



Cleveland Innerbelt Bridge

Lighting – Gateway (City)

Final Lighting Calculations

Summary of Photometrics for Gateway (City) Lighting:

City of Cleveland - Surface Street Lighting

Zone	Road Class	Area Class	Target F.C.	Actual F.C.	Target Min	Actual Min
R-1: Ontario St and Carnegie Ave	Arterial	Commercial	4.0	3.1	1.4	0.6
R-2: Central Viaduct Way	Local	Commercial	2.4	2.3	0.8	0.6
R-3: Commercial Road	Local	Intermediate	1.8	2.1	0.6	0.7
R-4: E. 9th Street Extension	Collector	Intermediate	2.7	2.7	0.9	1.0
R-5: Broadway Ave/E 14th St (Ext)/Orange**	Arterial	Commercial	4.0	3.9	1.4	1.0

See Note 1
See Note 2
See Note 3

Note 1: Switch to MH resulted in average F.C. below target 4.0. Dark spots appear on BL-14 (bridge over CGRTA).
Note 2: Switch to MH resulted in light level which are slightly below design criteria levels.
Note 3: Dark spots appear on Orange Avenue, in wide pavement section between E 9th and E 14th

Parking Lot under I-90

Zone	Target F.C.	Actual F.C.	Target Avg:Min	Actual Avg:Min
P-1: Parking Lot	1.0	2.3	5:1	4.6:1

Walking Paths (Out in the Open)

Zone	Target F.C.	Actual F.C.	Target Avg:Min	Actual Avg:Min
W-1: E 9t Bike Trail	1.0	1.6	4:1	4.0:1
W-2: Broadway Mills Overlook	1.0	1.3	4:1	4.3:1
W-3: Ontario Plaza	1.0	2.3	4:1	3.8:1
W-4: N Side of Broadway, W of 14th	1.0	2.6	4:1	3.3:1
W-5: W. side of C. Viaduct Sidewalk	1.0	1.8	4:1	6.0:1
W-6: Commercial Road Sidewalk	1.0	1.4	4:1	3.3:1
W-7: Carnegie Sidewalk, S. Side	1.0	3.9	4:1	3.0:1
W-8: W. Ontario, S. of Carnegie	1.0	4.1	4:1	2.0:1
W-9: N. Broadway and East walk on 14th	1.0	2.8	4:1	5.6:1
W-10: E. side of C. Viaduct	1.0	2.1	4:1	3.5:1
W-12: N. Orange E. of 14th	1.0	3.1	4:1	2.4:1
W-12: N. Orange W. of 14th	1.0	4.0	4:1	2.9:1

See Note 1.
See Note 2.
See Note 3.

* Per RP-8.00, Table 5: Includes influence from ODOT light towers.
Note 1. Dark spots at tip of plaza.
Note 2. Dark spots by fire station. Ambient building lighting will help mitigate uniformity ratio.
Note 3. Dark spots by sidewalk in the vicinity of existing light poles (to remain)

Walking Paths (Underpass)

Zone	Target F.C.	Actual F.C.	Target Avg:Min	Actual Avg:Min
WU-1: W. Ontario under I-90	1.0	5.2	4:1	4.8:1
WU-2: W. Commercial Rd under I-90	1.0	5.3	4:1	3.5:1
WU-3: Parking Lot Walkway	1.0	1.9	4:1	2.7:1
WU-4: Broadway Mills Plaza under I-90	1.0	2.8	4:1	7.0:1

See Note 1.
See Note 2.

* Per RP-8.00, Table 5: Does not include influence from ODOT light towers.
Note 1: Lighting required to maximize f.c. under roadway creates high average f.c. on sidewalks, and uniformity which slightly exceeds target values.
Note 2. Dark spots at tip of plaza.

