




















HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center






























08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Future Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	186	6	19	140	83
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	106	210	79	80	192	19	223					
Volume Left (vph)	73	0	45	80	0	19	0					
Volume Right (vph)	0	210	18	0	6	0	83					
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16					
Departure Headway (s)	6.5	5.4	6.4	6.6	6.1	6.8	5.9					
Degree Utilization, x	0.19	0.32	0.14	0.15	0.32	0.04	0.36					
Capacity (veh/h)	522	625	511	520	564	501	582					
Control Delay (s)	9.8	9.7	10.5	9.5	10.7	8.8	11.0					
Approach Delay (s)	9.7		10.5	10.4		10.8						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			10.3									
Level of Service			B									
Intersection Capacity Utilization			36.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W



























08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	42	1362	75	81	812	75	179	140	99	206	120	69
Future Volume (vph)	42	1362	75	81	812	75	179	140	99	206	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Fl t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1530	84	91	912	84	201	157	111	231	135	78
RTOR Reduction (vph)	0	0	37	0	0	38	0	0	96	0	0	68
Lane Group Flow (vph)	47	1530	47	91	912	46	201	157	15	231	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Effective Green, g (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1784	798	152	1687	776	379	220	190	364	197	176
v/s Ratio Prot	0.03	c0.48		0.03	c0.30		0.07	c0.10		c0.07	0.09	
v/s Ratio Perm			0.03			0.03			0.01			0.01
v/c Ratio	0.52	0.86	0.06	0.60	0.54	0.06	0.53	0.71	0.08	0.63	0.69	0.06
Uniform Delay, d1	54.9	22.5	12.1	55.6	17.1	12.4	49.1	49.7	45.5	50.5	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.84	0.56	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	5.6	0.1	4.5	1.2	0.1	1.0	9.4	0.1	3.0	8.3	0.1
Delay (s)	57.9	28.0	12.2	51.2	10.7	1.5	50.0	59.1	45.6	53.4	58.5	46.3
Level of Service	E	C	B	D	B	A	D	E	D	D	E	D
Approach Delay (s)		28.1			13.3			52.0			53.7	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			29.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			16.5		
Intersection Capacity Utilization			65.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				
Traffic Volume (vph)	19	1523	43	70	915	28	58	3	87	11	5	27
Future Volume (vph)	19	1523	43	70	915	28	58	3	87	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1655	47	76	995	30	63	3	95	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0
Lane Group Flow (vph)	21	1655	34	76	995	23	63	12	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132	
v/s Ratio Prot	0.01	c0.52		c0.05	0.32			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.72	0.04	0.63	0.42	0.02	0.58	0.09		0.12	0.06	
Uniform Delay, d1	57.6	9.7	4.8	53.8	4.6	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.14	0.16	0.03	1.40	0.19	0.13	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	1.2	0.0	7.4	0.5	0.0	6.5	0.2		0.4	0.1	
Delay (s)	69.5	2.8	0.2	82.6	1.4	0.4	58.3	49.5		49.9	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		3.5			6.9			53.0			49.5	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018




























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕↕	↕↕		↵	
Traffic Volume (veh/h)	4	1575	1041	21	52	24
Future Volume (Veh/h)	4	1575	1041	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1694	1119	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.78				0.78	0.78
vC, conflicting volume	1142				1986	571
vC1, stage 1 conf vol					1130	
vC2, stage 2 conf vol					855	
vCu, unblocked vol	627				1704	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				80	97
cM capacity (veh/h)	755				274	854
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	847	847	746	396	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	755	1700	1700	1700	1700	350
Volume to Capacity	0.01	0.50	0.50	0.44	0.23	0.23
Queue Length 95th (ft)	0	0	0	0	0	22
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	18.4
Lane LOS	A					C
Approach Delay (s)	0.0			0.0		18.4
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			58.7%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 						 		
Traffic Volume (vph)	1	1536	90	100	1019	69	42	8	71	214	13	1	
Future Volume (vph)	1	1536	90	100	1019	69	42	8	71	214	13	1	
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		-3%			2%			3%			2%		
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00		
Flt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96		
Satd. Flow (prot)	1607	3214	1480	1614	3111			1601	1465		1575		
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.78	1.00		0.70		
Satd. Flow (perm)	1607	3214	1480	1614	3111			1305	1465		1153		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	1	1670	98	109	1108	75	46	9	77	233	14	1	
RTOR Reduction (vph)	0	0	30	0	4	0	0	0	59	0	0	0	
Lane Group Flow (vph)	1	1670	68	109	1179	0	0	55	18	0	248	0	
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA		
Protected Phases	5	2		1	6			8				4	
Permitted Phases			2				8		8	4			
Actuated Green, G (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5		
Effective Green, g (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5		
Actuated g/C Ratio	0.01	0.56	0.56	0.08	0.63			0.24	0.24		0.24		
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0		
Lane Grp Cap (vph)	13	1807	832	121	1957			309	347		273		
v/s Ratio Prot	0.00	c0.52		c0.07	0.38								
v/s Ratio Perm			0.05					0.04	0.01		c0.22		
v/c Ratio	0.08	0.92	0.08	0.90	0.60			0.18	0.05		0.91		
Uniform Delay, d1	59.0	23.9	12.0	55.1	13.3			36.4	35.3		44.5		
Progression Factor	0.99	1.53	2.13	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	2.6	7.4	0.1	53.1	1.4			0.4	0.1		31.8		
Delay (s)	61.2	44.0	25.8	108.1	14.7			36.8	35.4		76.2		
Level of Service	E	D	C	F	B			D	D		E		
Approach Delay (s)		43.0			22.6			36.0			76.2		
Approach LOS		D			C			D			E		
Intersection Summary													
HCM 2000 Control Delay			37.5									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.92										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			85.0%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗		↘	
Traffic Vol, veh/h	3	1816	1180	29	62	6
Future Vol, veh/h	3	1816	1180	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1912	1242	31	65	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1273	0	636
Stage 1	-	-	1257
Stage 2	-	-	962
Critical Hdwy	4.76	-	6.7
Critical Hdwy Stg 1	-	-	5.46
Critical Hdwy Stg 2	-	-	5.46
Follow-up Hdwy	2.53	-	3.3
Pot Cap-1 Maneuver	400	-	441
Stage 1	-	-	264
Stage 2	-	-	366
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	400	-	441
Mov Cap-2 Maneuver	-	-	160
Stage 1	-	-	264
Stage 2	-	-	363

Approach	EB	WB	SB
HCM Control Delay, s	0	0	40.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	400	-	-	-	170
HCM Lane V/C Ratio	0.008	-	-	-	0.421
HCM Control Delay (s)	14.1	-	-	-	40.8
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Springbrook/Crestview		
Agency or Co.	KAI			E/W Street Name	Crestview Dr		
Date Performed	10/21/2017			N/S Street Name	Springbrook Rd		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	Background with Reassigned Traffic PM			Peak Hour Factor	0.93		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	2	13	0	3	2	162	0	7	374	7	2	182	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	57	2	14	0	4	2	174	0	8	414	8	2	196	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		73			180			430			539	
Entry Volume veh/h		73			179			418			533	
Circulating Flow (v _c), pc/h	490			481			257			14		
Exiting Flow (v _{ex}), pc/h	206			63			647			306		
Capacity (c _{PCE}), pc/h		837			845			1062			1360	
Capacity (c), veh/h		837			842			1032			1346	
v/c Ratio (x)		0.09			0.21			0.40			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			6.5			7.9			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.8			2.0			1.9	
Approach Delay, s/veh	5.1			6.5			7.9			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.8						A					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018






















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	179	5	9	161	8	14
Future Volume (Veh/h)	179	5	9	161	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	227	6	11	204	10	18
Pedestrians						2
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			235			458
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			235			458
tC, single (s)			4.1			6.4
tC, 2 stage (s)						
tF (s)			2.2			3.5
p0 queue free %			99			98
cM capacity (veh/h)			1342			559
						810
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	233	215	28			
Volume Left	0	11	10			
Volume Right	6	0	18			
cSH	1700	1342	698			
Volume to Capacity	0.14	0.01	0.04			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	0.5	10.4			
Lane LOS			A			B
Approach Delay (s)	0.0	0.5	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			27.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Future Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	210	5	70	189	42
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	152	228	256	142	215	70	231					
Volume Left (vph)	86	0	95	142	0	70	0					
Volume Right (vph)	0	228	90	0	5	0	42					
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06					
Departure Headway (s)	7.5	6.5	7.1	7.7	7.2	7.8	7.2					
Degree Utilization, x	0.32	0.41	0.50	0.31	0.43	0.15	0.46					
Capacity (veh/h)	455	525	470	432	463	431	462					
Control Delay (s)	12.7	12.7	17.1	12.9	14.4	11.1	15.1					
Approach Delay (s)	12.7		17.1	13.8		14.2						
Approach LOS	B		C	B		B						






























Intersection Summary

Delay	14.2
Level of Service	B
Intersection Capacity Utilization	53.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	98	1156	124	141	1481	150	374	179	124	217	212	84
Future Volume (vph)	98	1156	124	141	1481	150	374	179	124	217	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1180	127	144	1511	153	382	183	127	221	216	86
RTOR Reduction (vph)	0	0	63	0	0	75	0	0	109	0	0	67
Lane Group Flow (vph)	100	1180	64	144	1511	78	382	183	18	221	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Effective Green, g (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Actuated g/C Ratio	0.08	0.51	0.51	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1590	730	201	1596	710	465	237	193	517	268	226
v/s Ratio Prot	c0.06	0.38		0.05	c0.47		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.01			0.01
v/c Ratio	0.81	0.74	0.09	0.72	0.95	0.11	0.82	0.77	0.09	0.43	0.81	0.08
Uniform Delay, d1	63.5	27.3	17.8	63.7	33.3	18.6	58.0	57.9	52.2	52.8	56.9	50.3
Progression Factor	1.00	1.00	1.00	0.95	1.04	1.63	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	3.2	0.2	6.9	9.3	0.2	10.8	13.6	0.1	0.3	15.5	0.1
Delay (s)	92.9	30.4	18.0	67.2	43.9	30.5	68.8	71.5	52.3	53.1	72.3	50.4
Level of Service	F	C	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		33.8			44.6			66.5			60.6	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1035	101	220	1500	41	243	16	134	21	10	51
Future Volume (vph)	32	1035	101	220	1500	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1078	105	229	1562	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	43	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1078	62	229	1563	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.35		c0.14	c0.49			0.03				0.01
v/s Ratio Perm			0.04			0.02	c0.21			0.02		
v/c Ratio	0.52	0.65	0.08	0.87	0.75	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	23.2	15.8	57.5	16.2	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.72	1.26	1.96	0.81	0.47	0.37	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	1.5	0.2	14.6	1.2	0.0	43.5	0.2		0.2	0.1	
Delay (s)	51.6	30.7	31.1	61.4	8.8	3.2	97.7	44.6		44.2	43.7	
Level of Service	D	C	C	E	A	A	F	D		D	D	
Approach Delay (s)		31.3			15.2			77.4			43.8	
Approach LOS		C			B			E			D	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018



























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1173	1783	128	26	18
Future Volume (Veh/h)	32	1173	1783	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1261	1917	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.41				0.41	0.41
vC, conflicting volume	2055				2684	1028
vC1, stage 1 conf vol					1986	
vC2, stage 2 conf vol					698	
vCu, unblocked vol	721				2239	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	91				84	96
cM capacity (veh/h)	361				181	452
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	630	630	1278	777	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	361	1700	1700	1700	1700	238
Volume to Capacity	0.09	0.37	0.37	0.75	0.46	0.20
Queue Length 95th (ft)	8	0	0	0	0	18
Control Delay (s)	16.0	0.0	0.0	0.0	0.0	23.8
Lane LOS	C					C
Approach Delay (s)	0.4			0.0		23.8
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			67.9%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 						 		
Traffic Volume (vph)	6	1155	38	86	1774	140	135	17	139	174	2	2	
Future Volume (vph)	6	1155	38	86	1774	140	135	17	139	174	2	2	
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		-3%			2%			3%			2%		
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00		
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00		
Fr t	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00		
Fl t Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95		
Satd. Flow (prot)	1654	3184	1479	1646	3224			1632	1465		1617		
Fl t Permitted	0.95	1.00	1.00	0.95	1.00			0.78	1.00		0.49		
Satd. Flow (perm)	1654	3184	1479	1646	3224			1326	1465		826		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	6	1229	40	91	1887	149	144	18	148	185	2	2	
RTOR Reduction (vph)	0	0	16	0	4	0	0	0	116	0	0	0	
Lane Group Flow (vph)	6	1229	24	91	2032	0	0	162	32	0	189	0	
Confl. Bikes (#/hr)			1										
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA		
Protected Phases	5	2		1	6			8				4	
Permitted Phases			2				8		8	4			
Actuated Green, G (s)	1.0	82.3	82.3	12.6	93.9			30.1	30.1		30.1		
Effective Green, g (s)	1.0	82.3	82.3	12.6	93.9			30.1	30.1		30.1		
Actuated g/C Ratio	0.01	0.59	0.59	0.09	0.67			0.22	0.22		0.22		
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0		
Lane Grp Cap (vph)	11	1871	869	148	2162			285	314		177		
v/s Ratio Prot	0.00	0.39		c0.06	c0.63								
v/s Ratio Perm			0.02					0.12	0.02		c0.23		
v/c Ratio	0.55	0.66	0.03	0.61	0.94			0.57	0.10		1.07		
Uniform Delay, d1	69.3	19.4	12.1	61.4	20.5			49.1	44.1		54.9		
Progression Factor	1.08	0.41	1.00	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	47.5	1.5	0.0	8.4	9.6			3.1	0.2		86.8		
Delay (s)	122.0	9.4	12.1	69.8	30.1			52.3	44.3		141.8		
Level of Service	F	A	B	E	C			D	D		F		
Approach Delay (s)		10.0			31.8			48.5			141.8		
Approach LOS		B			C			D			F		
Intersection Summary													
HCM 2000 Control Delay			31.3			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio			0.98										
Actuated Cycle Length (s)			140.0			Sum of lost time (s)		15.0					
Intersection Capacity Utilization			90.5%			ICU Level of Service		E					
Analysis Period (min)			15										
c Critical Lane Group													

Intersection

Int Delay, s/veh 6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖↗		↖	
Traffic Vol, veh/h	31	1569	2186	75	61	17
Future Vol, veh/h	31	1569	2186	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1687	2351	81	66	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2431	0	3301
Stage 1	-	-	2391
Stage 2	-	-	910
Critical Hdwy	4.1	-	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.2	-	3.52
Pot Cap-1 Maneuver	197	-	~ 9
Stage 1	-	-	71
Stage 2	-	-	390
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	197	-	~ 7
Mov Cap-2 Maneuver	-	-	~ 55
Stage 1	-	-	71
Stage 2	-	-	325

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	\$ 316.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	197	-	-	-	65
HCM Lane V/C Ratio	0.169	-	-	-	1.29
HCM Control Delay (s)	27	-	-	-	\$ 316.6
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	6.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Appendix G
Select Zone Analysis Results

Newberg Transportation Model 2000

Select Zone 117 Daily Volumes

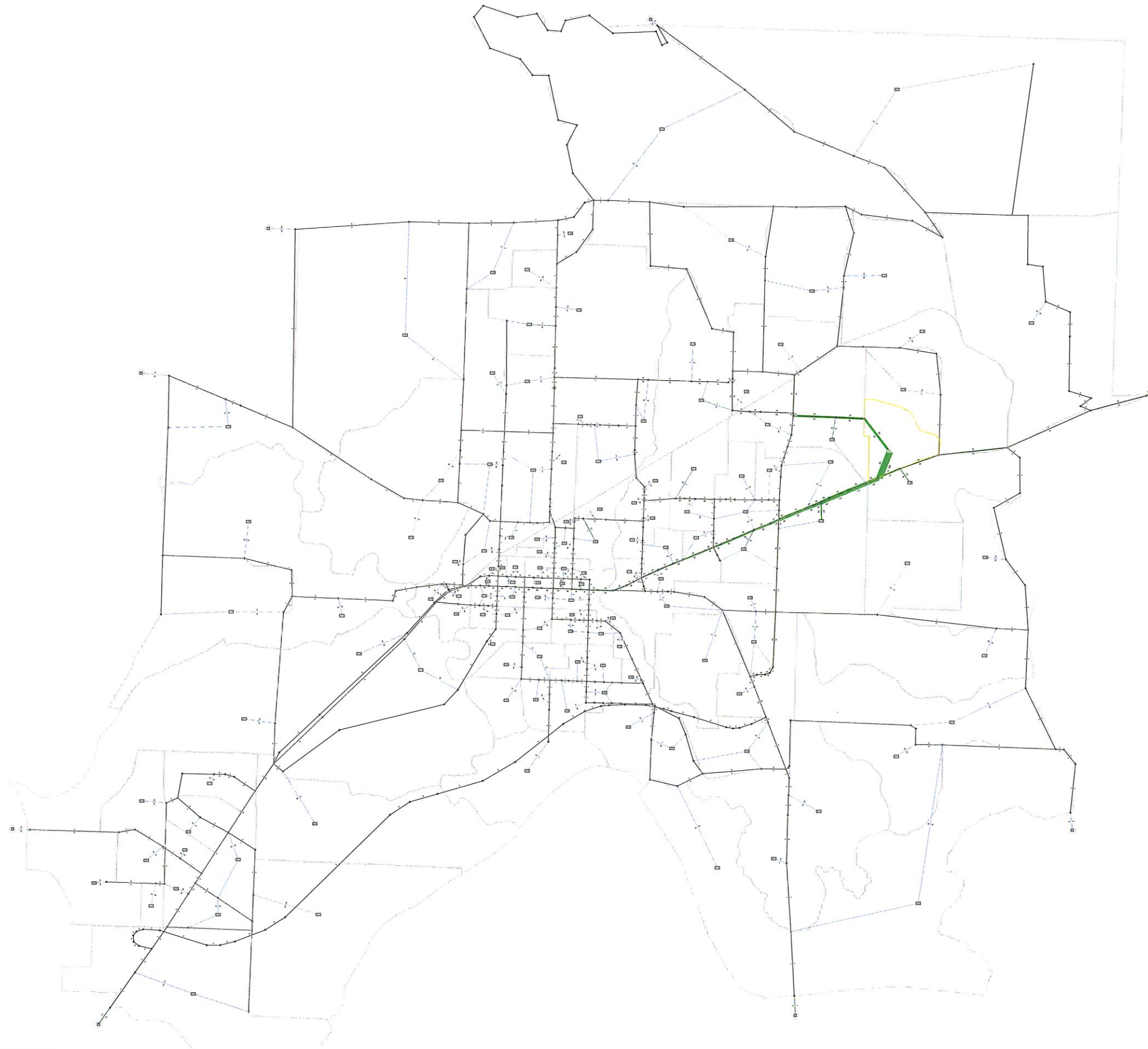


Newberg Transportation Model 2025
Select Zone 117 PM Peak Volumes



Newberg Transportation Model 2025
ODOT Request 001
Select Zone 117 Daily Volumes





Appendix H
Year 2020 Total Conditions
Level of Service Worksheets

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	ZHB				Intersection	Springbrook/Crestview			
Agency or Co.	KAI				E/W Street Name	Crestview Dr			
Date Performed	10/21/2017				N/S Street Name	Springbrook Rd			
Analysis Year	2020				Analysis Time Period (hrs)	0.25			
Time Analyzed	Total AM				Peak Hour Factor	0.66			
Project Description	Crestview Crossing				Jurisdiction				

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	2	54	29	54	0	19	40	83	2	49	254	7	1	216	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v _{PCE}), pc/h	3	89	50	84	0	29	61	126	3	76	400	11	2	409	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		226			216			490			858	
Entry Volume veh/h		210			216			473			753	
Circulating Flow (v _c), pc/h	671			573			553			172		
Exiting Flow (v _{ex}), pc/h	470			359			617			344		
Capacity (c _{PCE}), pc/h		696			769			785			1158	
Capacity (c), veh/h		647			769			758			1016	
v/c Ratio (x)		0.32			0.28			0.62			0.74	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.8			7.9			15.4			16.6	
Lane LOS		A			A			C			C	
95% Queue, veh		1.4			1.2			4.4			7.1	
Approach Delay, s/veh	9.8			7.9			15.4			16.6		
Approach LOS	A			A			C			C		
Intersection Delay, s/veh LOS	14.3						B					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018






















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	237	5	8	133	6	5
Future Volume (Veh/h)	237	5	8	133	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	349	7	12	196	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			356		572	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			356		572	352
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1214		452	696
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	356	208	16			
Volume Left	0	12	9			
Volume Right	7	0	7			
cSH	1700	1214	534			
Volume to Capacity	0.21	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	0.5	12.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.5	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			23.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center






























08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Future Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	216	45	16	18	99	186	6	19	140	83
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	106	216	79	99	192	19	223					
Volume Left (vph)	73	0	45	99	0	19	0					
Volume Right (vph)	0	216	18	0	6	0	83					
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16					
Departure Headway (s)	6.5	5.5	6.5	6.6	6.1	6.8	5.9					
Degree Utilization, x	0.19	0.33	0.14	0.18	0.33	0.04	0.37					
Capacity (veh/h)	517	619	505	519	562	497	576					
Control Delay (s)	9.9	9.9	10.6	9.8	10.8	8.9	11.1					
Approach Delay (s)	9.9		10.6	10.5		10.9						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			10.4									
Level of Service			B									
Intersection Capacity Utilization			36.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W



























08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	42	1373	75	89	844	91	179	140	102	211	120	69
Future Volume (vph)	42	1373	75	89	844	91	179	140	102	211	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1543	84	100	948	102	201	157	115	237	135	78
RTOR Reduction (vph)	0	0	37	0	0	46	0	0	100	0	0	68
Lane Group Flow (vph)	47	1543	47	100	948	56	201	157	15	237	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Effective Green, g (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1776	794	152	1728	772	387	220	190	372	197	176
v/s Ratio Prot	0.03	c0.48		0.03	c0.30		0.07	c0.10		c0.08	0.09	
v/s Ratio Perm			0.03			0.04			0.01			0.01
v/c Ratio	0.52	0.87	0.06	0.66	0.55	0.07	0.52	0.71	0.08	0.64	0.69	0.06
Uniform Delay, d1	54.9	22.9	12.2	55.8	17.3	12.6	48.8	49.7	45.5	50.3	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.78	0.46	0.05	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	6.1	0.1	7.7	1.2	0.2	0.7	9.4	0.1	2.9	8.3	0.1
Delay (s)	57.9	29.0	12.4	51.2	9.1	0.9	49.5	59.1	45.6	53.2	58.5	46.3
Level of Service	E	C	B	D	A	A	D	E	D	D	E	D
Approach Delay (s)		29.0			12.0			51.7			53.6	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			29.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			16.5		
Intersection Capacity Utilization			66.3%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	19	1542	43	86	971	28	58	3	92	11	5	27
Future Volume (vph)	19	1542	43	86	971	28	58	3	92	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.54	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		951	1361	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1676	47	93	1055	30	63	3	100	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	90	0	0	26	0
Lane Group Flow (vph)	21	1676	34	93	1055	23	63	13	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.70	0.70	0.09	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2231	891	146	2375	982	108	137		92	132	
v/s Ratio Prot	0.01	c0.53		c0.06	0.34			0.01				0.01
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.75	0.04	0.64	0.44	0.02	0.58	0.09		0.13	0.06	
Uniform Delay, d1	57.6	11.1	5.4	52.4	4.8	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.13	0.18	0.02	1.46	0.19	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	1.4	0.0	5.5	0.5	0.0	6.5	0.2		0.5	0.1	
Delay (s)	69.2	3.3	0.2	81.9	1.3	0.0	58.3	49.5		50.0	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		4.1			7.7			52.9			49.5	
Approach LOS		A			A			D			D	

Intersection Summary

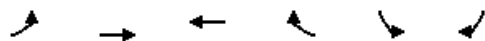
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018


























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕↕	↕↕		↵	
Traffic Volume (veh/h)	4	1599	1113	21	52	24
Future Volume (Veh/h)	4	1599	1113	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1719	1197	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.74				0.74	0.74
vC, conflicting volume	1220				2076	610
vC1, stage 1 conf vol					1208	
vC2, stage 2 conf vol					868	
vCu, unblocked vol	581				1744	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				79	97
cM capacity (veh/h)	738				269	803
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	860	860	798	422	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	738	1700	1700	1700	1700	341
Volume to Capacity	0.01	0.51	0.51	0.47	0.25	0.24
Queue Length 95th (ft)	0	0	0	0	0	23
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	18.9
Lane LOS	A					C
Approach Delay (s)	0.0			0.0		18.9
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			59.4%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

7: Providence Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Future Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Flt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1607	3214	1480	1614	3108			1604	1465		1548	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.71	1.00		0.75	
Satd. Flow (perm)	1607	3214	1480	1614	3108			1190	1465		1208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	1670	98	109	1108	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	26	0	4	0	0	0	55	0	8	0
Lane Group Flow (vph)	27	1670	72	109	1188	0	0	60	22	0	362	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Effective Green, g (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Actuated g/C Ratio	0.03	0.53	0.53	0.06	0.56			0.29	0.29		0.29	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	48	1706	785	91	1732			342	421		347	
v/s Ratio Prot	0.02	c0.52		c0.07	0.38							
v/s Ratio Perm			0.05					0.05	0.02		c0.30	
v/c Ratio	0.56	0.98	0.09	1.20	0.69			0.18	0.05		1.04	
Uniform Delay, d1	57.4	27.5	13.9	56.6	19.0			32.1	30.9		42.8	
Progression Factor	0.88	1.52	1.85	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	12.4	14.0	0.2	156.9	2.2			0.3	0.1		60.2	
Delay (s)	62.8	55.7	25.8	213.5	21.3			32.4	31.0		102.9	
Level of Service	E	E	C	F	C			C	C		F	
Approach Delay (s)		54.2			37.4			31.6			102.9	
Approach LOS		D			D			C			F	
Intersection Summary												
HCM 2000 Control Delay			52.3			HCM 2000 Level of Service					D	
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			92.1%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗		↘	
Traffic Vol, veh/h	3	1840	1188	29	62	6
Future Vol, veh/h	3	1840	1188	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1937	1251	31	65	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1281	0	641
Stage 1	-	-	1266
Stage 2	-	-	975
Critical Hdwy	4.76	-	6.7
Critical Hdwy Stg 1	-	-	5.46
Critical Hdwy Stg 2	-	-	5.46
Follow-up Hdwy	2.53	-	3.3
Pot Cap-1 Maneuver	397	-	438
Stage 1	-	-	261
Stage 2	-	-	361
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	397	-	438
Mov Cap-2 Maneuver	-	-	158
Stage 1	-	-	261
Stage 2	-	-	358

Approach	EB	WB	SB
HCM Control Delay, s	0	0	41.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	397	-	-	-	167
HCM Lane V/C Ratio	0.008	-	-	-	0.429
HCM Control Delay (s)	14.1	-	-	-	41.8
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Crestview/East-West Connector		
Agency or Co.	KAI			E/W Street Name	East-West Connector		
Date Performed	10/21/2017			N/S Street Name	Crestview Dr		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	Total AM			Peak Hour Factor	0.92		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	32	0	39	0	17	0	11	92	13	0	5	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v _{PCE}), pc/h	0	15	0	35	0	42	0	18	0	12	105	14	0	5	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		50			60			131			317	
Entry Volume veh/h		50			60			126			302	
Circulating Flow (v _c), pc/h	354			132			20			54		
Exiting Flow (v _{ex}), pc/h	19			17			138			384		
Capacity (c _{PCE}), pc/h		962			1206			1352			1306	
Capacity (c), veh/h		962			1206			1301			1246	
v/c Ratio (x)		0.05			0.05			0.10			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			3.4			3.5			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.3			1.0	
Approach Delay, s/veh	4.2			3.4			3.5			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.4						A					

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	ZHB				Intersection	Springbrook/Crestview			
Agency or Co.	KAI				E/W Street Name	Crestview Dr			
Date Performed	10/21/2017				N/S Street Name	Springbrook Rd			
Analysis Year	2020				Analysis Time Period (hrs)	0.25			
Time Analyzed	Total PM				Peak Hour Factor	0.93			
Project Description	Crestview Crossing				Jurisdiction				

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	20	13	0	14	13	172	0	7	374	25	2	200	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	57	22	14	0	18	14	185	0	8	414	27	2	215	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		93			217			449			558	
Entry Volume veh/h		93			214			437			552	
Circulating Flow (v _c), pc/h	523			481			296			40		
Exiting Flow (v _{ex}), pc/h	264			75			658			320		
Capacity (c _{PCE}), pc/h		809			845			1020			1325	
Capacity (c), veh/h		809			833			993			1311	
v/c Ratio (x)		0.11			0.26			0.44			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			7.1			8.6			6.8	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			1.0			2.3			2.1	
Approach Delay, s/veh	5.6			7.1			8.6			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.4						A					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↶			↷	↶	↷	
Traffic Volume (veh/h)	233	5	9	193	8	14	
Future Volume (Veh/h)	233	5	9	193	8	14	
Sign Control	Free			Free	Stop		
Grade	0%			0%	2%		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	
Hourly flow rate (vph)	295	6	11	244	10	18	
Pedestrians						2	
Lane Width (ft)						12.0	
Walking Speed (ft/s)						3.5	
Percent Blockage						0	
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume			303			566	300
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			303			566	300
tC, single (s)			4.1			6.4	6.2
tC, 2 stage (s)							
tF (s)			2.2			3.5	3.3
p0 queue free %			99			98	98
cM capacity (veh/h)			1267			483	743




















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	301	255	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1267	623
Volume to Capacity	0.18	0.01	0.04
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.4	11.0
Lane LOS			A B
Approach Delay (s)	0.0	0.4	11.0
Approach LOS			B

Intersection Summary			
Average Delay			0.7
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)			15

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Future Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	235	95	71	90	147	210	5	70	189	42
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	152	235	256	147	215	70	231					
Volume Left (vph)	86	0	95	147	0	70	0					
Volume Right (vph)	0	235	90	0	5	0	42					
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06					
Departure Headway (s)	7.5	6.5	7.1	7.8	7.3	7.9	7.3					
Degree Utilization, x	0.32	0.42	0.51	0.32	0.43	0.15	0.47					
Capacity (veh/h)	454	524	468	431	462	429	460					
Control Delay (s)	12.7	13.0	17.2	13.1	14.5	11.1	15.3					
Approach Delay (s)	12.9		17.2	13.9		14.3						
Approach LOS	B		C	B		B						






























Intersection Summary

Delay	14.4
Level of Service	B
Intersection Capacity Utilization	50.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W

08/11/2018




























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	98	1194	124	151	1501	155	374	179	142	224	212	84
Future Volume (vph)	98	1194	124	151	1501	155	374	179	142	224	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1218	127	154	1532	158	382	183	145	229	216	86
RTOR Reduction (vph)	0	0	63	0	0	76	0	0	124	0	0	67
Lane Group Flow (vph)	100	1218	64	154	1532	82	382	183	21	229	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Effective Green, g (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Actuated g/C Ratio	0.08	0.50	0.50	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1581	726	212	1644	711	462	237	193	515	268	226
v/s Ratio Prot	c0.06	0.39		0.05	c0.47		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.02			0.01
v/c Ratio	0.81	0.77	0.09	0.73	0.93	0.12	0.83	0.77	0.11	0.44	0.81	0.08
Uniform Delay, d1	63.5	28.1	18.0	63.4	32.8	18.6	58.1	57.9	52.3	53.0	56.9	50.3
Progression Factor	1.00	1.00	1.00	1.02	0.96	1.38	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	3.7	0.2	7.1	7.8	0.2	11.2	13.6	0.1	0.4	15.5	0.1
Delay (s)	92.9	31.8	18.2	71.6	39.1	25.9	69.3	71.5	52.5	53.4	72.3	50.4
Level of Service	F	C	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		34.9			40.7			66.4			60.6	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			45.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			16.5		
Intersection Capacity Utilization			91.6%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 								
Traffic Volume (vph)	32	1098	101	231	1535	41	243	16	152	21	10	51	
Future Volume (vph)	32	1098	101	231	1535	41	243	16	152	21	10	51	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		2%			0%			0%				-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1438		1675	1471		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.50	1.00		
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1438		875	1471		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	33	1144	105	241	1599	43	253	17	158	22	10	53	
RTOR Reduction (vph)	0	0	36	0	0	14	0	121	0	0	41	0	
Lane Group Flow (vph)	33	1144	69	241	1599	29	253	54	0	22	22	0	
Confl. Peds. (#/hr)							5		3	3		5	
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			4				8	
Permitted Phases			2			6	4			8			
Actuated Green, G (s)	3.9	69.3	69.3	25.6	91.0	91.0	32.6	32.6		32.6	32.6		
Effective Green, g (s)	3.9	69.3	69.3	25.6	91.0	91.0	32.6	32.6		32.6	32.6		
Actuated g/C Ratio	0.03	0.49	0.49	0.18	0.65	0.65	0.23	0.23		0.23	0.23		
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5		
Lane Grp Cap (vph)	45	1536	693	300	2078	878	284	334		203	342		
v/s Ratio Prot	0.02	c0.37		0.15	c0.50			0.04				0.02	
v/s Ratio Perm			0.05			0.02	c0.21			0.03			
v/c Ratio	0.73	0.74	0.10	0.80	0.77	0.03	0.89	0.16		0.11	0.07		
Uniform Delay, d1	67.5	28.3	18.8	54.8	17.2	8.8	52.0	42.8		42.3	41.8		
Progression Factor	0.76	1.08	1.16	0.73	0.51	0.37	1.00	1.00		1.00	1.00		
Incremental Delay, d2	32.8	2.4	0.2	1.4	0.3	0.0	27.3	0.2		0.2	0.1		
Delay (s)	84.0	33.0	21.9	41.6	8.9	3.3	79.3	43.0		42.4	41.9		
Level of Service	F	C	C	D	A	A	E	D		D	D		
Approach Delay (s)		33.4			13.0			64.4			42.0		
Approach LOS		C			B			E			D		

Intersection Summary

HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way
























08/11/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕↕	↕↕		↵	
Traffic Volume (veh/h)	32	1254	1829	128	26	18
Future Volume (Veh/h)	32	1254	1829	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1348	1967	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.42				0.42	0.42
vC, conflicting volume	2105				2778	1052
vC1, stage 1 conf vol					2036	
vC2, stage 2 conf vol					742	
vCu, unblocked vol	848				2466	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	90				82	96
cM capacity (veh/h)	324				158	454
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	674	674	1311	794	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	324	1700	1700	1700	1700	214
Volume to Capacity	0.10	0.40	0.40	0.77	0.47	0.22
Queue Length 95th (ft)	9	0	0	0	0	20
Control Delay (s)	17.4	0.0	0.0	0.0	0.0	26.5
Lane LOS	C					D
Approach Delay (s)	0.4			0.0		26.5
Approach LOS						D
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			69.3%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Future Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Fr t	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Fl t Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1654	3184	1479	1646	3219			1638	1465		1594	
Fl t Permitted	0.95	1.00	1.00	0.95	1.00			0.70	1.00		0.53	
Satd. Flow (perm)	1654	3184	1479	1646	3219			1191	1465		872	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1229	40	91	1887	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	18	0	5	0	0	0	111	0	6	0
Lane Group Flow (vph)	93	1229	22	91	2060	0	0	181	37	0	261	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Effective Green, g (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Actuated g/C Ratio	0.05	0.55	0.55	0.09	0.59			0.25	0.25		0.25	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	82	1762	818	148	1910			296	365		217	
v/s Ratio Prot	c0.06	0.39		0.06	c0.64							
v/s Ratio Perm			0.01					0.15	0.03		c0.30	
v/c Ratio	1.13	0.70	0.03	0.61	1.08			0.61	0.10		1.20	
Uniform Delay, d1	66.5	22.7	14.2	61.4	28.5			46.5	40.5		52.5	
Progression Factor	1.09	0.54	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	128.1	1.8	0.0	8.4	45.4			4.2	0.2		126.7	
Delay (s)	200.5	14.0	14.2	69.8	73.9			50.8	40.6		179.2	
Level of Service	F	B	B	E	E			D	D		F	
Approach Delay (s)		26.7			73.7			46.2			179.2	
Approach LOS		C			E			D			F	
Intersection Summary												
HCM 2000 Control Delay			62.8			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			140.0	Sum of lost time (s)				15.0				
Intersection Capacity Utilization			97.1%	ICU Level of Service				F				
Analysis Period (min)	15											
c Critical Lane Group												

Intersection

Int Delay, s/veh 4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	31	1453	2025	75	61	17
Future Vol, veh/h	31	1453	2025	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1562	2177	81	66	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2258	0	1129
Stage 1	-	-	2218
Stage 2	-	-	848
Critical Hdwy	4.1	-	6.7
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.2	-	3.3
Pot Cap-1 Maneuver	231	-	214
Stage 1	-	-	88
Stage 2	-	-	418
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	231	-	214
Mov Cap-2 Maneuver	-	-	68
Stage 1	-	-	88
Stage 2	-	-	358

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	207
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	231	-	-	-	80
HCM Lane V/C Ratio	0.144	-	-	-	1.048
HCM Control Delay (s)	23.2	-	-	-	207
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	5.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Crestview/East-West Connector		
Agency or Co.	KAI			E/W Street Name	East-West Connector		
Date Performed	10/21/2017			N/S Street Name	Crestview Dr		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	Total PM			Peak Hour Factor	0.94		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	9	0	21	0	25	0	11	0	36	210	43	0	19	205	15
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v _{pc}), pc/h	0	10	0	22	0	27	0	12	0	38	228	46	0	20	222	16
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		32			39			312			258	
Entry Volume veh/h		32			39			308			254	
Circulating Flow (v _c), pc/h	269			276			30			65		
Exiting Flow (v _{ex}), pc/h	66			54			250			271		
Capacity (c _{pce}), pc/h		1049			1041			1338			1291	
Capacity (c), veh/h		1049			1041			1319			1270	
v/c Ratio (x)		0.03			0.04			0.23			0.20	

Delay and Level of Service



























Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.7			3.8			4.7			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.1			0.9			0.7	
Approach Delay, s/veh	3.7			3.8			4.7			4.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.5						A					

Appendix I
Year 2020 Total Conditions with
Mitigation Level of Service
Worksheets

HCM Signalized Intersection Capacity Analysis

7: Providence Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Future Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1232	1642	1465	1235	1650	1402
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	1670	98	109	1108	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	30	0	0	33	0	0	59	0	0	60
Lane Group Flow (vph)	27	1670	68	109	1108	51	46	14	18	259	32	19
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2
Effective Green, g (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2
Actuated g/C Ratio	0.03	0.56	0.56	0.08	0.61	0.61	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	48	1807	832	125	1912	855	289	385	344	290	387	329
v/s Ratio Prot	0.02	c0.52		c0.07	c0.35			0.01				0.02
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.21		0.01
v/c Ratio	0.56	0.92	0.08	0.87	0.58	0.06	0.16	0.04	0.05	0.89	0.08	0.06
Uniform Delay, d1	57.4	23.9	12.0	54.8	14.1	9.5	36.5	35.4	35.6	44.4	35.8	35.6
Progression Factor	0.89	1.54	2.12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	7.3	0.1	45.0	1.3	0.1	0.4	0.1	0.1	27.8	0.1	0.1
Delay (s)	63.8	44.2	25.7	99.8	15.4	9.6	36.8	35.5	35.6	72.2	35.9	35.7
Level of Service	E	D	C	F	B	A	D	D	D	E	D	D
Approach Delay (s)		43.5			22.1			36.0			61.3	
Approach LOS		D			C			D			E	

Intersection Summary




























HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Future Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1277	1690	1465	1245	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1229	40	91	1887	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	16	0	0	46	0	0	120	0	0	41
Lane Group Flow (vph)	93	1229	24	91	1887	132	144	37	28	202	14	10
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Effective Green, g (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Actuated g/C Ratio	0.07	0.61	0.61	0.09	0.63	0.63	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	121	1946	904	148	2044	906	244	323	280	238	325	276
v/s Ratio Prot	c0.06	0.39		0.06	c0.58			0.02				0.01
v/s Ratio Perm			0.02			0.09	0.11		0.02	c0.16		0.01
v/c Ratio	0.77	0.63	0.03	0.61	0.92	0.15	0.59	0.11	0.10	0.85	0.04	0.04
Uniform Delay, d1	63.7	17.2	10.7	61.4	23.1	10.7	51.6	46.8	46.7	54.6	46.1	46.1
Progression Factor	1.27	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.2	1.2	0.0	8.4	8.5	0.3	4.4	0.2	0.2	24.3	0.1	0.1
Delay (s)	102.1	3.7	10.8	69.8	31.6	11.0	56.0	47.0	46.9	78.9	46.2	46.1
Level of Service	F	A	B	E	C	B	E	D	D	E	D	D
Approach Delay (s)		10.6			31.5			50.9			70.9	
Approach LOS		B			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			28.7				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)				15.0	
Intersection Capacity Utilization			87.6%				ICU Level of Service				E	
Analysis Period (min)			15									
c Critical Lane Group												

Appendix J
2025 Horizon Year Background
Conditions Level of Service
Worksheets

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Springbrook/Crestview		
Agency or Co.	KAI			E/W Street Name	Crestview Dr		
Date Performed	10/21/2017			N/S Street Name	Springbrook Rd		
Analysis Year	2025			Analysis Time Period (hrs)	0.25		
Time Analyzed	Background with Reassigned Traffic AM			Peak Hour Factor	0.66		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	2	54	23	54	0	3	24	67	2	49	254	2	1	211	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v _{PCE}), pc/h	3	89	39	84	0	5	36	102	3	76	400	3	2	400	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		215			143			482			849	
Entry Volume veh/h		200			143			465			746	
Circulating Flow (v _c), pc/h	638			573			533			123		
Exiting Flow (v _{ex}), pc/h	442			334			593			320		
Capacity (c _{PCE}), pc/h		720			769			801			1217	
Capacity (c), veh/h		671			769			773			1069	
v/c Ratio (x)		0.30			0.19			0.60			0.70	

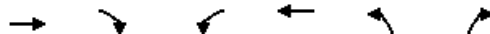
Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.1			6.7			14.4			14.2	
Lane LOS		A			A			B			B	
95% Queue, veh		1.3			0.7			4.1			6.0	
Approach Delay, s/veh	9.1			6.7			14.4			14.2		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018






















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	221	5	8	85	6	5
Future Volume (Veh/h)	221	5	8	85	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	325	7	12	125	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			332		478	328
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			332		478	328
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1239		515	717
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	332	137	16			
Volume Left	0	12	9			
Volume Right	7	0	7			
cSH	1700	1239	587			
Volume to Capacity	0.20	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	0.8	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			21.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center






























08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Future Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	186	6	19	140	83
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	106	210	79	80	192	19	223					
Volume Left (vph)	73	0	45	80	0	19	0					
Volume Right (vph)	0	210	18	0	6	0	83					
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16					
Departure Headway (s)	6.5	5.4	6.4	6.6	6.1	6.8	5.9					
Degree Utilization, x	0.19	0.32	0.14	0.15	0.32	0.04	0.36					
Capacity (veh/h)	522	625	511	520	564	501	582					
Control Delay (s)	9.8	9.7	10.5	9.5	10.7	8.8	11.0					
Approach Delay (s)	9.7		10.5	10.4		10.8						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			10.3									
Level of Service			B									
Intersection Capacity Utilization			36.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W




























08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	42	1486	75	81	888	75	179	140	99	206	120	69
Future Volume (vph)	42	1486	75	81	888	75	179	140	99	206	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1670	84	91	998	84	201	157	111	231	135	78
RTOR Reduction (vph)	0	0	37	0	0	38	0	0	96	0	0	68
Lane Group Flow (vph)	47	1670	47	91	998	46	201	157	15	231	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Effective Green, g (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1784	798	152	1687	776	379	220	190	364	197	176
v/s Ratio Prot	0.03	c0.52		0.03	c0.33		0.07	c0.10		c0.07	0.09	
v/s Ratio Perm			0.03			0.03			0.01			0.01
v/c Ratio	0.52	0.94	0.06	0.60	0.59	0.06	0.53	0.71	0.08	0.63	0.69	0.06
Uniform Delay, d1	54.9	24.5	12.1	55.6	17.8	12.4	49.1	49.7	45.5	50.5	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.82	0.53	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	10.8	0.1	4.4	1.4	0.1	1.0	9.4	0.1	3.0	8.3	0.1
Delay (s)	57.9	35.3	12.2	50.1	10.9	1.4	50.0	59.1	45.6	53.4	58.5	46.3
Level of Service	E	D	B	D	B	A	D	E	D	D	E	D
Approach Delay (s)		34.8			13.3			52.0			53.7	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			32.5				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			16.5		
Intersection Capacity Utilization			69.4%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 								
Traffic Volume (vph)	19	1683	43	70	1008	28	58	3	87	11	5	27	
Future Volume (vph)	19	1683	43	70	1008	28	58	3	87	11	5	27	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		2%			0%			0%			-2%		
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00		
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	21	1829	47	76	1096	30	63	3	95	12	5	29	
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0	
Lane Group Flow (vph)	21	1829	34	76	1096	23	63	12	0	12	8	0	
Confl. Peds. (#/hr)	2					2			1	1			
Confl. Bikes (#/hr)			1									1	
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			4				8	
Permitted Phases			2			6	4			8			
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7		
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7		
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10		
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5		
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132		
v/s Ratio Prot	0.01	c0.58		c0.05	0.36			0.01			0.01		
v/s Ratio Perm			0.03			0.02	c0.06			0.01			
v/c Ratio	0.51	0.80	0.04	0.63	0.46	0.02	0.58	0.09		0.12	0.06		
Uniform Delay, d1	57.6	11.0	4.8	53.8	4.9	3.2	51.8	49.3		49.5	49.2		
Progression Factor	1.11	0.21	0.03	1.40	0.18	0.11	1.00	1.00		1.00	1.00		
Incremental Delay, d2	3.2	1.5	0.0	7.0	0.5	0.0	6.5	0.2		0.4	0.1		
Delay (s)	67.4	3.8	0.2	82.5	1.4	0.4	58.3	49.5		49.9	49.3		
Level of Service	E	A	A	F	A	A	E	D		D	D		
Approach Delay (s)		4.4			6.5			53.0			49.5		
Approach LOS		A			A			D			D		

Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018




























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕↕	↕↕		↵	
Traffic Volume (veh/h)	4	1740	1145	21	52	24
Future Volume (Veh/h)	4	1740	1145	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1871	1231	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.74				0.74	0.74
vC, conflicting volume	1254				2186	627
vC1, stage 1 conf vol					1242	
vC2, stage 2 conf vol					944	
vCu, unblocked vol	653				1906	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				77	97
cM capacity (veh/h)	702				245	812
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	936	936	821	433	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	702	1700	1700	1700	1700	315
Volume to Capacity	0.01	0.55	0.55	0.48	0.25	0.26
Queue Length 95th (ft)	0	0	0	0	0	26
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	20.4
Lane LOS	B					C
Approach Delay (s)	0.0			0.0		20.4
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			63.6%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 						 		
Traffic Volume (vph)	1	1701	90	100	1123	69	42	8	71	214	13	1	
Future Volume (vph)	1	1701	90	100	1123	69	42	8	71	214	13	1	
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		-3%			2%			3%			2%		
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00		
Flt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96		
Satd. Flow (prot)	1607	3214	1480	1614	3113			1601	1465		1575		
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.78	1.00		0.70		
Satd. Flow (perm)	1607	3214	1480	1614	3113			1305	1465		1153		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	1	1849	98	109	1221	75	46	9	77	233	14	1	
RTOR Reduction (vph)	0	0	30	0	3	0	0	0	59	0	0	0	
Lane Group Flow (vph)	1	1849	68	109	1293	0	0	55	18	0	248	0	
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA		
Protected Phases	5	2		1	6			8				4	
Permitted Phases			2				8		8	4			
Actuated Green, G (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5		
Effective Green, g (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5		
Actuated g/C Ratio	0.01	0.56	0.56	0.08	0.63			0.24	0.24		0.24		
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0		
Lane Grp Cap (vph)	13	1807	832	121	1958			309	347		273		
v/s Ratio Prot	0.00	c0.58		c0.07	0.42								
v/s Ratio Perm			0.05					0.04	0.01		c0.22		
v/c Ratio	0.08	1.02	0.08	0.90	0.66			0.18	0.05		0.91		
Uniform Delay, d1	59.0	26.2	12.0	55.1	14.1			36.4	35.3		44.5		
Progression Factor	1.08	1.52	2.12	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2	2.3	23.4	0.1	53.1	1.8			0.4	0.1		31.8		
Delay (s)	66.2	63.2	25.7	108.1	15.9			36.8	35.4		76.2		
Level of Service	E	E	C	F	B			D	D		E		
Approach Delay (s)		61.3			23.0			36.0			76.2		
Approach LOS		E			C			D			E		
Intersection Summary													
HCM 2000 Control Delay			47.0			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			0.98										
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization			89.9%			ICU Level of Service			E				
Analysis Period (min)			15										

c Critical Lane Group

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖↗		↖	
Traffic Vol, veh/h	3	1986	1287	29	62	6
Future Vol, veh/h	3	1986	1287	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	2091	1355	31	65	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1385	0	693
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.76	-	6.7
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.53	-	3.3
Pot Cap-1 Maneuver	357	-	406
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	357	-	406
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	49.7
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	357	-	-	-	149
HCM Lane V/C Ratio	0.009	-	-	-	0.48
HCM Control Delay (s)	15.2	-	-	-	49.7
HCM Lane LOS	C	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	2.2

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Springbrook/Crestview		
Agency or Co.	KAI			E/W Street Name	Crestview Dr		
Date Performed	10/21/2017			N/S Street Name	Springbrook Rd		
Analysis Year	2025			Analysis Time Period (hrs)	0.25		
Time Analyzed	Background with Reassigned Traffic PM			Peak Hour Factor	0.93		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	2	13	0	3	2	162	0	7	374	7	2	182	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	57	2	14	0	4	2	174	0	8	414	8	2	196	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		73			180			430			539	
Entry Volume veh/h		73			179			418			533	
Circulating Flow (v _c), pc/h	490			481			257			14		
Exiting Flow (v _{ex}), pc/h	206			63			647			306		
Capacity (c _{PCE}), pc/h		837			845			1062			1360	
Capacity (c), veh/h		837			842			1032			1346	
v/c Ratio (x)		0.09			0.21			0.40			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			6.5			7.9			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.8			2.0			1.9	
Approach Delay, s/veh	5.1			6.5			7.9			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.8						A					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018






















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	179	5	9	161	8	14
Future Volume (Veh/h)	179	5	9	161	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	227	6	11	204	10	18
Pedestrians						2
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			235			458
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			235			458
tC, single (s)			4.1			6.4
tC, 2 stage (s)						
tF (s)			2.2			3.5
p0 queue free %			99			98
cM capacity (veh/h)			1342			559
						810
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	233	215	28			
Volume Left	0	11	10			
Volume Right	6	0	18			
cSH	1700	1342	698			
Volume to Capacity	0.14	0.01	0.04			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	0.5	10.4			
Lane LOS			A			B
Approach Delay (s)	0.0	0.5	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			27.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Future Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	210	5	70	189	42
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	152	228	256	142	215	70	231					
Volume Left (vph)	86	0	95	142	0	70	0					
Volume Right (vph)	0	228	90	0	5	0	42					
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06					
Departure Headway (s)	7.5	6.5	7.1	7.7	7.2	7.8	7.2					
Degree Utilization, x	0.32	0.41	0.50	0.31	0.43	0.15	0.46					
Capacity (veh/h)	455	525	470	432	463	431	462					
Control Delay (s)	12.7	12.7	17.1	12.9	14.4	11.1	15.1					
Approach Delay (s)	12.7		17.1	13.8		14.2						
Approach LOS	B		C	B		B						






























Intersection Summary

Delay	14.2
Level of Service	B
Intersection Capacity Utilization	53.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	98	1263	124	141	1616	150	374	179	124	217	212	84
Future Volume (vph)	98	1263	124	141	1616	150	374	179	124	217	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frft	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1289	127	144	1649	153	382	183	127	221	216	86
RTOR Reduction (vph)	0	0	63	0	0	68	0	0	109	0	0	67
Lane Group Flow (vph)	100	1289	64	144	1649	85	382	183	18	221	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Effective Green, g (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Actuated g/C Ratio	0.08	0.51	0.51	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1590	730	201	1596	710	465	237	193	517	268	226
v/s Ratio Prot	c0.06	0.41		0.05	c0.52		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.01			0.01
v/c Ratio	0.81	0.81	0.09	0.72	1.03	0.12	0.82	0.77	0.09	0.43	0.81	0.08
Uniform Delay, d1	63.5	28.9	17.8	63.7	35.0	18.7	58.0	57.9	52.2	52.8	56.9	50.3
Progression Factor	1.00	1.00	1.00	0.99	1.00	1.20	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	4.6	0.2	6.0	26.2	0.2	10.8	13.6	0.1	0.3	15.5	0.1
Delay (s)	92.9	33.5	18.0	69.2	61.2	22.5	68.8	71.5	52.3	53.1	72.3	50.4
Level of Service	F	C	B	E	E	C	E	E	D	D	E	D
Approach Delay (s)		36.1			58.7			66.5			60.6	
Approach LOS		D			E			E			E	

Intersection Summary

HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1147	101	220	1650	41	243	16	134	21	10	51
Future Volume (vph)	32	1147	101	220	1650	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1195	105	229	1719	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	39	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1195	66	229	1719	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.38		0.14	c0.54			0.03			0.01	
v/s Ratio Perm			0.05			0.02	c0.21			0.02		
v/c Ratio	0.52	0.72	0.09	0.87	0.82	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	24.6	15.9	57.5	18.0	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.78	1.24	1.56	0.81	0.52	0.35	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	1.9	0.2	12.0	1.5	0.0	43.5	0.2		0.2	0.1	
Delay (s)	54.6	32.3	25.0	58.4	10.8	3.0	97.7	44.6		44.2	43.7	
Level of Service	D	C	C	E	B	A	F	D		D	D	
Approach Delay (s)		32.3			16.1			77.4			43.8	
Approach LOS		C			B			E			D	

Intersection Summary

HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018



























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1298	1964	128	26	18
Future Volume (Veh/h)	32	1298	1964	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1396	2112	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	522					
pX, platoon unblocked	0.30				0.30	0.30
vC, conflicting volume	2250				2947	1125
vC1, stage 1 conf vol					2181	
vC2, stage 2 conf vol					766	
vCu, unblocked vol	484				2822	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	89				84	94
cM capacity (veh/h)	318				177	325
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	698	698	1408	842	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	318	1700	1700	1700	1700	217
Volume to Capacity	0.11	0.41	0.41	0.83	0.50	0.22
Queue Length 95th (ft)	9	0	0	0	0	20
Control Delay (s)	17.7	0.0	0.0	0.0	0.0	26.1
Lane LOS	C					D
Approach Delay (s)	0.4			0.0		26.1
Approach LOS						D
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			73.4%	ICU Level of Service	D	
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 						 		
Traffic Volume (vph)	0	1281	38	86	1955	140	135	17	139	174	2	2	
Future Volume (vph)	0	1281	38	86	1955	140	135	17	139	174	2	2	
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		-3%			2%			3%			2%		
Total Lost time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Lane Util. Factor		0.95	1.00	1.00	0.95			1.00	1.00		1.00		
Frbp, ped/bikes		1.00	0.98	1.00	1.00			1.00	1.00		1.00		
Flpb, ped/bikes		1.00	1.00	1.00	1.00			1.00	1.00		1.00		
Fr t		1.00	0.85	1.00	0.99			1.00	0.85		1.00		
Fl t Protected		1.00	1.00	0.95	1.00			0.96	1.00		0.95		
Satd. Flow (prot)		3184	1479	1646	3227			1632	1465		1617		
Fl t Permitted		1.00	1.00	0.95	1.00			0.78	1.00		0.49		
Satd. Flow (perm)		3184	1479	1646	3227			1326	1465		826		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	0	1363	40	91	2080	149	144	18	148	185	2	2	
RTOR Reduction (vph)	0	0	16	0	3	0	0	0	111	0	0	0	
Lane Group Flow (vph)	0	1363	24	91	2226	0	0	162	37	0	189	0	
Confl. Bikes (#/hr)			1										
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA		
Protected Phases	5	2		1	6			8				4	
Permitted Phases			2				8		8	4			
Actuated Green, G (s)		82.3	82.3	12.6	100.9			30.1	30.1		30.1		
Effective Green, g (s)		82.3	82.3	12.6	100.9			30.1	30.1		30.1		
Actuated g/C Ratio		0.59	0.59	0.09	0.72			0.22	0.22		0.22		
Clearance Time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5		
Vehicle Extension (s)		5.0	5.0	4.0	4.0			4.0	4.0		4.0		
Lane Grp Cap (vph)		1871	869	148	2325			285	314		177		
v/s Ratio Prot		0.43		0.06	c0.69								
v/s Ratio Perm			0.02					0.12	0.02		c0.23		
v/c Ratio		0.73	0.03	0.61	0.96			0.57	0.12		1.07		
Uniform Delay, d1		20.8	12.1	61.4	17.6			49.1	44.2		54.9		
Progression Factor		0.37	1.00	1.00	1.00			1.00	1.00		1.00		
Incremental Delay, d2		2.0	0.0	8.4	11.1			3.1	0.2		86.8		
Delay (s)		9.8	12.1	69.8	28.7			52.3	44.5		141.8		
Level of Service		A	B	E	C			D	D		F		
Approach Delay (s)		9.9			30.3			48.6			141.8		
Approach LOS		A			C			D			F		
Intersection Summary													
HCM 2000 Control Delay			29.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			1.03										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			95.8%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Intersection

Int Delay, s/veh 6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	31	1569	2186	75	61	17
Future Vol, veh/h	31	1569	2186	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1687	2351	81	66	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2431	0	3301
Stage 1	-	-	2391
Stage 2	-	-	910
Critical Hdwy	4.1	-	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.2	-	3.52
Pot Cap-1 Maneuver	197	-	~ 9
Stage 1	-	-	71
Stage 2	-	-	390
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	197	-	~ 7
Mov Cap-2 Maneuver	-	-	~ 55
Stage 1	-	-	71
Stage 2	-	-	325

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	\$ 316.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	197	-	-	-	65
HCM Lane V/C Ratio	0.169	-	-	-	1.29
HCM Control Delay (s)	27	-	-	-	\$ 316.6
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	6.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Appendix K
2025 Horizon Year Total
Conditions Level of Service
Worksheets

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	ZHB				Intersection	Springbrook/Crestview			
Agency or Co.	KAI				E/W Street Name	Crestview Dr			
Date Performed	10/21/2017				N/S Street Name	Springbrook Rd			
Analysis Year	2025				Analysis Time Period (hrs)	0.25			
Time Analyzed	Total AM				Peak Hour Factor	0.66			
Project Description	Crestview Crossing				Jurisdiction				

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	2	54	29	54	0	19	40	83	2	49	254	7	1	216	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v _{pce}), pc/h	3	89	50	84	0	29	61	126	3	76	400	11	2	409	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		226			216			490			858	
Entry Volume veh/h		210			216			473			753	
Circulating Flow (v _c), pc/h	671			573			553			172		
Exiting Flow (v _{ex}), pc/h	470			359			617			344		
Capacity (c _{pce}), pc/h		696			769			785			1158	
Capacity (c), veh/h		647			769			758			1016	
v/c Ratio (x)		0.32			0.28			0.62			0.74	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.8			7.9			15.4			16.6	
Lane LOS		A			A			C			C	
95% Queue, veh		1.4			1.2			4.4			7.1	
Approach Delay, s/veh	9.8			7.9			15.4			16.6		
Approach LOS	A			A			C			C		
Intersection Delay, s/veh LOS	14.3						B					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018






















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	237	5	8	133	6	5
Future Volume (Veh/h)	237	5	8	133	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	349	7	12	196	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			356		572	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			356		572	352
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1214		452	696
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	356	208	16			
Volume Left	0	12	9			
Volume Right	7	0	7			
cSH	1700	1214	534			
Volume to Capacity	0.21	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	0.5	12.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.5	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			23.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Future Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	216	45	16	18	99	186	6	19	140	83
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	106	216	79	99	192	19	223					
Volume Left (vph)	73	0	45	99	0	19	0					
Volume Right (vph)	0	216	18	0	6	0	83					
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16					
Departure Headway (s)	6.5	5.5	6.5	6.6	6.1	6.8	5.9					
Degree Utilization, x	0.19	0.33	0.14	0.18	0.33	0.04	0.37					
Capacity (veh/h)	517	619	505	519	562	497	576					
Control Delay (s)	9.9	9.9	10.6	9.8	10.8	8.9	11.1					
Approach Delay (s)	9.9		10.6	10.5		10.9						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			10.4									
Level of Service			B									
Intersection Capacity Utilization			36.9%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W



























08/11/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1497	75	89	920	91	179	140	102	211	120	69
Future Volume (vph)	42	1497	75	89	920	91	179	140	102	211	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1682	84	100	1034	102	201	157	115	237	135	78
RTOR Reduction (vph)	0	0	37	0	0	46	0	0	100	0	0	68
Lane Group Flow (vph)	47	1682	47	100	1034	56	201	157	15	237	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Effective Green, g (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1776	794	152	1728	772	387	220	190	372	197	176
v/s Ratio Prot	0.03	c0.53		0.03	c0.33		0.07	c0.10		c0.08	0.09	
v/s Ratio Perm			0.03			0.04			0.01			0.01
v/c Ratio	0.52	0.95	0.06	0.66	0.60	0.07	0.52	0.71	0.08	0.64	0.69	0.06
Uniform Delay, d1	54.9	25.0	12.2	55.8	18.1	12.6	48.8	49.7	45.5	50.3	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.76	0.46	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	12.0	0.1	7.6	1.4	0.2	0.7	9.4	0.1	2.9	8.3	0.1
Delay (s)	57.9	37.0	12.4	49.9	9.6	1.6	49.5	59.1	45.6	53.2	58.5	46.3
Level of Service	E	D	B	D	A	A	D	E	D	D	E	D
Approach Delay (s)		36.4			12.2			51.7			53.6	
Approach LOS		D			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			32.7				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				16.5	
Intersection Capacity Utilization			69.9%				ICU Level of Service				C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	19	1702	43	86	1064	28	58	3	92	11	5	27
Future Volume (vph)	19	1702	43	86	1064	28	58	3	92	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.54	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		951	1361	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1850	47	93	1157	30	63	3	100	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	90	0	0	26	0
Lane Group Flow (vph)	21	1850	34	93	1157	23	63	13	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.70	0.70	0.09	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2231	891	146	2375	982	108	137		92	132	
v/s Ratio Prot	0.01	c0.58		c0.06	0.38			0.01				0.01
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.83	0.04	0.64	0.49	0.02	0.58	0.09		0.13	0.06	
Uniform Delay, d1	57.6	12.6	5.4	52.4	5.0	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.12	0.21	0.03	1.45	0.16	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.8	0.0	5.1	0.5	0.0	6.5	0.2		0.5	0.1	
Delay (s)	67.4	4.5	0.2	81.0	1.3	0.0	58.3	49.5		50.0	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		5.0			7.1			52.9			49.5	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018


























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕↕	↕↕		↵	
Traffic Volume (veh/h)	4	1764	1217	21	52	24
Future Volume (Veh/h)	4	1764	1217	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1897	1309	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.69				0.69	0.69
vC, conflicting volume	1332				2277	666
vC1, stage 1 conf vol					1320	
vC2, stage 2 conf vol					956	
vCu, unblocked vol	580				1951	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				77	97
cM capacity (veh/h)	692				242	752
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	948	948	873	459	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	692	1700	1700	1700	1700	309
Volume to Capacity	0.01	0.56	0.56	0.51	0.27	0.27
Queue Length 95th (ft)	0	0	0	0	0	26
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	20.8
Lane LOS	B					C
Approach Delay (s)	0.0			0.0		20.8
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			64.3%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

7: Providence Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73
Future Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Flt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1607	3214	1480	1614	3110			1604	1465		1548	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.71	1.00		0.75	
Satd. Flow (perm)	1607	3214	1480	1614	3110			1190	1465		1208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	1849	98	109	1221	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	26	0	4	0	0	0	55	0	8	0
Lane Group Flow (vph)	27	1849	72	109	1301	0	0	60	22	0	362	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Effective Green, g (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Actuated g/C Ratio	0.03	0.53	0.53	0.06	0.56			0.29	0.29		0.29	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	48	1706	785	91	1733			342	421		347	
v/s Ratio Prot	0.02	c0.58		c0.07	0.42							
v/s Ratio Perm			0.05					0.05	0.02		c0.30	
v/c Ratio	0.56	1.08	0.09	1.20	0.75			0.18	0.05		1.04	
Uniform Delay, d1	57.4	28.1	13.9	56.6	20.2			32.1	30.9		42.8	
Progression Factor	0.89	1.50	1.85	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	10.8	44.8	0.1	156.9	3.0			0.3	0.1		60.2	
Delay (s)	62.2	87.0	25.8	213.5	23.3			32.4	31.0		102.9	
Level of Service	E	F	C	F	C			C	C		F	
Approach Delay (s)		83.7			37.9			31.6			102.9	
Approach LOS		F			D			C			F	
Intersection Summary												
HCM 2000 Control Delay			67.1			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			97.0%			ICU Level of Service			F			
Analysis Period (min)			15									

c Critical Lane Group

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖ ↗	↗ ↖	↖ ↗		↖ ↗	
Traffic Vol, veh/h	3	2010	1295	29	62	6
Future Vol, veh/h	3	2010	1295	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	2116	1363	31	65	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1394	0	2442
Stage 1	-	-	1378
Stage 2	-	-	1064
Critical Hdwy	4.76	-	6.46
Critical Hdwy Stg 1	-	-	5.46
Critical Hdwy Stg 2	-	-	5.46
Follow-up Hdwy	2.53	-	3.53
Pot Cap-1 Maneuver	353	-	~ 34
Stage 1	-	-	230
Stage 2	-	-	327
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	353	-	~ 34
Mov Cap-2 Maneuver	-	-	138
Stage 1	-	-	230
Stage 2	-	-	324

Approach	EB	WB	SB
HCM Control Delay, s	0	0	50.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	353	-	-	-	147
HCM Lane V/C Ratio	0.009	-	-	-	0.487
HCM Control Delay (s)	15.3	-	-	-	50.8
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.3

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	ZHB				Intersection	Crestview/East-West Connector			
Agency or Co.	KAI				E/W Street Name	East-West Connector			
Date Performed	10/21/2017				N/S Street Name	Crestview Dr			
Analysis Year	2025				Analysis Time Period (hrs)	0.25			
Time Analyzed	Total AM				Peak Hour Factor	0.92			
Project Description	Crestview Crossing				Jurisdiction				

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	32	0	39	0	17	0	11	92	13	0	5	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v _{PCE}), pc/h	0	15	0	35	0	42	0	18	0	12	105	14	0	5	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		50			60			131			317	
Entry Volume veh/h		50			60			126			302	
Circulating Flow (v _c), pc/h	354			132			20			54		
Exiting Flow (v _{ex}), pc/h	19			17			138			384		
Capacity (c _{PCE}), pc/h		962			1206			1352			1306	
Capacity (c), veh/h		962			1206			1301			1246	
v/c Ratio (x)		0.05			0.05			0.10			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			3.4			3.5			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.3			1.0	
Approach Delay, s/veh	4.2			3.4			3.5			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.4						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Springbrook/Crestview		
Agency or Co.	KAI			E/W Street Name	Crestview Dr		
Date Performed	10/21/2017			N/S Street Name	Springbrook Rd		
Analysis Year	2025			Analysis Time Period (hrs)	0.25		
Time Analyzed	Total PM			Peak Hour Factor	0.93		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	20	13	0	14	13	172	0	7	374	25	2	200	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	57	22	14	0	18	14	185	0	8	414	27	2	215	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		93			217			449			558	
Entry Volume veh/h		93			214			437			552	
Circulating Flow (v _c), pc/h	523			481			296			40		
Exiting Flow (v _{ex}), pc/h	264			75			658			320		
Capacity (c _{PCE}), pc/h		809			845			1020			1325	
Capacity (c), veh/h		809			833			993			1311	
v/c Ratio (x)		0.11			0.26			0.44			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			7.1			8.6			6.8	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			1.0			2.3			2.1	
Approach Delay, s/veh	5.6			7.1			8.6			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.4						A					

HCM Unsignalized Intersection Capacity Analysis

2: Libra St & Crestview Dr

08/11/2018






















Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↶			↷	↶	↷	
Traffic Volume (veh/h)	233	5	9	193	8	14	
Future Volume (Veh/h)	233	5	9	193	8	14	
Sign Control	Free			Free	Stop		
Grade	0%			0%	2%		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	
Hourly flow rate (vph)	295	6	11	244	10	18	
Pedestrians						2	
Lane Width (ft)						12.0	
Walking Speed (ft/s)						3.5	
Percent Blockage						0	
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume			303			566	300
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			303			566	300
tC, single (s)			4.1			6.4	6.2
tC, 2 stage (s)							
tF (s)			2.2			3.5	3.3
p0 queue free %			99			98	98
cM capacity (veh/h)			1267			483	743
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	301	255	28				
Volume Left	0	11	10				
Volume Right	6	0	18				
cSH	1700	1267	623				
Volume to Capacity	0.18	0.01	0.04				
Queue Length 95th (ft)	0	1	4				
Control Delay (s)	0.0	0.4	11.0				
Lane LOS			A		B		
Approach Delay (s)	0.0	0.4	11.0				
Approach LOS			B				
Intersection Summary							
Average Delay			0.7				
Intersection Capacity Utilization			27.5%	ICU Level of Service		A	
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis

3: Springbrook Rd & Haworth Ave/Shopping Center

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Future Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	235	95	71	90	147	210	5	70	189	42
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	152	235	256	147	215	70	231					
Volume Left (vph)	86	0	95	147	0	70	0					
Volume Right (vph)	0	235	90	0	5	0	42					
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06					
Departure Headway (s)	7.5	6.5	7.1	7.8	7.3	7.9	7.3					
Degree Utilization, x	0.32	0.42	0.51	0.32	0.43	0.15	0.47					
Capacity (veh/h)	454	524	468	431	462	429	460					
Control Delay (s)	12.7	13.0	17.2	13.1	14.5	11.1	15.3					
Approach Delay (s)	12.9		17.2	13.9		14.3						
Approach LOS	B		C	B		B						






























Intersection Summary

Delay	14.4
Level of Service	B
Intersection Capacity Utilization	50.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

4: Springbrook Rd & OR 99W

08/11/2018



























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		
Traffic Volume (vph)	98	1301	124	151	1636	155	374	179	142	224	212	84
Future Volume (vph)	98	1301	124	151	1636	155	374	179	142	224	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1328	127	154	1669	158	382	183	145	229	216	86
RTOR Reduction (vph)	0	0	63	0	0	70	0	0	124	0	0	67
Lane Group Flow (vph)	100	1328	64	154	1669	89	382	183	21	229	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Effective Green, g (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Actuated g/C Ratio	0.08	0.50	0.50	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1581	726	212	1644	711	462	237	193	515	268	226
v/s Ratio Prot	c0.06	0.42		0.05	c0.51		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.02			0.01
v/c Ratio	0.81	0.84	0.09	0.73	1.02	0.12	0.83	0.77	0.11	0.44	0.81	0.08
Uniform Delay, d1	63.5	29.8	18.0	63.4	35.0	18.7	58.1	57.9	52.3	53.0	56.9	50.3
Progression Factor	1.00	1.00	1.00	1.03	0.97	1.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	5.5	0.2	6.2	20.6	0.2	11.2	13.6	0.1	0.4	15.5	0.1
Delay (s)	92.9	35.4	18.2	71.5	54.5	20.5	69.3	71.5	52.5	53.4	72.3	50.4
Level of Service	F	D	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		37.7			53.1			66.4			60.6	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			50.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			16.5		
Intersection Capacity Utilization			95.6%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Brutscher St & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	32	1210	101	231	1685	41	243	16	152	21	10	51
Future Volume (vph)	32	1210	101	231	1685	41	243	16	152	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1438		1675	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.50	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1438		875	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1260	105	241	1755	43	253	17	158	22	10	53
RTOR Reduction (vph)	0	0	33	0	0	14	0	121	0	0	41	0
Lane Group Flow (vph)	33	1260	72	241	1755	29	253	54	0	22	22	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4				8
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.9	68.9	68.9	26.0	91.0	91.0	32.6	32.6		32.6	32.6	
Effective Green, g (s)	3.9	68.9	68.9	26.0	91.0	91.0	32.6	32.6		32.6	32.6	
Actuated g/C Ratio	0.03	0.49	0.49	0.19	0.65	0.65	0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	45	1528	689	305	2078	878	284	334		203	342	
v/s Ratio Prot	0.02	c0.41		0.15	c0.55			0.04				0.02
v/s Ratio Perm			0.05			0.02	c0.21			0.03		
v/c Ratio	0.73	0.82	0.10	0.79	0.84	0.03	0.89	0.16		0.11	0.07	
Uniform Delay, d1	67.5	30.4	19.0	54.4	19.0	8.8	52.0	42.8		42.3	41.8	
Progression Factor	0.79	1.05	1.02	0.73	0.49	0.34	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.1	3.4	0.2	1.3	0.4	0.0	27.3	0.2		0.2	0.1	
Delay (s)	83.6	35.5	19.6	40.9	9.7	3.0	79.3	43.0		42.4	41.9	
Level of Service	F	D	B	D	A	A	E	D		D	D	
Approach Delay (s)		35.4			13.3			64.4			42.0	
Approach LOS		D			B			E			D	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: OR 99W & Vittoria Way

08/11/2018


























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	
Traffic Volume (veh/h)	32	1379	2010	128	26	18
Future Volume (Veh/h)	32	1379	2010	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1483	2161	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.42				0.42	0.42
vC, conflicting volume	2299				3040	1150
vC1, stage 1 conf vol					2230	
vC2, stage 2 conf vol					810	
vCu, unblocked vol	1312				3095	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	84				71	96
cM capacity (veh/h)	215				95	453
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	742	742	1441	858	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	215	1700	1700	1700	1700	140
Volume to Capacity	0.16	0.44	0.44	0.85	0.50	0.34
Queue Length 95th (ft)	14	0	0	0	0	34
Control Delay (s)	24.9	0.0	0.0	0.0	0.0	43.2
Lane LOS	C					E
Approach Delay (s)	0.6			0.0		43.2
Approach LOS						E
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			74.7%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Future Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Fr t	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Fl t Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1654	3184	1479	1646	3222			1638	1465		1594	
Fl t Permitted	0.95	1.00	1.00	0.95	1.00			0.70	1.00		0.53	
Satd. Flow (perm)	1654	3184	1479	1646	3222			1191	1465		872	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1363	40	91	2080	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	18	0	4	0	0	0	105	0	6	0
Lane Group Flow (vph)	93	1363	22	91	2254	0	0	181	43	0	261	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Effective Green, g (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Actuated g/C Ratio	0.05	0.55	0.55	0.09	0.59			0.25	0.25		0.25	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	82	1762	818	148	1912			296	365		217	
v/s Ratio Prot	c0.06	0.43		0.06	c0.70							
v/s Ratio Perm			0.01					0.15	0.03		c0.30	
v/c Ratio	1.13	0.77	0.03	0.61	1.18			0.61	0.12		1.20	
Uniform Delay, d1	66.5	24.4	14.2	61.4	28.5			46.5	40.6		52.5	
Progression Factor	1.07	0.54	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	124.2	2.4	0.0	8.4	86.2			4.2	0.2		126.7	
Delay (s)	195.5	15.6	14.2	69.8	114.6			50.8	40.8		179.2	
Level of Service	F	B	B	E	F			D	D		F	
Approach Delay (s)		26.8			112.9			46.3			179.2	
Approach LOS		C			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			82.9			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)		15.0				
Intersection Capacity Utilization			102.4%			ICU Level of Service		G				
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Int Delay, s/veh 6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	
Traffic Vol, veh/h	31	1585	2213	75	61	17
Future Vol, veh/h	31	1585	2213	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1704	2380	81	66	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2460	0	3339
Stage 1	-	-	2420
Stage 2	-	-	919
Critical Hdwy	4.1	-	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.2	-	3.52
Pot Cap-1 Maneuver	192	-	~ 9
Stage 1	-	-	69
Stage 2	-	-	387
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	192	-	~ 7
Mov Cap-2 Maneuver	-	-	~ 54
Stage 1	-	-	69
Stage 2	-	-	320

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	\$ 326.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	192	-	-	-	64
HCM Lane V/C Ratio	0.174	-	-	-	1.31
HCM Control Delay (s)	27.6	-	-	-	\$ 326.2
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	7

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Crestview/East-West Connector		
Agency or Co.	KAI			E/W Street Name	East-West Connector		
Date Performed	10/21/2017			N/S Street Name	Crestview Dr		
Analysis Year	2025			Analysis Time Period (hrs)	0.25		
Time Analyzed	Total PM			Peak Hour Factor	0.94		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	9	0	21	0	25	0	11	0	36	210	43	0	19	205	15
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	10	0	22	0	27	0	12	0	38	228	46	0	20	222	16
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		32			39			312			258	
Entry Volume veh/h		32			39			308			254	
Circulating Flow (v _c), pc/h	269			276			30			65		
Exiting Flow (v _{ex}), pc/h	66			54			250			271		
Capacity (c _{PCE}), pc/h		1049			1041			1338			1291	
Capacity (c), veh/h		1049			1041			1319			1270	
v/c Ratio (x)		0.03			0.04			0.23			0.20	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.7			3.8			4.7			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.1			0.9			0.7	
Approach Delay, s/veh	3.7			3.8			4.7			4.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.5						A					

Appendix L
2025 Horizon Year Total
Conditions with Mitigation
Level of Service Worksheets

HCM Signalized Intersection Capacity Analysis

7: Providence Dr & OR 99W

08/11/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73	
Future Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73	
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		-3%			2%			3%			2%		
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00	
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1232	1642	1465	1235	1650	1402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	27	1849	98	109	1221	84	46	14	77	259	32	79	
RTOR Reduction (vph)	0	0	30	0	0	33	0	0	59	0	0	60	
Lane Group Flow (vph)	27	1849	68	109	1221	51	46	14	18	259	32	19	
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			8				4	
Permitted Phases			2			6	8		8	4		4	
Actuated Green, G (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2	
Effective Green, g (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2	
Actuated g/C Ratio	0.03	0.56	0.56	0.08	0.61	0.61	0.23	0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	48	1807	832	125	1912	855	289	385	344	290	387	329	
v/s Ratio Prot	0.02	c0.58		c0.07	c0.39			0.01				0.02	
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.21		0.01	
v/c Ratio	0.56	1.02	0.08	0.87	0.64	0.06	0.16	0.04	0.05	0.89	0.08	0.06	
Uniform Delay, d1	57.4	26.2	12.0	54.8	14.9	9.5	36.5	35.4	35.6	44.4	35.8	35.6	
Progression Factor	0.89	1.47	2.02	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.7	25.0	0.2	45.0	1.6	0.1	0.4	0.1	0.1	27.8	0.1	0.1	
Delay (s)	65.0	63.5	24.5	99.8	16.6	9.6	36.8	35.5	35.6	72.2	35.9	35.7	
Level of Service	E	E	C	F	B	A	D	D	D	E	D	D	
Approach Delay (s)		61.6			22.6			36.0			61.3		
Approach LOS		E			C			D			E		
Intersection Summary													
HCM 2000 Control Delay			46.5									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.97										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			90.5%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Providence Dr/Crestview Dr & OR 99W

08/11/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Future Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1277	1690	1465	1245	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1363	40	91	2080	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	16	0	0	42	0	0	114	0	0	41
Lane Group Flow (vph)	93	1363	24	91	2080	136	144	37	34	202	14	10
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Effective Green, g (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Actuated g/C Ratio	0.07	0.61	0.61	0.09	0.63	0.63	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	121	1946	904	148	2044	906	244	323	280	238	325	276
v/s Ratio Prot	c0.06	0.43		0.06	c0.64			0.02				0.01
v/s Ratio Perm			0.02			0.09	0.11		0.02	c0.16		0.01
v/c Ratio	0.77	0.70	0.03	0.61	1.02	0.15	0.59	0.11	0.12	0.85	0.04	0.04
Uniform Delay, d1	63.7	18.5	10.7	61.4	26.0	10.7	51.6	46.8	46.9	54.6	46.1	46.1
Progression Factor	1.25	0.18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.2	1.8	0.0	8.4	24.4	0.4	4.4	0.2	0.3	24.3	0.1	0.1
Delay (s)	101.6	5.1	10.8	69.8	50.5	11.1	56.0	47.0	47.1	78.9	46.2	46.1
Level of Service	F	A	B	E	D	B	E	D	D	E	D	D
Approach Delay (s)		11.2			48.2			51.0			70.9	
Approach LOS		B			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			37.3				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			92.9%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Appendix M
SimTraffic Queuing Worksheets

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	320	524	561	225	77	95	228	239	24	130	148	241
Average Queue (ft)	43	273	273	21	21	46	128	135	0	42	80	99
95th Queue (ft)	154	447	453	162	59	83	207	219	0	102	133	186
Link Distance (ft)		2053	2053				1271	1271				1159
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)		4	4	0								
Queuing Penalty (veh)		2	3	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	106	182	194	417	155
Average Queue (ft)	47	143	165	159	37
95th Queue (ft)	95	212	220	353	108
Link Distance (ft)				443	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		2	12	7	0
Queuing Penalty (veh)		3	22	33	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	53	140	162	35	128	138	174	75	145	137	53	62
Average Queue (ft)	11	35	43	4	44	36	52	5	53	45	8	16
95th Queue (ft)	38	99	115	21	101	101	130	32	118	103	34	44
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)			0				2	0			1	1
Queuing Penalty (veh)			0				1	0			0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	23	163
Average Queue (ft)	2	62
95th Queue (ft)	15	126
Link Distance (ft)		204
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	219	230	125	128	90	98	78	105
Average Queue (ft)	91	104	16	61	34	30	28	35
95th Queue (ft)	191	216	76	117	83	82	66	77
Link Distance (ft)	447	447			1785	1785	301	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			100	230				160
Storage Blk Time (%)		6	0					0
Queuing Penalty (veh)		3	0					0

