ORTIZ AVENUE WIDENING

COUNTY PROJECT NUMBER: CN 18-8479

LIGHTING DESIGN ANALYSIS REPORT

Prepared for

LEE COUNTY, FL
DEPARTMENT OF TRANSPORTATION
1500 Monroe St
Fort Myers, Florida

Prepared by

KISINGER CAMPO & ASSOCIATES CORP.
201 N Franklin St, Suite 400
Tampa, Florida 33602

April 2021

Professional Engineer Burak Konuk
Florida PE # 81581

TABLE OF CONTENTS

TABLE

APPENDIX

1.0 PROJECT OVERVIEW

1.1. INTRODUCTION

This Lighting Design Analysis Report (LDAR) has been prepared by **Kisinger Campo & Associates (KCA)** as part of the widening of Ortiz Avenue from Colonial Boulevard (SR 884) to Dr. Martin Luther King Jr. Boulevard (SR 82) Lee County, Florida, Project ID: CN180064.

1.2. PROJECT DESCRIPTION

As part of PID CN180064, Ortiz Avenue from Colonial Boulevard (SR 884) to Dr. Martin Luther King Jr. Boulevard (SR 82) will utilize a conventional lighting. The purpose of this memorandum is to document the results of the lighting analysis (photometric calculations) conducted for Ortiz Avenue using Light Emitting Diode (LED) luminaires while adhering to FDOT's roadway lighting "new construction" criteria for horizontal foot candles.

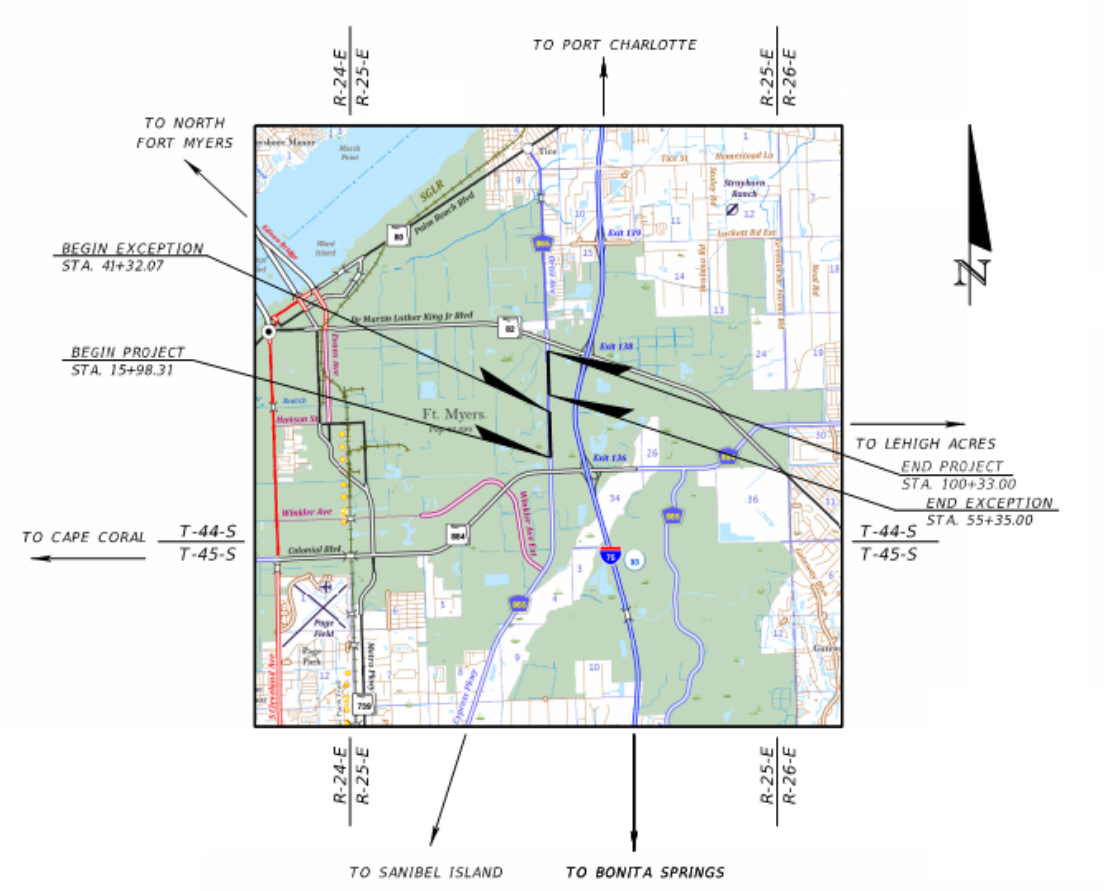


Figure 1 – Project Map

With the exception of the Hanson Street segment, the total length of the lighting limits is approximately 1.32 miles:

- Segment one:
  South of the Hanson Street Exception segment, approximately 0.50 miles from Sta 13+40.00 to Sta 40+00.00 of Ortiz Avenue.

- Segment two:
  North of the Hanson Street Exception segment, approximately 0.82 miles from Sta 56+00.00 to Sta 99+40.00 of Ortiz Ave.

The designed lighting system contains the following:

- Segment one:
  - 18 poles. Single arm mounted Mongoose Medium, P4 Performance Package, 180 watt Roadway LED Luminaire mounted at 40.0 feet height with 8-foot arm.
  - 14 poles. Each pole has a double arm mounted Mongoose Medium, P3 Performance Package, 155 watt Roadway LED Luminaire mounted at 40.0 feet height with 8 -foot single arms on roadway side and top mounted fixtures on sidewalk.

- Segment two:
  - 30 poles. Single arm mounted Mongoose Medium, P4 Performance Package, 180 watt Roadway LED Luminaire mounted at 40.0 feet height with 8-foot arm.
  - 20 poles. Each pole has a double arm mounted Mongoose Medium, P3 Performance Package, 155 watt Roadway LED Luminaire mounted at 40.0 feet height with 8 -foot single arms on roadway side and top mounted fixtures on sidewalk.

2.0 APPLICABLE STANDARDS

This is a conventional roadway lighting only project and was designed in accordance with the following Florida Department of Transportation (FDOT) Standards and Illuminating Engineering Society (IES) criteria for conventional lighting of major arterials.

2.1 2020 DESIGN STANDARDS

- Standard Plans Index No. 715-001 Conventional Lighting

2.2 FLORIDA DESIGN MANUAL

- FDM, Chapter 231, Lighting Criteria
- FDM, Chapter 215.2.4, Lateral Offset
- FDM Chapter 326, Lighting Plans

2.3 DESIGN CRITERIA

Table 1 Summarizes the Conventional Light Criteria as applicable to the project:

Table 1: Roadway Lighting Design Criteria

Lighting Design Criteria	Value	Source
Conventional Lighting		
Major Arterials		
Horizontal Average Illumination Initial Illuminance (H.F.C.)	1.5 Min.	FDM Part 1 Table 231.2.1
Avg./Min. Ratio	4:1 or Less	FDM Part 1 Table 231.2.1
Max./Min. Ratio	10:1 or Less	FDM Part 1 Table 231.2.1
Veiling Luminance Ratio	0.3:1 or Less	FDM Part 1 Table 231.2.1

The following lighting system specifications were used for photometric calculations and summarized in **Table 2**.

Table 2: Lighting System Specifications

Lighting System Specifications Design Criteria	
Pole Type	• Single Shoulder Mounted Aluminum Light Pole with 8' Arm
	• Double Arm Shoulder Mounted Aluminum with: - 8' single arm on roadway side - Top mounted fixtured on sidewalk side.
Fixture Types	• Holophane MGLEDM Mongoose Medium LED P3 Light Emitting Diode (LED) luminaire, 23480 lumens 155 Watts MGLEDM P3 40K XXXXX WR.ies • Holophane MGLEDM Mongoose Medium LED P4 Light Emitting Diode (LED) luminaire, 26,970 lumens 180 Watts MGLEDM P4 40K XXXXX WR.ies
Mounting Height	40' conventional
Design Wind Speed (Orange County)	160 MPH (Conventional Poles)
Maximum Voltage Drop	5% (Per FDOT 2021 Design Manual)
System Voltage	480 volts

3.0 LUMINAIRE SUMMARY

Appendix A includes a copy of the typical roadway sections. New light poles are proposed along the corridor. The following Luminaries by Holophane Series MGLEDM fixtures were used to achieve the lighting design criteria in Table 1.

Table 3 provides the summary and schedule for the luminaire proposed along Ortiz Ave. The minimum lateral clearance offset of 20 feet from the face of pole to the travel lane and a minimum of 14 feet from the face of pole to auxiliary lane was used in this project per current criteria.

The photometrics for all areas were within the acceptable range of illumination. Appendix B includes a copy of the photometric analysis and results.

Table 3: Luminaire Summary & Schedule

Product No.	Lamp Wattage (W)	Light Source	Lumen Output (lumens)	Distribution Type	Specifications	Qt.
Segment 1						
MGLEDM Mongoose Medium	180	LED	26,970	IES MGLEDM_ P4_40K_X XXXX_WR	8' Single arm length and 40' mounting height. (facing sidewalk)	21
	155 (Luminaire mounted on the same pole as the 180 W luminaire)		23,480	IES MGLEDM P3 40K XXXXX WR	Top mounted fixtured and 40' mounting height. (facing sidewalk)	11
Segment 2						
MGLEDM Mongoose Medium	180	LED	26,970	IES MGLEDM_ P4_40K_X XXXX_WR	8' Single arm length and 40' mounting height. (facing sidewalk)	30
	155 (Luminaire mounted on the same pole as the 180 W luminaire)		23,480	IES MGLEDM P3 40K XXXXX WR	Top mounted fixtured and 40' mounting height. (facing sidewalk)	20

4.0 PHOTOMETRIC SUMMARY

Photometric analysis was conducted for both segments. The AGI32 Software was used to analyze the photometric for this project. Table 4 provides a summary of the horizontal photometric analysis results. The photometrics for both segments were within the acceptable range of illumination. Appendix B includes a copy of the photometric analysis and results.

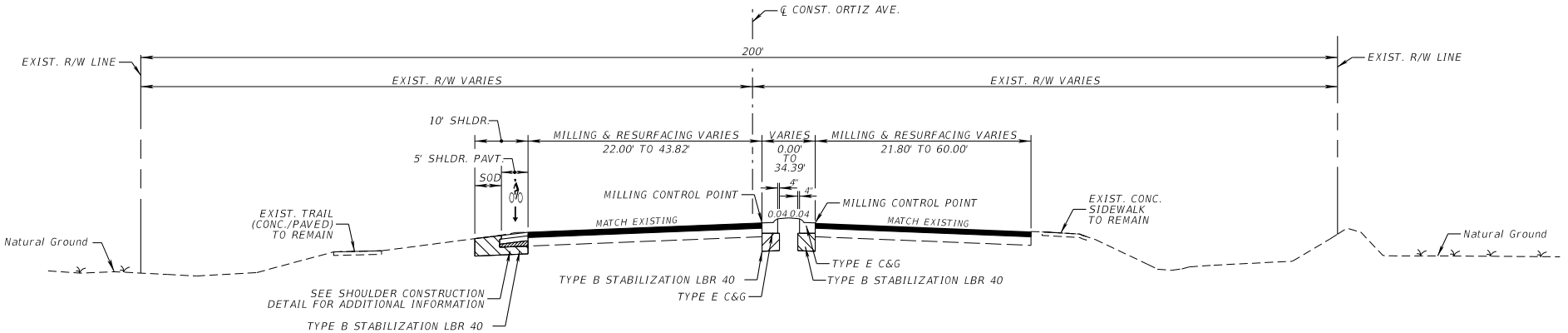
In this analysis, four poles from newly constructed Hanson Street Roundabout (LDO2018-00155) were considered. Specifically, and reflected in the photometric analysis two poles were considered at the end of the segment one and two poles were considered at the beginning of segment two.

Table 4: Photometric Summary

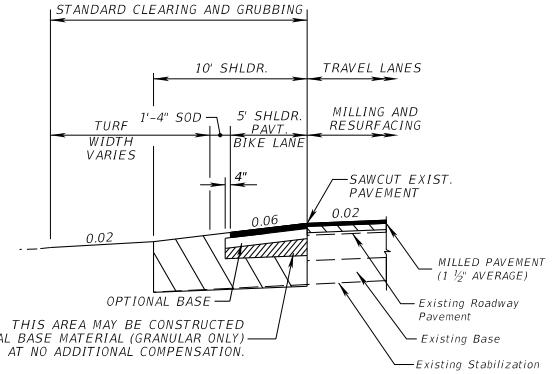
Segment #	Horizontal Illumination Avg	Max	Min	Avg/Min	Max/Min
Segment 1					
NB Seg 1_Sta_16 to Sta_ 41	1.71 fc	5.0 fc	0.6 fc	2.85:1	8.33:1
Trail NB Seg 1_Sta16 to Sta_41	1.51 fc	4.1 fc	0.5 fc	3.02:1	8.20:1
SB Seg 1_Sta 16 to Sta_41	1.86 fc	5.1 fc	0.6 fc	3.10:1	8.50:1
Trail SB Seg 1_Sta16 to Sta_41	1.99 fc	5.6 fc	0.6 fc	3.32:1	9.33:1
Segment 2					
NB Seg 2_Sta 55 to Sta 100	1.79 fc	5.7 fc	0.6 fc	2.98:1	9.50:1
Trail NB Seg. 2_Sta 55 to Sta100	1.51 fc	4.5 fc	0.5 fc	3.02:1	9.00:1
SB Seg 2_ Sta 55 to Sta100	1.50 fc	4.2 fc	0.5 fc	3.00:1	8.40:1
Trail SB Seg 2_Sta 55 to Sta100	1.92 fc	4.2 fc	0.5 fc	3.84:1	8.40:1

APPENDIX A

Typical Sections
Lighting



ORTIZ AVENUE
FROM STA. 15+98.31 TO STA. 17+50.00



TRAFFIC DATA

COLONIAL CENTER DRIVE TO HANSON STREET
CURRENT YEAR = 2019 AADT = 18,000
ESTIMATED OPENING YEAR = 2021 AADT = 21,000
ESTIMATED DESIGN YEAR = 2045 AADT = 33,500
K = 9.00% D = 56.32% T = 8.0% (24 HOUR)
DESIGN HOUR T = 4.0%
DESIGN SPEED = 45 MPH

TRAVEL LANES

MILL EXISTING ASPHALT PAVEMENT (1 ½" AVG. DEPTH)
RESURFACE WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1 ½")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 4 WITH
FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

SHOULDER CONSTRUCTION DETAIL

SEE PLAN SHEETS FOR LOCATIONS
N.T.S.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KCA KISINGER CAMPO & ASSOCIATES
13461 Parker Commons Blvd, Suite 104
Fort Myers, Florida 33912
Engineer of Record: Adrienne Wisdom
P.E. No.: 78492