Underpass

Zone	Target F.C.	Actual F.C.	Target Min	Actual Min
U-1: Ontario Ave Under I-90	4.0	2.6	1.4	0.7
U-2: E 9th Street Under I-90	4.0	3.3	1.4	1.1
U-3: E 14th Street Under I-90	4.0	3.7	1.4	1.6

See Notes 1 and 2.
See Note 1.
See Note 1.

* Lighting design criteria is per RP-8.00, Table 5
Note 1: Low min. light levels will typically appear in center of road under a wide bridge span, when underpass lighting is utilized.
Note 2: Average light levels on Ontario will be lower than design criteria. (The proposed bridge is clear span, there is not a center pier for UP lights.)

Highlight Denotes Zone which does not conform to criteria

Made by: Mark Hunter 9/7/2011
Checked by: George Mohan 9/7/2011

City of Cleveland - Pedestal "A"

PRELIMINARY VOLTAGE DROP CALCULATIONS

Voltage:240
 CUY-90-14.52

Wire Factor Used (Three - No. 2 AWG Wires)
 Wire Factor Used (Three - No. 4 AWG Wires)

Ohms/mft/1000
 0.3252
 0.5174

VOLTAGE DROP IN A SECTION = AMPS IN AND BEYOND SECTION (A) X SECTION LENGTH (FT) X WIRE FACTOR

From	Section		Feet	Fixt Type	At Point		Accum.	Ampere-Feet	AWG	Voltage Drop		% Drop	At Point
	To				Fixtures	Total				In Section	Accum.		
CIRCUIT 1													
A1-11	A1-12	140	LP	2	4.00	4.00	560	2	0.18	6.30	2.63	A1-11	
A1-12	A1-13	150	LP	2	4.00	8.00	1200	2	0.39	6.12	2.55	A1-12	
A1-13	A1-14	70	LP	2	4.00	12.00	840	2	0.27	5.73	2.39	A1-13	
A1-14	A1-3	90	LP	1	2.00	14.00	1260	2	0.41	5.46	2.27	A1-14	
A1-3	A1-4	60	BRANCH	1	4.33	18.33	1100	2	0.36	5.05	2.10	A1-3	
A1-4	A1-5	60	PED	1	0.33	18.66	1120	2	0.36	4.69	1.95	A1-4	
A1-5	A1-6	70	LP	1	2.00	20.66	1446	2	0.47	4.33	1.80	A1-5	
A1-6	A1-7	70	PED	1	0.33	20.99	1469	2	0.48	3.86	1.61	A1-6	
A1-7	A1-8	90	LP	1	2.00	22.99	2069	2	0.67	3.38	1.41	A1-7	
A1-8	A1-9	60	PED	1	0.33	23.32	1399	2	0.46	2.70	1.13	A1-8	
A1-9	A1-10	90	BRANCH	1	5.30	28.62	2576	2	0.84	2.25	0.94	A1-9	
A1-10	CC-A	150	PED	1	0.33	28.95	4343	2	1.41	1.41	0.59	A1-10	
CIRCUIT 2													
A2-1	A2-2	80	LP	1	2.00	2.00	160	2	0.05	2.54	1.06	A2-1	
A2-2	A2-3	50	LP	1	2.00	4.00	200	2	0.07	2.49	1.04	A2-2	
A2-3	A2-4	100	LP	1	2.00	6.00	600	2	0.20	2.42	1.01	A2-3	
A2-4	A2-5	70	LP	1	2.00	8.00	560	2	0.18	2.23	0.93	A2-4	
A2-5	A2-6	130	LP	1	2.00	10.00	1300	2	0.42	2.04	0.85	A2-5	
A2-6	A2-7	130	LP	1	2.00	12.00	1560	2	0.51	1.62	0.68	A2-6	
A2-7	A2-8	60	LP	1	2.00	14.00	840	2	0.27	1.11	0.46	A2-7	
A2-8	A2-9	70	PED	1	0.33	14.33	1003	2	0.33	0.84	0.35	A2-8	
A2-9	CC-A	60	LP	6	12.00	26.33	1580	2	0.51	0.51	0.21	A2-9	