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	38	297
Average Queue (ft)	2	158
95th Queue (ft)	17	349
Link Distance (ft)		526
Upstream Blk Time (%)		1
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 77

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	328	465	475	148	214	410	571	589	395	332	345	1699
Average Queue (ft)	201	213	217	5	79	111	254	266	87	303	335	1616
95th Queue (ft)	385	475	455	76	174	257	530	553	352	394	383	1901
Link Distance (ft)		3631	3631				1270	1270				1649
Upstream Blk Time (%)												77
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	14	0	1	0			2	4	0	9	65	12
Queuing Penalty (veh)	76	0	1	0			2	11	0	26	197	62

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	276	182	195	451	155
Average Queue (ft)	91	144	171	427	69
95th Queue (ft)	259	229	247	482	175
Link Distance (ft)				432	
Upstream Blk Time (%)				40	
Queuing Penalty (veh)				265	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)	0	11	30	60	1
Queuing Penalty (veh)	0	33	89	286	5

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	211	409	375	225	374	984	979	105	245	388	61	123
Average Queue (ft)	27	180	188	70	313	571	565	10	214	250	12	33
95th Queue (ft)	109	360	364	216	453	1383	1382	55	295	487	41	87
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						6	6			41		
Queuing Penalty (veh)						54	56			0		
Storage Bay Dist (ft)	260			200	350			80	220			50
Storage Blk Time (%)		3	7	0	39	2	18	0	50	3	2	7
Queuing Penalty (veh)		1	7	0	297	4	8	0	74	8	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	72	204	208	158
Average Queue (ft)	20	94	95	88
95th Queue (ft)	52	382	384	200
Link Distance (ft)		449	449	209
Upstream Blk Time (%)		4	5	10
Queuing Penalty (veh)		42	45	0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	2			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	259	285	106	189	768	748	218	131
Average Queue (ft)	118	128	7	92	303	305	90	46
95th Queue (ft)	214	228	51	196	1174	1169	177	106
Link Distance (ft)	449	449			1785	1785	301	
Upstream Blk Time (%)					1	1	0	
Queuing Penalty (veh)					11	13	0	
Storage Bay Dist (ft)			100	230				160
Storage Blk Time (%)		10	0	0	12		2	0
Queuing Penalty (veh)		2	0	0	8		2	0

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	95	158	164	541
Average Queue (ft)	28	52	51	510
95th Queue (ft)	73	354	347	607
Link Distance (ft)		746	746	526
Upstream Blk Time (%)		2	3	83
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1908

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	320	553	506	224	91	105	193	192	186	212	219	127
Average Queue (ft)	35	282	254	13	22	51	89	91	46	118	96	43
95th Queue (ft)	137	466	430	125	61	91	159	161	143	191	171	100
Link Distance (ft)		686	686				1271	1271				527
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		5	3	0								
Queuing Penalty (veh)		2	2	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	169	190	294	155
Average Queue (ft)	67	103	107	44
95th Queue (ft)	146	172	233	115
Link Distance (ft)			443	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	7	0
Queuing Penalty (veh)	0	2	19	1

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	114	234	249	76	130	144	163	36	132	116	54	75
Average Queue (ft)	13	66	76	8	53	19	30	2	54	47	9	16
95th Queue (ft)	60	168	182	43	109	77	104	24	114	99	33	48
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220			50
Storage Blk Time (%)		0	1	0			1	0			1	2
Queuing Penalty (veh)		0	0	0			0	0			0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	SB
Directions Served	L	T	T	LR
Maximum Queue (ft)	34	82	92	204
Average Queue (ft)	3	5	8	104
95th Queue (ft)	17	41	49	214
Link Distance (ft)		1266	1266	204
Upstream Blk Time (%)				14
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	15	457	458	125	189	190	187	101	102	302
Average Queue (ft)	1	273	297	41	88	79	86	35	34	178
95th Queue (ft)	8	445	463	126	155	157	166	77	71	275
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		0	0							
Queuing Penalty (veh)		2	3							
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)		20	23	0	0	0				
Queuing Penalty (veh)		0	20	0	0	0				

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	28	568
Average Queue (ft)	2	462
95th Queue (ft)	18	650
Link Distance (ft)		526
Upstream Blk Time (%)		61
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 55

Queuing and Blocking Report
2020 Background PM with rerouted traffic

08/13/2018

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	337	469	431	372	131	454	811	838	395	296	322	320
Average Queue (ft)	115	308	271	15	49	127	457	473	171	176	220	138
95th Queue (ft)	237	436	389	138	102	361	716	737	493	264	308	259
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	4	2	0		0	9	16	0	0	1	0
Queuing Penalty (veh)	0	4	2	0		0	13	24	1	0	3	1

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	192	178	195	417	155
Average Queue (ft)	52	75	124	183	67
95th Queue (ft)	121	145	211	339	161
Link Distance (ft)				432	
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				1	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	1	22	0
Queuing Penalty (veh)		0	2	67	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	174	387	392	225	375	1162	1180	105	245	379	68	124
Average Queue (ft)	36	187	206	64	327	609	599	17	227	292	16	36
95th Queue (ft)	113	369	391	206	454	1319	1322	75	284	488	50	88
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						2	2			52		
Queuing Penalty (veh)						15	18			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		2	8	0	49	3	19	0	61	1	2	10
Queuing Penalty (veh)		1	8	0	363	6	8	0	92	2	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	74	290	295	129
Average Queue (ft)	26	35	37	45
95th Queue (ft)	63	197	204	101
Link Distance (ft)		454	454	209
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		3	3	
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	3			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	57	242	241	125	250	462	462	278	185	256
Average Queue (ft)	7	109	116	18	83	208	221	124	71	145
95th Queue (ft)	31	207	208	77	180	392	406	223	156	233
Link Distance (ft)		454	454			1780	1780	301		314
Upstream Blk Time (%)								0		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)		10	12	0	0	5		6	0	
Queuing Penalty (veh)		1	4	0	0	5		9	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	89	8	17	541
Average Queue (ft)	27	0	1	517
95th Queue (ft)	65	6	7	584
Link Distance (ft)		746	746	526
Upstream Blk Time (%)				90
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 666

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	213	600	564	300	90	115	201	209	181	210	210	97
Average Queue (ft)	39	302	267	13	25	52	90	90	40	102	100	40
95th Queue (ft)	142	484	458	126	70	101	165	167	127	178	178	83
Link Distance (ft)		686	686				1271	1271				527
Upstream Blk Time (%)		1	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)	0	6	3	0								
Queuing Penalty (veh)	0	3	3	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	165	190	300	141
Average Queue (ft)	71	107	95	39
95th Queue (ft)	142	174	207	103
Link Distance (ft)			443	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	5	0
Queuing Penalty (veh)	0	1	14	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	55	216	237	72	180	136	137	24	133	117	47	57
Average Queue (ft)	12	72	80	7	64	17	29	1	50	42	7	15
95th Queue (ft)	38	171	186	43	136	67	79	10	115	91	27	41
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220			50
Storage Blk Time (%)		0	1				1				1	0
Queuing Penalty (veh)		0	0				0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	24	201	214	5	219
Average Queue (ft)	2	34	42	0	167
95th Queue (ft)	15	139	151	3	269
Link Distance (ft)		1266	1266	452	204
Upstream Blk Time (%)					54
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)		2			
Queuing Penalty (veh)		0			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	468	472	125	233	297	277	113	89	404
Average Queue (ft)	28	353	368	38	92	147	148	42	37	243
95th Queue (ft)	76	516	526	121	181	269	265	91	74	366
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		2	3							1
Queuing Penalty (veh)		14	24							0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	0	28	30	0	0	1				
Queuing Penalty (veh)	0	7	27	0	2	2				

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	25	352	433
Average Queue (ft)	2	12	328
95th Queue (ft)	15	252	654
Link Distance (ft)		1780	526
Upstream Blk Time (%)			39
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 98

Queuing and Blocking Report
2020 Total PM

08/13/2018

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	359	548	497	300	124	454	746	770	395	302	325	280
Average Queue (ft)	134	328	288	13	57	177	473	485	187	168	214	135
95th Queue (ft)	281	461	423	126	116	457	680	694	512	257	302	224
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)		5	1	0		0	10	19	0	0	1	
Queuing Penalty (veh)		5	2	0		0	15	29	1	0	2	

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	158	161	195	425	155
Average Queue (ft)	56	69	119	189	60
95th Queue (ft)	114	139	207	364	150
Link Distance (ft)				432	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	1	22	1
Queuing Penalty (veh)		0	2	66	2

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	153	385	426	225	344	367	374	105	244	357	61	93
Average Queue (ft)	24	194	211	58	181	220	238	16	184	117	16	28
95th Queue (ft)	104	355	383	191	307	341	351	70	265	284	46	67
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		3	7	0	1	0	23	0	10	0	0	5
Queuing Penalty (veh)		1	7	0	4	0	9	0	16	0	0	1

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (ft)	79	50	30	18	17	125
Average Queue (ft)	31	3	2	1	1	43
95th Queue (ft)	68	37	26	10	7	95
Link Distance (ft)		1264	1264	454	454	209
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	2	0				

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	374	356	119	254	1569	1564	281	185	331
Average Queue (ft)	86	161	159	13	132	1082	1083	137	89	213
95th Queue (ft)	141	344	329	65	274	1831	1824	236	183	337
Link Distance (ft)		454	454			1780	1780	301		314
Upstream Blk Time (%)		1	0			0	0	0		5
Queuing Penalty (veh)		4	2			3	4	0		0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	21	12	18	0	0	34		9	0	
Queuing Penalty (veh)	124	11	7	0	0	29		12	1	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (ft)	170	202	188	172	181	537
Average Queue (ft)	77	19	14	23	22	516
95th Queue (ft)	205	156	135	136	140	570
Link Distance (ft)		1780	1780	746	746	526
Upstream Blk Time (%)						94
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	250					
Storage Blk Time (%)	6	1				
Queuing Penalty (veh)	45	0				

Network Summary

Network wide Queuing Penalty: 421

Queuing and Blocking Report
 2020 Total AM with Mitigation

08/13/2018

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	459	467	125	188	241	246	92	94	57	99	224
Average Queue (ft)	35	318	332	43	82	120	119	14	34	12	40	175
95th Queue (ft)	87	486	497	128	149	214	218	54	75	38	79	244
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		1	1									
Queuing Penalty (veh)		8	10									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	0	24	26	0		0	0					10
Queuing Penalty (veh)	1	6	24	1		0	0					10

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	381	79
Average Queue (ft)	64	25
95th Queue (ft)	243	59
Link Distance (ft)	385	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	242	201	65	254	563	586	255	184	284	163	224
Average Queue (ft)	75	70	67	5	92	292	302	96	104	48	65	151
95th Queue (ft)	123	171	148	32	209	487	521	272	176	155	132	238
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	16	2	2	0		12	11	0	5		0	9
Queuing Penalty (veh)	96	2	1	0		10	19	0	9		1	6

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	300	82
Average Queue (ft)	40	26
95th Queue (ft)	188	65
Link Distance (ft)	300	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 2020 Total AM Phase II Sensitivity Analysis

08/13/2018

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	458	468	125	196	298	308	216	100	76	94	225
Average Queue (ft)	71	322	341	42	81	152	152	29	37	21	38	183
95th Queue (ft)	129	484	495	128	154	255	271	111	80	57	77	246
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		1	1									
Queuing Penalty (veh)		7	10									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	7	25	27	0		1	2	0				13
Queuing Penalty (veh)	55	17	24	0		1	1	0				17

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	372	98
Average Queue (ft)	105	34
95th Queue (ft)	328	73
Link Distance (ft)	385	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Queuing and Blocking Report
 2020 Total PM Phase II Sensitivity Analysis

08/13/2018

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	125	412	417	122	255	855	865	255	181	221	158	225
Average Queue (ft)	108	169	158	12	121	483	484	138	104	55	65	175
95th Queue (ft)	146	382	372	66	260	828	834	320	174	166	122	259
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)		1	0							0		
Queuing Penalty (veh)		3	3							0		
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	47	6	11	0	0	23	24	0	3	0	0	21
Queuing Penalty (veh)	264	8	4	0	0	20	49	1	6	1	1	29

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	324	184
Average Queue (ft)	111	63
95th Queue (ft)	334	138
Link Distance (ft)	300	
Upstream Blk Time (%)	7	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Queuing and Blocking Report
 2025 Background AM with rerouted traffic

08/13/2018

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	266	623	610	375	68	100	205	217	158	221	240	168
Average Queue (ft)	43	358	322	31	17	44	99	101	43	109	97	43
95th Queue (ft)	171	597	570	201	46	81	174	183	134	185	184	113
Link Distance (ft)		686	686				1271	1271				527
Upstream Blk Time (%)		2	2									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		11	8	0								0
Queuing Penalty (veh)		5	6	0								0

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	162	194	326	126
Average Queue (ft)	70	107	98	40
95th Queue (ft)	147	177	218	105
Link Distance (ft)			443	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	6	0
Queuing Penalty (veh)	0	1	17	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	44	268	264	60	146	132	154	37	122	132	42	63
Average Queue (ft)	9	110	118	8	51	22	28	2	46	54	8	16
95th Queue (ft)	31	228	236	34	107	88	93	18	101	110	29	44
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220			50
Storage Blk Time (%)		0	2				1				0	1
Queuing Penalty (veh)		0	1				0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	SB
Directions Served	L	T	T	LR
Maximum Queue (ft)	24	192	199	219
Average Queue (ft)	3	18	28	190
95th Queue (ft)	18	94	115	274
Link Distance (ft)		1266	1266	204
Upstream Blk Time (%)				73
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		1		
Queuing Penalty (veh)		0		

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	10	465	469	125	149	207	217	110	93	334
Average Queue (ft)	0	332	347	40	76	91	98	42	42	189
95th Queue (ft)	5	487	500	120	136	170	181	85	82	302
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		1	1							
Queuing Penalty (veh)		7	10							
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)		24	26	0		0		0		
Queuing Penalty (veh)		0	24	0		0		0		

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	36	4	554
Average Queue (ft)	3	0	493
95th Queue (ft)	19	0	638
Link Distance (ft)		746	526
Upstream Blk Time (%)			70
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 74

Queuing and Blocking Report
 2025 Background PM with rerouted traffic

08/13/2018

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	374	583	570	300	145	454	1182	1185	395	255	290	246
Average Queue (ft)	137	344	308	18	56	221	811	818	232	152	198	128
95th Queue (ft)	312	500	461	150	124	538	1395	1404	551	233	272	215
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)		0	0				4	5				
Queuing Penalty (veh)		0	0				34	46				
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	7	2	0		0	29	34	0		0	
Queuing Penalty (veh)	0	7	3	0		0	40	51	1		0	

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	143	150	195	437	155
Average Queue (ft)	56	73	125	209	63
95th Queue (ft)	109	134	208	399	156
Link Distance (ft)				432	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	0	23	0
Queuing Penalty (veh)		0	1	69	1

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	239	332	362	225	375	1285	1301	105	245	373	70	143
Average Queue (ft)	42	184	201	67	356	972	973	16	219	261	18	38
95th Queue (ft)	152	350	371	212	435	1597	1620	72	286	481	52	104
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						6	7			37		
Queuing Penalty (veh)						54	65			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		2	8	0	60	9	24	0	50	2	2	10
Queuing Penalty (veh)		1	8	0	494	19	10	0	75	5	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (ft)	85	78	41	404	401	230
Average Queue (ft)	25	3	1	178	177	154
95th Queue (ft)	69	43	29	514	517	260
Link Distance (ft)		1264	1264	454	454	209
Upstream Blk Time (%)				3	4	35
Queuing Penalty (veh)				35	43	0
Storage Bay Dist (ft)	100					
Storage Blk Time (%)	2					
Queuing Penalty (veh)	16					

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	317	316	125	254	1236	1258	281	184	289
Average Queue (ft)	119	132	18	112	630	637	136	78	144
95th Queue (ft)	232	246	75	250	1627	1633	241	167	242
Link Distance (ft)	454	454			1780	1780	301		314
Upstream Blk Time (%)					1	1	1		0
Queuing Penalty (veh)					14	14	0		0
Storage Bay Dist (ft)			100	230				160	
Storage Blk Time (%)	10	13	0	0	18		8	0	
Queuing Penalty (veh)	0	5	0	0	15		12	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	WB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	169	111	362	321	543
Average Queue (ft)	74	13	76	74	515
95th Queue (ft)	184	105	425	421	584
Link Distance (ft)		1780	746	746	526
Upstream Blk Time (%)			4	3	90
Queuing Penalty (veh)			0	0	0
Storage Bay Dist (ft)	250				
Storage Blk Time (%)	1	0			
Queuing Penalty (veh)	8	0			

Network Summary

Network wide Queuing Penalty: 1158

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	372	606	614	375	92	114	208	206	178	187	174	117
Average Queue (ft)	64	366	333	34	20	49	96	97	45	112	93	46
95th Queue (ft)	241	606	597	210	61	93	184	182	137	175	161	99
Link Distance (ft)		686	686				1271	1271				527
Upstream Blk Time (%)		3	4									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		12	9	0								
Queuing Penalty (veh)		5	7	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	170	194	324	153
Average Queue (ft)	72	110	109	40
95th Queue (ft)	150	186	223	109
Link Distance (ft)			443	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	6	0
Queuing Penalty (veh)	0	2	17	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	98	286	324	97	149	100	136	10	152	134	36	58
Average Queue (ft)	14	114	124	12	63	15	26	1	49	54	8	16
95th Queue (ft)	59	236	257	62	122	59	82	6	115	113	25	43
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220			50
Storage Blk Time (%)		1	2	0			1				0	0
Queuing Penalty (veh)		0	1	0			0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	43	517	530	11	219
Average Queue (ft)	2	164	176	0	207
95th Queue (ft)	22	487	495	8	235
Link Distance (ft)		1266	1266	452	204
Upstream Blk Time (%)					95
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)		11			
Queuing Penalty (veh)		0			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	474	482	125	203	333	378	117	98	400
Average Queue (ft)	30	413	428	46	86	174	184	44	43	266
95th Queue (ft)	88	533	535	137	170	296	328	92	80	396
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		9	10							5
Queuing Penalty (veh)		77	93							0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	0	35	37	0	0	2				
Queuing Penalty (veh)	0	9	34	0	0	2				

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	27	361	554
Average Queue (ft)	1	12	465
95th Queue (ft)	12	259	679
Link Distance (ft)		1780	526
Upstream Blk Time (%)		0	64
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 250

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	375	617	557	374	138	454	877	897	395	288	328	283
Average Queue (ft)	135	386	344	39	59	184	518	526	209	170	217	128
95th Queue (ft)	313	553	509	226	118	471	819	823	534	258	294	230
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)		0	0					0				
Queuing Penalty (veh)		0	0					0				
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	11	5	0		0	13	22	0	0	0	0
Queuing Penalty (veh)	0	10	6	0		0	19	34	1	0	1	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	235	162	195	430	155
Average Queue (ft)	70	74	110	183	70
95th Queue (ft)	142	137	190	345	164
Link Distance (ft)				432	
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				1	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	0	20	0
Queuing Penalty (veh)		0	1	62	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	161	461	465	225	316	376	363	105	244	343	66	107
Average Queue (ft)	23	210	221	66	161	227	243	15	172	110	15	32
95th Queue (ft)	85	395	398	209	275	338	344	68	255	271	46	83
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)	0	5	9	0	0	1	24	0	7	0	1	6
Queuing Penalty (veh)	0	1	9	0	3	1	10	0	12	1	0	1

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	103	152	123	16	113
Average Queue (ft)	30	13	11	1	50
95th Queue (ft)	73	107	100	8	116
Link Distance (ft)		1264	1264	454	209
Upstream Blk Time (%)					1
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)	1	2			
Queuing Penalty (veh)	5	1			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	423	425	123	254	1809	1818	284	177	324
Average Queue (ft)	88	220	216	20	99	1648	1645	139	80	218
95th Queue (ft)	145	402	395	89	231	2148	2149	256	173	323
Link Distance (ft)		454	454			1780	1780	301		314
Upstream Blk Time (%)		1	1			4	5	1		3
Queuing Penalty (veh)		9	6			47	54	0		0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	20	20	25	0	0	36		7	1	
Queuing Penalty (veh)	130	17	9	0	0	31		10	1	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	151	797	803	541
Average Queue (ft)	50	527	530	519
95th Queue (ft)	136	1068	1069	556
Link Distance (ft)		746	746	526
Upstream Blk Time (%)		33	33	81
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 502

Queuing and Blocking Report
 2025 Total AM with Mitigation

08/13/2018

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	108	457	472	125	180	280	279	47	94	78	104	224
Average Queue (ft)	31	352	366	42	86	132	128	15	39	15	43	172
95th Queue (ft)	81	493	498	130	146	239	230	38	84	50	90	243
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		2	2									
Queuing Penalty (veh)		13	19									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	0	27	29	0		1	1					11
Queuing Penalty (veh)	2	7	26	0		1	0					12

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	364	112
Average Queue (ft)	78	27
95th Queue (ft)	277	70
Link Distance (ft)	385	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Queuing and Blocking Report
 2025 Total PM with Mitigation

08/13/2018

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	260	258	125	255	1066	1064	255	180	212	156	224
Average Queue (ft)	85	101	90	9	112	702	700	140	114	38	66	159
95th Queue (ft)	137	212	196	52	244	1277	1260	328	185	127	123	244
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	25	6	5	0	0	26	26	0	5		0	10
Queuing Penalty (veh)	160	5	2	0	0	22	43	1	9		0	6

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	319	83
Average Queue (ft)	51	27
95th Queue (ft)	220	68
Link Distance (ft)	300	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Queuing and Blocking Report
 2025 Total AM Phase II Sensitivity Analysis

08/13/2018

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	470	484	125	238	355	355	142	107	61	96	225
Average Queue (ft)	67	366	379	42	94	161	160	20	37	18	40	176
95th Queue (ft)	125	520	523	129	185	281	286	72	81	48	79	244
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		4	4									
Queuing Penalty (veh)		29	35									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	6	29	30	0		2	2	0				10
Queuing Penalty (veh)	51	20	27	0		2	2	0				13

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	368	116
Average Queue (ft)	94	35
95th Queue (ft)	301	80
Link Distance (ft)	385	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Queuing and Blocking Report
 2025 Total PM Phase II Sensitivity Analysis

08/15/2018

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	125	429	442	87	255	1332	1331	255	178	192	159	224
Average Queue (ft)	113	214	185	10	104	1018	1024	161	104	42	70	177
95th Queue (ft)	143	417	408	58	240	1384	1391	344	178	125	133	257
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)		2	2							0		
Queuing Penalty (veh)		10	10							0		
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	50	8	13	0	0	34	34	0	4		0	17
Queuing Penalty (veh)	315	12	5	0	0	30	70	1	7		1	23

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	321	177
Average Queue (ft)	83	68
95th Queue (ft)	281	140
Link Distance (ft)	300	
Upstream Blk Time (%)	4	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Queues

7: Providence Dr & OR 99W

08/16/2018



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1795	55	67	1115	39	64
v/c Ratio	0.74	0.05	0.44	0.41	0.31	0.37
Control Delay	17.7	3.0	59.7	2.6	58.1	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	3.0	59.7	2.6	58.1	18.4
Queue Length 50th (ft)	770	7	50	77	29	0
Queue Length 95th (ft)	852	m11	94	121	64	43
Internal Link Dist (ft)	441			1753	284	
Turn Bay Length (ft)		100	230			160
Base Capacity (vph)	2412	1116	208	2735	271	303
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.05	0.32	0.41	0.14	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr & OR 99W

08/16/2018



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1334	23	78	1921	103	107
v/c Ratio	0.61	0.02	0.52	0.71	0.59	0.42
Control Delay	11.1	6.6	71.8	7.5	72.2	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	6.6	71.8	7.5	72.2	14.6
Queue Length 50th (ft)	196	3	69	312	91	0
Queue Length 95th (ft)	239	m5	121	486	148	55
Internal Link Dist (ft)	442			1753	284	
Turn Bay Length (ft)		100	230			160
Base Capacity (vph)	2203	1026	241	2693	353	402
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.02	0.32	0.71	0.29	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1	1670	98	109	1183	55	77	248
v/c Ratio	0.01	0.92	0.11	0.91	0.57	0.18	0.19	0.91
Control Delay	55.0	44.4	10.2	116.3	12.7	37.2	8.0	79.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	44.4	10.2	116.3	12.7	37.2	8.0	79.7
Queue Length 50th (ft)	1	612	29	~94	227	34	0	184
Queue Length 95th (ft)	m0	#772	m50	#214	377	70	35	#334
Internal Link Dist (ft)		441			1753	284		365
Turn Bay Length (ft)	100		100	230			160	
Base Capacity (vph)	71	1807	862	120	2083	326	427	288
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.92	0.11	0.91	0.57	0.17	0.18	0.86

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	6	1229	40	91	2036	162	148	189
v/c Ratio	0.10	0.66	0.04	0.61	0.89	0.57	0.34	1.07
Control Delay	73.7	9.6	0.1	79.0	23.5	58.1	9.0	138.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	9.6	0.1	79.0	23.5	58.1	9.0	138.1
Queue Length 50th (ft)	6	139	0	80	664	133	0	~189
Queue Length 95th (ft)	m11	159	m0	141	#1126	213	58	#350
Internal Link Dist (ft)		442			1753	284		281
Turn Bay Length (ft)	100		100	230			160	
Base Capacity (vph)	59	1871	908	166	2276	285	431	177
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.66	0.04	0.55	0.89	0.57	0.34	1.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr & OR 99W

08/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	1670	98	109	1108	84	46	14	77	259	32	79
v/c Ratio	0.32	0.92	0.11	0.87	0.56	0.09	0.16	0.04	0.19	0.90	0.08	0.20
Control Delay	56.5	44.6	10.2	107.9	15.4	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	44.6	10.2	107.9	15.4	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Length 50th (ft)	19	613	28	~94	282	0	28	8	0	191	19	0
Queue Length 95th (ft)	m30	#772	m47	#214	350	22	61	26	35	#338	46	37
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	85	1807	862	125	1976	914	308	410	427	308	412	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.92	0.11	0.87	0.56	0.09	0.15	0.03	0.18	0.84	0.08	0.19













Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	93	1229	40	91	1887	178	144	37	148	202	14	51
v/c Ratio	0.77	0.63	0.04	0.62	0.92	0.19	0.59	0.11	0.37	0.85	0.04	0.14
Control Delay	107.5	3.9	0.1	79.3	32.3	4.1	61.4	45.9	9.4	84.1	44.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.5	3.9	0.1	79.3	32.3	4.1	61.4	45.9	9.4	84.1	44.5	0.8
Queue Length 50th (ft)	90	58	0	80	771	18	118	28	0	175	10	0
Queue Length 95th (ft)	m#167	77	m0	141	#920	49	192	60	58	#294	30	0
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	121	1947	941	165	2045	953	273	362	430	266	364	391
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.63	0.04	0.55	0.92	0.19	0.53	0.10	0.34	0.76	0.04	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.













Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr & OR 99W

08/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	76	1670	98	109	1108	100	46	26	77	267	38	105
v/c Ratio	0.53	0.93	0.12	0.90	0.62	0.12	0.16	0.07	0.19	0.91	0.10	0.25
Control Delay	55.0	45.8	10.7	115.5	21.0	3.1	36.5	34.7	8.8	77.7	35.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	45.8	10.7	115.5	21.0	3.1	36.5	34.7	8.8	77.7	35.1	8.2
Queue Length 50th (ft)	52	655	28	~94	322	0	28	15	0	198	23	0
Queue Length 95th (ft)	m76	#820	m50	#214	401	27	60	39	38	#351	52	44
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	160	1794	850	121	1776	838	311	417	429	310	419	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.93	0.12	0.90	0.62	0.12	0.15	0.06	0.18	0.86	0.09	0.24













Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	1209	40	91	1856	219	144	45	148	236	22	126
v/c Ratio	0.94	0.64	0.04	0.62	0.96	0.24	0.55	0.13	0.35	0.93	0.06	0.32
Control Delay	127.2	3.8	0.1	79.3	40.6	5.3	58.3	45.7	9.1	93.9	44.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.2	3.8	0.1	79.3	40.6	5.3	58.3	45.7	9.1	93.9	44.5	9.5
Queue Length 50th (ft)	~144	55	0	80	804	28	117	33	0	211	16	0
Queue Length 95th (ft)	m#252	74	m0	141	#1023	66	192	70	58	#369	41	55
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	154	1898	905	165	1930	914	271	362	430	265	364	408
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.64	0.04	0.55	0.96	0.24	0.53	0.12	0.34	0.89	0.06	0.31

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1	1849	98	109	1296	55	77	248
v/c Ratio	0.01	1.02	0.11	0.91	0.62	0.18	0.19	0.91
Control Delay	60.0	62.1	10.2	116.3	13.8	37.2	8.0	79.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	62.1	10.2	116.3	13.8	37.2	8.0	79.7
Queue Length 50th (ft)	1	~817	25	~94	266	34	0	184
Queue Length 95th (ft)	m0	#930	m44	#214	438	70	35	#334
Internal Link Dist (ft)		441			1753	284		365
Turn Bay Length (ft)	100		100	230			160	
Base Capacity (vph)	71	1807	862	120	2084	326	427	288
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	1.02	0.11	0.91	0.62	0.17	0.18	0.86

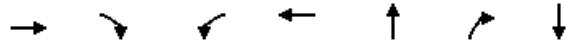
Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018



Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1363	40	91	2229	162	148	189
v/c Ratio	0.73	0.04	0.61	0.96	0.57	0.35	1.07
Control Delay	10.1	0.1	79.0	29.2	58.1	10.2	138.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	0.1	79.0	29.2	58.1	10.2	138.1
Queue Length 50th (ft)	147	0	80	868	133	4	~189
Queue Length 95th (ft)	181	m0	141	#1122	213	63	#350
Internal Link Dist (ft)	442			1753	284		281
Turn Bay Length (ft)		100	230			160	
Base Capacity (vph)	1871	908	166	2328	285	426	177
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.04	0.55	0.96	0.57	0.35	1.07













Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr & OR 99W

08/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	1849	98	109	1221	84	46	14	77	259	32	79
v/c Ratio	0.32	1.02	0.11	0.87	0.62	0.09	0.16	0.04	0.19	0.90	0.08	0.20
Control Delay	57.3	62.5	9.7	107.9	16.6	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	62.5	9.7	107.9	16.6	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Length 50th (ft)	19	~810	27	~94	328	0	28	8	0	191	19	0
Queue Length 95th (ft)	m31	#929	m47	#214	406	22	61	26	35	#338	46	37
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	85	1807	862	125	1976	914	308	410	427	308	412	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.02	0.11	0.87	0.62	0.09	0.15	0.03	0.18	0.84	0.08	0.19

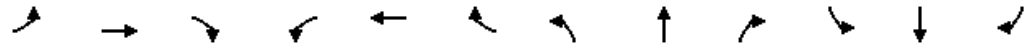
Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	93	1363	40	91	2080	178	144	37	148	202	14	51
v/c Ratio	0.77	0.70	0.04	0.62	1.02	0.19	0.59	0.11	0.38	0.85	0.04	0.14
Control Delay	107.6	5.3	0.1	79.3	50.6	4.7	61.4	45.9	10.9	84.1	44.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.6	5.3	0.1	79.3	50.6	4.7	61.4	45.9	10.9	84.1	44.5	0.8
Queue Length 50th (ft)	90	85	0	80	~1062	22	118	28	5	175	10	0
Queue Length 95th (ft)	m#170	109	m0	141	#1195	53	192	60	64	#294	30	0
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	121	1947	941	165	2045	949	273	362	424	266	364	391
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.70	0.04	0.55	1.02	0.19	0.53	0.10	0.35	0.76	0.04	0.13













Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr & OR 99W

08/16/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	76	1849	98	109	1221	100	46	26	77	267	38	105
v/c Ratio	0.53	1.03	0.12	0.90	0.69	0.12	0.16	0.07	0.19	0.91	0.10	0.25
Control Delay	56.5	65.0	10.3	115.5	22.7	3.2	36.5	34.7	8.8	77.7	35.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	65.0	10.3	115.5	22.7	3.2	36.5	34.7	8.8	77.7	35.1	8.2
Queue Length 50th (ft)	53	~790	27	~94	375	0	28	15	0	198	23	0
Queue Length 95th (ft)	m81	#973	m49	#214	465	27	60	39	38	#351	52	44
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	160	1794	850	121	1776	837	311	417	429	310	419	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	1.03	0.12	0.90	0.69	0.12	0.15	0.06	0.18	0.86	0.09	0.24

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

7: Providence Dr/Crestview Dr & OR 99W

08/16/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	1343	40	91	2049	219	144	45	148	236	22	126
v/c Ratio	0.94	0.71	0.04	0.62	1.06	0.24	0.55	0.13	0.35	0.93	0.06	0.32
Control Delay	128.1	5.5	0.1	79.3	67.7	5.9	58.3	45.7	9.1	93.9	44.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	128.1	5.5	0.1	79.3	67.7	5.9	58.3	45.7	9.1	93.9	44.5	9.5
Queue Length 50th (ft)	~144	84	0	80	~1077	33	117	33	0	211	16	0
Queue Length 95th (ft)	m#252	106	m0	141	#1212	73	192	70	58	#369	41	55
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	154	1898	905	165	1930	909	271	362	430	265	364	408
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.71	0.04	0.55	1.06	0.24	0.53	0.12	0.34	0.89	0.06	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Appendix N
Phase II Sensitivity Analysis
Level of Service Worksheets

HCM Signalized Intersection Capacity Analysis

7: Providence Dr & OR 99W

08/11/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	70	1536	90	100	1019	92	42	24	71	246	35	97	
Future Volume (vph)	70	1536	90	100	1019	92	42	24	71	246	35	97	
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		-3%			2%			3%			2%		
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00	
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1226	1642	1465	1221	1650	1402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	76	1670	98	109	1108	100	46	26	77	267	38	105	
RTOR Reduction (vph)	0	0	24	0	0	44	0	0	58	0	0	80	
Lane Group Flow (vph)	76	1670	74	109	1108	56	46	26	19	267	38	25	
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			8				4	
Permitted Phases			2			6	8		8	4		4	
Actuated Green, G (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0	
Effective Green, g (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.08	0.56	0.56	0.08	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	123	1794	826	121	1745	780	296	396	354	295	398	338	
v/s Ratio Prot	0.05	c0.52		c0.07	0.35			0.02				0.02	
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.22		0.02	
v/c Ratio	0.62	0.93	0.09	0.90	0.63	0.07	0.16	0.07	0.05	0.91	0.10	0.08	
Uniform Delay, d1	53.7	24.4	12.3	55.1	18.2	12.3	35.9	35.1	34.9	44.2	35.3	35.1	
Progression Factor	0.86	1.53	1.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.7	8.1	0.2	53.1	1.8	0.2	0.3	0.1	0.1	29.6	0.1	0.1	
Delay (s)	53.8	45.5	21.2	108.1	20.0	12.5	36.2	35.2	35.0	73.7	35.5	35.3	
Level of Service	D	D	C	F	C	B	D	D	D	E	D	D	
Approach Delay (s)		44.5			26.7			35.4			60.3		
Approach LOS		D			C			D			E		
Intersection Summary													
HCM 2000 Control Delay			39.6									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.92										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			86.1%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total AM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	32	0	77	0	35	0	11	92	83	0	37	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v _{PCE}), pc/h	0	15	0	35	0	84	0	38	0	12	105	90	0	40	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		50			122			207			352	
Entry Volume veh/h		50			122			202			337	
Circulating Flow (v _c), pc/h	431			132			55			96		
Exiting Flow (v _{ex}), pc/h	130			17			158			426		
Capacity (c _{PCE}), pc/h		889			1206			1305			1251	
Capacity (c), veh/h		889			1206			1273			1199	
v/c Ratio (x)		0.06			0.10			0.16			0.28	



























Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			3.8			4.2			5.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.3			0.6			1.2	
Approach Delay, s/veh	4.6			3.8			4.2			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.8						A					

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Future Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1268	1690	1465	1236	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	145	1343	40	91	2049	219	144	45	148	236	22	126
RTOR Reduction (vph)	0	0	16	0	0	53	0	0	117	0	0	100
Lane Group Flow (vph)	145	1343	24	91	2049	166	144	45	31	236	22	26
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.09	0.60	0.60	0.09	0.59	0.59	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	154	1899	882	148	1930	856	261	348	302	255	350	298
v/s Ratio Prot	c0.09	0.42		0.06	c0.63			0.03				0.01
v/s Ratio Perm			0.02			0.11	0.11		0.02	c0.19		0.02
v/c Ratio	0.94	0.71	0.03	0.61	1.06	0.19	0.55	0.13	0.10	0.93	0.06	0.09
Uniform Delay, d1	63.1	19.7	11.6	61.4	28.5	13.1	49.7	45.3	45.0	54.5	44.7	44.9
Progression Factor	1.27	0.18	0.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.9	1.8	0.0	8.4	39.1	0.5	3.1	0.2	0.2	37.0	0.1	0.2
Delay (s)	128.7	5.3	0.4	69.8	67.6	13.6	52.8	45.5	45.2	91.5	44.8	45.1
Level of Service	F	A	A	E	E	B	D	D	D	F	D	D
Approach Delay (s)		16.9			62.7			48.5			73.6	
Approach LOS		B			E			D			E	
Intersection Summary												
HCM 2000 Control Delay			47.4				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			96.9%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total PM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	6	10	14	0	142	10	39	0	29	210	145	0	43	205	12
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	6	11	15	0	151	11	41	0	31	228	154	0	46	222	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		32			203			413			281	
Entry Volume veh/h		32			203			409			277	
Circulating Flow (v _c), pc/h	419			265			63			193		
Exiting Flow (v _{ex}), pc/h	211			55			275			388		
Capacity (c _{PCE}), pc/h		900			1053			1294			1133	
Capacity (c), veh/h		900			1053			1280			1116	
v/c Ratio (x)		0.04			0.19			0.32			0.25	



























Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			5.2			5.7			5.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.7			1.4			1.0	
Approach Delay, s/veh	4.3			5.2			5.7			5.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.5						A					

HCM Signalized Intersection Capacity Analysis

7: Providence Dr & OR 99W

08/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	70	1701	90	100	1123	92	42	24	71	246	35	97
Future Volume (vph)	70	1701	90	100	1123	92	42	24	71	246	35	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1226	1642	1465	1221	1650	1402
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1849	98	109	1221	100	46	26	77	267	38	105
RTOR Reduction (vph)	0	0	24	0	0	44	0	0	58	0	0	80
Lane Group Flow (vph)	76	1849	74	109	1221	56	46	26	19	267	38	25
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0
Effective Green, g (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.08	0.56	0.56	0.08	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	123	1794	826	121	1745	780	296	396	354	295	398	338
v/s Ratio Prot	0.05	c0.58		c0.07	0.39			0.02				0.02
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.22		0.02
v/c Ratio	0.62	1.03	0.09	0.90	0.70	0.07	0.16	0.07	0.05	0.91	0.10	0.08
Uniform Delay, d1	53.7	26.5	12.3	55.1	19.3	12.3	35.9	35.1	34.9	44.2	35.3	35.1
Progression Factor	0.87	1.46	1.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	27.5	0.2	53.1	2.4	0.2	0.3	0.1	0.1	29.6	0.1	0.1
Delay (s)	55.1	66.1	20.4	108.1	21.7	12.5	36.2	35.2	35.0	73.7	35.5	35.3
Level of Service	E	E	C	F	C	B	D	D	D	E	D	D
Approach Delay (s)		63.4			27.6			35.4			60.3	
Approach LOS		E			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			49.3	HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				15.0				
Intersection Capacity Utilization			91.0%	ICU Level of Service				F				
Analysis Period (min)			15									

c Critical Lane Group

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	ZHB			Intersection	Crestview/East-West Connector		
Agency or Co.	KAI			E/W Street Name	East-West Connector		
Date Performed	10/21/2017			N/S Street Name	Crestview Dr		
Analysis Year	2025			Analysis Time Period (hrs)	0.25		
Time Analyzed	Total AM Phase II Sensitivity Analysis			Peak Hour Factor	0.92		
Project Description	Crestview Crossing			Jurisdiction			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	32	0	77	0	35	0	11	92	83	0	37	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v _{PCE}), pc/h	0	15	0	35	0	84	0	38	0	12	105	90	0	40	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		50			122			207			352	
Entry Volume veh/h		50			122			202			337	
Circulating Flow (v _c), pc/h	431			132			55			96		
Exiting Flow (v _{ex}), pc/h	130			17			158			426		
Capacity (c _{PCE}), pc/h		889			1206			1305			1251	
Capacity (c), veh/h		889			1206			1273			1199	
v/c Ratio (x)		0.06			0.10			0.16			0.28	

























Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			3.8			4.2			5.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.3			0.6			1.2	
Approach Delay, s/veh	4.6			3.8			4.2			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.8						A					

HCM Signalized Intersection Capacity Analysis

7: Providence Dr/Crestview Dr & OR 99W

08/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Future Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1268	1690	1465	1236	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	145	1343	40	91	2049	219	144	45	148	236	22	126
RTOR Reduction (vph)	0	0	16	0	0	53	0	0	117	0	0	100
Lane Group Flow (vph)	145	1343	24	91	2049	166	144	45	31	236	22	26
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.09	0.60	0.60	0.09	0.59	0.59	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	154	1899	882	148	1930	856	261	348	302	255	350	298
v/s Ratio Prot	c0.09	0.42		0.06	c0.63			0.03				0.01
v/s Ratio Perm			0.02			0.11	0.11		0.02	c0.19		0.02
v/c Ratio	0.94	0.71	0.03	0.61	1.06	0.19	0.55	0.13	0.10	0.93	0.06	0.09
Uniform Delay, d1	63.1	19.7	11.6	61.4	28.5	13.1	49.7	45.3	45.0	54.5	44.7	44.9
Progression Factor	1.27	0.18	0.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.9	1.8	0.0	8.4	39.1	0.5	3.1	0.2	0.2	37.0	0.1	0.2
Delay (s)	128.7	5.3	0.4	69.8	67.6	13.6	52.8	45.5	45.2	91.5	44.8	45.1
Level of Service	F	A	A	E	E	B	D	D	D	F	D	D
Approach Delay (s)		16.9			62.7			48.5			73.6	
Approach LOS		B			E			D			E	
Intersection Summary												
HCM 2000 Control Delay			47.4					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		15.0		
Intersection Capacity Utilization			96.9%					ICU Level of Service		F		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total PM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	10	14	0	142	10	39	0	29	210	145	0	43	205	12
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v _{PCE}), pc/h	0	6	11	15	0	151	11	41	0	31	228	154	0	46	222	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		32			203			413			281	
Entry Volume veh/h		32			203			409			277	
Circulating Flow (v _c), pc/h	419			265			63			193		
Exiting Flow (v _{ex}), pc/h	211			55			275			388		
Capacity (c _{PCE}), pc/h		900			1053			1294			1133	
Capacity (c), veh/h		900			1053			1280			1116	
v/c Ratio (x)		0.04			0.19			0.32			0.25	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			5.2			5.7			5.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.7			1.4			1.0	
Approach Delay, s/veh	4.3			5.2			5.7			5.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.5						A					

MEMORANDUM - DRAFT

Date: August 14, 2018

Project #: 21709

To: Jesse Nemec
JT Smith Companies
5285 Meadows Road, Suite 171
Lake Oswego, OR 97035

From: Diego Arguea and Matt Hughart

Project: Crestview Crossing Development

Subject: 6-Party Agreement Transportation Considerations

Pursuant to your request, we have reviewed the *Crestview Improvement Project (From Robin Court to Highway 99W Alignment Exploration)* that was included as part of a six-party agreement (Yamhill County Board Order 06-265) prepared in April 2006. The purpose of this agreement was to begin the process to amend the 2005 Newberg Transportation System Plan (TSP) and reclassify the Crestview Drive extension from a Minor Arterial to a Major Collector designation.

The current development proposed by JT Smith Companies is required to construct a portion of the Crestview Improvement Project, connecting Highway 99W to the existing terminus of Crestview Drive at the southern boundary of the Oxberg Lake and MeadowWood subdivisions.

EXECUTIVE SUMMARY

Our assessment of the six-party agreement (Agreement) concludes that the proposed Crestview Drive alignment, intersection treatments, and cross-sectional elements are consistent with the guiding principles established in the Agreement, and as such, provides functionally equivalent transportation infrastructure as that identified in the Agreement. Additional details are provided herein.

SIX-PARTY AGREEMENT BACKGROUND

In April 2006, the Yamhill County Board of Commissioners accepted an agreement to begin the amendment of the then-current 2005 TSP. The agreement's purpose was to authorize the City to conduct an amendment to the 2005 TSP that would designate Crestview Drive as a Major Collector roadway and identify a general design and alignment of the Crestview Drive extension (Reference 1, Agreement, #3). A traffic study was prepared by JRH Engineering concluding the change in classification of Crestview Drive

to a Major Collector would not measurably affect the City's transportation network. The TSP was subsequently amended to reflect Crestview Drive as a Major Collector.

Conceptual Alignment

The alignment identified in the Agreement extends Robin Court to Highway 99W and includes one roundabout intersection (located approximately 390 feet from 99W) and one traffic calming circle located approximately 895 feet north of the roundabout location. As stated in the Agreement, this represents a *general design and alignment* to provide direction for future development. Site-specific characteristics, unforeseen challenges, and street connectivity and layout were not addressed in the Agreement, and turn lanes, if required, were to be determined at a later date. The general design and alignment shown in the Agreement Exhibit A is shown below in Figure 1.

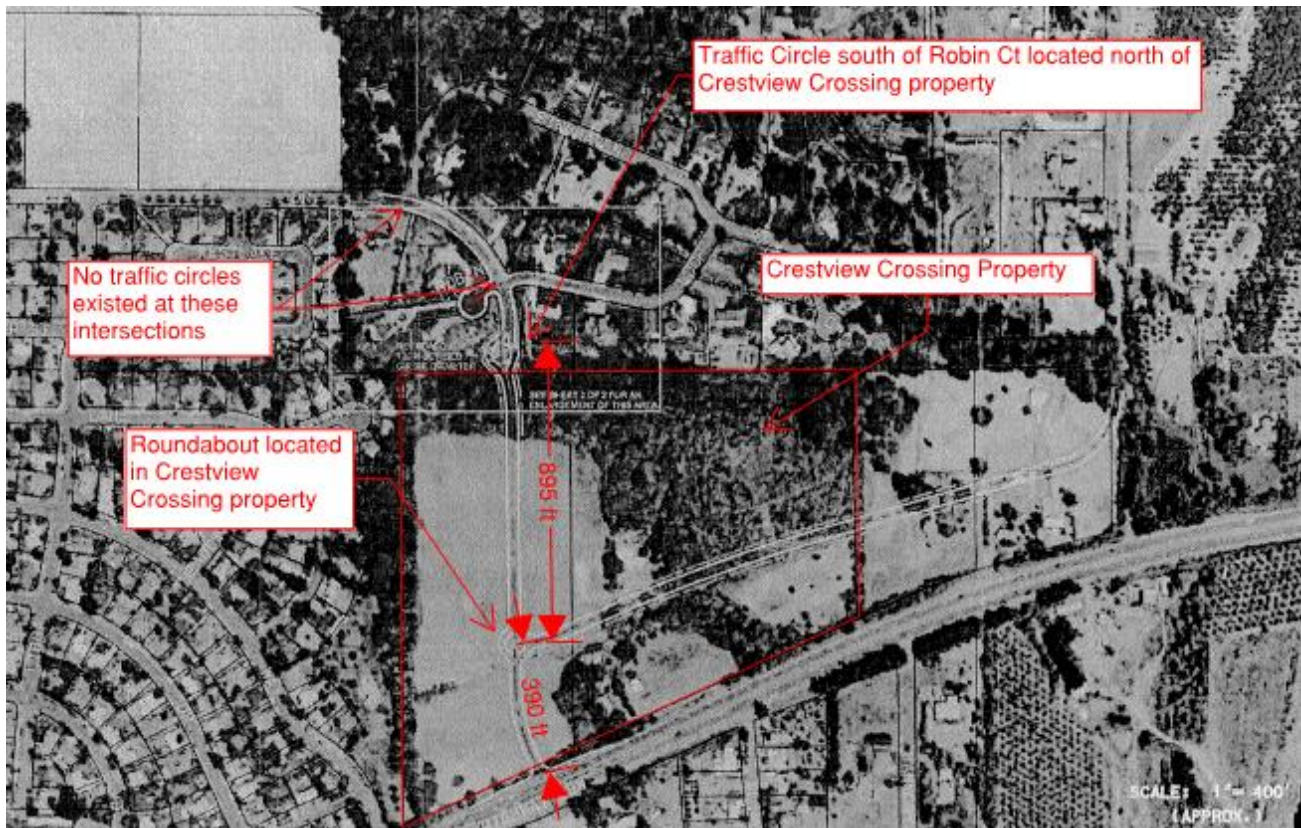


Figure 1. 6-Party Agreement Exhibit A

As shown above, the Agreement identifies a general alignment with two intersection treatments addressing intersection operations and traffic calming. As stated in the Agreement, the alignment should be *designed to encourage a 25 mph speed limit*.

PROPOSED DEVELOPMENT

The proposed residential application acknowledges responsibility to construct the extension of Crestview Drive, connecting from Robin Court to Highway 99W, and has developed an alignment consistent and in compliance with that shown in the 2006 Agreement.

Constructed To-Date

As shown in Figure 1, Crestview Drive, from Birdhaven Loop to the northern edge of Crestview Crossing, was reconstructed in 2011/2012 to include two intersection traffic calming traffic circles on Crestview Drive at Birdhaven Loop and Robin Court, depicted in Figure 2 below.



Figure 2. Traffic Calming Treatments along Crestview Drive

Neither of these traffic circles were identified in the Agreement. The traffic circles were constructed after the 2006 Agreement was adopted and are recognized to have a traffic calming effect to limit speeds to 25 mph.

PROPOSED ALIGNMENT

The June 2018 Crestview Crossing Traffic Impact Analysis (TIA) evaluated the impacts of the proposed development and identified recommended mitigation measures. The mitigation measures were selected considering anticipated traffic volumes along Crestview Drive and include the number and configuration travel lanes on the southbound approach to 99W, turn lane storage lengths, as well as transition tapers approaching the roundabout.

Roundabout Intersection

In accordance with the Agreement, construction of a roundabout is proposed to serve traffic into the residential areas north of Highway 99W, and connect to the future Benjamin Road Realignment (a Minor Collector). The roundabout location was determined based on the required queue storage length as an outcome of the TIA as well as roundabout design parameters, including entry deflection angles and transition tapers. As shown in Crestview Crossing site plan application, the roundabout is located approximately 545 feet north of Highway 99W (measured from the center of roundabout to the stop bar at Highway 99W). A southbound left-turn lane on Crestview Drive approaching Highway 99W provides 250 feet of storage and requires at least 50 feet of transition. The northbound transition taper into the roundabout is approximately 200 feet, and has been designed to accommodate all turning movements including u-turns.

The Public Improvement Standards of the Newberg Development Code (Chapter 15.505) were also reviewed to ensure consistency with Collector Roadway spacing standards (400 feet for a Major Collector designation). As such, the location of the roundabout has been designed to comply with the Newberg Development Code and the 6-Party Agreement in the context of the projected traffic operations while recognizing site-specific design considerations and constraints.

Two-way Stop Controlled Intersection

To provide efficient connectivity to adjacent residential development, a two-way stop-controlled intersection (Public Street C) has been designed approximately 500 feet north of the proposed roundabout. The location of this intersection is influenced by intersection spacing on a Major Collector (greater than 400 feet minimum spacing requirement), location of wetlands (site constraints), meeting minimum intersection sight distance requirements, and ability to provide an east-west roadway serving the proposed large lot homes of the Development. The location of this intersection is approximately 410 feet south of Robin Court, the closest public street intersection to the north.

Additional Considerations

Consideration was given to the 6-Party Agreement and the spacing between traffic calming devices during the roadway and site design process. As shown in Figure 1, the conceptual spacing shown in the Agreement between the roundabout and traffic calming circle is approximately 895 feet. The proposed site layout and intersection design maintains similar distance between the proposed roundabout and the constructed traffic calming circle on Robin Court (approximately 910 feet). We conclude that the difference in spacing (15 feet) will not impact travel speeds and that the 25 mph roadway design speed is consistent with the 6-Party Agreement.

COMPLIANCE WITH 6-PARTY AGREEMENT

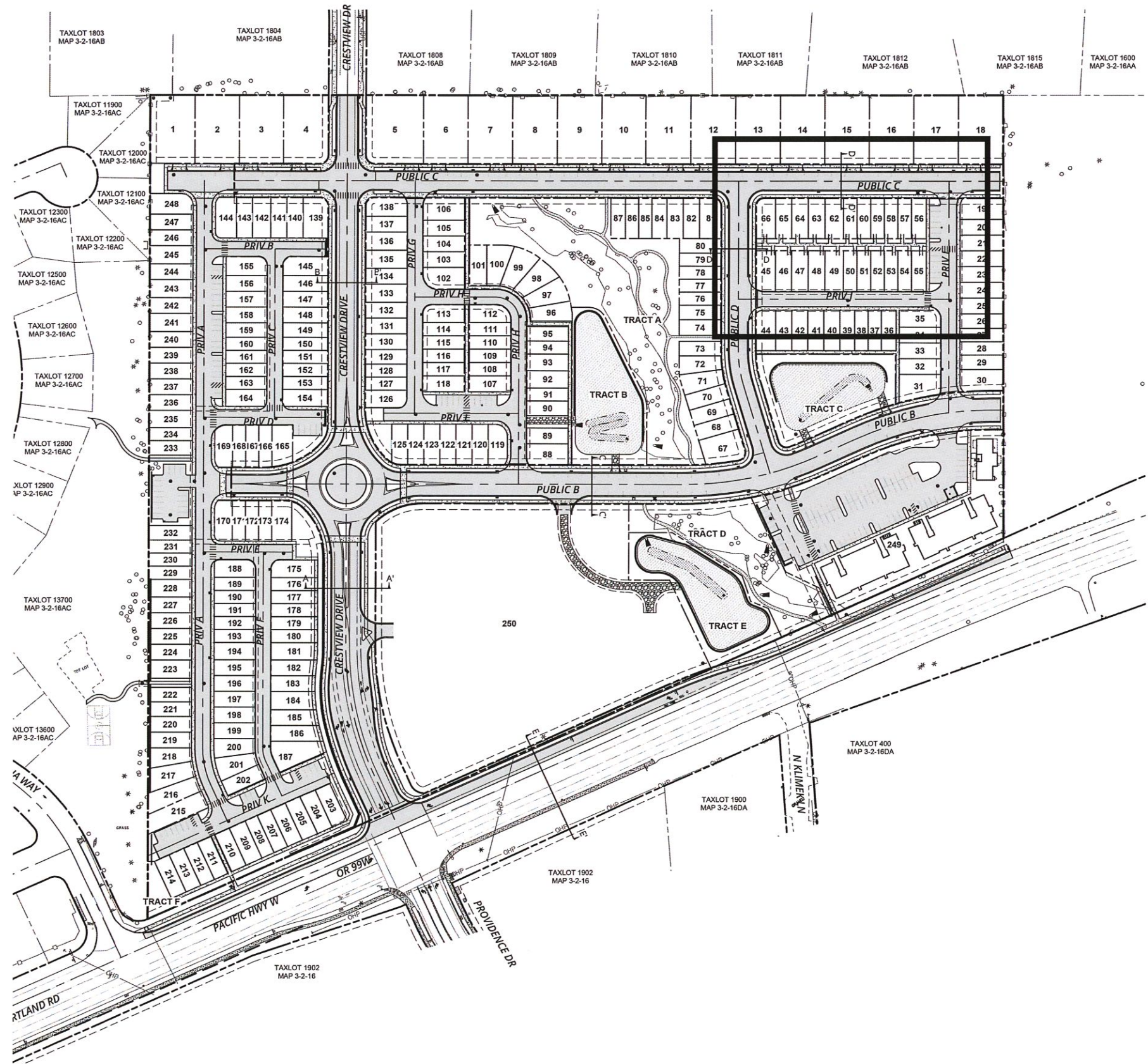
In summary, we conclude the proposed alignment and intersection treatments are consistent with and satisfy the terms of the 6-Party Agreement for the following reasons.

1. The purpose of the Agreement is to re-designate Crestview Drive from a Minor Arterial to a Major Collector designation. The re-designation was successfully incorporated into the City's Transportation System Plan based in part on the JRH traffic study.
2. The current Crestview Crossing development proposal acknowledges the Agreement and proposes a roadway extension design consistent with City Major Collector requirements as well as key Agreement elements.
3. The spacing difference between the proposed roundabout and the recently constructed traffic calming circle at Robin Court is not expected to impact travel speeds on Crestview Drive extension and thus is consistent with the traffic calming south in the 6-Party Agreement.
4. With construction of the proposed roundabout, there will be a total of three traffic calming intersection treatments along Crestview Drive between Highway 99W and Birdhaven Loop. This is a greater amount of traffic calming than originally identified in the Agreement, indicating compliance in design and fulfillment of intent by the Applicant.

We trust this memorandum demonstrates compliance with the 6-Party Agreement.

REFERENCES

1. Yamhill County Board of Commissioners. *6-Party Agreement, Crestview Improvement Project (From Robin Court to Highway 99W Alignment Exploration)*. Board Order #06-265. April 19, 2006.



PRELIMINARY PARKING COUNT:

APARTMENT PARKING:	91
PUBLIC STREET PARKING:	73
PRIVATE STREET PARKING:	85
17-FOOT FRONT LOAD PARKING:	48
17-FOOT REAR LOAD PARKING:	219
21-FOOT FRONT LOAD PARKING:	111
21-FOOT REAR LOAD PARKING:	268
25-FOOT FRONT LOAD PARKING:	52
25-FOOT REAR LOAD PARKING:	68
LARGE LOT PARKING:	72
TOTAL PARKING:	1087

CRESTVIEW CROSSING

PARKING EXHIBIT

3J CONSULTING
 CIVIL ENGINEERING . WATER RESOURCES . LAND USE PLANNING

AUGUST 2018



Crestview Crossing Homeowners Association

**Reserve Study
2020**

**Prepared by
Blue Mountain Community Management**
17933 NW Evergreen Place, Suite 200
Beaverton, OR 97006
503-332-2047

Table of Contents

PROPERTY DESCRIPTION	2
RESERVE STUDY & MAINTENANCE PLAN INFORMATION SECTION.....	3
FUNDING METHODS	5
FUNDING OPTIONS.....	7
MAINTENANCE PLAN 2020.....	8
MAINTENANCE PLAN EXECUTIVE SUMMARY	8
RESERVE STUDY 2020.....	9
FUNDING METHOD SUMMARY.....	9
Report Statistics	9
Report Assumptions/ Parameters	9
Funding Method Notes	9
Summary of Calculations.....	9
THRESHOLD METHOD PROJECTION	10
Summary of Calculations.....	10
Threshold Method Projection Annual Funding Chart - (All Lots).....	11
COMPONENT SUMMARY BY CATEGORY	12
COMPONENT SUMMARY BY GROUP.....	13
ANNUAL EXPENDITURE DETAIL	14
DETAIL REPORT BY CATEGORY.....	16
GROUNDS	16
Asphalt - Repair, Patch & Seal	16
Asphalt - Overlay	17
Concrete Allowance.....	18
Fence - Chain Link.....	18
Fitness Stations	19
Benches	19
Irrigation Controller.....	20
Bollard Lights	20
Bark Mulch	21
Cedar Chips.....	21
Retaining Wall Allowance	22
Open Space/Tree Allowance.....	22
Monument & Sign Allowance	23
Mailboxes.....	23

Property Description

Crestview Crossing Homeowners Association (herein referred to as the “community”) is a single family residential development located in Newberg, Yamhill County, Oregon. The **Crestview Crossing Homeowners Association** (herein referred to as the “Association”) shall provide repair, replacement and maintenance on all property designated as common area by the adopted community plat, recorded in Yamhill County, Oregon.

This reserve study utilizes a mix of information provided by the developer, various construction estimating and scheduling manuals/programs, and information from the **Crestview Crossing Homeowners Association** board in order to derive the useful life and replacement cost of each common item.

Funds will be accumulated in the reserve account as required by Oregon State Law based on estimates of future need for repairs and replacement of common property components. Actual expenditures, income and provisions for income taxes may vary from estimated amounts and the variations may be significant and material. Therefore, amounts accumulated in the replacement fund may not be adequate to meet future funding expectations. Please update your reserve study on an annual basis in order to maintain the best possible estimates.

If additional funds are needed for any repair, replacement or maintenance to common area properties, the Association has the right to increase regular assessments or to levy special assessments or delay repairs or replacement until funds become available.

Reserve Study & Maintenance Plan Information Section

Blue Mountain Community Management was selected by the **Crestview Crossing Homeowners Association** to conduct a Reserve Study for implementation beginning January 1, 2020. The enclosed Reserve Study and Maintenance Plan were developed in accordance with guidelines established by the Community Associations Institute and are in compliance with Oregon State Law including changes made during the 2007 legislative session to ORS Revised State Statutes, Chapters 94 and 100.

Assumptions used for inflation, interest, and other factors are detailed in the *Reserve Study Summary*. All assumptions made herein are based upon information provided by the developer and an onsite inspection of those details. This Reserve Study offers no warranties or guarantees based upon those assumptions and observations and provides an annual baseline for funding and maintaining common elements throughout the community.

All information regarding the useful lives and costs of reserve components were derived by Blue Mountain Community Management and various construction pricing and scheduling manuals.

The terms RS Means and National Construction Estimator refer to construction industry estimating databases that are used throughout the industry to establish cost estimates and useful life estimates for common building components and products. In any case, when work is to be performed, the association should obtain firm bids for these services.

Blue Mountain Community Management is not aware of any material issues that if not disclosed would cause distortion of this report.

Certain information such as the beginning balance of reserve funds and other information as detailed on the component reports were provided by Association representatives and are deemed to be reliable by Blue Mountain Community Management. This Reserve Study is a reflection of the information provided to Blue Mountain Community Management and cannot be used for the purpose of performing an audit, quality analysis, or background check for historical records. Onsite inspections are not to be considered a project audit or quality inspection of Association property.

The two most pressing responsibilities for a homeowner association board are the annual preparation of a budget and the maintenance of a reserve fund for community components identified as “common” to all members of the association. The annual operating budget reflects the association’s annual commitment to quality and service, while the reserve budget reflects the association’s desire to maintain the community for a 30-year period at a level acceptable to all members of the association.

Reserve studies, while an important guiding document for the long-term health of the community, must be maintained on an annual basis in order to continue to reflect an association’s desire to remain at a particular level of maintenance and replacement. Blue Mountain Community Management suggests remembering the following:

1. Update your Reserve Study on an annual basis. Hire a professional to refresh your Reserve Study annually and make this commitment by including a line item in your annual budget for doing so. A Reserve Study is a “snapshot in time” and its assumptions, factors and results will become skewed without annual maintenance.
2. Reserve studies are not perfect. While a paved section of road may have a useful life of 24 years, it doesn’t necessarily mean it will be replaced in 24 years. Sometimes asphalt doesn’t adhere perfectly, or the contractor makes a mistake and the road needs to be replaced in 15 years. Occasionally, the road looks just fine in 24 years and does not need replacement. Remember, an estimate is based on the best knowledge available at the time of the study.
3. This Reserve Study and its parameters are based upon information provided by the declarant, the association members, board of directors and a host of contractors, vendors and construction estimation programs. It represents an amalgamation of the best information available and relies on the information provided by several outside sources.
4. It is assumed that all assets have been designed and constructed properly unless otherwise noted.
5. This Reserve Study is provided as an aid for planning purposes and not as an accounting tool. It describes events and occurrences that have not yet occurred and there is no assurance that the results outlined in the Reserve Study will occur as described.

Funding Methods

Reserve studies are a complicated mix of assumptions and estimates used to approximate the cost of renewal/replacement of capital and non-capital assets associated with a given community's common elements. The Reserve Study User's Guide has been developed to assist homeowners, board members and declarants better understand the Reserve Study and maintenance plan they purchased.

A Reserve Study is best described as an assessment of current assets, their approximate value and their future value at the time of replacement. A Reserve Study is typically requested by the developer of a specific parcel of land that has been subdivided for condominiums or residential units for the purpose of determining the initial value of common elements like privately owned parks, pathways, clubhouses etc. In some states, reserve studies and maintenance plans have become a legal requirement in order to develop a new community.

A Reserve Study has two primary functions:

1. Establish the initial funding goals for the association as they relate to common elements and
2. Select an appropriate funding plan for those goals.

The basis for funding of reserves is to distribute the cost of the replacement over the useful life of a particular component. The ideal level of reserves is proportionate to the expected life of a component and those costs. Therefore, if a particular component has a useful life of 20 years, the expectation would be that the individual reserve for that item is spread equally over 20 years:

$$(\text{Age/Useful Life}) \times \text{Current Replacement Cost} = \text{Full Funding of Reserves}$$

Each year would equal $1/20^{\text{th}}$ of the useful life and the reserve should include $1/20^{\text{th}}$ of the value of the component over a 20-year period. If the fund meets this standard, then it is referred to as "fully funded."

Do not confuse "fully funded" with the concept that every Reserve Study has a 100% funding for all components at one time. A proper Reserve Study provides 100% funding based on expected life. If a given component fails or needs maintenance prior to its expected life cycle, the fund may become depleted or may incur a negative balance. Every Reserve Study is a "snapshot in time" based on accepted industry standards for life expectancy and costs.

There are four generally accepted funding plans from which most associations select:

1. **“Minimum Funding Method (Threshold)”**. This funding method focuses on keeping the reserve fund’s cash balance above zero. This means that while each component may not be fully funded, the cash balance overall does not drop below zero during the projected period. A large percentage of association’s use this model because of its relative lower cost and simplicity, however an association must remember that if an item prematurely expires prior to its useful life calculation, a deficit may occur in the reserve cash balance.
2. **“Capped Minimum Funding Method (Threshold +)”**. The same as the Minimum Funding model concept, however the fund balance never reaches below an arbitrarily set reserve cash balance. Instead of starting the fund with \$0, an association or developer compels the prospective homeowner to contribute an amount at time of closing in order to ensure a cushion in the reserve balance. This method is typically used by Condominium Associations who need to give rise to a large amount of money early on in order to ensure proper capital maintenance and replacement of elements.
3. **“Current Assessment Funding Method”**. Based on a cash flow funding model like the two previous methods, this model takes the current funding level of the reserve account and assumes that the amount will not change. The funding level is then projected over 30 years in order to illustrate the adequacy of current funding. This method is more regularly examined with long established associations with members who are sensitive to increased monthly dues.
4. **“Component Funding Method”**. The simplest and most conservative method. It distributes cash reserves to individual reserve components and then calculates what the reserve assessment and interest contribution should be, again by each reserve component. The current annual assessment is then determined by adding all the individual component assessments together. This is the most conservative method and leads to a fully funded reserve position at all times.

This particular Reserve Study utilizes the “Minimum Funding Method (Threshold)” based on the association’s annual cash flow. The annual balance of the fund will maintain more than \$1,000 annually at any given period for the next 30 years based on the assumptions provided in the Funding Method Summary and the additional caveat that no component fails in total prior to its expected useful life.

Funding Options

In the event a component does fail prior to its expected useful life, an association has three primary options:

1. **Acquire a loan.** Lending institutions will often loan money to an association for capital improvements using the future assets of the association as collateral for the loan. Traditionally, an additional monthly assessment for the principal and interest of the loan would be assessed against each unit for the period specified by the lender.
2. **Institute a special assessment.** Some associations may not be able to secure a loan for a component that has failed unexpectedly. Typically, the association board then turns to a special assessment. The cost of the item in need of replacement is divided equally among the homeowners and assessed against their HOA dues. This may be done as a one-time payment or as a monthly assessment for a given period of time.
3. **Defer the required repair or replacement.** This option is most commonly used and is often abused. Because it is much simpler to ignore a problem, an association will defer repair or replacement in lieu of having future funds. This usually leads to more deferred repair and replacement until eventually the entire reserve schedule is woefully behind. This method should only be used in extreme cases. Please consider all options prior to selecting deferral.

Maintenance Plan 2020

Maintenance Plan Executive Summary

Regular maintenance of common elements is necessary to insure maximum useful life and optimum performance of components. Items of particular concern are those that represent a safety hazard to residents or guests if they are not maintained properly and components that provide waterproofing or protection from other elements.

This maintenance plan is a cyclical plan that calls for maintenance at regular intervals. The frequency of maintenance and cost of the activity initially will follow a short narrative description. Every maintenance plan should be reviewed and updated on an annual basis when preparing the annual operating budget for the Association.

Information herein is coordinated from a frequently updated source, Reed Construction Data, a reputable provider of construction cost data.

Pursuant to Oregon State Statutes, Sections 94 and 100—requiring a maintenance plan as an integral part of the reserve study, the following maintenance procedures are recommended:

Concrete—Maintenance Allowance

Total Maintenance Frequency: Inspect Annually

Concrete steps, common area sidewalks, the curbs on private streets shall be kept in good condition. Any cracks, damage, or displacement should be repaired. Periodic pressure washing of the concrete steps at Tract G.

Reserve Study 2020

Funding Method Summary

Report Statistics		Report Assumptions/ Parameters	
Report Date	July 20, 2018	Inflation Factor	3.30%
Account Number	CrstVwTerrRS1	Annual Assessment Increase	3.30%
Budget Year Beginning	January 1, 2020	Interest Rate on Reserve Deposit	0.50%
Budget Year Ending	December 31, 2020	Tax Rate on Interest	0.00%
Total Units	248	Contingency	0.00%

Funding Method Notes

- The purpose of this study is to ensure that adequate replacement funds are available when components reach the end of their useful life according to a variety of assumptions. Components will be replaced as required, not necessarily in their expected replacement year. This analysis should be updated annually.
- The following items were not included in the analysis because their useful life is greater than thirty years: sanitary sewer and storm drains, telephone, cable, internet lines, grading, all other unmentioned components with a useful life deemed greater than thirty years by industry standards.
- Two funding projections are provided. The *Threshold Method Projection* establishes a reserve funding goal that keeps the reserve balance above **\$15,000**. The *Fully-Funded Projection* establishes a reserve funding goal that achieves a 100% fully-funded reserve balance by the end of the 30-year study period.

Contribution Rate Recommendation

Blue Mountain Community Management recommends that the Association adopt the contribution rates provided in the *Threshold Method Projection*.

Threshold Method Projection

This projection uses a “threshold funding” method, which establishes a reserve funding goal that keeps the reserve balance above a specified dollar or percent funded amount.

All – 248 Lots

The funding scenario for the 248 lots begins with a starting balance of **\$0.00** and an annual contribution of **\$16,425.00**. The annual contribution increases 3.3% each year for the remaining years of the study. A minimum balance of **\$15,000** is maintained from throughout the life of the study.

Summary of Calculations – All Lots

Required Annual Contribution	\$16,425.00
Required Monthly Contribution	\$1,368.75
Unit Monthly Contribution	\$5.52

Threshold Method Projection Chart – All Lots

Beginning Balance **\$0.00**

Year	Current Cost	Annual Contribution	Annual Interest	Annual Expenditures	Target Ending Reserves
2020	\$374,458	\$16,425	\$83	\$0	\$16,507
2021	\$386,815	\$16,967	\$167	\$0	\$33,642
2022	\$399,579	\$17,527	\$256	\$0	\$51,424
2023	\$412,766	\$18,105	\$321	\$5,291	\$64,560
2024	\$426,387	\$18,703	\$379	\$7,401	\$76,240
2025	\$440,458	\$19,320	\$478	\$0	\$96,038
2026	\$454,993	\$19,958	\$137	\$88,579	\$27,554
2027	\$470,007	\$20,616	\$241	\$0	\$48,411
2028	\$485,518	\$21,296	\$306	\$8,428	\$61,586
2029	\$501,540	\$21,999	\$386	\$6,429	\$77,542
2030	\$518,091	\$22,725	\$501	\$0	\$100,769
2031	\$535,188	\$23,475	\$621	\$0	\$124,865
2032	\$552,849	\$24,250	\$159	\$117,226	\$32,048
2033	\$571,093	\$25,050	\$285	\$0	\$57,384
2034	\$589,939	\$25,877	\$377	\$7,877	\$75,760
2035	\$609,407	\$26,731	\$473	\$7,812	\$95,153
2036	\$629,517	\$27,613	\$559	\$10,927	\$112,397
2037	\$650,291	\$28,524	\$705	\$0	\$141,626
2038	\$671,751	\$29,465	\$202	\$130,778	\$40,515
2039	\$693,919	\$30,438	\$355	\$0	\$71,308
2040	\$716,818	\$31,442	\$423	\$18,186	\$84,987
2041	\$740,473	\$32,480	\$540	\$9,492	\$108,515
2042	\$764,909	\$33,552	\$710	\$0	\$142,777
2043	\$790,151	\$34,659	\$887	\$0	\$178,323
2044	\$816,226	\$35,802	\$79	\$198,358	\$15,846
2045	\$843,161	\$36,984	\$264	\$0	\$53,094
2046	\$870,985	\$38,204	\$456	\$0	\$91,755
2047	\$899,728	\$39,465	\$598	\$11,533	\$120,286
2048	\$929,419	\$40,768	\$622	\$36,610	\$125,065
2049	\$960,090	\$42,113	\$836	\$0	\$168,014

Component Summary by Category

Description	Replacement Year	Useful Life	Remaining Life	Current Cost
Grounds				
Asphalt - Repair, Patch & Seal	2026	6	6	\$62,400
Asphalt - Overlay	2056	36	36	\$218,400
Concrete Sidewalk Allowance	2040	20	20	\$3,000
Fence - Chain Link	2055	35	35	\$30,608
Fitness Stations	2044	24	24	\$10,000
Benches	2048	28	28	\$3,250
Irrigation Controller, System Allowance	2026	6	6	\$5,700
Bollard Lights	2044	24	24	\$1,600
Bark Mulch	2023	3	3	\$4,800
Cedar Chips	2024	4	4	\$2,000
Retaining Wall Allowance	2034	14	14	\$2,500
Open Space/Tree Allowance	2024	4	4	\$4,500
Monument & Sign Allowance	2034	14	14	\$2,500
Mailboxes	2055	35	35	\$23,200
Total Grounds				\$374,458
Total Assets:				\$374,458

Component Summary by Group

Description	Replacement Year	Useful Life	Remaining Life	Current Cost
<i>Capital</i>				
Asphalt - Overlay	2056	35	36	\$218,400
Concrete Allowance	2040	20	20	\$3,000
Fence - Chain Link	2055	35	35	\$30,608
Fitness Stations	2044	24	24	\$10,000
Benches	2048	28	28	\$3,250
Irrigation Controller, System Allowance	2026	6	6	\$5,700
Bollard Lights	2044	24	24	\$1,600
Bark Mulch	2023	3	3	\$4,800
Cedar Chips	2024	4	4	\$2,000
Retaining Wall Allowance	2034	14	14	\$2,500
Open Space/Tree Allowance	2024	4	4	\$4,500
Monument & Sign Allowance	2034	14	14	\$2,500
Mailboxes	2055	35	35	\$23,200
Total Capital				\$312,058
Non-Capital				
Asphalt - Repair, Patch & Seal	2026	6	6	\$62,400
Total Non-Capital				\$62,400
Total Assets:				\$374,458

Annual Expenditure Detail

Description	Expenditure per Item	Expenditure per Year
<i>No replacement in 2020 - 2022</i>		
Replacement in 2023		\$5,291
Bark Mulch	\$5,291	
Replacement in 2024		\$7,401
Cedar Chips	\$2,277	
Open Space/Tree Allowance	\$5,124	
<i>No replacement in 2025</i>		
Replacement in 2026		\$88,578
Asphalt - Repair, Patch & Seal	\$75,820	
Irrigation, Controller	\$6,926	
Bark Mulch	\$5,832	
<i>No replacement in 2027</i>		
Replacement in 2028		\$8,428
Cedar Chips	\$2,593	
Open Space/Tree Allowance	\$5,835	
Replacement in 2029		\$6,429
Bark Mulch	\$6,429	
<i>No replacement in 2030 - 2031</i>		
Replacement in 2032		\$117,226
Asphalt - Repair, Patch & Seal	\$92,127	
Irrigation, Controller	\$8,415	
Bark Mulch	\$7,087	
Cedar Chips	\$2,953	
Open Space/Tree Allowance	\$6,644	
<i>No replacement in 2033</i>		
Replacement in 2034		\$7,878
Retaining Wall Allowance	\$3,939	
Monument & Sign Allowance	\$3,939	
Replacement in 2035		\$7,812
Bark Mulch	\$7,812	
Replacement in 2036		\$10,927
Cedar Chips	\$3,362	
Open Space/Tree Allowance	\$7,565	
<i>No replacement in 2037</i>		
Replacement in 2038		\$130,777
Asphalt - Repair, Patch & Seal	\$111,941	
Irrigation, Controller	\$10,225	
Bark Mulch	\$8,611	
<i>No replacement in 2039</i>		
Replacement in 2040		\$18,186
Concrete Sidewalk Allowance	\$5,743	
Cedar Chips	\$3,829	
Open Space/Tree Allowance	\$8,614	

Crestview Crossing Homeowner Association Reserve Study and Maintenance Plan 2020

Description	Expenditure per Item	Expenditure per Year
Replacement in 2041		\$9,492
Bark Mulch	\$9,492	
<i>No replacement in 2042 - 2043</i>		
Replacement in 2044		\$198,360
Asphalt - Repair, Patch & Seal	\$136,017	
Fitness Stations	\$21,798	
Irrigation, Controller	\$12,425	
Bollard Lights	\$3,488	
Bark Mulch	\$10,463	
Cedar Chips	\$4,360	
Open Space/Tree Allowance	\$9,809	
<i>No replacement in 2045 - 2046</i>		
Replacement in 2047		\$11,533
Bark Mulch	\$11,533	
Replacement in 2048		\$36,610
Benches	\$8,067	
Cedar Chips	\$4,964	
Retaining Wall Allowance	\$6,205	
Open Space/Tree Allowance	\$11,169	
Monument Allowance	\$6,205	
<i>No replacement in 2049</i>		
Total:	\$664,928	\$664,928

Detail Report by Category

Grounds

Asphalt Streets – Patch, Repair & Seal

Non-Capital: Grounds

Placed in Service:	2020	Cost Basis:	156,000 SF @ \$0.40
Useful Life:	6 years	Asset Cost:	\$62,400
Remaining Life:	6 years	Percent Replacement:	100%
Replacement Year:	2026	Replacement Year Cost:	\$75,820

This component category provides funding for the periodic application of an asphalt emulsion sealer also known as “Slurry Seal” to all asphalt surfaces maintained by the HOA. The process includes pre-cleaning of all pavement, filling of any cracks or fissures in the pavement as well as the patching of isolated, damaged pavement surfaces, followed by the application of the emulsion sealer either by hand or mechanical means.

A licensed paving contractor should perform this work and all asphalt striping (if necessary) will need to be renewed when the seal coating is applied. The component expense estimate includes the cost of this work as well the seal coating cost.

Useful life assumptions are based on accepted industry estimates established by RS Means, and/or The National Construction Estimator. The Association should obtain a bid prior to commencing work. The estimated costs obtained ranged from \$0.38 - \$0.56 per square foot with replacement every 7-8 years.

Asphalt Streets – Overlay

Capital: Grounds

Placed in Service:	2020	Cost Basis:	156,000 SF @ \$1.40
Useful Life:	36 years	Asset Cost:	\$218,400
Remaining Life:	36 years	Percent Replacement:	100%
Replacement Year:	2056	Replacement Year Cost:	\$680,399

This component category provides funding for the renewal/replacement of asphalt surfaces maintained by the HOA. Renewal/replacement of asphalt paving refers to the periodic application of bituminous asphalt overlay that is typically applied in continuous sections at a thickness of 1” to 2”, depending on the individual project specifications. The overlay is designed to renew the life of the pavement for another life cycle of equal duration to the initial life expectancy of the pavement. The new surface is to be maintained in the same fashion as the original surface.

A licensed paving contractor should perform this work and all asphalt striping (if necessary) will need to be renewed when the overlay is applied. The component expense estimate includes the cost of this work as well as the overlay cost.

Useful life assumptions are based on accepted industry estimates established by RS Means, and/or The National Construction Estimator. The Association should obtain a bid prior to commencing work.

Concrete Allowance

Capital: Grounds

Placed in Service:	2020	Cost Basis:	1 @ \$3,000
Useful Life:	20 years	Current Cost:	\$3,000
Remaining Life:	20 years	Percent Replacement:	100%
Replacement Year:	2040	Replacement Year Cost:	\$5,743

This component category provides the partial replacement and repair of common area concrete.

Because this item is outside the 30-year scope of this study, this item provides an allowance for periodic maintenance and repair every 20 years or as needed.

Fence – Chain Link

Capital: Grounds

Placed in Service:	2020	Cost Basis:	1,155 LF @ \$26.50
Useful Life:	35 years	Asset Cost:	\$30,608
Remaining Life:	35 years	Percent Replacement:	100%
Replacement Year:	2055	Replacement Year Cost:	\$95,354

This component category provides for the replacement of the chain link fence bordering the water quality facilities in the community.

