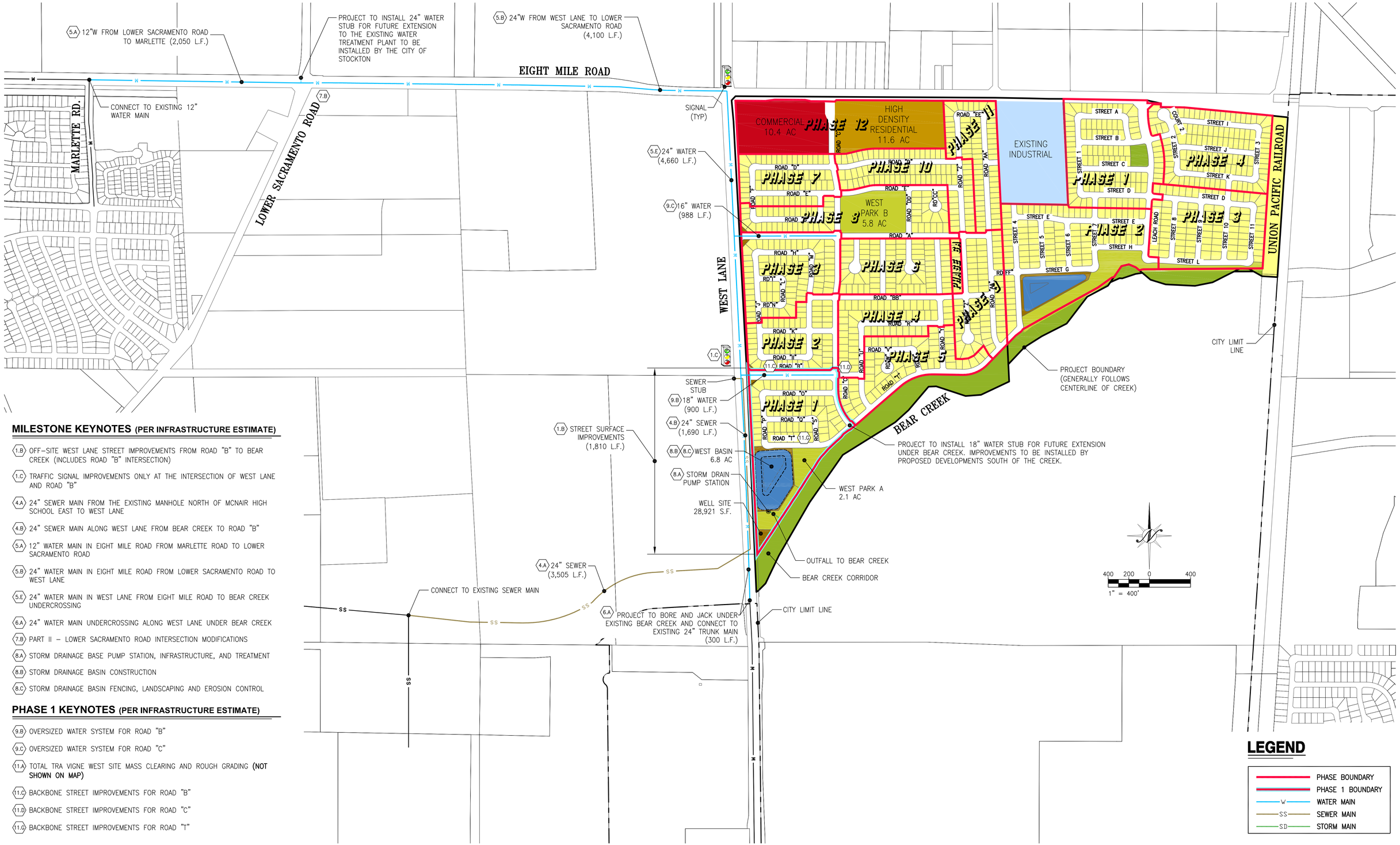
PRODUCT TYPE	5,000 SF	5,500 SF	6,000 SF	TOTAL
PHASE 4	114	–	–	114
PHASE 4 ROADS				
BACKBONE ROADS	E1	SEE EXHIBIT 5.1		
SEPARATE PHASE IN-TRACT ROADS				

COPYRIGHT © 2019 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 2/27/2019 3:43 PM PLOTTED BY: Phurban
DWGNAME: F:\15-1532 Bear Creek East\Planning\Exhibits\Phasing Exhibits\Tra Vigne East\Tra Vigne East Phase 4 Infrastructure.dwg

EXHIBIT E
MILESTONE IMPROVEMENTS AND PHASE 1
SEPTEMBER 13, 2019

NorthStar Engineering Group, Inc.
• CIVIL ENGINEERING • SURVEYING • PLANNING •
620 12th Street Modesto, CA 95354
(209) 524-3525 Phase (209) 524-3526 Fax



MILESTONE KEYNOTES (PER INFRASTRUCTURE ESTIMATE)

- 1.B OFF-SITE WEST LANE STREET IMPROVEMENTS FROM ROAD "B" TO BEAR CREEK (INCLUDES ROAD "B" INTERSECTION)
- 1.C TRAFFIC SIGNAL IMPROVEMENTS ONLY AT THE INTERSECTION OF WEST LANE AND ROAD "B"
- 4.A 24" SEWER MAIN FROM THE EXISTING MANHOLE NORTH OF MCNAIR HIGH SCHOOL EAST TO WEST LANE
- 4.B 24" SEWER MAIN ALONG WEST LANE FROM BEAR CREEK TO ROAD "B"
- 5.A 12" WATER MAIN IN EIGHT MILE ROAD FROM MARLETTE ROAD TO LOWER SACRAMENTO ROAD
- 5.B 24" WATER MAIN IN EIGHT MILE ROAD FROM LOWER SACRAMENTO ROAD TO WEST LANE
- 5.E 24" WATER MAIN IN WEST LANE FROM EIGHT MILE ROAD TO BEAR CREEK UNDERCROSSING
- 6.A 24" WATER MAIN UNDERCROSSING ALONG WEST LANE UNDER BEAR CREEK
- 7.B PART II – LOWER SACRAMENTO ROAD INTERSECTION MODIFICATIONS
- 8.A STORM DRAINAGE BASE PUMP STATION, INFRASTRUCTURE, AND TREATMENT
- 8.B STORM DRAINAGE BASIN CONSTRUCTION
- 8.C STORM DRAINAGE BASIN FENCING, LANDSCAPING AND EROSION CONTROL

PHASE 1 KEYNOTES (PER INFRASTRUCTURE ESTIMATE)

- 9.B OVERSIZED WATER SYSTEM FOR ROAD "B"
- 9.C OVERSIZED WATER SYSTEM FOR ROAD "C"
- 11.A TOTAL TRA VIGNE WEST SITE MASS CLEARING AND ROUGH GRADING **(NOT SHOWN ON MAP)**
- 11.C BACKBONE STREET IMPROVEMENTS FOR ROAD "B"
- 11.D BACKBONE STREET IMPROVEMENTS FOR ROAD "C"
- 11.G BACKBONE STREET IMPROVEMENTS FOR ROAD "T"

COPYRIGHT © 2020 NORTHSTAR ENGINEERING GROUP, INC

PLOTTED: 1/21/2020 10:36 AM PLOTTED BY: Phurbu
DRAWING: S:\15-1500 Bear Creek Estates\Dwg\Milestone Exhibits\Exhibit E- Milestone Improvements and Phase 1.dwg