55.28

LIGHTS	Watts	Volts	Lamp Loss		
	400	240	1.2 =	2.00	AMPS/FIXTURE - Shoebox
	250	240	1.2 =	1.25	AMPS/FIXTURE - Shoebox and/or UP Light
	80	240	1 =	0.33	Shoe Box Ped Light
	84.8	240	1 =	0.35	Lantern (Gateway) Fixture

TOTAL AMPS OF CIRCUIT 1 = **28.95** /0.8 = 36.2 40
 TOTAL AMPS OF CIRCUIT 2 = **26.33** /0.8 = 32.9 40

CONNECTED LOAD = (LINE VOLTAGE X TOTAL CURRENT)/1000
 240 x 55.28 = **13.2672** KVA

ENCLOSURE RATING= (SUM OF CIRCUIT LOAD/0.8)=
 55.28 /0.8 = 69.1 Amps Fuse=**100** (USE STANDARD 60, 100, OR 200)

Made by: Mark Hunter 9/7/2011
 Checked by: George Mohan 9/7/2011

City of Cleveland - Pedestal "B"

PRELIMINARY VOLTAGE DROP CALCULATIONS

Voltage:240
CUY-90-14.52

Wire Factor Used (Three - No. 2 AWG Wires)
Wire Factor Used (Three - No. 4 AWG Wires)
Wire Factor Used (Three - No. 4 AWG Wires - Aerial Cables)

Ohms/mft/1000
0.3252
0.5174
0.8175

VOLTAGE DROP IN A SECTION = AMPS IN AND BEYOND SECTION (A) X SECTION LENGTH (FT) X WIRE FACTOR

From	Section To	Feet	Fixt Type	Amperes		Ampere-Feet	AWG	Voltage Drop		% Drop	At Point	
				At Point	Accum.			In Section	Accum.			
CIRCUIT 1												
B1-2	B1-3	150	LP	1	2.00	2.00	300	2	0.10	5.50	2.29	B1-2
B1-3	B1-4	110	LP	2	4.00	6.00	660	2	0.21	5.41	2.25	B1-3
B1-4	PB-B1	120	LP	1	1.25	7.25	870	2	0.28	5.19	2.16	B1-4
PB-B1	B1-5	120	LP	1	1.25	8.50	1020	2	0.33	4.91	2.05	PB-B1
B1-5	PB-B2	150	LP	1	1.25	9.75	1463	2	0.48	4.58	1.91	B1-5
PB-B2	B1-8	120	LP	1	1.25	11.00	1320	2	0.43	4.10	1.71	PB-B2
B1-8	PB-B7	130	LP	1	1.25	12.25	1593	2	0.52	3.67	1.53	B1-8
PB-B7	B1-9	90	LP	2	4.00	16.25	1463	2	0.48	3.15	1.31	PB-B7
B1-9	B1-10	190	LP	1	1.25	17.50	3325	2	1.08	2.68	1.12	B1-9
B1-10	CC-B	190	Branch	1	8.35	25.85	4912	2	1.60	1.60	0.67	B1-10
CIRCUIT 2												
B2-1	B2-2	30	PED	1	0.35	0.35	11	2	0.00	2.23	0.93	B2-1
B2-2	B2-3	40	PED	1	0.35	0.70	28	2	0.01	2.23	0.93	B2-2
B2-3	B2-4	40	PED	1	0.35	1.05	42	2	0.01	2.22	0.92	B2-3
B2-4	B2-5	40	PED	1	0.35	1.40	56	2	0.02	2.20	0.92	B2-4
B2-5	B2-10	50	PED	1	0.35	1.75	88	2	0.03	2.19	0.91	B2-5
B2-10	CC-B	150	LP	1	42.46	44.21	6632	4	2.16	2.16	0.90	B2-10
CIRCUIT 3												
B3-9	PB-B4	60	LP	1	2.00	2.00	120	2	0.04	0.79	0.33	B3-9
PB-B4	B3-6	70	Branch	2	0.70	2.70	189	2	0.06	0.76	0.31	PB-B4
B3-6	PB-B5	90	PED	1	0.35	3.05	275	2	0.09	0.69	0.29	B3-6
PB-B5	B3-8	60	LP	1	16.05	19.10	1146	2	0.37	0.60	0.25	PB-B5
B3-8	CC-B	30	Branch	1	4.70	23.80	714	2	0.23	0.23	0.10	B3-8