Fitness Stations

Capital: Grounds

Placed in Service:	2020	Cost Basis:	5 @ \$2,000
Useful Life:	24 years	Asset Cost:	\$10,000
Remaining Life:	24 years	Percent Replacement:	100%
Replacement Year:	2044	Replacement Year Cost:	\$21,798

This component category provides funding for the replacement of the fitness stations in the community.

Benches

Capital: Grounds

Placed in Service:	2020	Cost Basis:	5 @ \$650
Useful Life:	28 years	Asset Cost:	\$3,250
Remaining Life:	28 years	Percent Replacement:	100%
Replacement Year:	2048	Replacement Year Cost:	\$8,067

This component category provides funding for the replacement of the benches located along the cedar path in Tract A.

Irrigation Controller

Capital: Grounds

Placed in Service:	2020	Cost Basis:	6 @ \$950
Useful Life:	6 years	Asset Cost:	\$5,700
Remaining Life:	6 years	Percent Replacement:	100%
Replacement Year:	2026	Replacement Year Cost:	\$6,926

This component category provides funding for the replacement of the irrigation controller and system in the common areas.

Bollard Lights

Capital: Grounds

Placed in Service:	2020	Cost Basis:	2 @ \$800
Useful Life:	24 years	Asset Cost:	\$1,600
Remaining Life:	24 years	Percent Replacement:	100%
Replacement Year:	2044	Replacement Year Cost:	\$3,488

This component category provides funding for the replenishment of the bollard style lights in the park.

Bark Mulch

Capital: Grounds

Placed in Service:	2020	Cost Basis:	10 @ \$480
Useful Life:	3 years	Asset Cost:	\$4,800
Remaining Life:	3 years	Percent Replacement:	100%
Replacement Year:	2023	Replacement Year Cost:	\$5,291

This component category provides funding for the replenishment of the bark mulch throughout the community.

Cedar Chips

Capital: Grounds

Placed in Service:	2020	Cost Basis:	4 @ \$500
Useful Life:	4 years	Asset Cost:	\$2,000
Remaining Life:	4 years	Percent Replacement:	100%
Replacement Year:	2024	Replacement Year Cost:	\$2,277

This component category provides funding for the replenishment of the cedar chip path in Tract A.

Retaining Wall Allowance

Capital: Grounds

Placed in Service:	2020	Cost Basis:	1 @ \$2,500
Useful Life:	14 years	Asset Cost:	\$2,500
Remaining Life:	14 years	Percent Replacement:	100%
Replacement Year:	2034	Replacement Year Cost:	\$3,939

This component category provides funding for the maintenance of the retaining wall.

Open Space/Tree Allowance

Capital: Grounds

Placed in Service:	2020	Cost Basis:	1 @ \$4,500
Useful Life:	4 years	Asset Cost:	\$4,500
Remaining Life:	4 years	Percent Replacement:	100%
Replacement Year:	2024	Replacement Year Cost:	\$5,124

This component category provides funding to upkeep the open space areas in Tracts A, B, C, & D.

AFTER RECORDING RETURN COPY TO:

JORDAN RAMIS, PC
2 CENTERPOINTE DR, 6TH FLOOR
LAKE OSWEGO, OR 97035
ATTN: JAMES D. HOWSLEY

DRAFT

SPACE ABOVE THIS LINE FOR RECORDER'S USE

**DECLARATION OF PRIVATE STREET
MAINTENANCE COVENANT AND AGREEMENT**

RECITALS

WHEREAS, CG Commercial, LLC, a Delaware limited liability company and VPCF Crestview, LLC, a Delaware limited liability company (“Declarants”) are the owners of the real property described in Exhibit A and depicted on Exhibit B attached hereto and incorporated by this reference (the “Private Street Tracts”).

WHEREAS, a Private Street Maintenance Covenant and Agreement (“Agreement”) is required pursuant to the City of Newberg Final Decision dated _____, 2018 approving the Crestview Crossing Subdivision (“Subdivision”) including the Private Street Tracts.

WHEREAS, the Subdivision plat will be recorded to create the Private Street Tracts.

WHEREAS, the Crestview Crossing Homeowners Association (“Association”) has been created to own, administer and maintain the Private Street Tracts, among other purposes.

AGREEMENT

NOW, THEREFORE, Declarants covenant and agree on behalf of Declarants and their successors, including the Association, that the following provisions shall constitute a covenant running with the Private Street Tracts, as more particularly described herein.

1. PURPOSE OF COVENANT AND AGREEMENT.

The purpose of this Agreement is to provide for the perpetual maintenance of the Private Street Tracts by the Association.

2. LEGAL DESCRIPTION.

The legal description of the Private Street Tracts is on Exhibit A and depicted on Exhibit

B.

3. DURATION AND NATURE OF AGREEMENT.

This Agreement shall continue in perpetuity. This Agreement is intended to and does attach to and run with the land affected herein. This Agreement is binding on the Declarant, and its successors, heirs and assigns. It is the intent of Declarants to create a continuing obligation and right of the Association as the future owner of the Private Street Tracts.

4. CONSTRUCTION OF IMPROVEMENTS.

Declarants shall design and construct the street improvements to the specifications established by the City of Newberg, at Declarants' expense.

5. OWNERSHIP.

When Declarants have conveyed a sufficient number of the lots in the Subdivision to others, it will convey ownership of the Private Street Tracts to the Association and Declarants' obligations shall terminate.

6. MAINTENANCE.

The Declarants shall maintain the Private Street Tracts through a one-year warranty period expiring on _____, 2019. Once the warranty period is complete, the Association shall maintain all improvements including asphalt pavement, concrete curbs, fire lane restriction signage and striping, to the satisfaction of the City of Newberg and/or the Fire Marshal. The Association shall ensure that no lot owner, guest, invitee, licensee, contractor, vendor or agent of an owner shall cause damage, or place upon or over the Private Street Tracts any improvement, planting or other materials which would interfere with the maintenance or operation of the Private Street Tracts.

At the direction of the Association, the Private Street Tracts shall be inspected by a licensed Civil Engineer, at no less than 5 year intervals to identify needed maintenance. The Civil Engineer will recommend the amount of maintenance needed, and the recommendations shall be considered, mutually agreed and acted on by Association.

Maintenance shall include, but not be limited to:

- a. The removal of leaves, trash or other unsightly or dangerous materials;
- b. The removal of diseased or dead trees, landscaping or natural vegetation and the replanting of replacement materials.
- c. The trimming of trees and vegetation.
- d. The removal and replacement of any broken pavement.

- e. The sealing of and/or the eventual repaving of the pavement, in a useable condition and in good repair.
- f. The repair and/or replacement of damaged or missing fire lane restriction parking signs (as applicable) to the satisfaction of the Fire Marshal.
- g. The re-painting of any and all fire lane restriction striping, including any stenciled lettering to the satisfaction of the Fire Marshal.

7. INDEMNIFICATION.

The Association shall hold harmless, defend and indemnify the Declarants, the City of Newberg and the Fire Marshal and their officers, agents and employees against all claims, demands, actions and suits, including attorneys' fees and costs brought against any of them arising out of the failure to properly design, locate, construct or maintain the Private Street Tracts which are subject to this Agreement.

All workers undertaking maintenance work within the Private Street Tracts shall have standard liability insurance in a reasonable amount from a reputable insurance company which protects the Association.

8. NOTICE.

Any notice, demand, or report required under this Agreement shall be sent to the owner of the Private Street Tracts. Any required notice of demand shall be made by hand delivery or certified mail, and shall be deemed received on actual receipt or 48 hours after being mailed whichever first occurs.

9. AMENDMENT AND TERMINATION.

The owner(s) of the Private Street Tracts may not amend, withdraw from or dissolve this Agreement without the written approval of the City of Newberg, and any such instrument shall be recorded in the deed records of Yamhill County.

10. NO DEDICATION AS PUBLIC RIGHT-OF-WAY.

Nothing in this Agreement shall be interpreted to mean the Private Street Tracts are or will be dedicated to the City of Newberg, the public, or other public agency for right-of-way purposes.

IN WITNESS WHEREOF, the Declarants have executed this Private Street Maintenance Covenant and Agreement to be effective on _____ 2018.

Signatures and acknowledgments are on the following page.

DECLARANTS

CG Commercial, LLC, a Delaware limited liability company LLC

By: _____

Title: _____

STATE OF OREGON

County of Clackamas

The above instrument was subscribed and sworn to before me this _____ day of _____.

By _____

As _____ of _____.

Notary Public – State of Oregon

My commission expires: _____

VPCF Crestview, LLC, a Delaware limited liability company

By: _____

Title: _____

STATE OF OREGON

County of Clackamas

The above instrument was subscribed and sworn to before me this _____ day of _____.

By _____

As _____ of _____.

Approved as to form

DRAFT

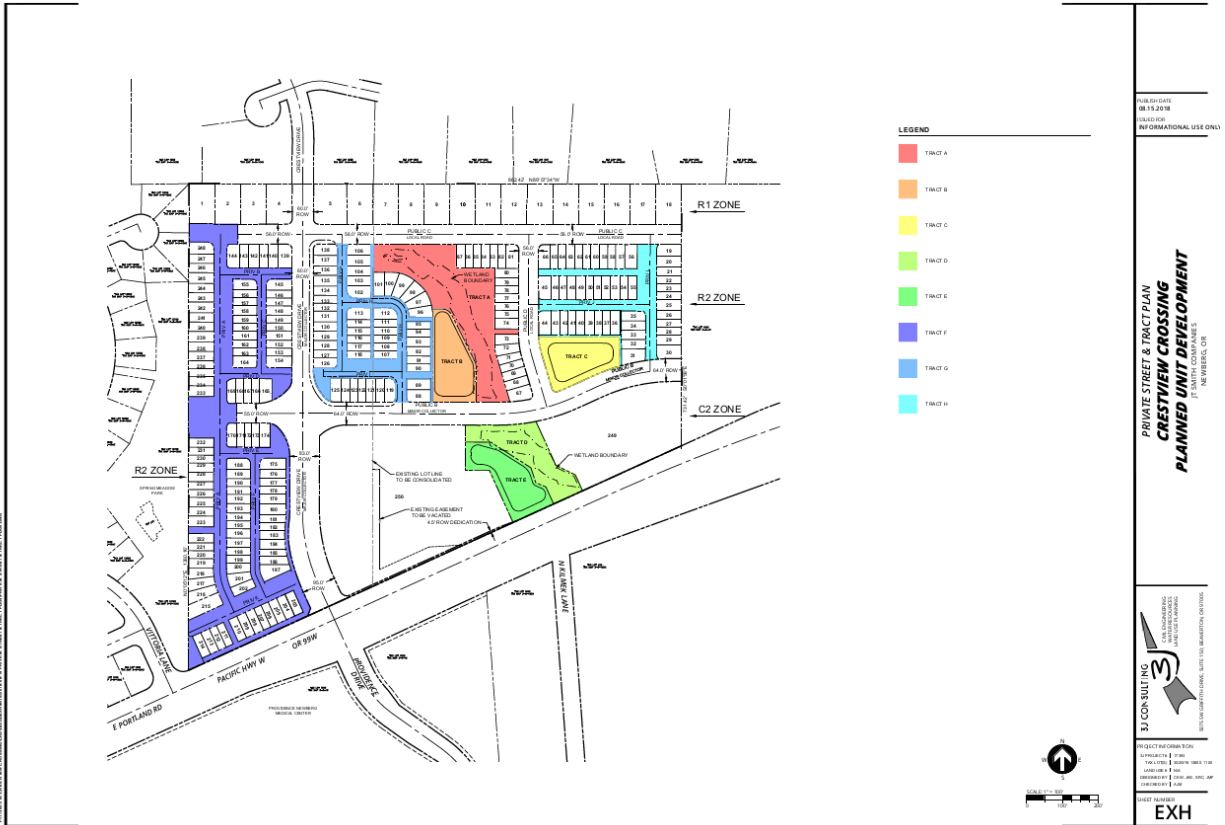
Joe Hannon
City Manager, City of Newberg

Exhibit A
Legal Description

Parcels of land in the northeast quarter of Section 16, Township 3 South, Range 2 West, Willamette Meridian, in the City of Newberg, Yamhill County, Oregon, more particularly described as follows.

Tracts F, G and H on the plat of Crestview Crossing, a subdivision recorded on _____, 2018 at Volume _____, Page _____, Book of Plats.

Exhibit B Map of Private Street Tracts



AFTER RECORDING RETURN TO:
JORDAN RAMIS, PC
2 Centerpointe Dr, 6th Floor
Lake Oswego, OR 97035
Attn: James D. Howsley

DRAFT

This space provided for recorder's use.

STORMWATER FACILITY EASEMENT AND MAINTENANCE AGREEMENT

BETWEEN: City of Newberg, a municipal corporation of the State of Oregon (“City”)

AND: CG Commercial, LLC, a Delaware limited liability company and VPCF
Crestview, LLC, a Delaware limited liability company (“Declarants”)

DATED: _____, 2018

RECITALS

- A. WHEREAS, Declarants are the owner of the real property described in Exhibit A and depicted on Exhibit B attached hereto and incorporated by this reference (the “Private Street Tracts” and the “Stormwater Tracts”).
- B. WHEREAS, this Stormwater Facility Easement and Maintenance Agreement (“Agreement”) is required pursuant to the City of Newberg Final Decision dated _____, 2018 approving the Crestview Crossing Subdivision (“Subdivision”) including the Stormwater Tracts.
- C. WHEREAS, the Subdivision plat is being recorded to create the Stormwater Tracts.
- D. WHEREAS, the Crestview Crossing Homeowners Association (“Association”) has been created to own, administer and maintain the Stormwater Tracts, among other purposes.
- E. The Stormwater Tracts were designed by a registered professional engineer to accommodate the anticipated volume of runoff, detain such runoff, and release it at a slow rate.
- F. The City desires a stormwater facility easement over a portion of the Stormwater Tracts. Declarant is willing to grant to the City a stormwater facility easement, subject to the terms and conditions of this Agreement.

NOW, THEREFORE, in consideration of the following covenants and conditions, it is agreed by and between the parties hereto as follows:

1. **Easement.** Declarants hereby grant the City, its employees, independent contractors and designees, a nonexclusive easement for ingress and egress over the Private Street Tracts, and over the Stormwater Tracts for the purpose of inspection of the Stormwater Tracts as specified below. Declarants understand and agrees that this easement limits the ability of Declarants, their successors and assigns from constructing any permanent buildings, structures, or other improvements that would interfere with the functioning of the Stormwater Tracts.
2. **Declarants' Agreement to Maintain Stormwater Tracts.** Declarants agree to maintain the Stormwater Tracts consistent with operations and maintenance program described in Exhibit C attached hereto and incorporated herein by this reference. In the event that the Declarants fail to so maintain the Stormwater Tracts, City may elect to exercise all remedies available to it in law and in equity, including the right of specific performance.
3. **City's Indemnity.** The City shall indemnify, defend and hold harmless Declarants, their officers, directors, agents and employees from any and all liability, damages, expenses, attorney's fees, causes of action, suits, claims or judgments, arising out of or connected with the City's exercise of its rights under this Agreement. In addition to the indemnity provided above, the City agrees to indemnify, defend and hold harmless Declarants, its officers, directors, agents and employees from and against all damages, costs, liabilities and expenses caused by, arising out of, or in connection with, City's handling, storage, discharge, transportation or disposal of hazardous or toxic wastes or substances, pollutants, oils, materials or contaminants, as those terms are defined by federal state or local law or regulation, as amended from time to time, on or about the Stormwater Tracts. City shall not be required to indemnify, hold harmless or defend Declarant from any claim, damage, loss, liability, cost or expense arising out of Declarant's negligence or intentional conduct.
4. **Declarant's Indemnity.** Declarant shall indemnify, defend and hold harmless City, its officials, agents and employees from any and all liability, damages, expenses, attorney's fees, causes of action, suits, claims or judgments, arising out of or connected with Declarant's acts or omissions which cause result in damage to the Stormwater Tracts. In addition to the indemnity provided above, Declarant agrees to indemnify, defend and hold harmless City, its officers, directors, agents and employees from and against all damages, costs, liabilities and expenses caused by, arising out of, or in connection with, Declarant's handling, storage, discharge, transportation or disposal of hazardous or toxic wastes or substances, pollutants, oils, materials or contaminants, as those terms are defined by federal state or local law or regulation, as amended from time to time, on or about the Stormwater Tracts. Declarant shall not be required to indemnify, hold harmless or defend the City from any claim, damage, loss, liability, cost or expense arising out of City's negligence or intentional conduct.
5. **Notice.** Any notice, demand, request, or other communication (collectively referred to in this as a "notice") required or permitted to be given or made by either party to the other pursuant to this Agreement shall be in writing and shall be delivered to the other party by delivery service (including by overnight delivery service such as Federal Express) or sent postage prepaid by registered or certified U.S. or Canadian mail, as applicable, addressed

to the party at its address set forth below or such other address as may be designated by such party by written notice hereunder. Notices shall be deemed given and shall be effective on the date of delivery or, if mailed, two (2) business days following the date of mailing.

In the case of a notice or communication, all notices shall be addressed as follows:

City: City of Newberg
414 E First St
Newberg, OR 97132
Attn: City Manager

Declarant:

With a copy to: Jordan Ramis, PC
2 Centerpointe Dr, 6th Floor
Lake Oswego, OR 97035
Attn: James D. Howsley

6. **Force and Effect.** This Agreement shall constitute deed covenants running with the land and shall be binding on all owners, their heirs, successors, and assigns.
7. **Amendments.** The terms of this Agreement may be amended by mutual agreement of the parties. Any amendments shall be in writing and shall refer specifically to this Agreement and shall be valid only when executed by both parties to this Agreement and duly recorded.
8. **Breach.** In the event either party breaches this Agreement, the nonbreaching party may elect to exercise all remedies available in law and equity.
9. **Prevailing Party.** In any action brought by either party to enforce the terms of this Agreement, or to foreclose any lien provided for herein, the prevailing party shall be entitled to recover all costs, including reasonable attorney fees as may be determined by the court having jurisdiction, including any appeal therefrom.
10. **Severability.** The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.
11. **Duration.** This agreement shall continue in perpetuity unless otherwise terminated and released by the parties hereto or their respective heirs, successors or assigns. In the event that the Declarant fails to use the Stormwater Tracts for a period of twenty-four (24) consecutive months, then this Agreement shall terminate and the parties hereto shall execute a termination of this Agreement and record the same in the real estate records of Yamhill County, Oregon. At the time of such termination, the Stormwater Tracts shall revert to Declarant.

12. **Recording.** This Agreement shall be recorded in the deed records of Yamhill County, Oregon.

13. **Exhibits.** All Exhibits attached hereto are incorporated herein by this reference.

14. **Recitals Contractual.** The Recitals in this Agreement are contractual.

IN WITNESS WHEREOF, Declarant has set his hand and seal the day and year first above written, and City has caused these presents to be signed in its name by its City Manager, attesting to the day and year first above written.

DECLARANTS

CG Commercial, LLC, a Delaware limited liability company LLC

By: _____

Title: _____

STATE OF OREGON
County of Clackamas

The above instrument was subscribed and sworn to before me this ____ day of _____.

By _____

As _____ of _____.

Notary Public – State of Oregon

My commission expires: _____

VPCF Crestview, LLC, a Delaware limited liability company

By: _____

Title: _____

STATE OF OREGON
County of Clackamas

The above instrument was subscribed and sworn to before me this ____ day of _____.

By _____

As _____ of _____.

CITY:

CITY OF NEWBERG, a municipal corporation of the State of Oregon

By: _____
Joe Hannon, City Manager

STATE OF OREGON)
) ss.
COUNTY OF)

This instrument was acknowledged before me on _____, 2018 by Joe Hannon as City Manager of the City of Newberg.

Notary Public for Oregon
My commission expires: _____

Exhibit A
Legal Description of Property

Parcels of land in the northeast quarter of Section 16, Township 3 South, Range 2 West, Willamette Meridian, in the City of Newberg, Yamhill County, Oregon, more particularly described as follows.

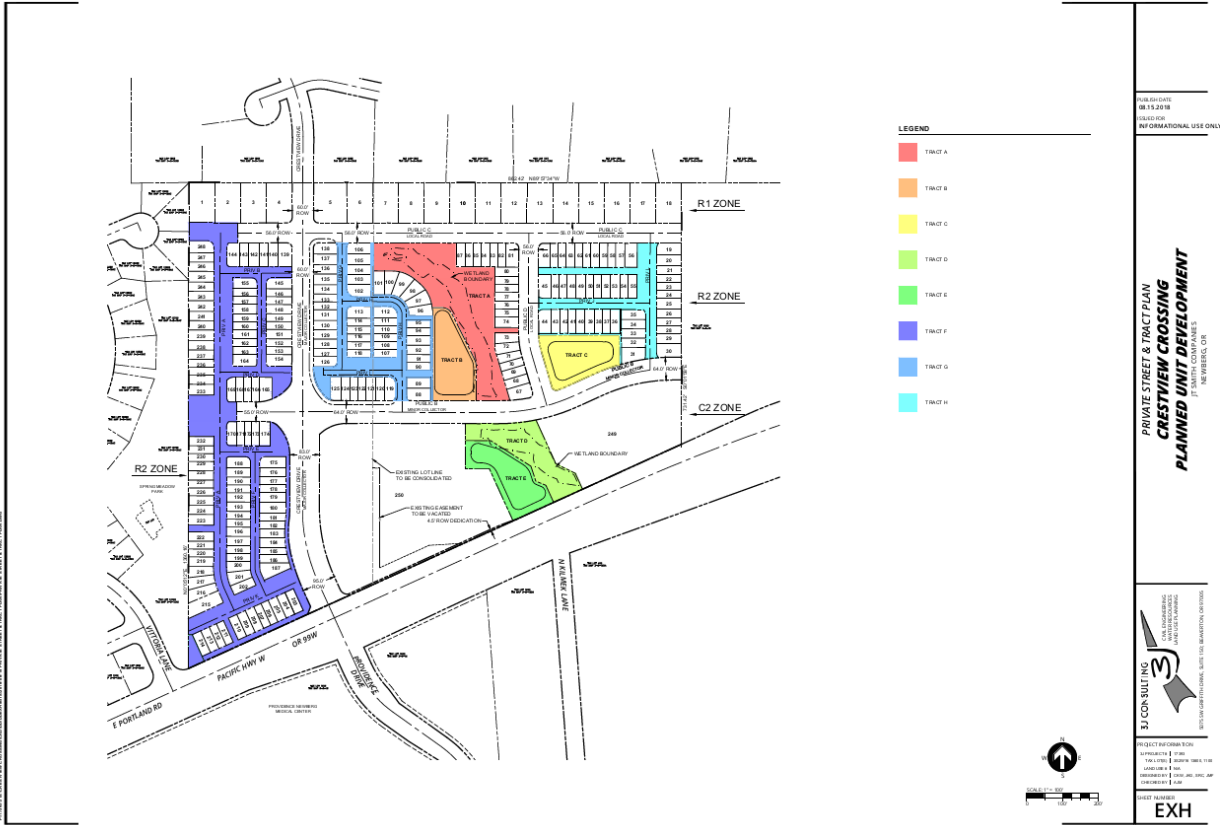
Private Street Tracts

Tracts F, G and H on the plat of Crestview Crossing, a subdivision recorded on _____, 2018 at Volume _____, Page _____, Book of Plats.

Stormwater Tracts

Tracts B and C on the plat of Crestview Crossing, a subdivision recorded on _____, 2018 at Volume _____, Page _____, Book of Plats.

Exhibit B Map of Private Street and Stormwater Tracts



SCALE: AS SHOWN
FOR 15.25 M
PLEASE USE
INFORMATIONAL USE ONLY

PRIVATE STREET & TRACT PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANY INC.
 WESTMINSTER, CO



PROJECT NUMBER: 2021-001
 REPRESENTATIVE: J. SMITH
 DATE: 10/15/2021
 PROJECT: CRESTVIEW CROSSING
 SHEET: EXH



EXHIBIT C

Maintenance Requirement for Stormwater Tracts B and C

1. Stormwater Tracts shall be mowed regularly to maintain a maximum grass height of 6 inches or less. Side slopes that are planted shall be maintained to prevent erosion. Bare soil shall be replanted as needed to maintain sufficient ground coverage.
2. The Stormwater Tracts access gates shall remain free of obstructions at all times allowing access by the City’s Public Works Department for inspection, maintenance, and repair, if necessary. The access gate shall remain locked at all times. The lock shall be accessible by both Declarant and the City.
3. The fence enclosing the Stormwater Tracts shall be maintained to remain structurally competent. Debris that accumulates along the fence and within the Stormwater Tracts shall be removed quarterly.
4. Inspect the Stormwater Tracts per the following table and stormwater retention basin inspection maintenance checklist.

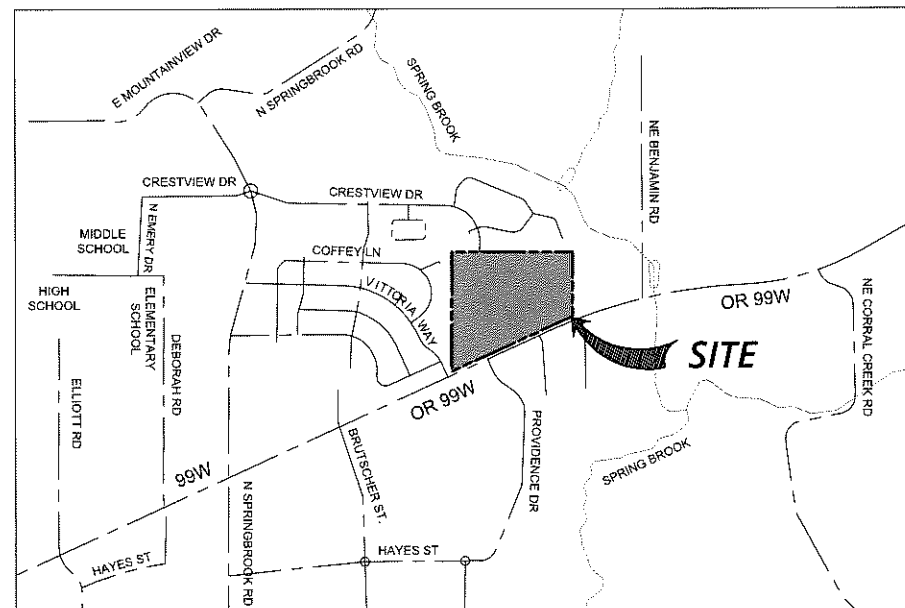
Table 1 Routine Maintenance Activities for Retention Basins		
No.	Maintenance Task	Frequency of Task
1	Conduct annual vegetation management during the summer, removing weeds and harvesting vegetation. Remove all grass cuttings and other green waste.	Once a year
2	Trim vegetation at beginning and end of wet season to prevent establishment of woody vegetation, and for aesthetics and mosquito control.	Twice a year (spring and fall)
3	Evaluate health of vegetation and remove and replace any dead or dying plants. Remove all green waste and dispose of properly.	Twice a year
4	If turf grass is included in basin design, conduct regular mowing and remove all grass cuttings. Avoid producing ruts when mowing.	Maintain less than 6-inches
5	Remove sediment when the sediment level reaches the level shown on the fixed vertical sediment marker and dispose of sediment properly.	As needed
6	Remove accumulated sediment and regrade when the accumulated sediment volume reduces the infiltration rate or impedes the outfall pipe and dispose of sediment properly.	Every 2-5 years, or as needed to maintain min. clearance below outlet
7	Remove accumulated trash and debris from the extended detention basin at the middle and end of the wet season and dispose of trash and debris properly.	Twice a year (January and April)
8	Irrigate during dry weather.	As needed
9	Inspect extended detention basin using the attached inspection checklist.	Quarterly, or as needed

LAND USE DOCUMENTS

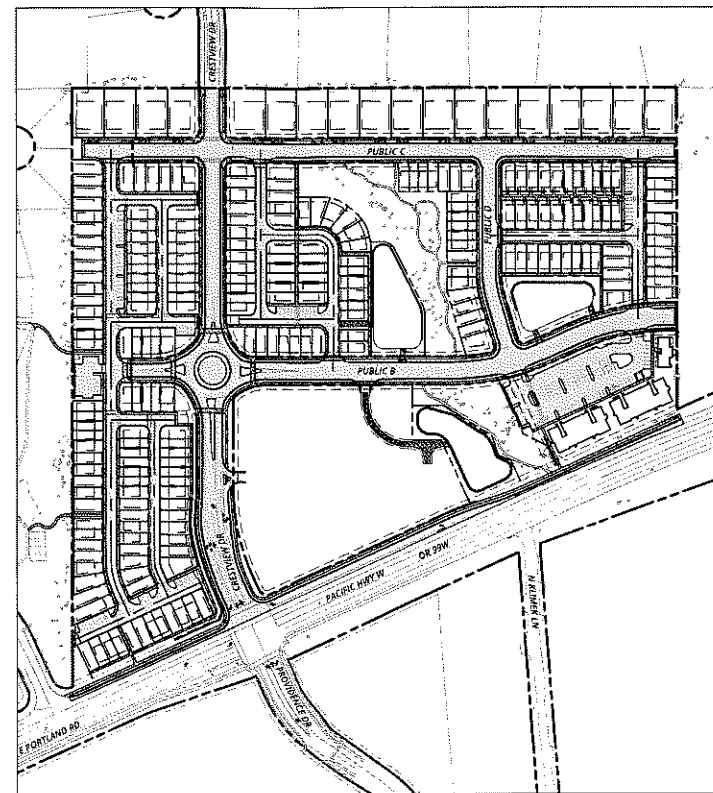
FOR

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

PREPARED FOR
JT SMITH COMPANIES



VICINITY MAP
NOT TO SCALE



SITE MAP
SCALE: 1" = 200'

PROJECT TEAM

OWNER/APPLICANT
JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE 171
LAKE OSWEGO, OR 97035
CONTACT: JESSE NEMEC
PHONE: (503) 730-8620
EMAIL: jnemec@jtsmithco.com

CIVIL ENGINEER
3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ASHLEY SEAL, PE
PHONE: (503) 946-9365
EMAIL: ashley.seal@3j-consulting.com

PLANNING CONSULTANT
3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: (503) 946-9365
EMAIL: andrew.tull@3j-consulting.com

LANDSCAPE ARCHITECT
CARDNO, INC.
8720 SW MACADAM AVE, SUITE 200
PORTLAND, OR 97219
CONTACT: ANDREW HILL
PHONE: (503) 419-2500
EMAIL: andrew.hill@cardno.com

TAX LOTS 13800 AND 01100 LOCATED IN THE
NE 1/4 OF SECTION 16, T.3S., R.2W., W.M.
CITY OF NEWBURG, YAMHILL COUNTY, OREGON

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C000	COVER SHEET
C100	EXISTING CONDITIONS PLAN
C110	TREE REMOVAL AND PRESERVATION PLAN
C120	1200C COVER SHEET
C121	1200C CLEARING AND DEMOLITION ESCP I
C122	1200C GRADING AND STREET CONSTRUCTION ESCP I
C123	1200C DETAILS I
C124	1200C DETAILS II
C150	OVERALL TENTATIVE PLAT
C151	TENTATIVE PLAT I
C152	TENTATIVE PLAT II
C153	TENTATIVE PLAT III
C154	TENTATIVE PLAT IV
C200	TYPICAL SECTIONS I
C201	TYPICAL SECTIONS II
C210	OVERALL SITE PLAN
C215	MULTI-FAMILY SITE PLAN
C218	MULTI-FAMILY GRADING PLAN
C220	ACCESS, PARKING, AND CIRCULATION PLAN
C230	FIRE ACCESS PLAN
C290	PHOTOMETRICS PLAN
C291	MULTI-FAMILY PHOTOMETRICS PLAN
C300	COMPOSITE UTILITY PLAN
C301	OFFSITE SEWER CONNECTION
C302	PRELIMINARY STREET LIGHT CONDUIT ROUTING PLAN
C303	MULTI-FAMILY COMPOSITE UTILITY PLAN
LS 1.0	LS 1.0 STREET TREE PLAN
LS 1.1	LS 1.1 PLANTING PLAN
LS 1.2	LS 1.2 PLANTING PLAN
LS 1.3	LS 1.3 PLANTING PLAN
LS 1.4	LS 1.4 PLANTING PLAN

SITE INFORMATION

SITE ADDRESS
4505 E PORTLAND RD
NEWBURG, OR 97132

TAX LOT(S)
352W16 13800, 1100

FLOOD HAZARD
MAP NUMBER: 41071C0241D AND
41071C0235D ZONE X (UNSHADED)

JURISDICTION
CITY OF NEWBURG

ZONING
R-1, R-2, AND C-2

GROSS SITE AREA
33.13 ACRES

UTILITIES & SERVICES

STORM, SEWER
CITY OF NEWBURG

WATER
CITY OF NEWBURG

POWER
PGE

GAS
NORTHWEST NATURAL GAS

CABLE
COMCAST, VERIZON

FIRE
TUALATIN VALLEY FIRE & RESCUE

SCHOOLS
NEWBURG OREGON SCHOOL DISTRICT

POLICE
NEWBURG POLICE DEPARTMENT

PARKS
CHEHALEM

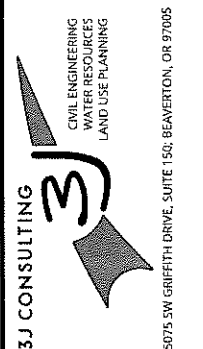
ROADS
CITY OF NEWBURG, ODOT

ALL WORK PERFORMED SHALL
CONFORM TO ALL STANDARD
SPECIFICATIONS FOUND
WITHIN THE LATEST VERSION
OF THE CITY OF NEWBURG'S
PUBLIC WORKS DESIGN AND
CONSTRUCTION STANDARDS.



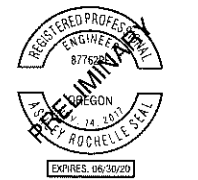
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

COVER SHEET
**CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT**
JT SMITH COMPANIES
NEWBURG, OR



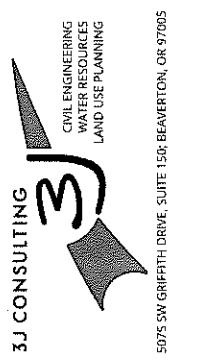
PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 352W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMD
CHECKED BY | AJM, RGW

SHEET NUMBER
C000



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

EXISTING CONDITIONS PLAN
CRESTVIEW CROSSING
 PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | A.M. RGW
 SHEET NUMBER
C100

EXISTING LEGEND

	EXISTING BUILDING		EXISTING MAJOR CONTOUR
	PROJECT BOUNDARY		EXISTING MINOR CONTOUR
	RIGHT-OF-WAY LINE		EXISTING INTERSECTION SIGNAL
	RIGHT-OF-WAY CENTERLINE		EXISTING MAILBOX
	EASEMENT LINE		EXISTING LIGHTPOLE
	EXISTING LOT LINE		EXISTING UTILITY POLE
	EXISTING ADJACENT PROPERTY LINE		EXISTING CONIFEROUS TREE
	EXISTING CONCRETE		EXISTING DECIDUOUS TREE
	EXISTING WETLAND		EXISTING SIGN
	EXISTING CURB		EXISTING SANITARY MANHOLE
	EXISTING FENCE LINE		EXISTING STORM MANHOLE
	EXISTING STRIPING, WHITE		EXISTING STORM INLET
	EXISTING STRIPING, YELLOW		EXISTING POWER METER
	EXISTING TELECOM. LINE		EXISTING GAS METER
	EXISTING GAS LINE		EXISTING TELEPHONE PEDESTAL
	EXISTING OVERHEAD POWER		
	EXISTING SANITARY SEWER		
	EXISTING STORM SEWER		
	EXISTING WATER MAIN		

SURVEYOR'S NOTES:

- WETLAND BOUNDARIES SHOWN WERE DELINEATED BY MARTIN SCHOTT AND ASSOCIATES AND WERE SURVEYED BY AKS ENGINEERING AND FORESTRY, LLC. THE WEEK OF 03/11/13 TO 03/14/13. FIELD WORK WAS CONDUCTED 03/07/13 TO 03/14/13.
- UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS PER UTILITY LOCATE TICKET NUMBERS 13163881 AND 14165137. THERE IS NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
- FIELD WORK WAS CONDUCTED 08/06/13 TO 08/12/13 AND 07/07/14 TO 07/18/14.
- DATUM: CITY OF NEWBERG (ESTABLISHED OCTOBER OF 1984 AND REVISED IN 2001)
 BM NO. 111 ELEVATION = 230.11 (NGVD 29)
 BENCHMARK LOCATION: BRASS DISK IN THE TOP OF CURB, CENTER OF THE NORTHEAST CURB RETURN AT THE CORNER OF AQUARIUS BLVD. AND MADRONNA DRIVE.
- CONTOUR INTERVAL IS 2 FEET.

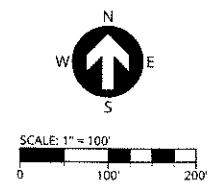
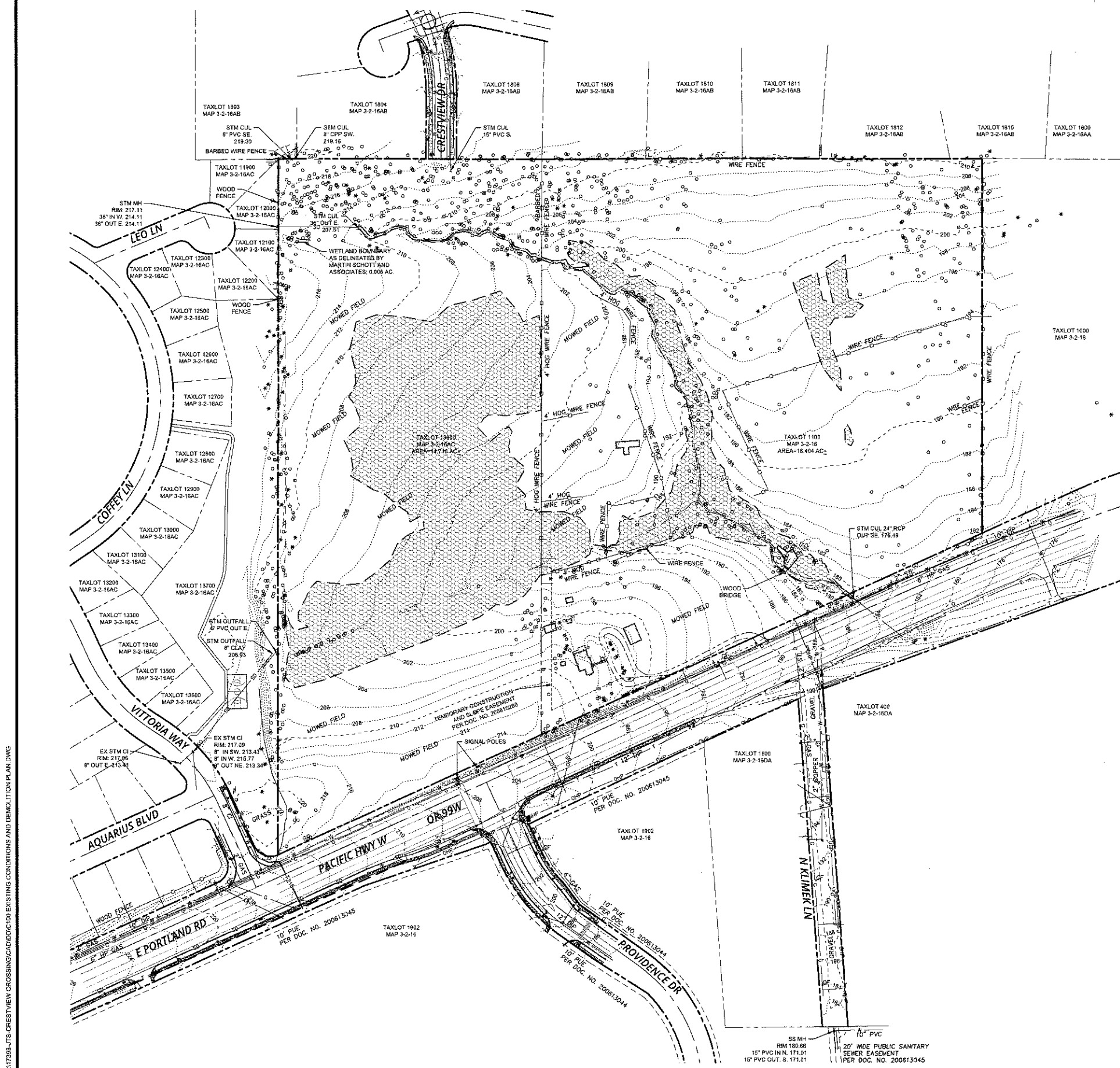
EXISTING CONDITIONS PLAN

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF SITE SURVEY FROM AKS ENGINEERING (SENT 07-07-2017), PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS AND PHYSICAL SITE OBSERVATIONS. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

ZONE X (UN-SHADED) THE SITE IS LOCATED WITHIN ZONE X (UN-SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 41071C0241D AND 41071C0235D FEMA'S DEFINITION OF ZONE X (UN-SHADED) IS AN AREA OF MINIMAL FLOOD HAZARD. USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE X IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

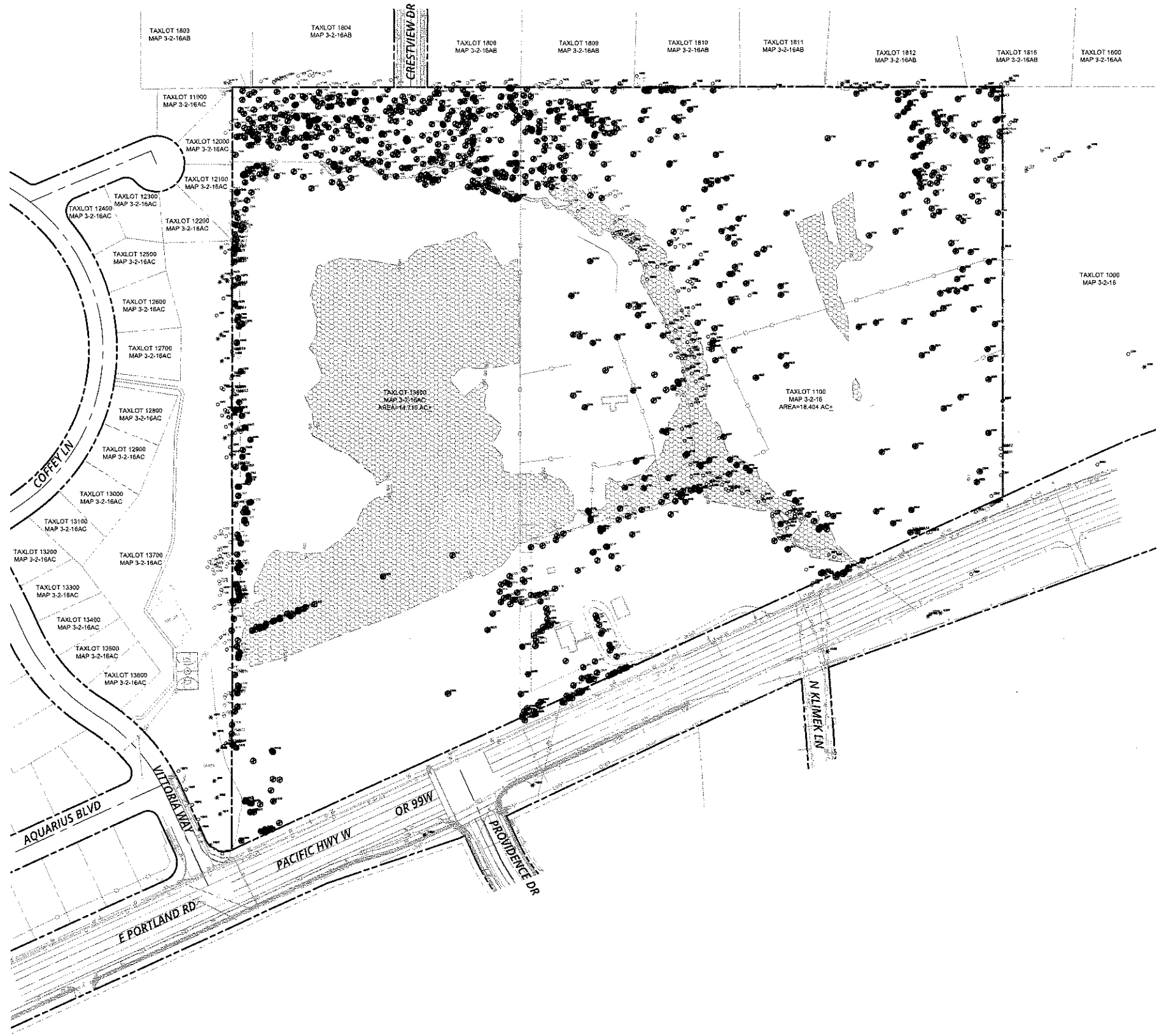
GENERAL NOTES:

WETLAND BOUNDARY DELINEATED BY MARTIN SCHOTT AND ASSOCIATES; SURVEYED BY AKS WEEK OF 3/11/13 - 3/14/13



P:\17393\JTS-CRESTVIEW CROSSING\CADD\C100-EXISTING CONDITIONS AND DEMOLITION PLAN.DWG

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C110 TREE REMOVAL AND PRESERVATION PLAN.DWG



LEGEND

- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- TREE TO BE REMOVED (848 TOTAL)

GENERAL TREE INVENTORY STATISTICS

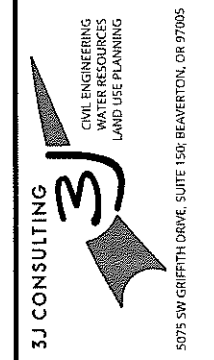
TOTAL TREE INVENTORY (IN PROJECT LIMITS):	1,042 EA
TOTAL TREES RETAINED:	119 EA
TOTAL TREES REMOVED:	923 EA



PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

TREE REMOVAL AND PRESERVATION PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



N
W ↑ E
S

SCALE: 1" = 100'

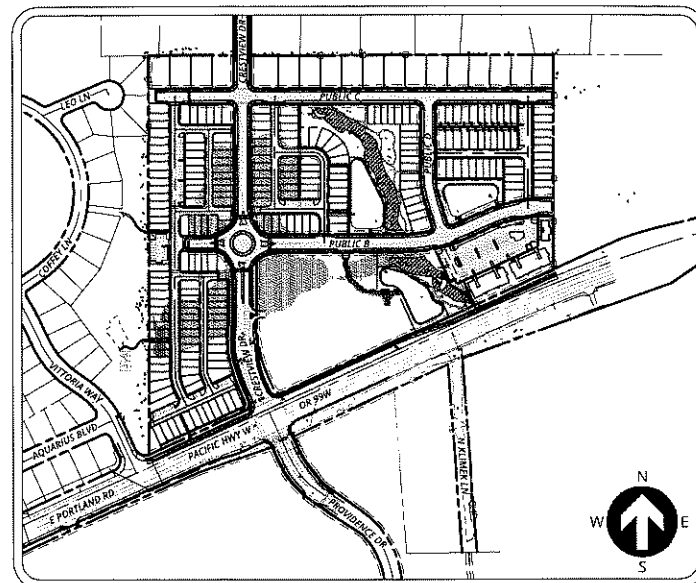
0 100' 200'



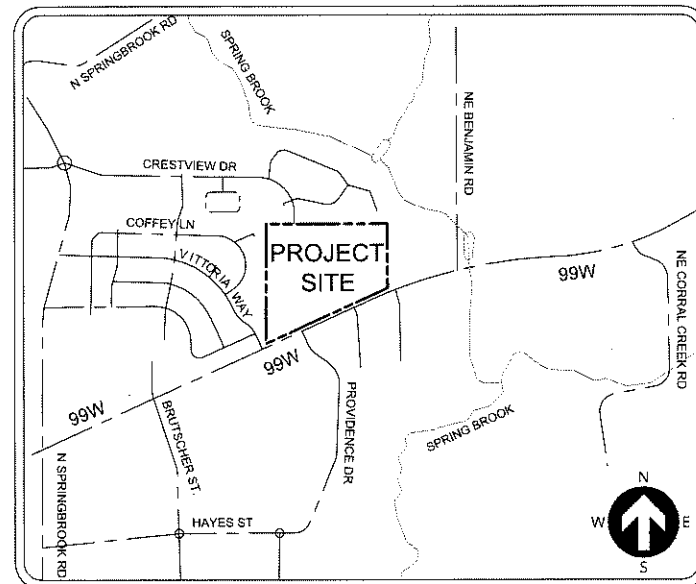
PROJECT INFORMATION

3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C110



SITE MAP
SCALE: 1" = 300'



VICINITY MAP
SCALE: N.T.S.

INSPECTION FREQUENCY:

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOW MELT, IS OCCURRING. AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY MONTH.
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6999.



CRESTVIEW CROSSING SUBDIVISION

EROSION AND SEDIMENT CONTROL PLAN (ESCP) COVER SHEET

PROPERTY DESCRIPTION:

TAX LOTS 13600 AND 01100 LOCATED IN THE NE 1/4 OF SECTION 16, T.3S., R.2W., W.M. CITY OF NEWBURG, YAMHILL COUNTY, OREGON

PROJECT LOCATION:

NEAR THE WASHINGTON COUNTY BENCHMARK #59, EL. 145.876, WASHINGTON COUNTY, OREGON
LATITUDE = 45°29'29.53" N, LONGITUDE = 122°55'58.33" W

OWNER/APPLICANT

JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE 171
LAKE OSWEGO, OR 97035
CONTACT: JESSE NEMEC
PHONE: (503) 730-8620
EMAIL: jnec@jtsmithco.com

PLANNING CONSULTANT

3J CONSULTING, INC
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: (503) 946-9365
EMAIL: andrew.tull@3j-consulting.com

CIVIL ENGINEER

3J CONSULTING, INC
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ASHLEY SEAL, PE
PHONE: (503) 946-9365
EMAIL: ashley.seal@3j-consulting.com

LANDSCAPE ARCHITECT

CARDNO, INC
8720 SW MACADAM AVE, SUITE 200
PORTLAND, OR 97219
CONTACT: ANDREW HILL
PHONE: (503) 419-2500
EMAIL: andrew.hill@cardno.com

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

ONE HOUSE WITH ACCESSORY STRUCTURES. REMAINDER OF SITE CONSISTS OF WETLANDS AND GRASSY FIELD, WITH SCATTERED TREES.

DEVELOPED CONDITIONS

SUBDIVIDE INTO 4.20 ACRE COMMERCIAL SPACE, 2 APARTMENT BUILDINGS WITH 48 TOTAL UNITS, 230 HIGH DENSITY LOTS AND 16 SINGLE FAMILY HOME LOTS.

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

- * CLEARING (JUNE 2019)
- * MASS GRADING (JUNE-JULY 2019)
- * UTILITY INSTALLATION (AUGUST-SEPTEMBER 2019)
- * STREET CONSTRUCTION (MAY 2020)
- * FINAL STABILIZATION (JUNE 2020)

TOTAL ON-SITE AREA = 1,442,521 SF = 33.13 ACRES

TOTAL OFF-SITE AREA = 50,990 SF = 1.17 ACRES

TOTAL AREA = 1,493,511 SF = 34.30 ACRES

SITE SOIL CLASSIFICATION:

- * AMITY SILT LOAM, 0-3% SLOPE - 51.1%
- * WOODBURN SILT LOAM, 0-3% SLOPE - 21.7%
- * WOODBURN SILT LOAM, 3-12% SLOPE - 26.5%
- * WOODBURN SILT LOAM, 12-20% SLOPE - 0.8%

ON-SITE SOILS HAVE A MODERATE TO HIGH EROSION POTENTIAL. ALL FILL MATERIAL SHALL BE GENERATED ON-SITE FROM GRADING EXCAVATION AND UTILITY TRENCH SPOILS.

RECEIVING WATER BODIES:

NEAREST WATER BODY: SPRING BROOK, A PART OF THE WILLAMETTE RIVER BASIN.

SITE IS ZONE X (UNSHADED) PER FEMA FIRM MAP NUMBER: 41071C0241D AND 41071C0235D. NO ELEVATED FLOOD RISK.

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

- HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.8.C.I.(3))
- ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.12.B AND SCHEDULE B.1)
- INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SCHEDULE B.1.C AND B.2)
- RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, THE ABOVE RECORDS MUST BE RETAINED BY THE PERMIT REGISTRANT BUT DO NOT NEED TO BE AT THE CONSTRUCTION SITE. (SCHEDULE B.2.C)
- ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A.8.A)
- THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.12.C.I)
- SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS. (SCHEDULE A.12.C.IV AND V)
- PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SCHEDULE A.7.A.II)
- IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.I.(1) AND (2))
- PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.A.V)
- MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FOOT OF WATERS OF THE STATE. (SCHEDULE A.7.B.I.AND 2(A)(B))
- INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE. (SCHEDULE A.8.C.I.(6))
- CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SCHEDULE A.7.C)
- CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SCHEDULE A.7.D.I)
- ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.I.(8))
- APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATION MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS. (SCHEDULE A.8.C.II.(3))
- ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.I.(7))
- PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPs SUCH AS: CONSTRUCTION ENTRANCE GRAVEL (OR PAVED) EXITS AND PARKING AREAS; GRAVEL ALL UNPAVED ROADS LOCATED ON-SITE. OR USE AN EXIT TIRE WASH. THESE BMPs MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A.7.D.II AND A.8.C.II.(4))
- WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II.(5))
- CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SCHEDULE A.6)
- USE BMPs TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS, VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.I.(2))
- IMPLEMENT THE FOLLOWING BMPs WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES. EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES. SPILL KITS IN ALL VEHICLES. REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY. MATERIAL DELIVERY AND STORAGE CONTROLS. TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCHEDULE A.7.E.II.)
- USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL. (SCHEDULE A.7.A.IV)
- THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.8.B.II)
- IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.8.D)
- TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A.7.B)
- AS NEEDED BASED ON WEATHER CONDITIONS. AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPs MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A.7.E.II.(2))
- CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND BARE GROUND ACTIVITIES DURING WET WEATHER. (SCHEDULE A.7.A.I)
- SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SCHEDULE A.8.C.I)
- OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL. (SCHEDULE A.8.C.I)
- CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT. (SCHEDULE A.8.C.II.IV)
- WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED, INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME. (SCHEDULE A.8.B.I)
- THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS. (SCHEDULE A.8.B.II)
- THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.I)
- PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.II)
- DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROL AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. (SCHEDULE A.8.C.II.I) AND D.3.C.I AND III)

LOCAL AGENCY (CITY OF NEWBERG) SPECIFIC EROSION CONTROL NOTES:

- THE IMPLEMENTATION OF THIS ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED. APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- THE ESC PLAN, ANY REVISIONS, AND INSPECTION LOGS SHALL BE KEPT ON-SITE AT ALL TIMES.
- THE ESC MEASURES SHOWN ON THE PLAN ARE THE MINIMUM REQUIREMENTS FOR THE PROJECT SITE AND SHALL BE UPGRADED AS NEEDED TO MAINTAIN COMPLIANCE WITH ALL REGULATIONS.
- SEDIMENT MUST BE REMOVED FROM SUMPED STRUCTURES WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY 10% AND WITHIN 30 DAYS OF PROJECT COMPLETION.
- TOXIC AND HAZARDOUS MATERIALS MUST ALSO HAVE SECONDARY CONTAINMENT.
- PAVING ACTIVITIES SHALL BE MINIMIZED BETWEEN OCTOBER 1ST AND MAY 31ST OF THE FOLLOWING YEAR TO AVOID POTENTIAL DISCHARGE OF PAVING CHEMICALS INTO THE STORM DRAINS, STREETS, WATERCOURSES, OR SENSITIVE AREAS.
- ALL ESC MEASURES SHALL BE REMOVED FROM THE SITE 30 DAYS AFTER CONSTRUCTION IS COMPLETED AND APPROVED BY THE CITY.

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	STREET CONSTRUCTION	FINAL STABILIZATION	WET WEATHER (OCT. 1 - MAY 31ST)
EROSION PREVENTION						
PRESERVE NATURAL VEGETATION	**	X	X	X	X	X
GROUND COVER					X	X
HYDRAULIC APPLICATIONS					X	X
PLASTIC SHEETING					X	X
MATTING					X	X
DUST CONTROL	X	X	X	X	X	X
TEMPORARY PERMANENT SEEDING					X	X
BUFFER ZONE					X	X
OTHER:						
SEDIMENT CONTROL						
SEDIMENT FENCE (PERIMETER)	**	X	X	X	X	X
SEDIMENT FENCE (INTERNAL)			X	X	X	X
STRAW MATS					X	X
FILTER MEDIA					X	X
INLET PROTECTION	**	X	X	X	X	X
DEWATERING					X	X
SEDIMENT TRAP					X	X
NATURAL BUFFER ENFORCEMENT	**	**	**	**	**	**
OTHER:						
BMP OFF CONTROL						
CONSTRUCTION ENTRANCE	**	X	X	X	X	X
WHEEL WASH	**	X	X	X	X	X
PRE SLOPE BRUSH			X	X	X	X
OUTLET PROTECTION		X	X	X	X	X
SURFACE ROUGHENING			X	X	X	X
CHECK DAMS	**	X	X	X	X	X
OTHER:						
POLLUTION PREVENTION						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA	X	X	X	X	X	X
OTHER:						

- * SIGNIFIES ADDITIONAL BMP'S REQUIRED FOR WORK WITHIN 50' OF WATER OF THE STATE.
- ** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ'S GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP'S WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

INITIAL

PERMITTEE'S SITE INSPECTOR:

COMPANY/AGENCY: Sevin Simpson, 3J Consulting
PHONE: (503) 946-9365 x229 - WORK
(541) 508-9159 - CELL
E-MAIL: sevin.simpson@3j-consulting.com
DESCRIPTION OF EXPERIENCE: ATTENDED A TWO-DAY TRAINING COURSE ON THE PRINCIPLES AND PRACTICES OF EROSION CONTROL
CESOL #ECO-3-4131801

SHEET INDEX

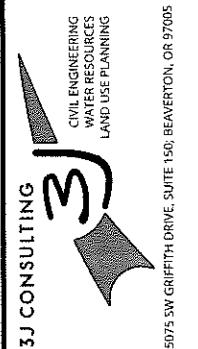
EROSION AND SEDIMENT CONTROL PLANS

- C120 EROSION AND SEDIMENT CONTROL COVER SHEET
- C121 CLEARING AND DEMOLITION EROSION AND SEDIMENT CONTROL PLAN
- C122 GRADING AND STREET CONSTRUCTION EROSION AND SEDIMENT CONTROL PLAN
- C123 EROSION AND SEDIMENT CONTROL DETAILS I
- C124 EROSION AND SEDIMENT CONTROL DETAILS II



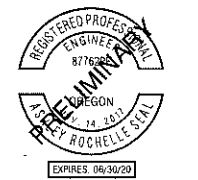
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C COVER SHEET
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR



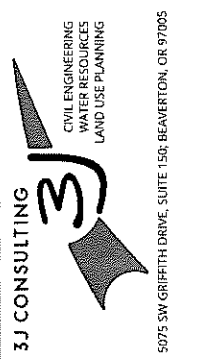
PROJECT INFORMATION
3J PROJECT # | 17390
TAX LOTS | 3522W6 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JE, BMO
CHECKED BY | A.J.M. RWG

SHEET NUMBER
C120



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C CLEARING AND DEMOLITION ESCP I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR



PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOTS # | 352W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW
SHEET NUMBER
C121

EROSION CONTROL KEY NOTES

- 1 CONSTRUCT CONSTRUCTION ENTRANCE PER NEWBERG STANDARD DRAWING 601 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
- 2 INSTALL TREE PROTECTION FENCING PER DETAIL T-1 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION. ALL RELOCATION OF TREE PROTECTION FENCING AND WORK WITHIN THE STANDARD TREE PROTECTION ZONE SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ARBORIST OR THE CITY'S URBAN FORESTER. FENCING SHALL BE REPLACED TO 5' BEYOND THE TREE DRILLLINE ONCE WORK WITHIN THE TREE PROTECTION ZONE IS COMPLETED.
- 3 INSTALL SILT FENCING PER NEWBERG STANDARD DRAWING 602 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
- 4 INSTALL BIO-FILTER BAG CHECK DAMS AT 50' O.C. SPACING PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
- 5 CONSTRUCT CONCRETE WASHOUT BASIN PER NEWBERG STANDARD DRAWING 607 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION.
- 6 PROVIDE CONSTRUCTION STAGING AND PARKING AREA FOR SITE ACCESS MANAGEMENT AND JOBSITE ADMINISTRATION.
- 7 INSTALL INLET PROTECTION PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.

DEMOLITION KEY NOTES

- 1 SHUT OFF, DISCONNECT, AND REMOVE UTILITY LINES AND DISPOSE OFF-SITE.
- 2 REMOVE EXISTING STRUCTURE AND FOUNDATION AND DISPOSE OFF-SITE AFTER ALL UTILITY LINES ARE PROPERLY SHUT OFF AND DISCONNECTED.
- 3 REMOVE EXISTING FENCING AND ASSOCIATED APPURTENANCES AND DISPOSE OFF-SITE.
- 4 SAWCUT AND REMOVE LAST 2' OF AC AT TIME OF ROAD CONSTRUCTION, AND DISPOSE OFF-SITE.
- 5 REMOVE EXISTING CULVERT AND ENTRANCE, CLEAR DITCH OF DEBRIS, AND DISPOSE OFF-SITE.

GENERAL DEMOLITION NOTES

1. SEE TREE REMOVAL AND PRESERVATION PLAN (SHEET C110) FOR ALL TREE REMOVAL INFORMATION.
2. SEE GEOTECHNICAL REPORT FOR SURFACE GRUBBING AND STRIPPING INFORMATION.
3. NO UNAUTHORIZED GROUND DISTURBANCE MAY OCCUR WITHIN VEGETATED CORRIDOR AND SENSITIVE AREA.

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

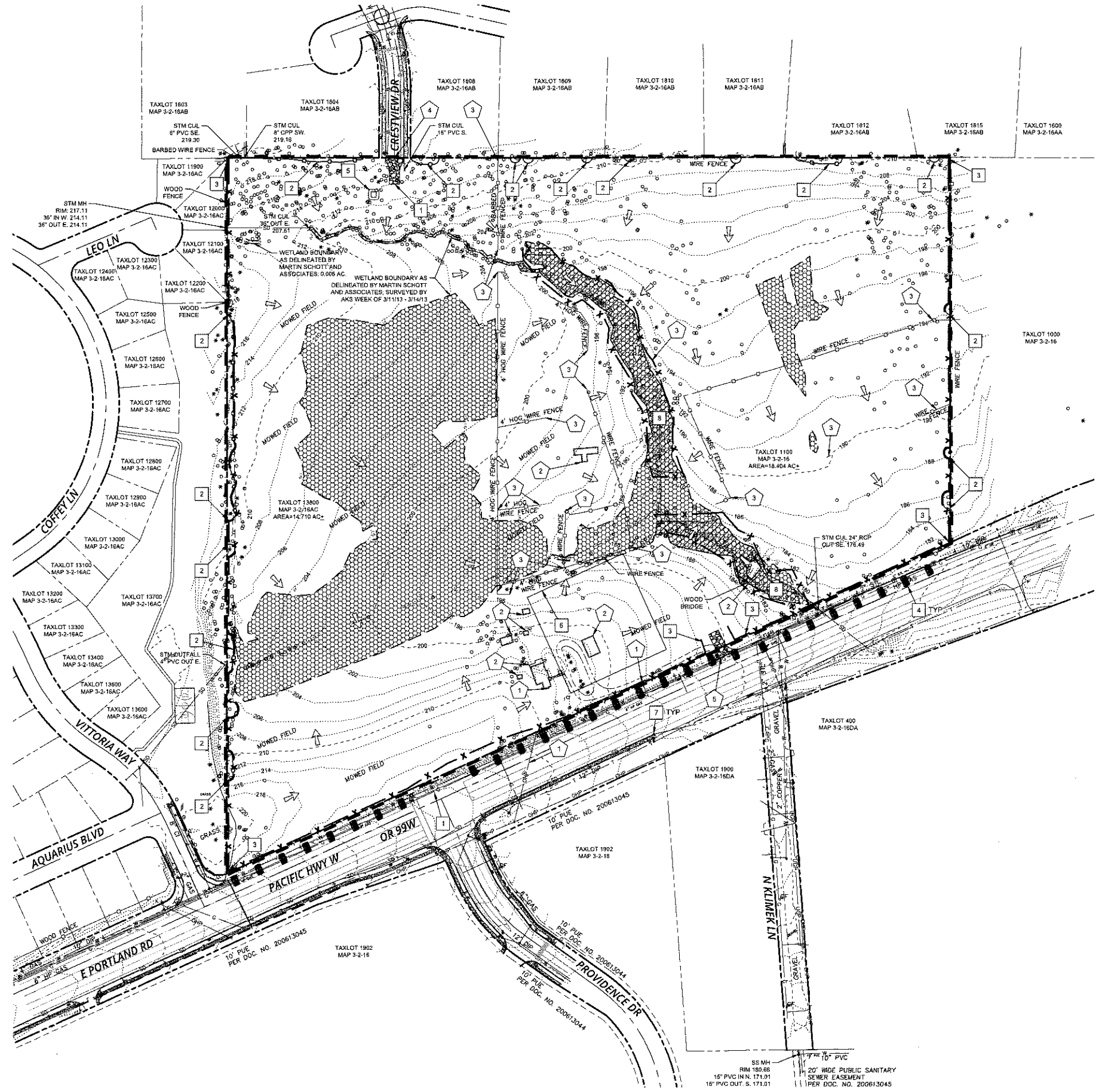
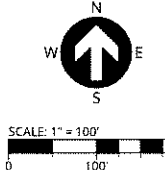
1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.
4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

GENERAL EROSION CONTROL NOTES

1. THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES SHALL BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.

LEGEND

- - - - -100- - - - - EXISTING MAJOR CONTOUR
- - - - -92- - - - - EXISTING MINOR CONTOUR
- x - - - - - PROPOSED SILT FENCING
- o - - - - - PROPOSED TREE PROTECTING FENCING
- [hatched] - - - - - PROPOSED CONSTRUCTION ENTRANCE
- [square] - - - - - PROPOSED INLET PROTECTION
- [square] - - - - - PROPOSED BIO BAG CHECK DAM
- [arrow] - - - - - EXISTING SURFACE RUN-OFF FLOW ARROW
- [dashed] - - - - - PROPOSED LIMITS OF DISTURBANCE
- [hatched] - - - - - WETLAND TO REMAIN

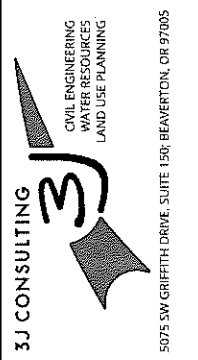


P:\17393-3J-CRESTVIEW CROSSING\CADD\C121 1200C SET.DWG



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C GRADING AND STREET CONSTRUCTION ESCP I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR



PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 352W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | A.J.M, RGW

SHEET NUMBER
C122

EROSION CONTROL KEY NOTES

1. INSTALL CONSTRUCTION ENTRANCE PER NEWBERG STANDARD DRAWING 601 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
2. INSTALL TREE PROTECTION FENCING PER DETAIL T-1 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION. ALL RELOCATION OF TREE PROTECTION FENCING AND WORK WITHIN THE STANDARD TREE PROTECTION ZONE SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ARBORIST OR THE CITY'S URBAN FORESTER. FENCING SHALL BE REPLACED TO 5' BEYOND THE TREE DRILLINE ONCE WORK WITHIN THE TREE PROTECTION ZONE IS COMPLETED.
3. INSTALL SILT FENCING PER NEWBERG STANDARD DRAWING 602 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
4. INSTALL BIO-FILTER BAG CHECK DAMS AT 50' O.C. SPACING PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
5. CONSTRUCT CONCRETE WASHOUT BASIN PER NEWBERG STANDARD DRAWING 607 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION.
6. PROVIDE CONSTRUCTION STAGING AND PARKING AREA FOR SITE ACCESS MANAGEMENT AND JOBSITE ADMINISTRATION.
7. INSTALL INLET PROTECTION PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
8. INSTALL OUTLET PROTECTION PER NEWBERG STANDARD DRAWING 606 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES:

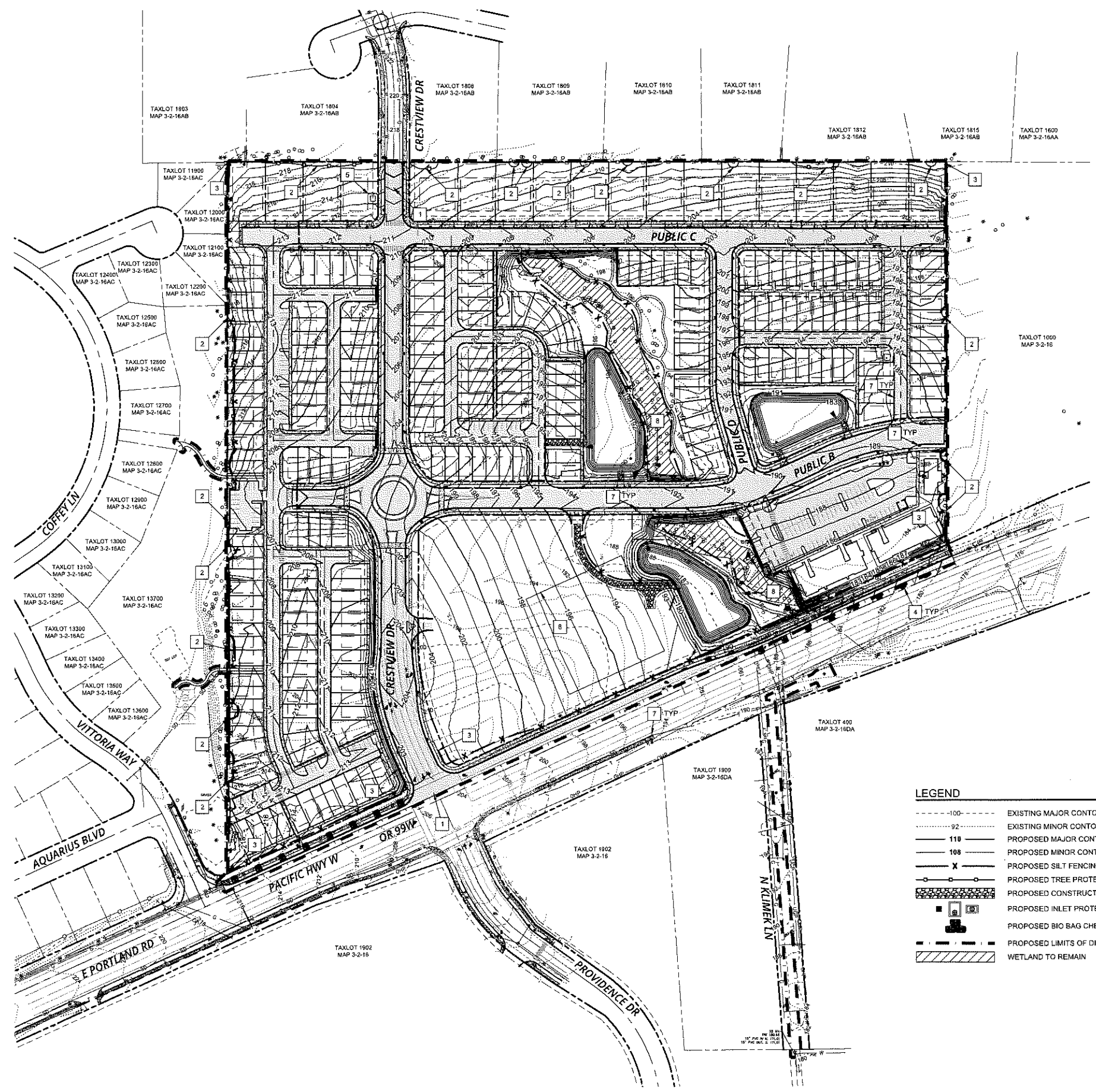
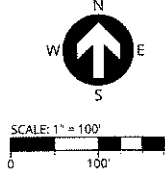
1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
 - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
 - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
 1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
 2. CREEPING RED FESCUE (20% BY WEIGHT)
 - C. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.)
 1. ANNUAL RYEGRASS (40% BY WEIGHT)
 2. TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.
16. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1ST FOR EACH PHASE OF CONSTRUCTION.

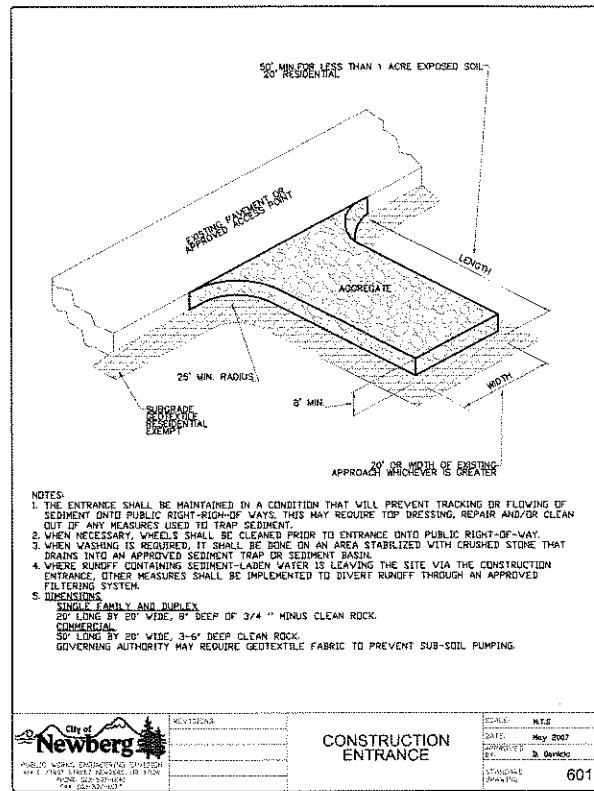
EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION. PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. UTILIZATION OF STOCK PILE AREAS SHOULD TRANSITION FROM PRIMARY STOCK PILE AREA TO SECONDARY STOCK PILE AREAS ACCORDING TO CUT AND FILL ACTIVITY.
3. ALL SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING) SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.
4. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING MATTING" SHALL BE IN PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.
5. THE STORM WATER FACILITY SHALL BE CONSTRUCTED AND LANDSCAPED PRIOR TO THE STORM WATER SYSTEM FUNCTIONING AND SITE PACING.
6. INLET PROTECTION SHALL BE IN PLACE IMMEDIATELY FOLLOWING PAVING ACTIVITIES.

