ELECTRICAL CALCULATIONS REPORT

SKINNERS BUTTE LIGHTING IMPROVEMENT, PHASE lll

REGISTERED PROFESSIONAL ENGINEER
80,621
DIGITALLY SIGNED
OREGON
MAY 21, 2014
MATTHEW B. REICH
EXPIRES: 12-31-18

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MAY 29, 2018
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ELECTRICAL CALCULATIONS SUMMARY

Circuit Identification

The following circuit identifications were used for calculations of voltage drop, sizing of conduit, and wiring. Each circuit identifies the poles that are expected to be connected to it.

Circuit #1 – Includes Poles #1, ,2, 3, 4

Circuit #2 – Includes Poles #5, 6 ,7, 8, 9, 10, 11

Circuit #3 – Includes Poles #12, 13, 14, 15, 16, 17, 18

Circuit #4 – Includes Poles #19, 20, 21, 31, 32

Circuit #5 – Includes Poles #23, 35, 36

Circuit #6 – Includes Poles #29, 30, 33, 34

Circuit #7 – Includes Poles #22, 24, 25, 26, 27, 28

Circuit #8 – Includes Poles #37, 38, 39, 40, 41,42

Circuit #9 – Includes Poles #43, 44, 45, 46, 47

Voltage Drop/Conductor Size Summary

The following summary describes the total cumulative voltage drop across each circuit. The total voltage drop represents the percentage drop from the electrical panel to the last pole in the circuit. A pole-to-pole voltage drop is given in the detailed calculations in Appendix A. The Public Improvements Design Standards Manual requires a maximum voltage drop of 2%. The wire size below is the recommended cable size for each circuit to maintain a voltage drop below 2%.

Circuit ID	Voltage Drop	Wire size
Circuit #1	0.9%	#10
Circuit #2	0.8%	#8
Circuit #3	1.3%	#6 (From panel to Pole #12), #8 (From Pole #12 to Pole #18)
Circuit #4	0.5%	#10
Circuit #5	0.3%	#10
Circuit #6	0.3%	#10
Circuit #7	0.8%	#10
Circuit #8	0.8%	#6 (From panel to Pole#37), #8 (From Pole #37 to Pole #42)
Circuit #9	0.9%	#6

Conduit Size

The Public Improvements Design Standards Manual requires a minimum of 1-½" conduit for lighting circuits. A 1-½" conduit can be used for all individual circuits and for those circuits that are combined in the same raceway and still maintain a 20% conduit fill requirement.

Panel Schedules

The panel schedules below indicate the required circuit breaker size for each circuit at the designated panel and the load associated with each circuit for reference. The panel is provided only to show circuit breaker size and load information. Existing panels referenced may have additional loads that are not provided below.

PANEL SCHEDULE

PANEL: LAMB COTTAGE
VOLTS: 120/240
LOCATION: LAMB COTTAGE
MOUNTING: SURFACE
NOTES:

TYPE: BOLT ON **AMPS:** 100
PHASE: 1 **WIRE:** 3
MAIN: 100

LOAD CLASS	Conn. VA	Demand Factor	Demand Load VA
LIGHTING	1680	125%	2100
OUTLETS	0	*	0
MOTOR LOADS	0	**	0
RESISTANCE LOADS	0	100%	0
SUBFEED	0	100%	0
MISC. LOADS	0	100%	0
SUBFEED BREAKER	0		0

	Connected	Demand
TOTAL VOLT-AMPS	1,680	2,100
MAXIMUM PHASE AMPS	7.0	8.8

BREAKER A	BREAKER P	DESCRIPTION	WATTS	CIR. NO.	PHASE	CIR. NO.	WATTS	DESCRIPTION	BREAKER P	BREAKER A
15	2	CIRCUIT #4	120	1	A	2	180	CIRCUIT #7	2	15
			120	3	B	4	180			
15	2	CIRCUIT #5	90	5	A	6	180	CIRCUIT #8	2	15
			90	7	B	8	180			
15	2	CIRCUIT #6	120	9	A	10	150	CIRCUIT #9	2	15
			120	11	B	12	150			