93.86

LIGHTS	Watts	Volts	Lamp Loss		
	400	240	1.2	=	2.00 AMPS/FIXTURE - Shoebox
	250	240	1.2	=	1.25 AMPS/FIXTURE - Shoebox and/or UP Light
	80	240	1	=	0.33 Shoe Box Ped Light
	84.8	240	1	=	0.35 Lantern (Gateway) Fixture
	25	120	1	=	0.21 Bollards
	50	120	1	=	0.42 Pavers
					Amps (Rating) Fuse
	TOTAL AMPS OF CIRCUIT 1 =				25.85 /0.8 32.3 40
	TOTAL AMPS OF CIRCUIT 2 =				44.21 /0.8 55.3 60
	TOTAL AMPS OF CIRCUIT 3 =				23.80 /0.8 29.8 40

CONNECTED LOAD = (LINE VOLTAGE X TOTAL CURRENT)/1000
240 x 93.86 = **22.5264** KVA

ENCLOSURE RATING= (SUM OF CIRCUIT LOAD/0.8)=
93.86 /0.8 = 117.325 Amps Existing Fuse= **200** (USE STANDARD 60, 100, OR 200)

Made by: Mark Hunter 9/7/2011
Checked by: George Mohan 9/7/2011

City of Cleveland - Pedestal "C"

PRELIMINARY VOLTAGE DROP CALCULATIONS

Voltage:240
CUY-90-14.52

Wire Factor Used (Three - No. 2 AWG Wires)
Wire Factor Used (Three - No. 4 AWG Wires)