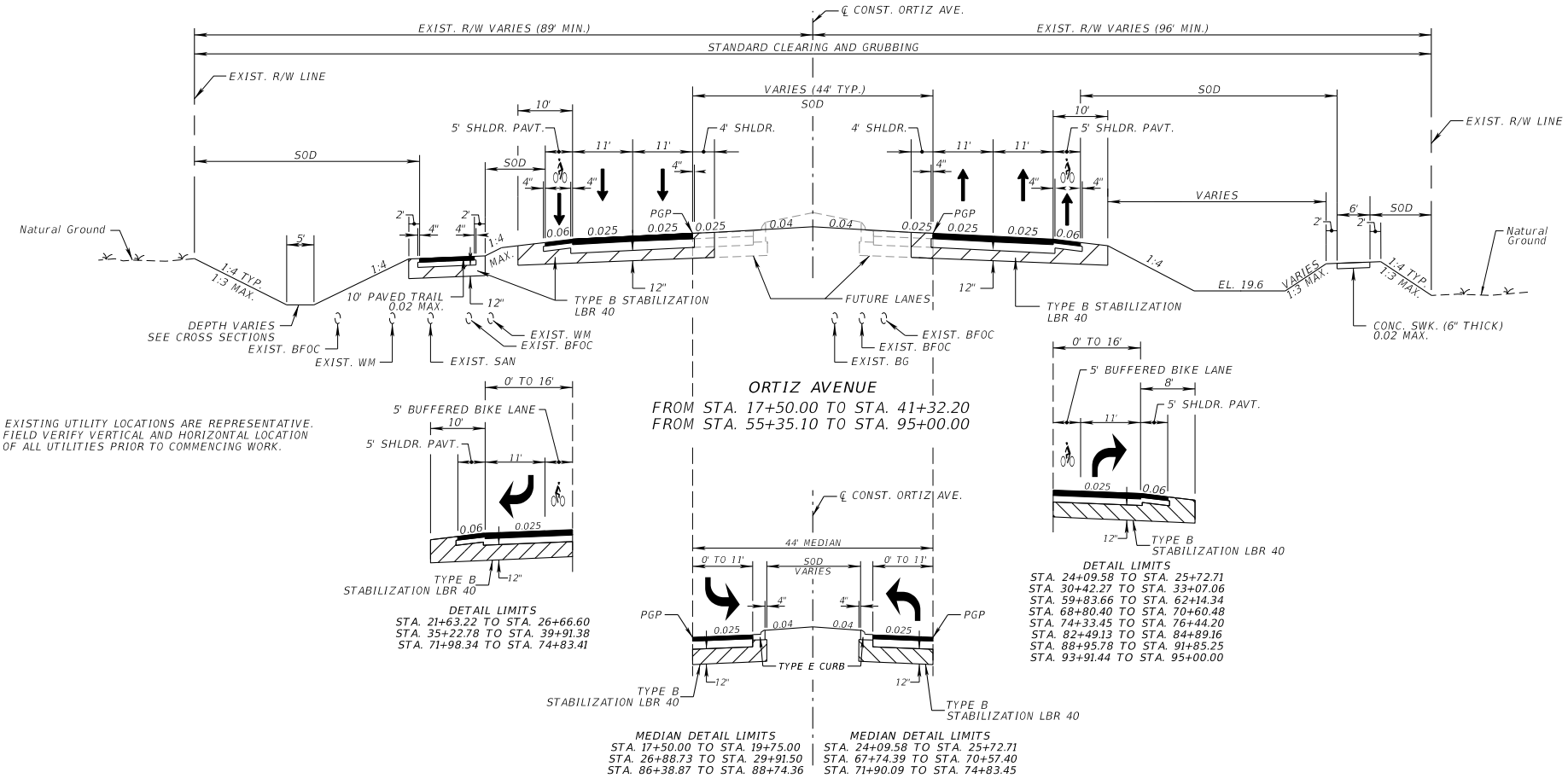
LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD	COUNTY	CONTRACT NO.
CR 865 (ORTIZ AVE.)	LEE COUNTY	CN18-8479

TYPICAL SECTION (1)

SHEET NO.

emarin 10/28/2020 5:29:30 PM M:\1201814 Ortiz Avenue\Roadway\TYPSRD01.dgn



NOTE: EXISTING UTILITY LOCATIONS ARE REPRESENTATIVE. FIELD VERIFY VERTICAL AND HORIZONTAL LOCATION OF ALL UTILITIES PRIOR TO COMMENCING WORK.

ORTIZ AVENUE
FROM STA. 17+50.00 TO STA. 41+32.20
FROM STA. 55+35.10 TO STA. 95+00.00

DETAIL LIMITS
STA. 21+63.22 TO STA. 26+66.60
STA. 35+22.78 TO STA. 39+91.38
STA. 71+98.34 TO STA. 74+83.41

DETAIL LIMITS
STA. 24+09.58 TO STA. 25+72.71
STA. 30+42.27 TO STA. 33+07.06
STA. 59+83.66 TO STA. 62+14.34
STA. 68+80.40 TO STA. 70+60.48
STA. 74+33.45 TO STA. 76+44.20
STA. 82+49.13 TO STA. 84+89.16
STA. 88+95.78 TO STA. 91+85.25
STA. 93+91.44 TO STA. 95+00.00

MEDIAN DETAIL LIMITS
STA. 17+50.00 TO STA. 19+75.00
STA. 26+88.73 TO STA. 29+91.50
STA. 86+38.87 TO STA. 88+74.36

MEDIAN DETAIL LIMITS
STA. 24+09.58 TO STA. 25+72.71
STA. 67+74.39 TO STA. 70+57.40
STA. 71+90.09 TO STA. 74+83.45

TRAFFIC DATA

COLONIAL CENTER DRIVE TO HANSON STREET
CURRENT YEAR = 2019 AADT = 18,000
ESTIMATED OPENING YEAR = 2021 AADT = 21,000
ESTIMATED DESIGN YEAR = 2045 AADT = 33,500
K = 9.00% D = 56.32% T = 8.0% (24 HOUR)
DESIGN HOUR T = 4.0%
DESIGN SPEED = 45 MPH

HANSON STREET TO RACETRAC FULL ACCESS
CURRENT YEAR = 2019 AADT = 18,000
ESTIMATED OPENING YEAR = 2021 AADT = 20,000
ESTIMATED DESIGN YEAR = 2045 AADT = 31,500
K = 9.00% D = 56.32% T = 8.0% (24 HOUR)
DESIGN HOUR T = 4.0%
DESIGN SPEED = 45 MPH

TRAVEL LANES
OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (3")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

SHOULDER PAVEMENT
OPTIONAL BASE GROUP 4 WITH
FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

MULTI-USE TRAIL
OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1 ½")

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KCA KISINGER CAMPO & ASSOCIATES
13461 Parker Commons Blvd, Suite 104
Fort Myers, Florida 33912
Engineer of Record: Adrienne Wisdom P.E. No.: 78492

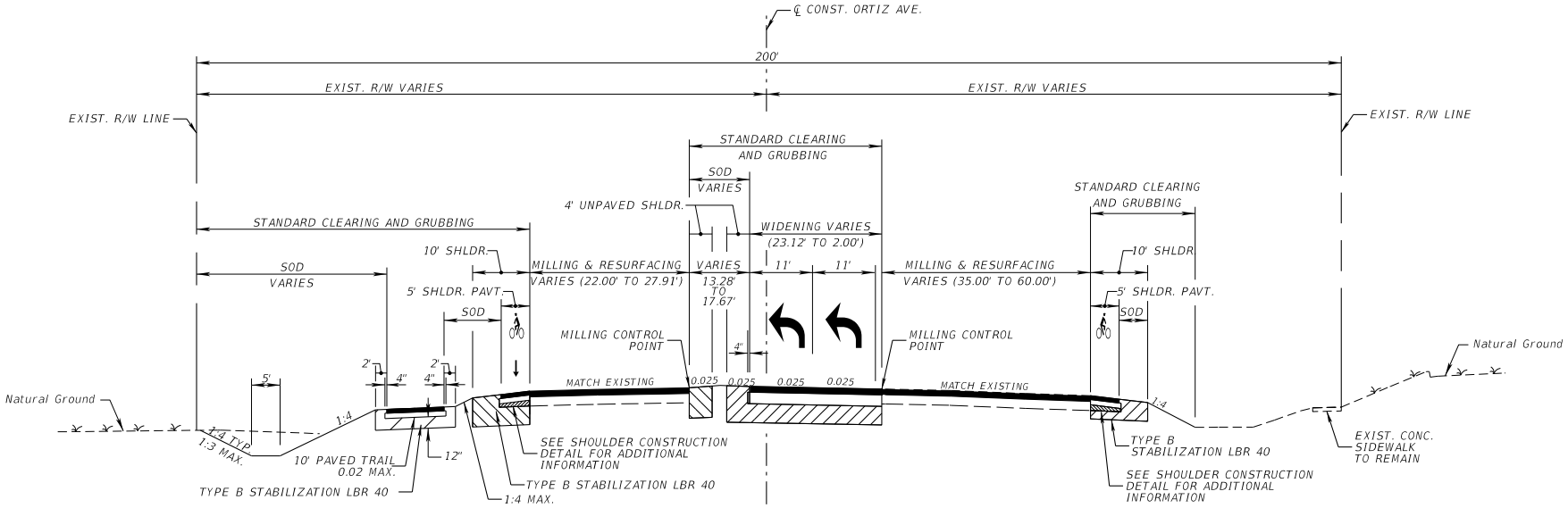
LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD	COUNTY	CONTRACT NO.
CR 865 (ORTIZ AVE.)	LEE COUNTY	CN18-8479

TYPICAL SECTION (2)

SHEET NO.

emarin 10/28/2020 5:29:31 PM M:\1201814 Ortiz Avenue\Roadway\TYPSRD01.dgn



ORTIZ AVENUE
FROM STA. 95+00.00 TO STA. 100+06.75

TRAFFIC DATA

RACETRAC FULL ACCESS TO SR 82
CURRENT YEAR = 2019 AADT = 21,500
ESTIMATED OPENING YEAR = 2021 AADT = 23,500
ESTIMATED DESIGN YEAR = 2045 AADT = 36,000
K = 9.00% D = 56.32% T = 8.0% (24 HOUR)
DESIGN HOUR T = 4.0%
DESIGN SPEED = 45 MPH

TRAVEL LANES

MILL EXISTING ASPHALT PAVEMENT (1 ½" AVG. DEPTH)
RESURFACE WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1 ½")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 4 WITH
FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

MULTI-USE TRAIL

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1 ½")

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KCA KISINGER CAMPO & ASSOCIATES
13461 Parker Commons Blvd, Suite 104
Fort Myers, Florida 33912
Engineer of Record: Adrienne Wisdom
P.E. No.: 78492

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD	COUNTY	CONTRACT NO.
CR 865 (ORTIZ AVE.)	LEE COUNTY	CNI18-8479

TYPICAL SECTION (3)

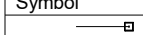
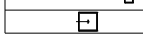
SHEET NO.

emarin 10/28/2020 5:29:31 PM M:\1201814 Ortiz Avenue\Roadway\TYPSRD01.dgn

APPENDIX B

AGi32 Software Output
Photometric Lighting Results

Luminaire Summary

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	90	MGLEDM_P4_40K_XXXXX_WR	SINGLE	N.A.	1.000	MGLEDM P4 40K XXXXX WR
	31	MGLEDM_P3_40K_XXXXX_WR	SINGLE	N.A.	1.000	MGLEDM P3 40K XXXXX WR

Luminaire Location Summary

Coordinates In Feet

Luminaire Location Summary						
LumNo	**Label**	**X**	**Y**	**Z**	**Orient**	**Tilt**
1	MGLEDM_P4_40K_XXXXX_WR	717883.0	828676.9	40	195.938	0
2	MGLEDM_P4_40K_XXXXX_WR	717729.0	828695.0	40	352.218	0
3	MGLEDM_P4_40K_XXXXX_WR	717880.8	828786.4	40	179.865	0
4	MGLEDM_P4_40K_XXXXX_WR	717882.0	828907.7	40	179.477	0
5	MGLEDM_P4_40K_XXXXX_WR	717737.0	828919.3	40	0.909	0
6	MGLEDM_P4_40K_XXXXX_WR	717879.7	829041.5	40	155.916	0
7	MGLEDM_P4_40K_XXXXX_WR	717751.6	829057.3	40	0.794	0
8	MGLEDM_P4_40K_XXXXX_WR	717748.5	829156.8	40	0.794	0
9	MGLEDM_P4_40K_XXXXX_WR	717739.4	829284.1	40	359.85	0
10	MGLEDM_P4_40K_XXXXX_WR	717871.4	829287.2	40	175.129	0
11	MGLEDM_P3_40K_XXXXX_WR	717871.4	829287.2	40	359.472	0
12	MGLEDM_P4_40K_XXXXX_WR	717735.1	829464.8	40	0.444	0
13	MGLEDM_P3_40K_XXXXX_WR	717873.3	829467.0	40	359.472	0
14	MGLEDM_P4_40K_XXXXX_WR	717872.5	829467.2	40	181.39	0
15	MGLEDM_P4_40K_XXXXX_WR	717727.5	829644.3	40	0.439	0
16	MGLEDM_P3_40K_XXXXX_WR	717873.0	829646.5	40	359.472	0
17	MGLEDM_P4_40K_XXXXX_WR	717871.9	829646.8	40	181.554	0
18	MGLEDM_P4_40K_XXXXX_WR	717726.1	829824.3	40	1.752	0
19	MGLEDM_P4_40K_XXXXX_WR	717893.7	829858.9	40	180.911	0
20	MGLEDM_P4_40K_XXXXX_WR	717723.7	830003.5	40	359.736	0
21	MGLEDM_P4_40K_XXXXX_WR	717879.9	830020.2	40	181.466	0
22	MGLEDM_P3_40K_XXXXX_WR	717732.2	830183.6	40	181.373	0
23	MGLEDM_P4_40K_XXXXX_WR	717732.2	830183.6	40	1.525	0
24	MGLEDM_P4_40K_XXXXX_WR	717864.8	830189.3	40	182.001	0
25	MGLEDM_P3_40K_XXXXX_WR	717729.4	830362.9	40	182.802	0
26	MGLEDM_P4_40K_XXXXX_WR	717730.0	830363.3	40	0.103	0
27	MGLEDM_P4_40K_XXXXX_WR	717874.3	830367.5	40	181.724	0
28	MGLEDM_P4_40K_XXXXX_WR	717877.2	830508.5	40	181.22	0
29	MGLEDM_P3_40K_XXXXX_WR	717727.4	830543.7	40	182.773	0
30	MGLEDM_P4_40K_XXXXX_WR	717728.4	830543.8	40	0.573	0
31	MGLEDM_P4_40K_XXXXX_WR	717879.5	830688.7	40	181.371	0
32	MGLEDM_P4_40K_XXXXX_WR	717724.9	830743.9	40	358.665	0
33	MGLEDM_P3_40K_XXXXX_WR	717724.9	830744.0	40	176.624	0
34	MGLEDM_P4_40K_XXXXX_WR	717862.9	830899.5	40	181.591	0
35	MGLEDM_P4_40K_XXXXX_WR	717721.9	830922.2	40	0.568	0
36	MGLEDM_P4_40K_XXXXX_WR	717710.3	831076.9	40	0.897	0
37	MGLEDM_P4_40K_XXXXX_WR	717838.0	831078.1	40	182.701	0
38	MGLEDM_P3_40K_XXXXX_WR	717838.3	831078.7	40	359.472	0
39	MGLEDM_P4_40K_XXXXX_WR	717705.0	831243.9	40	0.548	0
40	MGLEDM_P3_40K_XXXXX_WR	717705.0	831243.9	40	180.917	0
41	MGLEDM_P4_40K_XXXXX_WR	717835.0	831246.4	40	179.116	0
42	MGLEDM_P3_40K_XXXXX_WR	717838.2	831246.6	40	359.472	0
43	MGLEDM_P4_40K_XXXXX_WR	717704.6	831414.4	40	0.854	0
44	MGLEDM_P3_40K_XXXXX_WR	717826.2	831416.7	40	359.472	0
45	MGLEDM_P4_40K_XXXXX_WR	717822.3	831416.7	40	180.846	0
46	MGLEDM_P4_40K_XXXXX_WR	717712.1	831578.5	40	0.912	0
47	MGLEDM_P4_40K_XXXXX_WR	717816.7	831580.6	40	221.174	0
48	MGLEDM_P4_40K_XXXXX_WR	717695.2	832932.8	40	1.878	0
49	MGLEDM_P4_40K_XXXXX_WR	717798.9	832934.4	40	182.054	0
50	MGLEDM_P4_40K_XXXXX_WR	717689.2	833084.4	40	359.568	0

Luminaire Location Summary - Cont.