PHASE TOTALS		A	B
	Connected VA	840	840
	Demand VA	1050	1050
	Connected Amps	7.0	7.0
	Demand Amps	8.8	8.8

* 10kVA at 100%, remainder at 50%
** 100% plus 25% of the largest Motor

PANEL SCHEDULE

PANEL: FLORAL AVENUE PNL

VOLTS: 120/240

LOCATION: FLORAL AVEN UE

MOUNTING:

NOTES:

TYPE: BOLT ON **AMPS:** 100

PHASE: 1 **WIRE:** 3

MAIN:

LOAD CLASS	Conn. VA	Demand Factor	Demand Load VA
LIGHTING	660	125%	825
OUTLETS	0	*	0
MOTOR LOADS	0	**	0
RESISTANCE LOADS	0	100%	0
SUBFEED	0	100%	0
MISC. LOADS	0	100%	0
SUBFEED BREAKER	0		0
		Connected	Demand
TOTAL VOLT-AMPS		660	825
MAXIMUM PHASE AMPS		2.8	3.4

BREAKER A	BREAKER P	DESCRIPTION	WATTS	CIR. NO.	PHASE	CIR. NO.	WATTS	DESCRIPTION	BREAKER P	BREAKER A
15	2	CIRCUIT #1	120	1	A	2	210	CIRCUIT #3	2	15
			120	3	B	4	210			
15	1	CIRCUIT #2	210	5	A	6				
			210	7	B	8				

		A	B
PHASE TOTALS	Connected VA	330	330
	Demand VA	413	413
	Connected Amps	2.8	2.8
	Demand Amps	3.4	3.4

* 10kVA at 100%, remainder at 50%

** 100% plus 25% of the largest Motor

APPENDIX **A**

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #1 **NUMBER:** **POLES 1-4** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

								CUMULATIVE DROP
LOAD :	POLE #1		Voltage from previous stage:	240				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	1	Vdrop (line to line, this stage)		0.19	VOLTS			0.1%
LENGTH:	84	Actual Voltage		239.81	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				1.10179	OHMS	
LOAD :	POLE #2		Voltage from previous stage:	239.814899				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.75	Vdrop (line to line, this stage)		0.27	VOLTS			0.2%
LENGTH:	165	Actual Voltage		239.54	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				1.10179	OHMS	
LOAD :	POLE #3		Voltage from previous stage:	239.542204				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.5	Vdrop (line to line, this stage)		0.16	VOLTS			0.3%
LENGTH:	147	Actual Voltage		239.38	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				1.10179	OHMS	
LOAD :	POLE #4		Voltage from previous stage:	239.380241				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.25	Vdrop (line to line, this stage)		0.07	VOLTS			0.3%
LENGTH:	127	Actual Voltage		239.31	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				1.10179	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #1 (FUTURE) **NUMBER:** **POLES 1-4** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

							CUMULATIVE DROP
LOAD :	PNL LOCATION		Voltage from previous stage:	240			
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.5	Vdrop (line to line, this stage)	0.11	VOLTS			0.0%
LENGTH:	101	Actual Voltage	239.89	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #2		Voltage from previous stage:	239.888719			
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.25	Vdrop (line to line, this stage)	0.09	VOLTS			0.1%
LENGTH:	158	Actual Voltage	239.80	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #2 **NUMBER:** **POLES 5-7** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

								CUMULATIVE DROP
LOAD :	AT JB		Voltage from previous stage:	240				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	1.75	Vdrop (line to line, this stage)		1.58	VOLTS			0.7%
LENGTH:	623	Actual Voltage		238.42	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.7	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				0.72467	OHMS	
LOAD :	POLE #7		Voltage from previous stage:	238.419865				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.75	Vdrop (line to line, this stage)		0.18	VOLTS			0.7%
LENGTH:	166	Actual Voltage		238.24	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				0.72467	OHMS	
LOAD :	POLE #6		Voltage from previous stage:	238.239423				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.5	Vdrop (line to line, this stage)		0.10	VOLTS			0.8%
LENGTH:	136	Actual Voltage		238.14	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				0.72467	OHMS	
LOAD :	POLE #5		Voltage from previous stage:	238.140869				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.25	Vdrop (line to line, this stage)		0.04	VOLTS			0.8%
LENGTH:	106	Actual Voltage		238.10	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:				0.72467	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #2 **NUMBER:** **POLES 8-11** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