Ohms/mft/1000
0.3252
0.5174

VOLTAGE DROP IN A SECTION = AMPS IN AND BEYOND SECTION (A) X SECTION LENGTH (FT) X WIRE FACTOR

From	Section To	Feet	Fixt Type	Amperes At Point		Accum.	Ampere-Feet	AWG	Voltage Drop		% Drop	At Point
				Fixtures	Total				In Section	Accum.		
CIRCUIT 1												
PB-C9	C1-14	90	LP	13	26.00	26.00	2340	2	0.76	2.16	0.90	PB-C9
C1-14	PB-C8	20	LP	1	2.00	28.00	560	2	0.18	1.40	0.58	C1-14
PB-C8	CC-C	110	LP	3	6.00	34.00	3740	2	1.22	1.22	0.51	PB-C8
<i>Voltage Drop is calculated for new circuit wire. Voltage drop for circuit which is existing to remain will not be negatively impacted.</i>												
CIRCUIT 2												
C2-11	PB-C12	50	LP	10	20.00	20.00	1000	2	0.33	1.76	0.73	C2-11
PB-C12	CC-C	200	LP	1	2.00	22.00	4400	2	1.43	1.43	0.60	PB-C12
<i>Voltage Drop is calculated for new circuit wire. Voltage drop for circuit which is existing to remain will not be negatively impacted.</i>												
CIRCUIT 3												
PB-C5	PB-C3	130	LP	6	12.00	12.00	1560	2	0.51	2.12	0.88	PB-C5
PB-C3	PB-C1	220	LP	4	8.00	20.00	4400	2	1.43	1.61	0.67	PB-C3
PB-C1	CC-C	20	LP	4	8.00	28.00	560	2	0.18	0.18	0.08	PB-C1
CIRCUIT 4												
C4-20	CC-C	230	LP	20	40.00	40.00	9200	2	2.99	2.99	1.25	C4-20
<i>Voltage Drop is calculated for new circuit wire. Voltage drop for circuit which is existing to remain will not be negatively impacted.</i>												
CIRCUIT 5												
PB-C13	CC-C	370	LP	16	32.00	32.00	11840	2	3.85	3.85	1.60	PB-C13
<i>Voltage Drop is calculated for new circuit wire. Voltage drop for circuit which is existing to remain will not be negatively impacted.</i>												
156.00												
LIGHTS		Watts		Volts	Lamp Loss							
		400		240	1.2 =		2.00		AMPS/FIXTURE - Shoebox			
		250		240	1.2 =		1.25		AMPS/FIXTURE - Shoebox and/or UP Light			
		80		240	1 =		0.33		Shoe Box Ped Light			
		84.8		240	1 =		0.35		Lantern (Gateway) Fixture			
									Amps (Rating)	Fuse		
		TOTAL AMPS OF CIRCUIT 1 =					34.00	/0.8	42.5	50		
		TOTAL AMPS OF CIRCUIT 2 =					22.00	/0.8	27.5	30		
		TOTAL AMPS OF CIRCUIT 3 =					28.00	/0.8	35.0	40		
		TOTAL AMPS OF CIRCUIT 4 =					40.00	/0.8	50.0	60		
		TOTAL AMPS OF CIRCUIT 5 =					32.00	/0.8	40.0	50		
CONNECTED LOAD =		(LINE VOLTAGE X TOTAL CURRENT)/1000										
		240	x	156.00			37.44		KVA			
ENCLOSURE RATING=		(SUM OF CIRCUIT LOAD/0.8)=										
		156.00	/0.8	=		195 Amps	200		(USE STANDARD 60, 100, OR 200)			

Made by: Mark Hunter 9/7/2011
Checked by: George Mohan 9/7/2011

City of Cleveland - Pedestal "D"

PRELIMINARY VOLTAGE DROP CALCULATIONS

Voltage: 240
CUY-90-14.52

Wire Factor Used (Three - No. 2 AWG Wires)
Wire Factor Used (Three - No. 4 AWG Wires)
Wire Factor Used (Three - No. 4 AWG Wires - Aerial Cables)