Coordinates In Feet

Luminaire Location Summary						
LumNo	**Label**	**X**	**Y**	**Z**	**Orient**	**Tilt**
51	MGLEDM_P4_40K_XXXXX_WR	717801.0	833084.6	40	180.796	0
52	MGLEDM_P3_40K_XXXXX_WR	717801.7	833084.6	40	3.134	0
53	MGLEDM_P4_40K_XXXXX_WR	717692.0	833264.8	40	358.967	0
54	MGLEDM_P4_40K_XXXXX_WR	717805.1	833266.2	40	179.283	0
55	MGLEDM_P3_40K_XXXXX_WR	717805.2	833266.4	40	3.134	0
56	MGLEDM_P3_40K_XXXXX_WR	717698.3	833448.3	40	180.864	0
57	MGLEDM_P4_40K_XXXXX_WR	717699.0	833448.3	40	358.615	0
58	MGLEDM_P3_40K_XXXXX_WR	717818.8	833461.1	40	3.134	0
59	MGLEDM_P4_40K_XXXXX_WR	717818.6	833461.3	40	179.972	0
60	MGLEDM_P4_40K_XXXXX_WR	717836.9	833650.1	40	176.622	0
61	MGLEDM_P3_40K_XXXXX_WR	717836.9	833650.3	40	3.134	0
62	MGLEDM_P4_40K_XXXXX_WR	717699.6	833658.7	40	358.419	0
63	MGLEDM_P3_40K_XXXXX_WR	717854.7	833840.1	40	3.134	0
64	MGLEDM_P4_40K_XXXXX_WR	717854.7	833840.1	40	179.589	0
65	MGLEDM_P4_40K_XXXXX_WR	717715.3	833847.5	40	358.306	0
66	MGLEDM_P3_40K_XXXXX_WR	717861.0	834002.7	40	3.134	0
67	MGLEDM_P4_40K_XXXXX_WR	717861.0	834002.7	40	179.967	0
68	MGLEDM_P4_40K_XXXXX_WR	717721.2	834004.0	40	0.177	0
69	MGLEDM_P4_40K_XXXXX_WR	717864.2	834182.9	40	180.516	0
70	MGLEDM_P3_40K_XXXXX_WR	717864.2	834183.0	40	3.134	0
71	MGLEDM_P4_40K_XXXXX_WR	717724.4	834183.7	40	359.716	0
72	MGLEDM_P3_40K_XXXXX_WR	717869.0	834343.2	40	3.134	0
73	MGLEDM_P4_40K_XXXXX_WR	717869.3	834343.2	40	180.909	0
74	MGLEDM_P4_40K_XXXXX_WR	717723.8	834344.0	40	359.478	0
75	MGLEDM_P4_40K_XXXXX_WR	717727.6	834502.0	40	0.23	0
76	MGLEDM_P4_40K_XXXXX_WR	717869.8	834504.6	40	180.258	0
77	MGLEDM_P4_40K_XXXXX_WR	717713.6	834651.1	40	359.837	0
78	MGLEDM_P4_40K_XXXXX_WR	717869.3	834655.3	40	180.509	0
79	MGLEDM_P3_40K_XXXXX_WR	717869.1	834655.5	40	3.134	0
80	MGLEDM_P4_40K_XXXXX_WR	717709.3	834841.3	40	1.376	0
81	MGLEDM_P3_40K_XXXXX_WR	717853.4	834845.3	40	3.134	0
82	MGLEDM_P4_40K_XXXXX_WR	717853.1	834845.5	40	182.512	0
83	MGLEDM_P4_40K_XXXXX_WR	717706.3	835051.2	40	1.465	0
84	MGLEDM_P4_40K_XXXXX_WR	717862.3	835059.4	40	178.753	0
85	MGLEDM_P3_40K_XXXXX_WR	717861.9	835059.6	40	3.134	0
86	MGLEDM_P4_40K_XXXXX_WR	717706.0	835211.5	40	0.791	0
87	MGLEDM_P4_40K_XXXXX_WR	717858.6	835215.3	40	180.188	0
88	MGLEDM_P4_40K_XXXXX_WR	717855.7	835364.8	40	179.772	0
89	MGLEDM_P4_40K_XXXXX_WR	717702.3	835422.1	40	0.788	0
90	MGLEDM_P4_40K_XXXXX_WR	717851.9	835523.8	40	180.936	0
91	MGLEDM_P4_40K_XXXXX_WR	717696.8	835641.8	40	1.695	0
92	MGLEDM_P4_40K_XXXXX_WR	717851.2	835644.7	40	180.048	0
93	MGLEDM_P4_40K_XXXXX_WR	717695.2	835791.3	40	0.91	0
94	MGLEDM_P4_40K_XXXXX_WR	717832.3	835794.0	40	181.835	0
95	MGLEDM_P3_40K_XXXXX_WR	717831.9	835794.1	40	3.134	0
96	MGLEDM_P4_40K_XXXXX_WR	717692.0	835952.7	40	0.266	0
97	MGLEDM_P4_40K_XXXXX_WR	717831.2	835953.0	40	180.909	0
98	MGLEDM_P3_40K_XXXXX_WR	717831.2	835953.0	40	3.134	0
99	MGLEDM_P4_40K_XXXXX_WR	717687.1	836142.4	40	359.83	0
100	MGLEDM_P3_40K_XXXXX_WR	717824.4	836145.0	40	3.134	0

Luminaire Location Summary - Cont.

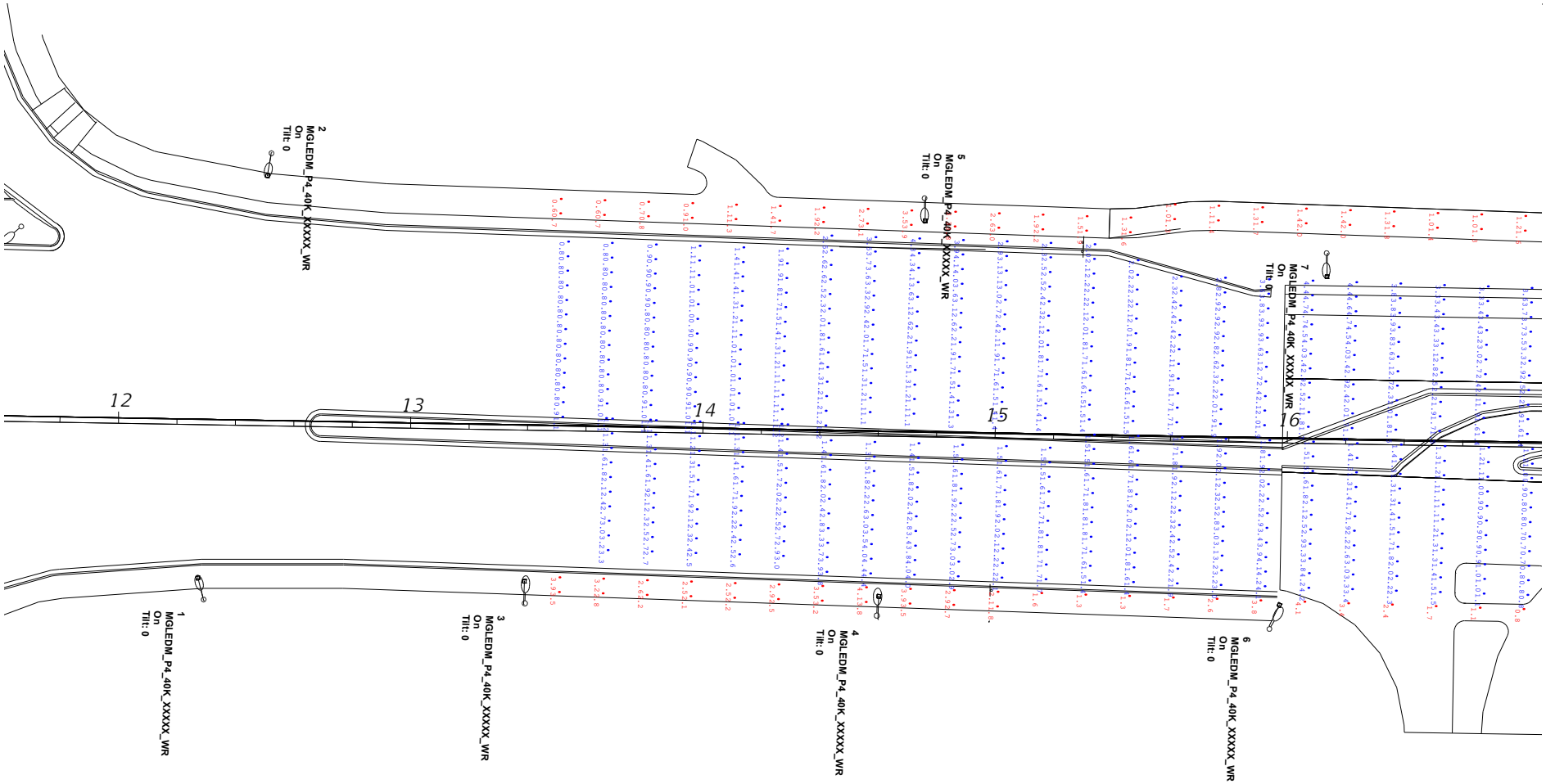
Coordinates In Feet

Luminaire Location Summary						
LumNo	**Label**	**X**	**Y**	**Z**	**Orient**	**Tilt**
101	MGLEDM_P4_40K_XXXXX_WR	717824.4	836145.0	40	179.355	0
102	MGLEDM_P4_40K_XXXXX_WR	717689.4	836305.2	40	2.332	0
103	MGLEDM_P4_40K_XXXXX_WR	717818.0	836367.9	40	180.041	0
104	MGLEDM_P3_40K_XXXXX_WR	717819.0	836368.1	40	3.134	0
105	MGLEDM_P4_40K_XXXXX_WR	717664.6	836490.4	40	0.908	0
106	MGLEDM_P4_40K_XXXXX_WR	717822.6	836578.6	40	180.243	0
107	MGLEDM_P4_40K_XXXXX_WR	717663.1	836651.2	40	359.783	0
108	MGLEDM_P4_40K_XXXXX_WR	717804.1	836783.8	40	181.596	0
109	MGLEDM_P3_40K_XXXXX_WR	717805.1	836783.9	40	3.134	0
110	MGLEDM_P4_40K_XXXXX_WR	717671.1	836830.7	40	3.221	0
111	MGLEDM_P4_40K_XXXXX_WR	717669.8	837000.7	40	2.018	0
112	MGLEDM_P4_40K_XXXXX_WR	717808.9	837004.3	40	180.908	0
113	MGLEDM_P3_40K_XXXXX_WR	717809.0	837004.4	40	3.134	0
114	MGLEDM_P4_40K_XXXXX_WR	717662.4	837160.8	40	1.572	0
115	MGLEDM_P4_40K_XXXXX_WR	717804.6	837163.9	40	180.472	0
116	MGLEDM_P3_40K_XXXXX_WR	717805.4	837163.9	40	3.134	0
117	MGLEDM_P3_40K_XXXXX_WR	717802.0	837333.8	40	3.134	0
118	MGLEDM_P4_40K_XXXXX_WR	717802.4	837333.8	40	180.909	0
119	MGLEDM_P4_40K_XXXXX_WR	717658.3	837381.0	40	358.992	0
120	MGLEDM_P4_40K_XXXXX_WR	717890.5	837391.4	40	71.41	0
121	MGLEDM_P4_40K_XXXXX_WR	717633.1	837489.5	40	66.75	0

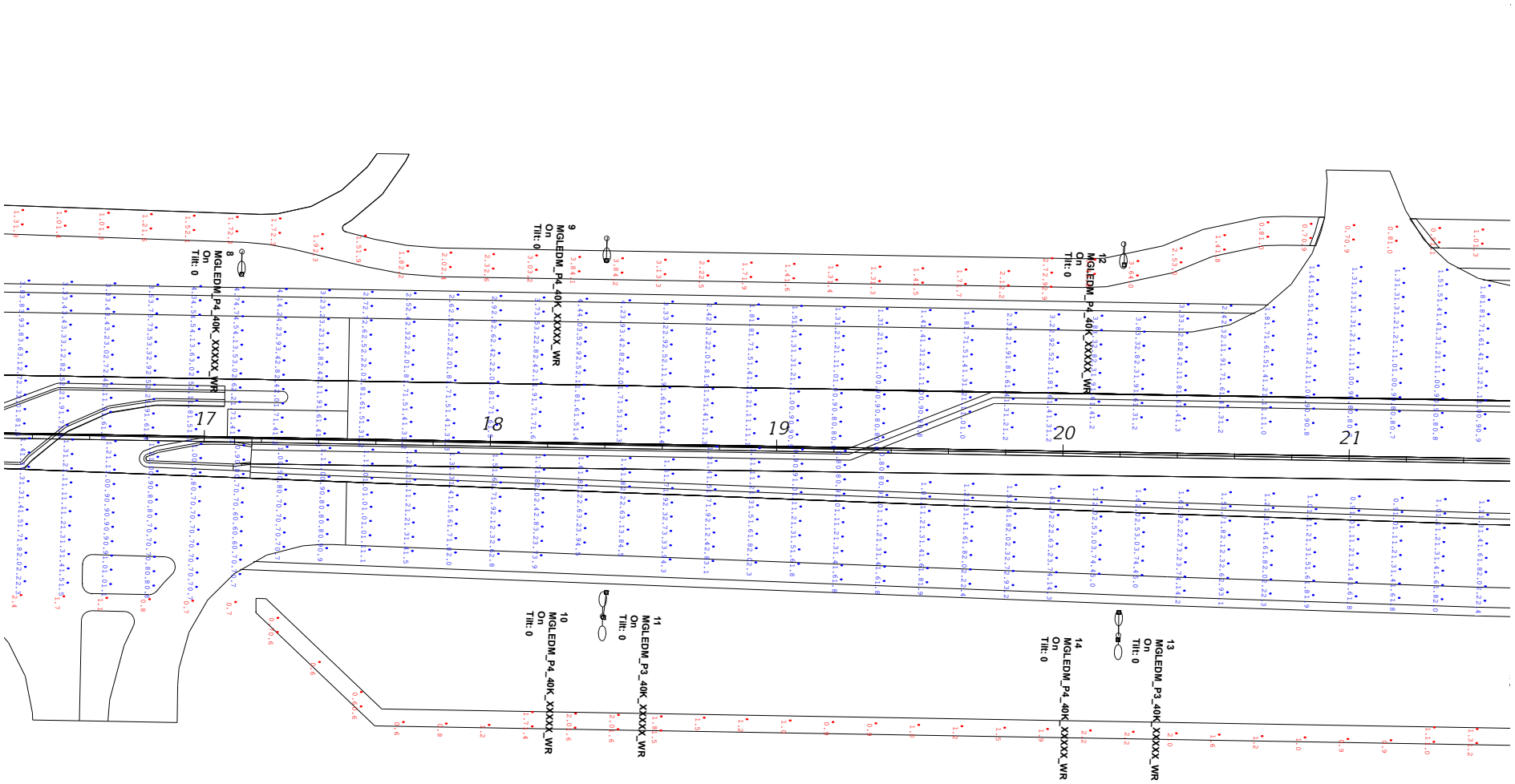
Calculation Summary

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
NB Seg 1_Sta_16 to Sta_ 41	Illuminance	Fc	1.71	5.0	0.6	2.85	8.33
NB Seg 2_Sta 55 to Sta 100	Illuminance	Fc	1.79	5.7	0.6	2.98	9.50
SB Seg 1_Sta 16 to Sta_41	Illuminance	Fc	1.86	5.1	0.6	3.10	8.50
SB Seg 2_ Sta 55 to Sta100	Illuminance	Fc	1.50	4.2	0.5	3.00	8.40
Trail NB Seg 1_Sta16 to Sta_41	Illuminance	Fc	1.51	4.1	0.5	3.02	8.20
Trail NB Seg 2_Sta 55 to Sta100	Illuminance	Fc	1.51	4.5	0.5	3.02	9.00
Trail SB Seg 1_Sta16 to Sta41	Illuminance	Fc	1.99	5.6	0.6	3.32	9.33
Trail SB Seg 2_Sta 55 to Sta100	Illuminance	Fc	1.92	4.2	0.5	3.84	8.40