								CUMULATIVE DROP
LOAD :	AT JB		Voltage from previous stage:	240				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	1.75	Vdrop (line to line, this stage)		1.58	VOLTS			0.7%
LENGTH:	623	Actual Voltage		238.42	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.7	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:		0.72467	OHMS			
LOAD :	POLE #8		Voltage from previous stage:	238.419865				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	1	Vdrop (line to line, this stage)		0.06	VOLTS			0.7%
LENGTH:	40	Actual Voltage		238.36	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:		0.72467	OHMS			
LOAD :	POLE #9		Voltage from previous stage:	238.361892				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.75	Vdrop (line to line, this stage)		0.18	VOLTS			0.8%
LENGTH:	161	Actual Voltage		238.19	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:		0.72467	OHMS			
LOAD :	POLE #10		Voltage from previous stage:	238.186885				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.5	Vdrop (line to line, this stage)		0.10	VOLTS			0.8%
LENGTH:	140	Actual Voltage		238.09	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:		0.72467	OHMS			
LOAD :	POLE #11		Voltage from previous stage:	238.085432				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.25	Vdrop (line to line, this stage)		0.06	VOLTS			0.8%
LENGTH:	161	Actual Voltage		238.03	VOLTS			
FEEDER:	50T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:		0.72467	OHMS			

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #3 **NUMBER:** **POLES 12-18** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

							CUMULATIVE DROP
LOAD :	POLE # 12	Voltage from previous stage:	240				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.75	Vdrop (line to line, this stage)	1.90	VOLTS			0.8%
LENGTH:	1171	Actual Voltage	238.10	VOLTS			
FEEDER:	60T	% DROP (this stage)=			0.8	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS	
LOAD :	POLE #13	Voltage from previous stage:	238.10145				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.5	Vdrop (line to line, this stage)	0.30	VOLTS			0.9%
LENGTH:	136	Actual Voltage	237.81	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #14	Voltage from previous stage:	237.805786				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.25	Vdrop (line to line, this stage)	0.25	VOLTS			1.0%
LENGTH:	136	Actual Voltage	237.56	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #15	Voltage from previous stage:	237.5594				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1	Vdrop (line to line, this stage)	0.23	VOLTS			1.1%
LENGTH:	156	Actual Voltage	237.33	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #16	Voltage from previous stage:	237.333304				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.75	Vdrop (line to line, this stage)	0.17	VOLTS			1.2%
LENGTH:	152	Actual Voltage	237.17	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #17	Voltage from previous stage:	237.16808				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.5	Vdrop (line to line, this stage)	0.09	VOLTS			1.2%
LENGTH:	126	Actual Voltage	237.08	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #18	Voltage from previous stage:	237.076772				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.25	Vdrop (line to line, this stage)	0.05	VOLTS			1.2%
LENGTH:	148	Actual Voltage	237.02	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #4 **NUMBER:** **POLES 19-21** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

							CUMULATIVE DROP
LOAD :	JB		Voltage from previous stage:	240			
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.25	Vdrop (line to line, this stage)	0.58	VOLTS			0.2%
LENGTH:	210	Actual Voltage	239.42	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.2	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #21	Voltage from previous stage:	239.421558				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.75	Vdrop (line to line, this stage)	0.33	VOLTS			0.4%
LENGTH:	200	Actual Voltage	239.09	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #20	Voltage from previous stage:	239.09102				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.5	Vdrop (line to line, this stage)	0.15	VOLTS			0.4%
LENGTH:	140	Actual Voltage	238.94	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #19	Voltage from previous stage:	238.936768				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.25	Vdrop (line to line, this stage)	0.07	VOLTS			0.5%
LENGTH:	131	Actual Voltage	238.86	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #4 **NUMBER:** **POLES 31-32** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