Ohms/mft/1000
0.3252
0.5174
0.8175

VOLTAGE DROP IN A SECTION = AMPS IN AND BEYOND SECTION (A) X SECTION LENGTH (FT) X WIRE FACTOR

From	Section To	Feet	Fixt Type	Amperes At Point			Accum.	Ampere-Feet	AWG	Voltage Drop		% Drop	At Point
				Fixtures	Total	Accum.				In Section	Accum.		
CIRCUIT 1													
D1-1	D1-2	130	LP	1	2.00	2.00	260	2	0.08	8.10	3.38	D1-1	
D1-2	D1-3	130	LP	1	2.00	4.00	520	2	0.17	8.02	3.34	D1-2	
D1-3	D1-4	130	LP	1	2.00	6.00	780	2	0.25	7.85	3.27	D1-3	
D1-4	D1-5	140	LP	1	2.00	8.00	1120	2	0.36	7.60	3.17	D1-4	
D1-5	D1-6	120	LP	1	2.00	10.00	1200	2	0.39	7.23	3.01	D1-5	
D1-6	D1-7	100	LP	1	2.00	12.00	1200	2	0.39	6.84	2.85	D1-6	
D1-7	D1-8	90	LP	1	2.00	14.00	1260	2	0.41	6.45	2.69	D1-7	
D1-8	D1-9	80	LP	1	2.00	16.00	1280	2	0.42	6.04	2.52	D1-8	
D1-9	D1-10	100	LP	1	2.00	18.00	1800	2	0.59	5.63	2.34	D1-9	
D1-10	D1-12	110	LP	1	2.00	20.00	2200	2	0.72	5.04	2.10	D1-10	
D1-12	CC-D	350	LP	9	18.00	38.00	13300	2	4.33	4.33	1.80	D1-12	
Branch to D1-11 thru D1-19													
CIRCUIT 2													
D2-1	D2-2	100	LP	1	2.00	2.00	200	2	0.07	4.14	1.72	D2-1	
D2-2	D2-3	130	LP	1	2.00	4.00	520	2	0.17	4.07	1.70	D2-2	
D2-3	D2-4	130	LP	1	2.00	6.00	780	2	0.25	3.90	1.63	D2-3	
D2-4	D2-5	140	LP	1	2.00	8.00	1120	2	0.36	3.65	1.52	D2-4	
D2-5	D2-6	140	LP	1	2.00	10.00	1400	2	0.46	3.28	1.37	D2-5	
D2-6	D2-7	110	LP	1	2.00	12.00	1320	2	0.43	2.83	1.18	D2-6	
D2-7	D2-8	60	LP	1	2.00	14.00	840	2	0.27	2.40	1.00	D2-7	
D2-8	D2-9	100	LP	1	2.00	16.00	1600	2	0.52	2.13	0.89	D2-8	
D2-9	D2-10	130	LP	1	2.00	18.00	2340	2	0.76	1.61	0.67	D2-9	
D2-10	CC-D	130	LP	1	2.00	20.00	2600	2	0.85	0.85	0.35	D2-10	
CIRCUIT 3													
D3-1	D3-2	130	LP	1	1.25	1.25	163	2	0.05	9.70	4.04	D3-1	
D3-2	D3-3	120	LP	1	1.25	2.50	300	2	0.10	9.65	4.02	D3-2	
D3-3	D3-4	120	LP	1	1.25	3.75	450	2	0.15	9.55	3.98	D3-3	
D3-4	D3-5	120	LP	1	1.25	5.00	600	2	0.20	9.40	3.92	D3-4	
D3-5	D3-6	130	LP	1	1.25	6.25	813	2	0.26	9.21	3.84	D3-5	
D3-6	D3-7	120	LP	1	1.25	7.50	900	2	0.29	8.94	3.73	D3-6	
D3-7	D3-8	90	LP	1	1.25	8.75	788	2	0.26	8.65	3.60	D3-7	
D3-8	D3-9	110	LP	1	2.00	10.75	1183	2	0.38	8.39	3.50	D3-8	
D3-9	D3-11	120	LP	2	4.00	14.75	1770	2	0.58	8.01	3.34	D3-9	
D3-11	D3-12	150	LP	1	2.00	16.75	2513	2	0.82	7.43	3.10	D3-11	
D3-12	D3-13	140	LP	1	2.00	18.75	2625	2	0.85	6.62	2.76	D3-12	
D3-13	D3-14	140	LP	1	2.00	20.75	2905	2	0.94	5.76	2.40	D3-13	
D3-14	D3-15	140	LP	1	2.00	22.75	3185	2	1.04	4.82	2.01	D3-14	