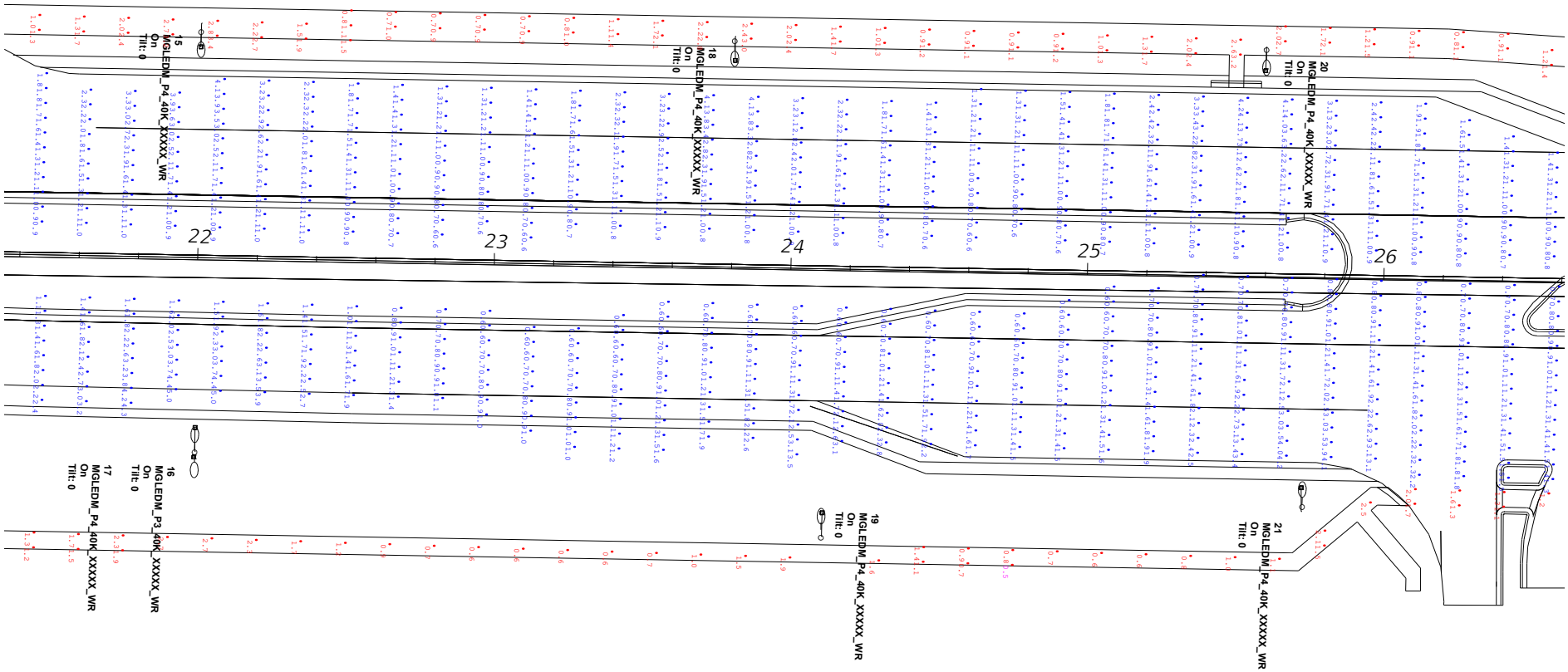
Viewpoint


12
13
14
15
16
1
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0
2
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0
3
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0
4
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0
5
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0
6
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0
7
MGLEDM_P4_40K_XXXXX_WR
On
Tilt: 0

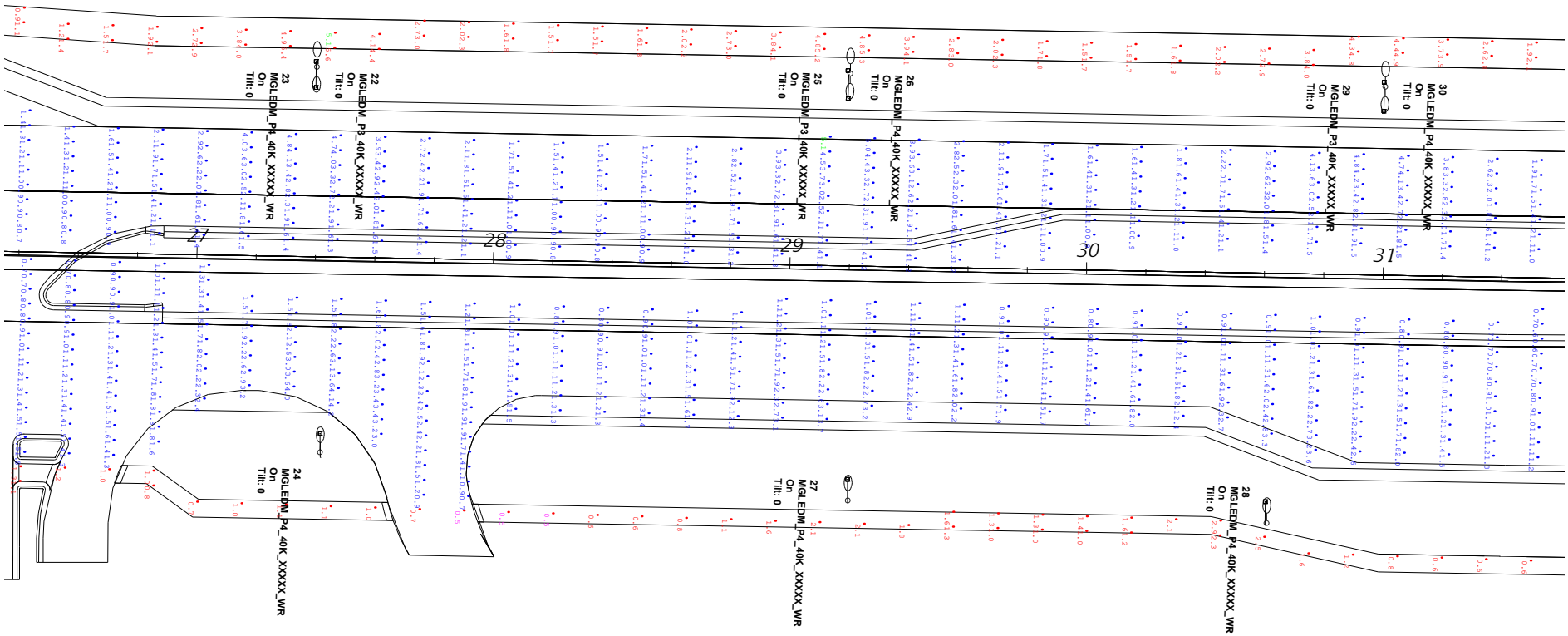
Viewpoint - Cont.



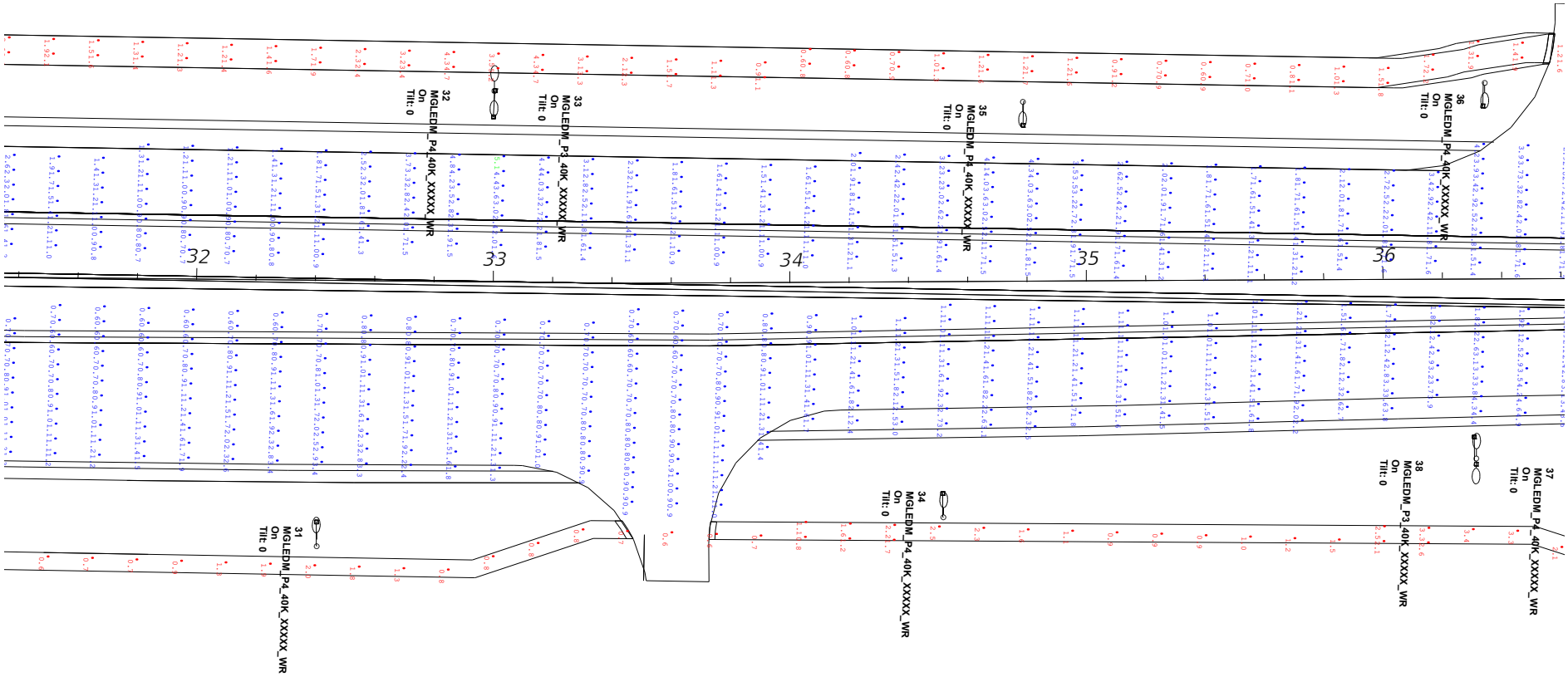
Viewpoint - Cont.



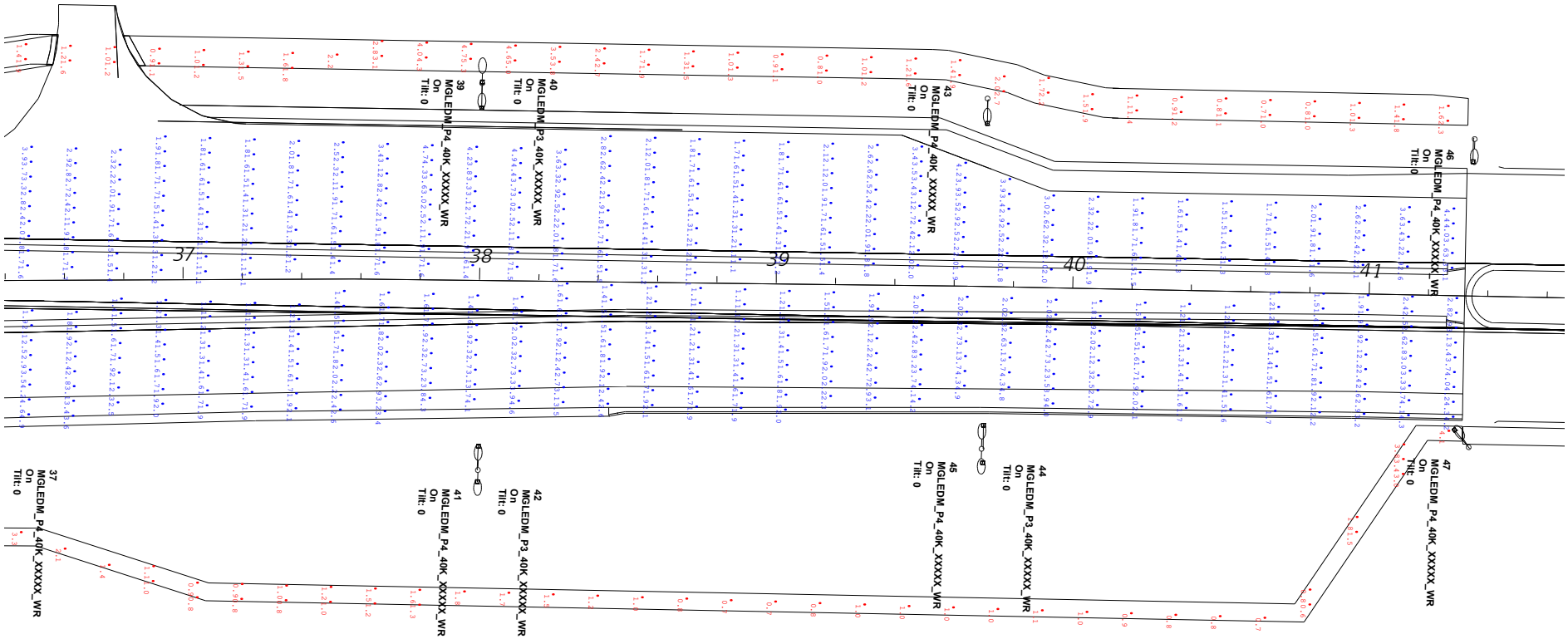
Viewpoint - Cont.