						CUMULATIVE DROP
LOAD :	JB		Voltage from previous stage:	240		
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	1.25	Vdrop (line to line, this stage)	0.58	VOLTS		0.2%
LENGTH:	210	Actual Voltage	239.42	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.2 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS
LOAD :	POLE #31	Voltage from previous stage:	239.418583			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.5	Vdrop (line to line, this stage)	0.29	VOLTS		0.4%
LENGTH:	260	Actual Voltage	239.13	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.1 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS
LOAD :	POLE #32	Voltage from previous stage:	239.130643			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.25	Vdrop (line to line, this stage)	0.09	VOLTS		0.4%
LENGTH:	163	Actual Voltage	239.04	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.0 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #5 **NUMBER:** **POLES 23,35,36** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

								CUMULATIVE DROP
LOAD :	POLE #35		Voltage from previous stage:	240				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.75	Vdrop (line to line, this stage)		0.49	VOLTS			0.2%
LENGTH:	294	Actual Voltage		239.51	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.2	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:				1.10746	OHMS	
LOAD :	POLE #23		Voltage from previous stage:	239.51161				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.25	Vdrop (line to line, this stage)		0.08	VOLTS			0.2%
LENGTH:	136	Actual Voltage		239.44	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:				1.10746	OHMS	
LOAD :	POLE #36		Voltage from previous stage:	239.436302				
VOLTAGE CLASS:	240							
PHASE:	1							
AMPS:	0.25	Vdrop (line to line, this stage)		0.08	VOLTS			0.3%
LENGTH:	147	Actual Voltage		239.35	VOLTS			
FEEDER:	30T	% DROP (this stage)=				0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:				1.10746	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #6 **NUMBER:** **POLES 29,30,33,34** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

						CUMULATIVE DROP
LOAD :	POLE #33	Voltage from previous stage:	240			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	1	Vdrop (line to line, this stage)	0.24	VOLTS		0.1%
LENGTH:	108	Actual Voltage	239.76	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.1 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS
LOAD :	POLE#29	Voltage from previous stage:	239.760788			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.75	Vdrop (line to line, this stage)	0.18	VOLTS		0.2%
LENGTH:	110	Actual Voltage	239.58	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.1 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS
LOAD :	POLE #30	Voltage from previous stage:	239.578057			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.5	Vdrop (line to line, this stage)	0.16	VOLTS		0.2%
LENGTH:	141	Actual Voltage	239.42	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.1 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS
LOAD :	POLE #34	Voltage from previous stage:	239.421905			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.25	Vdrop (line to line, this stage)	0.08	VOLTS		0.3%
LENGTH:	140	Actual Voltage	239.34	VOLTS		
FEEDER:	30T	% DROP (this stage)=			0.0 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	M	IMPEDANCE PER 1000 FEET:			1.10746	OHMS

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #7 **NUMBER:** **POLES 22,24-28**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

							CUMULATIVE DROP
LOAD :	POLE # 22	Voltage from previous stage:	240				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.5	Vdrop (line to line, this stage)	0.91	VOLTS			0.4%
LENGTH:	274	Actual Voltage	239.09	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.4	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #24	Voltage from previous stage:	239.094325				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.25	Vdrop (line to line, this stage)	0.34	VOLTS			0.5%
LENGTH:	124	Actual Voltage	238.75	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #25	Voltage from previous stage:	238.752769				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1	Vdrop (line to line, this stage)	0.28	VOLTS			0.6%
LENGTH:	126	Actual Voltage	238.48	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #26	Voltage from previous stage:	238.475116				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.75	Vdrop (line to line, this stage)	0.20	VOLTS			0.7%
LENGTH:	120	Actual Voltage	238.28	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #27	Voltage from previous stage:	238.276793				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.5	Vdrop (line to line, this stage)	0.13	VOLTS			0.8%
LENGTH:	117	Actual Voltage	238.15	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	
LOAD :	POLE #28	Voltage from previous stage:	238.147883				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.25	Vdrop (line to line, this stage)	0.06	VOLTS			0.8%
LENGTH:	116	Actual Voltage	238.08	VOLTS			
FEEDER:	30T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			1.10179	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #8 **NUMBER:** **POLES 37-42** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