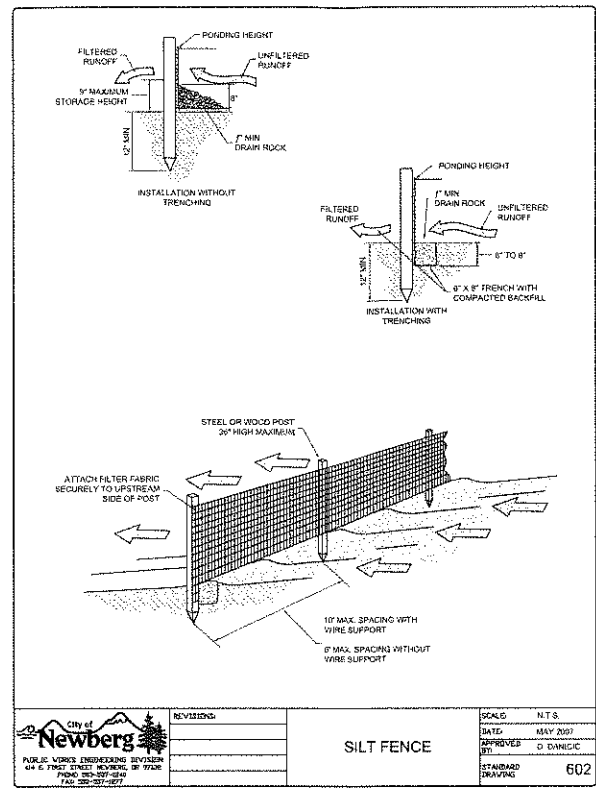
LEGEND

	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED SILT FENCING
	PROPOSED TREE PROTECTING FENCING
	PROPOSED CONSTRUCTION ENTRANCE
	PROPOSED INLET PROTECTION
	PROPOSED BIO BAG CHECK DAM
	PROPOSED LIMITS OF DISTURBANCE
	WETLAND TO REMAIN

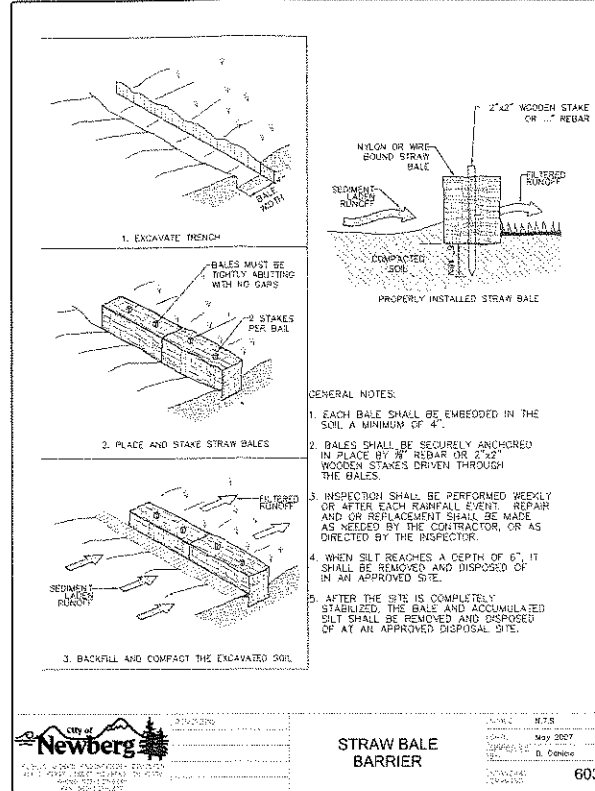




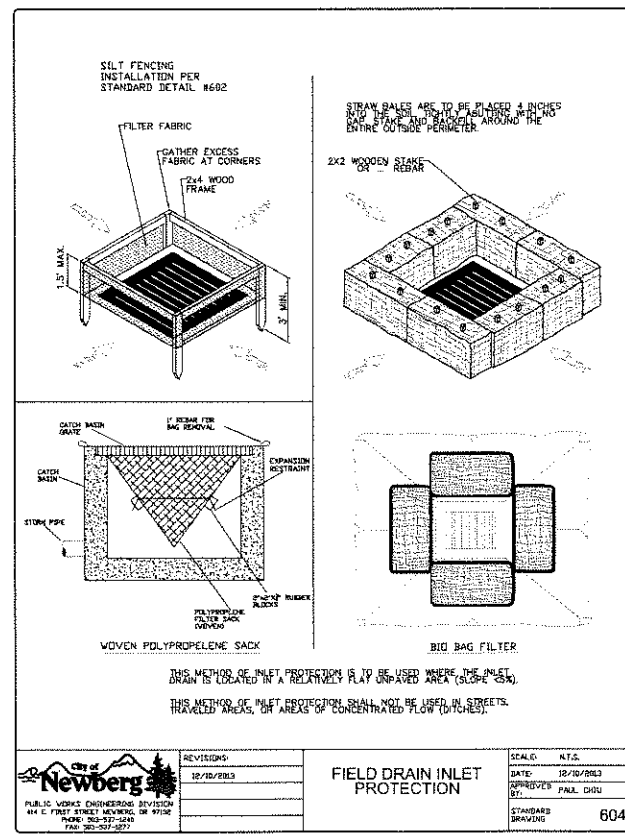
City of Newberg	REVISIONS:	SCALE: N.T.S.
	DATE: May 2007	
	APPROVED BY: J. Devine	
	STANDARD DRAWING: 601	



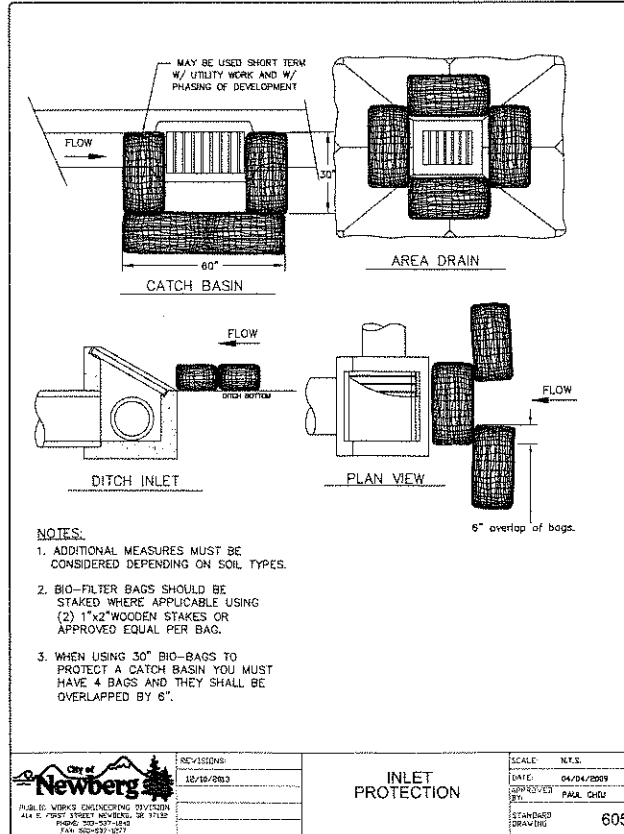
City of Newberg	REVISIONS:	SCALE: N.T.S.
	DATE: May 2007	
	APPROVED BY: J. Devine	
	STANDARD DRAWING: 602	



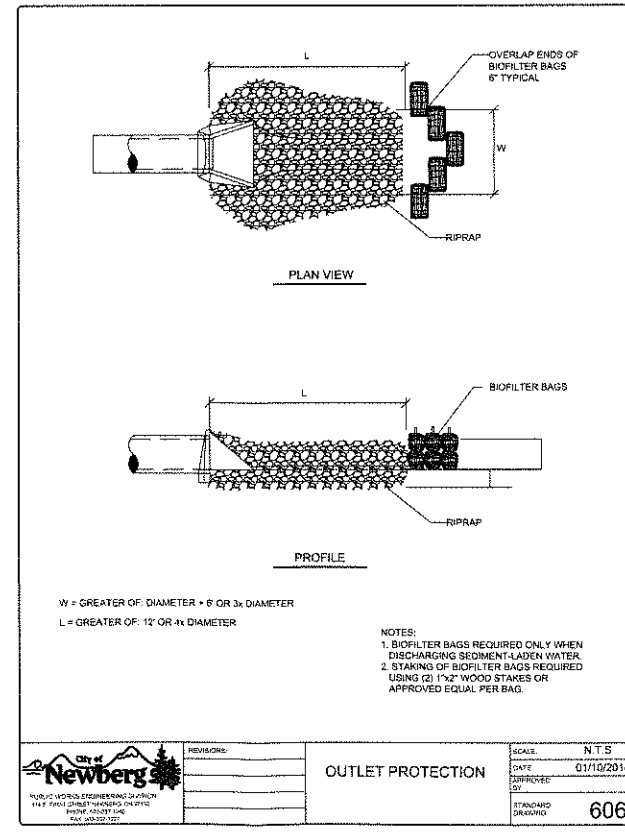
City of Newberg	REVISIONS:	SCALE: N.T.S.
	DATE: May 2007	
	APPROVED BY: J. Devine	
	STANDARD DRAWING: 603	



City of Newberg	REVISIONS:	SCALE: N.T.S.
	DATE: 10/10/2003	
	APPROVED BY: PAUL CHIU	
	STANDARD DRAWING: 604	



City of Newberg	REVISIONS:	SCALE: N.T.S.
	DATE: 10/10/2003	
	APPROVED BY: PAUL CHIU	
	STANDARD DRAWING: 605	

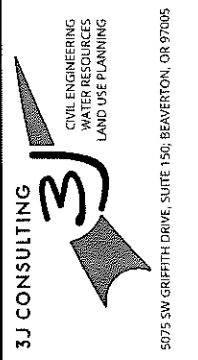


City of Newberg	REVISIONS:	SCALE: N.T.S.
	DATE: 01/10/2014	
	APPROVED BY: PAUL CHIU	
	STANDARD DRAWING: 606	



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

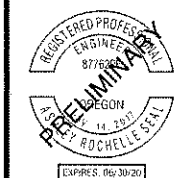
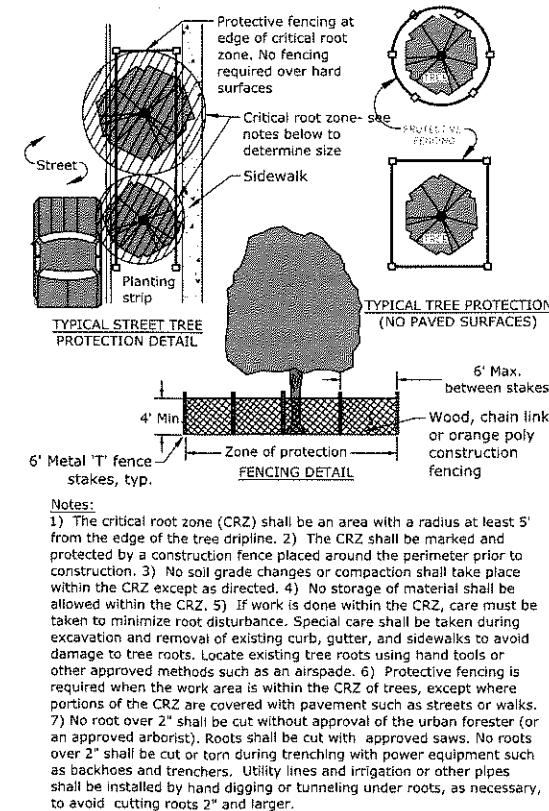
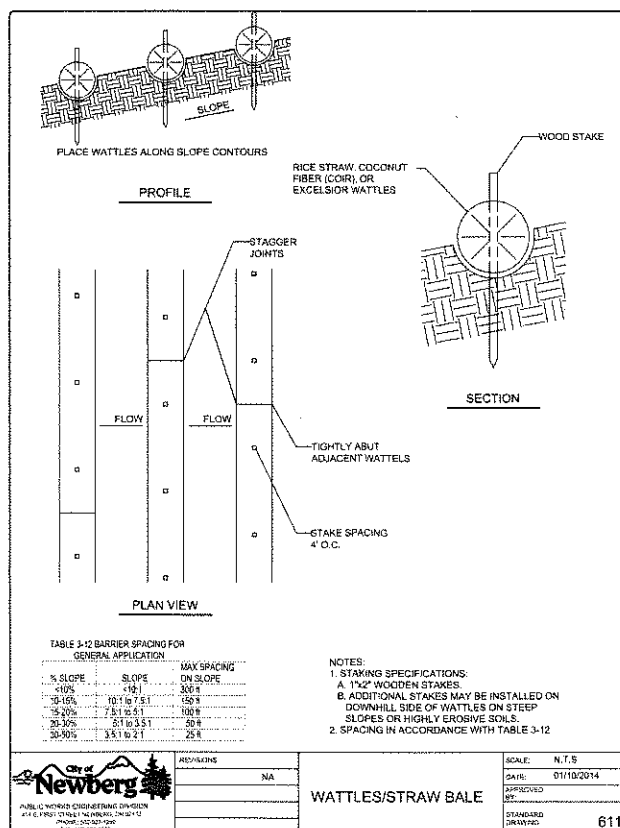
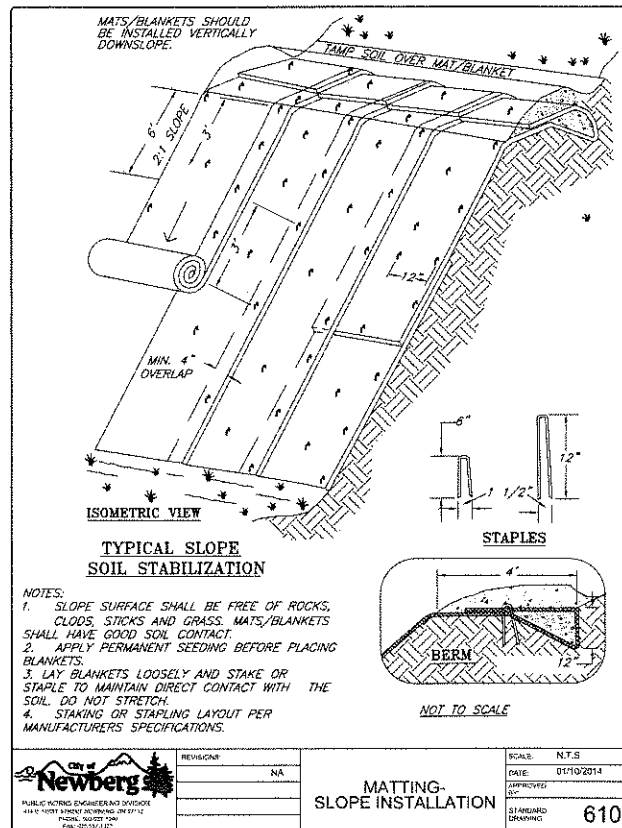
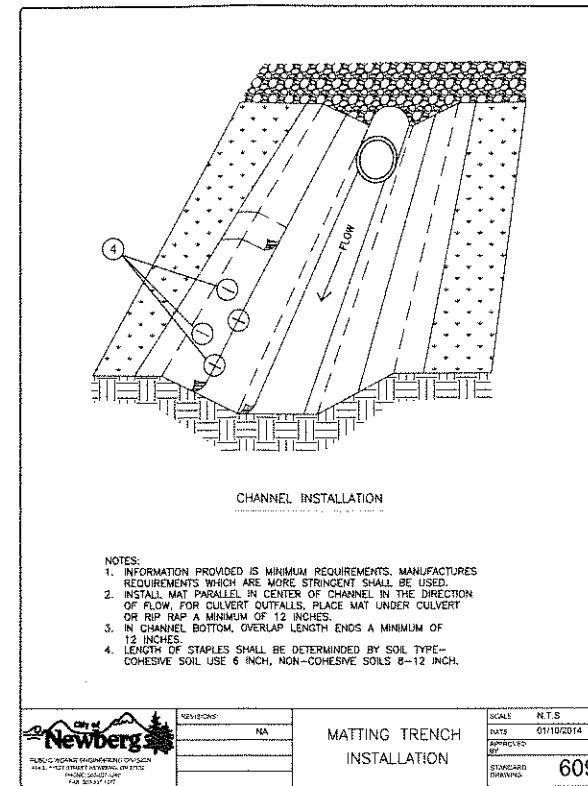
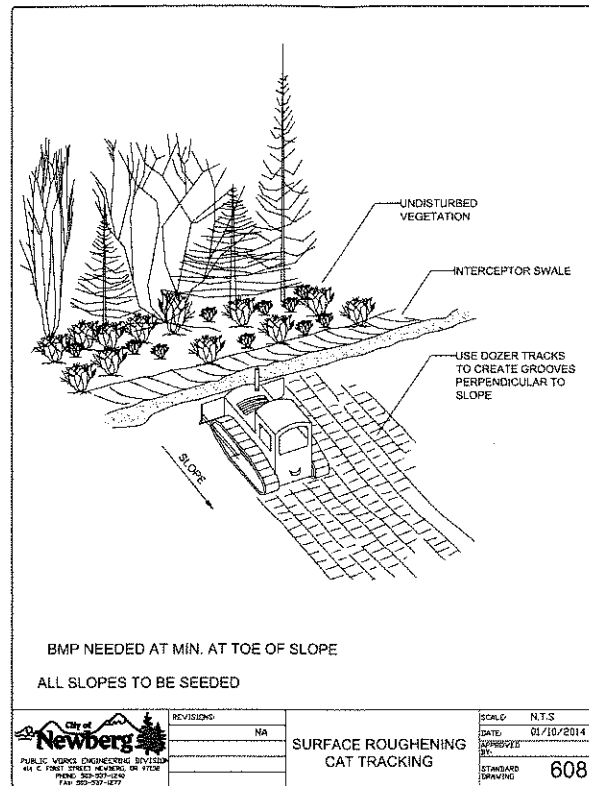
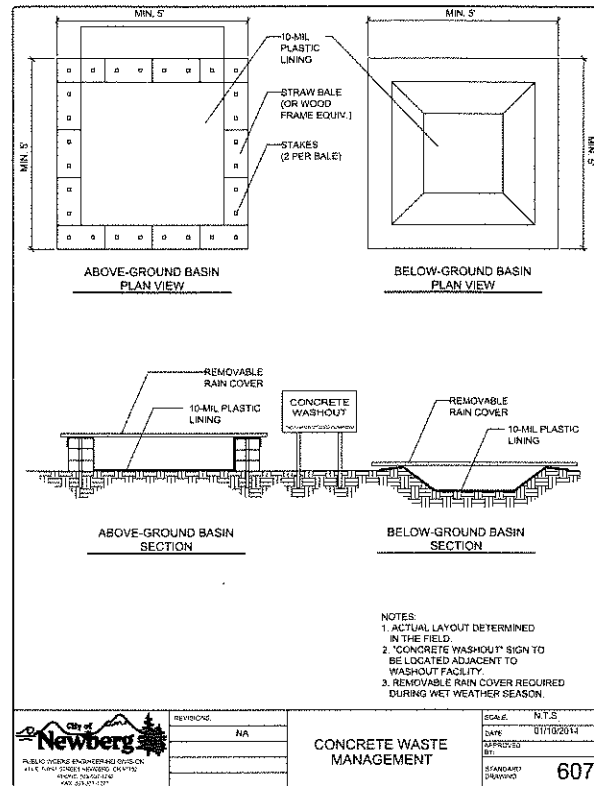
1200C DETAILS I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR



PROJECT INFORMATION
3J PROJECT # | 17389
TAX LOT(S) | 352W16 13800 1100
LAND USE # | NA
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGV

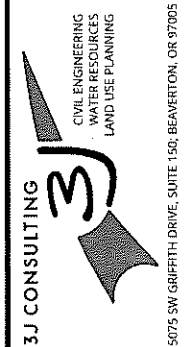
SHEET NUMBER
C123

P:\17389\3J-CRESTVIEW CROSSING\CAD\120 1200C SET.DWG



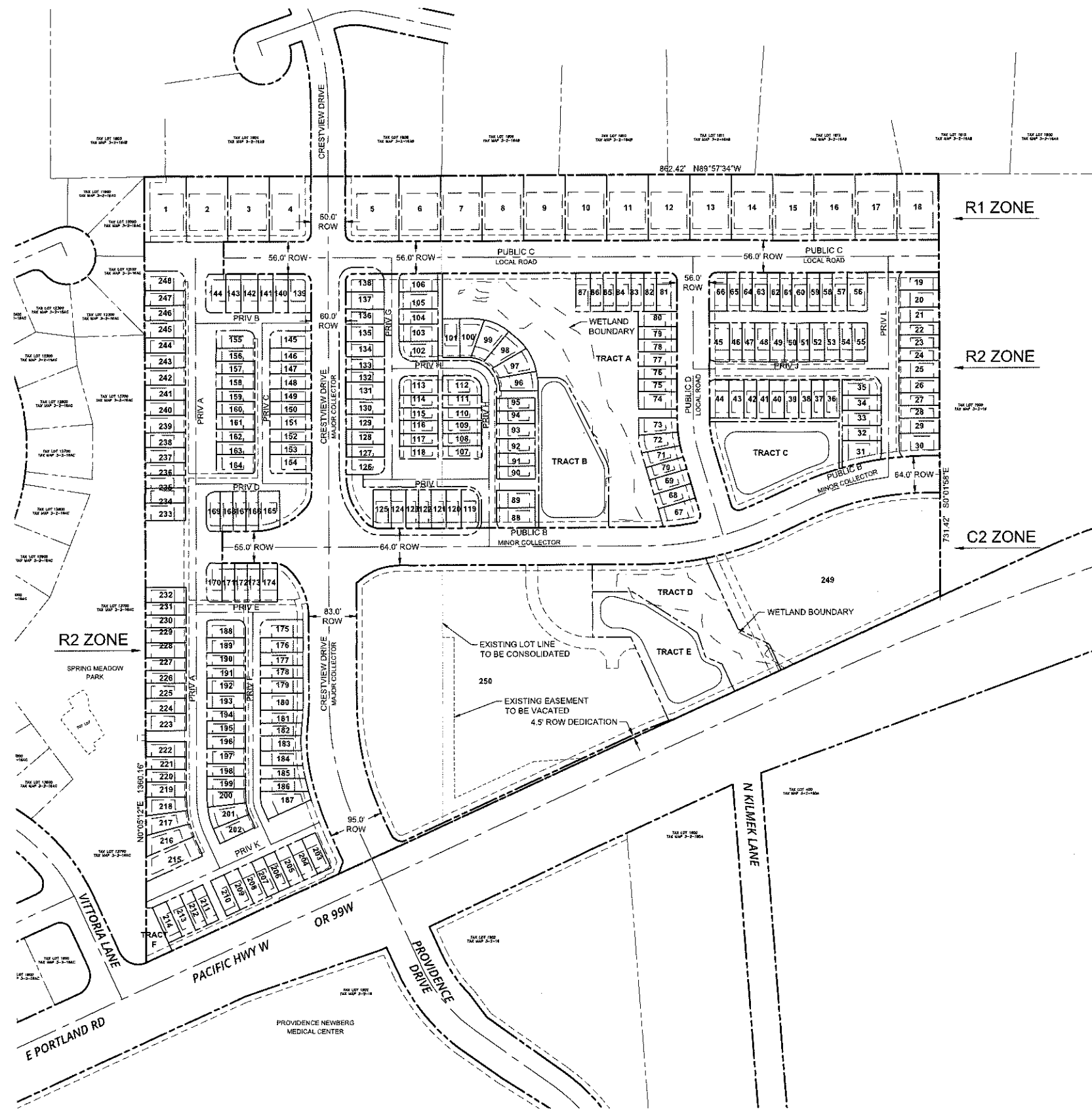
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C DETAILS II
**CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT**
JT SMITH COMPANIES
NEWBERG, OR



PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 352W16 13800. 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEL, BMO
CHECKED BY | AJM, RGW
SHEET NUMBER
C124

P117393-JTS-CRESTVIEW CROSSING(CADD)C124 1200C SET DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

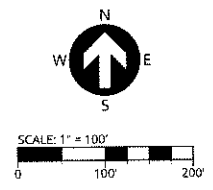
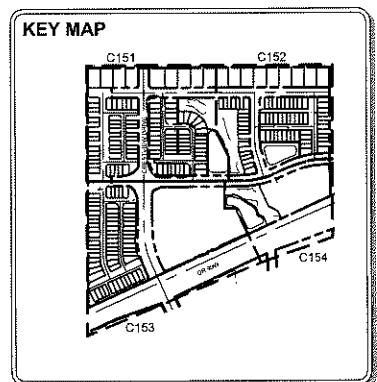
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10 FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

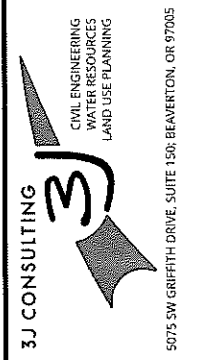
THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- - - EXISTING RIGHT-OF-WAY LINE
- - - EXISTING RIGHT-OF-WAY CENTERLINE
- - - EXISTING LOT LINE
- - - EXISTING ADJACENT PROPERTY LINE
- - - EXISTING EASEMENT
- - - PROPOSED RIGHT-OF-WAY LINE
- - - PROPOSED RIGHT-OF-WAY CENTERLINE
- - - PROPOSED LOT LINE
- - - PROPOSED SETBACK LINE
- - - PROPOSED EASEMENT



OVERALL TENTATIVE PLAT
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEU, BMD
 CHECKED BY | AJM, RGW

SHEET NUMBER
C150

P:\17393\17393-CRESTVIEW CROSSING\CADD\C150 TENTATIVE PLAT.DWG

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

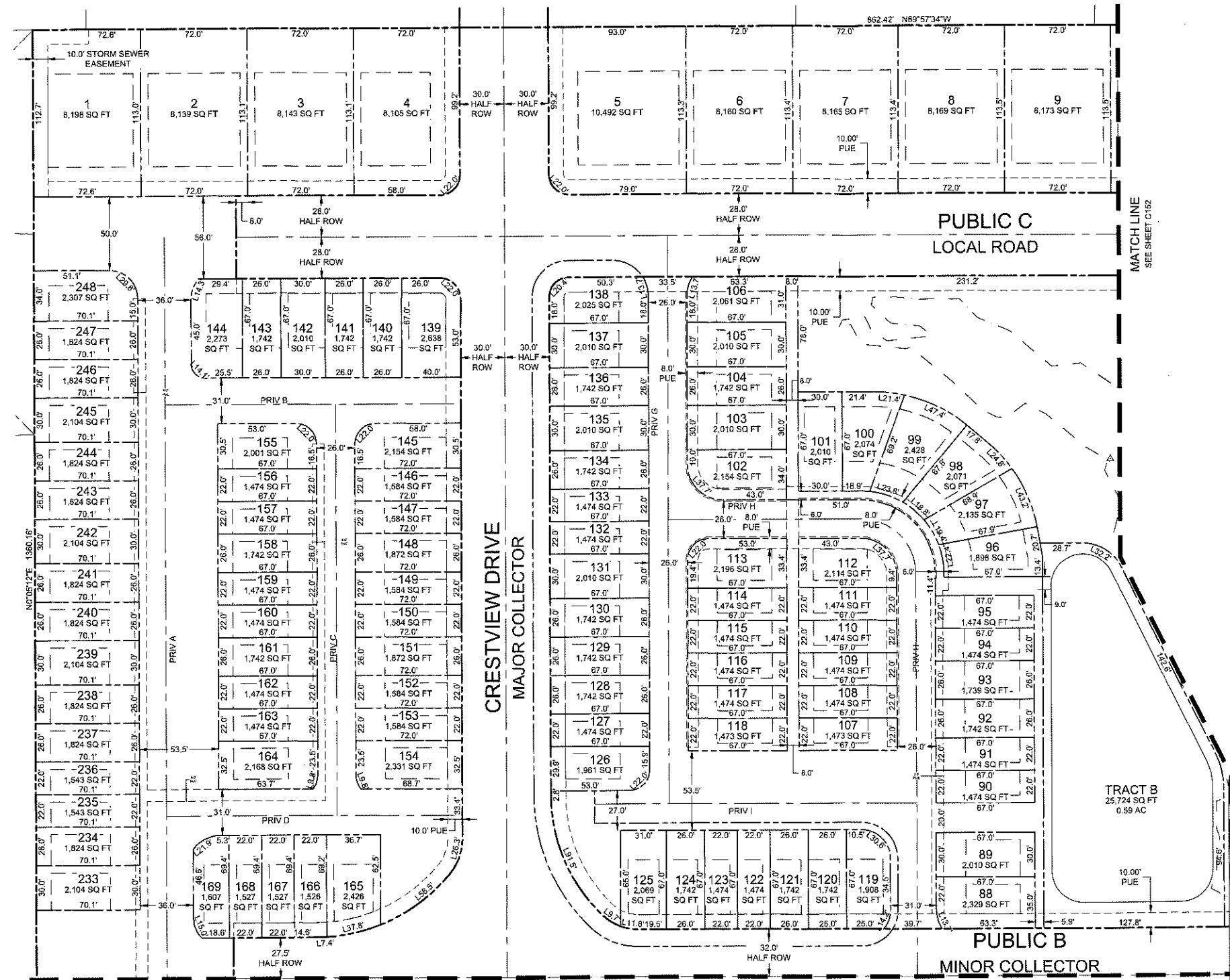
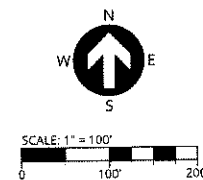
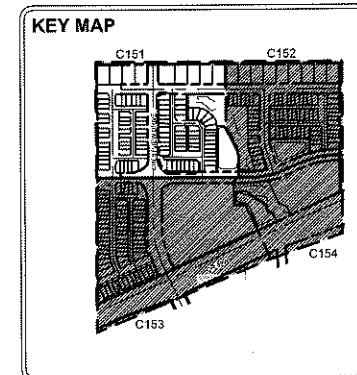
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

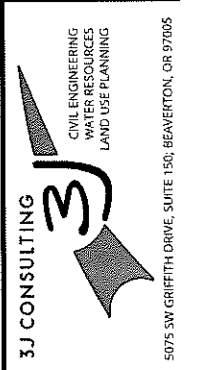
THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- - - EXISTING RIGHT-OF-WAY LINE
- - - EXISTING RIGHT-OF-WAY CENTERLINE
- - - EXISTING LOT LINE
- - - EXISTING ADJACENT PROPERTY LINE
- - - EXISTING EASEMENT
- - - PROPOSED RIGHT-OF-WAY LINE
- - - PROPOSED RIGHT-OF-WAY CENTERLINE
- - - PROPOSED LOT LINE
- - - PROPOSED SETBACK LINE
- - - PROPOSED EASEMENT
- - - PROPOSED WETLAND BOUNDARY



TENTATIVE PLAT I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C151

P:\17393\115-CRESTVIEW CROSSING\CADD\C151 TENTATIVE PLAT.DWG

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

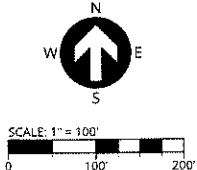
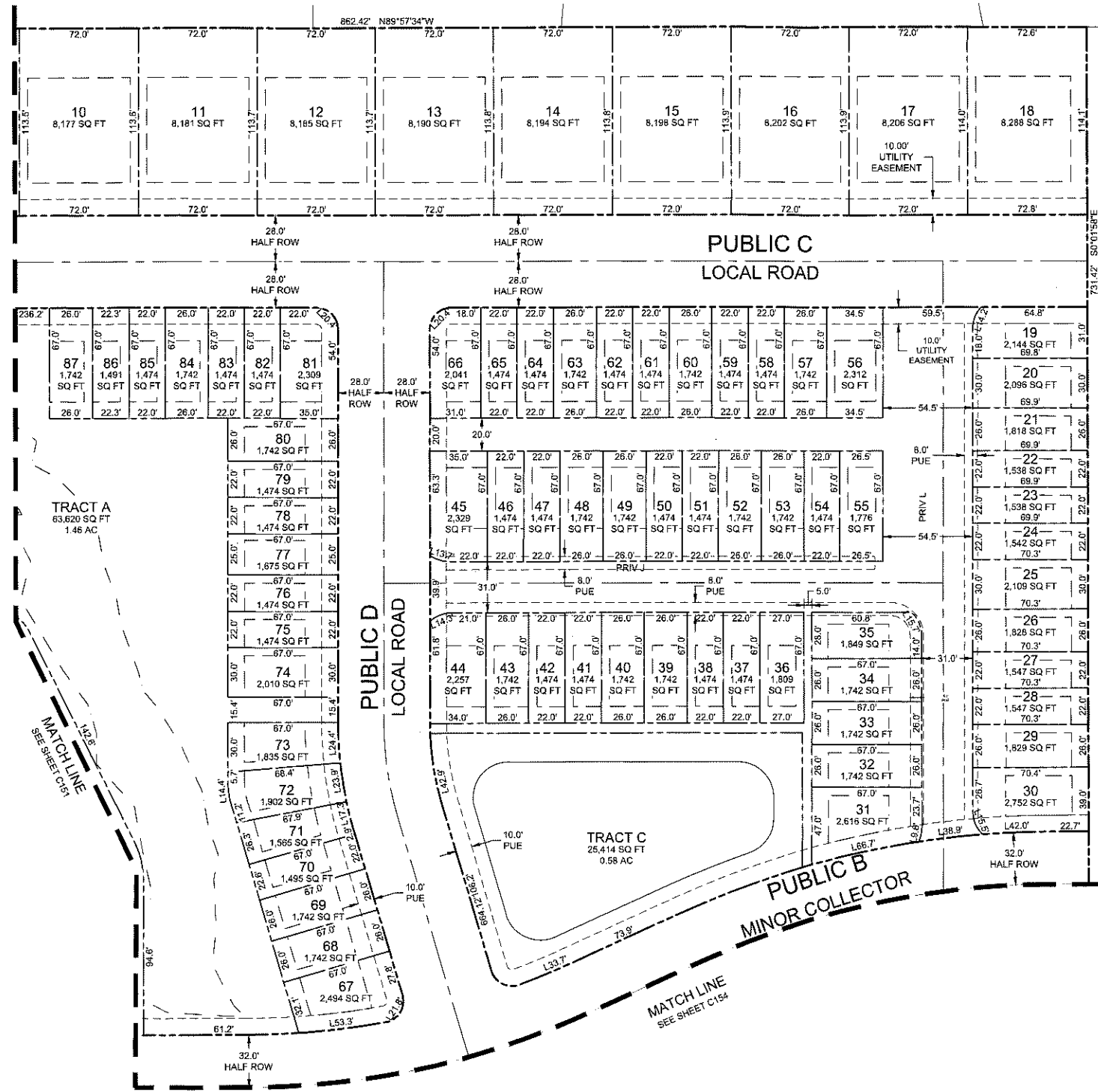
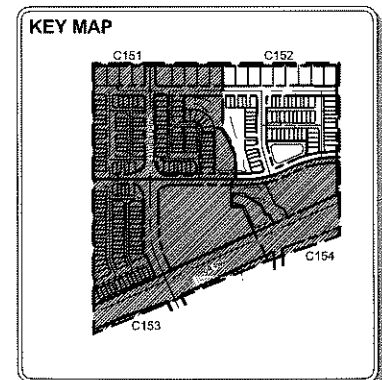
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- - - EXISTING RIGHT-OF-WAY LINE
- - - EXISTING RIGHT-OF-WAY CENTERLINE
- - - EXISTING LOT LINE
- - - EXISTING ADJACENT PROPERTY LINE
- - - EXISTING EASEMENT
- - - PROPOSED RIGHT-OF-WAY LINE
- - - PROPOSED RIGHT-OF-WAY CENTERLINE
- - - PROPOSED LOT LINE
- - - PROPOSED SETBACK LINE
- - - PROPOSED EASEMENT
- - - PROPOSED WETLAND BOUNDARY



TENTATIVE PLAT II
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

3J CONSULTING
 CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING
 5075 SW GRIFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17383
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEI, BMO
 CHECKED BY | AJM, RGW
 SHEET NUMBER
C152

MATCH LINE
SEE SHEET C151

**PUBLIC B
MINOR COLLECTOR**

MATCH LINE
SEE SHEET C154

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE	CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA		4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*		175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE		10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE		5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH		35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE		30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT		30 FT	30 FT	30 FT	N/A

SETBACKS

	15 FT	15 FT	10 FT	10 FT
FRONT				
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10 FT

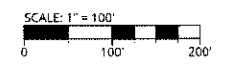
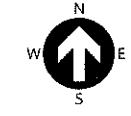
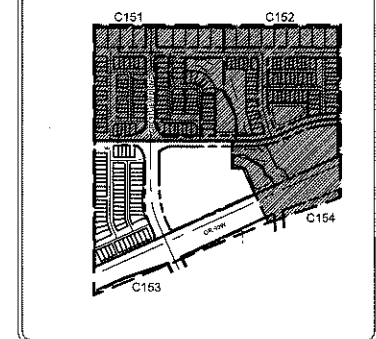
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- - - EXISTING RIGHT-OF-WAY LINE
- - - EXISTING RIGHT-OF-WAY CENTERLINE
- - - EXISTING LOT LINE
- - - EXISTING ADJACENT PROPERTY LINE
- - - EXISTING EASEMENT
- - - PROPOSED RIGHT-OF-WAY LINE
- - - PROPOSED RIGHT-OF-WAY CENTERLINE
- - - PROPOSED LOT LINE
- - - PROPOSED SETBACK LINE
- - - PROPOSED EASEMENT

KEY MAP



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

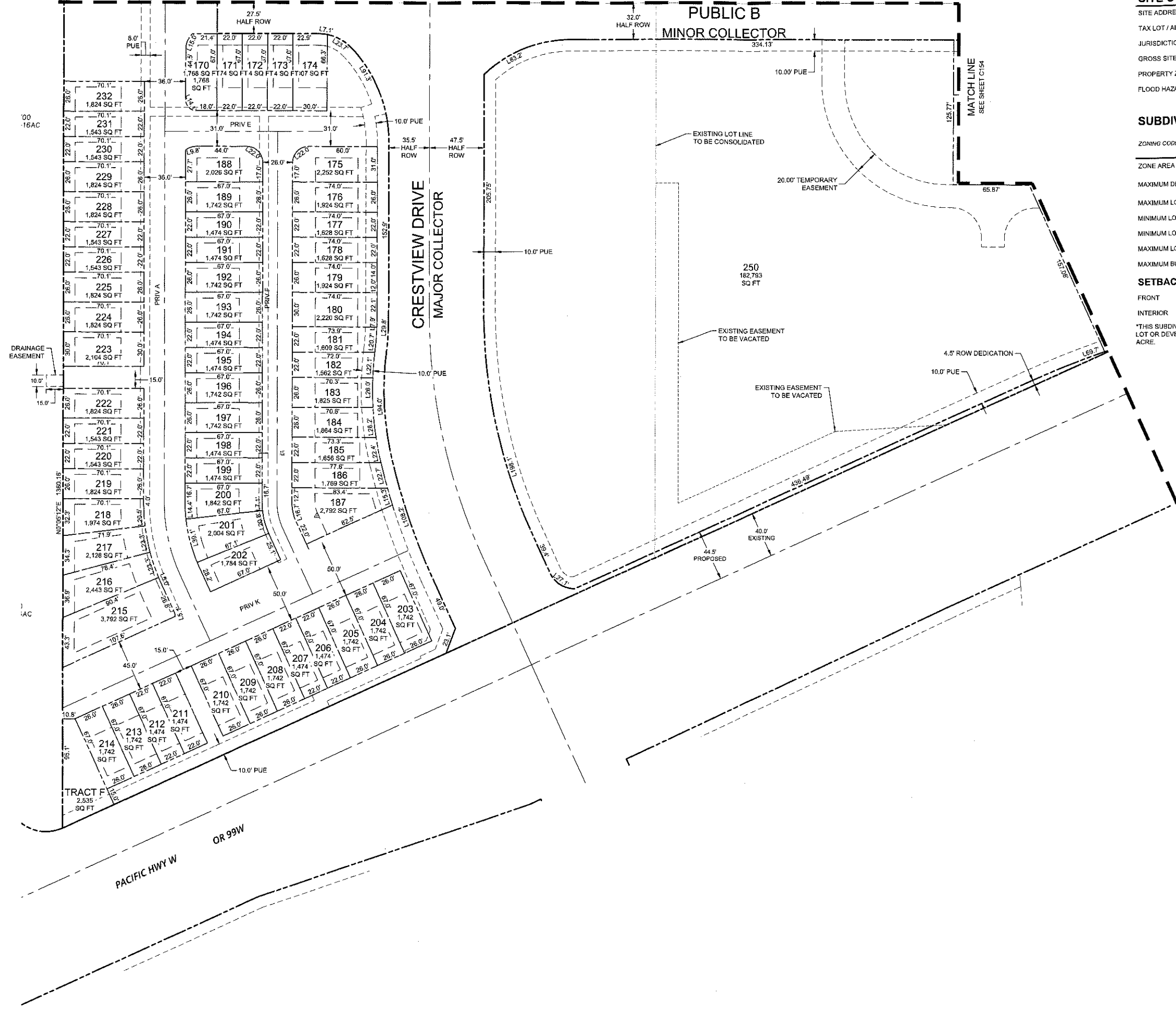
TENTATIVE PLAT III
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

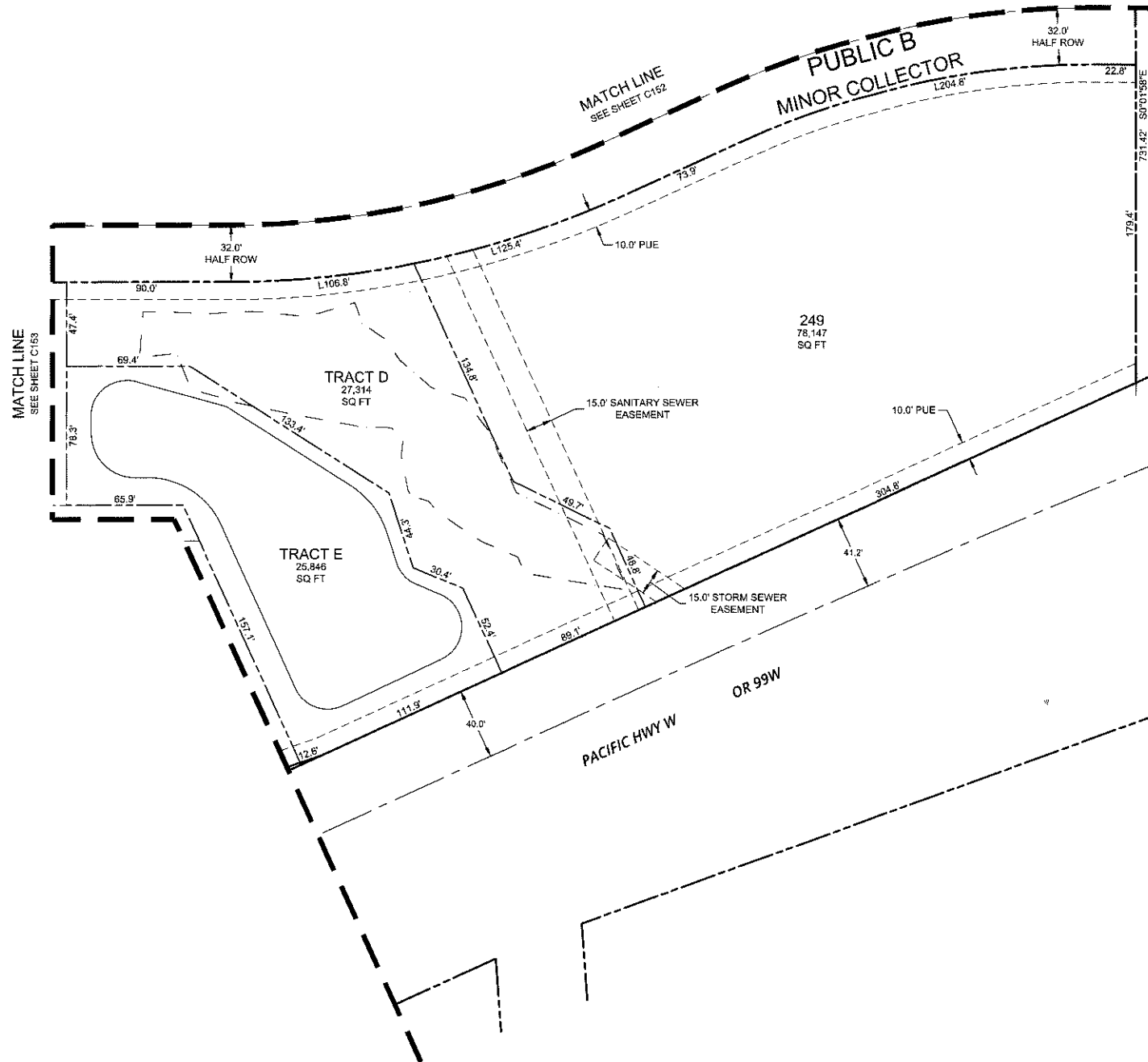
3J CONSULTING
 CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING
 5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17383
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | A.M. RGW

SHEET NUMBER
C153

P:\17383\3JTS-CRESTVIEW CROSSING\CADD\C150 TENTATIVE PLAT.DWG





SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

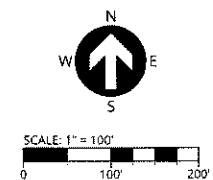
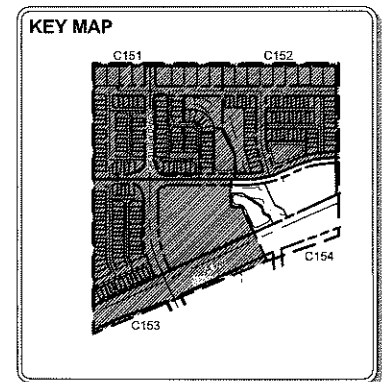
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10 FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

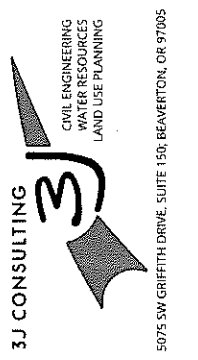
LEGEND

- PROJECT BOUNDARY
- - - EXISTING RIGHT-OF-WAY LINE
- - - EXISTING RIGHT-OF-WAY CENTERLINE
- - - EXISTING LOT LINE
- - - EXISTING ADJACENT PROPERTY LINE
- - - EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- - - PROPOSED RIGHT-OF-WAY CENTERLINE
- - - PROPOSED LOT LINE
- - - PROPOSED SETBACK LINE
- - - PROPOSED EASEMENT
- - - PROPOSED WETLAND BOUNDARY



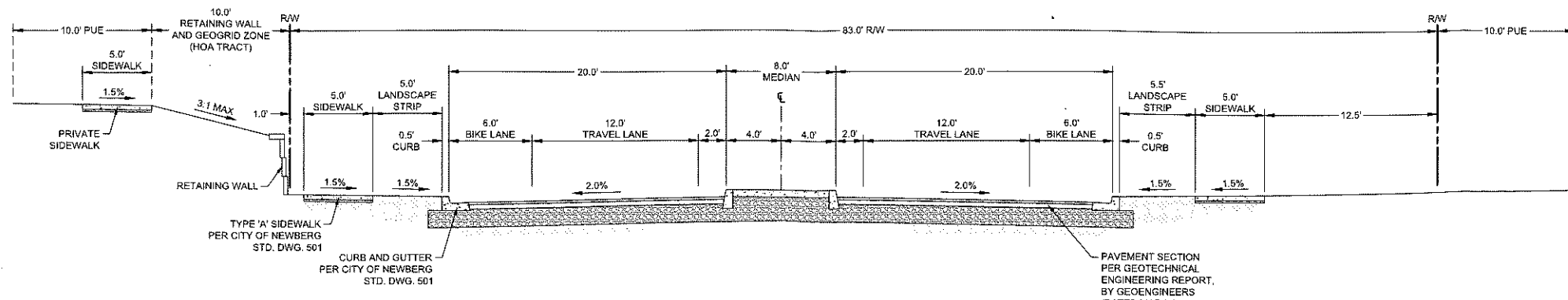
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT IV
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

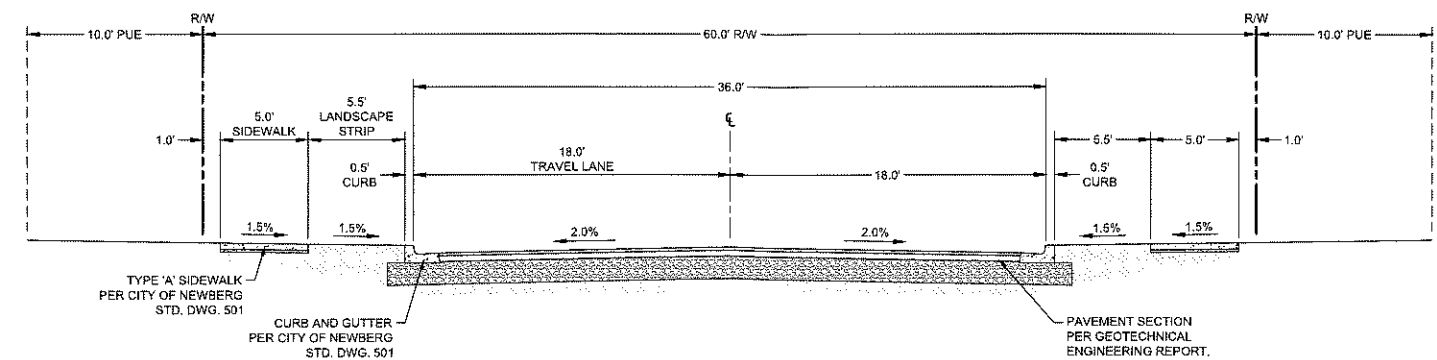


PROJECT INFORMATION
 3J PROJECT # | 17383
 TAX LOT(S) | 3S2W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, EMO
 CHECKED BY | AJM, RGW

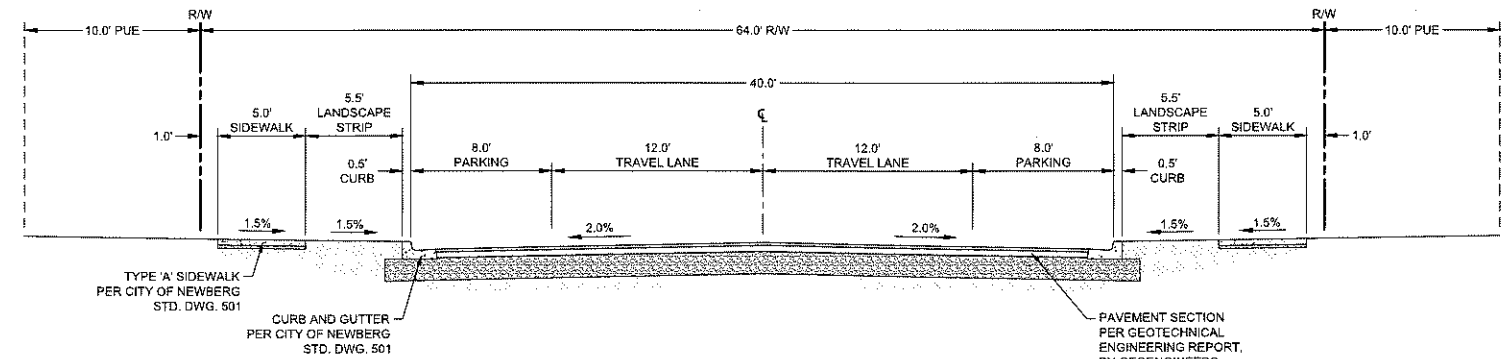
SHEET NUMBER
C154



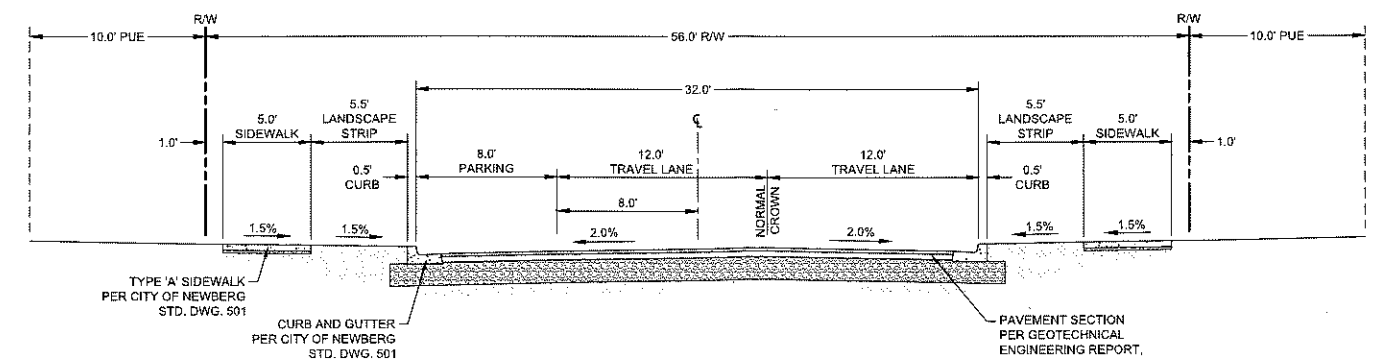
TYPICAL STREET SECTION A-A' - MAJOR COLLECTOR
CRESTVIEW DR
NTS



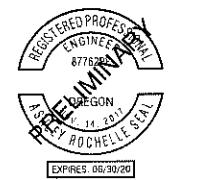
TYPICAL STREET SECTION B-B' - MAJOR COLLECTOR
CRESTVIEW DR
NTS



TYPICAL STREET SECTION C-C' - MINOR COLLECTOR
PUBLIC B
NTS

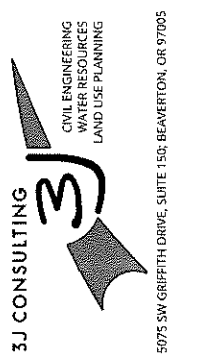


TYPICAL STREET SECTION D-D' - LOCAL ROAD
PUBLIC C
PUBLIC D
NTS



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TYPICAL SECTIONS I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR



PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

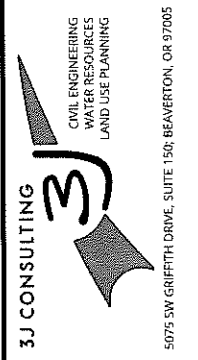
SHEET NUMBER
C200

P:\17393\ITS-CRESTVIEW CROSSING\CADD\C200 TYPICAL SECTIONS.DWG



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OVERALL SITE PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

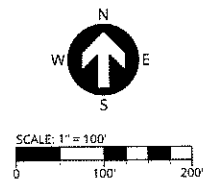
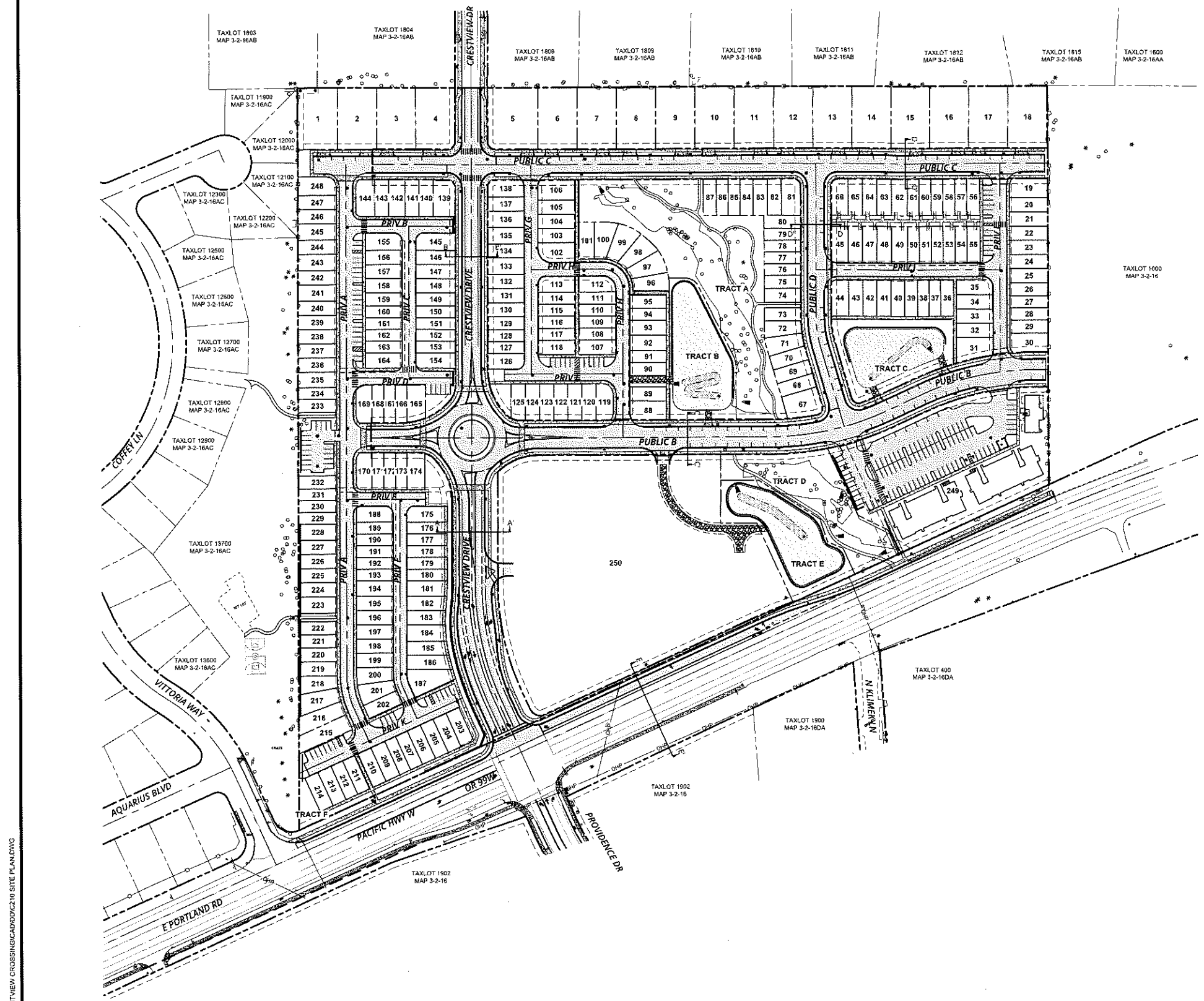


PROJECT INFORMATION
3J PROJECT # | 17383
TAX LOT(S) | 352W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

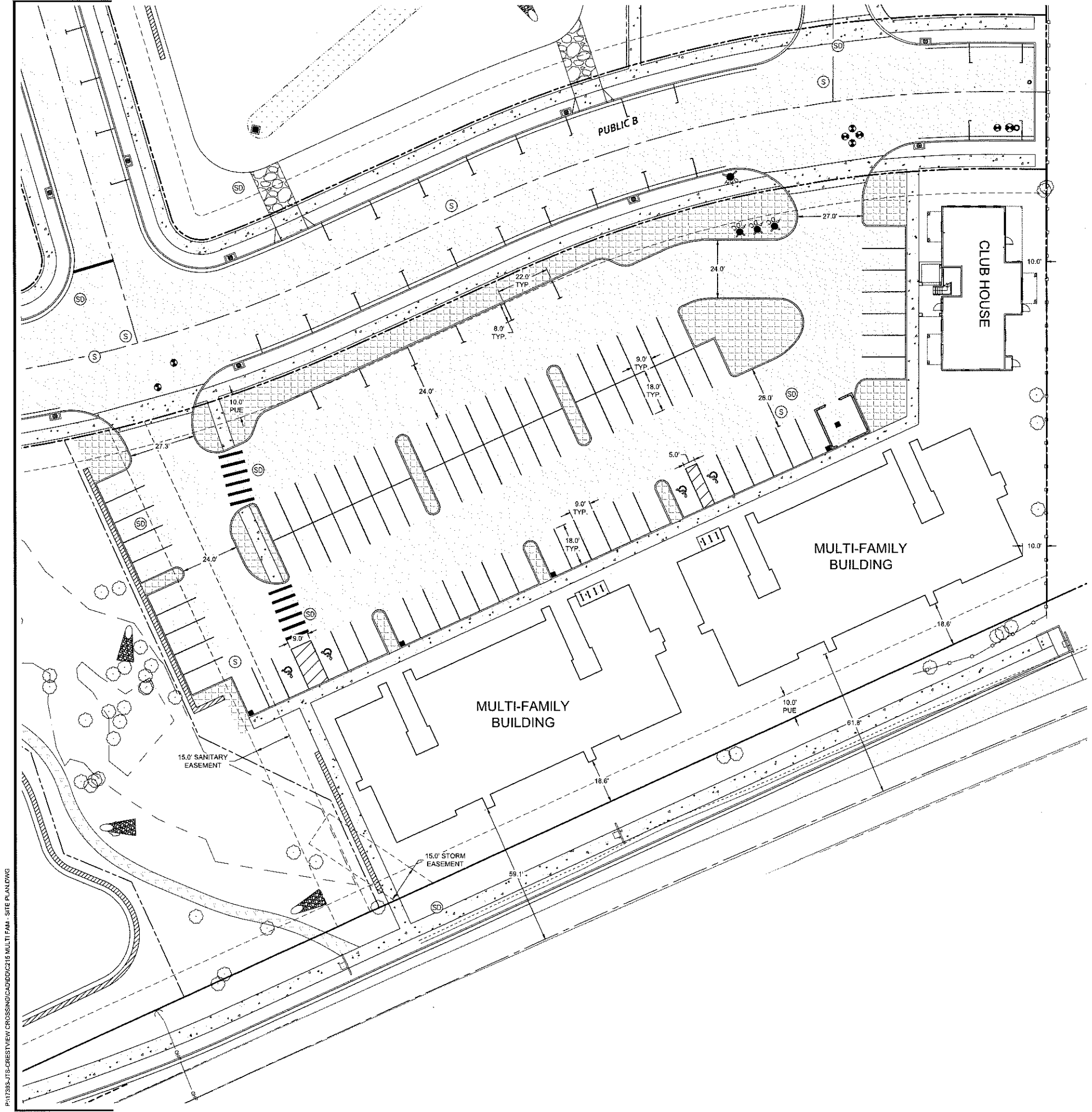
SHEET NUMBER
C210

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED STORM FACILITY
- PROPOSED SWALE
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED TYPICAL STREET SECTION
SEE SHEETS C200 & C201



P:\17383-ITS-CRESTVIEW-CROSSING\CADD\C210 SITE PLAN.DWG



- LEGEND**
- PROJECT BOUNDARY
 - - - EXISTING RIGHT-OF-WAY LINE
 - - - EXISTING RIGHT-OF-WAY CENTERLINE
 - - - EXISTING ADJACENT PROPERTY LINE
 - - - PROPOSED RIGHT-OF-WAY LINE
 - - - PROPOSED RIGHT-OF-WAY CENTERLINE
 - - - PROPOSED LOT LINE
 - - - PROPOSED SETBACK LINE
 - - - PROPOSED EASEMENT
 - - - PROPOSED CURB FACE
 - - - PROPOSED CURB BACK
 - - - PROPOSED LIP OF GUTTER
 - - - PROPOSED WHITE STRIPING
 - ▨ PROPOSED CONCRETE
 - ▩ PROPOSED ASPHALT
 - ▧ PROPOSED LANDSCAPING
 - ▦ PROPOSED GRAVEL
 - ▤ PROPOSED WOODCHIP PATH
 - ▥ PROPOSED RETAINING WALL
 - ▧ PROPOSED DRIVEWAY
 - ▨ PROPOSED PEDESTRIAN CROSSWALK STRIPING
 - ▩ PROPOSED BIKE PARKING
 - ▧ PROPOSED ACCESSIBLE PARKING STALL
 - ▦ PROPOSED HYDRANT
 - ▤ PROPOSED VALVE
 - ▥ PROPOSED BLOW-OFF / AIR RELEASE ASSY.
 - ▧ PROPOSED FIRE DPT. CONNECTION
 - ⊙ PROPOSED SEWER MANHOLE
 - ⊙ PROPOSED STORM MANHOLE
 - ⊙ PROPOSED CATCH BASIN
 - ⊙ EXISTING DECIDUOUS TREE

PARKING STATISTICS - MULTIFAMILY LOT

PROPOSED STALL COUNT & SUMMARY

TYPE * (WIDTH x DEPTH)	STANDARD 9' x 18'	PARALLEL 8' x 22'	ADA 9' x 18'	ADA - VAN 9' x 18'	TOTAL
MULTIPLE FAMILY APARTMENTS =	80	7	3	1	91
TOTAL =	80	7	3	1	91

VEHICLES
DEVELOPMENT CODE CHAPTER 15.440.30

	MINIMUM	PROPOSED
MAXIMUM PARKING - MULTI-FAMILY		NONE
MINIMUM PARKING - MULTI-FAMILY		74
PROPOSED		91

BICYCLES
DEVELOPMENT CODE CHAPTER 15.440.30

	MINIMUM	PROPOSED
MINIMUM BICYCLE PARKING - MULTI-FAMILY	13	14

ACCESSIBLE
OSSC SECTION 1109.1

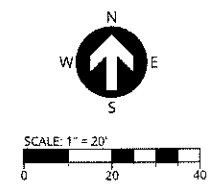
	MINIMUM	PROPOSED
MULTI-FAMILY PARKING LOT (76 TO 100)		
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

LANDSCAPING
DEVELOPMENT CODE CHAPTER 15.420.010

	REQUIRED	PROPOSED
MULTI-FAMILY PARKING LOT (25 SF PER STALL)	2,275 SF	6,357 SF

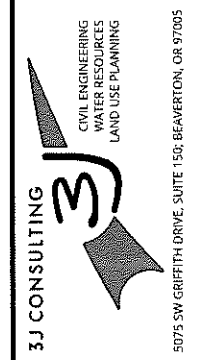
SETBACKS
ZONE C3 - MULTI-FAMILY LOT

	10 FT
FRONT	10 FT
INTERIOR	0 FT/10 FT
STREET - EXPRESSWAY CENTERLINE	50 FT



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

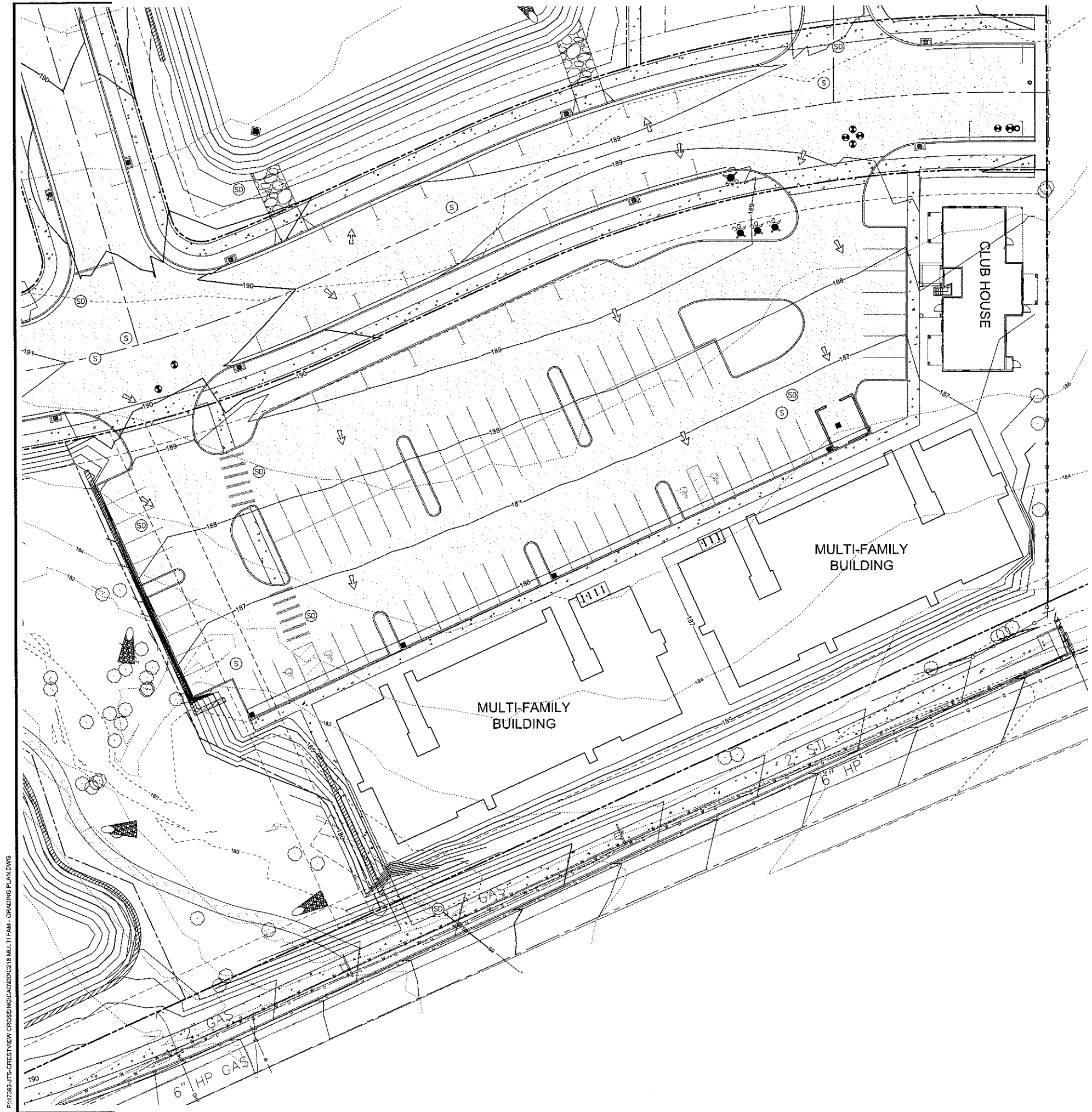
MULTI-FAMILY SITE PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JE, BMO
 CHECKED BY | AJM, RGW

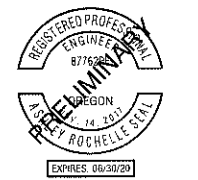
SHEET NUMBER
C215

P:\17393-JT-CRESTVIEW CROSSING\CAD\DC215 MULTI-FAM - SITE PLAN.DWG



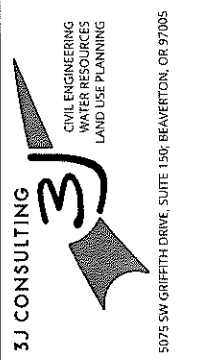
LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED SURFACE FLOW ARROW
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- PROPOSED SEWER MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE



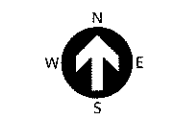
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY GRADING PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



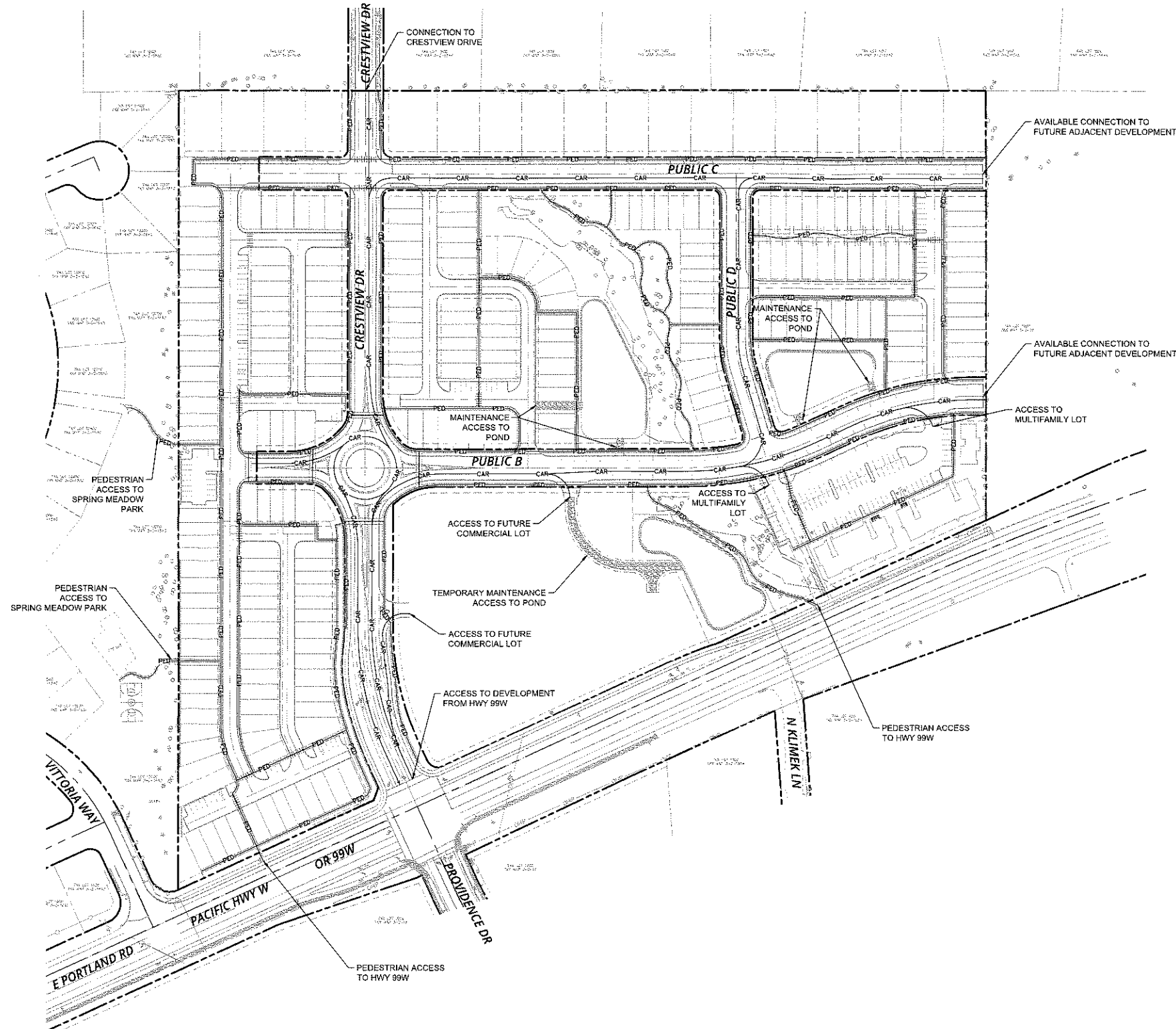
PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEI, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C218



P:\17393-JT-CRESTVIEW CROSSING\CAD\DDC218 MULTI-FAM - GRADING PLAN.DWG

P:\17385\JTS-CRESTVIEW CROSSING\CD\CD\220 CIRCULATION PLAN.DWG



LEGEND

- PROPOSED CAR CIRCULATION
- PROPOSED PEDESTRIAN CIRCULATION
- PROPOSED STANDARD PARKING STALL
- PROPOSED PARALLEL PARKING STALL
- PROPOSED ADA PARKING STALLS

PARKING STATISTICS

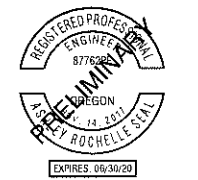
PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD (9' x 18')	PARALLEL (8' x 22')	ADA (9' x 18')	ADA VAN (9' x 18')	TOTAL
PUBLIC ON-STREET =	0	72	0	0	72
PRIVATE =	71	0	10	2	83
MULTIFAMILY LOT =	80	7	3	1	91
TOTAL =	151	79	13	3	246

MULTIFAMILY LOT PARKING - ACCESSIBLE

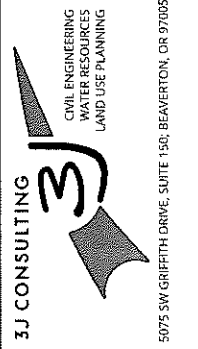
(OSSC SECTION 1106.1)

PARKING FACILITY TOTAL = 76 TO 100 STALLS	MINIMUM REQUIRED	AS PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1



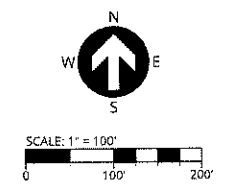
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

ACCESS, PARKING, AND CIRCULATION PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17383
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | A.J.M, RGW

SHEET NUMBER
C220



LIGHTING ZONE CALCULATIONS

ACI 1: ARTERIAL COMMERCIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	4.0 MIN	4.27

ARI 1: ARTERIAL RESIDENTIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.0 MIN	2.46

ARR 2: ARTERIAL RESIDENTIAL ROAD #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.0 MIN	1.45

CCI 2: COLLECTOR COMMERCIAL INTERSECTION #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.83

CCR 2: COLLECTOR COMMERCIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.31

CCR 3: COLLECTOR COMMERCIAL ROAD #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.51

CRI 1: COLLECTOR RESIDENTIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.68

CRI 3: COLLECTOR RESIDENTIAL INTERSECTION #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.82

CRR 1: COLLECTOR RESIDENTIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.51

CRR 3: COLLECTOR RESIDENTIAL ROAD #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.95

CRR 5: COLLECTOR RESIDENTIAL ROAD #5		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.84

CRR 7: COLLECTOR RESIDENTIAL ROAD #7		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.97

LRR 2: LOCAL RESIDENTIAL ROAD #2 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.15

APL 1: APARTMENTS PARKING LOT #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	N/A	1.38

ACR 1: ARTERIAL COMMERCIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.0 MIN	2.49

ARR 1: ARTERIAL RESIDENTIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.0 MIN	1.41

CCI 1: COLLECTOR COMMERCIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.49

CCI 3: COLLECTOR COMMERCIAL INTERSECTION #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.69

CCR 1: COLLECTOR COMMERCIAL ROAD #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.31

CCR 3: COLLECTOR COMMERCIAL ROAD #4		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.39

CRI 2: COLLECTOR RESIDENTIAL INTERSECTION #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.85

CRI 4: COLLECTOR RESIDENTIAL INTERSECTION #4		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.47

CRR 2: COLLECTOR RESIDENTIAL ROAD #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.15

CRR 4: COLLECTOR RESIDENTIAL ROAD #4		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.14

CRR 6: COLLECTOR RESIDENTIAL ROAD #6		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.69

LRR 1: LOCAL RESIDENTIAL ROAD #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.01

LRR 3: LOCAL RESIDENTIAL ROAD #3 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.10

CONSTRUCTION KEY NOTES

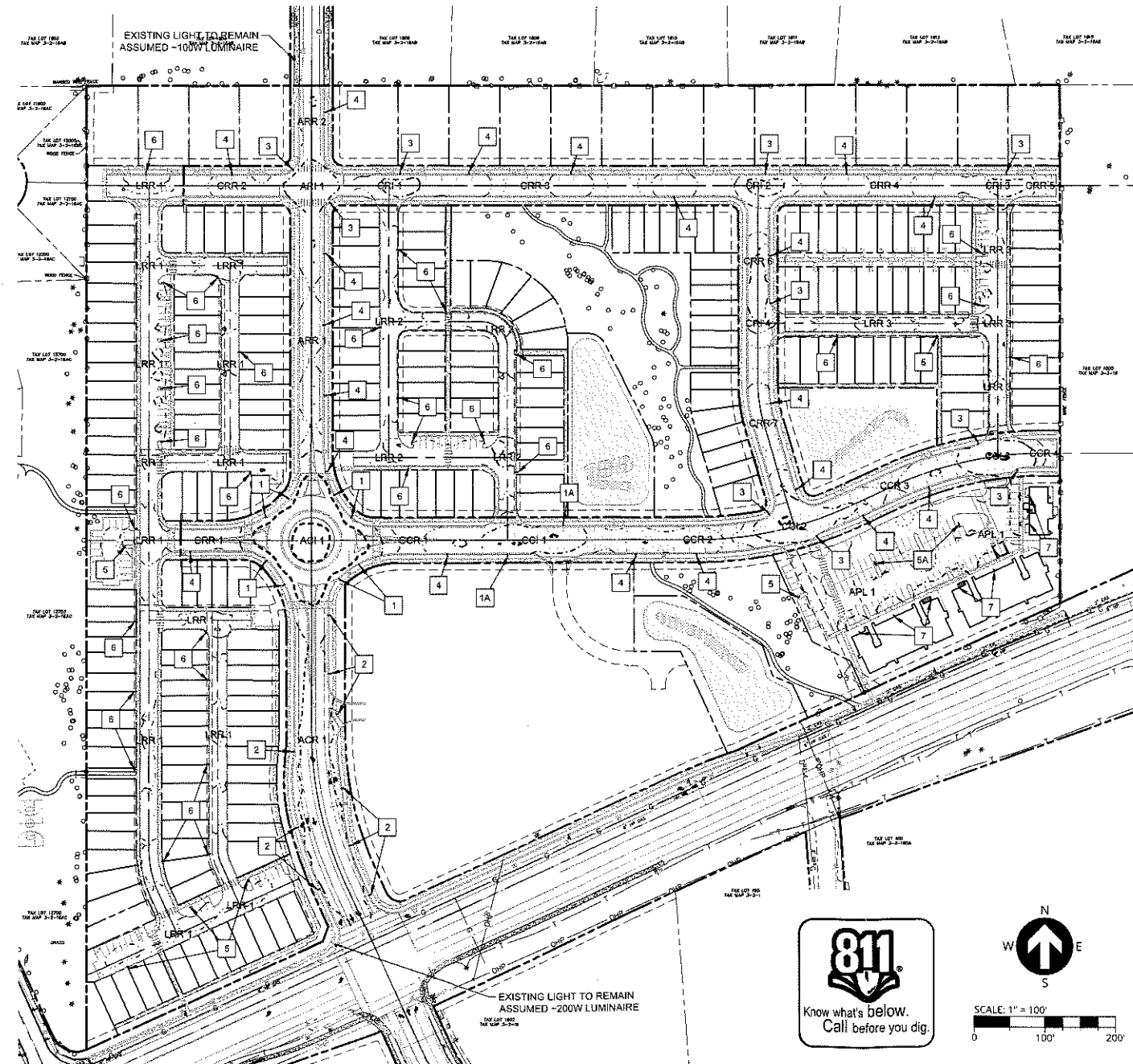
- 1 INSTALL 180W LED LUMINAIRE, TYPE III, 30' POLE, 6' ARM, BACKLIGHT SHIELD (17700 LUMENS). LUMINAIRE: LEOTEK GC1-80F-MV-NW-3-GY-700-HSS OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2708458054-DNA OR CITY APPROVED EQUIVALENT.
- 1A INSTALL 180W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM, (17700 LUMENS, 80 LEDS). LUMINAIRE: LEOTEK GC1-80F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2208458054-DNA OR CITY APPROVED EQUIVALENT.
- 2 INSTALL 133W LED LUMINAIRE, TYPE III, 30' POLE, 6' ARM, BACKLIGHT SHIELD (13400 LUMENS). LUMINAIRE: LEOTEK GC1-60F-MV-NW-3-GY-700-HSS OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2708458054-DNA OR CITY APPROVED EQUIVALENT.
- 3 INSTALL 133W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (13400 LUMENS, 60 LEDS). LUMINAIRE: LEOTEK GC1-60F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2208458054-DNA OR CITY APPROVED EQUIVALENT.
- 4 INSTALL 92W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (9300 LUMENS, 40 LEDS). LUMINAIRE: LEOTEK GC1-40F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2208458054-DNA OR CITY APPROVED EQUIVALENT.
- 5 INSTALL 70W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS). LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2208458054-DNA OR CITY APPROVED EQUIVALENT.
- 5A INSTALL TWO 70W LED LUMINAIRES, TYPE III, 25' POLE IN DOUBLE ARM ARRANGEMENT, 6' ARMS LUMINAIRE: TWO LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 2MA06325-2208458054-DNA OR CITY APPROVED EQUIVALENT.
- 6 INSTALL 70W LED LUMINAIRE, TYPE II, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS). LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA06325-2208458054-DNA OR CITY APPROVED EQUIVALENT.
- 7 INSTALL 65W LED LUMINAIRE, TYPE III, WALL MOUNTED, NO ARM (7000 LUMENS, 30 LEDS MIN) LUMINAIRE: LUMARK WPSOLED-65-UNV OR APPROVED EQUIVALENT.

LEGEND

- 4.0 FOOT-CANDLE ISOLINE
- 2.0 FOOT-CANDLE ISOLINE
- 1.0 FOOT-CANDLE ISOLINE
- 0.5 FOOT-CANDLE ISOLINE

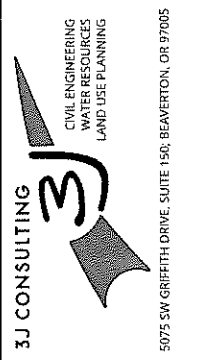
ILLUMINATION GENERAL NOTES

1. ELECTRICAL BY OTHERS
2. TOTAL LIGHT LOSS FACTOR OF 0.855 ASSUMED FOR MAINTAINED LEVEL.
3. ALL ILLUMINATION CALCULATIONS AND ISOLINES DEVELOPED USING AGI32 V14.6.13 PHOTOMETRIC SOFTWARE BY LIGHTING ANALYSTS, INC.
4. LIGHT POLES SHALL BE ALUMINUM, NATURAL FINISH, AND ELLIPTICAL MAST ARMS.
5. LUMINAIRES SHALL BE LED LIGHT SOURCE WITH NO LESS THAN 30 LEDS AND NO LESS THAN 7000 LUMENS, WITH GREY COLORED 'COBRAHEAD' STYLE HOUSINGS.

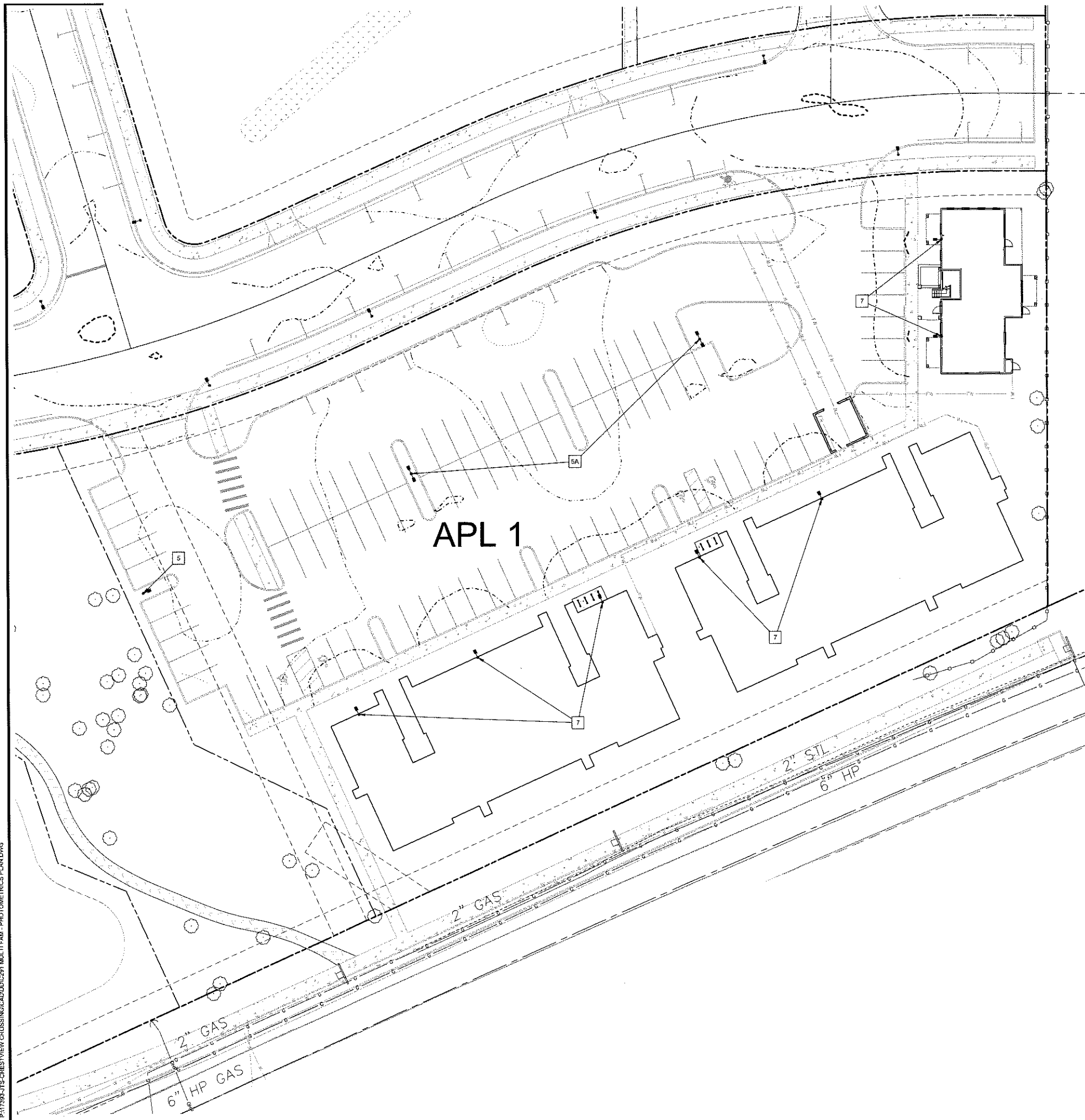


PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

PHOTOMETRICS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW
 SHEET NUMBER
C290



LEGEND

- 4.0 FOOT-CANDLE ISOLINE
- - - 2.0 FOOT-CANDLE ISOLINE
- 1.0 FOOT-CANDLE ISOLINE
- 0.5 FOOT-CANDLE ISOLINE

ILLUMINATION GENERAL NOTES

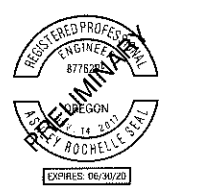
1. ELECTRICAL BY OTHERS
2. TOTAL LIGHT LOSS FACTOR OF 0.855 ASSUMED FOR MAINTAINED LEVEL.
3. ALL ILLUMINATION CALCULATIONS AND ISOLINES DEVELOPED USING AGI32 V14.6.13 PHOTOMETRIC SOFTWARE BY LIGHTING ANALYSTS, INC.
4. LIGHT POLES SHALL BE ALUMINUM, NATURAL FINISH, AND ELLIPTICAL MAST ARMS.
5. LUMINAIRES SHALL BE LED LIGHT SOURCE WITH NO LESS THAN 30 LEDS AND NO LESS THAN 7000 LUMENS, WITH GREY COLORED "COBRAHEAD" STYLE HOUSINGS.