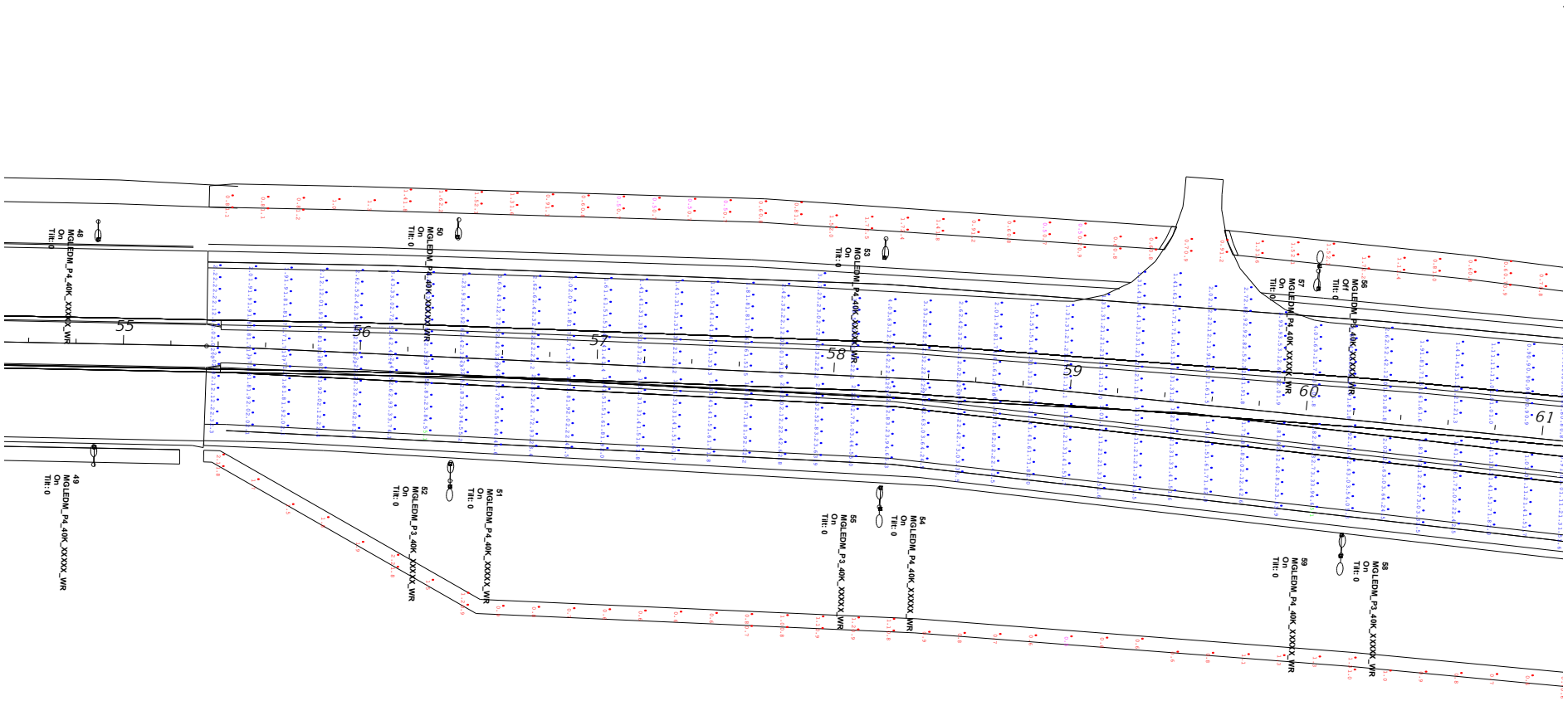
Viewpoint - Cont.



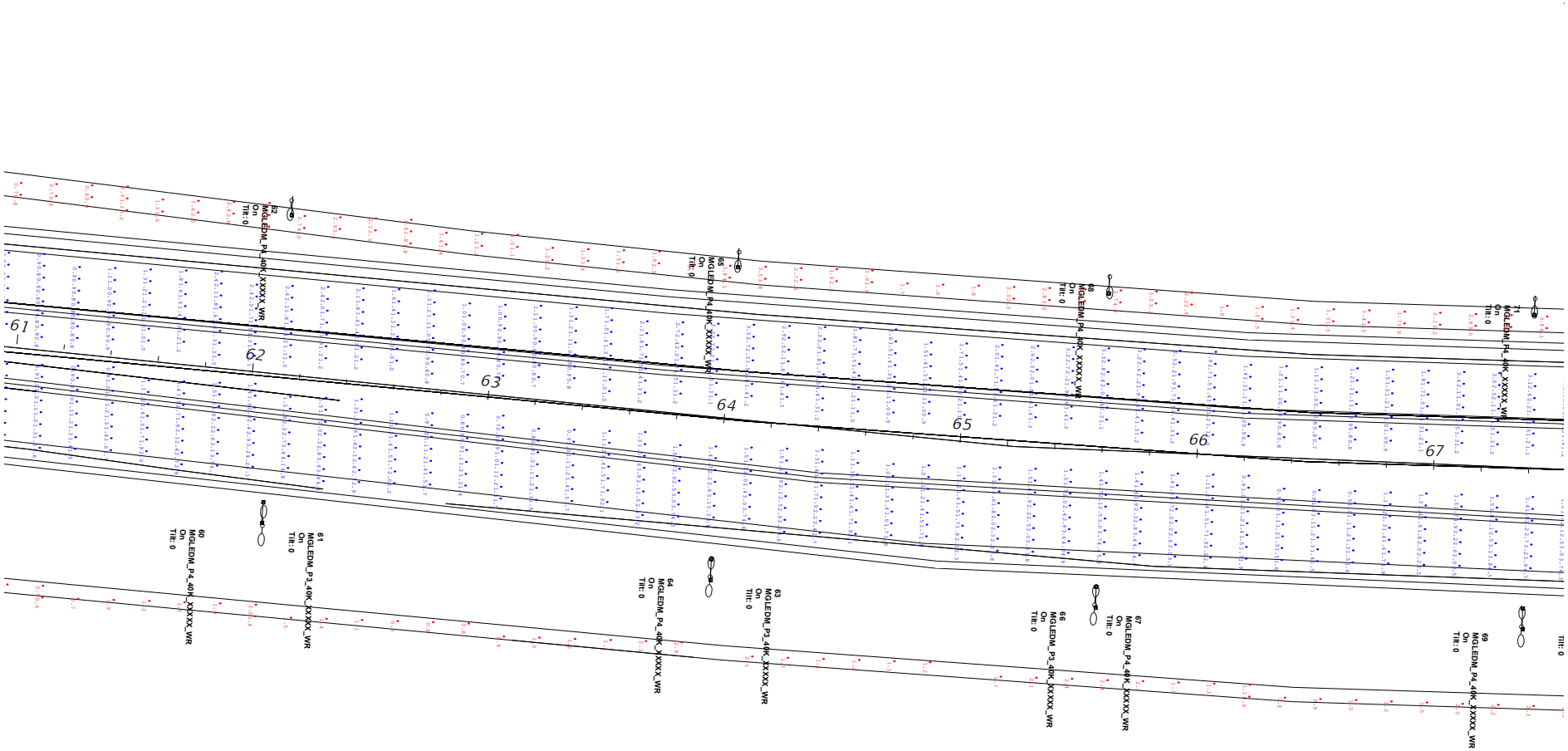
Viewpoint - Cont.



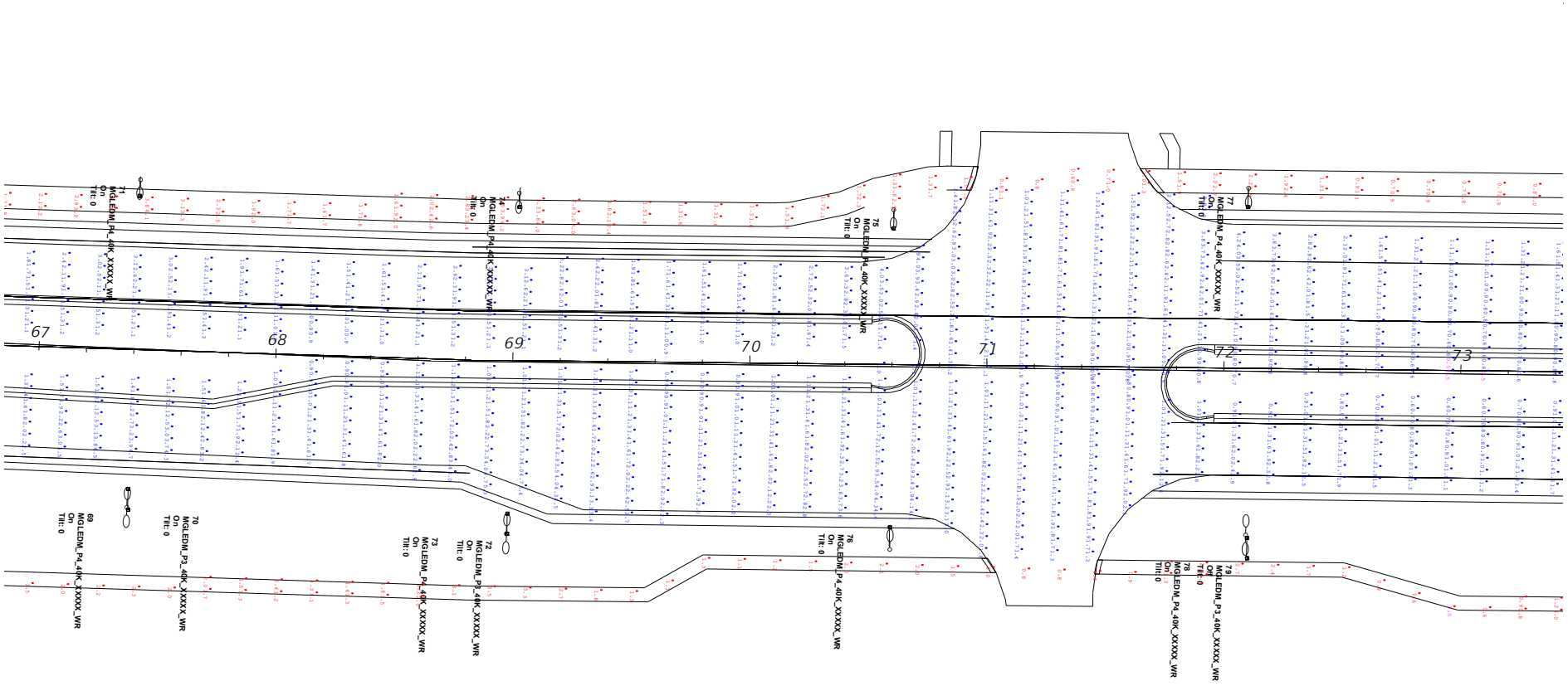
Viewpoint - Cont.



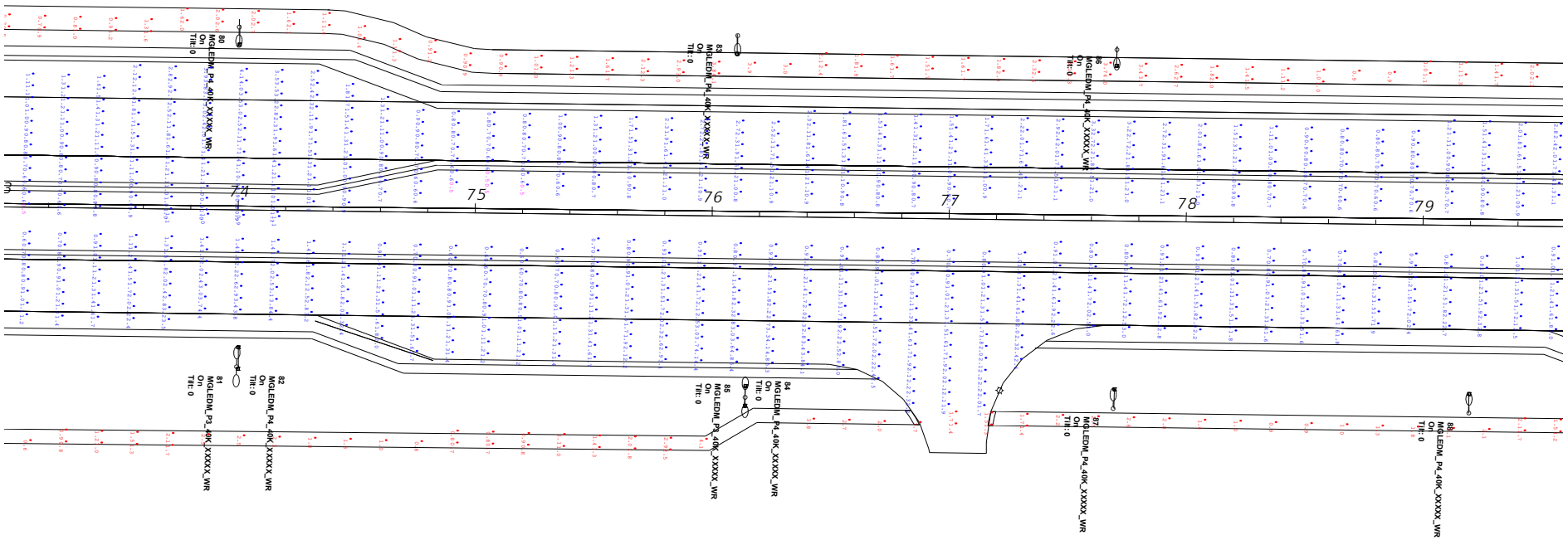
Viewpoint - Cont.



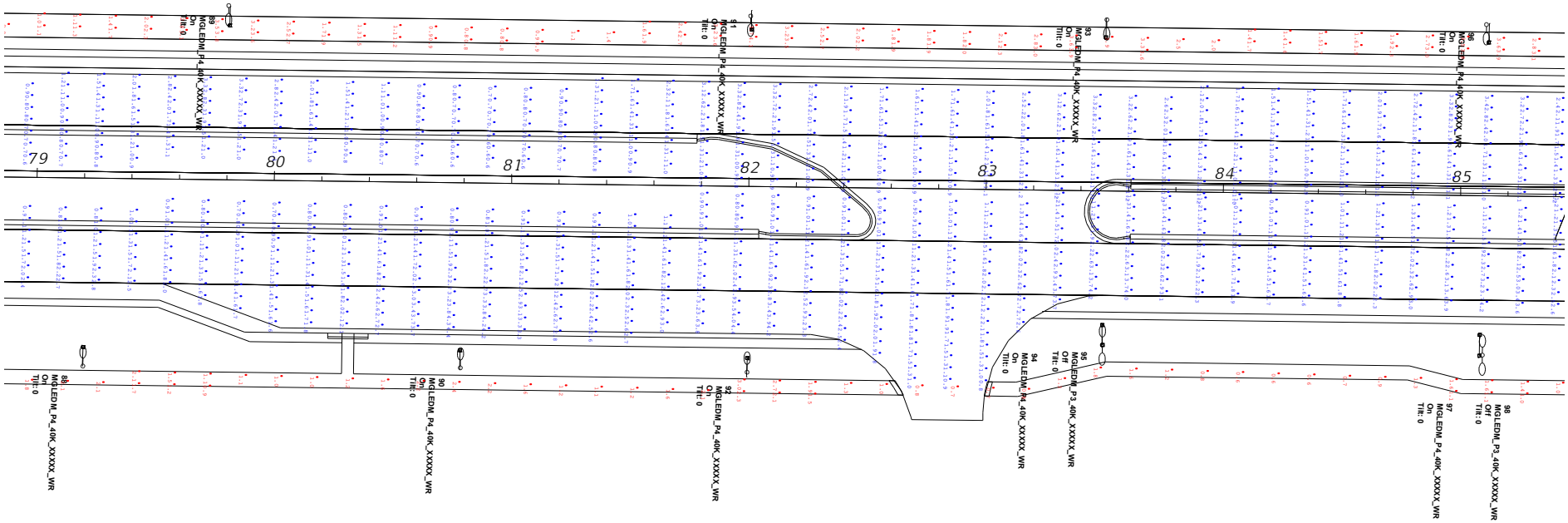
Viewpoint - Cont.