							CUMULATIVE DROP
LOAD :	POLE #37	Voltage from previous stage:	240				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.5	Vdrop (line to line, this stage)	1.22	VOLTS			0.5%
LENGTH:	877	Actual Voltage	238.78	VOLTS			
FEEDER:	60T	% DROP (this stage)=			0.5	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS	
LOAD :	POLE #38	Voltage from previous stage:	238.781241				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1.25	Vdrop (line to line, this stage)	0.22	VOLTS			0.6%
LENGTH:	122	Actual Voltage	238.56	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #39	Voltage from previous stage:	238.560218				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	1	Vdrop (line to line, this stage)	0.17	VOLTS			0.7%
LENGTH:	120	Actual Voltage	238.39	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #40	Voltage from previous stage:	238.386298				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.75	Vdrop (line to line, this stage)	0.13	VOLTS			0.7%
LENGTH:	116	Actual Voltage	238.26	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.1	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #41	Voltage from previous stage:	238.260206				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.5	Vdrop (line to line, this stage)	0.08	VOLTS			0.8%
LENGTH:	117	Actual Voltage	238.18	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	
LOAD :	POLE #42	Voltage from previous stage:	238.17542				
VOLTAGE CLASS:	240						
PHASE:	1						
AMPS:	0.25	Vdrop (line to line, this stage)	0.04	VOLTS			0.8%
LENGTH:	120	Actual Voltage	238.13	VOLTS			
FEEDER:	50T	% DROP (this stage)=			0.0	%	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.72467	OHMS	

VOLTAGE DROP CALCULATION

RUN ID CIRCUIT #9 **NUMBER:** **POLES 43-47** **29-May-18**

SOURCE: VOLTAGE 240 Volts Line to Line ASSUMED POWER FACTOI 0.9
% ALLOWED 2 % MAX VOLTS ALLOWED: 4.8 VOLTS

						CUMULATIVE DROP
LOAD :	POLE #43	Voltage from previous stage:	240			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	1.25	Vdrop (line to line, this stage)	1.73	VOLTS		0.7%
LENGTH:	1498	Actual Voltage	238.27	VOLTS		
FEEDER:	60T	% DROP (this stage)=			0.7 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS
LOAD :	POLE #44	Voltage from previous stage:	238.265202			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	1	Vdrop (line to line, this stage)	0.11	VOLTS		0.8%
LENGTH:	123	Actual Voltage	238.15	VOLTS		
FEEDER:	60t	% DROP (this stage)=			0.0 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS
LOAD :	POLE #45	Voltage from previous stage:	238.151248			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.75	Vdrop (line to line, this stage)	0.08	VOLTS		0.8%
LENGTH:	122	Actual Voltage	238.07	VOLTS		
FEEDER:	60T	% DROP (this stage)=			0.0 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS
LOAD :	POLE #46	Voltage from previous stage:	238.066476			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.5	Vdrop (line to line, this stage)	0.06	VOLTS		0.8%
LENGTH:	123	Actual Voltage	238.01	VOLTS		
FEEDER:	60T	% DROP (this stage)=			0.0 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS
LOAD :	POLE #47	Voltage from previous stage:	238.009499			
VOLTAGE CLASS:	240					
PHASE:	1					
AMPS:	0.25	Vdrop (line to line, this stage)	0.03	VOLTS		0.8%
LENGTH:	134	Actual Voltage	237.98	VOLTS		
FEEDER:	60T	% DROP (this stage)=			0.0 %	
[M]AGNETIC OR [N]ON-MAGNETIC CONDUIT:	N	IMPEDANCE PER 1000 FEET:			0.46323	OHMS