CONSTRUCTION KEY NOTES

- 5 INSTALL 70W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS); LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
- 5A INSTALL TWO 70W LED LUMINAIRES, TYPE III, 25' POLE IN DOUBLE ARM ARRANGEMENT, 6' ARMS LUMINAIRE: TWO LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 2MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
- 7 INSTALL 65W LED LUMINAIRE, TYPE III, WALL MOUNTED, NO ARM (7000 LUMENS, 30 LEDS MIN) LUMINAIRE: LUMARK WPSQLED-65-UNV OR APPROVED EQUIVALENT.

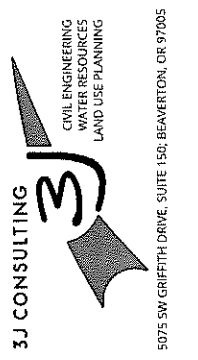
LIGHTING ZONE CALCULATIONS

APL 1: APARTMENTS PARKING LOT #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	N/A	1.36



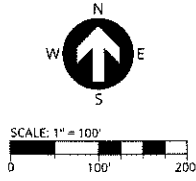
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY PHOTOMETRICS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17353
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEI, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C291



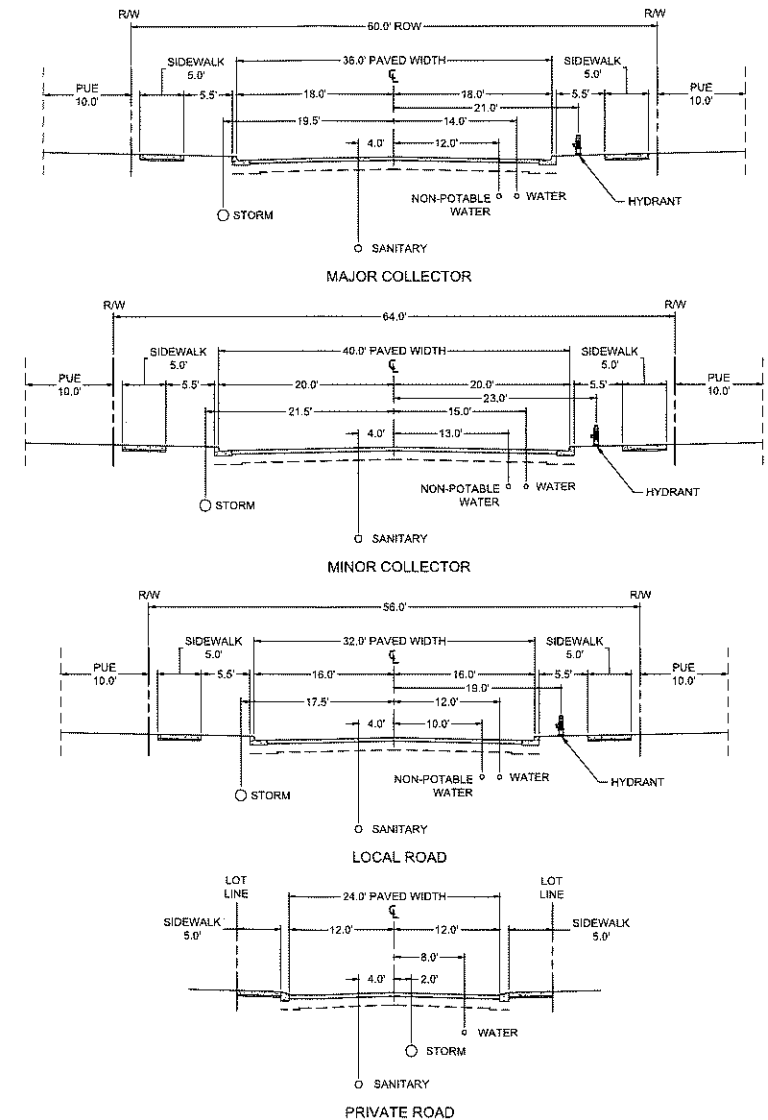
P:\17353-JTS-CRESTVIEW CROSSING\140101\C291 MULTI-FAM - PHOTOMETRICS PLAN.DWG

GENERAL NOTES

1. LOTS 1 THROUGH 7 SHALL HAVE STORMWATER QUALITY TREATMENT LOCATED WITHIN LOT BOUNDARIES. STORMWATER DISCHARGE FROM THESE LOTS SHALL CONNECT TO PROPOSED STORM SEWER BYPASS AND OUTFALL TO THE WETLAND.

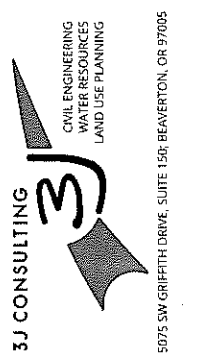
LEGEND

	PROPOSED STORM PIPE		EXISTING TELECOM. LINE
	PROPOSED SANITARY MAIN		EXISTING GAS LINE
	PROPOSED WATER MAIN		EXISTING UNDERGROUND POWER
	PROPOSED NON-POTABLE WATER MAIN		EXISTING OVERHEAD POWER
	PROPOSED WATER FIRE SERVICE		EXISTING SANITARY SEWER
	PROPOSED DETENTION POND		EXISTING STORM DRAIN
	PROPOSED WATER QUALITY SWALE		EXISTING WATER MAIN
	PIPE CAP / STUB		EXISTING HYDRANT
	PROPOSED HYDRANT		EXISTING WATER VALVE
	PROPOSED WATER VALVE		EXISTING SANITARY MANHOLE
	PROPOSED WATER PIPE BLOWOFF/ PROPOSED AIR RELEASE ASSEMBLY		EXISTING STORM MANHOLE
	PROPOSED FIRE DPT. CONNECTION		EXISTING STORM INLET
	PROPOSED SANITARY MANHOLE		EXISTING POWER METER
	PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT		EXISTING GAS METER
	PROPOSED STORM MANHOLE		EXISTING TELEPHONE PEDESTAL
	PROPOSED STORM OUTFALL PROTECTION		EXISTING GUY ANCHOR
	PROPOSED STANDARD INLET MANHOLE		EXISTING LIGHT POLE
	PROPOSED SUPERSIZED INLET MANHOLE		EXISTING UTILITY POLE
	PROPOSED CATCH BASIN		EXISTING INTERSECTION SIGNAL
	PROPOSED DITCH INLET		EXISTING ELECTRICAL BOX
	PROPOSED STREET LIGHTING		



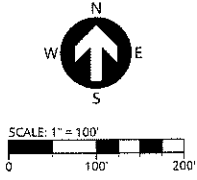
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

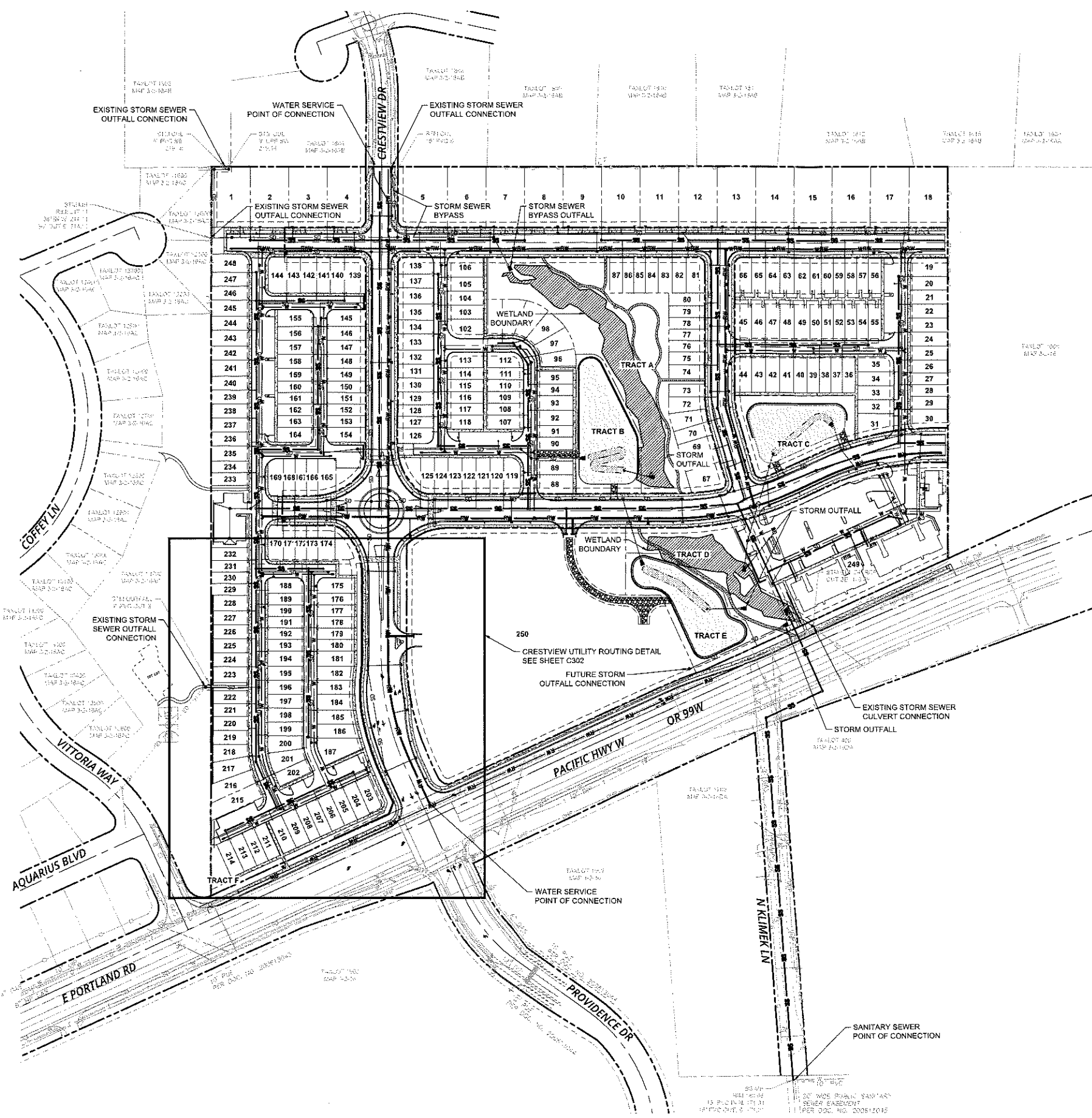


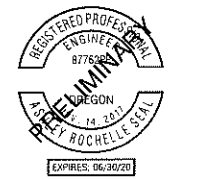
PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352WH 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C300



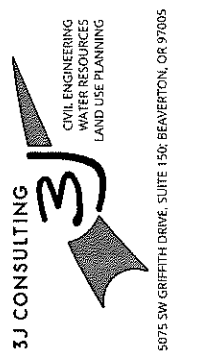
P17393-JTS-CRESTVIEW CROSSING/CADD/C300-COMPOSITE UTILITY PLAN.DWG





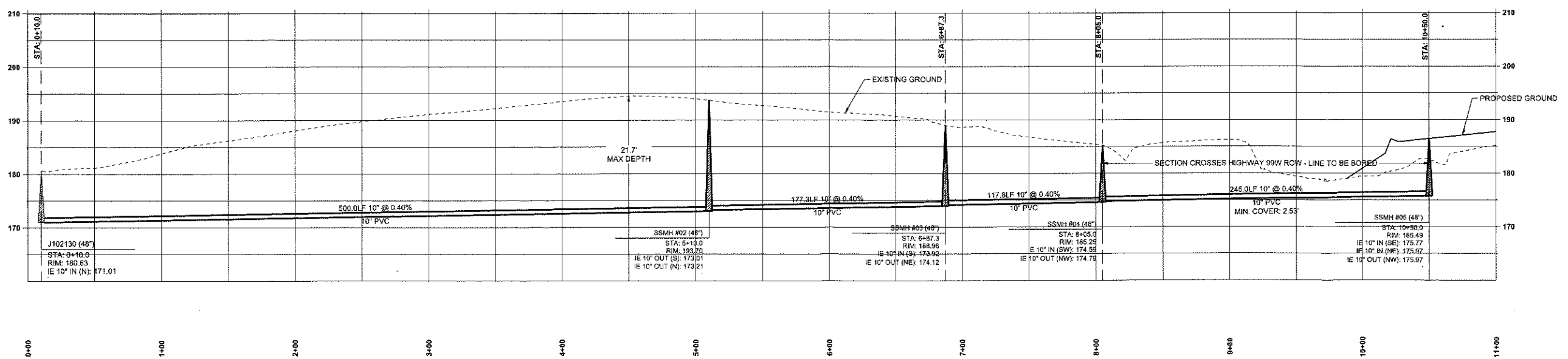
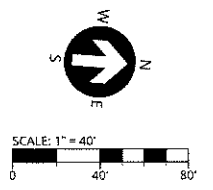
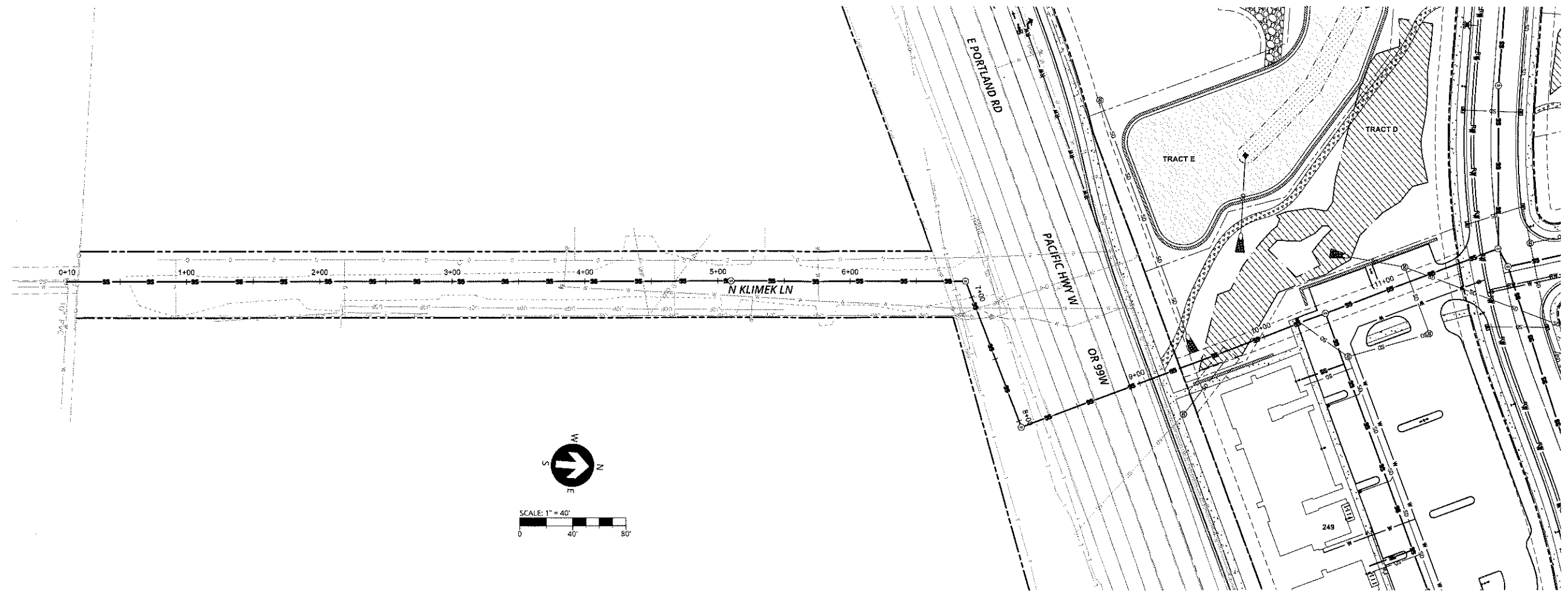
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OFFSITE SEWER CONNECTION
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR



PROJECT INFORMATION
3J PROJECT # | 17383
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | A.J.M, RGW

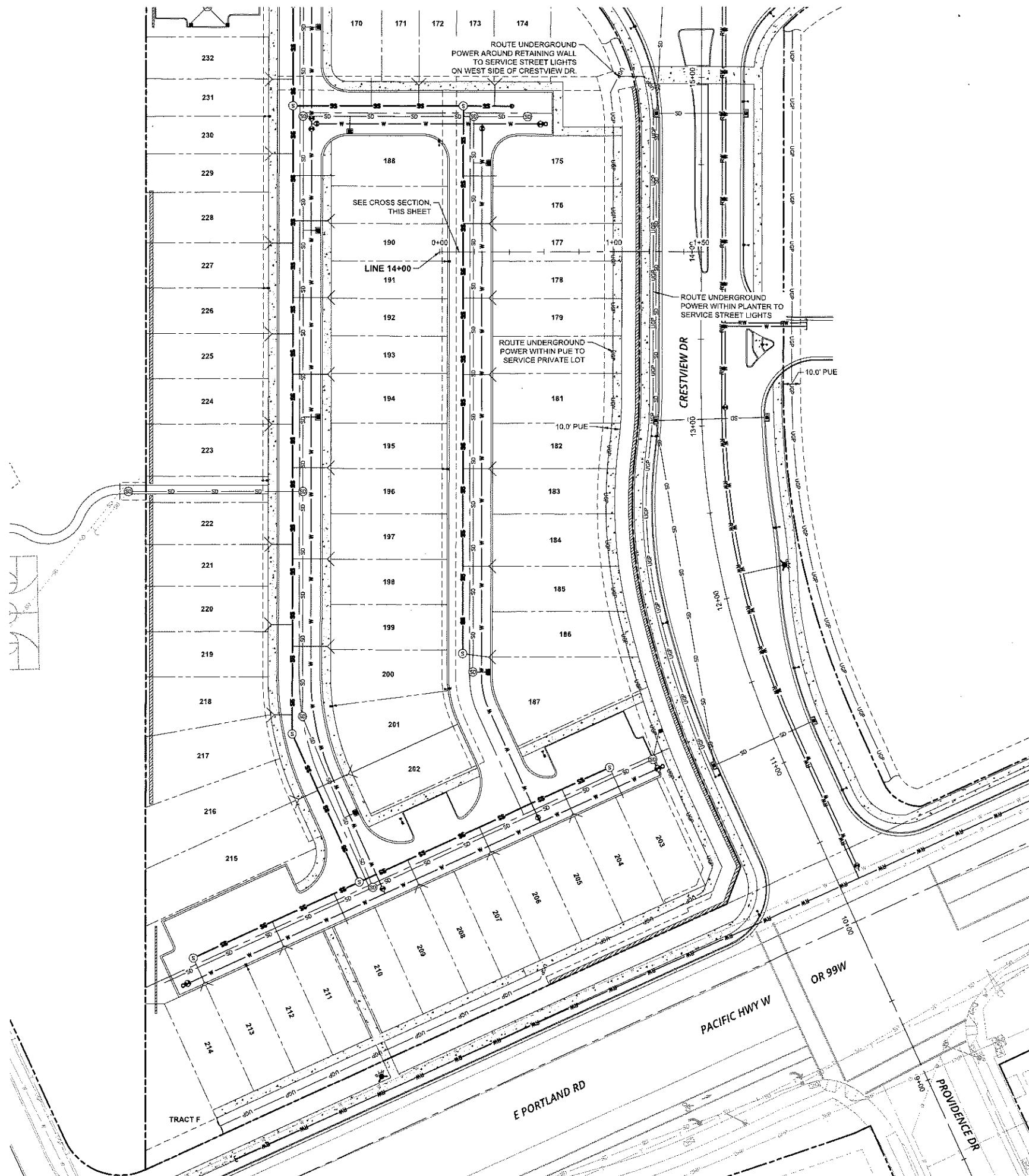
SHEET NUMBER
C301



OFFSITE SEWER PROFILE
(STA: 0+00 - STA: 11+00)
SCALE: 1" = 40' H; 1" = 10' V

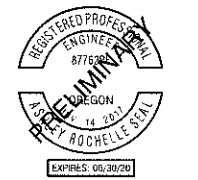
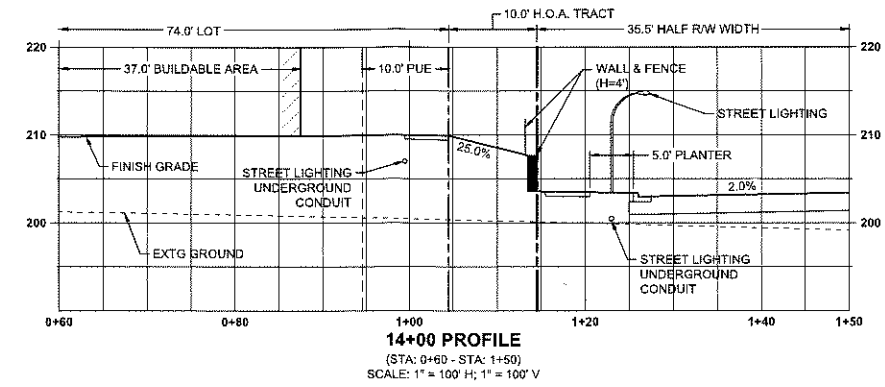
P:\17383\JTS-CRESTVIEW CROSSING\CADD\C301-COMPOSITE UTILITY PLAN.DWG

P:\17399\JTS-CRESTVIEW CROSSING\CA\DD\300 COMPOSITE UTILITY PLAN.DWG



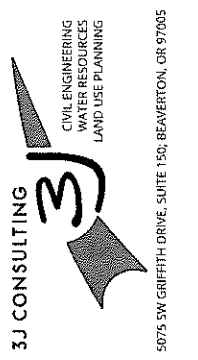
LEGEND

- SD PROPOSED STORM PIPE
- SS PROPOSED SANITARY MAIN
- SS PROPOSED SANITARY SERVICE LATERAL
- W PROPOSED WATER PIPE
- RW PROPOSED RECLAIMED WATER MAIN
- FW PROPOSED WATER FIRE SERVICE
- UGP PROPOSED UNDERGROUND POWER CONDUIT
- PROPOSED STREET LIGHT



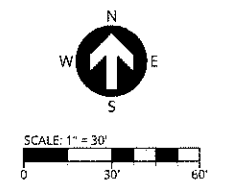
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

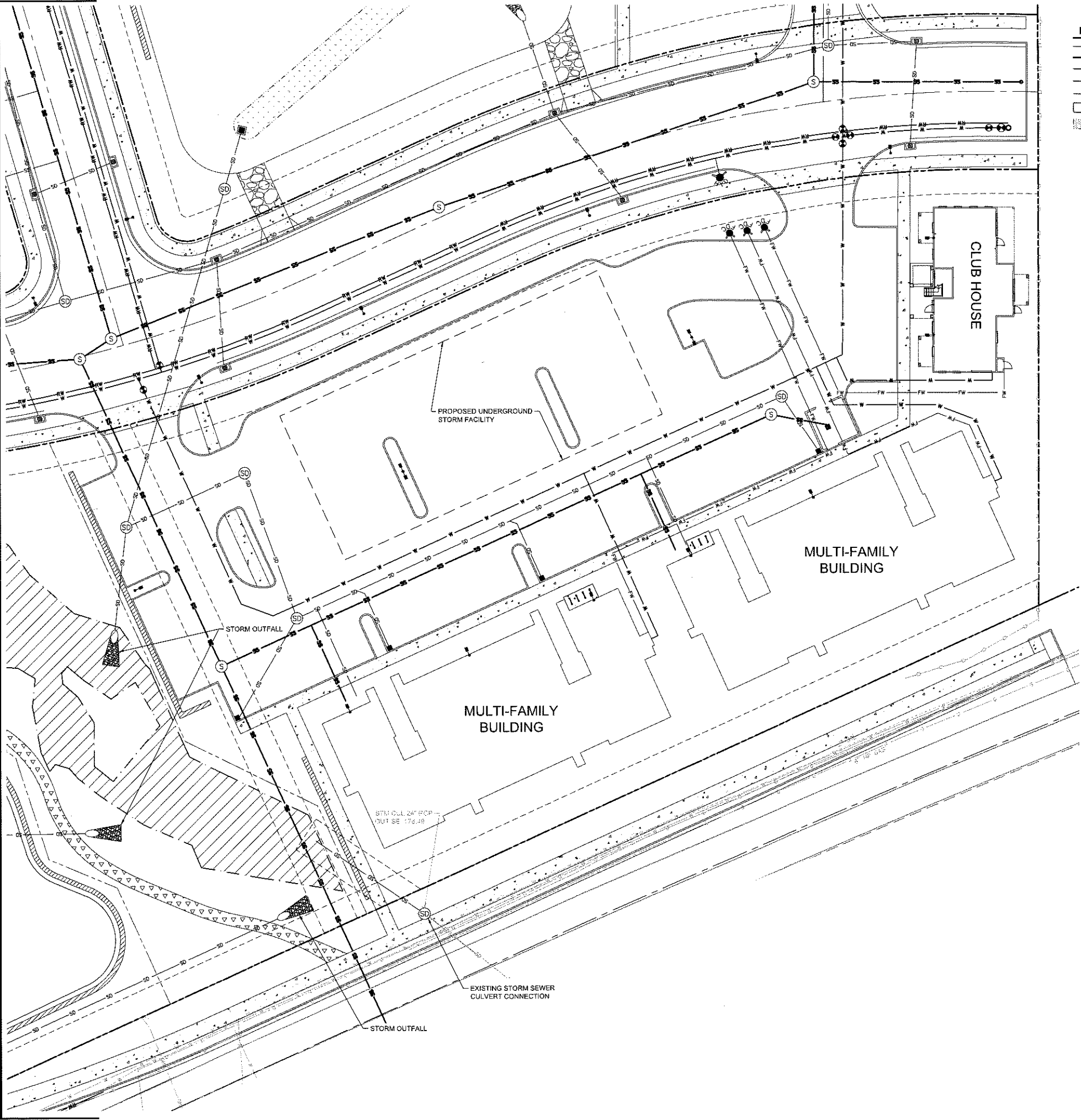
PRELIMINARY STREET LIGHT CONDUIT ROUTING PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 3S2W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, ROW

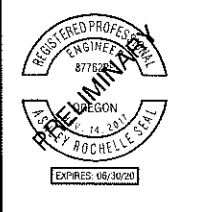
SHEET NUMBER
C302





LEGEND

	PROPOSED STORM PIPE		EXISTING TELECOM. LINE
	PROPOSED SANITARY MAIN		EXISTING GAS LINE
	PROPOSED WATER MAIN		EXISTING UNDERGROUND POWER
	PROPOSED NON-POTABLE WATER MAIN		EXISTING OVERHEAD POWER
	PROPOSED WATER FIRE SERVICE		EXISTING SANITARY SEWER
	PROPOSED DETENTION POND		EXISTING STORM DRAIN
	PROPOSED WATER QUALITY SWALE		EXISTING WATER MAIN
	PIPE CAP / STUB		EXISTING HYDRANT
	PROPOSED HYDRANT		EXISTING WATER VALVE
	PROPOSED FIRE DEPARTMENT CONNECTION		EXISTING SANITARY MANHOLE
	PROPOSED WATER VALVE		EXISTING STORM MANHOLE
	PROPOSED WATER PIPE BLOWOFF/ AIR RELEASE ASSEMBLY		EXISTING STORM INLET
	PROPOSED SANITARY MANHOLE		EXISTING POWER METER
	PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT		EXISTING GAS METER
	PROPOSED STORM MANHOLE		EXISTING TELEPHONE PEDESTAL
	PROPOSED STORM OUTFALL PROTECTION		EXISTING GUY ANCHOR
	PROPOSED STANDARD INLET MANHOLE		EXISTING LIGHT POLE
	PROPOSED SUPERSIZED INLET MANHOLE		EXISTING UTILITY POLE
	PROPOSED CATCH BASIN		EXISTING INTERSECTION SIGNAL
	PROPOSED DITCH INLET		EXISTING ELECTRICAL BOX
	PROPOSED STREET LIGHTING		



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

P:\17385-JTS-CRESTVIEW CROSSING\CAD\DC303 MULTI-FAM - COMPOSITE UTILITY PLAN.DWG

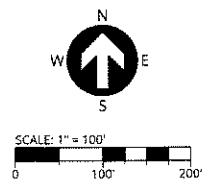
3J CONSULTING

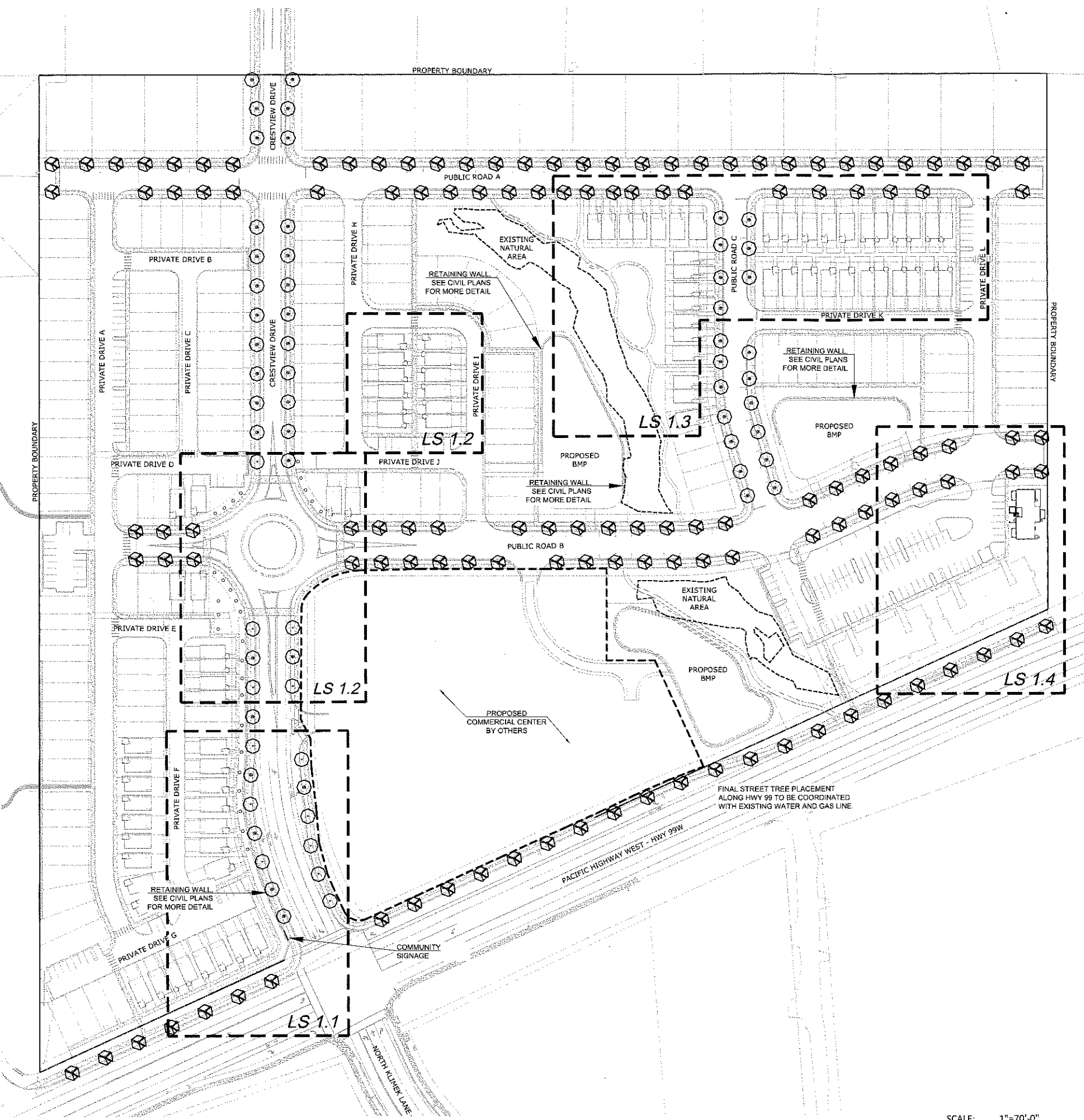
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOTS | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | A.J.M, RDW

SHEET NUMBER
C303





STREET TREE PLANT MATERIAL SCHEDULE

SYMBOL	STREET TREES ITEM	SIZE
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.

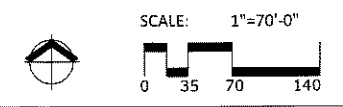
NOTE: A STREET LIGHT LAYOUT PLAN HAS NOT YET BEEN GENERATED. STREET TREE LOCATIONS WILL BE COORDINATED WITH PROPOSED STREET LIGHT, DRIVEWAY, AND UTILITY LOCATIONS DURING CONSTRUCTION DOCUMENT PREPARATION.

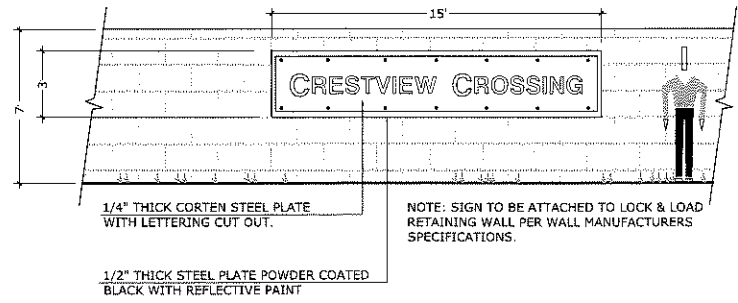
GENERAL LANDSCAPE NOTES

- LANDSCAPE PLANTING SHALL CONFORM TO THE STANDARDS ESTABLISHED UNDER THE CITY OF NEWBERG PLANNING DEPARTMENT.
- ALL PLANT BEDS SHALL HAVE A 3" DEPTH OF BARK MULCH.
- LANDSCAPE AREAS SHALL HAVE A COMPLETE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM WITH FULL HEAD TO HEAD COVERAGE. WETLAND BUFFER SHALL HAVE A TEMPORARY IRRIGATION SYSTEM FOR THE TWO YEAR ESTABLISHMENT PERIOD.
- ALL PLANT MATERIAL DELIVERED TO THIS SITE SHALL MEET THE AMERICAN STANDARD FOR NURSERY STOCK STANDARDS.
- CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THE DRAWINGS.

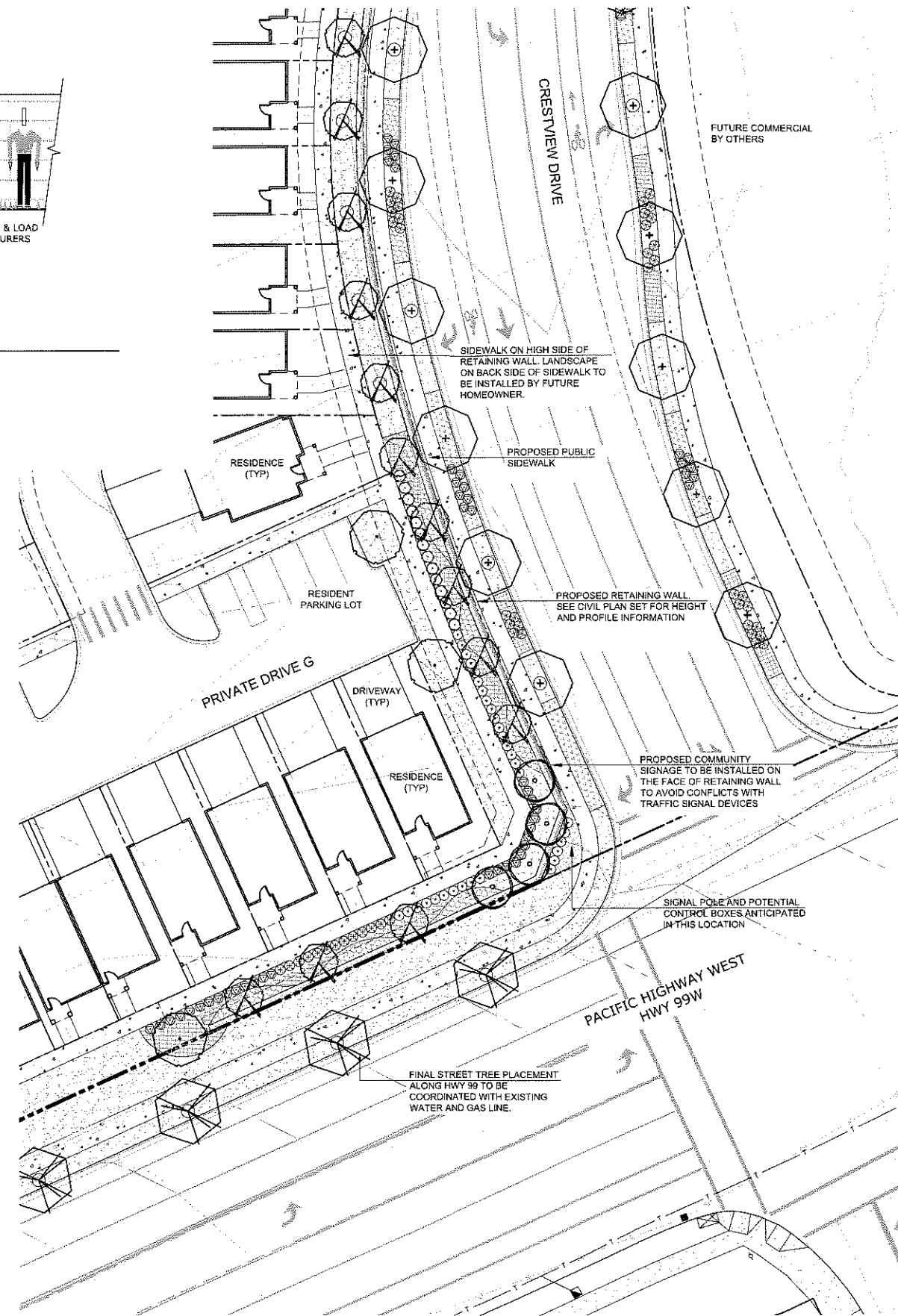
DASHED BOX AND SHEET NUMBER REFLECT CORRESPONDING SHEET WITH DETAILED ENLARGEMENT.

LS 1.4

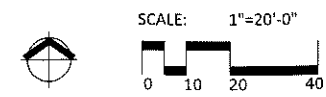




A MAIN ENTRY SIGNAGE
SCALE 1/4" = 1'-0"

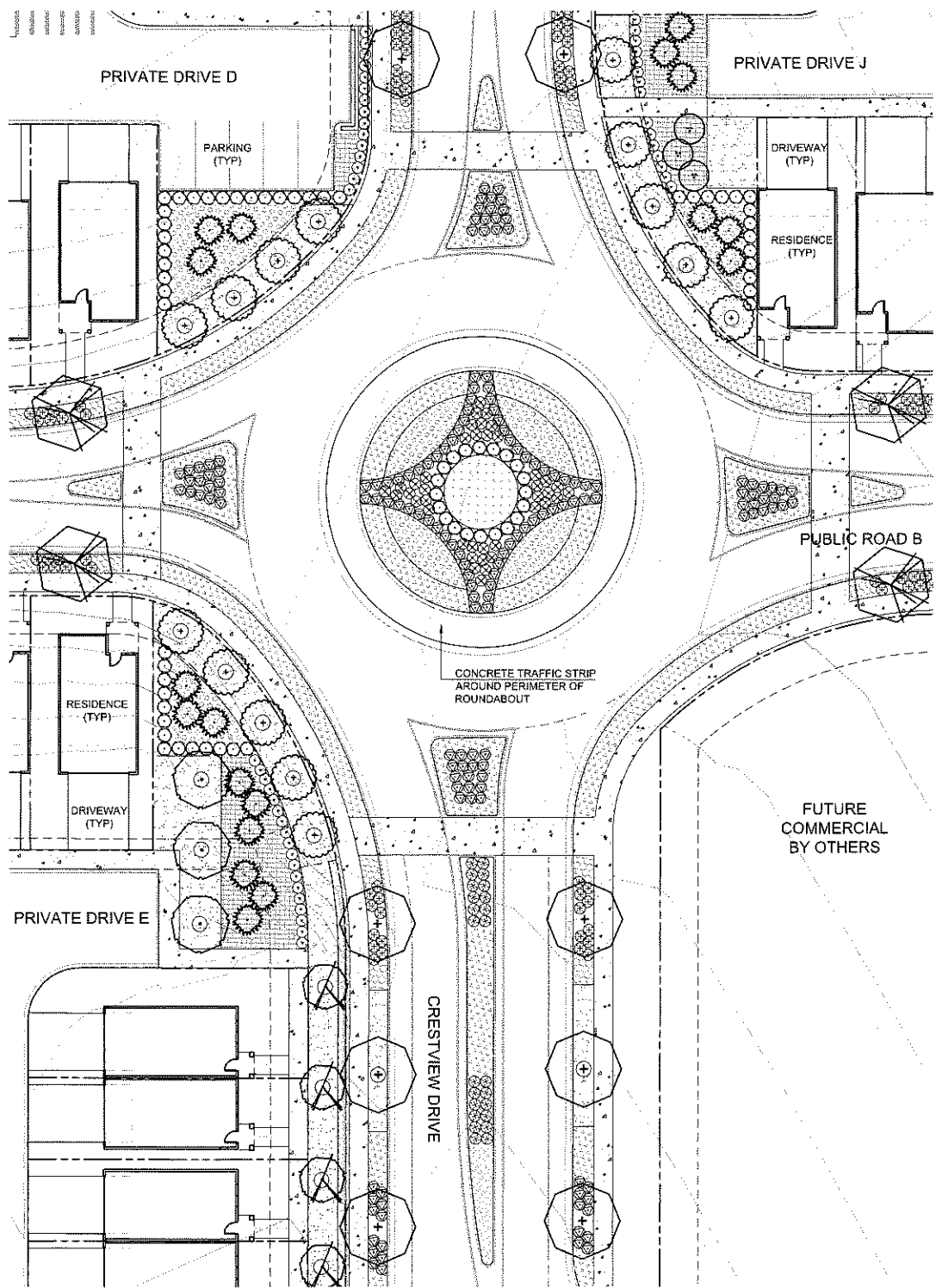


B MAIN ENTRY AND CRESTVIEW DRIVE ENLARGEMENT
SCALE 1" = 20'-0"

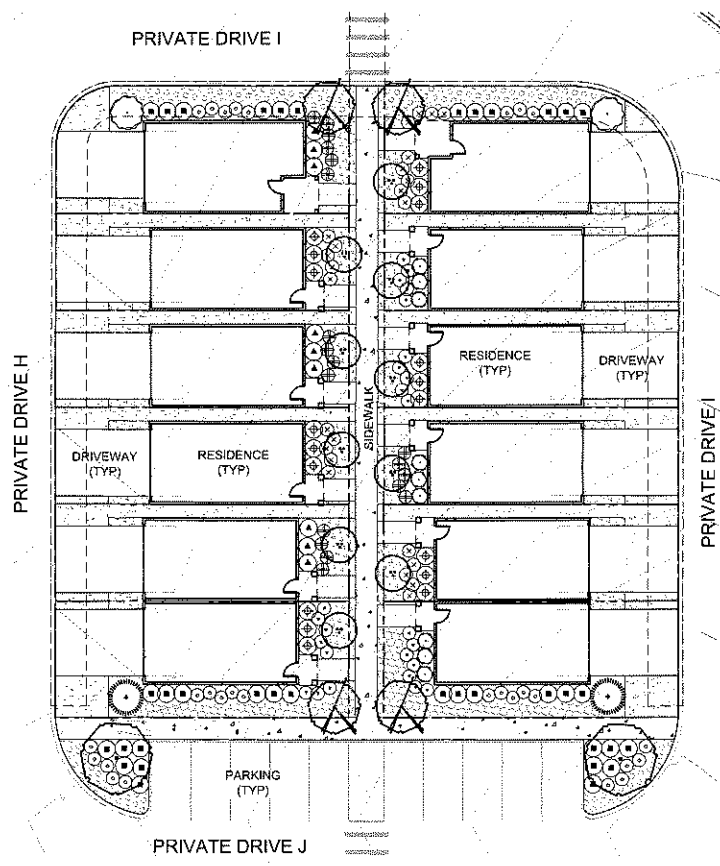


LANDSCAPE PLANT MATERIAL SCHEDULE

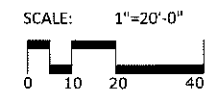
SYMBOL	ITEM	SIZE
STREET TREES		
	ACER RUBRUM 'FRANKSRED'	2' CAL.
	RED SUNSET MAPLE	
	PLATANUS X ACERIFOLIA 'BLOODGOOD'	2' CAL.
	BLOODGOOD LONDON PLANE TREE	
TREES		
	ZELKOVA SERRATA 'GREEN VASE'	2' CAL.
	GREEN VASE ZELKOVA	
	TILIA CORDATA 'GREENSPIRE'	2' CAL.
	GREENSPIRE LINDEN	
	BETULA JACQUEMONTII	2' CAL.
	HIMALAYAN BIRCH	
	CERCIS CANADENSIS	1.5" CAL.
	EASTERN REDBUD	
	PRUNUS SARGENTII	1.5" CAL.
	SARGENT CHERRY	
	STYRAX JAPONICUS	1.5" CAL.
	JAPANESE SNOWBELL	
	ACER CIRCINATUM	7-8' HT.
	VINE MAPLE	
TREES-EVERGREEN		
	PINUS STROBUS 'FASTIGIATA'	6' HT. / B&B
	FASTIGIATE WHITE PINE	
	CHAMAECYPARIS OBTUSA 'GRACILIS'	6' HT. / B&B
	SLENDER HINOKI FALSE CYPRESS	
	THUJA PLICATA 'HOGAN'	6' HT. / B&B
	HOGAN'S WESTERN REDCEDAR	
SHRUBS - DECIDUOUS		
	VIBURNUM P. TOMENTOSUM 'MARIENII'	7 GAL.
	DOUBLEFILE VIBURNUM	
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'	7 GAL.
	SNOW QUEEN OAKLEAF HYDRANGEA	
	CORNUS STOLONIFERA 'FARROW'	3 GAL.
	ARCTIC FIRE RED TWIG DOGWOOD	
	BERBERIS THUNBERGII 'CHERRY BOMB'	3 GAL.
	CHERRY BOMB BARBERRY	
	ROSA X RADRAZZI	3 GAL.
	KNOCK OUT SHRUB ROSE	
SHRUBS - EVERGREEN		
	PRUNUS LAUROCERASUS 'NANA'	7 GAL.
	DWARF ENGLISH LAUREL	
	CHOISYA TERNATA	7 GAL.
	MEXICAN ORANGE	
	ABELIA X GRANDIFLORA	7 GAL.
	GLOSSY ABELIA	
	OSMANTHUS FRAGRANS	7 GAL.
	SWEET OLIVE	
	SARCOCOCCA HOOKERIANA VAR. HUMILIS	3 GAL.
	HIMALAYAN SWEET BOX	
	DAPHNE ODORA 'AUREO-MARGINATA'	3 GAL.
	VARIEGATED WINTER DAPHNE	
	NANDINA DOMESTICA 'COMPACTA'	3 GAL.
	DWARF HEAVENLY BAMBOO	
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA'	3 GAL.
	EDGING BOXWOOD	
	VIBURNUM DAVIDII	3 GAL.
	DAVID VIBURNUM	
	ESCALLONIA 'COMPACTA'	3 GAL.
	COMPACT ESCALLONIA	
GRASSES & ACCENTS		
	LIRIOPE MUSCARI 'BIG BLUE'	1 GAL.
	BIG BLUE LILYTURF	
	MISCANTHUS SINENSIS 'VARIEGATUS'	3 GAL.
	VARIEGATED JAPANESE SILVER GRASS	
	MISCANTHUS SINENSIS 'LITTLE KITTEN'	3 GAL.
	LITTLE KITTEN MAIDEN GRASS	
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM'	3 GAL.
	OVERDAM FEATHER REED GRASS	
GROUNDCOVERS		
	COTONEASTER DAMMERI 'LOWFAST'	1 GAL.
	BEARBERRY COTONEASTER	3' O.C.
	RUBUS CALY. 'EMERALD CARPET'	1 GAL.
	EMERALD CARPET CREEPING BERRY	3' O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 789 ROUGH & READY ECO-TURF MIX	SEED
	BY PRO TIME LAWN SEED	5-7 LBS. / 1,000 SF



A CRESTVIEW DRIVE AND ROUNDABOUT ENLARGEMENT
SCALE 1"=20'-0"



B COURTYARD ENLARGEMENT
SCALE 1"=20'-0"



LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	STREET TREES ITEM	SIZE
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
TREES		
ITEM	SIZE	
	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LINDEN	2" CAL.
	BETULA JACQUEMONTII HIMALAYAN BIRCH	2" CAL.
	CERCIS CANADENSIS EASTERN REDBUD	1.5" CAL.
	PRUNUS SARGENTII SARGENT CHERRY	1.5" CAL.
	STYRAX JAPONICUS JAPANESE SNOWBELL	1.5" CAL.
	ACER CIRCINATUM VINE MAPLE	7'-8" HT.
TREES-EVERGREEN		
ITEM	SIZE	
	PINUS STROBUS 'FASTIGIATA' FASTIGIATE WHITE PINE	6' HT. / B&B
	CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
	THUJA PLICATA 'HOGAN' HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
SHRUBS - DECIDUOUS		
ITEM	SIZE	
	VIBURNUM P. TOMENTOSUM 'MARISSI' DOUBLE FILE VIBURNUM	7 GAL.
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN' SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
	CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
	BERBERIS THUN. 'CHERRY BOMB' CHERRY BOMB BARBERRY	3 GAL.
	ROSA X RADRAZZ' KNOCK OUT SHRUB ROSE	3 GAL.
SHRUBS - EVERGREEN		
ITEM	SIZE	
	PRUNUS LAUROCERASUS 'NANA' DWARF ENGLISH LAUREL	7 GAL.
	CHOISYA TERNATA MEXICAN ORANGE	7 GAL.
	ABELIA X GRANDIFLORA GLOSSY ABELIA	7 GAL.
	OSMANTHUS FRAGRANS SWEET OLIVE	7 GAL.
	SARCOCOCCA HOOKERIANA VAR. HUMILIS HIMALAYAN SWEET BOX	3 GAL.
	DAPHNE ODORA 'AUREO-MARGINATA' VARIEGATED WINTER DAPHNE	3 GAL.
	NANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
	VIBURNUM DAVIDII DAVID VIBURNUM	3 GAL.
	ESCALLONIA 'COMPACTA' COMPACT ESCALLONIA	3 GAL.
GRASSES & ACCENTS		
ITEM	SIZE	
	LIRIOPE MUSCARI 'BIG BLUE' BIG BLUE LILYTURF	1 GAL.
	MISCANTHUS SINENSIS 'VARIEGATUS' VARIEGATED JAPANESE SILVER GRASS	3 GAL.
	MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	3 GAL.
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
GROUNDCOVERS		
ITEM	SIZE	
	COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3" O.C.
	RUBUS CALY. 'EMERALD CARPET' EMERALD CARPET CREEPING BERRY	1 GAL. 3" O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 769 ROUGH & READY ECO-TURF MIX BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

Cardno
Shaping the Future
PORTLAND
5415 SW NESSGATE DR. STE 100, PORTLAND, OR 97221
TEL (503) 419-2800 FAX (503) 419-2800
www.cardno.com

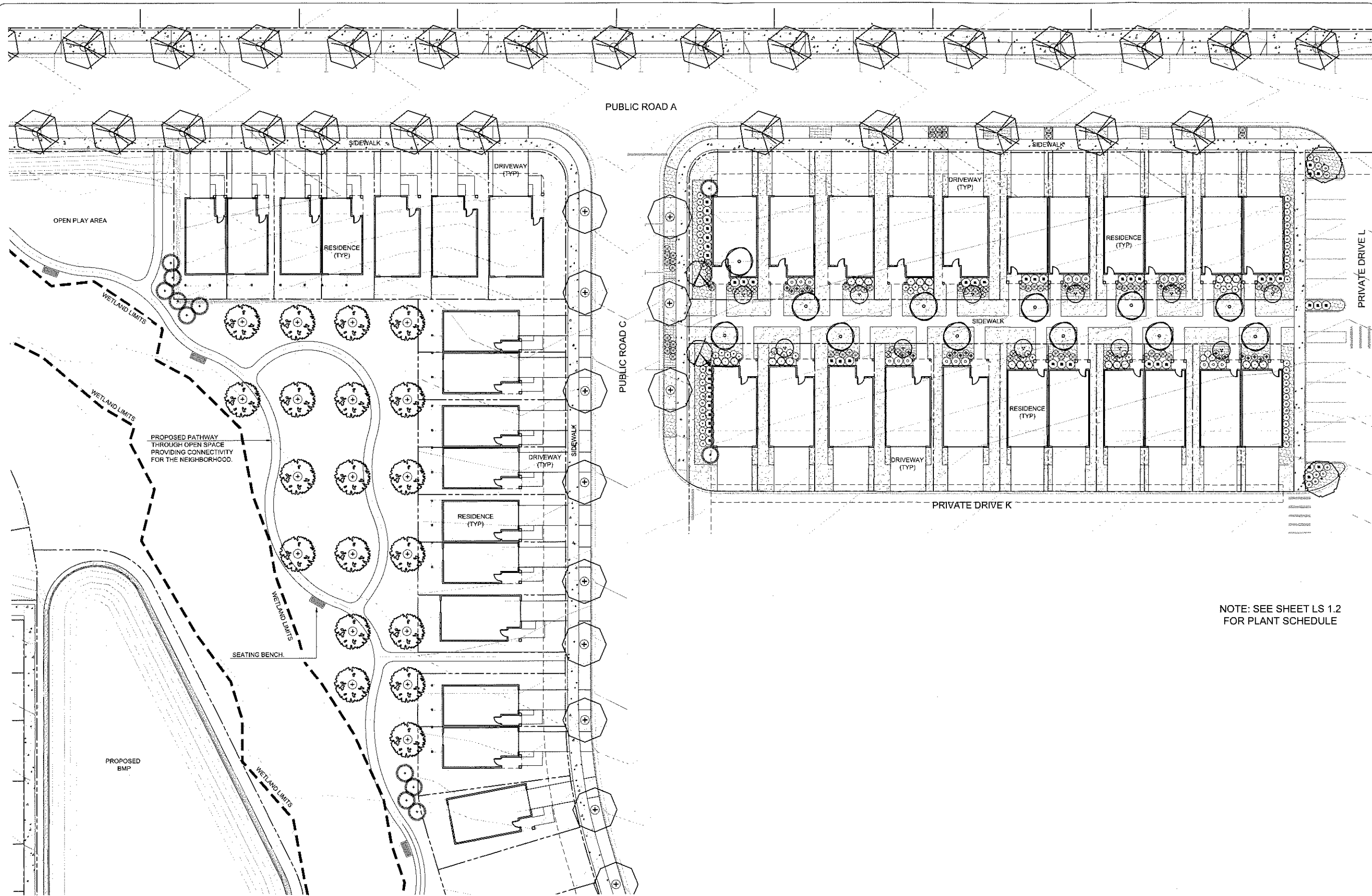
J.T. SMITH
LANDSCAPE ARCHITECT

PLANTING PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

REGISTERED
LA907
ANDREW D. HILL
OREGON
10/19/18
LANDSCAPE ARCHITECT
EXPIRES 10/31/18

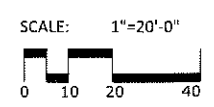
PROJECT NO.:
DATE: 06-06-2018
DESIGNED BY: ADH
DRAWN BY: KIW
CHECKED BY: ADH

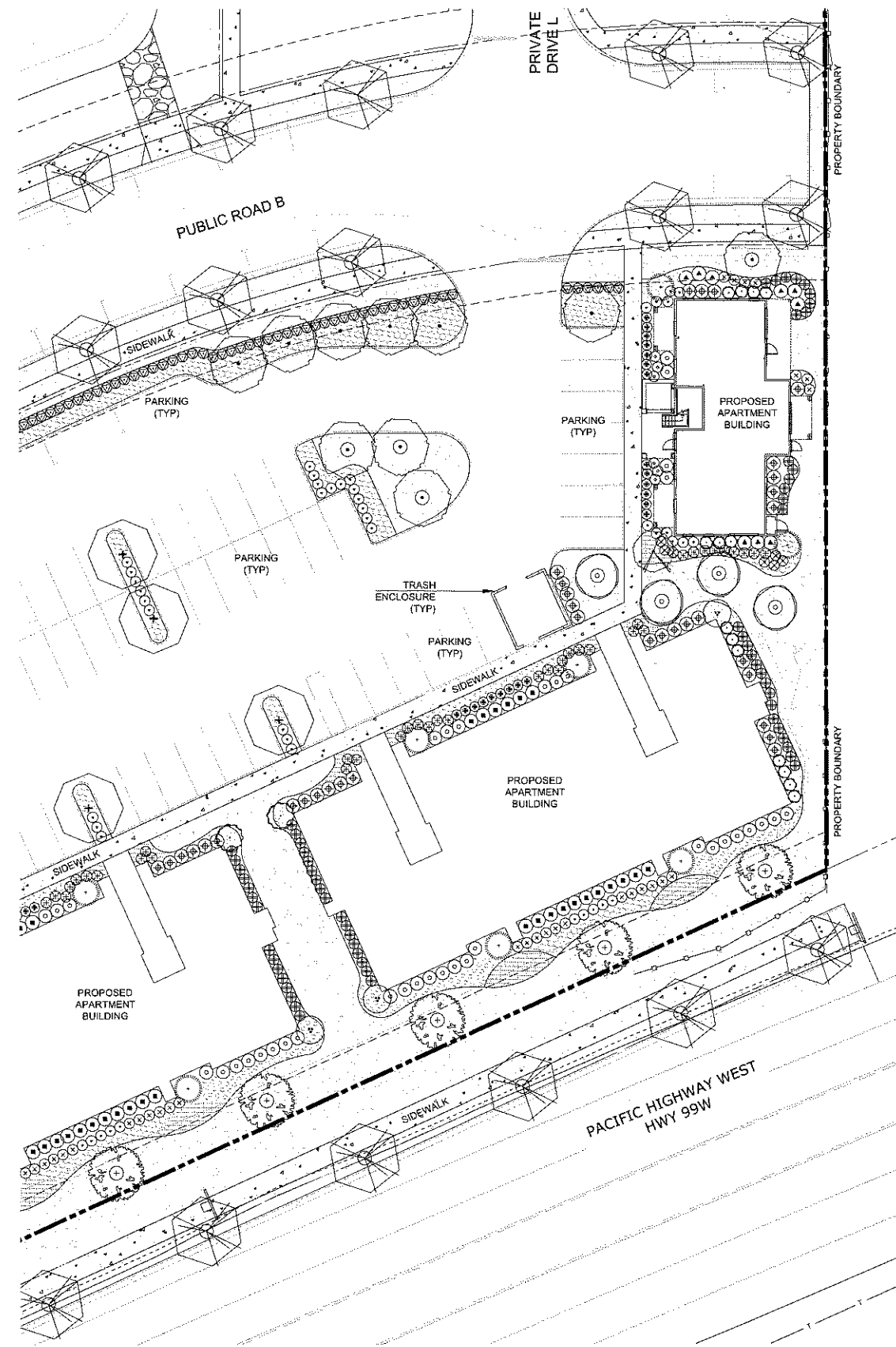
PLANTING PLAN



NOTE: SEE SHEET LS 1.2 FOR PLANT SCHEDULE

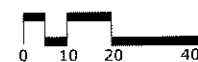
A WETLAND/ COMMON OPEN SPACE PATHWAY AND RESIDENTIAL COURTYARD ENLARGEMENT
SCALE 1"=20'-0"





A APARTMENT COMPLEX AND HWY 99 FRONTAGE ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"



LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	STREET TREES ITEM	SIZE
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LINDEN	2" CAL.
	BETULA JACQUEMONTII HIMALAYAN BIRCH	2" CAL.
	CERCIS CANADENSIS EASTERN REDBUD	1.5" CAL.
	PRUNUS SARGENTII SARGENT CHERRY	1.5" CAL.
	STYRAX JAPONICUS JAPANESE SNOWBELL	1.5" CAL.
	ACER CIRCINATUM VINE MAPLE	7-8' HT.
	PINUS STROBUS 'FASTIGIATA' FASTIGIATE WHITE PINE	6' HT. / B&B
	CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
	THUJA PLICATA 'HOGAN' HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
	VIBURNUM P. 'TOMENTOSUM 'MARIESI' DOUBLEFILE VIBURNUM	7 GAL.
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN' SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
	CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
	BERBERIS THUN 'CHERRY BOMB' CHERRY BOMB BARBERRY	3 GAL.
	ROSA X 'RADRAZZ' KNOCK OUT SHRUB ROSE	3 GAL.
	PRUNUS LAUROCERASUS 'NANA' DWARF ENGLISH LAUREL	7 GAL.
	CHOISYA TERNATA MEXICAN ORANGE	7 GAL.
	ABELIA X GRANDIFLORA GLOSSY ABELIA	7 GAL.
	OSMANTHUS FRAGRANS SWEET OLIVE	7 GAL.
	SARCOCOCOA HOOKERIANA VAR. HUMILIS HIMALAYAN SWEET BOX	3 GAL.
	DAPHNE ODORA 'AUREO-MARGINATA' VARIEGATED WINTER DAPHNE	3 GAL.
	MANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
	VIBURNUM DAVIDII DAVID VIBURNUM	3 GAL.
	ESCALLONIA 'COMPACTA' COMPACT ESCALLONIA	3 GAL.
	LIRIOPE MUSCARI 'BIG BLUE' BIG BLUE LILYTURF	1 GAL.
	MISCANTHUS SINENSIS 'VARIEGATUS' VARIEGATED JAPANESE SILVER GRASS	3 GAL.
	MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	3 GAL.
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
	COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3" O.C.
	RUBUS CALY. 'EMERALD CARPET' EMERALD CARPET CREEPING BERRY	1 GAL. 3" O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 769 ROUGH & READY ECO-TURF MIX BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

PRELIMINARY
 NOT FOR
 CONSTRUCTION

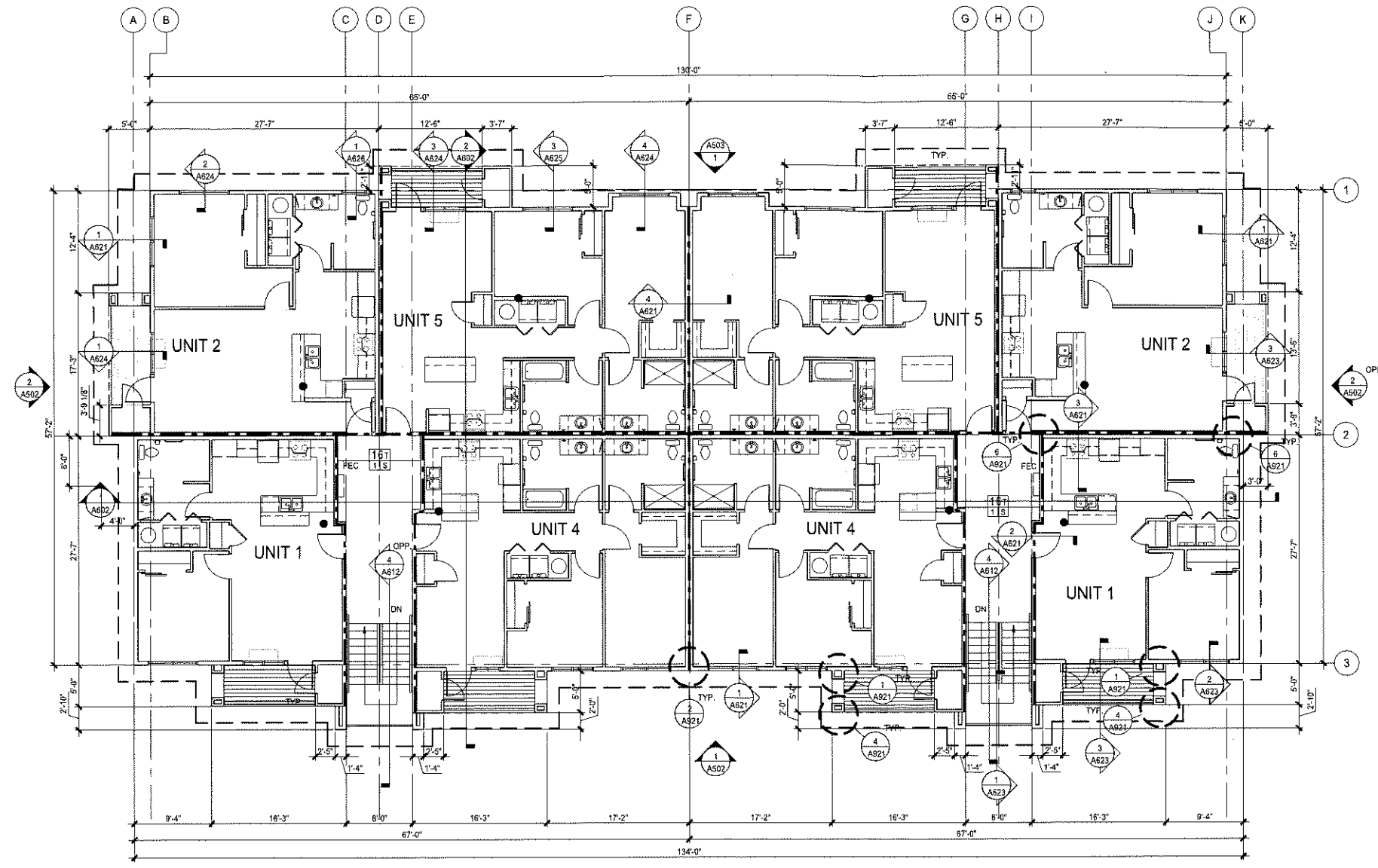
CONSULTANT:

PROJECT NUMBER:
**Crestview
 Crossing
 NEWBERG, OR**

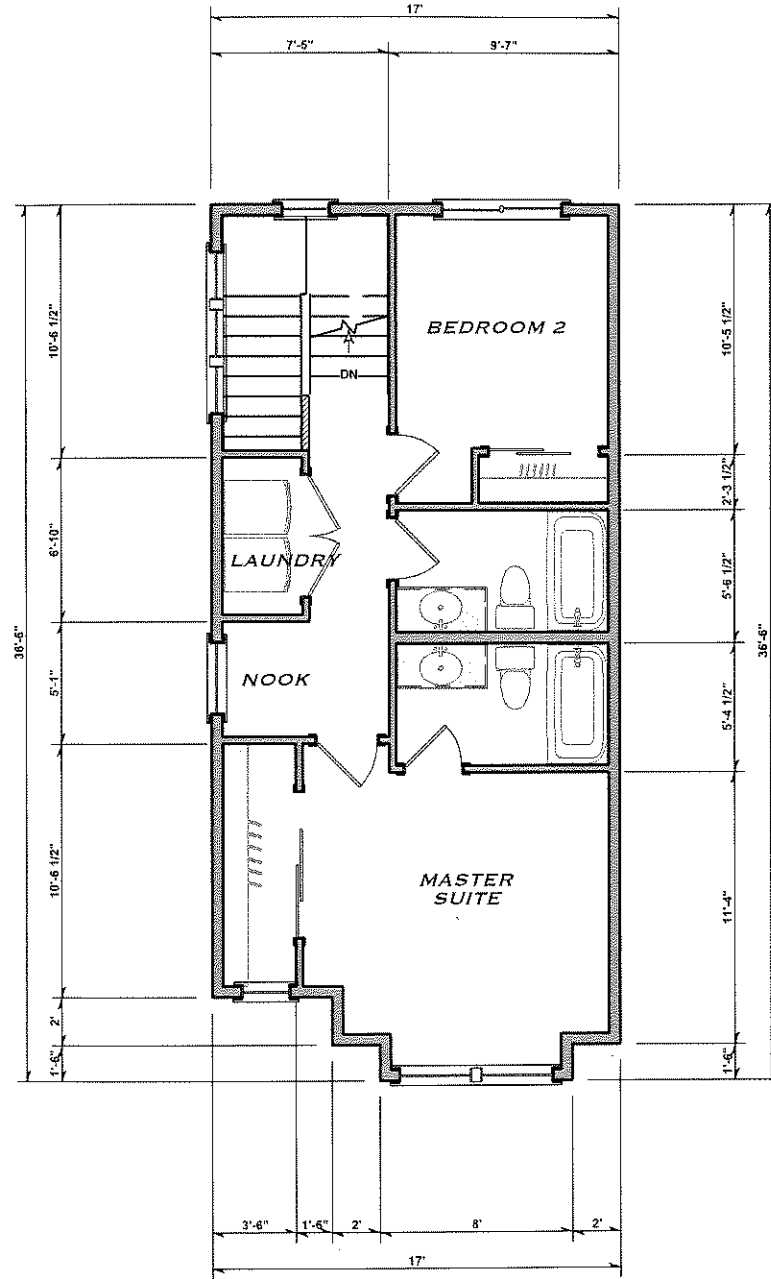
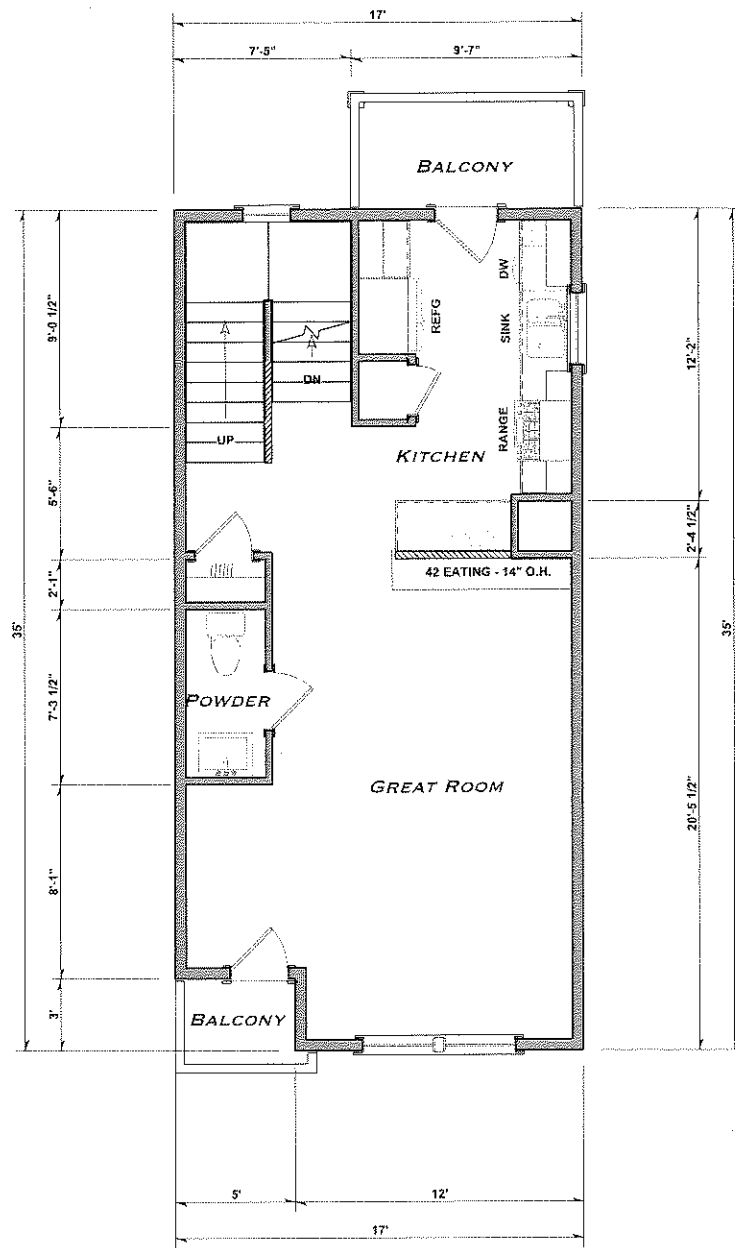
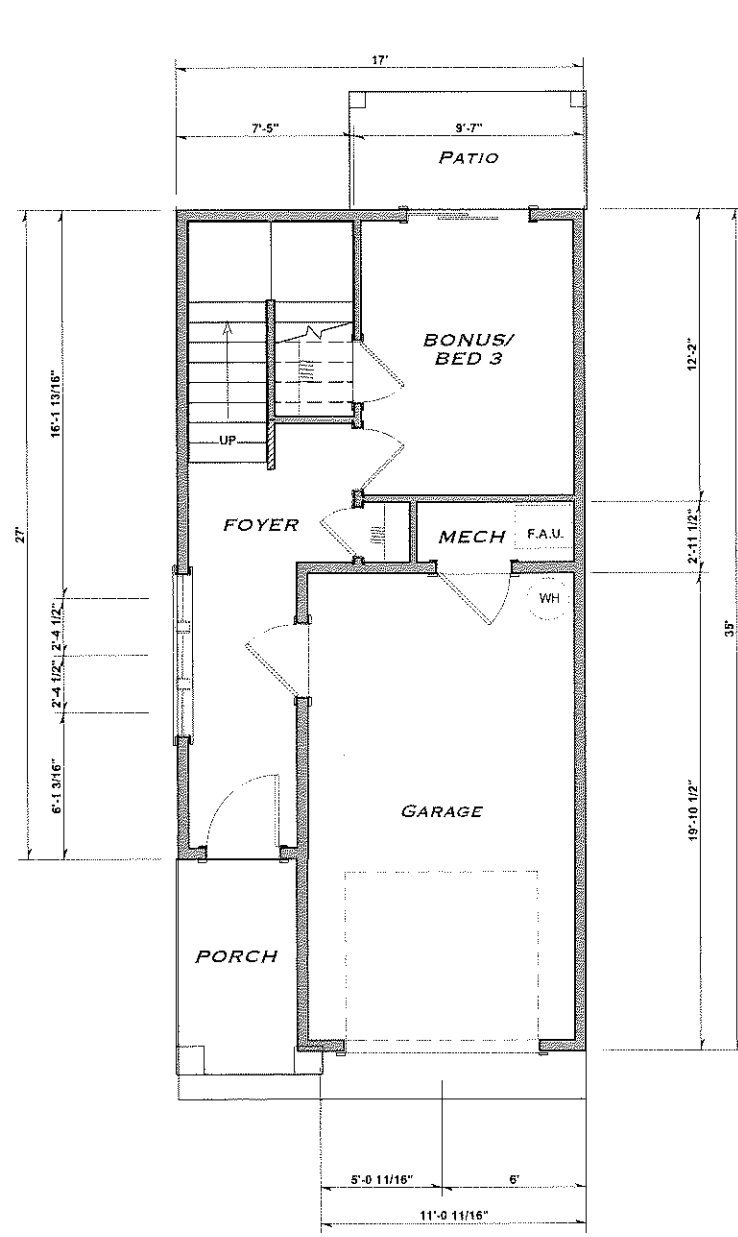
SHEET TITLE:
**BUILDING A2
 FLOOR PLANS**

DRAWN BY:
 DATE ISSUED:

SHEET: **A206**
LRS Architects, Inc. © 2015



1 BUILDING TYPE A2 - THIRD FLOOR UNITS
 SCALE: 1/8" = 1'-0"



17ft wide plan concept

ground floor	322 sq ft
main floor	518 sq ft
upper floor	529 sq ft
total	1,369 sq ft



17ft wide plan concept

ground floor	322 sq ft
main floor	518 sq ft
upper floor	529 sq ft
total	1,369 sq ft



Crestview Crossing

Newberg, Oregon



August 14, 2018

This perspective is conceptual in nature and may change at the owner's discretion in order to meet jurisdictional codes, final site engineering requirements and budget based on pricing for the final plan.

Highway 99 Frontage



Crestview Crossing

Newberg, Oregon

August 14, 2018



J.T. SMITH
companies



This perspective is conceptual in nature and may change at the owner's discretion in order to meet jurisdictional codes, final site engineering requirements and budget based on pricing for the final plan.