D3-15	CC-D	470	LP	1	2.00	24.75	11633	2	3.78	3.78	1.58	D3-15	
Branch to D3-10													
CIRCUIT 4													
D4-14	D4-13	190	LP	1	2.00	2.00	380	2	0.12	5.44	2.27	D4-14	
D4-13	D4-12	110	LP	1	2.00	4.00	440	2	0.14	5.31	2.21	D4-13	
D4-12	D4-11	200	LP	1	2.00	6.00	1200	2	0.39	5.17	2.15	D4-12	
D4-11	D4-10	140	LP	1	2.00	8.00	1120	2	0.36	4.78	1.99	D4-11	
D4-10	D4-9	110	LP	1	2.00	10.00	1100	2	0.36	4.42	1.84	D4-10	
D4-9	D4-8	130	LP	1	2.00	12.00	1560	2	0.51	4.06	1.69	D4-9	
D4-8	D4-7	120	LP	1	2.00	14.00	1680	2	0.55	3.55	1.48	D4-8	
D4-7	CC-D	330	LP	7	14.00	28.00	9240	2	3.00	3.00	1.25	D4-7	
Branch to D4-1 thru D4-6													
CIRCUIT 5													
D5-1	D5-2	140	LP	1	1.25	1.25	175	2	0.06	5.87	2.45	D5-1	
D5-2	D5-3	130	LP	1	1.25	2.50	325	2	0.11	5.61	2.42	D5-2	
D5-3	D5-4	120	LP	1	1.25	3.75	450	2	0.15	5.71	2.38	D5-3	
D5-4	D5-5	110	LP	1	1.25	5.00	550	2	0.18	5.56	2.32	D5-4	
D5-5	D5-6	70	LP	1	2.00	7.00	490	2	0.16	5.38	2.24	D5-5	
D5-6	D5-7	150	LP	1	2.00	9.00	1350	2	0.44	5.22	2.18	D5-6	
D5-7	D5-8	150	LP	1	2.00	11.00	1650	2	0.54	4.78	1.99	D5-7	
D5-8	D5-9	150	LP	1	2.00	13.00	1950	2	0.63	4.25	1.77	D5-8	
D5-9	D5-10	140	LP	1	2.00	15.00	2100	2	0.68	3.61	1.51	D5-9	
D5-10	CC-D	530	LP	1	2.00	17.00	9010	2	2.93	2.93	1.22	D5-10	
CIRCUIT 6													
D6-1	D6-2	110	LP	1	2.00	2.00	220	2	0.07	1.09	0.46	D6-1	
D6-2	D6-3	110	LP	1	2.00	4.00	440	2	0.14	1.02	0.43	D6-2	
D6-3	D6-4	60	LP	1	2.00	6.00	360	2	0.12	0.88	0.37	D6-3	
D6-4	D6-5	80	LP	1	2.00	8.00	640	2	0.21	0.76	0.32	D6-4	
D6-5	CC-D	170	LP	1	2.00	10.00	1700	2	0.55	0.55	0.23	D6-5	
137.75													
LIGHTS													
	Watts		Volts	Lamp Loss									
	400		240	1.2 =	2.00	AMPS/FIXTURE - Shoebox							
	250		240	1.2 =	1.25	AMPS/FIXTURE - Shoebox and/or UP Light							
	80		240	1 =	0.33	Shoe Box Ped Light							
	84.8		240	1 =	0.35	Lantern (Gateway) Fixture							
						Amps (Rating)	Fuse						
	TOTAL AMPS OF CIRCUIT 1 =					38.00	/0.8	47.5	50				
	TOTAL AMPS OF CIRCUIT 2 =					20.00	/0.8	25.0	30				
	TOTAL AMPS OF CIRCUIT 3 =					24.75	/0.8	30.9	40				
	TOTAL AMPS OF CIRCUIT 4 =					28.00	/0.8	35.0	40				
	TOTAL AMPS OF CIRCUIT 5 =					17.00	/0.8	21.3	30				
	TOTAL AMPS OF CIRCUIT 6 =					10.00	/0.8	12.5	20				
CONNECTED LOAD = (LINE VOLTAGE X TOTAL CURRENT)/1000													
	240		x	137.75				33.06	KVA				
ENCLOSURE RATING= (SUM OF CIRCUIT LOAD/0.8)=													
	137.75		/0.8	=		172.1875	Amps	200	(USE STANDARD 60, 100, OR 200)				