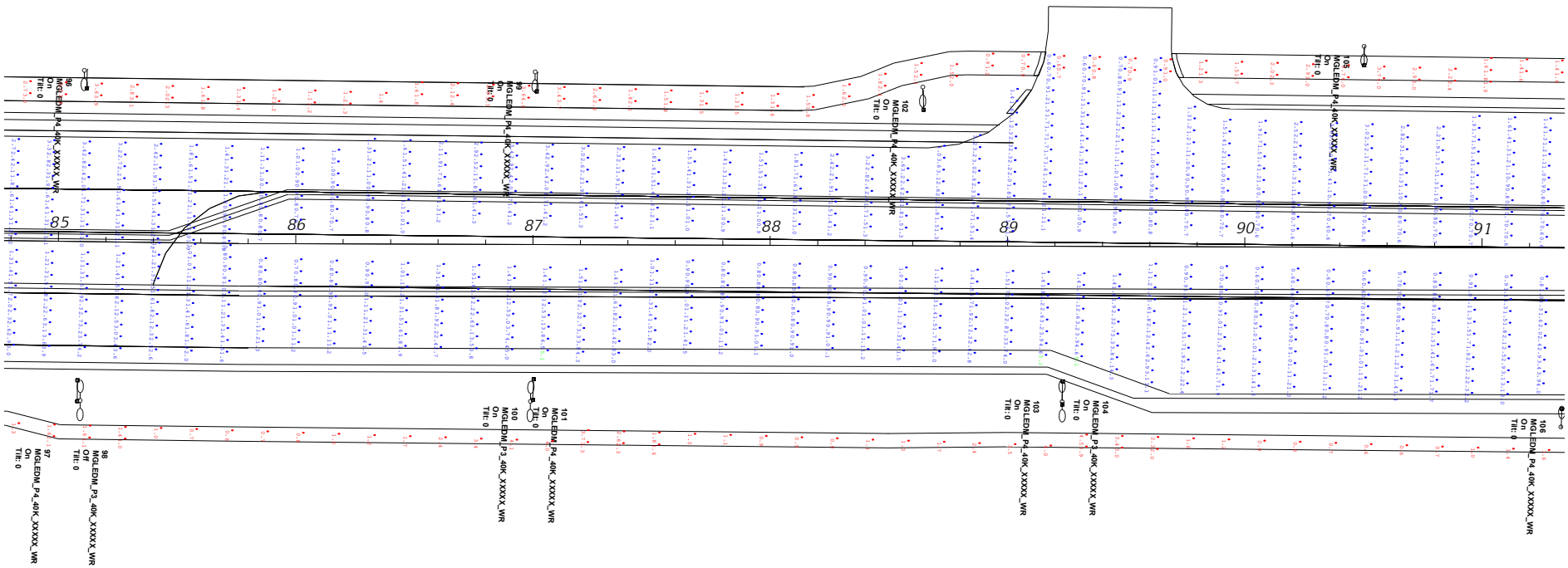
Viewpoint - Cont.



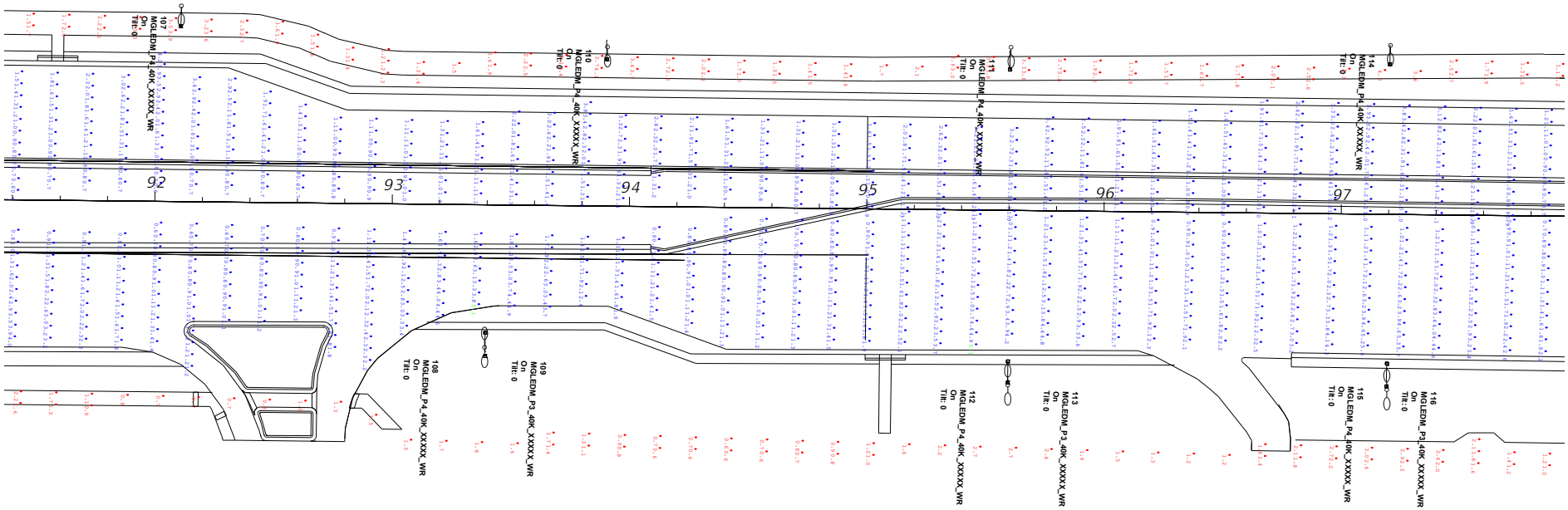
Viewpoint - Cont.



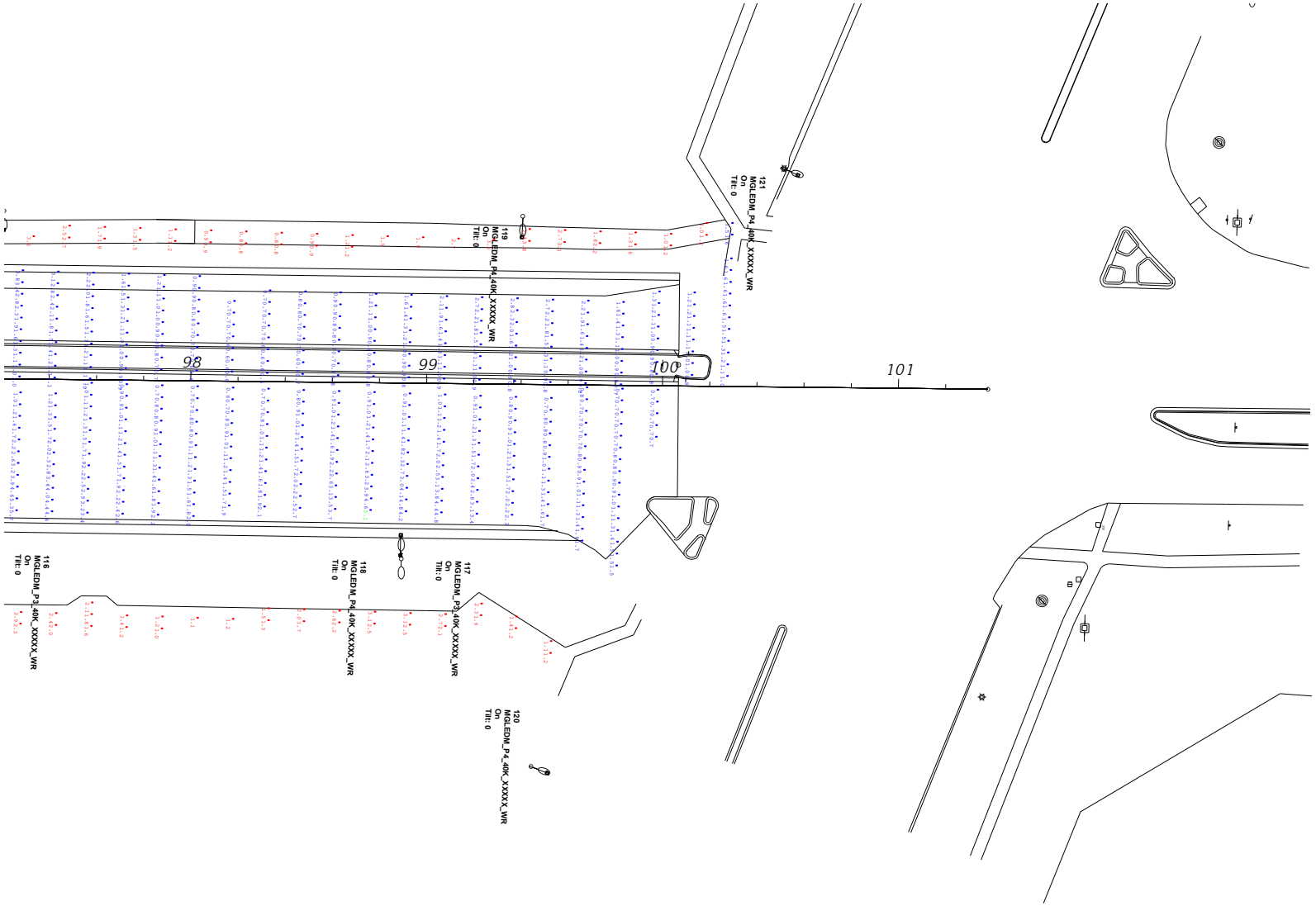
Viewpoint - Cont.



Viewpoint - Cont.



Viewpoint - Cont.



APPENDIX C

Voltage Drop Calculations

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.		**W.P.I. NO:**	
ROAD:	Ortiz Ave	**COUNTY:**	Lee
PROJECT DESCRIPTON:		**PREPARED BY:**	Josh Robinson, PE
COMMENT:	Analysis for Circuit A-1	**CHECKED BY:**	Fathy Abdalla, PE
SERVICE VOLTAGE:	480 Phase-to-Phase	**DATE:**	03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.A to Pole 11	130	6	3	75	180/155	2	0.000510	0.873	0.0663	4.63	0.31	0.31
Pole 11 to Pole 9	370	6	3	75	180	1	0.000510	0.469	0.1887	3.75	0.71	1.01
Pole 9 to Pole7	370	6	3	75	180	1	0.000510	0.469	0.1887	3.28	0.62	1.63
Pole 7 to Pole 6	370	6	3	75	180	1	0.000510	0.469	0.1887	2.81	0.53	2.17
Pole 6 to Pole 4	370	6	3	75	180	1	0.000510	0.469	0.1887	2.35	0.44	2.61
Pole 4 to Pole 2A	370	6	3	75	180	1	0.000510	0.469	0.1887	1.88	0.35	2.96
Pole 2A to Pole 2A1	265	6	3	75	180	1	0.000510	0.469	0.1352	1.41	0.19	3.15
Pole 2A1 to Pole 1A	210	6	3	75	180	1	0.000510	0.469	0.1071	0.94	0.10	3.25
Pole 1A to Pole 1A1	410	6	3	75	180	1	0.000510	0.469	0.2091	0.47	0.10	3.35

MAXIMUM VOLTAGE DROP:	**3.35**
PERCENT VOLTAGE DROP:	**0.70%**
CONDUCTOR SIZE:	**O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.		**W.P.I. NO:**	
ROAD:	Ortiz Ave	**COUNTY:**	Lee
PROJECT DESCRIPTON:		**PREPARED BY:**	Josh Robinson, PE
COMMENT:	Analysis for Circuit A-2	**CHECKED BY:**	Fathy Abdalla, PE
SERVICE VOLTAGE:	480 Phase-to-Phase	**DATE:**	03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.A to Pole 12	450	6	3	75	180	1	0.000510	0.469	0.2295	5.43	1.25	1.25
Pole 12 to Pole 10	350	6	3	75	180	1	0.000510	0.469	0.1785	4.96	0.89	2.13
Pole 10 to Pole 8	400	6	3	75	180/155	2	0.000510	0.873	0.2040	4.50	0.92	3.05
Pole 8 to Pole 5	370	6	3	75	180/155	2	0.000510	0.873	0.1887	3.62	0.68	3.73
Pole 5 to Pole 3	370	6	3	75	180/155	2	0.000510	0.873	0.1887	2.75	0.52	4.25
Pole 3 to Pole 2B	370	6	3	75	180	2	0.000510	0.469	0.1887	1.88	0.35	4.61
Pole 2B to Pole 1B	510	6	3	75	180	1	0.000510	0.469	0.2601	1.41	0.37	4.97
Pole 1B to Pole 1B1	280	6	3	75	180	1	0.000510	0.469	0.1428	0.94	0.13	5.11
Pole 1B to Pole 1B2	250	6	3	75	180	1	0.000510	0.469	0.1275	0.47	0.06	5.17

MAXIMUM VOLTAGE DROP:	**5.17**
PERCENT VOLTAGE DROP:	**1.08%**
CONDUCTOR SIZE:	**O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.		**W.P.I. NO:**	
ROAD:	Ortiz Ave	**COUNTY:**	Lee
PROJECT DESCRIPTON:		**PREPARED BY:**	Josh Robinson, PE
COMMENT:	Analysis for Circuit A-3	**CHECKED BY:**	Fathy Abdalla, PE
SERVICE VOLTAGE:	480 Phase-to-Phase	**DATE:**	03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.A to Pole 14	260	6	3	75	180/155	2	0.000510	0.873	0.1326	4.90	0.65	0.65
Pole 14 to Pole 16	370	6	3	75	180/155	2	0.000510	0.873	0.1887	4.03	0.76	1.41
Pole 16 to Pole 18	410	6	3	75	180/155	2	0.000510	0.873	0.2091	3.15	0.66	2.07
Pole 18 to Pole 20	370	6	3	75	180	1	0.000510	0.469	0.1887	2.28	0.43	2.50
Pole 20 to Pole 22	320	6	3	75	180	1	0.000510	0.469	0.1632	1.81	0.30	2.79
Pole 22 to Pole 24	340	6	3	75	180/155	2	0.000510	0.873	0.1734	1.34	0.23	3.03
Pole 24 to Pole 26	350	6	3	75	180	1	0.000510	0.469	0.1785	0.47	0.08	3.11

MAXIMUM VOLTAGE DROP:	**3.11**
PERCENT VOLTAGE DROP:	**0.65%**
CONDUCTOR SIZE:	**O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.
ROAD: Ortiz Ave
PROJECT DESCRIPTON:
COMMENT: Analysis for Circuit A-4
SERVICE VOLTAGE: 480 Phase-to-Phase

W.P.I. NO:
COUNTY: Lee
PREPARED BY: Josh Robinson, PE
CHECKED BY: Fathy Abdalla, PE
DATE: 03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.A to Pole 13	500	6	3	75	180/155	2	0.000510	0.873	0.2550	5.30	1.35	1.35
Pole 13 to Pole 15	330	6	3	75	180	1	0.000510	0.469	0.1683	4.43	0.75	2.10
Pole 15 to Pole 17	350	6	3	75	180/155	2	0.000510	0.873	0.1785	3.96	0.71	2.80
Pole 17 to Pole 19	510	6	3	75	180	1	0.000510	0.469	0.2601	3.09	0.80	3.61
Pole 19 to Pole 21	330	6	3	75	180/155	2	0.000510	0.873	0.1683	2.62	0.44	4.05
Pole 21 to Pole 23	330	6	3	75	180/155	2	0.000510	0.873	0.1683	1.75	0.29	4.34
Pole 23 to Pole 25	350	6	3	75	180/155	1	0.000510	0.873	0.1785	0.87	0.16	4.50

MAXIMUM VOLTAGE DROP: **4.50**
PERCENT VOLTAGE DROP: **0.94%**
CONDUCTOR SIZE: **O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.
ROAD: Ortiz Ave
PROJECT DESCRIPTON:
COMMENT: Analysis for Circuit B-1
SERVICE VOLTAGE: 480 Phase-to-Phase

W.P.I. NO:
COUNTY: Lee
PREPARED BY: Josh Robinson, PE
CHECKED BY: Fathy Abdalla, PE
DATE: 03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.B to Pole 50	350	6	3	75	180	1	0.000510	0.469	0.1785	6.50	1.16	1.16
Pole 50 to Pole 48	330	6	3	75	180	1	0.000510	0.469	0.1683	6.03	1.02	2.18
Pole 48 to Pole 46	430	6	3	75	180	1	0.000510	0.469	0.2193	5.56	1.22	3.40
Pole 46 to Pole 44	390	6	3	75	180	1	0.000510	0.469	0.1989	5.09	1.01	4.41
Pole 44 to Pole 43	310	6	3	75	180	1	0.000510	0.469	0.1581	4.63	0.73	5.14
Pole 43 to Pole 41	330	6	3	75	180	1	0.000510	0.469	0.1683	4.16	0.70	5.84
Pole 41 to Pole 39	330	6	3	75	180	1	0.000510	0.469	0.1683	3.69	0.62	6.46
Pole 39 to Pole 36	330	6	3	75	180	1	0.000510	0.469	0.1683	3.22	0.54	7.00
Pole 36 to Pole 35	390	6	3	75	180	1	0.000510	0.469	0.1989	2.75	0.55	7.55
Pole 35 to Pole 32	390	6	3	75	180	1	0.000510	0.469	0.1989	2.28	0.45	8.00
Pole 32 to Pole 31	430	6	3	75	180/155	2	0.000510	0.873	0.2193	1.81	0.40	8.40
Pole 31 to Pole 29	370	6	3	75	180	1	0.000510	0.469	0.1887	0.94	0.18	8.58
Pole 29 to Pole 27	370	6	3	75	180	1	0.000510	0.469	0.1887	0.47	0.09	8.66