Main Entry Concept



Concrete Traffic Strip Around
Perimeter of Roundabout

Future Commercial Site
By Others

Right of Way

Crestview Crossing

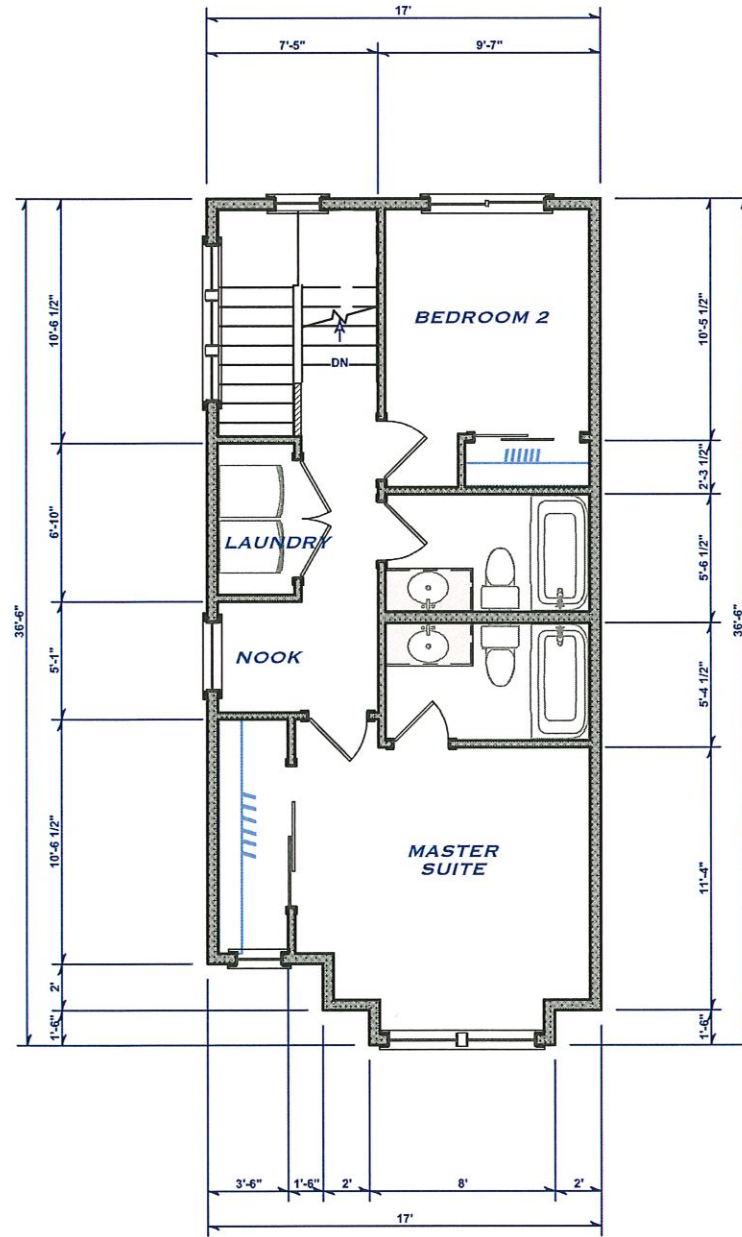
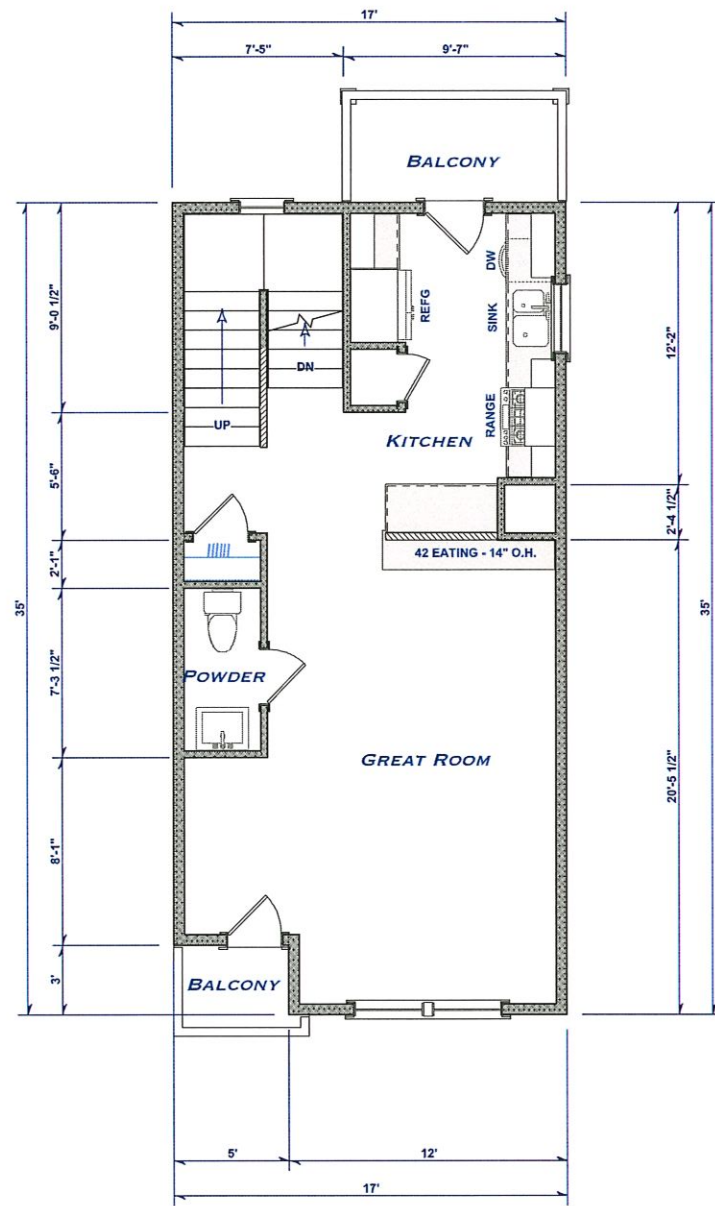
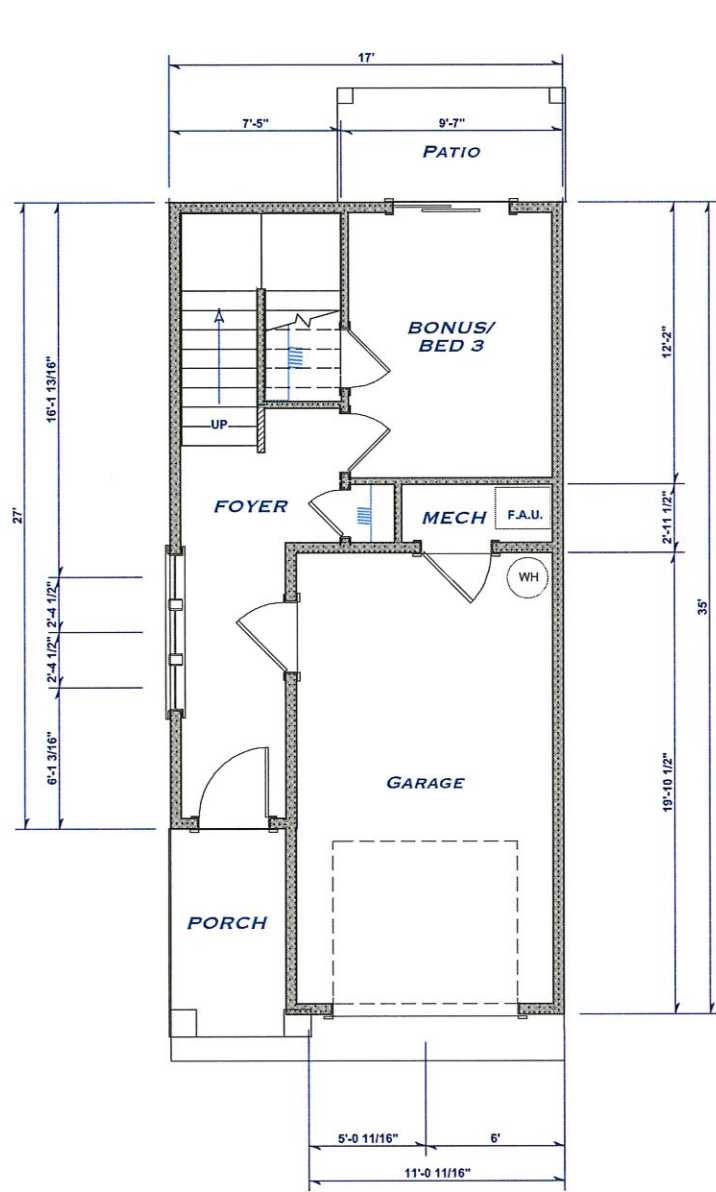
Newberg, Oregon



August 14, 2018

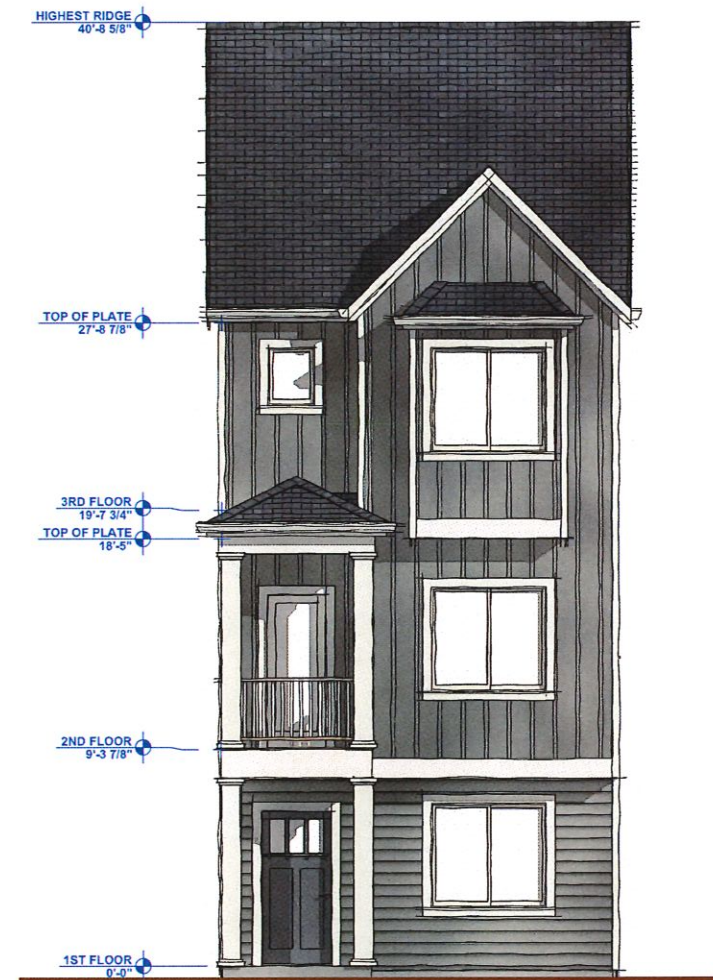
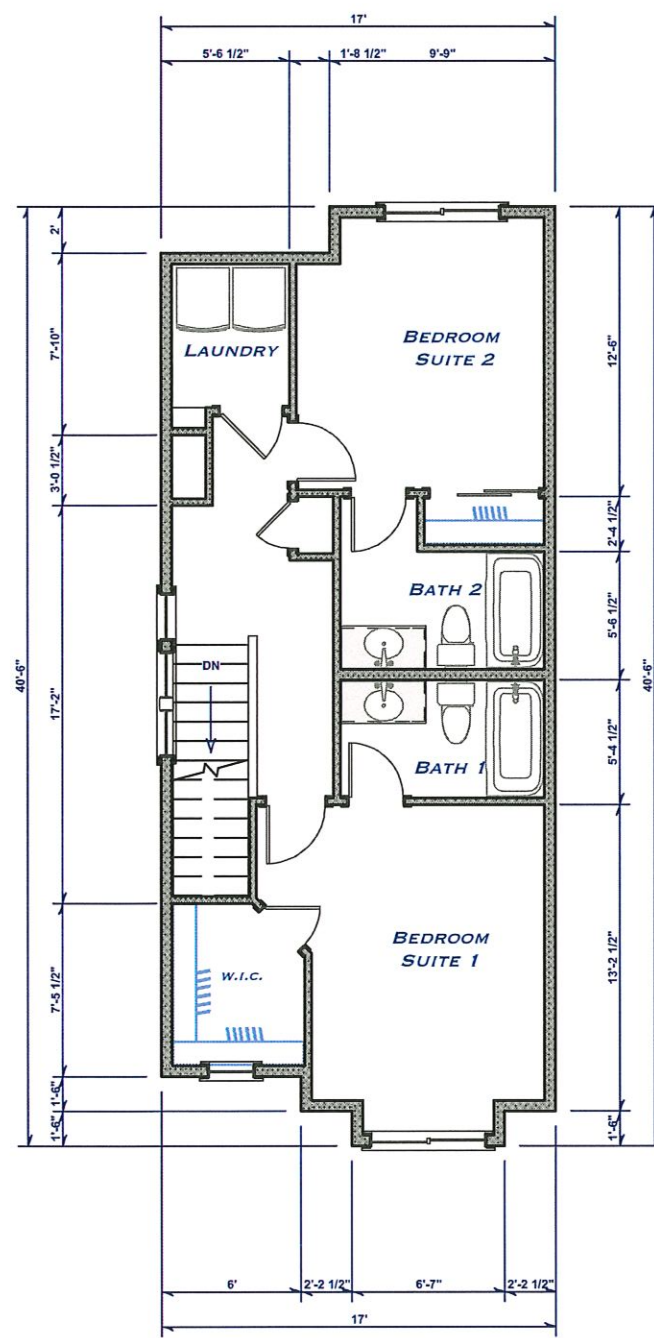
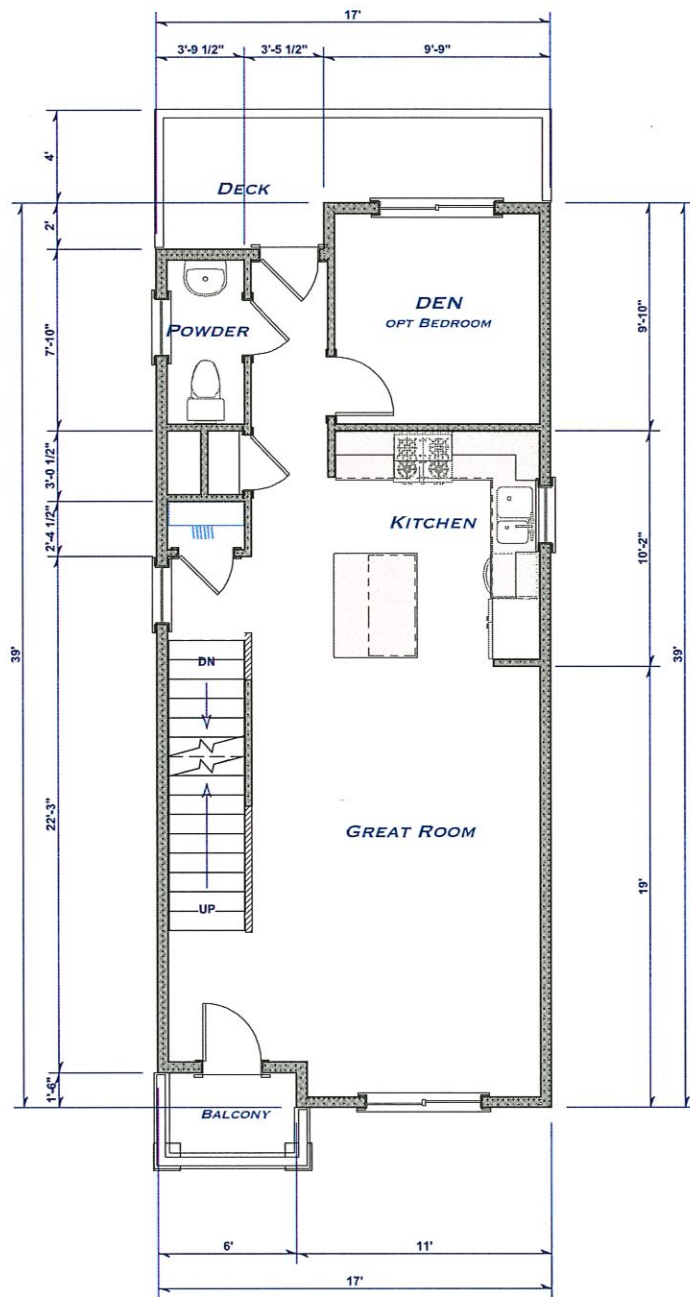
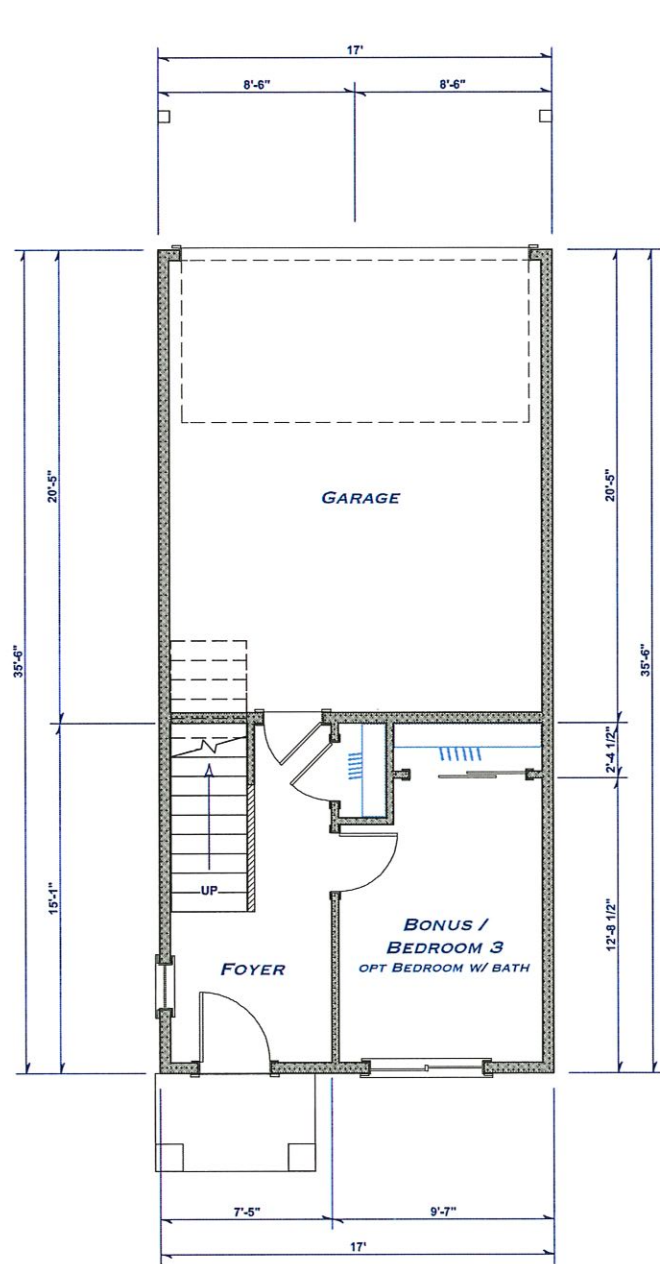
Roundabout Concept

This plan is conceptual in nature and may change as the owner's
discusses in order to meet professional codes, final site engineering
requirements, and budget based on pricing for the final plan.



17ft wide plan concept

ground floor	322 sq ft
main floor	518 sq ft
upper floor	529 sq ft
total	1,369 sq ft



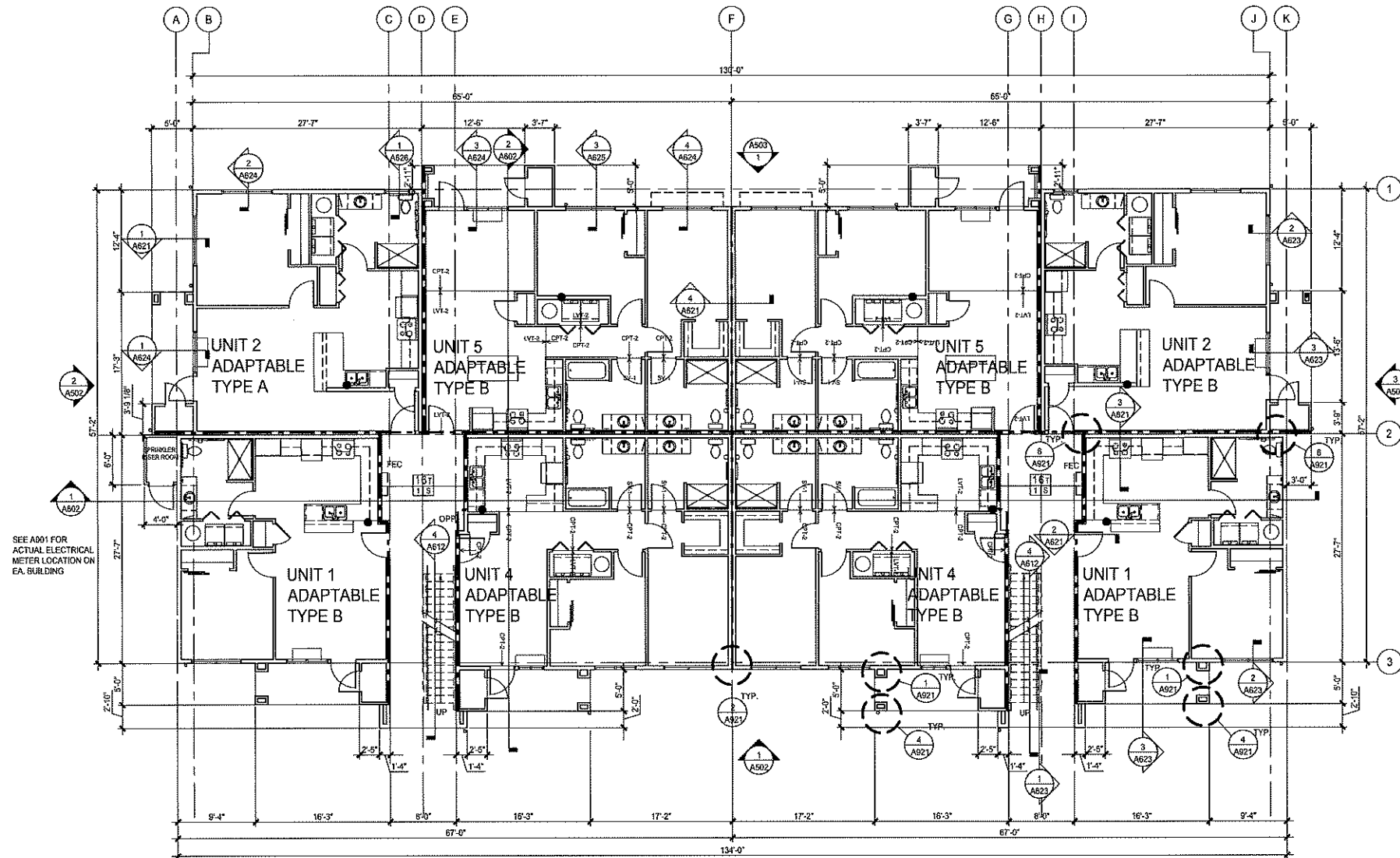
19ft rear loaded townhome plan concept

ground floor	264 sq ft
main floor	595 sq ft
upper floor	608 sq ft
total	1,467 sq ft

PRELIMINARY
 NOT FOR
 CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:
**Crestview
 Crossing**
 NEWBERG, OR



1 BUILDING TYPE A2 - FIRST FLOOR ADAPTABLE UNITS

SCALE: 1/8" = 1'-0"

SHEET TITLE:
**BUILDING A2
 FLOOR PLANS**

DRAWN BY:
 DATE ISSUED:

SHEET: **A204**
LRS Architects, Inc. © 2019

PRELIMINARY
 NOT FOR
 CONSTRUCTION

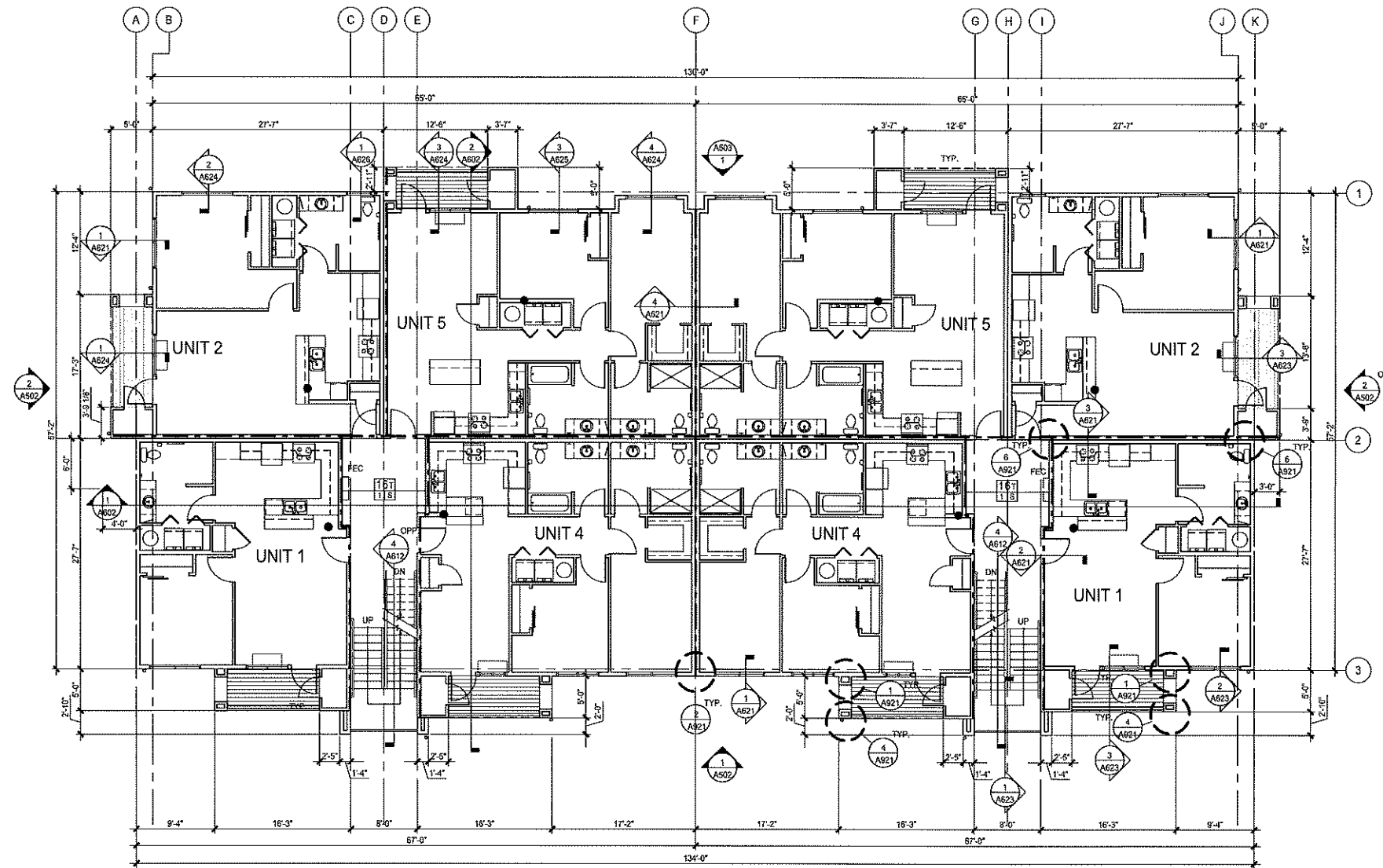
CONSULTANT:

PROJECT NUMBER:
Crestview
Crossing
 NEWBERG, OR

SHEET TITLE:
BUILDING A2
FLOOR PLANS

DRAWN BY:
 DATE ISSUED:

SHEET: **A205**
LRS ARCHITECTS, INC. © 2015



1 BUILDING TYPE A2 - SECOND FLOOR UNITS

SCALE: 1/8" = 1'-0"

PRELIMINARY
 NOT FOR
 CONSTRUCTION

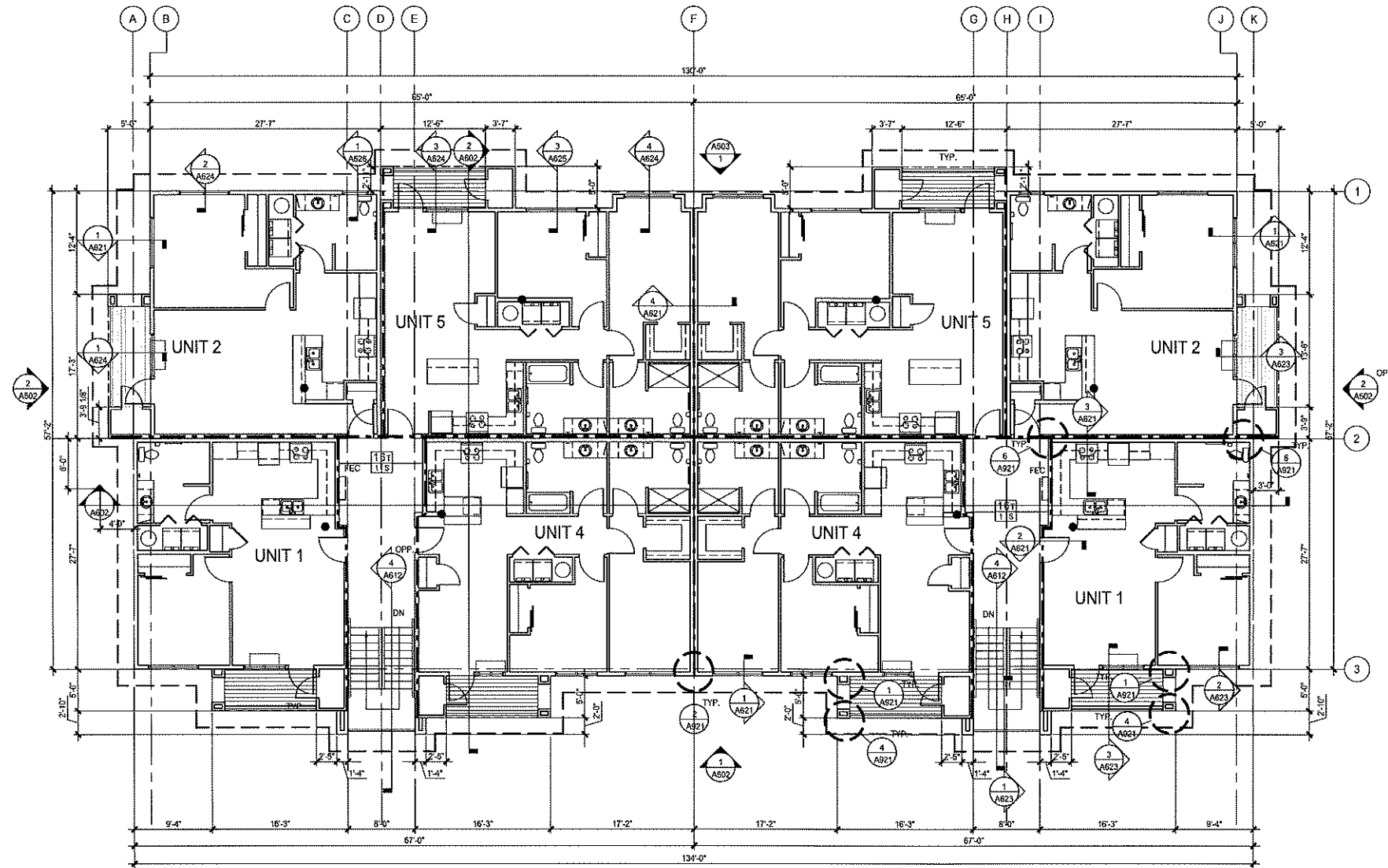
CONSULTANT:

PROJECT NUMBER:
**Crestview
 Crossing**
 NEWBERG, OR

SHEET TITLE:
**BUILDING A2
 FLOOR PLANS**

DRAWN BY:
 DATE ISSUED: 0

SHEET: **A206**
LRS Architects, Inc. © 2015



1 BUILDING TYPE A2 - THIRD FLOOR UNITS
 SCALE: 1/8" = 1'-0"

final 11.12.2015 June P:\Projects\2015\151118_Talman_Woods_Apartment\3D\Documents\A206\A206_03.dwg - BUILDING OVERALL FLOOR PLAN.rvt

PRELIMINARY
 NOT FOR
 CONSTRUCTION

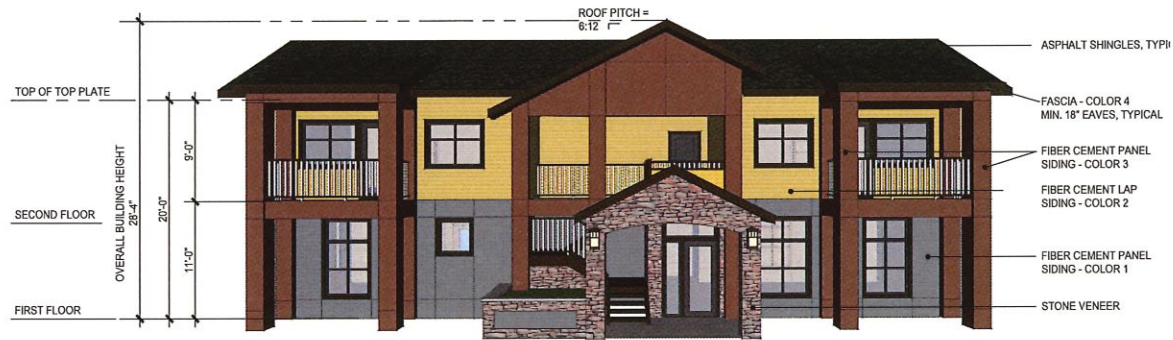
CONSULTANT:

PROJECT NUMBER:
**Crestview
 Crossing
 NEWBERG, OR**

SHEET TITLE:
**CLUBHOUSE
 EXTERIOR
 ELEVATIONS**

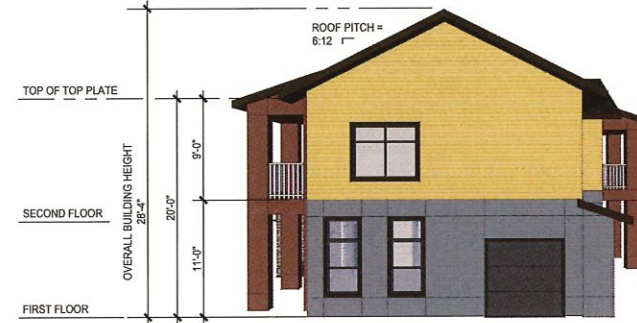
DRAWN BY: SD
 DATE ISSUED: 5/06/11/18

SHEET: **A103**
LRS Architects, Inc. © 2016



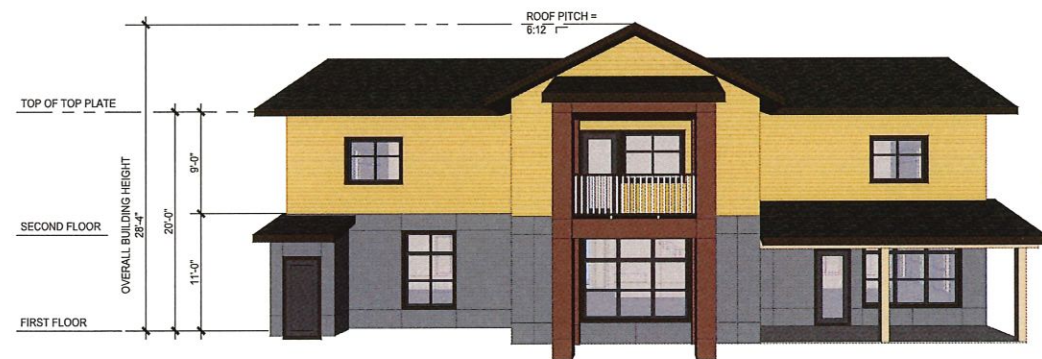
10. SOUTH ELEVATION

SCALE: 1/8"=1'-0"



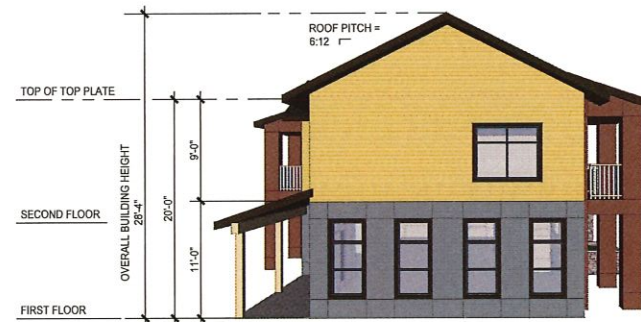
4. WEST ELEVATION

SCALE: NTS



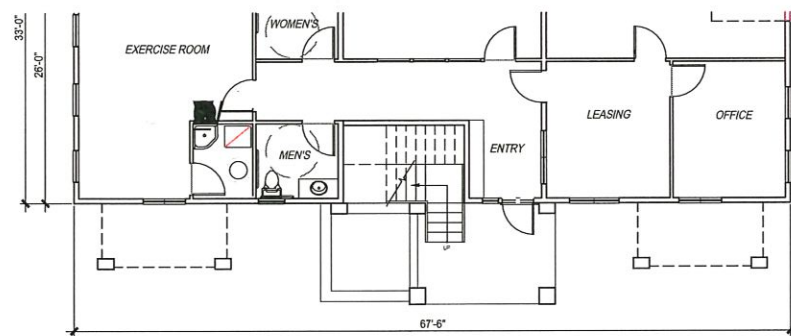
11. NORTH ELEVATION

SCALE: 1/8"=1'-0"



5. EAST ELEVATION

SCALE: 1/8"=1'-0"



12. MAIN LEVEL PLAN VIEW

SCALE: 1/8"=1'-0"

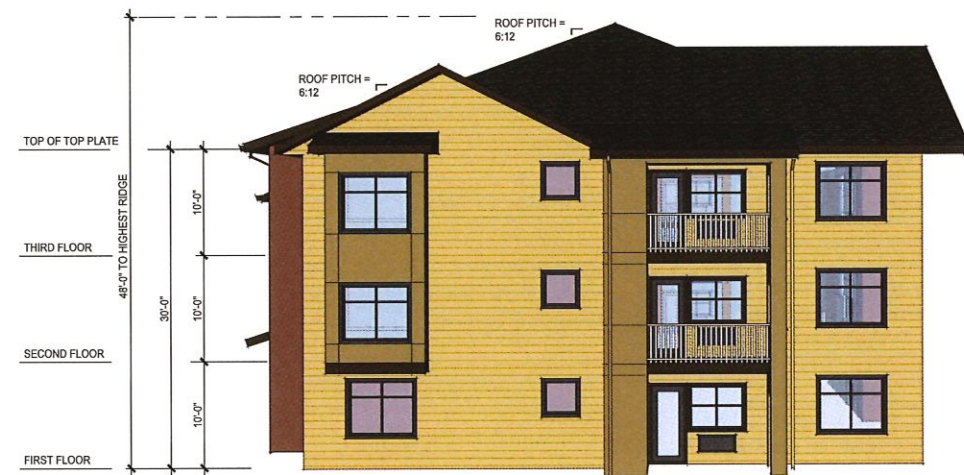


6. PERSPECTIVE

SCALE: NTS

PRELIMINARY
 NOT FOR
 CONSTRUCTION

CONSULTANT:



10. BUILDING TYPE A2 - TYPICAL END ELEVATION

SCALE: 1/8"=1'-0"



5. PERSPECTIVE

SCALE: NOT TO SCALE



11. BUILDING TYPE A2 - ENTRY ELEVATION

SCALE: 1/8"=1'-0"



12. BUILDING TYPE A2 - REAR ELEVATION

SCALE: 1/8"=1'-0"

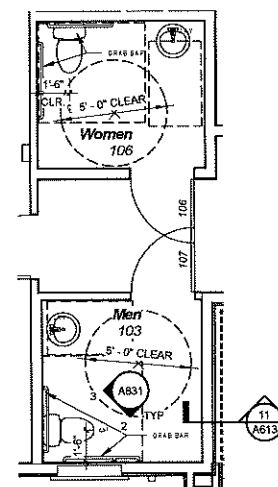
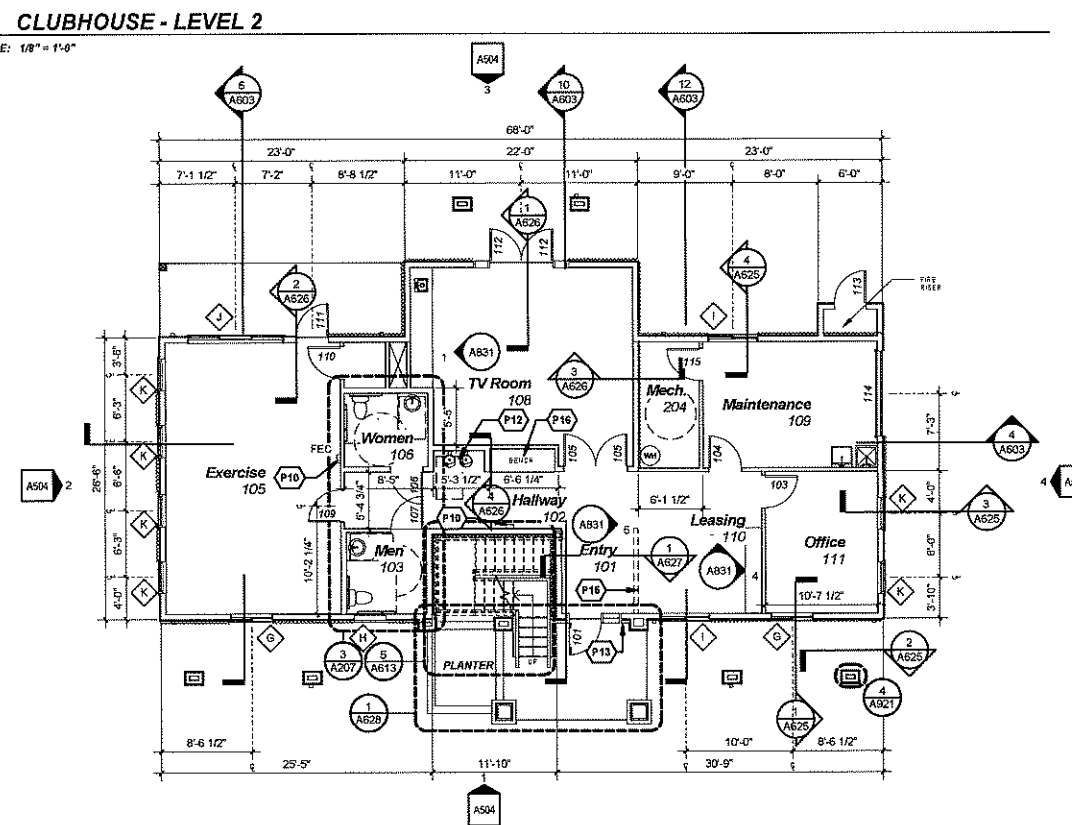
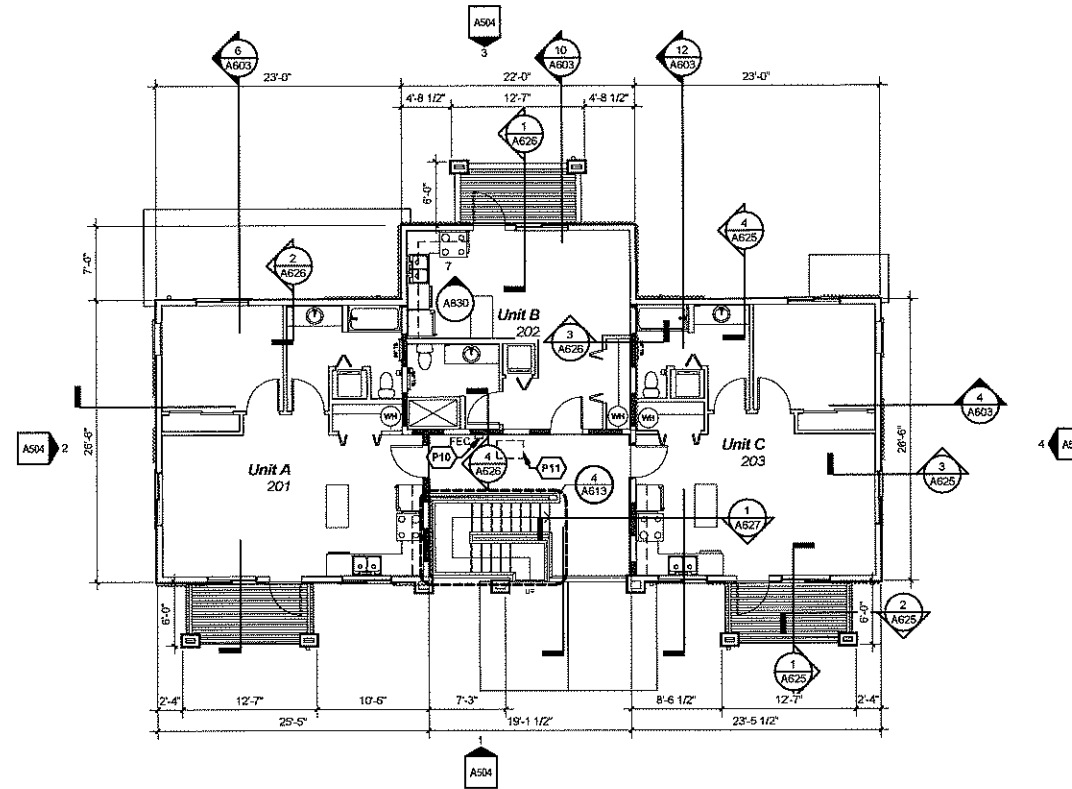
PROJECT NUMBER:
**Crestview
 Crossing**
 NEWBERG, OR

SHEET TITLE:
**BUILDING A2
 EXTERIOR
 ELEVATIONS**

DRAWN BY: JW
 DATE ISSUED: 06/01/18

SHEET: **A102**
LRS Architects, Inc. © 2018

11:23am 7 June P:\Projects\2018\18066_Alexisbrook_Apartment\305_Arch\A2\Ext Elevations\A2_11.dwg



- GENERAL NOTES:**
- ALL PLAN WALLS SHOW FRAMING ONLY. NO FINISHES ARE DRAWN. ALL DIMENSIONS ARE TO FACE OF FRAMING UNLESS OTHERWISE NOTED. EXTERIOR DIMENSIONS ARE TO FACE OF FOUNDATION. FACE OF FRAMING DIMENSIONS INDICATED AS "CLEAR MINIMUM" ARE TO FACE OF FINISH.
 - ALL DOOR OPENINGS PERPENDICULAR TO A WALL ARE 9" TO THE WALL UNLESS NOTED.
 - SEE AI SHEET FOR STANDARD FIXTURE MOUNTING HEIGHTS AND REQUIREMENTS UNLESS NOTED.
 - SEE SITE PLAN FOR BUILDING ORIENTATION.
 - SQUARE CORNERS AT ALL GYPSUM BOARD CORNERS.
 - SEE ENLARGED UNIT PLANS FOR INTERIOR WALL DIMENSIONS AT LEVEL 2.
 - FOR ENLARGED UNIT PLANS SEE DRAWING SHEETS BEGINNING AT "A220".

KEYNOTES

P10	FIRE EXT. CABINET
P11	20" X 30" MINIMUM ATTIC ACCESS
P12	DRINKING FOUNDATION COMBO HIGH/LOW ALLOWABLE OCCUPANCY SIGN
P15	WOOD SLAT PARTITION - GREEN FURNITURE SOLUTIONS. TWO 4'-0" X 6'-0" PARTITIONS.
P18	DENALI LIVE EDGE WOOD BENCH

- WALL TYPES**
- EXTERIOR WALLS:**
EXTERIOR WALL TYPES VARY. SEE EXTERIOR ELEVATIONS AND WALL SECTIONS FOR LOCATIONS.
 - TYPICAL WALL W/ SIDING SYSTEM IS TYPE AT PANEL SIDING: **16.1 N/E**
 - TYPICAL WALL W/ SIDING SYSTEM IS TYPE AT LAP SIDING: **26.1 N/E**
 - TYPICAL WALL IS TYPE: **34.1 N/E**
 - TYPICAL WALL W/ STONE IS TYPE: **43.1 N/P**
 - INTERIOR WALLS:**
 - TYPICAL INTERIOR WALL IS TYPE: **14.1 N/S**
 - TYPICAL BATHRM WALL IS: **14.1 N/S**
 - TYPICAL SHARED UNIT (PARTY) WALL IS TYPE: **34.1 T/S**
- WALLS WITH WOOD SHEATHING:**
- FOR STRUCTURAL SHEAR, LOCATE WOOD SHEATHING ON SIDE OF WALL WITH SAWTOOTH LINE AS INDICATED. SEE STRUCTURAL DRAWINGS FOR SIZE AND NAILING SCHEDULE.

HORIZONTAL ASSEMBLIES

SEE WALL SECTIONS AND CODE ANALYSIS DRAWINGS FOR TYPE. ALL WITH FIRE RESISTANCE OPENING PROTECTION BY SHAFTS, ASSEMBLIES, BY EXCEPTION FOR DUCTS AND PENETRATIONS.

- LEGEND**
- 1-HOUR FIRE PARTITION.
 - SEE CODE ANALYSIS PLANS FOR WALL DESIGNATIONS. FIRE RESISTIVE OPENING PROTECTION AT DOORS, WINDOWS, DUCTS (WITH EXCEPTIONS), PENETRATIONS, AND PROTECTION AT JOINTS. SEE WALL TYPES, DOOR AND WINDOW SCHEDULES, PENETRATION DETAILS, AND JOINT DETAILS WHERE APPLICABLE.
 - NON-RATED WALL: AT NON-BEARING INTERIOR WALLS WITH NO OPENING PROTECTION REQUIRED AT DOORS, WINDOWS, DUCTS, PENETRATIONS, AND JOINTS UNLESS NOTED. SEE WALL TYPES. SEE STRUCT.
 - FIRE EXTINGUISHER CABINET.

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com

7916 REGISTERED ARCHITECT
THOMAS PAUL FRANK, JR.
STATE OF WASHINGTON

PROJECT NUMBER: 216086
Alderbrook Apartments
Vancouver, WA

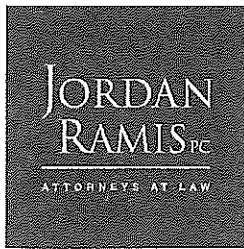
KEY PLAN:

True North

SHEET TITLE:
CLUBHOUSE - OVERALL FLOOR PLANS

DRAWN BY: DM
DATE CREATED: 09/09/16

SHEET:
A207
PHASE 1-PERMIT SET
September 09, 2016
LRS Architects, Inc. © 2016



Lake Oswego
Two Centerpointe Dr., 6th Floor
Lake Oswego, OR 97035
503-598-7070
www.jordanramis.com

Vancouver
1499 SE Tech Center Pl., #380
Vancouver, WA 98683
360-567-3900

Bend
360 SW Bond St., Suite 510
Bend, OR 97702
541-550-7900

Via E-Mail
doug.rux@newbergoregon.gov

August 9, 2018

City of Newberg
Planning Commission
c/o Doug Rux, Community Development Director
414 E First Street
Newberg, OR 97132

Re: ***Crestview Crossing – Planning Commission Hearing***

Dear Planning Commissioners:

We are writing on behalf of our client JT Smith Companies (JT Smith) the developers of Crestview Crossing, regarding Thursday's scheduled hearing for the property located at OR 99W and Crestview Drive (Tax Lot Nos. 3216AC 13800 & 3216 1100). First of all we would like to thank staff for all of their hard work and support for this project. However, the hearing for Crestview Crossing PUD18-0001/CUP18-004 was scheduled before the staff report and other preparations were complete which made it difficult for ourselves and other interested parties to prepare, and therefore we request a continuance of the hearing until the September meeting. We believe this will also allow staff additional time to evaluate additional forthcoming clarifications, analysis and information.

This is a large mixed use development, and a correspondingly large volume of application materials was provided. Unfortunately the staff report was delayed and none of the interested parties have had the customary amount of time to review it and prepare for the hearing. In addition, it was recently discovered that a project opponent has used the developer's law firm on an unrelated matter, and therefore the developer's land use attorney was compelled to abruptly withdraw from this application to avoid a potential conflict of interest. I am the new developer's attorney, and have not had sufficient time to prepare for the hearing, despite the best efforts of Keith Leonard and Doug Rux to bring me up to speed. We appreciate their help and the staff recommendation for approval.

At more than 900 pages and counting, understanding the record is a daunting challenge for everyone involved. It includes extensive data on traffic, including the Six Party Agreement regarding Crestview Drive, and detailed soil and geologic information regarding the wetland and local hydrology. The project opponents have raised several concerns on these and related topics, some of which are outside the scope of typical approval criteria, such as interpretation of the Six Party Agreement. The developer and its consultants will provide appropriate responses, however that takes time, and cannot be prepared on short notice.

Planning Commissioners
August 9, 2018
Page 2

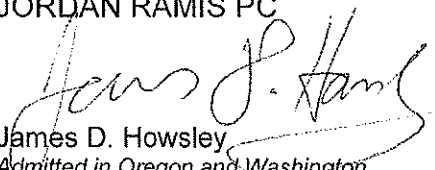
The Planning Commission should continue the hearing until the next regular meeting on September 13 to allow everyone, including Planning Commissioners, time to review and absorb the staff report and the extensive record materials. At the September 13 hearing, the Planning Commission can hear testimony from all interested parties in one evening. The project opponents can explain their concerns, and the development team will present expert testimony to respond to those concerns and confirm that the project continues to meet the approval standards and criteria. Having both sides present at the same hearing is the most effective way to receive testimony about complex projects. And we believe that given more time we can narrow the issues for all of the parties, including staff and the planning commission to consider.

In order to enable the extension of time required for the preparation and the submission of substantive responses and evidence the Applicant is prepared to concurrently request an extension of the project's 120 day clock by thirty six (36) days in order to allow for the submission of new information and the public hearing on September 13, 2018.

Thank you for considering this request to continue the hearing, we look forward to being before you this evening and will reiterate this request and working with you to make this project a success for the City.

Very truly yours,

JORDAN RAMIS PC

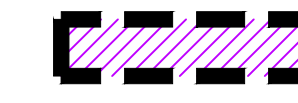
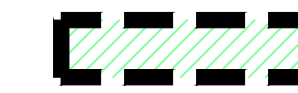





James D. Howsley
Admitted in Oregon and Washington
Jamie.howsley@jordanramis.com
OR Direct Dial (503) 598-5590
WA Direct Dial (360) 567-3913

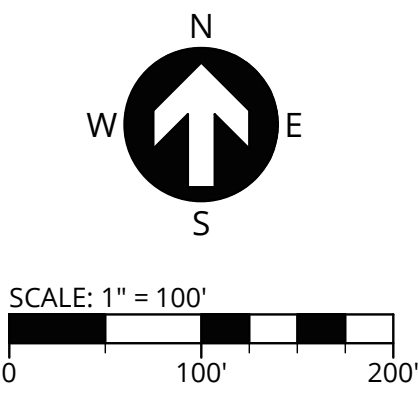
cc: Gary Bliss
Jason Dale
Allyn Edwards
Ron Wolfe
Philip Smith
Robert Ficker
Miranda Piros

P:\17283-JTS-CRESTVIEW CROSSING\CADD\EXHIBITS\2018-07-17 PHASING EXHIBIT\17283-EXH-PHASING PLAN.DWG



LEGEND

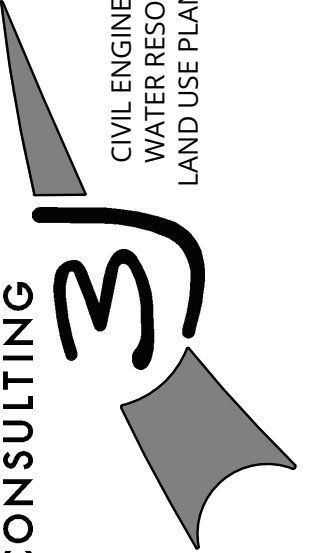
-  PHASE 1
-  PHASE 1A
-  PHASE 2
-  PHASE 3
-  PHASE B (ANYTIME AFTER PHASE 1)
-  PHASE C (ANYTIME AFTER PHASE 1)



PUBLISH DATE
07.18.2018
 ISSUED FOR
 LAND USE DOCUMENTS

PHASING PLAN
CRESTVIEW CROSSING
 PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

3J CONSULTING



CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING

5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
EXH

July 24, 2018

Mr. Keith Leonard, AICP
Associate Planner
City of Newberg
414 E. First Street
Newberg, Oregon 97132

Crestview Crossing #3216AC-13800

Dear Mr. Leonard,

This letter has been prepared on behalf of our client, JT Smith Companies, to introduce new information into the record for the Crestview Crossing Planned Unit Development and Conditional Use Permit (#3216AC-13800).

As you are aware, this is a large and complex project. During the time which has elapsed since the initial submission to the City, our clients have been receiving refined sales and absorption projections and have been updating the plat to accommodate a series of potential changes to the housing mix. Our office has also been working over the past several weeks to develop a project phasing plan for construction and for the platting of lots within the development. Phasing plans are permitted within Planned Unit Developments within section 15.240.020.C of the City's Community Development Code. Because of the size and complexity of this development project, the Applicant has submitted the attached preliminary phasing plan and revised preliminary plat for consideration by the City. The following sections have been provided in order to further explain the intent of the submission of each document:

Project Phasing:

As directed by section 15.240.020.D of the City's general provisions for a Planned Unit Development, the Applicant is entitled to propose a phasing schedule for the completion of final plan phases and may specify a schedule for the completion of phase within a development. This section indicates that if preliminary plans encompassing only a portion of the site are submitted, they must be accompanied by a statement and be sufficiently detailed to prove that the entire area can be developed and used in accordance with city standards, policies, plans, and ordinances. In the original land use application, the applicant acknowledged that a phasing plan could be submitted. This letter has been prepared to transmit a proposed phasing plan. The phasing plan is described as follows:

- Phase 1: This phase will include improvements to the site's frontage along Highway 99 and the installation of underground utility connections necessary to provide service to the site.
- Phase 1a: This phase will include the extension of Crestview Drive through the site and the construction of roadways and lots located east of the Crestview extension to public road D. This phase will also include the stormwater facility located south of public road B.
- Phase 2: This phase will include the installation of the roadways, infrastructure and lots which are to be located west of the Crestview extension.



- Phase 3: This phase will include the lots located east of public road D to the property's eastern property boundary.
- Phases B and C will be constructed after the construction of Phases 1 and 1A and may be constructed independently of the subdivision lots and by other entities or assigns.

Due to the size of the plan and the complexity of the various components within the development, the Applicant would request that the City grant the developer a ten (10) year window for the construction of the infrastructure shown within the plan's phases with opportunities for up to five (5) one (1) year extensions following the approval of the preliminary plat. While the Applicant does not intend to wait for ten (10) years to allow for the construction of the proposed improvements, the flexibility afforded by the ten (10) year schedule with the requested extensions will allow for the project's various components to be sensitive to changing market conditions.

In addition to covering the entitlements afforded to the developer through Section D of the Planned Unit Development's general conditions, this phasing schedule is also intended to supersede the one (1) year limitation imposed upon Conditional Use Permits which is described in section 15.225.100 and the Final Plat criteria described in section 15.235.070. This time limitation can be made to be flexible by section 15.225.080.L of the City's code. Within this section, the City's hearing body provided with the ability to define the time period within which the proposed uses shall be developed.

Revised Preliminary Plat

As mentioned above, the preliminary plat submitted with the application has been recently evaluated by a series of real estate professionals with the intent of providing guidance regarding product selection and absorption. While the guidance provided is helpful to the developer, it should be noted that as the development is constructed and as homes are constructed and sold, the projected data regarding product typologies and market preferences will convert from projection to tangible sales data.

The attached revised preliminary plat has been submitted as a slight alternative to the plat initially submitted. The proposed changes in the alternative plat reflect a desire on the part of the builder to remove the attached product from the plan in favor of all detached homes. This resulted in a slight reconfiguration of several of the lots which had previously been identified as attached units. The reconfiguration resulted in slight adjustments to the proposed lots to accommodate the desired setback configurations for detached products.

The information gathered as sales commence may cause the developer to select slight alterations to the product mixture represented within the attached plat and may result in the need for changes to the widths of lots within the proposed preliminary plat. This request has been expressed in order to allow the developer to make adjustments as required to support homebuyer's preferences and choices. In no event would the developer anticipate the removal of or addition of new lots within the development without first requesting an amendment to the approved planned unit development.

We very much appreciate the City's considerations of the additional materials submitted herein. We would invite you to please feel free to give us a call if you have any questions or need any additional clarification.



Sincerely,

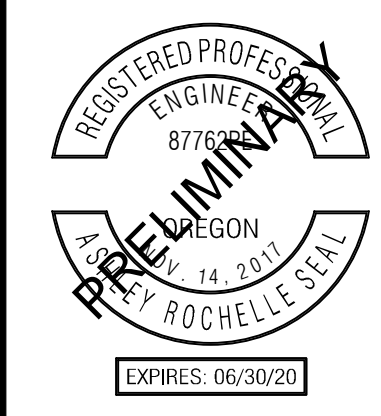


Andrew Tull

Principal Planner
3J Consulting, Inc.

copy: Jesse Nemec, JT Smith Companies
Mike Robinson, Schwabe Williamson and Wyatt
File - 17393





PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SITE STATISTICS	
SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

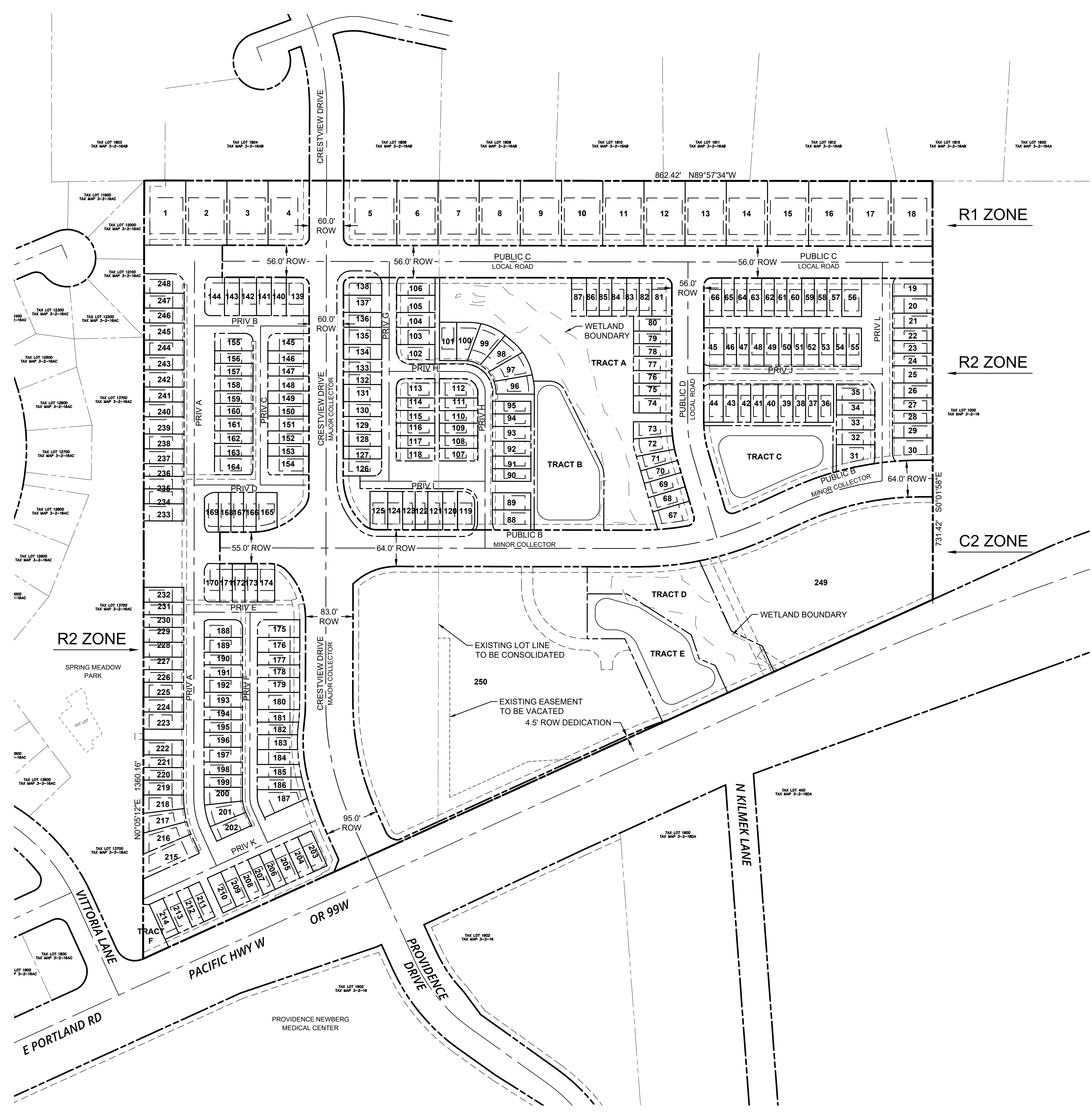
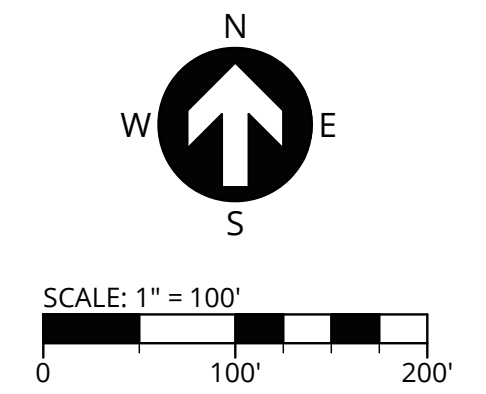
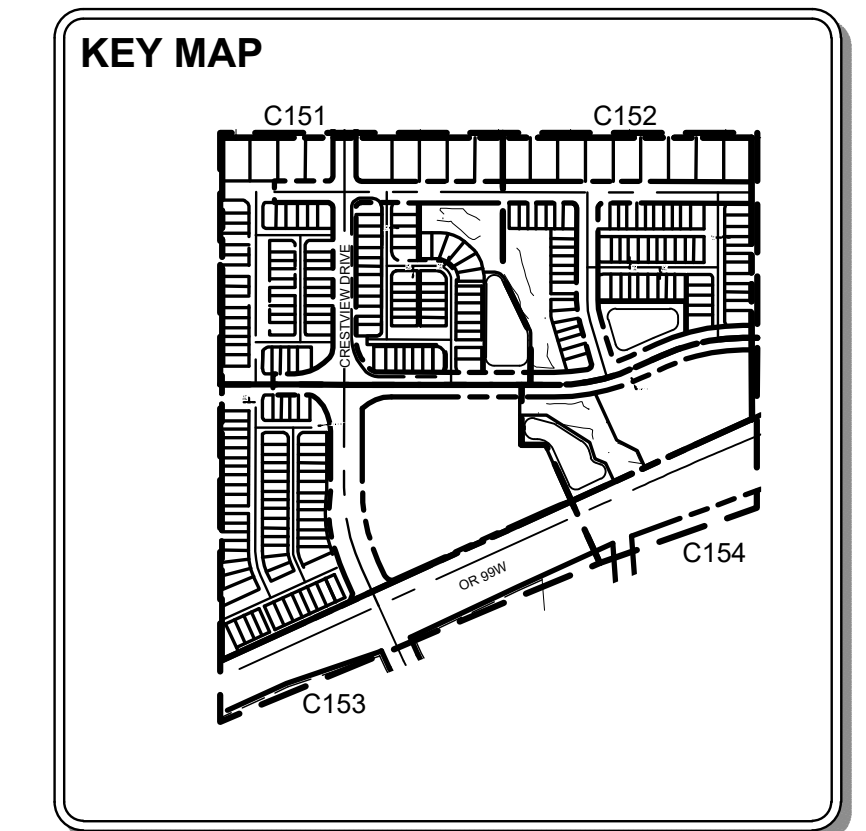
ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	
			ZONE R-2	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS	
FRONT	15 FT 15 FT 10 FT 10 FT
INTERIOR	5 FT 5 FT 2.5 FT 0 FT/10 FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND	
	PROJECT BOUNDARY
	EXISTING RIGHT-OF-WAY LINE
	EXISTING RIGHT-OF-WAY CENTERLINE
	EXISTING LOT LINE
	EXISTING ADJACENT PROPERTY LINE
	EXISTING EASEMENT
	PROPOSED RIGHT-OF-WAY LINE
	PROPOSED RIGHT-OF-WAY CENTERLINE
	PROPOSED LOT LINE
	PROPOSED SETBACK LINE
	PROPOSED EASEMENT



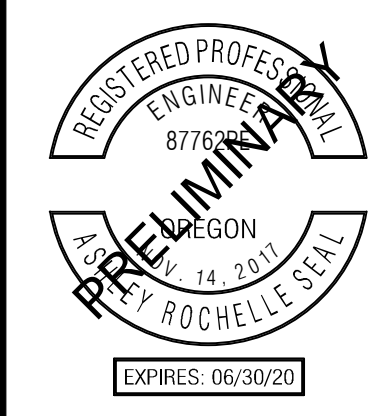
OVERALL TENTATIVE PLAT
CRESTVIEW CROSSING
 PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

3J CONSULTING
 CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING
 5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C150

P:\17393-3J-CRESTVIEW CROSSING\CADD\DC150 TENTATIVE PLAT.DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

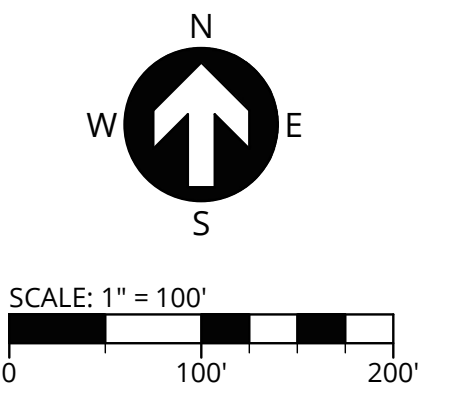
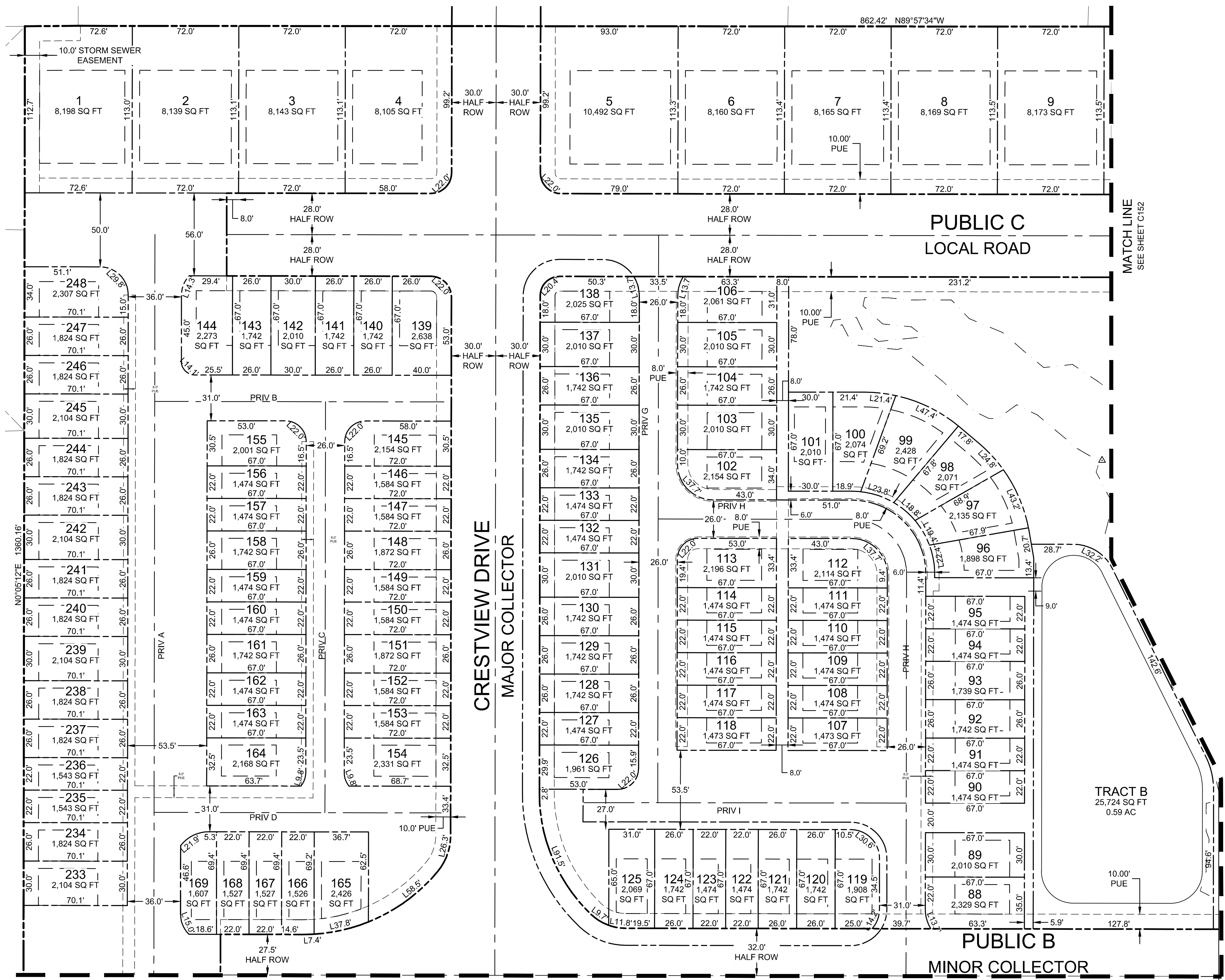
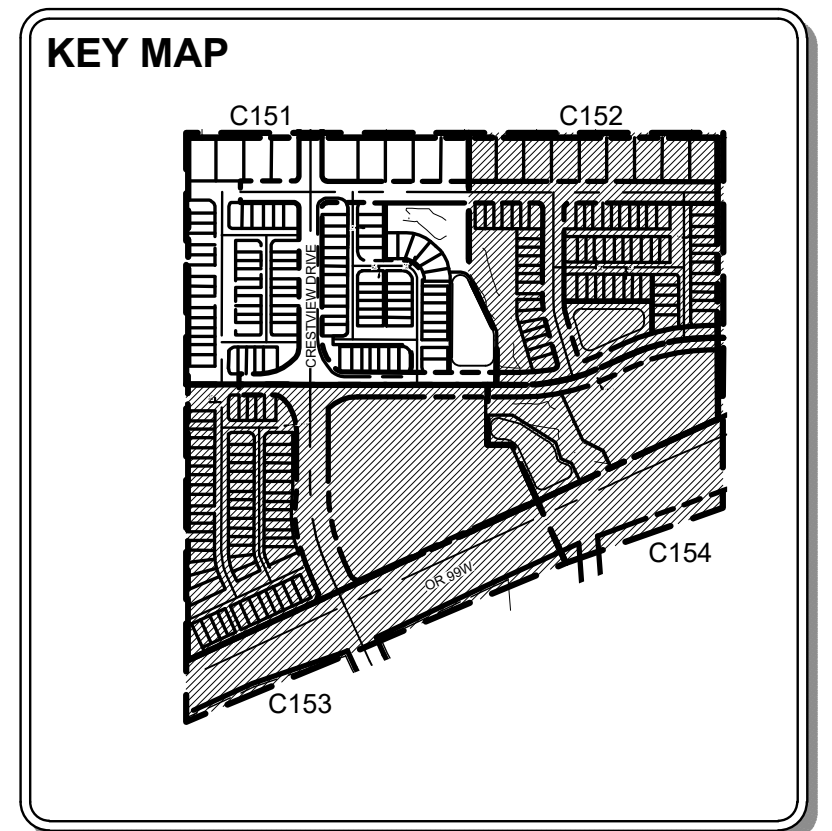
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10 FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

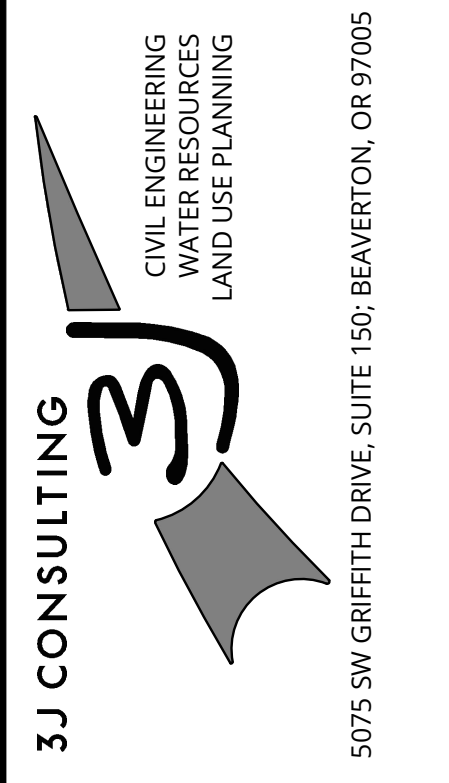
THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY



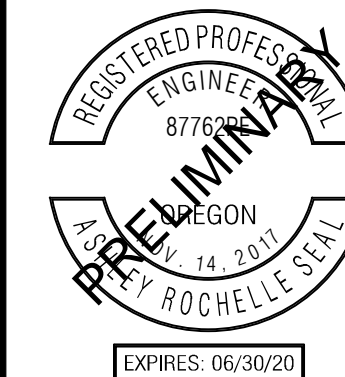
TENTATIVE PLAT /
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR



PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C151

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C151.DWG TENTATIVE PLAT.DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A
SETBACKS				
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

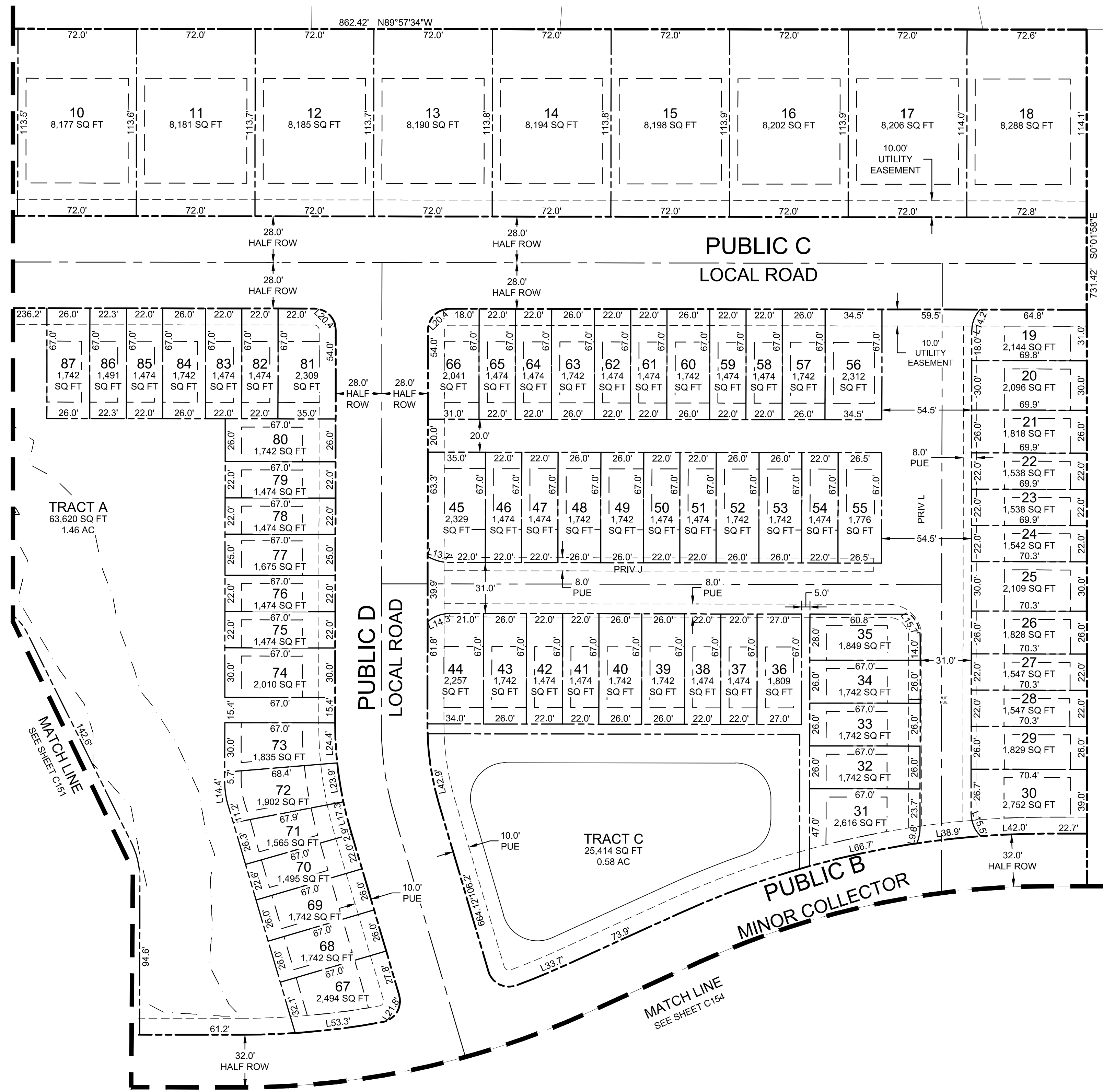
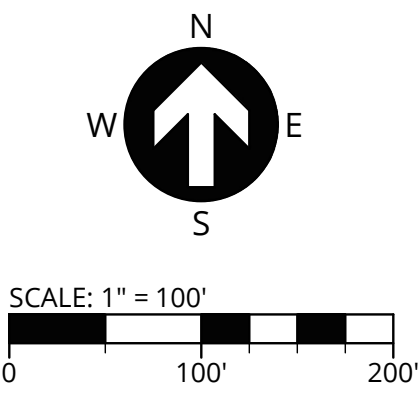
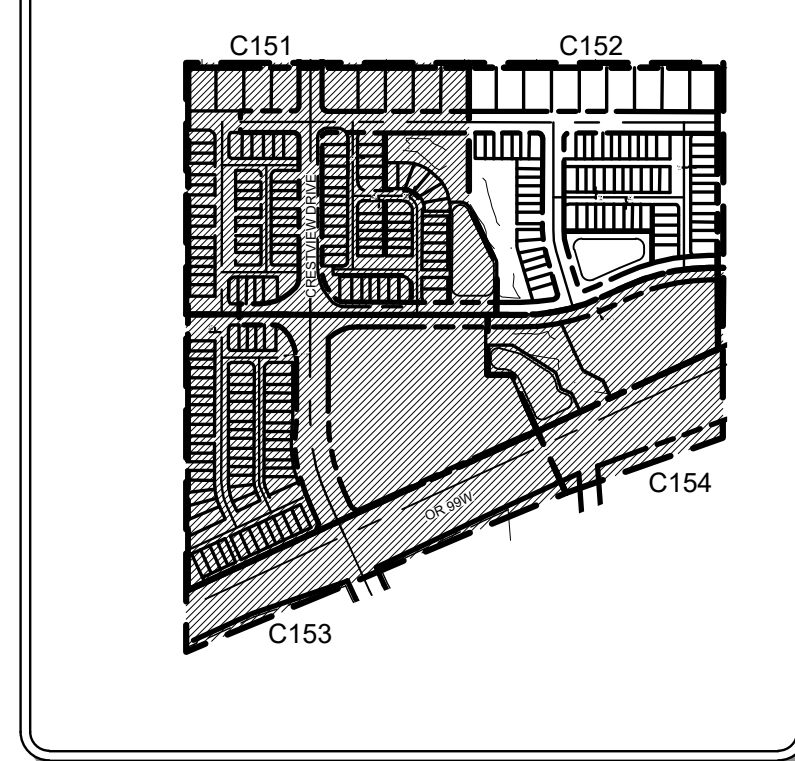
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



TENTATIVE PLAT II
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

3J CONSULTING
 CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING
 5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C152

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C152 TENTATIVE PLAT.DWG

MATCH LINE
SEE SHEET C151

**PUBLIC B
MINOR COLLECTOR**

MATCH LINE
SEE SHEET C154

**CRESTVIEW DRIVE
MAJOR COLLECTOR**

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

	FRONT	REAR	LEFT	RIGHT
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10 FT

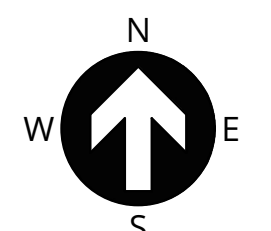
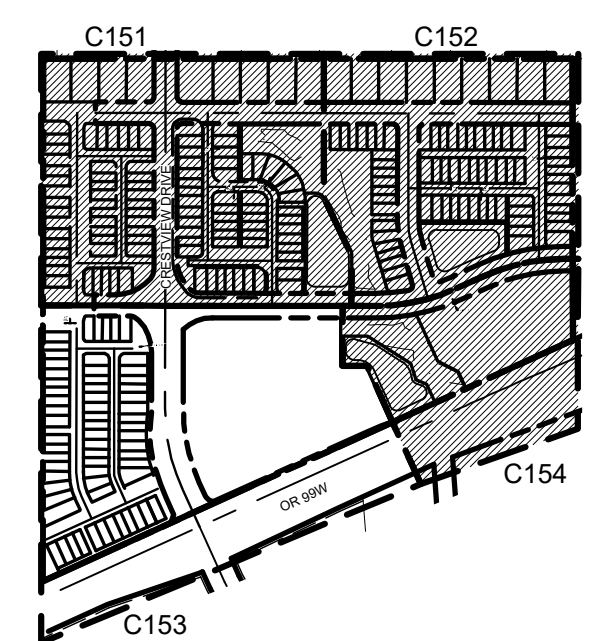
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

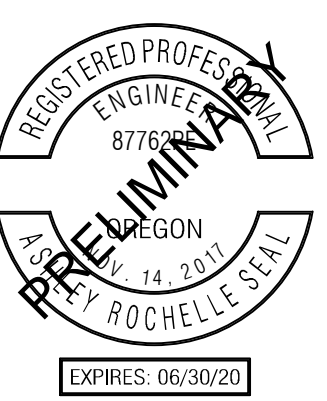
LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



SCALE: 1" = 100'
0 100' 200'



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

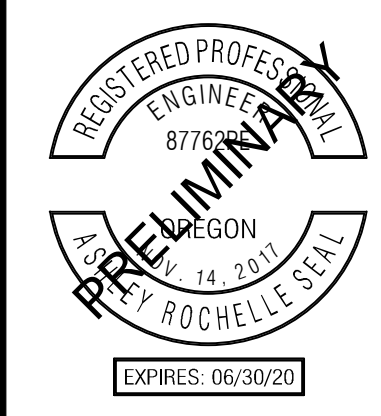
TENTATIVE PLAT III
**CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT**
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 352W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C153

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C153 TENTATIVE PLAT.DWG



PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

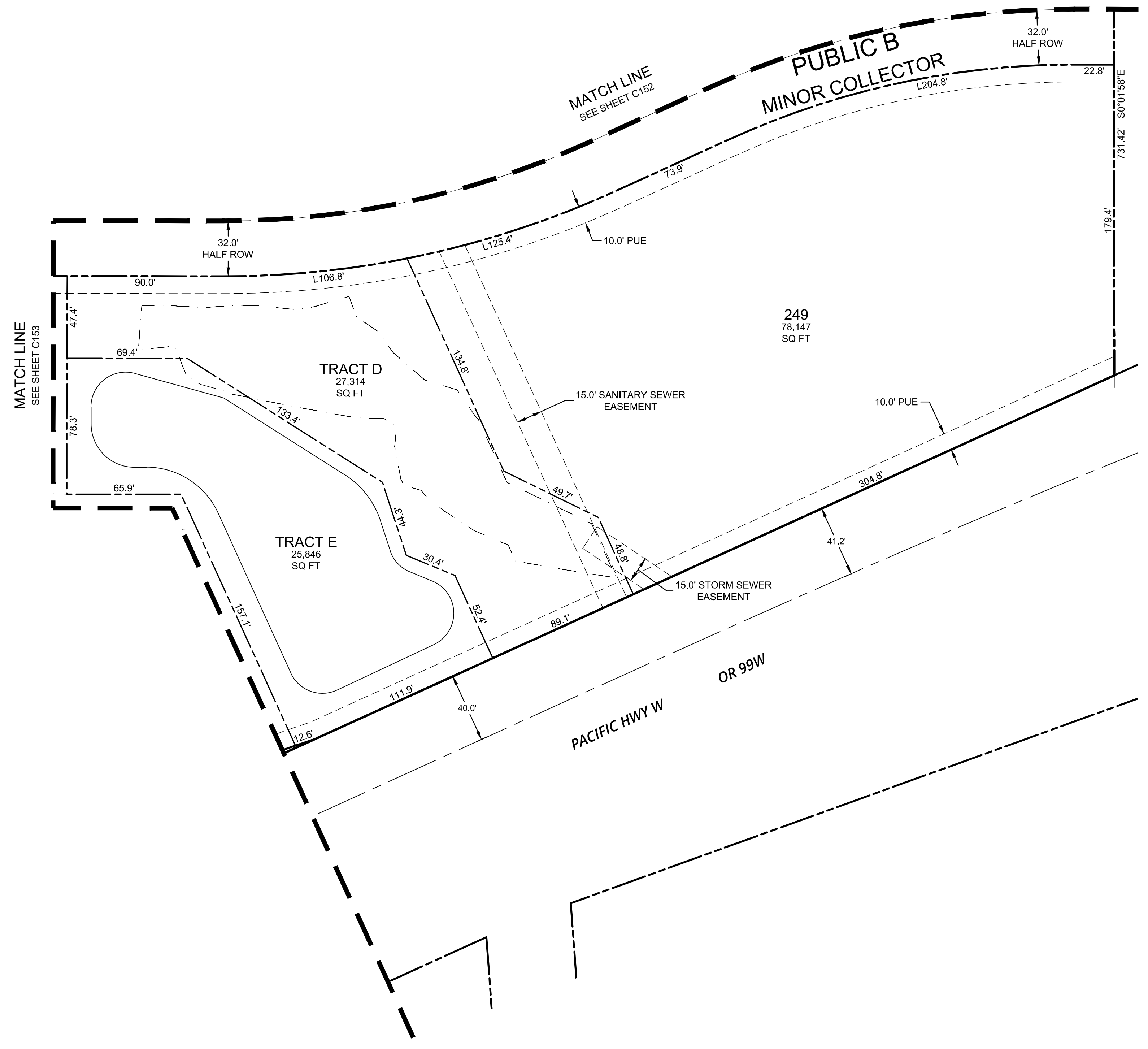
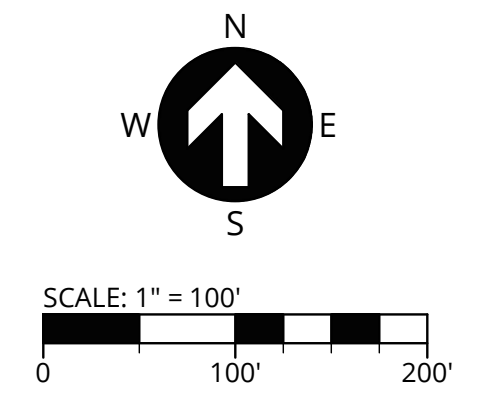
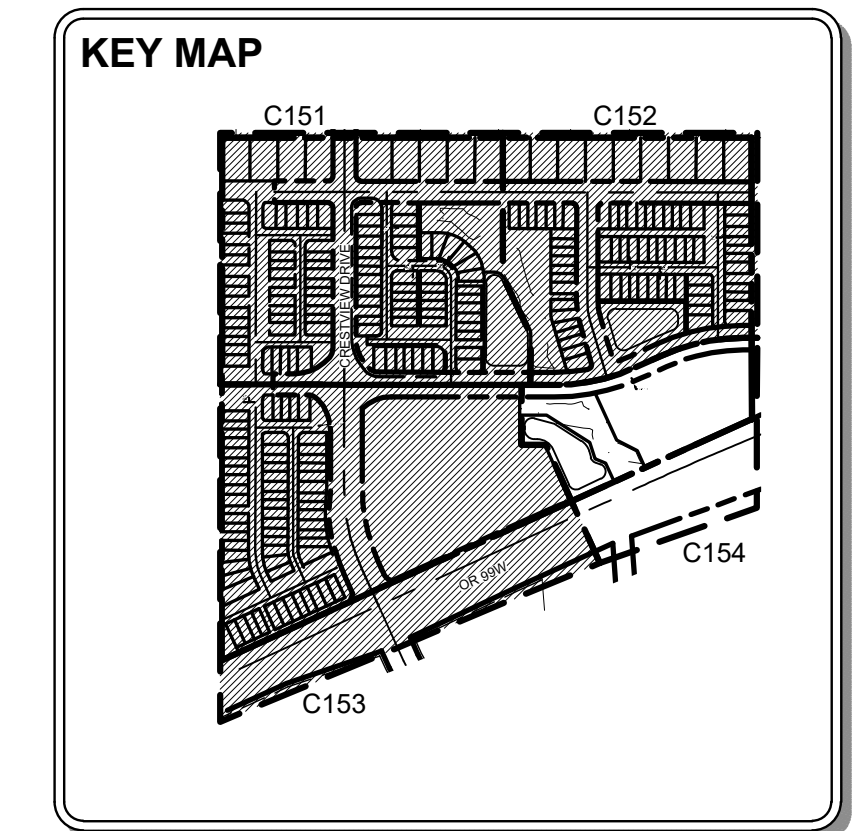
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY



TENTATIVE PLAT IV
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
 JT SMITH COMPANIES
 NEWBERG, OR

3J CONSULTING
 CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING
 5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
 3J PROJECT # | 17393
 TAX LOT(S) | 352W16 13800, 1100
 LAND USE # | N/A
 DESIGNED BY | ARS, JEJ, BMO
 CHECKED BY | AJM, RGW

SHEET NUMBER
C154

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C154.TENTATIVE PLAT.DWG

MEMORANDUM

Date: August 15, 2018

Project #: 21709

To: Jesse Nemec
JT Smith Companies
5285 Meadows Road, Suite 171
Lake Oswego, OR 97035

From: Diego Arguea and Matt Hughart

Project: Crestview Crossing Development

Subject: 6-Party Agreement Transportation Considerations

Pursuant to your request, we have reviewed the *Crestview Improvement Project (From Robin Court to Highway 99W Alignment Exploration)* that was referenced in a six-party agreement (Yamhill County Board Order 06-265) executed in April 2006. The purpose of this agreement was to begin the process to amend the 2005 Newberg Transportation System Plan (TSP) and reclassify the Crestview Drive extension from a Minor Arterial to a Major Collector designation.