City of Cleveland - Pedestal "E"

PRELIMINARY VOLTAGE DROP CALCULATIONS

Voltage: 240
CUY-90-14.52

Wire Factor Used (Three - No. 2 AWG Wires)
Wire Factor Used (Three - No. 4 AWG Wires)

Ohms/mft/1000
0.3252
0.5174

VOLTAGE DROP IN A SECTION = AMPS IN AND BEYOND SECTION (A) X SECTION LENGTH (FT) X WIRE FACTOR

From	Section		Feet	Fixt Type	At Point		Accum.	Ampere-Feet	AWG	Voltage Drop		% Drop	At Point
	To				Fixtures	Total				In Section	Accum.		
CIRCUIT 1													
E1-1	E1-2		50	LP	1	2.00	2.00	100	2	0.03	1.86	0.78	E1-1
E1-2	E1-3		50	Lantern	1	0.35	2.35	118	2	0.04	1.83	0.76	E1-2
E1-3	E1-5		100	LP	1	2.00	4.35	435	2	0.14	1.79	0.75	E1-3
E1-5	PB-E1		30	LP	1	2.00	6.35	191	2	0.06	1.65	0.69	E1-5
PB-E1	E1-6		120	Branch	1	2.00	8.35	1002	2	0.33	1.59	0.66	PB-E1
E1-6	E1-7		70	LP	1	2.00	10.35	725	2	0.24	1.26	0.53	E1-6
E1-7	E1-8		40	PED	1	0.33	10.68	427	2	0.14	1.03	0.43	E1-7
E1-8	E1-9		40	LP	1	2.00	12.68	507	2	0.16	0.89	0.37	E1-8
E1-9	E1-10		40	PED	1	0.33	13.01	520	2	0.17	0.72	0.30	E1-9
E1-10	CC-E		40	Branch	1	29.71	42.72	1709	2	0.56	0.56	0.23	E1-10
CIRCUIT 2													
E2-1	E2-2		80	LP	1	2.00	2.00	160	2	0.05	2.31	0.96	E2-1
E2-2	E2-3		60	PED	1	0.33	2.33	140	2	0.05	2.26	0.94	E2-2
E2-3	E2-4		60	LP	1	2.00	4.33	260	2	0.08	2.21	0.92	E2-3
E2-4	E2-5		80	PED	1	0.33	4.66	373	2	0.12	2.13	0.89	E2-4
E2-5	PB-E2		30	LP	1	2.00	6.66	200	2	0.06	2.01	0.84	E2-5
PB-E2	E2-7		60	Branch	1	9.37	16.03	962	2	0.31	1.94	0.81	PB-E2
E2-7	CC-E		250	LP	2	4.00	20.03	5008	2	1.63	1.63	0.68	E2-7

Branch to E1-4

Branch to MB-E1, PB-E6, PB-E5

Branch to E2-9 thru E2-11 and MB-B2

54.40

LIGHTS	Watts	Volts	Lamp Loss	
	400	240	1.2 =	2.00 AMPS/FIXTURE - Shoebox
	250	240	1.2 =	1.25 AMPS/FIXTURE - Shoebox and/or UP Light
	150	240	1.2 =	0.75 AMPS/FIXTURE - UP Light
	80	240	1 =	0.33 Shoe Box Ped Light
	84.8	240	1 =	0.35 Lantern (Gateway) Fixture
	50	120	1 =	0.42 Spot Lights

TOTAL AMPS OF CIRCUIT 1 = **42.72** /0.8 = 53.4 60
 TOTAL AMPS OF CIRCUIT 2 = **20.03** /0.8 = 25.0 30

CONNECTED LOAD = (LINE VOLTAGE X TOTAL CURRENT)/1000
 240 x 54.40 = **13.056** KVA

ENCLOSURE RATING= (SUM OF CIRCUIT LOAD/0.8)=
 54.40 /0.8 = **68** Amps Fuse=**100** (USE STANDARD 60, 100, OR 200)

Made by: Mark Hunter 9/7/2011
 Checked by: George Mohan 9/7/2011