MAXIMUM VOLTAGE DROP: **8.66**
PERCENT VOLTAGE DROP: **1.81%**
CONDUCTOR SIZE: **O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.
ROAD: Ortiz Ave
PROJECT DESCRIPTON:
COMMENT: Analysis for Circuit B-2
SERVICE VOLTAGE: 480 Phase-to-Phase

W.P.I. NO:
COUNTY: Lee
PREPARED BY: Josh Robinson, PE
CHECKED BY: Fathy Abdalla, PE
DATE: 03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.B to Pole 52	370	6	3	75	180	1	0.000510	0.469	0.1887	11.01	2.08	2.08
Pole 52 to Pole 51	310	6	3	75	180	1	0.000510	0.469	0.1581	10.54	1.67	3.74
Pole 51 to Pole 49	350	6	3	75	180/155	2	0.000510	0.873	0.1785	10.07	1.80	5.54
Pole 49 to Pole 47	420	6	3	75	180/155	2	0.000510	0.873	0.2142	9.20	1.97	7.51
Pole 47 to Pole 45	390	6	3	75	180/155	2	0.000510	0.873	0.1989	8.33	1.66	9.17
Pole 45 to Pole 42	310	6	3	75	180	1	0.000510	0.469	0.1581	7.45	1.18	10.35
Pole 42 to Pole 40	330	6	3	75	180/155	2	0.000510	0.873	0.1683	6.98	1.18	11.52
Pole 40 to Pole 38	330	6	3	75	180/155	2	0.000510	0.873	0.1683	6.11	1.03	12.55
Pole 38 to Pole 37	370	6	3	75	180/155	2	0.000510	0.873	0.1887	5.24	0.99	13.54
Pole 37 to Pole 34	330	6	3	75	180/155	2	0.000510	0.873	0.1683	4.37	0.73	14.27
Pole 34 to Pole 33	390	6	3	75	180/155	2	0.000510	0.873	0.1989	3.49	0.69	14.97
Pole 33 to Pole 30	390	6	3	75	180/155	2	0.000510	0.873	0.1989	2.62	0.52	15.49
Pole 30 to Pole 29A	410	6	3	75	180/155	2	0.000510	0.873	0.2091	1.75	0.37	15.85
Pole 29A to Pole 28	380	6	3	75	180/155	2	0.000510	0.873	0.1938	0.87	0.17	16.02

MAXIMUM VOLTAGE DROP:	**16.02**
PERCENT VOLTAGE DROP:	**3.34%**
CONDUCTOR SIZE:	**O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.
ROAD: Ortiz Ave
PROJECT DESCRIPTON:
COMMENT: Analysis for Circuit B-3
SERVICE VOLTAGE: 480 Phase-to-Phase

W.P.I. NO:
COUNTY: Lee
PREPARED BY: Josh Robinson, PE
CHECKED BY: Fathy Abdalla, PE
DATE: 03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.B to Pole 53	100	6	3	75	180	1	0.000510	0.469	0.0510	6.03	0.31	0.31
Pole 53 to Pole 55	470	6	3	75	180	1	0.000510	0.469	0.2397	5.56	1.33	1.64
Pole 55 to Pole 57	290	6	3	75	180	1	0.000510	0.469	0.1479	5.09	0.75	2.39
Pole 57 to Pole 59	330	6	3	75	180	1	0.000510	0.469	0.1683	4.63	0.78	3.17
Pole 59 to Pole 62	390	6	3	75	180	1	0.000510	0.469	0.1989	4.16	0.83	4.00
Pole 62 to Pole 63	340	6	3	75	180	1	0.000510	0.469	0.1734	3.69	0.64	4.64
Pole 63 to Pole 65	380	6	3	75	180	1	0.000510	0.469	0.1938	3.22	0.62	5.26
Pole 65 to Pole 67	330	6	3	75	180	1	0.000510	0.469	0.1683	2.75	0.46	5.73
Pole 67 to Pole 69	370	6	3	75	180	1	0.000510	0.469	0.1887	2.28	0.43	6.16
Pole 69 to Pole 71	350	6	3	75	180	1	0.000510	0.469	0.1785	1.81	0.32	6.48
Pole 71 to Pole 73	390	6	3	75	180	1	0.000510	0.469	0.1989	1.34	0.27	6.75
Pole 73 to Pole 75	450	6	3	75	180	1	0.000510	0.873	0.2295	0.87	0.20	6.95

MAXIMUM VOLTAGE DROP: **6.95**
PERCENT VOLTAGE DROP: **1.45%**
CONDUCTOR SIZE: **O.K.**

ROADWAY LIGHTING VOLTAGE DROP CALCULATIONS

Project No.
ROAD: Ortiz Ave
PROJECT DESCRIPTON:
COMMENT: Analysis for Circuit B-4
SERVICE VOLTAGE: 480 Phase-to-Phase

W.P.I. NO:
COUNTY: Lee
PREPARED BY: Josh Robinson, PE
CHECKED BY: Fathy Abdalla, PE
DATE: 03/25/2021

60 CYCLE AC RESISTANCE ONE WIRE (CU)

WIRE SIZE (#AWG)	25 DEG C (OHMS/FT)	40 DEG C (OHMS/FT)	75 DEG C (OHMS/FT)
10	0.00101800	0.00107700	0.00012900
8	0.00065400	0.00069200	0.00080900
6	0.00041000	0.00043350	0.00051000
4	0.00025900	0.00027400	0.00032100
2	0.00016200	0.00017150	0.00020100
0	0.00010210	0.00010811	0.00012700

INPUT DATA / CALCULATED RESULTS

FIXTURE TO FIXTURE	WIRE LENGTH X 2 (FEET) *(L)*	WIRE SIZE *(AWG)*	NUMBER OF WIRES *CONDUCTORS*	TEMPERATURE FOR RESISTANCE *DEGREE "C"*	FIXTURE SIZE *(Watts)*	NUMBER OF FIXTURES	CONDUCTOR RESISTANCE *(r)*	FIXTURE AMPERAGE *(i)*	SEGMENT RESISTANCE *(R=L*r)*	TOTAL AMPERAGE *(I)*	SEGMENT VOLTAGE DROP *(V=I*R)*	ACCUMULATED VOLTAGE DROP *(V1+V2+...)*
Service Pt.B to Pole 54	610	6	3	75	180	1	0.000510	0.469	0.3111	5.97	1.86	1.86
Pole 54 to Pole 56	250	6	3	75	180	1	0.000510	0.469	0.1275	5.50	0.70	2.56
Pole 56 to Pole 58	260	6	3	75	180	2	0.000510	0.469	0.1326	5.03	0.67	3.22
Pole 58 to Pole 60	330	6	3	75	180	2	0.000510	0.469	0.1683	4.56	0.77	3.99
Pole 60 to Pole 61	380	6	3	75	180	2	0.000510	0.469	0.1938	4.09	0.79	4.78
Pole 61 to Pole 64	330	6	3	75	180	2	0.000510	0.469	0.1683	3.62	0.61	5.39
Pole 64 to Pole 66	370	6	3	75	180	1	0.000510	0.469	0.1887	3.15	0.59	5.99
Pole 66 to Pole 68	350	6	3	75	180	2	0.000510	0.469	0.1785	2.68	0.48	6.47
Pole 68 to Pole 70	390	6	3	75	180	2	0.000510	0.469	0.1989	2.22	0.44	6.91
Pole 70 to Pole 72	450	6	3	75	180	2	0.000510	0.873	0.2295	1.75	0.40	7.31
Pole 72 to Pole 74	350	6	3	75	180	2	0.000510	0.873	0.1785	0.87	0.16	7.47

MAXIMUM VOLTAGE DROP: **7.47**
PERCENT VOLTAGE DROP: **1.56%**
CONDUCTOR SIZE: **O.K.**

APPENDIX D

Manufacturer’s Luminaire Specifications

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS

Catalog Number	
Notes	Type

MGLEDM

Mongoose Medium LED

The Mongoose Medium LED offset roadway and area lighting product provides significant energy and maintenance savings vs. HID luminaires. It offers the ultimate in application flexibility with a uniquely designed advanced optical system and attractive appearance. This combined with multiple lighting distributions, mounting options and the ability to tilt the fixture offers unequalled performance in a diverse set of applications ranging from interstates and parking lots.

Mechanical

- Rugged grade A360 diecast aluminum (<1% copper)
- Tool-less access with stainless steel latches
- Terminal block in arm
- Rigorous 5-stage pretreatment polyester topcoat to ensure maximum durability that achieves a scribe creepage rating of 8 after 5,000 hours of salt spray
- Removable "power tray" facilitates maintenance
- Corrosion resistant stainless-steel latches ensure secure closure over the long fixture life
- Horizontal mast arms or vertical tenon (VH) and universal mounting to round and square poles (UN) options
- Universal mount mates to all major manufacturer's hole patterns
- All Mountings are 3G vibration rated per ANSI C136.31
- Adjustable fixture tilt from 0-45 degrees provides flexibility to optimize lighting performance

Electrical

- Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2
- LED light engines are rated > 100,000 at 25°C, L70
- Electronic driver has an expected life of > 100,000 hours at 25°C
- Rated for -40°C / (-40°F) minimum ambient
- Programmable electronic driver with 0-10V control leads
- Driver voltage options: 120-277V 50/60 Hz and 347 50/60 Hz and 480V 50/60 Hz

Optical

- Performance is comparable to 150-400 watt HPS or 175-1,000 watt MH
- IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation
- IP66 rated optics
- Molded Silicone optics: Area (Type 5) (AR), Forward Throw (FT), Medium Roadway (MR), Narrow Roadway (NR) and Wide Roadway (WR)
- Borosilicate glass refractor optics: Area (AG), Forward Throw (FG), Medium Roadway (MG), Narrow Roadway (NG) and Wide Roadway (WG)
- 3000K, 4000K and 5000K CCT, 70 CRI
- Optional Uplight Skirt (US) when used with refractor ensures zero uplight above 90°
- House side shield (HSS), light trespass shield and option available
- Wire guard kit option available

Controls

- 7 pin NEMA photocontrol receptacle
- Premium solid-state locking-style photocontrol (PCSS) – 10 year rated life
- Extreme long life solid state locking-style photocontrol (PCLL) – 20 year rated life
- Field adjustable output
- nLight Air motion and daylight sensor
- Programmable motion and daylight sensor

Certification & Standards

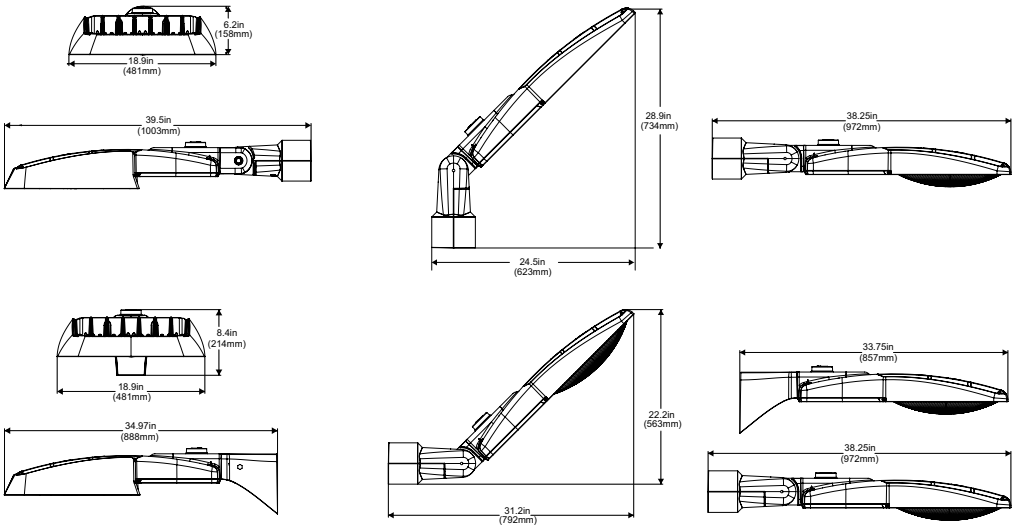
- CSA Certified to US and Canadian standards
- Suitable for operation in an ambient temperature up to 40°C / 104°F for standard product
- Designlights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Warranty

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/support/customer-support/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25°C

DIMENSIONAL DATA



Mounting/Optic	Tilt	Weight	EPA
VH	0°	35 lbs.	1.64 sq. ft.
VH with Refractor & US		44 lbs.	
VH	45°	35 lbs.	2.85 sq. ft.
VH with Refractor & US		44 lbs.	
UN	0°	31 lbs.	1.64 sq. ft.
UN with Refractor & US		38 lbs.	

ORDERING INFORMATION

Example: MGLEDM P2 40K MVOLT FT UN GRSD

Series	LED performance package	Color temperature	Voltage	Optics
MGLEDM Mongoose Medium	P1 15,400 Lumens P2 19,000 Lumens P3 22,400 Lumens P4 25,800 Lumens P5 28,900 Lumens P6 31,900 Lumens P7 35,100 Lumens P8 38,000 Lumens	30K 3,000 K CCT 40K 4,000 K CCT 50K 5,000 K CCT	MVOLT Auto-sensing voltage (120 thru 277) 347 347 Volt 480 480 Volt	AG Area with Refractor AR Area FG Forward Throw with Refractor FT Forward Throw MG Medium Roadway with Refractor MR Medium Roadway NG Narrow Roadway with Refractor NR Narrow Roadway WG Wide Roadway with Refractor WR Wide Roadway

Mounting	Super Durable Paint	Options	
VH Vertical Tenon/ Horizontal Arm UN Universal (Rd. & Sq)	GRSD Vitracoat Gray GHSD Vitracoat Graphite BKSD Vitracoat Black GNSD Vitracoat Green WHSD Vitracoat White BZSD Vitracoat Bronze	Adjustable/Programmable Options AO Field Adjustable Output Control Options PCLL DTL Extreme Long Life Twistlock Photocontrol for Solid State (20 year rated life) PCSS DSS Premium Twistlock Photocontrol for Solid State (10 year rated life) POC2[1] Programmable occ. and daylight sensor, for mounting applications up to 20' POC4[1] Programmable occ. and daylight sensor, for mounting applications between 20' & 40' RSDGR nLight Air Occ. and daylight sensor	NEMA Label Options NL NEMA LABEL NEMA Receptacle Options PR7 7-pin Photocontrol Receptacle Shielding Options US Uplight Skirt HSS House Side Shield Shorting Cap Option SH SHORTING CAP

Accessories: *Order as separate catalog number.*

Wire Guard Kit	
MGLEDM WG	Mongoose Medium Wire Guard Kit
Light Trespass Shield	
MGLEDM LTS	Mongoose Medium Light Trespass Shield
Uplight Skirt	
MGLEDM US GRSD	Mongoose Medium Uplight Skirt, Vitracoat Gray
MGLEDM US GHSD	Mongoose Medium Uplight Skirt, Vitracoat Graphite
MGLEDM US BKSD	Mongoose Medium Uplight Skirt, Vitracoat Black
MGLEDM US GNSD	Mongoose Medium Uplight Skirt, Vitracoat Green
MGLEDM US WHSD	Mongoose Medium Uplight Skirt, Vitracoat White
MGLEDM US BZSD	Mongoose Medium Uplight Skirt, Vitracoat Bronze
House Side Shield	
MGLEDM HSS	Mongoose Medium House Side Shield

Notes
1 For custom programming of the sensor, a wireless handheld configuration tool, Part No. FSIR-100 should be purchased, either from Legrand, or from Acuity (by special request).