The current development proposed by JT Smith Companies will be required to construct a portion of the Crestview Improvement Project, connecting Highway 99W to the existing terminus of Crestview Drive at the southern boundary of the Oxberg Lake and MeadowWood subdivisions.

EXECUTIVE SUMMARY

Our assessment of the six-party agreement (Agreement) concludes that the proposed Crestview Drive alignment, intersection treatments, and cross-sectional elements are consistent with the guiding principles established in the Agreement, and as such, provides equivalent transportation infrastructure as that identified in the Agreement. Additional details are provided herein.

SIX-PARTY AGREEMENT BACKGROUND

In April 2006, the Yamhill County Board of Commissioners accepted an agreement to begin the amendment of the then-current 2005 TSP. The agreement's purpose authorized the City to conduct an amendment to the 2005 TSP that would designate Crestview Drive as a Major Collector roadway and identify a general design and alignment of the Crestview Drive extension (Reference 1, Agreement, #3). A traffic study was prepared by JRH Engineering concluding the change in classification of Crestview Drive

to a Major Collector would not measurably affect the City's transportation network. The TSP was subsequently amended to reflect Crestview Drive as a Major Collector.

Conceptual Alignment

The alignment identified in the Agreement extends Robin Court to Highway 99W and includes one roundabout intersection (located approximately 380 feet from 99W) and one traffic calming circle located approximately 850 feet north of the roundabout location. As stated in the Agreement, this represents a **"general design and alignment"** to provide direction for future development. Site-specific characteristics, unforeseen challenges, and street connectivity and layout were not addressed in the Agreement, and turn lanes, if required, were to be determined at a later date. The general design and alignment shown in the Agreement Exhibit A is shown below in Figure 1.

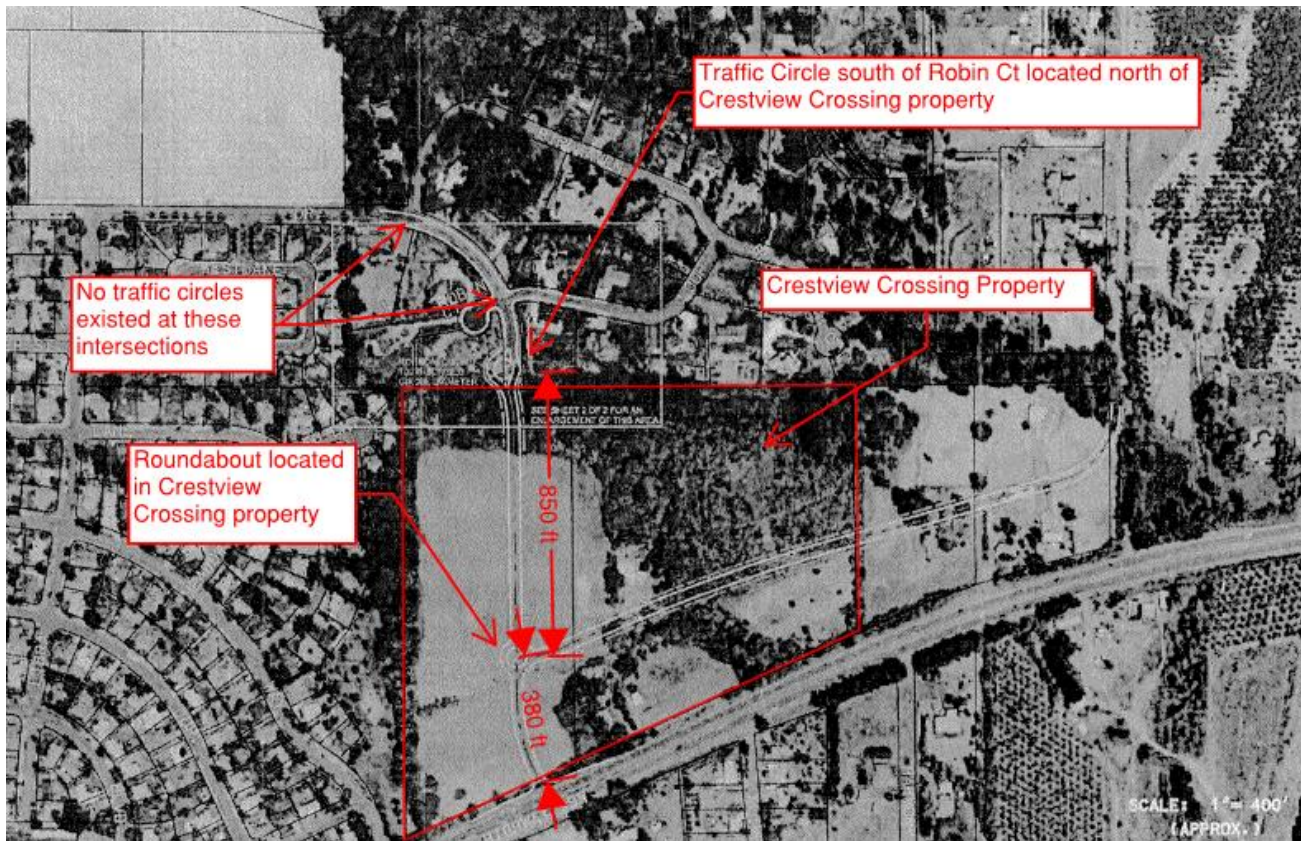


Figure 1. 6-Party Agreement Exhibit A

As shown above, the Agreement identifies a general alignment with two intersection treatments addressing intersection operations and traffic calming. As stated in the Agreement, the alignment should be *designed to encourage a 25 mph speed limit.*

PROPOSED DEVELOPMENT

The proposed residential application acknowledges responsibility to construct the extension of Crestview Drive, connecting from Robin Court to Highway 99W, and has developed an alignment consistent with that shown in the 2006 Agreement.

Constructed To-Date

As shown in Figure 1, Crestview Drive, from Birdhaven Loop to the northern edge of Crestview Crossing, was reconstructed in 2011/2012 to include two intersection traffic calming traffic circles on Crestview Drive at Birdhaven Loop and Robin Court, depicted in Figure 2 below.



Figure 2. Traffic Calming Treatments along Crestview Drive

Neither of these traffic calming circles were identified in the Agreement. The traffic calming circles were constructed after the 2006 Agreement was adopted and are recognized to have a traffic calming effect to limit speeds to 25 mph.

PROPOSED ALIGNMENT

The June 2018 Crestview Crossing Traffic Impact Analysis (TIA) evaluated the impacts of the proposed development and identified recommended mitigation measures. The mitigation measures were selected considering anticipated traffic volumes along Crestview Drive and include the number and configuration travel lanes on the southbound approach to 99W, turn lane storage lengths, as well as transition tapers approaching the roundabout.

Roundabout Intersection

In accordance with the Agreement, construction of a roundabout is proposed to serve traffic into the residential areas north of Highway 99W, and connect to the future Benjamin Road Realignment (a Minor Collector). The roundabout location was determined based on the required queue storage length as an outcome of the TIA as well as roundabout design parameters, including entry deflection angles and transition tapers. As shown in Crestview Crossing site plan application, the roundabout is located approximately 545 feet north of Highway 99W (measured from the center of roundabout to the stop bar at Highway 99W). A southbound left-turn lane on Crestview Drive approaching Highway 99W provides 250 feet of storage and requires at least 50 feet of transition. The northbound transition taper into the roundabout is approximately 200 feet, and has been designed to accommodate all turning movements including u-turns. A detailed exhibit illustrates these distances and is included as an attachment to this memorandum.

The Public Improvement Standards of the Newberg Development Code (Chapter 15.505) were also reviewed to ensure consistency with Collector Roadway spacing standards (400 feet for a Major Collector designation). As such, the location of the roundabout has been designed to comply with the Newberg Development Code and the 6-Party Agreement in the context of the projected traffic operations while recognizing site-specific design considerations and constraints.

Two-way Stop Controlled Intersection

To provide efficient connectivity to adjacent residential development, a two-way stop-controlled intersection (Public Street C) has been designed approximately 500 feet north of the proposed roundabout. The location of this intersection is influenced by intersection spacing on a Major Collector (greater than 400 feet minimum spacing requirement), location of wetlands (site constraints), meeting minimum intersection sight distance requirements, and ability to provide an east-west roadway serving the proposed large lot homes of the Development. The location of this intersection is approximately 410 feet south of Robin Court, the closest public street intersection to the north.

Additional Considerations

Consideration was given to the 6-Party Agreement and the spacing between traffic calming devices during the roadway and site design process. The intersection spacing shown in the conceptual alignment of the 6-Party Agreement and the proposed alignment is shown in a detailed exhibit included as an attachment to this memorandum

As shown in the attachment and in Figure 1, the conceptual spacing shown in the Agreement between the roundabout and traffic calming circle is approximately 850 feet. The proposed site layout and intersection design maintains similar distance between the proposed roundabout and the constructed traffic calming circle on Robin Court (approximately 910 feet). We conclude that the difference in spacing (60 feet) will not impact travel speeds and that the 25 mph roadway design speed is consistent with the 6-Party Agreement.

6-PARTY AGREEMENT CONSISTENCY

In summary, we conclude the proposed alignment and intersection treatments are consistent with and satisfy the terms of the 6-Party Agreement for the following reasons.

1. The purpose of the Agreement is to re-designate Crestview Drive from a Minor Arterial to a Major Collector designation. The re-designation was successfully incorporated into the City's Transportation System Plan based in part on the JRH traffic study.
2. The current Crestview Crossing development proposal acknowledges the Agreement and proposes a roadway extension design consistent with City Major Collector requirements as well as key Agreement elements.
3. The spacing difference between the proposed roundabout and the recently constructed traffic calming circle at Robin Court is not expected to impact travel speeds on Crestview Drive extension and thus is consistent with the traffic calming south in the 6-Party Agreement.
4. With construction of the proposed roundabout, there will be a total of three traffic calming intersection treatments along Crestview Drive between Highway 99W and Birdhaven Loop. This is a greater amount of traffic calming than originally identified in the Agreement, indicating consistency in design and fulfillment of intent by the Applicant.

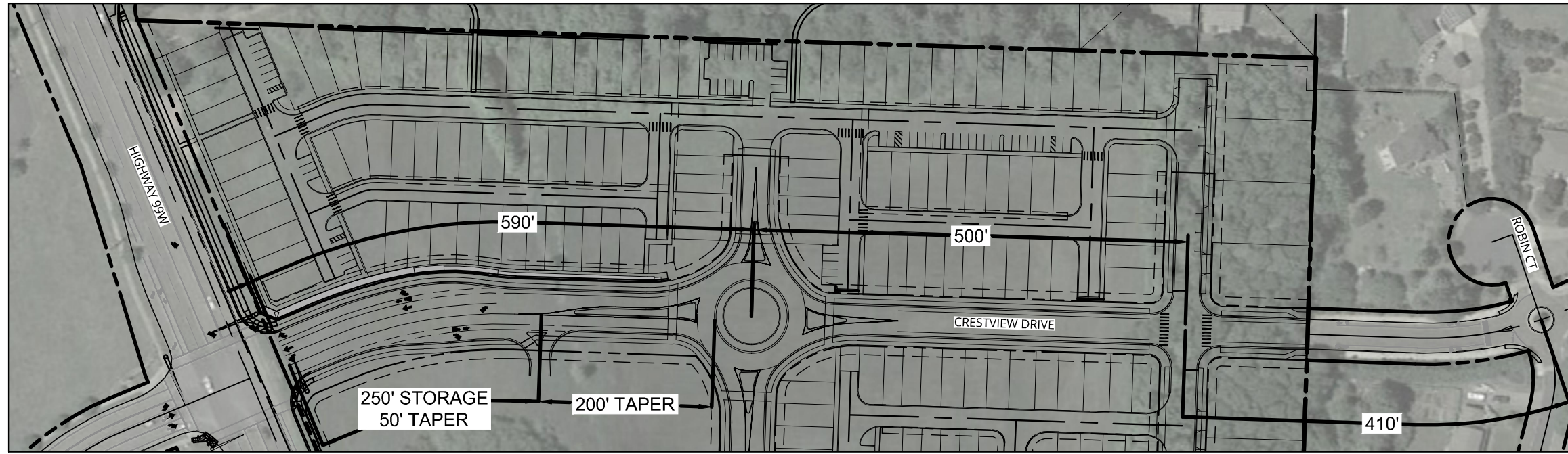
We trust this memorandum demonstrates consistency with the 6-Party Agreement.

REFERENCES

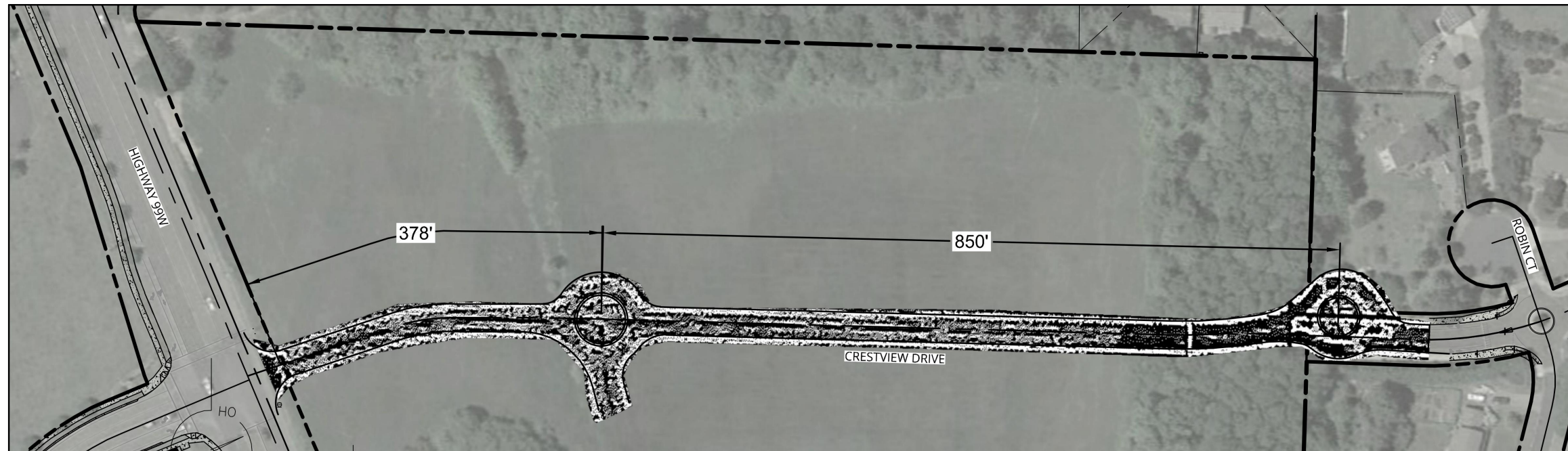
1. Yamhill County Board of Commissioners. *6-Party Agreement, Crestview Improvement Project (From Robin Court to Highway 99W Alignment Exploration)*. Board Order #06-265. April 19, 2006.

ATTACHMENT

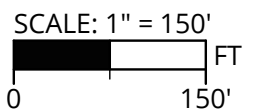
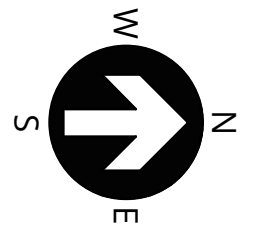
Crestview Drive Exhibit: Intersection Spacing Distances



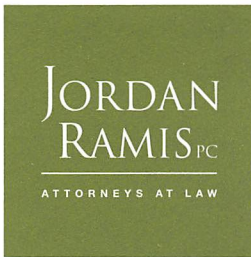
CRESTVIEW DRIVE DESIGN, PROPOSED



CRESTVIEW DRIVE GENERAL DESIGN AND ALIGNMENT, SIX-PARTY AGREEMENT 2006



08/15/18



Lake Oswego

Two Centerpointe Dr., 6th Floor
Lake Oswego, OR 97035
503-598-7070
www.jordanramis.com

Vancouver

1499 SE Tech Center Pl., #380
Vancouver, WA 98683
360-567-3900

Bend

360 SW Bond St., Suite 510
Bend, OR 97702
541-550-7900

August 17, 2018

Via E-Mail
Doug.rux@newbergoregon.gov

Doug Rux, AICP
Community Development Director
City of Newberg
414 E First Street
Newberg, OR 97123

Re: **Crestview Crossing Submittal – PUD 18-0001/CUP 18-0004**

Dear Doug:

Thanks for your assistance with scheduling the follow up submittals and the next Planning Commission hearing on September 13th. Pursuant to your request, the applicant team is providing several additional and revised submittals to address concerns raised by staff, neighbors and the Planning Commission.

Today's submittals include:

- An exhibit showing typical parking configurations;
- Draft Maintenance Agreements for the Private Street and Stormwater Tracts. These items have been provided in lieu of CC&R's;
- A draft reserve study for the Private Street Tracts;
- An updated Phasing Plan;
- Two alternative plats;
- Rendering of Highway 99 frontage and the Crestview entrance;
- A Kittelson memorandum addressing the roundabout location and the 5/6 party agreement;
- A geology report addressing the wells at Oxberg Lake Estates and Hydrogeology;
- An updated Traffic Report;
- An updated land use narrative.

Specifically we want to take this opportunity to discuss a few of the submittal items and point out how they address some of the concerns raised. First the draft maintenance agreement for the private streets will ensure that the maintenance of those streets and stormwater tracts will be privately maintained in perpetuity. Our office has drafted numerous maintenance agreements and for the sake of clarity, ease of use, and convenience to the City they are usually called out in separate agreements that are eventually incorporated into the CCRs as exhibits. Along with this we have provided you the draft reserve study which demonstrates that the private streets can easily be maintained in perpetuity.

Secondly, we would like to have you pay close attention to the Kittelson memorandum which addresses concerns raised in correspondence from interested parties related to the 5/6 party agreement. The memorandum is self-explanatory, but concludes that the design of the project is consistent with the agreement.

Doug Rux
August 17, 2018
Page 2

Third we have provided the City a geology report addressing concerns raised by interested parties in relation to the wells at Oxberg Lake Estates. The report concludes that those wells will not be impacted by Crestview Crossing.

Finally, we did hear a concern both at a staff and planning commission level about the need for an amplified narrative in certain areas. We trust that our updated narrative and supplemental information should address the concerns that staff had about not having the requisite information prior to issuing the staff report.

In conclusion, we hope that by getting these today ahead of the September 11 hearing that it will allow ample time for review by city staff, outside agencies, and the Planning Commission prior to that hearing. In the interim, let us know if there is additional information that you think might be helpful.

Very truly yours,

JORDAN RAMIS PC



James D. Howsley
Admitted in Oregon and Washington
james.howsleyt@jordanramis.com
WA Direct Dial (360) 567-3913

Enclosures

cc: Jesse Nemec
John Wyland
Andrew Tull

Table of Contents

GENERAL INFORMATION 2

SITE INFORMATION..... 2

INTRODUCTION..... 3

 APPLICANT'S REQUEST..... 3

 SITE DESCRIPTION/SURROUNDING LAND USE 3

 PROPOSAL..... 3

APPLICABLE CRITERIA..... 5

TITLE 15 DEVELOPMENT CODE 5

 Division 15.200 Land Use Applications 5

 15.225 Conditional Use Procedures..... 5

 15.240 PD Planned Unit Development Regulations 10

 Division 15.300 Zoning Districts..... 26

 15.305 Zoning Use Table..... 26

 15.356 Bypass Interchange (BI) Overlay 27

 Division 15.400 Development Standards..... 27

 15.405 Lot Requirements..... 27

 15.410 Yard Setback Requirements 30

 15.415 Building and Site Design Standards..... 35

 15.420 Landscaping and Outdoor Areas 37

 15.425 Exterior Lighting 43

 15.430 Underground Utility Installation 46

 15.440 Off-Street Parking, Bicycle Parking, and Private Walkways..... 46

 Division 15.500 Public Improvement Standards..... 52

 15.505 Public Improvements Standards 52

SUMMARY AND CONCLUSION 69

Attachments

- Appendix A – Land Use Application
- Appendix B – Pre-Application Notes
- Appendix C – Notification Materials
- Appendix D – Technical Reports
- Appendix E – Land Use Plans

GENERAL INFORMATION

Property Owner and Applicant: CG Commercial, LLC & VPCF Crestview, LLC
5285 Meadows Road, Suite 171
Lake Oswego, OR 97035
Contact: Jesse Nemec
Phone: (503)-730-8620
Email: jnemec@jtsmithco.com

Applicant's Representative: 3J Consulting, Inc.
5075 SW Griffith Drive, Suite 150
Beaverton, OR 97005
Contact: Andrew Tull
Phone: (503)-545-1907
Email: andrew.tull@3j-consulting.com

Legal Representative: Jordan Ramis, PC
2 Centerpointe Drive, Suite 600
Lake Oswego, Oregon 97035
Contact: James Howsley
Phone: (503) 598-7070
Email: jamie.howsley@jordanramis.com

SITE INFORMATION

Parcel Number: 3216AC 13800 &1100
Address: OR 99W and Crestview Drive
Size: 33.13 acres
Zoning Designations: R-1, R-2, C-2
Existing Use: Vacant
Street Functional Classification: OR-99W is classified as a Major Arterial and is an ODOT facility. Crestview Drive is classified as a Minor Arterial and is within the City's jurisdiction.
Surrounding Zoning: The properties to the west are located within the City of Newberg and are zoned Low Density Residential (R-1). The properties to the south are zoned City Institutional (I) and County VLDR-2.5. The properties to the north are located within Yamhill county and are zoned VLDR-1. The properties to the east are located within Yamhill County and are zoned EF-20.

INTRODUCTION

APPLICANT'S REQUEST

The Applicant seeks approval of an application for a Type III Planned Unit Development (PUD) and Conditional Use Permit (CUP). This narrative has been prepared to describe the proposed development and to document compliance with the relevant sections of Newberg's Development Code.

SITE DESCRIPTION/SURROUNDING LAND USE

The subject site is 33.13 acres in size and is located north of OR-99W, south of Crestview Drive. The property is located within the City and is Zoned C-2, R-2, and R-1. The site has sloping topography which generally slopes towards the southeastern end of the property. The site currently contains numerous wetlands that will be preserved or mitigated, in compliance with Department of State Lands and Army Corps of Engineers standards.

PROPOSAL

The proposed Planned Community will create a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. The proposed development includes 18 single-family homes on large lots, 230 cottage homes, and 51 multi-family homes with modifications to the base zone's dimensions as permitted through the PUD process. The project will include a 4.4-acre parcel which has been created to allow for future commercial development.

The proposed neighborhood will feature active and passive open space areas for use by the residents. The proposed design includes a network of open spaces and wetlands, a thoughtfully linked pedestrian circulation system, and several pedestrian amenities. A neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The development will utilize a network of public and private streets, as well as alleyways which will provide for additional on-street parking. Additional parking for residents has been provided in several off-street parking areas.

The project will include an affordable housing component. While affordable housing is not a required component of a submission for a Planned Unit Development or a Conditional Use Permit, the City does have an Affordable Housing Action Plan which identifies a significant shortage of affordably priced homes within the City and the Applicant said it would include this element. In recognition of the City's needs for affordable housing options, the Applicant proposes to create five percent of the single family detached homes with price reductions and deed restrictions designed to create perpetual affordability.

Affordable Housing is defined within the City's Affordable Housing Action Plan as when a family spends no more than 30% of its income for housing. The twelve single family homes created as part of this program will initially be marketed at rates which make them eligible for families earning less than the median family incomes as described within the Housing Action Plan's definitions of affordable housing. At closing, buyers will be required to sign covenants agreeing to limit the price of any future sale to a rate of appreciation which is tied to either the Area Median Family Income rate or another acceptable index of income. The Applicant plans to work with the Housing Authority of Yamhill County and the City's Affordable Housing

Ad Hoc Committee to refine the covenants which will be recorded with the sale of these units and to eventually find parties which may qualify for the purchase of affordable houses. The proposed affordable homes will require owner occupation and will be constructed at various locations throughout the development.

As proposed, the Applicant has included two alternative plats for the property, one of which shows attached, duplex styled housing on some of the lots. The alternative plat also shows a scenario with exclusively detached products. As the project moves through construction and as sales data is received, the applicant specifically requests flexibility in preparing the final plats for the various phases within the development to allow for the platting of either detached or attached homes. The adjustments necessary to the final plat to process these changes will not require significant modifications to lots and will not result in the addition or deletion of any lots within the plan.

APPLICABLE CRITERIA

The following sections of Newberg's and Development Code have been extracted as they have been deemed to be applicable to the proposal. Following each bold applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document, with absolute certainty, that the proposed development has satisfied the approval criteria for a Planned Unit Development and a Conditional Use Permit.

TITLE 15 DEVELOPMENT CODE

Division 15.200 Land Use Applications

15.225 Conditional Use Procedures

15.225.010 Description and purpose.

A. It is recognized that certain types of uses require special consideration prior to their being permitted in a particular district. The reasons for requiring such special consideration involves, among other things, the size of the area required for the full development of such uses, the nature of the traffic problems incidental to operation of the use, the effect such uses have on any adjoining land uses and on the growth and development of the community as a whole.

Applicant's Facts and Findings: The proposal includes residential development in a commercial zoning district, requiring a conditional use permit. The applicable conditional use permit standards are addressed below.

This standard is met.

B. All uses permitted conditionally are declared to be possessing such unique and special characteristics as to make impractical their being included as outright uses in any of the various districts herein defined. The authority for the location and operation of the uses shall be subject to review and the issuance of a conditional use permit. The purpose of review shall be to determine that the characteristics of any such use shall be reasonably compatible with the type of uses permitted in surrounding areas, and for the further purpose of stipulating such conditions as may be reasonable so that the basic purposes of this code shall be served. Nothing construed herein shall be deemed to require the hearing body to grant a conditional use permit.

Applicant's Facts and Findings: The development of residential housing in the C-2 (Commercial) zoning district requires a conditional use permit. The Conditional Use Permit is used in this scenario to ensure that density, lot coverage, parking, vehicular access, pedestrian and bicycle connectivity, and other residential characteristics are developed to be compatible with surrounding land uses.

This standard is met.

15.225.020 Conditional use permit prerequisite to building.

No building permit shall be issued when a conditional use permit is required by the terms of this code unless a permit has been granted by the hearing body and then only in accordance with the terms and conditions of the conditional use permit. Conditional use permits may be temporary or permanent for any use or purpose for which such permits are required or permitted by provisions of this code.

Applicant's Facts and Findings: This land use application proposes a permanent conditional use permit for residential development in the C-2 zoning district. Building permits have not been issued for this development.

This standard is met.

15.225.030 Application.

Application for a conditional use permit shall be accompanied by such information including, but not limited to, site and building plans, drawings and elevations, and operational data, as may be required by the director to allow proper evaluation of the proposal. The plan submittal requirements identified in NMC 15.220.030 and 15.445.190 shall be used as a guide. All proposals for conditional use permit shall be accompanied by a detailed project description which includes information such as the use, information relating to utilities, the number of employees, the hours of operation, traffic information, odor impacts, and other information needed to adequately describe the project.

Applicant's Facts and Findings: The proposed Conditional Use Permit includes all information necessary for a complete and thorough review.

This standard is met.

15.225.040 Concurrent design review.

If new buildings or structures are to be included as part of the application, the planning commission shall concurrently review the application for site design review in order to streamline the review process.

Applicant's Facts and Findings: The proposed Conditional Use Permit includes a proposed Planned Unit Development on the site with both single-family detached and multi-family housing. The review of the CUP is proposed concurrent with the PUD.

This standard is met.

15.225.050 Additional information.

In order to fully evaluate the proposal, additional information may be required. This includes but is not limited to traffic studies, noise studies, visual analysis, and other site impact studies as determined by the director or planning commission.

Applicant's Facts and Findings: The proposal includes a traffic study and materials display boards. Noise studies are not necessary based on the residential proposal.

This standard is met.

15.225.060 General conditional use permit criteria – Type III.

A conditional use permit may be granted through a Type III procedure only if the proposal conforms to all the following criteria:

A. The location, size, design and operating characteristics of the proposed development are such that it can be made reasonably compatible with and have minimal impact on the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to harmony in scale, bulk, coverage and density; to the availability of public facilities and utilities; to the generation of traffic and the capacity of surrounding streets, and to any other relevant impact of the development.

B. The location, design, and site planning of the proposed development will provide a convenient and functional living, working, shopping or civic environment, and will be as attractive as the nature of the use and its location and setting warrants.

C. The proposed development will be consistent with this code.

Applicant's Facts and Findings:

The proposed residential development on this site will allow a gradual transition from the residentially-developed properties to the north and west toward the 4.4-acre retail commercial designated pad adjacent to Highway 99W. The large-lot single-family detached properties immediately adjacent to the site will be buffered by large-lot single-family detached homes. Higher-density single-family detached housing will be located central to the site and adjacent to the park on the western property boundary. The two proposed multi-family buildings are in the southeast corner of the site, adjacent to Highway 99W and near the proposed retail commercial area to be developed at a later date.

This "stair step" approach to lot size and density will serve to ensure harmony in scale, bulk, coverage and density while the multi-family near commercial will provide a convenient and functional living, working and shopping environment. All homes in the site have access via sidewalk to Spring Meadow Park and further into the City of Newberg, satisfying the requirement that the conditional use permit provide a convenient and functional civic environment.

As shown on the included design and materials boards, the proposed development includes a high level of residential design to reflect the location of the development at the eastern entry to the City of Newberg. Materials such as wood, stone, brick and northwest-style siding are all utilized to blend the site to both the natural and built surrounding areas.

Findings are made regarding all applicable sections of the Newberg Development Code throughout this narrative. As identified the findings of each individual code section, the proposed Planned Unit Development and Conditional Use Permit meet all applicable sections of the Newberg Development Code.

This standard has been met.

15.225.080 Conditions.

The hearing body shall designate conditions in connection with the conditional use permit deemed necessary to secure the purpose of this chapter and the general conditional use permit criteria and require the guarantees and evidence that such conditions will be complied with. Such conditions may include:

- A. Regulation of uses.**
- B. Special yards, spaces**
- C. Fences and walls.**
- D. Surfacing of parking areas to city specifications.**
- E. Street dedications and improvements (or bonds).**
- F. Regulation of points of vehicular ingress and egress.**
- G. Regulation of signs.**
- H. Landscaping and maintenance of landscaping.**
- I. Maintenance of the grounds.**
- J. Regulation of noise, vibration, odors or other similar nuisances.**
- K. Regulation of time for certain activities.**
- L. Time period within which the proposed use shall be developed.**
- M. Duration of use.**
- N. Such other conditions as will make possible the development of the city in an orderly and efficient manner in conformity with the Newberg comprehensive plan and the Newberg development code.**

Applicant's Facts and Findings: The Conditional Use Permit is required for residential development within the C-2 (Commercial) zoned portion of this site. The proposed residential development includes appropriate yards and spaces, parking areas, ingress and egress, landscaping, vehicular, pedestrian and bicycle connectivity and maintenance plans to ensure compliance with this Section of the Code.

The Applicant's proposed landscaping and screening is adequate for most of the surrounding lots with the exception of 1812 Leo Lane, tax lot 12100, located in Spring Meadow subdivision. The property in Spring Meadow subdivision will abut proposed lots 245 through 248. The Applicant has indicated that they intend to provide landscape plantings along the boundary of lots 245 to 248 to provide a vegetative buffer between the lower density Spring Meadows Subdivision and the higher density lots proposed along the project's boundary. The Applicant has indicated a willingness to accept a condition of approval requiring the final landscape plan to incorporate vegetative screening along these properties to buffer any perceived impacts from the construction of the new single-family homes.

Additional conditions are not warranted to secure the purpose of the Conditional Use Permit chapter.

This standard is met.

15.225.090 Development in accord with plans.

Construction, site development, and landscaping shall be carried out in substantial accord with the plans, drawings, conditions, sketches, and other documents approved as part of a final decision on a conditional use permit.

Applicant's Facts and Findings: It is feasible for the Applicant to carry out development of the site in substantial accord with the plans, drawings, sketches and other documents approved as part of this final decision on the Conditional Use Permit.

This standard is met.

15.225.100 Conditional use permit must be exercised to be effective.

A. A conditional use permit granted under this code shall be effective only when the exercise of the right granted thereunder shall be commenced within one year from the effective date of the decision. The director under a Type I procedure may grant an extension for up to six months if the applicant files a request in writing prior to the expiration of the approval and demonstrates compliance with the following:

- 1. The land use designation of the property has not been changed since the initial use permit approval; and**
- 2. The applicable standards in this code which applied to the project have not changed.**

B. In case such right is not exercised, or extension obtained, the conditional use permit decision shall be void. Any conditional use permit granted pursuant to this code is transferable to subsequent owners or contract purchasers of the property unless otherwise provided at the time of granting such permit.

Applicant's Facts and Findings: The Applicant acknowledges that the Conditional Use Permit approval is valid for one year if an extension is not requested. The Applicant intends to begin construction of the residential development on this site within one year of the approval date. If unforeseen delay is encountered, an extension request will be filed in writing prior to the expiration date.

This standard is met.

15.225.110 Preexisting uses now listed as a conditional use.

Where a use is legally established and continuing, but that use currently would require a conditional use permit, the use shall be considered as having a conditional use permit under the terms of the prior permit approval. Any nonconforming site development shall be subject to the provisions of Chapter 15.205 NMC.

Applicant's Facts and Findings: This proposal does not include a preexisting use now listed as a conditional use and, as such, this standard is not applicable.

15.240 PD Planned Unit Development Regulations

15.240.010 Purpose.

The city's planned unit development regulations are intended to:

- A. Encourage comprehensive planning in areas of sufficient size to provide developments at least equal in the quality of their environment to traditional lot-by-lot development and that are reasonably compatible with the surrounding area; and
- B. Provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of circulation facilities, parking, storage and related site and design considerations; and
- C. Promote an attractive, safe, efficient and stable environment which incorporates a compatible variety and mix of uses and dwelling types; and
- D. Provide for economy of shared services and facilities; and
- E. Implement the density requirements of the comprehensive plan and zoning districts through the allocation of the number of permitted dwelling units based on the number of bedrooms provided.

Applicant's Facts and Findings: The Applicant proposes a residential Planned Unit Development (PUD) meeting the stated purposes of the PUD regulations. This site is of sufficient size as to warrant comprehensive planning rather than traditional lot-by-lot development. The Applicant proposes flexibility in placement and clustering of buildings, use of open space, circulation, parking and density to promote a safe, attractive, efficient and stable residential environment adjacent to a highway facility and a future commercial development.

This standard is met.

15.240.020 General provisions.

A. Ownership. Except as provided herein, the area included in a proposed planned unit development must be in single ownership or under the development control of a joint application of owners or option holders of the property involved.

Applicant's Facts and Findings: The area included in the planned unit development is in single ownership.

This standard is met.

B. Processing Steps – Type III. Prior to issuance of a building permit, planned unit development applications must be approved through a Type III procedure and using the following steps:

1. **Step One – Preliminary Plans.** Consideration of applications in terms of on-site and off-site factors to assure the flexibility afforded by planned unit development regulations is used to preserve natural amenities; create an attractive, safe, efficient, and stable environment; and assure reasonable compatibility with the surrounding area. Preliminary review necessarily involves consideration of the off-site impact of the proposed design, including building height and location.

2. Step Two – Final Plans. Consideration of detailed plans to assure substantial conformance with preliminary plans as approved or conditionally approved. Final plans need not include detailed construction drawings as subsequently required for a building permit.

Applicant’s Facts and Findings: The Applicant acknowledges the two-step process to PUD approval and submits materials in support of Step One- Preliminary Plans.

This standard is met.

C. Phasing. If approved at the time of preliminary plan consideration, final plan applications may be submitted in phases. If preliminary plans encompassing only a portion of a site under single ownership are submitted, they must be accompanied by a statement and be sufficiently detailed to prove that the entire area can be developed and used in accordance with city standards, policies, plans and ordinances.

Applicant’s Facts and Findings: The applicant is proposing the following phasing:

Phase 1: This phase will include improvements to the site’s frontage along E Portland Road and the installation of underground utility connections necessary to provide service to the site.

Phase 1a: This phase will include the extension of E Crestview Drive through the site and the construction of roadways and lots located east of the E Crestview Drive extension to public road D. This phase will also include the stormwater facility located south of public road B.

Phase 2: This phase will include the installation of the roadways, infrastructure and lots which are to be located west of the E Crestview extension.

Phase 3: This phase will include the lots located east of public road D to the property’s eastern property boundary.

Phases B and C will be constructed after the construction of Phases 1 and 1A and may be constructed independently of the subdivision lots and by other entities or assigns.

Due to the size of the plan and the complexity of the various components within the development, the Applicant has requested that the City grant the developer a ten (10) year window for the construction of the infrastructure shown within the plan’s phases with opportunities for up to five (5) one (1) year extensions following the approval of the preliminary plat. While the Applicant does not intend to wait for ten (10) years to allow for the construction of the proposed improvements, the flexibility afforded by the ten (10) year schedule with the requested extensions will allow for the project’s various components to be sensitive to changing market conditions.

This standard is met.

D. Lapse of Approval. If the applicant fails to submit material required for consideration at the next step in accordance with the schedule approved at the previous step or, in the absence of a specified schedule, within one year of such approval, the application as approved at the previous step expires. If the applicant fails to obtain a building permit for construction in accordance with the schedule as previously approved, or in the absence of a specified schedule, within three years of a preliminary plan approval, preliminary and final plan approvals expire. Prior to expiration of plan approval at any step, the hearing authority responsible for approval may, if requested, extend or modify the schedule, providing it is not detrimental to the public interest or contrary to the findings and provisions specified herein for planned unit developments. Unless the preliminary plan hearing authority provides to the contrary, expiration of final plan approval of any phase automatically renders all phases void that are not yet finally approved or upon which construction has not begun.

Applicant's Facts and Findings: The Applicant acknowledges the process for lapse of PUD approval and intends to follow through with development of the site based on the original approval timeline.

This standard is met.

E. Resubmittal Following Expiration. Upon expiration of preliminary or final plan approval, a new application and fee must be submitted prior to reconsideration. Reconsideration shall be subject to the same procedures as an original application.

Applicant's Facts and Findings: The Applicant acknowledges the process for resubmittal following expiration.

This standard is met.

F. Density. Except as provided in NMC 15.302.040 relating to subdistricts, dwelling unit density provisions for residential planned unit developments shall be as follows:

1. Maximum Density.

- a. Except as provided in adopted refinement plans, the maximum allowable density for any project shall be as follows:

District	Density Points
R-1	175 density points per <u>gross acre</u> , as calculated in subsection (F)(1)(b) of this section
R-2	310 density points per <u>gross acre</u> , as calculated in subsection (F)(1)(b) of this section
R-3	640 density points per <u>gross acre</u> , as calculated in subsection (F)(1)(b) of this section
RP	310 density points per <u>gross acre</u> , as calculated in subsection (F)(1)(b) of this section

C-1	As per required findings
C-2	As per required findings
C-3	As per required findings

- b. Density point calculations in the following table are correlated to dwellings based on the number of bedrooms, which for these purposes is defined as an enclosed room which is commonly used or capable of conversion to use as sleeping quarters. Accordingly, family rooms, dens, libraries, studies, studios, and other similar rooms shall be considered bedrooms if they meet the above definitions, are separated by walls or doors from other areas of the dwelling and are accessible to a bathroom without passing through another bedroom. Density points may be reduced at the applicant’s discretion by 25 percent for deed-restricted affordable dwelling units as follows:

Density Point Table

Dwelling Type	Density Points: Standard Dwelling	Density Points: Income- Restricted Affordable Dwelling Units
Studio and Efficiency	12	9
One-bedroom	14	11
Two-bedroom	21	16
Three-bedroom	28	21
Four or more bedroom	35	26

The density points in the right-hand column are applicable to income-restricted affordable dwelling units, provided the dwelling units meet the affordability criteria under NMC 15.242.030 regarding affordable housing requirements for developments using the flexible development standards.

2. **Approved Density.** The number of dwelling units allowable shall be determined by the hearing authority in accordance with the standards set forth in these regulations. The hearing authority may change density subsequent to preliminary plan approval only if the reduction is necessary to comply with required findings for preliminary plan approval or if conditions of preliminary plan approval cannot otherwise be satisfied.
3. **Easement Calculations.** Density calculations may include areas in easements if the applicant clearly demonstrates that such areas will benefit residents of the proposed planned unit development.
4. **Dedications.** Density calculations may include areas dedicated to the public for recreation or open space.
5. **Cumulative Density.** When approved in phases, cumulative density shall not exceed the overall density per acre established at the time of preliminary plan approval.

Applicant’s Facts and Findings: This narrative includes a Density Matrix, identifying the total number of density points available to this site vs. the total number of density points necessary to develop the site as proposed. The C-2 zoning district is proposed at the same maximum allowable density as the R-3 zoning district, or 640 points per acre. The

total number of density points available to this site, as detailed on the Density Matrix, is 11,859.85. The total number and type of residential dwelling units proposed requires 9,085 density points, which is less than the number of points available to this site.

This standard is met.

G. Buildings and Uses Permitted. Buildings and uses in planned unit developments are permitted as follows:

- 1. R-1, R-2, R-3 and RP Zones.**
 - a. Buildings and uses permitted outright or conditionally in the use district in which the proposed planned unit development is located.**
 - b. Accessory buildings and uses.**
 - c. Duplexes.**
 - d. Dwellings, single, manufactured, and multifamily.**
 - e. Convenience commercial services which the applicant proves will be patronized mainly by the residents of the proposed planned unit development.**

Applicant's Facts and Findings: The proposal includes single-family detached and multi-family residential uses within the R-1 and R-2 portions of this site, both of which are permitted by subsection d. above.

This standard is met.

- 2. C-1, C-2 and C-3 Zones.**
 - a. When proposed as a combination residential-commercial planned unit development, uses and buildings as listed in subsection (G)(1) of this section and those listed as permitted outright or conditionally in the use district wherein the development will be located.**
 - b. When proposed as a residential or commercial planned unit development, uses and buildings as permitted outright or conditionally in the use district wherein the development will be located.**

Applicant's Facts and Findings: The proposed Planned Community will create a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. All uses proposed are permitted either outright or conditionally for the C-2 portion of this property, in compliance with subsections a. and b. above.

This standard is met.

- 3. M-1, M-2 and M-3 Zones. Uses and buildings as permitted outright or conditionally in the use district wherein the development will be located.**

4. **M-4 Zone.** Uses and buildings as permitted outright or conditionally in the use district wherein the development will be located. Proposed sites, structures and uses must work together to support a common theme, product or industry. Applicants for an industrial planned development in M-4 must demonstrate conformance with any adopted master plan for the subject area and provide a plan describing how the proposed structures and uses will work together to support a common theme, product or industry. Prior to subdivision, covenants must limit occupancy to the types of industrial and related uses identified in the development plan.

Applicant's Facts and Findings: No part of this site is located within the M-1, M-2, M-3 or M-4 zoning district and, as such, this standard is not applicable.

H. Professional Coordinator and Design Team. Professional coordinators and design teams shall comply with the following:

1. **Services.** A professional coordinator, licensed in the State of Oregon to practice architecture, landscape architecture or engineering, shall ensure that the required plans are prepared. Plans and services provided for the city and between the applicant and the coordinator shall include:
 - a. Preliminary design;
 - b. Design development;
 - c. Construction documents, except for single-family detached dwellings and duplexes in subdivisions; and
 - d. Administration of the construction contract, including, but not limited to, inspection and verification of compliance with approved plans.
2. **Address and Attendance.** The coordinator or the coordinator's professional representative shall maintain an Oregon address, unless this requirement is waived by the director. The coordinator or other member of the design team shall attend all public meetings at which the proposed planned unit development is discussed.
3. **Design Team Designation.** Except as provided herein, a design team, which includes an architect, a landscape architect, engineer, and land surveyor, shall be designated by the professional coordinator to prepare appropriate plans. Each team member must be licensed to practice the team member's profession in the State of Oregon.
4. **Design Team Participation and Waiver.** Unless waived by the director upon proof by the coordinator that the scope of the proposal does not require the services of all members at one or more steps, the full design team shall participate in the preparation of plans at all three steps.
5. **Design Team Change.** Written notice of any change in design team personnel must be submitted to the director within three working days of the change.
6. **Plan Certification.** Certification of the services of the professionals responsible for particular drawings shall appear on drawings submitted for consideration and shall be signed and stamped with the registration seal issued by the State of Oregon for each professional so involved. To assure comprehensive review by the design team of all plans for compliance

with these regulations, the dated cover sheet shall contain a statement of review endorsed with the signatures of all designated members of the design team.

Applicant's Facts and Findings: This Planned Unit Development application includes all of the required plans and documents. A professional engineer in the State of Oregon has ensured that all required plans are prepared, certified as necessary and submitted. The Applicant acknowledges the process for a design team change.

This standard is met.

I. Modification of Certain Regulations. Except as otherwise stated in these regulations, fence and wall provisions, general provisions pertaining to height, yards, area, lot width, frontage, depth and coverage, number of off-street parking spaces required, and regulations pertaining to setbacks specified in this code may be modified by the hearing authority, provided the proposed development will be in accordance with the purposes of this code and those regulations. Departures from the hearing authority upon a finding by the engineering director that the departures will not create hazardous conditions for vehicular or pedestrian traffic. Nothing contained in this subsection shall be interpreted as providing flexibility to regulations other than those specifically encompassed in this code.

Applicant's Facts and Findings: This Planned Unit Development proposal seeks to modify the lot size standards of the R-1, R-2 and C-2 zoning districts. The PUD further seeks to modify the minimum lot sizes, minimum lot dimensions, minimum lot frontages, maximum lot and parking area coverage and minimum setback standards. The proposed modifications are shown on the attached preliminary site plan and plat and are intended to allow for the development of smaller residential lots, allowing a lower price-point than homes built in similar zoning districts. The creativity in site design also allows for the provision of parks and open space facilities exceeding those of a typical subdivision. And finally, varying the standards allows for the construction of a street network exceeding that of a typical residential subdivision.

The proposed modifications are in accordance with the purposes of this code as they support the efficient development of land within the City Limits, provide functional, attractive housing for the residents of the City and include safe, convenient, efficient transportation design.

This standard is met.

J. Lot Coverage. Maximum permitted lot and parking area coverage as provided in this code shall not be exceeded unless specifically permitted by the hearing authority in accordance with these regulations.

Applicant's Facts and Findings: The maximum permitted lot coverage shall be maintained within the proposed development. For the R-1 lots along the northern boundary, these lots are approximately 8,165 sf. The driveways on these lots will be approximately 20x20

feet or 400 sf. The homes within these areas will likely be two stories with first floor footprints within the 1,200-1,700 range. The maximum permitted lot coverage within the R-1 zoning district is 30% for two story homes or 40% for single story homes. Building footprints and overall lot coverage can be verified at the time of building permit issuance. The anticipated coverage for these lots will be less than the stated maximum.

The Applicant proposes a coverage of up to 70% throughout the R-2 single family portions of the plan area. The smaller lot sizes allow for the provision of a more affordable housing stock and the increased parking ensures an adequate supply for residents and visitors. The lots within the R-2 zoned portions of the plan area range in size from 1,474 to 2,010 depending upon product size and lot width. The first floors of most of the plans proposed for the lots will range between 520 sf to 881 sf, depending upon the width of the lot. For a 1,474 sf lot, a 17 foot wide home will likely be provided. These homes will have a first floor area of approximately 595 sf. The parking area for these lots will be approximately 12x20 feet, or 240 sf. The overall lot coverage for these lots, with parking and the anticipated first floor area will be approximately 835 sf or 56.6%.

For a 2,010 sf lot within the R-2 zone, a 25 foot wide house will likely be located on a 30 foot wide lot. The typical anticipated footprint for these lots will be approximately 881 sf. The parking area for these houses will consist of a 20x20 foot wide driveway, or 400 sf. The total anticipated lot coverage and parking total would be approximately 1,281 sf or 63.7%.

For a 1,742 sf lot within the R-2 zone, a 21 foot wide house will likely be located on a 26 foot wide lot. The typical anticipated footprint for these lots will be approximately 748 sf. The parking area for these houses will consist of a 20x20 foot wide driveway, or 400 sf. The total anticipated lot coverage and parking total would be approximately 1,148 sf or 65.9%.

While there may be some variation in the amount of coverage provided per lot, the Applicant's request for a blanket 70% allowance for lot coverage should be sufficient to allow for adequate area for parking and building areas. The lot coverage for each individual lot can be verified at the time of building permit submission. The Applicant requests these exceptions be specifically permitted by the Planning Commission in reviewing the Planned Unit Development and Conditional Use Permit request.

This standard is met.

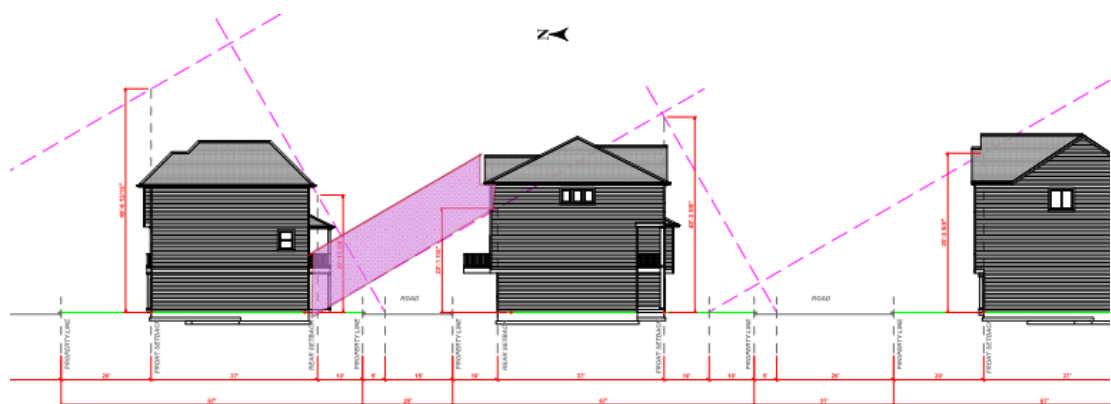
K. Height. Unless determined by the hearing authority that intrusion of structures into the sun exposure plane will not adversely affect the occupants or potential occupants of adjacent properties, all buildings and structures shall be constructed within the area contained between lines illustrating the sun exposure plane (see Appendix A, Figure 8 and the definition of "sun exposure plane" in NMC 15.05.030). The hearing authority may further modify heights to:

1. **Protect lines of sight and scenic vistas from greater encroachment than would occur as a result of conventional development.**
2. **Protect lines of sight and scenic vistas.**
3. **Enable the project to satisfy required findings for approval.**

Applicant's Facts and Findings: This proposed residential Planned Unit Development includes three story single-family residential structures with reduced setbacks. This development type allows the developer to provide the housing at an approachable price point, complete the much-needed transportation system for the area and provide parks and open spaces for the residents of this and neighboring developments.

The Applicant has prepared a sun exposure diagram showing that some of the north/south oriented lots may have slight impacts on the first floors of the proposed homes. Impacts due to shade along the north/south oriented lots are anticipated to be slightly experienced on lots 36-66 and on lots 81&82. The east/west oriented lots appear to be exempt from these requirements as the sun should have full access from the south on both these lots front and rear yards.

The slight impacts to the lots identified herein are illustrated within the diagram below however the impacts to the homes is limited to first floors, in areas where garages will be located.



As described elsewhere within this narrative, the benefits of housing configured within this manner provides numerous benefits to the future residents and provides opportunities for the creation of a highly efficient and well-designed community. The Applicant's proposal for closely located buildings offers numerous benefits to the community as a whole and allows the site to meet the City's other code requirements for density, site configuration, parking, and access. Because the impacts of the shade will be limited to only the ground floors of a few properties within the plan and because the Applicant has compensated for these impacts with the provision of a significant amount of open space area, parks, and site amenities, the residents of this community will not experience any adverse effects.

L. Dedication, Improvement and Maintenance of Public Thoroughfares. Public thoroughfares shall be dedicated, improved and maintained as follows:

- 1. Streets and Walkways. Including, but not limited to, those necessary for proper development of adjacent properties. Construction standards that minimize maintenance and protect the public health and safety, and setbacks as specified in NMC 15.410.050, pertaining to special setback requirements to planned rights-of-way, shall be required.**
- 2. Notwithstanding subsection (L)(1) of this section, a private street may be approved if the following standards are satisfied.**
 - a. An application for approval of a PUD with at least 50 dwelling units may include a private street and the request for a private street shall be supported by the evidence required by this section. The planning commission may approve a private street if it finds the applicant has demonstrated that the purpose statements in NMC 15.240.010(A) through (D) are satisfied by the evidence in subsections (L)(2)(a)(i) through (v) of this section.**
 - i. A plan for managing on-street parking, maintenance and financing of maintenance of the private street, including a draft reserve study showing that the future homeowners association can financially maintain the private street;**
 - ii. A plan demonstrating that on- and off-street parking shall be sufficient for the expected parking needs and applicable codes;**
 - iii. Proposed conditions, covenants and restrictions that include a requirement that the homeowners association shall be established in perpetuity and shall continually employ a community management association whose duties shall include assisting the homeowners association with the private street parking management and maintenance, including the enforcement of parking restrictions;**
 - iv. Evidence that the private street is of sufficient width and construction to satisfy requirements of the fire marshal and cityengineer; and**
 - v. The PUD shall be a Class I planned community as defined in ORS Chapter 94.**
 - b. If the PUD is established, the homeowners association shall provide an annual written report on the anniversary date of the final approval of the PUD approval to the community development director that includes the following:**
 - i. The most recent reserve study.**
 - ii. The name and contact information for the retained community management association.**
 - iii. A report on the condition of the private street and any plans for maintenance of the private street.**
- 3. Easements. As are necessary for the orderly extension of public utilities and bicycle and pedestrian access.**

Applicant's Facts and Findings: This proposed PUD includes a mixture of public and private streets. As identified in subsection L.2 above, private streets may be approved if:

- a PUD proposes at least 50 dwelling units,
- has provided a plan for on-street parking, maintenance and financing of maintenance of the private street,

- demonstrates sufficient parking,
- includes CCRs addressing the private street,
- is constructed to proper standards, and
- the PUD is a Class I planned community as defined in ORS Ch. 94.

The proposal meets all of the criteria for private streets identified above. The purpose statements in NMC 15.240.010(A) through (D) include:

- encourage comprehensive planning in areas of sufficient size...
- provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of circulation facilities, parking, storage and related site and design considerations
- promote an attractive, safe, efficient and stable environment...and
- provide for economy of shared services and facilities.

The proposed PUD is of a sufficient size to warrant comprehensive planning that is similar to traditional lot-by-lot developments in the same zoning and compatible with the surrounding environment. The inclusion of private streets makes it feasible to preserve more of the natural areas on the site. The housing design and placement, open space and outdoor living areas, circulation, parking and storage on this site are all designed to work together to form a cohesive neighborhood feel. The shared services and facilities within the development include the private streets, parking areas and open spaces. The adjacent commercial development that will be added in the future will allow for shared services as well.

All public streets are designed to City standards and proposed to be dedicated to the City.

The proposal includes all of the necessary materials to approve both the public and private streets.

This standard is met.

M. Underground Utilities. Unless waived by the hearing authority, the developer shall locate all on-site utilities serving the proposed planned unit development underground in accordance with the policies, practices and rules of the serving utilities and the Public Utilities Commission.

Applicant’s Facts and Findings: The proposal includes all on-site utilities located underground.

This standard is met.

N. Usable Outdoor Living Area. All dwelling units shall be served by outdoor living areas as defined in this code. Unless waived by the hearing authority, the outdoor living area must equal at least 10 percent of the gross floor area of each unit. So long as outdoor living area is available to each dwelling unit, other outdoor living space may be offered for dedication to the city, in fee or easement, to be incorporated in a city-approved recreational facility. A portion or all of a dedicated area may be included in calculating density if permitted under these regulations.

Applicant's Facts and Findings: All dwelling units are served by outdoor living areas equal to at least 10 percent of the gross floor area of each unit. The single-family units will have outdoor living on individual lots. The multi-family will utilize a combination of balconies and porches as well as common outdoor living areas located throughout the overall planned unit development. All proposed dwelling units will be able to provide at least 10% of the gross floor area in outdoor living space. Outdoor living spaces for each unit can be verified at the time of building permit issuance.

This standard is met.

O. Site Modification. Unless otherwise provided in preliminary plan approval, vegetation, topography and other natural features of parcels proposed for development shall remain substantially unaltered pending final plan approval.

Applicant's Facts and Findings: This site contains several wetlands which will be a combination of preserved on site and mitigated off-site. The permitting for this is occurring separate from the land use review. This is the only substantial change to the natural features of the site.

This standard is met.

P. Completion of Required Landscaping. If required landscaping cannot be completed prior to occupancy, or as otherwise required by a condition of approval, the director may require the applicant to post a performance bond of a sufficient amount and time to assure timely completion.

Applicant's Facts and Findings: The Applicant acknowledges the possibility of a performance bond being required to assure timely completion of any delayed landscaping.

This standard is met.

Q. Design Standards. The proposed development shall meet the design requirements for multifamily residential projects identified in NMC 15.220.060. A minimum of 40 percent of the required points shall be obtained in each of the design categories.

Applicant's Facts and Findings: There are 23 possible site design points and 23 possible building design points, therefore, this project must obtain 9 each site design and building design points (40% of each).

Site Design:

- Consolidated green space: 3 points
- Parking lot to the back of project when viewed from 99W: 3 points
- Good-quality coordinated site landscaping: 2 points
- Landscaped Edges of Parking Lots: 2 points
- Street trees: 1 point

Entry Accents to mark major entries to multi-family buildings: 1 point
Appropriate Outdoor Lighting: 1 point
Total Site Design Points: 13

Building Design:

Respect scale and patterns of nearby buildings by reflecting architectural styles, building details, materials and scale of existing buildings: 3 points

Break up large buildings into bays/vary planes at least every 50 feet: 3 points

Provide variation in repeated units using color, porches, balconies, windows, railings, building materials and form, alone or in combination: 3 points

Building materials: Wood or wood-like siding applied horizontally or vertically as board and batten at entry ways; shingles, as roofing; wood or wood-like sash windows; and wood or wood-like trim: 4 points

A porch at every main entry: 2 points

Total Building Design Points: 15

This standard is met as described above.

15.240.030 Preliminary plan consideration – Step one.

A. Preapplication Conference. Prior to filing an application for preliminary plan consideration, the applicant or coordinator may request through the director a preapplication conference to discuss the feasibility of the proposed planned unit development and determine the processing requirements.

Applicant's Facts and Findings: The Applicant attended a pre-application conference with the City on March 14, 2018.

This standard is met.

B. Application. An application, with the required fee, for preliminary plan approval shall be made by the owner of the affected property, or the owner's authorized agent, on a form prescribed by and submitted to the director. Applications, accompanied by such additional copies as requested by the director for purposes of referral, shall contain or have attached sufficient information as prescribed by the director to allow processing and review in accordance with these regulations. As part of the application, the property owner requesting the planned development shall file a waiver stating that the owner will not file any demand against the city under Ballot Measure 49, approved November 6, 2007, that amended ORS Chapters 195 and 197 based on the city's decision on the planned development.

Applicant's Facts and Findings: This land use application includes all required fees, forms and documentation for review of the Planned Unit Development and Conditional Use requests.

This standard is met.

C. Type III Review and Decision Criteria. Preliminary plan consideration shall be reviewed through the Type III procedure. Decisions shall include review and recognition of the potential impact of the entire development, and preliminary approval shall include written affirmative findings that:

- 1. The proposed development is consistent with standards, plans, policies and ordinances adopted by the city; and**

Applicant's Facts and Findings: As described in this narrative, the proposed development is consistent with standards, plans, policies and ordinances adopted by the City.

This standard is met.

- 2. The proposed development's general design and character, including but not limited to anticipated building locations, bulk and height, location and distribution of recreation space, parking, roads, access and other uses, will be reasonably compatible with appropriate development of abutting properties and the surrounding neighborhood; and**

Applicant's Facts and Findings: As discussed previously, the proposed PUD includes larger lot single-family detached homes along the northern property line, separating this development from a single-family detached development. Lot sizes will then decrease as one heads south into the site, with two multi-family residential buildings constructed in the southeast corner of the site. The homes on the site will all be designed and constructed so as to provide a cohesive design and character to the entire development. The distribution of recreation space, parking, roads, access and other uses is reasonably compatible with the appropriate development of abutting properties and the surrounding neighborhood.

This standard is met.

- 3. Public services and facilities are available to serve the proposed development. If such public services and facilities are not at present available, an affirmative finding may be made under this criterion if the evidence indicates that the public services and facilities will be available prior to need by reason of:**
 - a. Public facility planning by the appropriate agencies; or**
 - b. A commitment by the applicant to provide private services and facilities adequate to accommodate the projected demands of the project; or**
 - c. Commitment by the applicant to provide for offsetting all added public costs or early commitment of public funds made necessary by the development; and**

Applicant's Facts and Findings: Public services and facilities are either available to serve the proposed development or can be reasonably conditioned to be installed and provided. The public improvement plans included with the land use submittal demonstrate full public facilities will be provided, including water, sanitary sewer, storm sewer,

electricity and natural gas. Public services are currently available to serve this site, including police, fire, garbage/recycling and US Mail.

This standard is met.

4. The provisions and conditions of this code have been met; and

Applicant's Facts and Findings: As discussed in detail in this narrative, the provisions and conditions of this code have been met.

This standard is met.

5. Proposed buildings, roads, and other uses are designed and sited to ensure preservation of features, and other unique or worthwhile natural features and to prevent soil erosion or flood hazard; and

Applicant's Facts and Findings: The buildings, roads and other site features are located so as to preserve several wetlands and natural features and to prevent soil erosion or flood hazard.

This standard is met.

6. There will be adequate on-site provisions for utility services, emergency vehicular access, and, where appropriate, public transportation facilities; and

Applicant's Facts and Findings: The site is well provisioned for utility services, emergency vehicular access and, if the opportunity arises in the future, public transportation facilities. The public roadways are designed to public street standards and the private streets are designed to provide vehicular access. The application includes a letter from Tualatin Valley Fire & Rescue indicating that the private streets are adequate for emergency vehicle access.

This standard is met.

7. Sufficient usable recreation facilities, outdoor living area, open space, and parking areas will be conveniently and safely accessible for use by residents of the proposed development; and

Applicant's Facts and Findings: The proposed neighborhood will feature active and passive open space areas for use by the residents. The proposed design includes a civic use park which has been envisioned to provide space for community events as well as a space for featured local vendors. A smaller neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The proposal includes multiple open spaces, most of which include a trail system within. The multi-family housing has common outdoor living areas, as well as balconies and patios for some

individual units. The single-family housing has outdoor living areas adjacent to the homes.

This standard is met.

- 8. Proposed buildings, structures, and uses will be arranged, designed, and constructed so as to take into consideration the surrounding area in terms of access, building scale, bulk, design, setbacks, heights, coverage, landscaping and screening, and to assure reasonable privacy for residents of the development and surrounding properties.**

Applicant's Facts and Findings: This site has been designed reflect the surrounding area and to provide a reasonable level of privacy for residents of the development and surrounding properties. Large lot single-family detached dwellings are proposed along the northern property line, separating this development from another large lot residential development, easing the transition from lower density to higher. The site is buffered from the residential developments to the west by the park that is adjacent to the site. The site as a whole is designed to provide safe and convenient access. The building scale, bulk, design, setbacks, heights, coverage, landscaping and screening are designed to provide harmony within the site while respecting and reflecting design patterns utilized in other nearby developments.

This standard is met.

D. Conditions. Applications may be approved subject to conditions necessary to fulfill the purpose and provisions of these regulations.

Applicant's Facts and Findings: The Applicant acknowledges the possibility of conditions imposed to fulfill the purpose and provisions of the PUD regulations. However, based on the findings identified in this narrative, the Applicant finds the proposal in full compliance with the PUD standards.

This standard is met.

15.240.040 Final plan consideration – Step two.

A. Application. An application, with the required fee, for final plan approval shall be submitted in accordance with the provisions of this code, and must be in compliance with all conditions imposed and schedules previously prescribed.

B. Referral. Referral of final plans and supportive material shall be provided to appropriate agencies and departments.

C. Decision Type I Procedure. The final plan consideration shall be reviewed through the Type I procedure. Upon receipt of the application and fee, final plans and required supportive material, the director shall approve, conditionally approve or deny the application for final plan approval. The decision of the director to approve or deny the application shall be based on written findings of

compliance or noncompliance with approved preliminary plans and city standards, plans, policies and ordinances. Minor variations from approved preliminary plans may be permitted if consistent with the general character of the approved preliminary plans.

D. Conditions. Applications may be approved subject to such conditions as are necessary to fulfill the purpose and provisions of this code.

1. **Preparation and Signatures.** A duly notarized performance agreement binding the applicant, and the applicant’s successors in interest, assuring construction and performance in accordance with the approved final plans shall be prepared by the city and executed by the applicant and city prior to issuance of a building permit.
2. **Return.** Unless an executed copy of the agreement is returned to the director within 60 days of its delivery to the applicant, final plan approval shall expire, necessitating the reapplication for final plan reapproval.
3. **Filing.** The director shall file a memorandum of the performance agreement with the Yamhill County recorder.
4. **Improvement Petitions and Dedications.** Improvement petitions and all documents required with respect to dedications and easements shall be submitted prior to completion of the agreement.
5. **Project Changes.** The director may permit project changes subsequent to execution of the agreement upon finding the changes substantially conform to final approved plans and comply with city standards, plans, policies and ordinances. Other modifications are subject to reapplication at the appropriate step.
6. **Compliance.** Compliance with this section is a prerequisite to the issuance of a building permit.

Applicant’s Facts and Findings: The Applicant acknowledges the process for Step Two of a PUD review.

This standard is met.

Division 15.300 Zoning Districts

15.305 Zoning Use Table

Use	R-1	R-2	C-2
Residential Uses			
Dwelling, single-family detached	P(2)	P	C(4)
Dwelling, multifamily	C	P	C(4)
Parks and Open Spaces			
Open Space	P	P	P
Park	P	P	P

Notes.

(2) Limited to one per lot as a permitted use. More than one per lot allowed only through a conditional use permit or planned unit development, subject to density limits of NMC 15.405.010(B).

(4) The permitted density shall be stated on the conditional use permit.

Applicant's Facts and Findings: The proposed residential development requires a conditional use permit because a part of the site, including the area proposed for multi-family residential, is within the C-2 zoning district. Single-family residential development is permitted in the R-1 and R-2 zones. The Planned Unit Development proposes residential development, both single-family and multi-family, on all areas of the site (zoned R-1, R-2 and C-2).

As this application includes a conditional use permit application, this standard is met.

15.356 Bypass Interchange (BI) Overlay

Applicant's Facts and Findings: The frontage of this site is adjacent to the Bypass Interchange (BI) Overlay. While the provisions of the BI Overlay may apply to this site, the provisions only speak to permitted, conditional and prohibited uses. Residential development is a permitted use in the R-1 and R-2 zoning districts and a conditional use in the C-2 zoning district. Residential development is not prohibited in the BI Overlay.

This standard is met.

Division 15.400 Development Standards

15.405 Lot Requirements

15.405.010 Lot area – Lot areas per dwelling unit.

A. In the following districts, each lot or development site shall have an area as shown below except as otherwise permitted by this code:

- 1. In the R-1 district, each lot or development site shall have a minimum area of 5,000 square feet or as may be established by a subdistrict. The average size of lots in a subdivision intended for single-family development shall not exceed 10,000 square feet.**
- 2. In the R-2, R-3, and RP districts, each lot or development site shall have a minimum area of 3,000 square feet or as may be established by a subdistrict. In the R-2 and R-P districts, the average size of lots in a subdivision intended for single-family development shall not exceed 5,000 square feet.**
- 3. In the AI, AR, C-1, C-2, and C-3 districts, each lot or development site shall have a minimum area of 5,000 square feet or as may be established by a subdistrict.**
- 4. In the M-1, M-2 and M-3 districts, each lot or development site shall have a minimum area of 20,000 square feet.**

5. **Institutional districts shall have a minimum size of five contiguous acres in order to create a large enough campus to support institutional uses; however, additions to the district may be made in increments of any size.**
6. **Within the commercial zoning district(s) of the riverfront overlay subdistrict, there is no minimum lot size required, provided the other standards of this code can be met.**

Applicant’s Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lot sizes and an increase in the allowable lot coverage standard for the R-2 zoned portions of the site. The standards for a PUD are discussed previously in this narrative.

This standard is met.

B. Lot or Development Site Area per Dwelling Unit.

1. **In the R-1 district, there shall be a minimum of 5,000 square feet per dwelling unit.**
2. **In the R-2, AR, and R-P districts, there shall be a minimum of 3,000 square feet of lot or development site area per dwelling unit. In the R-2 and R-P districts, lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex or multifamily dwellings shall be developed at a minimum of one dwelling per 5,000 square feet lot area.**
3. **In the R-3 district, there shall be a minimum of 1,500 square feet of lot or development site area per dwelling unit. Lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex or multifamily dwellings shall be developed at a minimum of one dwelling per 2,500 square feet lot area.**

C. In calculating lot area for this section, lot area does not include land within public or private streets. In calculating lot area for maximum lot area/minimum density requirements, lot area does not include land within stream corridors, land reserved for public parks or open spaces, commons buildings, land for preservation of natural, scenic, or historic resources, land on slopes exceeding 15 percent or for avoidance of identified natural hazards, land in shared access easements, public walkways, or entirely used for utilities, land held in reserve in accordance with a future development plan, or land for uses not appurtenant to the residence.

D. Lot size averaging is allowed for any subdivision. Some lots may be under the minimum lot size required in the zone where the subdivision is located, as long as the average size of all lots is at least the minimum lot size.

Applicant’s Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lots (development site areas) and an increase in the amount of lot coverage for the R-2 zoned portions of the plan. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.405.020 Lot area exceptions.

The following shall be exceptions to the required lot areas:

- A. Lots of record with less than the area required by this code.**
- B. Lots or development sites which, as a process of their creation, were approved in accordance with this code.**
- C. Planned unit developments, provided they conform to requirements for planned unit development approval.**

Applicant’s Facts and Findings: This proposal complies with subsection C. of this criterion as a Planned Unit Development is proposed with conformity to all PUD requirements.

This standard is met.

15.405.030 Lot dimensions and frontage.

- A. Width. Widths of lots shall conform to the standards of this code.**
- B. Depth to Width Ratio. Each lot and parcel shall have an average depth between the front and rear lines of not more than two and one-half times the average width between the side lines. Depths of lots shall conform to the standards of this code. Development of lots under 15,000 square feet are exempt from the lot depth to width ratio requirement.**
- C. Area. Lot sizes shall conform to standards set forth in this code. Lot area calculations shall not include area contained in public or private streets as defined by this code.**
- D. Frontage.**

- 1. No lot or development site shall have less than the following lot frontage standards:**
 - a. Each lot or development site shall have either frontage on a public street for a distance of at least 25 feet or have access to a public street through an easement that is at least 25 feet wide. No new private streets, as defined in NMC 15.05.030, shall be created to provide frontage or access.**
 - b. Each lot in an R-2 and R-3 zone shall have a minimum width of 30 feet at the front building line.**
 - c. Each lot in an R-1, AI, or RP zone shall have a minimum width of 50 feet at the front building line.**
 - d. Each lot in an AR zone shall have a minimum width of 45 feet at the front building line.**
- 2. The above standards apply with the following exceptions:**
 - a. Legally created lots of record in existence prior to the effective date of the ordinance codified in this code.**
 - b. Lots or development sites which, as a process of their creation, were approved with sub-standard widths in accordance with provisions of this code.**
 - c. Existing private streets may not be used for new dwelling units, except private streets that were created prior to March 1, 1999, including paving to fire access roads standards and installation of necessary utilities, and private streets allowed in the airport residential and airport industrial districts.**

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lot dimensions, increased lot coverage, and reduced frontage requirements. Private streets are proposed to provide access to many of the lots in this development. Private streets are permitted as discussed previously in this narrative. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.405.040 Lot coverage and parking coverage requirements.

A. Purpose. The lot coverage and parking coverage requirements below are intended to:

- 1. Limit the amount of impervious surface and storm drain runoff on residential lots.**
- 2. Provide open space and recreational space on the same lot for occupants of that lot.**
- 3. Limit the bulk of residential development to that appropriate in the applicable zone.**

B. Residential uses in residential zones shall meet the following maximum lot coverage and parking coverage standards. See the definitions in NMC 15.05.030 and Appendix A, Figure 4.

- 1. Maximum Lot Coverage.**
 - a. R-1: 30 percent, or 40 percent if all structures on the lot are one-story.**
 - b. R-2 and RP: 50 percent.**
 - c. AR and R-3: 50 percent.**
- 2. Maximum Parking Coverage. R-1, R-2, R-3, and RP: 30 percent.**
- 3. Combined Maximum Lot and Parking Coverage.**
 - a. R-1, R-2 and RP: 60 percent.**
 - b. R-3: 70 percent.**

C. All other districts and uses not listed in subsection (B) of this section shall not be limited as to lot coverage and parking coverage except as otherwise required by this code.

