

ELECTRICAL DISTRIBUTION

The procedure used to develop the electrical system for a rest area or parking lot is similar to the discussion in [Section V – Roadway Lighting, Appendix VB-4 Electrical Distribution](#). However, the electrical system in a parking area normally functions on 120/240-Volt, or 120/208-Volt, single-phase power. The Amp-Balance and Voltage Drop tables along with the Example Electrical Schematic presented below match the lighting layout shown in the example rest area plans in [Appendix VIA-5, Rest Area Lighting Plan Sheet](#) and [Appendix VIA-6, Rest Area Lighting Panelboard Schedule](#).

Table 1						PAGE	x	OF	y		
VDOT Project Name						MADE BY:	JH	DATE		08/10/00	
LUMINAIRE LAYOUT AND AMP BALANCING						CHKD. BY	TG	DATE		01/17/00	
REST AREA CONTROL CENTER											
Circuits 2, 4 (Truck Parking & Ent. Ramp)						Circuits 3, 5 (Car Parking & Pedestrian Lighting)					
LUM	WATT	AMP BY PHASE		DIST	Branch	LUM	WATT	AMP BY PHASE		DIST	Branch
#		L1	L2	feet		#		L1	L2	feet	
LED SIGN	20	0.2		500	1	18	250		2.8	190	1
1	250		2.8	240	1	19	250	2.8		110	1
2	250	2.8		240	1	20	70		0.7	30	1
3	250		2.8	190	1						
4	250	2.8		190	1	21	70	0.7		35	2
5	250		2.8	230	1						
6	250	2.8		190	1	JB-F				45	3
7	250		2.8	190	1	9	250	2.8		130	4
8	250	2.8		110	1	10	250		2.8	25	4
JB A				15		11	70	0.7		75	4
CC						12	70		0.7	50	4
CIRCUITS 2 & 4		L1	L2			13	70	0.7		10	4
TOTAL AMPS		11.4	11.2			JB-E				60	5
% IMBALANCE		0.88%				14	70		0.7	75	5
Circuits 6, 8 (Exit Ramp)											
LUM	WATT	AMP BY PHASE		DIST	Branch	LUM	WATT	AMP BY PHASE		DIST	Branch
33	250	2.8		240	1	15	70	0.7		30	5
32	250		2.8	240	1	16	250		2.8	130	5
31	250	2.8		240	1	17	250	2.8		35	5
30	250		2.8	240	1						
29	250	2.8		240	1	22	250		2.8	200	6
28	250		2.8	210	1	23	250	2.8		70	6
27	250	2.8		220	1	JB-D				115	6
26	250		2.8	55	1	24	250		2.8	80	6
JB-B				100	1	25	70	0.7		80	6
JB-A				15	1	JB-C				40	7
CC					1	JB-B				100	7
CIRCUITS 4 & 6		L1	L2			JB-A				15	7
TOTAL AMPS		11.2	11.2			CC					
% IMBALANCE		0.00%				CIRCUITS 3 & 5		L1	L2		
						TOTAL AMPS		14.7	16.1		
						% IMBALANCE		4.55%			
CONTROL CENTER											
								L1*	L2		
OVERALL TOTAL								39.0	38.5		
% IMBALANCE								0.65%			
* PHASE L1 HAS 1.7 AMPS ADDED TO ACCOUNT FOR THE PHOTOCCELL											

Table 2: Wire Size Program							
Car Parking & Ped. Lighting				Car Parking & Ped. Lighting			
Number of Branches		7		Number of Branches		7	
Line voltage		120 VAC		Line voltage		120 VAC	
Maximum allowable voltage drop		3%		Maximum allowable voltage drop		3%	
Circuit L1-5	Branch #1	Load (Amps)	Distance	Circuit L2-3	Branch #1	Load (Amps)	Distance
	1 LUM. 19	2.8	140		1 LUM. 18	2.8	300
					2 LUM.20	0.7	30
	Branch #2	Load (Amps)	Distance		Branch #2	Load (Amps)	Distance
	1 LUM. 21	0.7	35		1 JB-F	0	0
	Branch #3	Load (Amps)	Distance		Branch #3	Load (Amps)	Distance
	1 JB-F	3.5	45		1 JB-F	3.5	45
	Branch #4	Load (Amps)	Distance		Branch #4	Load (Amps)	Distance
	1 LUM. 9	2.8	155		1 LUM. 10	2.8	100
	2 LUM. 11	0.7	125		2 LUM. 12	0.7	60
	3 LUM. 13	0.7	10		Branch #5	Load (Amps)	Distance
	Branch #5	Load (Amps)	Distance		1 JB-E	7.0	60
	1 JB-E	7.7	135		2 LUM. 14	0.7	105
	2 LUM. 15	0.7	160		3 LUM. 16	2.8	165
	3 LUM. 17	2.8	35		Branch #6	Load (Amps)	Distance
	Branch #6	Load (Amps)	Distance		1 LUM. 22	2.8	315
	1 LUM. 23	2.8	265		2 LUM. 24	2.8	160
	2 LUM. 25	0.7	80		Branch #7	Load (Amps)	Distance
	Branch #7	Load (Amps)	Distance		1 JB-C	16.1	155
	1 JB-C	14.7	155		Required wire size:	#4 AWG	
	Required wire size:	#4 AWG			Required wire size:	#4 AWG	
Truck Parking & Ent. Ramp				Exit Ramp			
Circuit L1-2	Branch #1	Load (Amps)	Distance	Circuit L1-6	Branch #1	Load (Amps)	Distance
	1 LED Sign	0.2	740		1 LUM. 33	2.8	480
	2 LUM. 2	2.8	430		2 LUM. 31	2.8	480
	3 LUM. 4	2.8	460		3 LUM. 29	2.8	450
	4 LUM. 6	2.8	380		4 LUM. 27	2.8	390
	5 LUM. 8	2.8	125		Required wire size:	#0 AWG	
	Required wire size:	#2 AWG			Required wire size:	#0 AWG	
Circuit L2-4	Branch #1	Load (Amps)	Distance	Circuit L1-8	Branch #1	Load (Amps)	Distance
	1 LUM. 1	0.2	480		1 LUM. 32	2.8	480
	2 LUM. 3	2.8	420		2 LUM. 30	2.8	480
	3 LUM. 5	2.8	420		3 LUM. 28	2.8	430
	4 LUM. 7	2.8	315		4 LUM. 26	2.8	170
	Required wire size:	#2 AWG			Required wire size:	#0 AWG	