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes an increase to the maximum lot coverage standards to 70% within the R-2 zoned portions of the site to match the R-3 standard of 70%. This increase to the maximum is proposed to provide more housing options at an approachable price point, including some affordable housing. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.410 Yard Setback Requirements

15.410.010 General yard regulations.

A. No yard or open space provided around any building for the purpose of complying with the provisions of this code shall be considered as providing a yard or open space for any other building.

B. No yard or open space on adjoining property shall be considered as providing required yard or open space for another lot or development site under the provisions of this code.

C. No front yards provided around any building for the purpose of complying with the regulations of this code shall be used for public or private parking areas or garages, or other accessory buildings, except as specifically provided elsewhere in this code.

D. When the common property line separating two or more contiguous lots is covered by a building or a permitted group of buildings with respect to such common property line or lines does not fully conform to the required yard spaces on each side of such common property line or lines, such lots shall constitute a single development site and the yards as required by this code shall then not apply to such common property lines.

E. Dwellings Where Permitted above Nonresidential Buildings. The front and interior yard requirements for residential uses shall not be applicable; provided, that all yard requirements for the district in which such building is located are complied with.

F. In the AI airport industrial district, clear areas, safety areas, object-free areas, taxiways, parking aprons, and runways may be counted as required yards for a building, even if located upon an adjacent parcel.

G. In the AR airport residential district, clear areas, safety areas, object-free areas, taxiways, parking aprons, and runways may be counted as required yards for a building, if located upon an adjacent parcel.

15.410.020 Front yard setback.

A. Residential (see Appendix A, Figure 10).

- 1. AR, R-1 and R-2 districts shall have a front yard of not less than 15 feet. Said yard shall be landscaped and maintained.**
- 2. R-3 and RP districts shall have a front yard of not less than 12 feet. Said yard shall be landscaped and maintained.**
- 3. The entrance to a garage or carport, whether or not attached to a dwelling, shall be set back at least 20 feet from the nearest property line of the street to which access will be provided. However, the foregoing setback requirement shall not apply where the garage or carport will be provided with access to an alley only.**

B. Commercial.

- 1. All lots or development sites in the C-1 district shall have a front yard of not less than 10 feet. Said yard shall be landscaped and maintained.**
- 2. All lots or development sites in the C-2 district shall have a front yard of not less than 10 feet. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.**
- 3. All lots or development sites in the C-3 district shall have no minimum front yard requirements. The maximum allowable front yard shall be 20 feet. In the case of a through lot with two front yards, at least one front yard must meet the maximum setback requirement. In the case of three or more front yards, at least two front yards must meet the maximum setback requirements. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.**
- 4. All lots or development sites in the C-4 district will comply with the front yard requirements described in NMC 15.352.040(E).**

15.410.030 Interior yard setback.

A. Residential.

1. All lots or development sites in the AR, R- 1, R-2 and R-3 districts shall have interior yards of not less than five feet, except that where a utility easement is recorded adjacent to a side lot line, there shall be a side yard no less than the width of the easement.
2. All lots or development sites in the RP district shall have interior yards of not less than eight feet.

B. Commercial.

1. All lots or development sites in the C-1 and C-2 districts have no interior yards required where said lots or development sites abut property lines of commercially or industrially zoned property. When interior lot lines of said districts are common with property zoned residentially, interior yards of not less than 10 feet shall be required opposite the residential districts.
2. All lots or development sites in the C-3 district shall have no interior yard requirements.
3. All lots or development sites in the C-4 district will comply with the interior yard requirements described in NMC 15.352.040(E).

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced yard setbacks of 2.5 feet within the R-2 zoned portions of the site plan. The reduced yard setbacks allow innovation in design and density of this site that promotes the purpose of the PUD to provide an approachable price point for housing, including some affordable housing. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.410.060 Vision clearance setback.

The following vision clearance standards shall apply in all zones (see Appendix A, Figure 9).

- A. At the intersection of two streets, including private streets, a triangle formed by the intersection of the curb lines, each leg of the vision clearance triangle shall be a minimum of 50 feet in length.
- B. At the intersection of a private drive and a street, a triangle formed by the intersection of the curb lines, each leg of the vision clearance triangle shall be a minimum of 25 feet in length.
- C. Vision clearance triangles shall be kept free of all visual obstructions from two and one-half feet to nine feet above the curb line. Where curbs are absent, the edge of the asphalt or future curb location shall be used as a guide, whichever provides the greatest amount of vision clearance.
- D. There is no vision clearance requirement within the commercial zoning district(s) located within the riverfront (RF) overlay subdistrict.

Applicant's Facts and Findings: The proposed development maintains all required vision clearance setbacks, as demonstrated on the submitted plans.

This standard is met.

15.410.070 Yard exceptions and permitted intrusions into required yard setbacks.

The following intrusions may project into required yards to the extent and under the conditions and limitations indicated:

A. Depressed Areas. In any district, open work fences, hedges, guard railings or other landscaping or architectural devices for safety protection around depressed ramps, stairs or retaining walls may be located in required yards; provided, that such devices are not more than three and one-half feet in height.

B. Accessory Buildings. In front yards on through lots, where a through lot has a depth of not more than 140 feet, accessory buildings may be located in one of the required front yards; provided, that every portion of such accessory building is not less than 10 feet from the nearest street line.

C. Projecting Building Features. The following building features may project into the required front yard no more than five feet and into the required interior yards no more than two feet; provided, that such projections are no closer than three feet to any interior lot line:

1. Eaves, cornices, belt courses, sills, awnings, buttresses or other similar features.
2. Chimneys and fireplaces, provided they do not exceed eight feet in width.
3. Porches, platforms or landings which do not extend above the level of the first floor of the building.
4. Mechanical structures (heat pumps, air conditioners, emergency generators and pumps).

D. Fences and Walls.

1. In the residential district, a fence or wall shall be permitted to be placed at the property line or within a yard setback as follows:
 - a. Not to exceed six feet in height. Located or maintained within the required interior yards. For purposes of fencing only, lots that are corner lots or through lots may select one of the street frontages as a front yard and all other yards shall be considered as interior yards, allowing the placement of a six-foot fence on the property line. In no case may a fence extend into the clear vision zone as defined in NMC 15.410.060.
 - b. Not to exceed four feet in height. Located or maintained within all other front yards.
2. In any commercial or industrial district, a fence or wall shall be permitted to be placed at the property line or within a yard setback as follows:
 - a. Not to exceed eight feet in height. Located or maintained in any interior yard except where the requirements of vision clearance apply. For purposes of fencing only, lots that are corner lots or through lots may select one of the street frontages as a front yard and all other yards shall be considered as interior yards, allowing the placement of an eight-foot fence on the property line.
 - b. Not to exceed four feet in height. Located or maintained within all other front yards.
3. If chain link (wire-woven) fences are used, they are manufactured of corrosion-proof materials of at least 11-1/2 gauge.
4. The requirements of vision clearance shall apply to the placement of fences.

Applicant's Facts and Findings: The Applicant acknowledges permitted intrusions into required yard setbacks. The fences surrounding the single-family residential in the R-1 and R-2 zoning areas will not exceed 6-feet in height. The fencing in the C-2 zoning areas will not exceed 8-feet in height. No fence exceeding 4-feet in height will be placed in a front yard setback.

This standard is met.

E. Parking and Service Drives (Also Refer to NMC 15.440.010 through 15.440.080).

1. In any district, service drives or accessways providing ingress and egress shall be permitted, together with any appropriate traffic control devices in any required yard.
2. In any residential district, public or private parking areas and parking spaces shall not be permitted in any required yard except as provided herein:
 - a. Required parking spaces shall be permitted on service drives in the required front yard in conjunction with any single-family or two-family dwelling on a single lot.
 - b. Recreational vehicles, boat trailers, camperettes and all other vehicles not in daily use are restricted to parking in the front yard setback for not more than 48 hours; and recreational vehicles, boat trailers, camperettes and all other vehicles not in daily use are permitted to be located in the required interior yards.
 - c. Public or private parking areas, parking spaces or any building or portion of any building intended for parking which have been identified as a use permitted in any residential district shall be permitted in any interior yard that abuts an alley, provided said parking areas, structures or spaces shall comply with NMC 15.440.070, Parking tables and diagrams (Diagrams 1 through 3).
 - d. Public or private parking areas, service drives or parking spaces which have been identified as a use permitted in any residential district shall be permitted in interior yards; provided, that said parking areas, service drives or parking spaces shall comply with other requirements of this code.
3. In any commercial or industrial district, except C-1, C-4 and M-1, public or private parking areas or parking spaces shall be permitted in any required yard (see NMC 15.410.030). Parking requirements in the C-4 district are described in NMC 15.352.040(H).
4. In the I district, public or private parking areas or parking spaces may be no closer to a front property line than 20 feet, and no closer to an interior property line than five feet.

F. Public Telephone Booths and Public Transit Shelters. Public telephone booths and public transit shelters shall be permitted; provided, that vision clearance is maintained for vehicle requirements for vision clearance.

G. Hangars within the AR airport residential district may be constructed with no yard setbacks to property lines adjacent to other properties within the airport residential or airport industrial districts

Applicant's Facts and Findings: Parking is proposed on private lots in driveways, on-street parallel, on-street in perpendicular "bays", and in designated parking lots. There are a total of 246 parking spaces proposed to serve the residential development plus either two or four parking spaces per unit within the garages of the single family homes.

In total, the project will provide the following parking space configuration:

- Apartment Parking – 91 Spaces
- Public Street Parking – 73 Spaces
- Private Street Parking – 85 Spaces
- R-1 Lot Parking – 72 Spaces
- 17' Front Load Parking – 46 Spaces
- 17' Rear Load Parking – 219 Spaces
- 21' Front Load Spaces – 111 Spaces
- 21' Rear Load Spaces – 268 Spaces
- 25' Front Load Spaces – 52 Spaces
- 25' Rear Load Spaces – 68 Spaces

The total number of spaces may vary based upon the revisions necessary to satisfy any conditions of approval or as a result of changes to the final plat and product configuration but the current design, showing detached units, currently provides 1,085 parking spaces.

The location of the proposed parking areas meets the requirements of this standard.

This standard is met.

15.415 Building and Site Design Standards

15.415.010 Main buildings and uses as accessory buildings.

A. Hereinafter, any building which is the only building on a lot is a main building.

B. In any residential district except RP, there shall be only one main use per lot or development site; provided, that home occupations shall be allowed where permitted.

C. In any residential district, there shall be no more than two accessory buildings on any lot or development site.

Applicant's Facts and Findings: The proposed residential development includes only main residential-use buildings at this time. The Applicant acknowledges that no more than two accessory buildings will be permitted on any lot in the R-zoned portions of the development.

This standard is met.

15.415.020 Building height limitation.

A. Residential.

- 1. In the R-1, R-2, AR, and RP districts, no main building shall exceed 30 feet in height. Accessory buildings in the R-1, R-2, R-3, AR, and RP districts are limited to 16 feet in height, except as follows:**
 - a. Up to 800 square feet of an accessory building may have a height of up to 24 feet.**
 - b. Aircraft hangars in the AR district may be the same height as the main building.**

2. **In the R-3 district, no main building shall exceed 45 feet in height, except, where an R-3 district abuts upon an R-1 district, the maximum permitted building height shall be limited to 30 feet for a distance of 50 feet from the abutting boundary of the aforementioned district.**
3. **Single-family dwellings permitted in commercial or industrial districts shall not exceed 30 feet in height.**

Applicant's Facts and Findings: The proposed a combination of single-family three story attached and detached structures proposed will exceed the 30 foot height limits. The proposed buildings will be approximately 35 feet in height. The applicant has proposed a height allowance which exceeds the limitations of this section as part of an overall plan to create a planned unit development.

This standard is met.

B. Commercial and Industrial.

1. **In the C-1 district no main building or accessory building shall exceed 30 feet in height.**
2. **In the AI, C-2, C-3, M-1, M-2, and M-3 districts there is no building height limitation, except, where said districts abut upon a residential district, the maximum permitted building height shall not exceed the maximum building height permitted in the abutting residential district for a distance of 50 feet from the abutting boundary.**
3. **In the C-4 district, building height limitation is described in NMC 15.352.040(J)(1).**

Applicant's Facts and Findings: The multi-family buildings proposed in the C-2 zoned portion of this site require a conditional use permit. As such, the maximum height of buildings in the C-2 zoning district will be stated in the Conditional Use Permit, as required by subsection C., below.

This standard is not applicable as a Conditional Use Permit is requested and will state the maximum height of buildings.

C. The maximum height of buildings and uses permitted conditionally shall be stated in the conditional use permits.

Applicant's Facts and Findings: The Applicant proposes a maximum building height of 48 feet for the multi-family residential structures. This maximum height shall be stated on the Conditional Use Permit.

This standard is met.

15.415.040 Public access required.

No building or structure shall be erected or altered except on a lot fronting or abutting on a public street or having access to a public street over a private street or easement of record approved in accordance with provisions contained in this code. New private streets may not be created to provide

access except as allowed under NMC 15.332.020(B)(24), 15.336.020(B)(8), and in the M-4 zone. Existing private streets may not be used for access for new dwelling units, except as allowed under NMC 15.405.030. No building or structure shall be erected or altered without provisions for access roadways as required in the Oregon Fire Code, as adopted by the city.

Applicant's Facts and Findings: All proposed residential structures will have access to a public street either directly or via a connection from a private street, as permitted by the Planned Unit Development (PUD) criteria and as previously discussed in this narrative.

This standard is met.

15.420 Landscaping and Outdoor Areas

15.420.010 Required minimum standards.

A. Private and Shared Outdoor Recreation Areas in Residential Developments.

1. **Private Areas.** Each ground-level living unit in a residential development subject to a design review plan approval shall have an accessible outdoor private space of not less than 48 square feet in area. The area shall be enclosed, screened or otherwise designed to provide increased privacy for unit residents, their guests and neighbors.
2. **Individual and Shared Areas.** Usable outdoor recreation space shall be provided for the individual and/or shared use of residents and their guests in any duplex or multifamily residential development, as follows:
 - a. **One- or two-bedroom units: 200 square feet per unit.**
 - b. **Three- or more bedroom units: 300 square feet per unit.**
 - c. **Storage areas are required in residential developments. Convenient areas shall be provided in residential developments for the storage of articles such as bicycles, barbecues, luggage, outdoor furniture, and the like. These shall be entirely enclosed.**
3. **In the AR airport residential district a five percent landscaping standard is required with the goal of "softening" the buildings and making the development "green" with plants, where possible. The existence of the runway, taxiway, and approach open areas already provide generally for the 15 percent requirement.**

Applicant's Facts and Findings: Each ground-level home within the community will have a minimum of 48 square feet of private outdoor open space. The multi-family housing area provides the required shared usable outdoor recreation space. Enclosed storage areas are provided attached to the outdoor private areas in the multi-family residential and in the garages of the single-family residential.

This standard is met.

B. Required Landscaped Area. The following landscape requirements are established for all developments except single-family dwellings:

1. **A minimum of 15 percent of the lot area shall be landscaped; provided, however, that computation of this minimum may include areas landscaped under subsection (B)(3) of this**

section. Development in the C-3 (central business district) zoning district and M-4 (large lot industrial) zoning district is exempt from the 15 percent landscape area requirement of this section. Additional landscaping requirements in the C-4 district are described in NMC 15.352.040(K). In the AI airport industrial district, only a five percent landscaping standard is required with the goal of “softening” the buildings and making the development “green” with plants, where possible. The existence of the runway, taxiway, and approach open areas already provide generally for the 15 percent requirement. Developments in the AI airport industrial district with a public street frontage shall have said minimum landscaping between the front property line and the front of the building.

Applicant’s Facts and Findings: A minimum of fifteen percent (15%) of the area surrounding the multi-family development will be landscaped.

This standard is met.

2. All areas subject to the final design review plan and not otherwise improved shall be landscaped.

Applicant’s Facts and Findings: All areas included with the final design review plan and not otherwise improved will be landscaped.

This standard is met.

3. The following landscape requirements shall apply to the parking and loading areas:

- a. A parking or loading area providing 10 or more spaces shall be improved with defined landscaped areas totaling no less than 25 square feet per parking space.
- b. A parking, loading area, or drive aisle which runs adjacent to a property line shall be separate from any lot line adjacent to a street by a landscaped strip at least 10 feet in interior width or the width of the required yard, whichever is greater, and any other lot line by a landscaped strip of at least five feet in interior width. See subsections (B)(3)(c) and (d) of this section for material to plant within landscape strips.
- c. A landscaped strip separating a parking area, loading area, or drive aisle from a street shall contain street trees spaced as appropriate to the species, not to exceed 50 feet apart on average, and a combination of shrubs and ground cover, or lawn. This landscaping shall provide partial screening of these areas from the street.
- d. A landscaped strip separating a parking area, loading area, or drive aisle from an interior lot line shall contain any combination of trees, shrubs, ground cover or lawn. Plant material shall be selected from at least two different plant material groups (example: trees and shrubs, or lawn and shrubs, or lawn and trees and shrubs).
- e. Landscaping in a parking or loading area shall be located in defined landscaped areas which are uniformly distributed throughout the parking or loading area.
- f. Landscaping areas in a parking lot, service drive or loading area shall have an interior width of not less than five feet.

- g. **All multifamily, institutional, commercial, or industrial parking areas, service drives, or loading zones which abut a residential district shall be enclosed with a 75 percent opaque, site-obscuring fence, wall or evergreen hedge along and immediately adjacent to any interior property line which abuts the residential district. Landscape plantings must be large enough to provide the required minimum screening requirement within 12 months after initial installation. Adequate provisions shall be maintained to protect walls, fences or plant materials from being damaged by vehicles using said parking areas.**
- h. **An island of landscaped area shall be located to separate blocks of parking spaces. At a minimum, one deciduous shade tree per seven parking spaces shall be planted to create a partial tree canopy over and around the parking area. No more than seven parking spaces may be grouped together without an island separation unless otherwise approved by the director based on the following alternative standards:**
 - i. **Provision of a continuous landscaped strip, with a five-foot minimum width, which runs perpendicular to the row of parking spaces (see Appendix A, Figure 13).**
 - ii. **Provision of tree planting landscape islands, each of which is at least 16 square feet in size, and spaced no more than 50 feet apart on average, within areas proposed for back-to-back parking (see Appendix A, Figure 14).**

Applicant's Facts and Findings: As identified on the included site plan, the parking areas providing 10 or more spaces all meet the minimum landscaping requirements. All landscaped areas in parking areas provide a minimum of two different plant material groups, including trees, shrubs, ground cover or lawn. Fencing will be provided in compliance with this Section.

This standard is met.

- 4. **Trees, Shrubs and Ground Covers. The species of street trees required under this section shall conform to those authorized by the city council through resolution. The director shall have the responsibility for preparing and updating the street tree species list which shall be adopted in resolution form by the city council.**
 - a. **Arterial and minor arterial street trees shall have spacing of approximately 50 feet on center. These trees shall have a minimum two-inch caliper tree trunk or stalk at a measurement of two feet up from the base and shall be balled and burlapped or boxed.**
 - b. **Collector and local street trees shall be spaced approximately 35 to 40 feet on center. These trees shall have a minimum of a one and one-half or one and three-fourths inch tree trunk or stalk and shall be balled and burlapped or boxed.**
 - c. **Accent Trees. Accent trees are trees such as flowering cherry, flowering plum, crab-apple, Hawthorne and the like. These trees shall have a minimum one and one-half inch caliper tree trunk or stalk and shall be at least eight to 10 feet in height. These**

trees may be planted bare root or balled and burlapped. The spacing of these trees should be approximately 25 to 30 feet on center.

- d. All broad-leafed evergreen shrubs and deciduous shrubs shall have a minimum height of 12 to 15 inches and shall be balled and burlapped or come from a two-gallon can. Gallon-can size shrubs will not be allowed except in ground covers. Larger sizes of shrubs may be required in special areas and locations as specified by the design review board. Spacing of these shrubs shall be typical for the variety, three to eight feet, and shall be identified on the landscape planting plan.
- e. **Ground Cover Plant Material.** Ground cover plant material such as greening juniper, cotoneaster, minor Bowles, English ivy, hypericum and the like shall be one of the following sizes in specified spacing for that size:

Gallon cans	3 feet on center
4" containers	2 feet on center
2-1/4" containers	18" on center
Rooted cuttings	12" on center

Applicant’s Facts and Findings: As identified on the submitted landscaping plan, all street trees and ground cover provided in this development will meet city standards.

This standard is met.

- 5. **Automatic, underground irrigation systems shall be provided for all areas required to be planted by this section. The director shall retain the flexibility to allow a combination of irrigated and nonirrigated areas. Landscaping material used within nonirrigated areas must consist of drought-resistant varieties. Provision must be made for alternative irrigation during the first year after initial installation to provide sufficient moisture for plant establishment.**
- 6. **Required landscaping shall be continuously maintained.**
- 7. **Maximum height of tree species shall be considered when planting under overhead utility lines.**
- 8. **Landscaping requirements and standards for parking and loading areas (subsection (B)(3) of this section) will apply to development proposals unless the institution has addressed the requirements and standards by an approved site development master plan. With an approved site development master plan, the landscape requirements will be reviewed through an administrative Type I review process.**
- 9. **In the M-4 zone, landscaping requirements and standards for parking and loading areas (subsection (B)(3) of this section) do not apply unless within 50 feet of a residential district.**

Applicant’s Facts and Findings: Automatic, underground irrigation systems will be provided for all landscaped areas. Landscaping will be continuously maintained by the project’s Homeowner’s Association. As identified in the included landscaping plan, the trees and shrubs

have been chosen for their appropriateness for the location in which they are to be planted.

This standard is met.

C. Installation of Landscaping. All landscaping required by these provisions shall be installed prior to the issuance of occupancy permits, unless security equal to 110 percent of the cost of the landscaping as determined by the director is filed with the city, insuring such installation within six months of occupancy. A security – cash, certified check, time certificates of deposit, assignment of a savings account, bond or such other assurance of completion as shall meet with the approval of the city attorney – shall satisfy the security requirements. If the installation of the landscaping is not completed within the six-month period, or within an extension of time authorized by the director, the security may be used by the city to complete the installation. Upon completion of the installation, any portion of the remaining security deposited with the city shall be returned to the applicant.

Applicant’s Facts and Findings: Landscaping will be installed or assured according to City requirements prior to the issuance of occupancy permits.

This standard is met.

15.420.020 Landscaping and amenities in public rights-of-way.

The following standards are intended to create attractive streetscapes and inviting pedestrian spaces. A review body may require any of the following landscaping and amenities to be placed in abutting public rights-of-way as part of multifamily, commercial, industrial, or institutional design reviews, or for subdivisions and planned unit developments. In addition, any entity improving existing rights-of-way should consider including these elements in the project. A decision to include any amenity shall be based on comprehensive plan guidelines, pedestrian volumes in the area, and the nature of surrounding development.

A. Pedestrian Space Landscaping. Pedestrian spaces shall include all sidewalks and medians used for pedestrian refuge. Spaces near sidewalks shall provide plant material for cooling and dust control, and street furniture for comfort and safety, such as benches, waste receptacles and pedestrian-scale lighting. These spaces should be designed for short-term as well as long-term use. Elements of pedestrian spaces shall not obstruct sightlines and shall adhere to any other required city safety measures. Medians used for pedestrian refuge shall be designed for short-term use only with plant material for cooling and dust control, and pedestrian-scale lighting. The design of these spaces shall facilitate safe pedestrian crossing with lighting and accent paving to delineate a safe crossing zone visually clear to motorists and pedestrians alike.

1. Street trees planted in pedestrian spaces shall be planted according to NMC 15.420.010(B)(4).
2. Pedestrian spaces shall have low (two and one-half feet) shrubs and ground covers for safety purposes, enhancing visibility and discouraging criminal activity.
 - a. Plantings shall be 90 percent evergreen year-round, provide seasonal interest with fall color or blooms, and at maturity maintain growth within the planting area (refer to plant material matrix below).

- b. Plant placement shall also adhere to clear sight line requirements as well as any other relevant city safety measures
- 3. Pedestrian-scale lighting shall be installed along sidewalks and in medians used for pedestrian refuge.
 - a. Pole lights as well as bollard lighting may be specified; however, the amount and type of pedestrian activity during evening hours, e.g., transit stops, nighttime service districts, shall ultimately determine the type of fixture chosen.
 - b. Luminaire styles shall match the area/district theme of existing luminaires and shall not conflict with existing building or roadway lights causing glare.
 - c. Lighting heights and styles shall be chosen to prevent glare and to designate a clear and safe path and limit opportunities for vandalism (see Appendix A, Figure 17, Typical Pedestrian Space Layouts).
 - d. Lighting shall be placed near the curb to provide maximum illumination for spaces furthest from building illumination. Spacing shall correspond to that of the street trees to prevent tree foliage from blocking light.
- 4. Street furniture such as benches and waste receptacles shall be provided for spaces near sidewalks only.
 - a. Furniture should be sited in areas with the heaviest pedestrian activity, such as downtown, shopping districts, and shopping centers.
 - b. Benches should be arranged to facilitate conversation between individuals with L-shaped arrangements and should face the area focal point, such as shops, fountains, plazas, and should divert attention away from nearby traffic.
- 5. Paving and curb cuts shall facilitate safe pedestrian crossing and meet all ADA requirements for accessibility.

Applicant’s Facts and Findings:

The submitted landscaping plan identifies landscaping and amenities proposed for the public right-of-way. Due to the residential nature of the site and the amenities to be provided within the project’s open spaces, the public rights-of-way have been provided with mainly plantings. Once the commercial component of this site develops, we would anticipate the need for more benches, trash receptacles and other pedestrian amenities, potentially within the rights-of-way.

This standard is met.

B. Planting Strip Landscaping. All planting strips shall be landscaped. Planting strips provide a physical and psychological buffer for pedestrians from traffic with plant material that reduces heat and dust, creating a more comfortable pedestrian environment. Planting strips shall have different arrangements and combinations of plant materials according to the frequency of on-street parking (see Appendix A, Figures 18 and 19).

- 1. Planting strips which do not have adjacent parking shall have a combination of ground covers, low (two and one-half feet) shrubs and trees. Planting strips adjacent to frequently used on-street parking, as defined by city staff, shall only have trees protected by tree grates, and planting strips adjacent to infrequently used on-street parking shall be planted with

ground cover as well as trees (see Appendix A, Figures 18 and 19, Typical Planting Strip Layouts). District themes or corridor themes linking individual districts should be followed utilizing a unifying plant characteristic, e.g., bloom color, habit, or fall color. When specifying thematic plant material, monocultures should be avoided, particularly those species susceptible to disease.

2. Street trees shall be provided in all planting strips as provided in NMC 15.420.010(B)(4).
 - a. Planting strips without adjacent parking or with infrequent adjacent parking shall have street trees in conjunction with ground covers and/or shrubs.
 - b. Planting strips with adjacent parking used frequently shall have only street trees protected by tree grates.
3. Shrubs and ground covers shall be provided in planting strips without adjacent parking with low (two and one-half feet) planting masses to enhance visibility, discourage criminal activity, and provide a physical as well as psychological buffer from passing traffic.
 - a. Plantings shall be 90 percent evergreen year-round, provide seasonal interest with fall color or blooms and at maturity maintain growth within the planting area.
 - b. Ground cover able to endure infrequent foot traffic shall be used in combination with street trees for planting strips with adjacent occasional parking (refer to plant material matrix below).
 - c. All plant placement shall adhere to clear sight line requirements as well as any other relevant city safety measures.

C. Maintenance. All landscapes shall be maintained for the duration of the planting to encourage health of plant material as well as public health and safety. All street trees and shrubs shall be pruned to maintain health and structure of the plant material for public safety purposes.

Applicant's Facts and Findings: As identified in the included landscaping plan, all planting strips will be landscaped with a combination of ground covers, shrubs and trees. All landscaping will be maintained for the duration of the planting and all street trees and shrubs will be pruned to maintain the health and structure of the plants.

This standard is met.

D. Exception. In the AI airport industrial district and AR airport residential district, no landscape or amenities except for grass are required for any area within 50 feet of aircraft operation areas including aircraft parking areas, taxiways, clear areas, safety areas, object-free areas, and the runway.

Applicant's Facts and Findings: This standard is not in the AI or AR zone and, as such, this standard is not applicable.

15.425 Exterior Lighting

15.425.010 Purpose.

The purpose of this chapter is to regulate the placement, orientation, distribution patterns, and fixture types of on-site outdoor lighting. The intent of this section is to provide minimum lighting

standards that promote safety, utility, and security, prevent glare on public roadways, and protect the privacy of residents.

15.425.020 Applicability and exemptions.

A. Applicability. Outdoor lighting shall be required for safety and personal security in areas of assembly, parking, and traverse, as part of multifamily residential, commercial, industrial, public, recreational and institutional uses. The applicant for any Type I or Type II development permit shall submit, as part of the site plan, evidence that the proposed outdoor lighting plan will comply with this section. This information shall contain but not be limited to the following:

1. The location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture.
2. Additional information the director may determine is necessary, including but not limited to illuminance level profiles, hours of business operation, and percentage of site dedicated to parking and access.
3. If any portion of the site is used after dark for outdoor parking, assembly or traverse, an illumination plan for these areas is required. The plan must address safety and personal security.

B. Exemptions. The following uses shall be exempt from the provisions of this section:

1. Public street and airport lighting.
2. Circus, fair, carnival, or outdoor governmentally sponsored event or festival lighting.
3. Construction or emergency lighting, provided such lighting is discontinued immediately upon completion of the construction work or abatement of the emergency necessitating said lighting.
4. Temporary Lighting. In addition to the lighting otherwise permitted in this code, a lot may contain temporary lighting during events as listed below:
 - a. Grand Opening Event. A grand opening is an event of up to 30 days in duration within 30 days of issuance of a certificate of occupancy for a new or remodeled structure, or within 30 days of change of business or ownership. No lot may have more than one grand opening event per calendar year. The applicant shall notify the city in writing of the beginning and ending dates prior to the grand opening event.
 - b. Other Events. A lot may have two other events per calendar year. The events may not be more than eight consecutive days in duration, nor less than 30 days apart.
5. Lighting activated by motion sensor devices.
6. Nonconforming lighting in place as of September 5, 2000. Replacement of nonconforming lighting is subject to the requirements of NMC 15.205.010 through 15.205.100.
7. Light Trespass onto Industrial Properties. The lighting trespass standards of NMC 15.425.040 do not apply where the light trespass would be onto an industrially zoned property.

Applicant's Facts and Findings: The land use submittal includes a lighting plan identifying the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture. Lighting is provided in the parking areas and the multi-family residential buildings.

This standard is met.

15.425.030 Alternative materials and methods of construction, installation, or operation.

The provisions of this section are not intended to prevent the use of any design, material, or methods of installation or operation not specifically prescribed by this section, provided any such alternate has been approved by the director. Alternatives must be an approximate equivalent to the applicable specific requirement of this section and must comply with all other applicable standards in this section.

Applicant's Facts and Findings: This land use submittal does not include a request for alternative materials and methods of construction, installation or operation.

This standard is met.

15.425.040 Requirements.

A. General Requirements – All Zoning Districts.

1. Low-level light fixtures include exterior lights which are installed between ground level and six feet tall. Low-level light fixtures are considered nonintrusive and are unrestricted by this code.
2. Medium-level light fixtures include exterior lights which are installed between six feet and 15 feet above ground level. Medium-level light fixtures must either comply with the shielding requirements of subsection (B) of this section, or the applicant shall show that light trespass from a property has been designed not to exceed one-half foot-candle at the property line.
3. High-level light fixtures include exterior lights which are installed 15 feet or more above ground level. High-level light fixtures must comply with the shielding requirements of subsection (B) of this section, and light trespass from a property may not exceed one-half foot-candle at the property line.

B. Table of Shielding Requirements.

Fixture Lamp Type	Shielded
Low/high pressure sodium, mercury vapor, metal halide and fluorescent over 50 watts	Fully
Incandescent over 160 watts	Fully
Incandescent 160 watts or less	None
Fossil fuel	None
Any light source of 50 watts or less	None
Other sources	As approved by NMC <u>15.425.030</u>

Applicant's Facts and Findings: The land use submittal includes a lighting plan identifying the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture. Lighting is provided in the parking areas and the multi-family residential buildings. All medium- and high-level lighting is designed to meet this section.

This standard is met.

15.430 Underground Utility Installation

15.430.010 Underground utility installation.

A. All new utility lines, including but not limited to electric, communication, natural gas, and cable television transmission lines, shall be placed underground. This does not include surface-mounted transformers, connections boxes, meter cabinets, service cabinets, temporary facilities during construction, and high-capacity electric lines operating at 50,000 volts or above.

B. Existing utility lines shall be placed underground when they are relocated, or when an addition or remodel requiring a Type II design review is proposed, or when a developed area is annexed to the city.

C. The director may make exceptions to the requirement to underground utilities based on one or more of the following criteria:

- 1. The cost of undergrounding the utility is extraordinarily expensive.**
- 2. There are physical factors that make undergrounding extraordinarily difficult.**
- 3. Existing utility facilities in the area are primarily overhead and are unlikely to be changed.**

Applicant's Facts and Findings: All new utility lines will be located underground.

This standard is met.

15.440 Off-Street Parking, Bicycle Parking, and Private Walkways

Article I. Off-Street Parking Requirements

15.440.010 Required off-street parking.

A. Off-street parking shall be provided on the development site for all R-1, C-1, M-1, M-2 and M-3 zones. In all other zones, the required parking shall be on the development site or within 400 feet of the development site which the parking is required to serve. All required parking must be under the same ownership as the development site served except through special covenant agreements as approved by the city attorney, which bind the parking to the development site.

B. Off-street parking is not required in the C-3 district, except for:

- 1. Dwelling units meeting the requirements noted in NMC 15.305.020.**
- 2. New development which is either immediately adjacent to a residential district or separated by nothing but an alley.**

C. Within the C-4 district, the minimum number of required off-street parking spaces shall be 50 percent of the number required by NMC 15.440.030, except that no reduction is permitted for residential uses.

D. All commercial, office, or industrial developments that have more than 20 off-street parking spaces and that have designated employee parking must provide at least one preferential carpool/vanpool parking space. The preferential carpool/vanpool parking space(s) must be located close to a building entrance.

Applicant's Facts and Findings: The proposed parking for the single-family homes will be on the same lot as the use. Additional on-street parking and "guest parking" areas are proposed and will be owned and maintained according by the project's Homeowner's Association. The proposed parking for the multi-family buildings will also be on the same development site as the buildings, in a parking lot adjacent to the buildings. There are no commercial, office or industrial developments proposed at this time and, as such, no carpool/vanpool parking spaces are required.

This standard is met.

15.440.020 Parking area and service drive design.

A. All public or private parking areas, parking spaces, or garages shall be designed, laid out and constructed in accordance with the minimum standards as set forth in NMC 15.440.070.

B. Groups of three or more parking spaces, except those in conjunction with single-family or two-family dwellings on a single lot, shall be served by a service drive so that no backward movement or other maneuvering of a vehicle within a street, other than an alley, will be required. Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety in traffic access and egress and maximum safety of pedestrian and vehicular traffic on the site, but in no case shall two-way and one-way service drives be less than 20 feet and 12 feet, respectively. Service drives shall be improved in accordance with the minimum standards as set forth in NMC 15.440.060.

C. Gates. A private drive or private street serving as primary access to more than one dwelling unit shall not be gated to limit access, except as approved by variance.

D. In the AI airport industrial district and AR airport residential district, taxiways may be used as part of the service drive design where an overall site plan is submitted that shows how the circulation of aircraft and vehicles are safely accommodated, where security fences are located, if required, and is approved by the fire marshal, planning director, and public works director. The following submittal must be made:

- 1. A drawing of the area to be developed, including the probable location, height, and description of structures to be constructed; the location and description of a security fence or gate to secure the aircraft operations areas of off-airport property from the other nonsecured pedestrian/auto/truck areas of on-airport property; the proposed location of the proposed taxiway access in accordance with FAA specifications (refer to Federal Aviation Administration Advisory Circular No. 150/5300-13 regarding airport design, and AC/5370-10B regarding construction standards for specifications that should be used as a guideline); and the identification of the vehicular traffic pattern area clearly separated from aircraft traffic. Once specific buildings have been designed, FAA Form 7460-1, Notice of Proposed Construction or Alteration, must be submitted to the City of Newberg, the private airport owner, and the FAA for airspace review.**

15.440.030 Parking spaces required.

Use	Minimum Parking Spaces Required
Residential Types	
<p>Dwelling, multifamily and multiple single-family dwellings on a single lot</p> <p>Studio or one-bedroom unit</p> <p>Two-bedroom unit</p> <p>Three- and four-bedroom unit</p> <p>Five- or more bedroom unit</p> <ul style="list-style-type: none"> • Unassigned spaces • Visitor spaces • On-street parking credit • Available transit service 	<p>1 per <u>dwelling unit</u></p> <p>1.5 per <u>dwelling unit</u></p> <p>2 per <u>dwelling unit</u></p> <p>0.75 spaces per bedroom</p> <p>If a development is required to have more than 10 spaces on a <u>lot</u>, then it must provide some unassigned spaces. At least 15 percent of the total required <u>parking spaces</u> must be unassigned and be located for convenient <u>use</u> by all occupants of the development. The location shall be approved by the <u>director</u>.</p> <p>If a development is required to have more than 10 spaces on a <u>lot</u>, then it must provide at least 0.2 visitor spaces per <u>dwelling unit</u>.</p> <p>On-street parking spaces may be counted toward the minimum number of required spaces for developments required to have more than 10 spaces on a lot. The on-street spaces must be directly adjoining and on the same side of the street as the subject property, must be legal spaces that meet all city standards, and cannot be counted if they could be removed by planned future street widening or a bike lane on the street.</p> <p>At the review body’s discretion, affordable housing projects may reduce the required off-street parking by 10 percent if there is an adequate continuous pedestrian route no more than 1,500 feet in length from the development to transit service with an average of less than one hour regular service intervals during commuting periods or where the development provides its own transit. A developer may qualify for this parking reduction if improvements on a proposed pedestrian route are made by the developer, thereby rendering it an adequate continuous route.</p>
<p>Dwelling, single-family or two-family</p>	<p>2 for each dwelling unit on a single lot</p>

Applicant's Facts and Findings: All single-family development will have parking on the individual lots with at least 2 parking spaces provided on each lot, one within the garage and one within the driveway provided for each single family lot. Many of the single family homes will be provided with up to 4 parking spaces on each lot as two car garages and two car driveways will be developed on the majority of the lots within the development. The multi-family development proposes to create 51 units with 27 one bedroom homes and 24 two bedroom homes. The required parking for the one bedroom units is 27 spaces, the two bedroom units require 36 parking spaces and a total of 10 visitor parking spaces are required for a total of 74 parking spaces. As proposed, 92 spaces are provided which are on the same site as the multi-family buildings. An additional 7 on-street parking spaces are provided adjacent to the multi-family lot.

In total, the project will provide the following parking space configuration:

Apartment Parking – 91 Spaces
Public Street Parking – 73 Spaces
Private Street Parking – 85 Spaces
R-1 Lot Parking – 72 Spaces
17' Front Load Parking – 46 Spaces
17' Rear Load Parking – 219 Spaces
21' Front Load Spaces – 111 Spaces
21' Rear Load Spaces – 268 Spaces
25' Front Load Spaces – 52 Spaces
25' Rear Load Spaces – 68 Spaces

The total number of spaces may vary based upon the revisions necessary to satisfy any conditions of approval or as a result of changes to the final plat and product configuration but the current design, showing detached units, currently provides 1,085 parking spaces.

This standard is met.

15.440.060 Parking area and service drive improvements.

All public or private parking areas, outdoor vehicle sales areas, and service drives shall be improved according to the following:

A. All parking areas and service drives shall have surfacing of asphaltic concrete or Portland cement concrete or other hard surfacing such as brick or concrete pavers. Other durable and dust-free surfacing materials may be approved by the director for infrequently used parking areas. All parking areas and service drives shall be graded so as not to drain stormwater over the public sidewalk or onto any abutting public or private property.

B. All parking areas shall be designed not to encroach on public streets, alleys, and other rights-of-way. Parking areas shall not be placed in the area between the curb and sidewalk or, if there is no sidewalk, in the public right-of-way between the curb and the property line. The director may issue a permit for exceptions for unusual circumstances where the design maintains safety and aesthetics.

C. All parking areas, except those required in conjunction with a single-family or two-family dwelling, shall provide a substantial bumper which will prevent cars from encroachment on abutting private and public property.

D. All parking areas, including service drives, except those required in conjunction with single-family or two-family dwellings, shall be screened in accordance with NMC 15.420.010(B).

E. Any lights provided to illuminate any public or private parking area or vehicle sales area shall be so arranged as to reflect the light away from any abutting or adjacent residential district.

F. All service drives and parking spaces shall be substantially marked and comply with NMC 15.440.070.

G. Parking areas for residential uses shall not be located in a required front yard, except as follows:

- 1. Attached or detached single-family or two-family: parking is authorized in a front yard on a service drive which provides access to an improved parking area outside the front yard.**
- 2. Three- or four-family: parking is authorized in a front yard on a service drive which is adjacent to a door at least seven feet wide intended and used for entrance of a vehicle (see Appendix A, Figure 12).**

H. A reduction in size of the parking stall may be allowed for up to a maximum of 30 percent of the total number of spaces to allow for compact cars. For high turnover uses, such as convenience stores or fast-food restaurants, at the discretion of the director, all stalls will be required to be full-sized.

I. Affordable housing projects may use a tandem parking design, subject to approval of the community development director.

J. Portions of off-street parking areas may be developed or redeveloped for transit-related facilities and uses such as transit shelters or park-and-ride lots, subject to meeting all other applicable standards, including retaining the required minimum number of parking spaces.

Applicant's Facts and Findings: As identified on the submitted site plan and utility plans, all parking areas and service drives will be constructed to City standards. Parking areas do not encroach on public streets. Substantial parking bumpers are provided for the multi-family parking area. All parking area lighting will be designed to reduce light spill and glare away from any proposed or existing neighboring developments.

This standard is met.

Article II. Bicycle Parking

15.440.090 Purpose.

Cycling is a healthy activity for travel and recreation. In addition, by maximizing bicycle travel, the community can reduce negative effects of automobile travel, such as congestion and pollution. To maximize bicycle travel, developments must provide effective support facilities. At a minimum, developments need to provide a secure place for employees, customers, and residents to park their bicycles. [Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.1.]

15.440.100 Facility requirements.

Bicycle parking facilities shall be provided for the uses shown in the following table. Fractional space requirements shall be rounded up to the next whole number.

Use	Minimum Number of Bicycle Parking Spaces Required
New multiple dwellings, including additions creating additional dwelling units	One bicycle parking space for every four dwelling units

Applicant’s Facts and Findings: The proposed 51 multi-family dwelling units requires 13 bicycle parking spaces. This proposal includes the provision of 13 bicycle parking spaces.

This standard is met.

15.440.110 Design.

A. Bicycle parking facilities shall consist of one or more of the following:

1. A firmly secured loop, bar, rack, or similar facility that accommodates locking the bicycle frame and both wheels using a cable or U-shaped lock.
2. An enclosed locker.
3. A designated area within the ground floor of a building, garage, or storage area. Such area shall be clearly designated for bicycle parking.
4. Other facility designs approved by the director.

B. All bicycle parking spaces shall be at least six feet long and two and one-half feet wide. Spaces shall not obstruct pedestrian travel.

C. All spaces shall be located within 50 feet of a building entrance of the development.

D. Required bicycle parking facilities may be located in the public right-of-way adjacent to a development subject to approval of the authority resp

Applicant’s Facts and Findings: As shown on the included site development plans, the bicycle parking facility is designed to meet these requirements.

This standard is met.

Article III. Private Walkways

15.440.120 Purpose.

Sidewalks and private walkways are part of the city’s transportation system. Requiring their construction is part of the city’s plan to encourage multimodal travel and to reduce reliance on the automobile. Considerable funds have and will be expended to install sidewalks along the streets in the city. Yet there is little point to this expense if it is not possible for people to walk from the sidewalk to the developments along each side. The following requirements are intended to provide safe and convenient paths for employees, customers, and residents to walk from public sidewalks to development entrances, and to walk between buildings on larger sites.

15.440.130 Where required.

Private walkways shall be constructed as part of any development requiring Type II design review, including mobile home parks. In addition, they may be required as part of conditional use permits or planned unit developments. In the airport industrial (AI) district and residential (AR) district, on-site walks are not required in aircraft operations areas, such as parking aprons, taxiways, and runways.

Applicant's Facts and Findings: As this application includes a Planned Unit Development and Conditional Use Permit, walkways and sidewalks are required.

This standard is met.

15.440.140 Private walkway design.

- A. All required private walkways shall meet the applicable building code and Americans with Disabilities Act requirements.**
- B. Required private walkways shall be a minimum of four feet wide.**
- C. Required private walkways shall be constructed of portland cement concrete or brick.**
- D. Crosswalks crossing service drives shall, at a minimum, be painted on the asphalt or clearly marked with contrasting paving materials or humps/raised crossings. If painted striping is used, it should consist of thermoplastic striping or similar type of durable application.**
- E. At a minimum, required private walkways shall connect each main pedestrian building entrance to each abutting public street and to each other.**
- F. The review body may require on-site walks to connect to development on adjoining sites.**
- G. The review body may modify these requirements where, in its opinion, the development provides adequate on-site pedestrian circulation, or where lot dimensions, existing building layout, or topography preclude compliance with these standards.**

Applicant's Facts and Findings: The proposal includes private walkways connecting the multi-family units to Highway 99W and connecting the western portion of the site to Spring Meadow Park. These walkways will be a minimum of 4-feet in width and will be constructed of Portland cement concrete. Crosswalks will be provided on the site to delineate the shift from public streets to private streets. Crosswalks will be painted/clearly striped in conformance with these requirements.

This standard is met.

Division 15.500 Public Improvement Standards

15.505 Public Improvements Standards

15.505.010 Purpose.

This chapter provides standards for public infrastructure and utilities installed with new development, consistent with the policies of the City of Newberg comprehensive plan and adopted city master plans. The standards are intended to minimize disturbance to natural features, promote energy conservation and efficiency, minimize and maintain development impacts on surrounding

properties and neighborhoods, and ensure timely completion of adequate public facilities to serve new development.

15.505.020 Applicability.

The provision and utilization of public facilities and services within the City of Newberg shall apply to all land developments in accordance with this chapter. No development shall be approved unless the following improvements are provided for prior to occupancy or operation, unless future provision is assured in accordance with NMC 15.505.030(E).

A. Public Works Design and Construction Standards. The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall comply with the requirements of the most recently adopted Newberg public works design and construction standards.

B. Street Improvements. All projects subject to a Type II design review, partition, or subdivision approval must construct street improvements necessary to serve the development.

C. Water. All developments, lots, and parcels within the City of Newberg shall be served by the municipal water system as specified in Chapter 13.15 NMC.

D. Wastewater. All developments, lots, and parcels within the City of Newberg shall be served by the municipal wastewater system as specified in Chapter 13.10 NMC.

E. Stormwater. All developments, lots, and parcels within the City of Newberg shall manage stormwater runoff as specified in Chapters 13.20 and 13.25 NMC.

F. Utility Easements. Utility easements shall be provided as necessary and required by the review body to provide needed facilities for present or future development of the area.

G. City Approval of Public Improvements Required. No building permit may be issued until all required public facility improvements are in place and approved by the director, or are otherwise bonded for in a manner approved by the review authority, in conformance with the provisions of this code and the Newberg Public Works Design and Construction Standards.

Applicant's Facts and Findings: As identified on the included public improvement plans, the design and construction of all improvements within existing and proposed public rights-of-way and easements and all improvements to be maintained by the city are designed to comply with the requirements of the most recently adopted Newberg public works design and construction standards. All improvements for which city approval is required are proposed to the most recently adopted Newberg public works design and construction standards or, in the case of private streets, as reviewed and approved by the Newberg Engineering Department. The site development plan includes private and public streets, utility easements where necessary, connection to public water and sanitary sewer services and management of stormwater runoff.

This standard is met.

15.505.030 Street standards.

A. Purpose. The purpose of this section is to:

1. Provide for safe, efficient, and convenient multi-modal transportation within the City of Newberg.
2. Provide adequate access to all proposed and anticipated developments in the City of Newberg. For purposes of this section, “adequate access” means direct routes of travel between destinations; such destinations may include residential neighborhoods, parks, schools, shopping areas, and employment centers.
3. Provide adequate area in all public rights-of-way for sidewalks, wastewater and water lines, stormwater facilities, natural gas lines, power lines, and other utilities commonly and appropriately placed in such rights-of-way. For purposes of this section, “adequate area” means space sufficient to provide all required public services to standards defined in this code and in the Newberg public works design and construction standards.

B. Applicability. The provisions of this section apply to:

1. The creation, dedication, and/or construction of all public streets, bike facilities, or pedestrian facilities in all subdivisions, partitions, or other developments in the City of Newberg.
2. The extension or widening of existing public street rights-of-way, easements, or street improvements including those which may be proposed by an individual or the city, or which may be required by the city in association with other development approvals.
3. The construction or modification of any utilities, pedestrian facilities, or bike facilities in public rights-of-way or easements.
4. The designation of planter strips. Street trees are required subject to Chapter 15.420 NMC.
5. Developments outside the city that tie into or take access from city streets.

Applicant’s Facts and Findings: As demonstrated in the public improvement plans, this development includes public and private streets designed to provide safe and convenient vehicular and pedestrian access. Proposed improvements include paved streets, curbs (rolled curb on private streets), sidewalks, crosswalks, planter strips with street trees and appropriate groundcover, and utility easements where necessary.

This standard is met.

C. Layout of Streets, Alleys, Bikeways, and Walkways. Streets, alleys, bikeways, and walkways shall be laid out and constructed as shown in the Newberg transportation system plan. In areas where the transportation system plan or future street plans do not show specific transportation improvements, roads and streets shall be laid out so as to conform to previously approved subdivisions, partitions, and other developments for adjoining properties, unless it is found in the public interest to modify these patterns. Transportation improvements shall conform to the standards within the Newberg Municipal Code, the Newberg public works design and construction standards, the Newberg transportation system plan, and other adopted city plans.

Applicant's Facts and Findings: While no bikeways are proposed, the streets, alleys and walkways are designed to comply with the Newberg Transportation System Plan. Streets are planned to meet with adjoining roadways and to provide for future connectivity to the east.

This standard is met.

D. Construction of New Streets. Where new streets are necessary to serve a new development, subdivision, or partition, right-of-way dedication and full street improvements shall be required. Three-quarter streets may be approved in lieu of full street improvements when the city finds it to be practical to require the completion of the other one-quarter street improvement when the adjoining property is developed; in such cases, three-quarter street improvements may be allowed by the city only where all of the following criteria are met:

1. The land abutting the opposite side of the new street is undeveloped and not part of the new development; and
2. The adjoining land abutting the opposite side of the street is within the city limits and the urban growth boundary.

Applicant's Facts and Findings: Full street improvements are proposed throughout the site.

This standard is met.

E. Improvements to Existing Streets.

1. All projects subject to partition, subdivision, or Type II design review approval shall dedicate right-of-way sufficient to improve the street to the width specified in subsection (G) of this section.
2. All projects subject to partition, subdivision, or Type II design review approval must construct a minimum of a three-quarter street improvement to all existing streets adjacent to, within, or necessary to serve the development. The director may waive or modify this requirement where the applicant demonstrates that the condition of existing streets to serve the development meets city standards and is in satisfactory condition to handle the projected traffic loads from the development. Where a development has frontage on both sides of an existing street, full street improvements are required.
3. In lieu of the street improvement requirements outlined in NMC 15.505.040(B), the review authority may elect to accept from the applicant monies to be placed in a fund dedicated to the future reconstruction of the subject street(s). The amount of money deposited with the city shall be 100 percent of the estimated cost of the required street improvements (including any associated utility improvements), and 10 percent of the estimated cost for inflation. Cost estimates used for this purpose shall be based on preliminary design of the constructed street provided by the applicant's engineer and shall be approved by the director.

Applicant's Facts and Findings: The proposal includes development of full street improvements throughout the site. The public streets will be constructed to public street standards and

dedicated to the City of Newberg. The private streets will be full street improvements and will be owned and maintained by the future Homeowner's Association subject to the CC&Rs (a draft of which is submitted with this proposal).

This standard is met.

F. Improvements Relating to Impacts. Improvements required as a condition of development approval shall be roughly proportional to the impact of the development on public facilities and services. The review body must make findings in the development approval that indicate how the required improvements are roughly proportional to the impact. Development may not occur until required transportation facilities are in place or guaranteed, in conformance with the provisions of this code. If required transportation facilities cannot be put in place or be guaranteed, then the review body shall deny the requested land use application.

Applicant's Facts and Findings: Development of the proposed street network and utilities within the development and connecting to the neighboring properties is roughly proportional to the transportation and development impacts from the development. Transportation facilities will be in place or guaranteed prior to development of the site.

This standard is met.

G. Street Width and Design Standards.

- 1. Design Standards. All streets shall conform with the standards contained in Table 15.505.030(G). Where a range of values is listed, the director shall determine the width based on a consideration of the total street section width needed, existing street widths, and existing development patterns. Preference shall be given to the higher value. Where values may be modified by the director, the overall width shall be determined using the standards under subsections (G)(2) through (10) of this section.**

Table 15.505.030(G) Street Design Standards

Type of Street	Right-of-Way Width	Curb-to-Curb Pavement Width	Motor Vehicle Travel Lanes	Median Type	Striped Bike Lane (Both Sides)	On-Street Parking
Arterial Streets						
Expressway**	ODOT	ODOT	ODOT	ODOT	ODOT	ODOT
Minor arterial	69 – 80 feet	48 feet	2 lanes	TWLTL or median*	Yes	No*
Collectors						
Minor	61 – 65 feet	40 feet	2 lanes	None*	Yes*	Yes*
Local Streets						
Local residential	54-60 feet	32 feet	2 lanes	None	No	Yes

2. **Motor Vehicle Travel Lanes.** Collector and arterial streets shall have a minimum width of 12 feet.
3. **Bike Lanes.** Striped bike lanes shall be a minimum of six feet wide. Bike lanes shall be provided where shown in the Newberg transportation system plan.
4. **Parking Lanes.** Where on-street parking is allowed on collector and arterial streets, the parking lane shall be a minimum of eight feet wide.
5. **Center Turn Lanes.** Where a center turn lane is provided, it shall be a minimum of 12 feet wide.
6. **Limited Residential Streets.** Limited residential streets shall be allowed only at the discretion of the review authority, and only in consideration of the following factors:
 - a. The requirements of the fire chief shall be followed.
 - b. The estimated traffic volume on the street is low, and in no case more than 600 average daily trips.
 - c. Use for through streets or looped streets is preferred over cul-de-sac streets.
 - d. Use for short blocks (under 400 feet) is preferred over longer blocks.
 - e. The total number of residences or other uses accessing the street in that block is small, and in no case more than 30 residences.
 - f. On-street parking usage is limited, such as by providing ample off-street parking, or by staggering driveways so there are few areas where parking is allowable on both sides.
7. **Sidewalks.** Sidewalks shall be provided on both sides of all public streets. Minimum width is five feet.
8. **Planter Strips.** Except where infeasible, a planter strip shall be provided between the sidewalk and the curb line, with a minimum width of five feet. This strip shall be landscaped in accordance with the standards in NMC 15.420.020. Curb-side sidewalks may be allowed on limited residential streets. Where curb-side sidewalks are allowed, the following shall be provided:
 - a. Additional reinforcement is done to the sidewalk section at corners.
 - b. Sidewalk width is six feet.
9. **Slope Easements.** Slope easements shall be provided adjacent to the street where required to maintain the stability of the street.
10. **Intersections and Street Design.** The street design standards in the Newberg public works design and construction standards shall apply to all public streets, alleys, bike facilities, and sidewalks in the city.
11. **The planning commission may approve modifications to street standards for the purpose of ingress or egress to a minimum of three and a maximum of six lots through a conditional use permit.**

Applicant's Facts and Findings: Streets, sidewalks and planter strips, as identified on the proposed public improvement plans, are designed to meet the standards of the Newberg Transportation System Plan and this section.

In one instance, the Applicant's proposed design departs from the City's standards. This proposed modification is requested within proposed planter width along the extension of Crestview Drive. A 0.5 foot reduction in planter width from 6 to 5.5 feet has been requested to accommodate grading for the lots proposed south of the round-a-bout. A total of 0.5 foot reduction has been proposed and is in the public interest as it allows for the retaining walls necessary for the extension of Crestview to be located outside of the public right-of-way. This reduction is only sought for the section of Crestview which is located between highway 99 and the proposed round-a-bout.

This standard is met.

H. Modification of Street Right-of-Way and Improvement Width. The director, pursuant to the Type II review procedures of Chapter 15.220 NMC, may allow modification to the public street standards of subsection (G) of this section, when the criteria in both subsections (H)(1) and (2) of this section are satisfied:

- 1. The modification is necessary to provide design flexibility in instances where:**
 - a. Unusual topographic conditions require a reduced width or grade separation of improved surfaces; or**
 - b. Lot shape or configuration precludes accessing a proposed development with a street which meets the full standards of this section; or**
 - c. A modification is necessary to preserve trees or other natural features determined by the city to be significant to the aesthetic character of the area; or**
 - d. A planned unit development is proposed and the modification of street standards is necessary to provide greater privacy or aesthetic quality to the development.**
- 2. Modification of the standards of this section shall only be approved if the director finds that the specific design proposed provides adequate vehicular access based on anticipated traffic volumes.**

Applicant's Facts and Findings: In one instance, the Applicant's proposed design departs from the City's standards. This proposed modification is requested within proposed planter width along the extension of Crestview Drive. A 0.5 foot reduction in planter width from 6 to 5.5 feet has been requested to accommodate grading for the lots proposed south of the round-a-bout. A total of 0.5 foot reduction has been proposed and is in the public interest as it allows for the retaining walls necessary for the extension of Crestview to be located outside of the public right-of-way. This reduction is only sought for the section of Crestview which is located between highway 99 and the proposed round-a-bout.

I. Temporary Turnarounds. Where a street will be extended as part of a future phase of a development, or as part of development of an abutting property, the street may be terminated with a temporary turnaround in lieu of a standard street connection or circular cul-de-sac bulb. The director and fire chief shall approve the temporary turnaround. It shall have an all-weather surface,

and may include a hammerhead-type turnaround meeting fire apparatus access road standards, a paved or graveled circular turnaround, or a paved or graveled temporary access road. For streets extending less than 150 feet and/or with no significant access, the director may approve the street without a temporary turnaround. Easements or right-of-way may be required as necessary to preserve access to the turnaround.

Applicant's Facts and Findings: The east-west minor collector dead-ends at the eastern property line for connection to future development. The easternmost north-south private street creates a hammerhead-type turnaround with the minor collector.

This standard is met.

J. Topography. The layout of streets shall give suitable recognition to surrounding topographical conditions in accordance with the purpose of this code.

Applicant's Facts and Findings: The layout of the streets takes into consideration the surrounding topography.

This standard is met.

K. Future Extension of Streets. All new streets required for a subdivision, partition, or a project requiring site design review shall be constructed to be "to and through": through the development and to the edges of the project site to serve adjacent properties for future development.

Applicant's Facts and Findings: The street network connects to the existing street to the north and future street development to the east. Connection to the west is not possible because the entire property line is adjacent to Spring Meadow Park. The connection to the south is the access from Highway 99W.

This standard is met.

L. Cul-de-Sacs.

1. **Cul-de-sacs shall only be permitted when one or more of the circumstances listed in this section exist. When cul-de-sacs are justified, public walkway connections shall be provided wherever practical to connect with another street, walkway, school, or similar destination.**
 - a. **Physical or topographic conditions make a street connection impracticable. These conditions include but are not limited to controlled access streets, railroads, steep slopes, wetlands, or water bodies where a connection could not be reasonably made.**
 - b. **Buildings or other existing development on adjacent lands physically preclude a connection now or in the future, considering the potential for redevelopment.**
 - c. **Where streets or accessways would violate provisions of leases, easements, or similar restrictions.**

- d. Where the streets or accessways abut the urban growth boundary and rural resource land in farm or forest use, except where the adjoining land is designated as an urban reserve area.
2. Cul-de-sacs shall be no more than 400 feet long (measured from the centerline of the intersection to the radius point of the bulb).
3. Cul-de-sacs shall not serve more than 18 single-family dwellings.
Each cul-de-sac shall have a circular end with a minimum diameter of 96 feet, curb-to-curb, within a 109-foot minimum diameter right-of-way. For residential uses, a 35-foot radius may be allowed if the street has no parking, a mountable curb, curbside sidewalks, and sprinkler systems in every building along the street.

Applicant's Facts and Findings: No cul-de-sacs are proposed as part of this development and, as such, this standard is not applicable.

M. Street Names and Street Signs. Streets that are in alignment with existing named streets shall bear the names of such existing streets. Names for new streets not in alignment with existing streets are subject to approval by the director and the fire chief and shall not unnecessarily duplicate or resemble the name of any existing or platted street in the city. It shall be the responsibility of the land divider to provide street signs.

Applicant's Facts and Findings: The north-south major collector will be named Crestview Street as that is the name of the connection to the north. Other streets in the development are new and will be established with this development.

This standard is met.

N. Platting Standards for Alleys.

1. An alley may be required to be dedicated and constructed to provide adequate access for a development, as deemed necessary by the director.
2. The right-of-way width and paving design for alleys shall be not less than 20 feet wide. Slope easements shall be dedicated in accordance with specifications adopted by the city council under NMC 15.505.010 et seq.
3. Where two alleys intersect, 10-foot corner cut-offs shall be provided.
4. Unless otherwise approved by the city engineer where topographical conditions will not reasonably permit, grades shall not exceed 12 percent on alleys, and centerline radii on curves shall be not less than 100 feet.
5. All provisions and requirements with respect to streets identified in this code shall apply to alleys the same in all respects as if the word "street" or "streets" therein appeared as the word "alley" or "alleys" respectively.

Applicant's Facts and Findings: The alleys included with this proposal are all proposed as private streets owned and maintained by the Homeowner's Association.

This standard is met.

O. Platting Standards for Blocks.

1. **Purpose.** Streets and walkways can provide convenient travel within a neighborhood and can serve to connect people and land uses. Large, uninterrupted blocks can serve as a barrier to travel, especially walking and biking. Large blocks also can divide rather than unite neighborhoods. To promote connected neighborhoods and to shorten travel distances, the following minimum standards for block lengths are established.
2. **Maximum Block Length and Perimeter.** The maximum length and perimeters of blocks in the zones listed below shall be according to the following table. The review body for a subdivision, partition, conditional use permit, or a Type II design review may require installation of streets or walkways as necessary to meet the standards below.

Zones(s)	Maximum Block Length	Maximum Block Perimeter
R-1	800 feet	2,000 feet
R-2, R-3, RP, I	1,200 feet	3,000 feet

3. **Exceptions.**
 - a. If a public walkway is installed mid-block, the maximum block length and perimeter may be increased by 25 percent.
 - b. Where a proposed street divides a block, one of the resulting blocks may exceed the maximum block length and perimeter standards provided the average block length and perimeter of the two resulting blocks do not exceed these standards.
 - c. Blocks in excess of the above standards are allowed where access controlled streets, street access spacing standards, railroads, steep slopes, wetlands, water bodies, preexisting development, ownership patterns or similar circumstances restrict street and walkway location and design. In these cases, block length and perimeter shall be as small as practical. Where a street cannot be provided because of these circumstances but a public walkway is still feasible, a public walkway shall be provided.
 - d. Institutional campuses located in an R- 1 zone may apply the standards for the institutional zone.
 - e. Where a block is in more than one zone, the standards of the majority of land in the proposed block shall apply.
 - f. Where a local street plan, concept master site development plan, or specific plan has been approved for an area, the block standards shall follow those approved in the plan. In approving such a plan, the review body shall follow the block standards listed above to the extent appropriate for the plan area.

Applicant’s Facts and Findings: The proposed development would create several blocks however the patterns of natural resources present on the site and the existing development surrounding the property make a traditional subdivision with blocks meeting the standards listed above impractical, particularly along the project’s boundaries. Where future

connections to the east are possible, a block length patterns of less than 1,200 feet with perimeter distances of less than 1,800 feet have been set up for future extension. Along the northern, southern, and western boundaries, the pattern of existing development completely prevents the extension of roadways (Crestview Drive excluded).

Throughout the rest of the development, instead of a traditional block layout, the applicant has proposed a series of blocks which are porous and interconnected with private streets, walkways, and alleys. In no instance within the internal street network are block lengths or perimeters exceeding the standards.

The applicant's proposal qualifies for the exemptions listed in Subsection C of this requirement due to the presence of existing natural resources, and because of the unique existing roadway spacing plans described within the City's Transportation System Plan. This criterion is met.

This standard is met.

P. Private Streets. New private streets, as defined in NMC 15.05.030, shall not be created, except as allowed by NMC 15.240.020(L)(2).

Applicant's Facts and Findings: Private streets are proposed in compliance with NMC 15.240.020(L)(2), as addressed previously in this narrative.

This standard is met.

Q. Traffic Calming.

- 1. The following roadway design features may be required in new street construction where traffic calming needs are anticipated:**
 - a. Serpentine alignment.**
 - b. Curb extensions.**
 - c. Traffic diverters/circles.**
 - d. Raised medians and landscaping.**
 - e. Other methods shown effective through engineering studies.**
- 2. Traffic-calming measures such as speed humps should be applied to mitigate traffic operations and/or safety problems on existing streets. They should not be applied with new street constructions.**

Applicant's Facts and Findings: Traffic calming measures are not proposed as the submitted Transportation Impact Analysis demonstrates that the proposed street network is safe and effective.

This standard is met.

R. Vehicular Access Standards.

1. **Purpose.** The purpose of these standards is to manage vehicle access to maintain traffic flow, safety, roadway capacity, and efficiency. They help to maintain an adequate level of service consistent with the functional classification of the street. Major roadways, including arterials and collectors, serve as the primary system for moving people and goods within and through the city. Access is limited and managed on these roads to promote efficient through movement. Local streets and alleys provide access to individual properties. Access is managed on these roads to maintain safe maneuvering of vehicles in and out of properties and to allow safe through movements. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function.
2. **Access Spacing Standards.** Public street intersection and driveway spacing shall follow the standards in Table 15.505.R below. The Oregon Department of Transportation (ODOT) has jurisdiction of some roadways within the Newberg city limits, and ODOT access standards will apply on those roadways.

Table 15.505.R. Access Spacing Standards

Roadway Functional Classification	Area¹	Minimum Public Street Intersection Spacing (Feet)²	Driveway Setback from Intersecting Street³
Expressway	All	Refer to ODOT Access Spacing Standards	NA
Major Arterial	Urban CBD	Refer to ODOT Access Spacing Standards	
Minor Arterial	Urban CBD	500 200	150 100
Major Collector	All	400	150
Minor Collector	All	300	100

3. **Properties with Multiple Frontages.** Where a property has frontage on more than one street, access shall be limited to the street with the lesser classification.
4. **Driveways.** More than one driveway is permitted on a lot accessed from either a minor collector or local street as long as there is at least 40 feet of lot frontage separating each driveway approach. More than one driveway is permitted on a lot accessed from a major collector as long as there is at least 100 feet of lot frontage separating each driveway approach.
5. **Alley Access.** Where a property has frontage on an alley and the only other frontages are on collector or arterial streets, access shall be taken from the alley only. The review body may allow creation of an alley for access to lots that do not otherwise have frontage on a public street provided all of the following are met:
 - a. The review body finds that creating a public street frontage is not feasible.
 - b. The alley access is for no more than six dwellings and no more than six lots.
 - c. The alley has through access to streets on both ends.

- d. **One additional parking space over those otherwise required is provided for each dwelling. Where feasible, this shall be provided as a public use parking space adjacent to the alley.**
- 6. Closure of Existing Accesses. Existing accesses that are not used as part of development or redevelopment of a property shall be closed and replaced with curbing, sidewalks, and landscaping, as appropriate.**
- 7. Shared Driveways.**
 - a. **The number of driveways onto arterial streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The city shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes. Where there is an abutting developable property, a shared driveway shall be provided as appropriate. When shared driveways are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway temporarily ends at the property line, but may be accessed or extended in the future as the adjacent parcel develops. "Developable" means that a parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).**
 - b. **Access easements (i.e., for the benefit of affected properties) and maintenance agreements shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.**
 - c. **No more than four lots may access one shared driveway.**
 - d. **Shared driveways shall be posted as no parking fire lanes where required by the fire marshal.**
 - e. **Where three lots or three dwellings share one driveway, one additional parking space over those otherwise required shall be provided for each dwelling. Where feasible, this shall be provided as a common use parking space adjacent to the driveway.**
- 8. Frontage Streets and Alleys. The review body for a partition, subdivision, or design review may require construction of a frontage street to provide access to properties fronting an arterial or collector street.**
- 9. ODOT or Yamhill County Right-of-Way. Where a property abuts an ODOT or Yamhill County right-of-way, the applicant for any development project shall obtain an access permit from ODOT or Yamhill County.**
- 10. Exceptions. The director may allow exceptions to the access standards above in any of the following circumstances:**
 - a. **Where existing and planned future development patterns or physical constraints, such as topography, parcel configuration, and similar conditions, prevent access in accordance with the above standards.**
 - b. **Where the proposal is to relocate an existing access for existing development, where the relocated access is closer to conformance with the standards above and does not increase the type or volume of access.**

- c. **Where the proposed access results in safer access, less congestion, a better level of service, and more functional circulation, both on street and on site, than access otherwise allowed under these standards.**

11. **Where an exception is approved, the access shall be as safe and functional as practical in the particular circumstance. The director may require that the applicant submit a traffic study by a registered engineer to show the proposed access meets these criteria.**

Applicant's Facts and Findings: This application proposes one access on Highway 99W.

The submitted plans show the driveways for Private Street G and Private Street H to the east of E Crestview Drive (major collector). The plans provided illustrate that Private Street G does not meet spacing requirements from a Public Street intersection but this intersection has been determined to be ideal for access to the northern portion of this block because of the presence of a wetland located to the east and because of the proposed private street and block platting pattern.

Because the applicant is not meeting street spacing standards, Private Street G, driveway setbacks need to be a minimum of 150-feet from E Crestview Drive per Table 15.505.R Access Spacing Standards. The Applicant is willing to accept a condition of approval requiring an access control device, such as a right-in/right-out access restriction at the northern end of Private Street G.

All other driveway and intersection spacing standards are met, as demonstrated on the submitted public improvement plans.

This standard is met.

S. Public Walkways.

1. **Projects subject to Type II design review, partition, or subdivision approval may be required to provide public walkways where necessary for public safety and convenience, or where necessary to meet the standards of this code. Public walkways are meant to connect cul-de-sacs to adjacent areas, to pass through oddly shaped or unusually long blocks, to provide for networks of public paths according to adopted plans, or to provide access to schools, parks or other community destinations or public areas. Where practical, public walkway easements and locations may also be used to accommodate public utilities.**
2. **Public walkways shall be located within a public access easement that is a minimum of 15 feet in width.**
3. **A walk strip, not less than 10 feet in width, shall be paved in the center of all public walkway easements. Such paving shall conform to specifications in the Newberg public works design and construction standards.**
4. **Public walkways shall be designed to meet the Americans with Disabilities Act requirements.**
5. **Public walkways connecting one right-of-way to another shall be designed to provide as short and straight of a route as practical.**

6. **The developer of the public walkway may be required to provide a homeowners' association or similar entity to maintain the public walkway and associated improvements.**
7. **Lighting may be required for public walkways in excess of 250 feet in length.**
8. **The review body may modify these requirements where it finds that topographic, preexisting development, or similar constraints exist.**

Applicant's Facts and Findings: Public walkways are proposed to connect the multi-family resident to Highway 99W, throughout the wetland/natural areas, and connecting from the development to Spring Meadow Park to the west.

This standard is met.

T. Street Trees. Street trees shall be provided for all projects subject to Type II design review, partition, or subdivision. Street trees shall be installed in accordance with the provisions of NMC 15.420.010(B)(4).

Applicant's Facts and Findings: As indicated on the submitted landscaping plans, street trees are proposed on all streets.

This standard is met.

U. Street Lights. All developments shall include underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards. The developer shall install all such facilities and make the necessary arrangements with the serving electric utility as approved by the city. Upon the city's acceptance of the public improvements associated with the development, the street lighting system, exclusive of utility-owned service lines, shall be and become property of the city unless otherwise designated by the city through agreement with a private utility.

Applicant's Facts and Findings: This proposal includes developer-installed underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards.

This standard is met.

V. Transit Improvements. Development proposals for sites that include or are adjacent to existing or planned transit facilities, as shown in the Newberg transportation system plan or adopted local or regional transit plan, shall be required to provide any of the following, as applicable and required by the review authority:

1. **Reasonably direct pedestrian connections between the transit facility and building entrances of the site. For the purpose of this section, "reasonably direct" means a route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for users.**

2. A transit passenger landing pad accessible to disabled persons.
3. An easement of dedication for a passenger shelter or bench if such facility is in an adopted plan.
4. Lighting at the transit facility.

Applicant's Facts and Findings: There are no transit facilities within or adjacent to this site and, as such, this standard is not applicable.

15.505.040 Public utility standards.

A. Purpose. The purpose of this section is to provide adequate services and facilities appropriate to the scale and type of development.

B. Applicability. This section applies to all development where installation, extension or improvement of water, wastewater, or private utilities is required to serve the development or use of the subject property.

C. General Standards.

1. The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall conform to the Newberg public works design and construction standards and require a public improvements permit.
2. The location, design, installation and maintenance of all utility lines and facilities shall be carried out with minimum feasible disturbances of soil and site. Installation of all proposed public and private utilities shall be coordinated by the developer and be approved by the city to ensure the orderly extension of such utilities within public right-of-way and easements.

D. Standards for Water Improvements. All development that has a need for water service shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary wastewater and stormwater facilities, as applicable.

1. All developments shall be required to be linked to existing water facilities adequately sized to serve their intended area by the construction of water distribution lines, reservoirs and pumping stations which connect to such water service facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.
2. Specific location, size and capacity of such facilities will be subject to the approval of the director with reference to the applicable water master plan. All water facilities shall conform with city pressure zones and shall be looped where necessary to provide adequate pressure and fire flows during peak demand at every point within the system in the development to which the water facilities will be connected. Installation costs shall remain entirely the developer's responsibility.
3. The design of the water facilities shall take into account provisions for the future extension beyond the development to serve adjacent properties, which, in the judgment of the city, cannot be feasibly served otherwise.

4. Design, construction and material standards shall be as specified by the director for the construction of such public water facilities in the city.

E. Standards for Wastewater Improvements. All development that has a need for wastewater services shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary water services and stormwater facilities, as applicable.

1. All septic tank systems and on-site sewage systems are prohibited. Existing septic systems must be abandoned or removed in accordance with Yamhill County standards.
2. All properties shall be provided with gravity service to the city wastewater system, except for lots that have unique topographic or other natural features that make gravity wastewater extension impractical as determined by the director. Where gravity service is impractical, the developer shall provide all necessary pumps/lift stations and other improvements, as determined by the director.
3. All developments shall be required to be linked to existing wastewater collection facilities adequately sized to serve their intended area by the construction of wastewater lines which connect to existing adequately sized wastewater facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.
4. Specific location, size and capacity of wastewater facilities will be subject to the approval of the director with reference to the applicable wastewater master plan. All wastewater facilities shall be sized to provide adequate capacity during peak flows from the entire area potentially served by such facilities. Installation costs shall remain entirely the developer's responsibility.
5. Temporary wastewater service facilities, including pumping stations, will be permitted only if the director approves the temporary facilities, and the developer provides for all facilities that are necessary for transition to permanent facilities.
6. The design of the wastewater facilities shall take into account provisions for the future extension beyond the development to serve upstream properties, which, in the judgment of the city, cannot be feasibly served otherwise.
7. Design, construction and material standards shall be as specified by the director for the construction of such wastewater facilities in the city.

F. Easements. Easements for public and private utilities shall be provided as deemed necessary by the city, special districts, and utility companies. Easements for special purpose uses shall be of a width deemed appropriate by the responsible agency. Such easements shall be recorded on easement forms approved by the city and designated on the final plat of all subdivisions and partitions. Minimum required easement width and locations are as provided in the Newberg public works design and construction standards.

Applicant's Facts and Findings: The development will connect to public utilities, including water and sanitary sewer. As demonstrated on the submitted public improvement plans, all public utilities are designed to be constructed to City standards.

This standard is met.

15.505.050 Stormwater system standards.

A. Purpose. The purpose of this section is to provide for the drainage of surface water from all development; to minimize erosion; and to reduce degradation of water quality due to sediments and pollutants in stormwater runoff.

B. Applicability. The provisions of this section apply to all developments subject to site development review or land division review and to the reconstruction or expansion of such developments that increases the flow or changes the point of discharge to the city stormwater system. Additionally, the provisions of this section shall apply to all drainage facilities that impact any public storm drain system, public right-of-way or public easement, including but not limited to off-street parking and loading areas.

C. General Requirement. All stormwater runoff shall be conveyed to a public storm wastewater or natural drainage channel having adequate capacity to carry the flow without overflowing or otherwise causing damage to public and/or private property. The developer shall pay all costs associated with designing and constructing the facilities necessary to meet this requirement.

D. Plan for Stormwater and Erosion Control. No construction of any facilities in a development included in subsection (B) of this section shall be permitted until an engineer registered in the State of Oregon prepares a stormwater report and erosion control plan for the project. This plan shall contain at a minimum:

1. The methods to be used to minimize the amount of runoff, sedimentation, and pollution created from the development both during and after construction.
2. Plans for the construction of stormwater facilities and any other facilities that depict line sizes, profiles, construction specifications, and other such information as is necessary for the city to review the adequacy of the stormwater plans.
3. Design calculations shall be submitted for all drainage facilities. These drainage calculations shall be included in the stormwater report and shall be stamped by a licensed professional engineer in the State of Oregon. Peak design discharges shall be computed based upon the design criteria outlined in the public works design and construction standards for the city.

E. Development Standards. Development subject to this section shall be planned, designed, constructed, and maintained in compliance with the Newberg public works design and construction standards.

Applicant's Facts and Findings: The submitted public improvement plans include details of the proposed stormwater detention and treatment plan. The stormwater detention and treatment plan is designed to meet City standards and to preclude stormwater drainage on surrounding properties.

This standard is met.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests approval from the City's Planning Commission of this application for a Planned Unit Development and a Conditional Use Permit.

August 9, 2018

J.T. Smith Companies
5285 Meadows Road, Suite 171
Lake Oswego, Oregon 97035

Attention: Jesse Nemec

Subject: Revised Geologic and Hydrogeologic Technical Memorandum
Crestview Crossing Project
Newberg, Oregon
File No. 6748-002-03



Expires: 2/1/2019

INTRODUCTION AND PROJECT UNDERSTANDING

The purpose of this memorandum is to provide J.T. Smith Companies with GeoEngineers, Inc. hydrogeologic assessment regarding Oxberg Inc.'s concern that grading and in-filling of the wetlands on the proposed Crestview Crossing Site (the Site) may harm the adjacent property's drinking water supply capacity and increase source water contamination potential. The assessment is based on infiltrations analysis on the Site, well logs, and previous area hydrogeological studies and reports. The project area is on the north side of Highway 99W, just east of the City of Newburg (Proximity Map of Crestview Crossing Site to Oxberg Well, Figure 1).

In this memorandum we summarize:

- Groundwater and surface water interaction
- Site geology and hydrogeology
- Oxberg well log
- Near-by wells
- Site-specific infiltration rates
- Source water assessment
- Conclusions



SURFACE WATER AND GROUNDWATER INTERACTION

Surface water comes in many forms; water in wetlands, streams, rivers, lakes and oceans. Groundwater on the other hand is subsurface water and is found in pore spaces between material like soil particles, sand grains and gravels; and in fractures, cracks and broken zones in rock. If these pores and fractures are full of water subsurface groundwater conditions are described as saturated and an aquifer is present. Conversely, if the pores and fractures are not completely full, then the subsurface groundwater conditions are described as unsaturated.

Aquifers are commonly described as confined or unconfined. One of the simplest ways to understand the difference is where water occurs during well drilling. If the water level in a well after it is built is the same as it was first encountered during drilling, that aquifer would be referred to as unconfined. If water level in a well after it is built is higher than where it was first encountered during drilling, that aquifer would be referred to as confined. Unconfined aquifers also are under atmospheric pressure and they are commonly in hydraulic continuity with surface water. Conversely, confined aquifers are under higher pressure than atmospheric and have very limited to essentially no hydraulic continuity with nearby surface water.

When surface water infiltrates into the ground it moves at different rates; quickly over a period of days or weeks or slowly over months and years. The ability of a porous material (rock/silt/sand/gravel) to allow fluids to pass through it is called permeability. Gravels and sands have high permeability that allow water to move quickly horizontally while finer materials like silt and clay have a lower permeability and can create layers in the subsurface that make it difficult for water to move through. Figure 2 provides a look at how long it can take water to move through a shallow unconfined aquifer into deeper confined aquifers. Generally, in a shallow unconfined aquifer the younger the water, while in a confined aquifer the older the water is.

Figure 2 also shows a common relationship between a shallow aquifer and surface water. In cases where a shallow unconfined aquifer discharges to surface water the surface waters can be described as gaining. In the opposite case, where surface water is leaking into a shallow unconfined aquifer the surface water would be described as losing. If the underlying aquifer is confined one would generally conclude that the surface water-groundwater connection is limited to non-existent with flow paths between the two expressed in decades, centuries, or even longer.