MOUNTING OPTIONS

Vertical Tenon/Horizontal Arm Mount – VH
Attaches to 2" vertical tenon or horizontal mast arm (2 3/8" O.D.)

Universal Mount – UN
Attaches to square or 3" minimum round pole

OPTIONS MATRIX

Mounting		SELECTED OPTION (start here)							
		A0	PR7	PCLL	PCSS	POC2	POC4	RSDGR	SH
Controls	A0		Y	Y	Y	N	N	N	Y
	PR7	Y		Y	Y	N	N	N	Y
	PCLL	Y	Y		N	N	N	N	N
	PCSS	Y	Y	N		N	N	N	N
	POC2	N	N	N	N		N	N	N
	POC4	N	N	N	N	N		N	N
	RSDGR	N	N	N	N	N	N		N
	SH	Y	Y	N	N	N	N	N	
Voltage	MVOLT	Y	Y	Y	Y	Y	Y	Y	Y
	347	Y	Y	Y	N	Y	Y	Y	Y
	480	Y	Y	Y	N	Y	Y	Y	Y
Performance Packages	P1	Y	Y	Y	Y	Y	Y	Y	Y
	P2	Y	Y	Y	Y	Y	Y	Y	Y
	P3	Y	Y	Y	Y	Y	Y	Y	Y
	P4	Y	Y	Y	Y	Y	Y	Y	Y
	P5	Y	Y	Y	Y	Y	Y	Y	Y
	P6	Y	Y	Y	Y	Y	Y	Y	Y
	P7	Y	Y	Y	Y	Y	Y	Y	Y
	P8	Y	Y	Y	Y	Y	Y	Y	Y

Y = Valid Option Combination
N = Combination Not available

LUMEN AMBIENT TEMPERATURE (LAT) MULTIPLIERS

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Temperature		Ambient Temperature (°C) Lumen Multiplier							
°C	°F	P1	P2	P3	P4	P5	P6	P7	P8
0	32	1.03	1.03	1.03	1.03	1.04	1.04	1.04	1.05
5	41	1.02	1.02	1.03	1.03	1.03	1.03	1.03	1.04
10	50	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.03
15	59	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.02
20	68	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
25	77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

PERFORMANCE DATA

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P1	AG	105	15,680	149	4	2	2	16,129	154	4	2	2	16,329	156	4	2	2	0.97	0.97	0.96
	AR		16,915	161	4	0	2	17,400	166	4	0	2	17,616	168	4	0	2			
	FG		14,519	138	2	3	3	14,935	142	2	3	3	15,120	144	3	3	3			
	FT		15,763	150	2	0	3	16,215	154	2	0	3	16,416	156	2	0	3			
	MG		15,064	143	2	2	2	15,496	148	2	2	2	15,687	149	3	2	2			
	MR		16,193	154	2	0	2	16,657	159	3	0	3	16,863	161	3	0	3			
	NG		15,292	146	3	2	2	15,731	150	3	2	2	15,925	152	3	2	2			
	NR		16,326	155	3	0	2	16,794	160	3	0	2	17,002	162	3	0	2			
	WG		14,577	139	3	2	3	14,994	143	3	2	3	15,180	145	3	2	3			
	WR		15,746	150	3	0	3	16,198	154	3	0	3	16,398	156	3	0	3			
P2	AG	126	19,225	153	4	2	2	19,776	157	4	2	2	20,021	159	4	3	2	0.97	0.97	0.96
	AR		20,740	165	4	0	2	21,335	169	4	0	2	21,599	171	4	0	2			
	FG		17,802	141	3	3	3	18,313	145	3	3	4	18,539	147	3	3	4			
	FT		19,328	153	3	0	4	19,882	158	3	0	4	20,128	160	3	0	4			
	MG		18,470	147	3	2	3	19,000	151	3	2	3	19,235	153	3	2	3			
	MR		19,854	158	3	0	3	20,423	162	3	0	3	20,676	164	3	0	3			
	NG		18,750	149	3	2	2	19,288	153	3	2	2	19,527	155	3	2	3			
	NR		20,018	159	3	0	2	20,592	163	3	0	2	20,847	165	3	0	2			
	WG		17,873	142	3	3	3	18,385	146	3	3	3	18,613	148	3	3	3			
	WR		19,307	153	3	0	3	19,860	158	3	0	3	20,106	160	3	0	3			
P3	AG	155	22,726	147	4	3	2	23,377	151	4	3	2	23,667	153	4	3	2	0.97	0.96	0.96
	AR		24,517	158	4	0	2	25,219	163	5	0	3	25,532	165	5	0	3			
	FG		21,044	136	3	3	4	21,647	140	3	3	4	21,915	141	3	3	4			
	FT		22,847	147	3	0	4	23,502	152	3	0	4	23,793	154	3	0	4			
	MG		21,833	141	3	3	3	22,459	145	3	3	3	22,737	147	3	3	3			
	MR		23,469	151	3	0	3	24,142	156	3	0	3	24,441	158	3	0	3			
	NG		22,164	143	3	2	3	22,799	147	3	2	3	23,082	149	3	2	3			
	NR		23,663	153	3	0	3	24,341	157	3	0	3	24,643	159	3	0	3			
	WG		21,127	136	3	3	3	21,732	140	3	3	3	22,001	142	3	3	3			
	WR		22,822	147	3	0	3	23,476	151	3	0	3	23,767	153	3	0	3			
P4	AG	180	26,107	145	4	3	2	26,855	149	4	3	2	27,188	151	4	3	2	0.97	0.96	0.95
	AR		28,164	156	5	0	3	28,972	161	5	0	3	29,330	163	5	0	3			
	FG		24,175	134	3	3	4	24,868	138	3	3	4	25,176	140	3	3	4			
	FT		26,246	146	3	0	5	26,998	150	3	0	5	27,333	152	3	0	5			
	MG		25,082	139	3	3	3	25,800	143	3	3	3	26,120	145	3	3	3			
	MR		26,961	150	3	0	3	27,734	154	3	0	3	28,077	156	3	0	3			
	NG		25,462	141	3	3	3	26,192	146	3	3	3	26,516	147	3	3	3			
	NR		27,184	151	3	0	3	27,963	155	3	0	3	28,309	157	3	0	3			
	WG		24,270	135	3	3	3	24,966	139	3	3	3	25,275	140	3	3	3			
	WR		26,218	146	3	0	3	26,969	150	3	0	3	27,303	152	3	0	3			

PERFORMANCE DATA (continued)

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P5	AG	206	29,340	142	4	3	2	30,181	147	5	3	3	30,555	148	5	3	3	0.96	0.96	0.95
	AR		31,653	154	5	0	3	32,560	158	5	0	3	32,963	160	5	0	3			
	FG		27,169	132	3	3	5	27,947	136	3	3	5	28,294	137	3	3	5			
	FT		29,497	143	3	0	5	30,342	147	3	0	5	30,718	149	3	0	5			
	MG		28,188	137	3	3	3	28,996	141	3	3	3	29,355	143	3	3	3			
	MR		30,300	147	3	0	3	31,169	151	3	0	3	31,555	153	3	0	3			
	NG		28,615	139	4	3	3	29,436	143	4	3	3	29,800	145	4	3	3			
	NR		30,550	148	4	0	3	31,426	153	4	0	3	31,815	154	4	0	3			
	WG		27,276	132	3	3	3	28,058	136	3	3	3	28,405	138	3	3	3			
	WR		29,465	143	3	0	3	30,309	147	3	0	3	30,685	149	3	0	3			
P6	AG	230	32,375	141	5	3	3	33,303	145	5	3	3	33,715	147	5	3	3	0.96	0.95	0.94
	AR		34,926	152	5	0	3	35,927	156	5	0	3	36,372	158	5	0	3			
	FG		29,978	130	3	3	5	30,838	134	3	3	5	31,220	136	3	3	5			
	FT		32,547	142	3	0	5	33,480	146	3	0	5	33,894	147	3	0	5			
	MG		31,103	135	3	3	3	31,995	139	3	3	3	32,391	141	3	3	3			
	MR		33,434	145	3	0	4	34,392	150	3	0	4	34,818	151	3	0	4			
	NG		31,575	137	4	3	3	32,480	141	4	3	3	32,882	143	4	3	3			
	NR		33,710	147	4	0	3	34,676	151	4	0	3	35,105	153	4	0	3			
	WG		30,097	131	4	3	4	30,960	135	4	3	4	31,343	136	4	3	4			
	WR		32,512	141	3	0	4	33,444	145	3	0	4	33,858	147	4	0	4			
P7	AG	255	35,515	139	5	3	3	36,533	143	5	3	3	36,986	145	5	3	3	0.96	0.95	0.93
	AR		38,314	150	5	0	4	39,412	155	5	0	4	39,900	156	5	0	4			
	FG		32,886	129	3	3	5	33,829	133	4	3	5	34,248	134	4	3	5			
	FT		35,704	140	3	0	5	36,728	144	4	0	5	37,183	146	4	0	5			
	MG		34,120	134	3	3	3	35,098	138	3	3	3	35,533	139	4	3	3			
	MR		36,677	144	3	0	4	37,728	148	3	0	4	38,195	150	3	0	4			
	NG		34,638	136	4	3	3	35,630	140	4	3	3	36,072	141	4	3	3			
	NR		36,980	145	4	0	3	38,040	149	4	0	3	38,511	151	4	0	3			
	WG		33,017	129	4	3	4	33,963	133	4	3	4	34,383	135	4	3	4			
	WR		35,666	140	4	0	4	36,688	144	4	0	4	37,142	146	4	0	4			
P8	AG	280	38,510	138	5	3	3	39,614	141	5	3	3	40,104	143	5	3	3	0.95	0.93	0.92
	AR		41,545	148	5	0	4	42,735	153	5	0	4	43,265	155	5	0	4			
	FG		35,659	127	4	3	5	36,681	131	4	3	5	37,136	133	4	3	5			
	FT		38,715	138	4	0	5	39,824	142	4	0	5	40,318	144	4	0	5			
	MG		36,997	132	4	3	3	38,058	136	4	3	3	38,529	138	4	3	3			
	MR		39,770	142	4	0	4	40,909	146	4	0	4	41,416	148	4	0	4			
	NG		37,558	134	4	3	3	38,635	138	4	3	3	39,113	140	4	3	3			
	NR		40,098	143	4	0	3	41,247	147	4	0	3	41,758	149	4	0	3			
	WG		35,800	128	4	3	4	36,827	132	4	3	4	37,283	133	4	3	4			
	WR		38,673	138	4	0	4	39,782	142	4	0	4	40,274	144	4	0	4			

PERFORMANCE DATA — SKIRT OPTION

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P1	AG	105	14,813	141	3	0	2	15,237	145	3	0	2	15,426	147	3	0	2	0.97	0.97	0.96
	AR		16,041	153	4	0	2	16,500	157	4	0	2	16,705	159	4	0	2			
	FG		13,647	130	3	0	2	14,038	134	3	0	2	14,212	135	3	0	2			
	FT		14,662	140	2	0	2	15,082	144	2	0	2	15,269	145	2	0	2			
	MG		14,623	139	2	0	2	15,042	143	3	0	2	15,228	145	3	0	2			
	MR		15,485	147	2	0	2	15,928	152	2	0	2	16,126	154	2	0	2			
	NG		14,965	143	3	0	2	15,394	147	3	0	2	15,585	148	3	0	2			
	NR		15,868	151	3	0	2	16,323	155	3	0	2	16,525	157	3	0	2			
	WG		13,943	133	3	0	2	14,343	137	3	0	2	14,521	138	3	0	2			
	WR		14,571	139	3	0	2	14,989	143	3	0	2	15,174	145	3	0	2			
P2	AG	126	18,162	144	4	0	2	18,683	148	4	0	2	18,914	150	4	0	2	0.97	0.97	0.96
	AR		19,668	156	4	0	2	20,232	161	4	0	2	20,482	163	4	0	2			
	FG		16,733	133	3	0	2	17,212	137	3	0	2	17,426	138	3	0	2			
	FT		17,978	143	3	0	3	18,493	147	3	0	3	18,722	149	3	0	3			
	MG		17,929	142	3	0	2	18,443	146	3	0	2	18,672	148	3	0	2			
	MR		18,986	151	3	0	2	19,530	155	3	0	3	19,772	157	3	0	3			
	NG		18,349	146	3	0	2	18,875	150	3	0	2	19,109	152	3	0	2			
	NR		19,456	154	3	0	2	20,014	159	3	0	2	20,262	161	3	0	2			
	WG		17,097	136	3	0	3	17,587	140	3	0	3	17,804	141	3	0	3			
	WR		17,866	142	3	0	2	18,378	146	3	0	3	18,606	148	3	0	3			
P3	AG	155	21,469	139	4	0	2	22,084	142	4	0	2	22,358	144	4	0	2	0.97	0.96	0.96
	AR		23,249	150	4	0	2	23,915	154	4	0	2	24,211	156	4	0	2			
	FG		19,779	128	3	0	2	20,346	131	3	0	3	20,598	133	3	0	3			
	FT		21,251	137	3	0	3	21,860	141	3	0	3	22,131	143	3	0	3			
	MG		21,194	137	3	0	3	21,801	141	3	0	3	22,071	142	3	0	3			
	MR		22,443	145	3	0	3	23,086	149	3	0	3	23,372	151	3	0	3			
	NG		21,690	140	3	0	2	22,312	144	3	0	2	22,588	146	3	0	2			
	NR		22,999	148	3	0	2	23,658	153	3	0	2	23,951	155	3	0	2			
	WG		20,209	130	3	0	3	20,788	134	3	0	3	21,046	136	3	0	3			
	WR		21,119	136	3	0	3	21,724	140	3	0	3	21,993	142	3	0	3			
P4	AG	180	24,663	137	4	0	2	25,370	141	4	0	2	25,685	143	4	0	2	0.97	0.96	0.95
	AR		26,708	148	4	0	2	27,474	153	4	0	2	27,814	155	4	0	2			
	FG		22,722	126	3	0	3	23,374	130	3	0	3	23,663	131	3	0	3			
	FT		24,413	136	3	0	3	25,113	140	3	0	3	25,424	141	3	0	3			
	MG		24,347	135	3	0	3	25,045	139	3	0	3	25,355	141	3	0	3			
	MR		25,782	143	3	0	3	26,521	147	3	0	3	26,850	149	3	0	3			
	NG		24,917	138	3	0	2	25,631	142	3	0	2	25,949	144	4	0	2			
	NR		26,421	147	3	0	2	27,178	151	3	0	2	27,515	153	3	0	2			
	WG		23,216	129	3	0	3	23,882	133	3	0	3	24,177	134	3	0	3			
	WR		24,261	135	3	0	3	24,957	139	3	0	3	25,266	140	3	0	3			

PERFORMANCE DATA — UPLIGHT SKIRT OPTION (continued)

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P5	AG	206	27,718	135	4	0	2	28,513	138	4	0	2	28,866	140	4	0	2	0.96	0.96	0.95
	AR		30,016	146	5	0	3	30,876	150	5	0	3	31,259	152	5	0	3			
	FG		25,536	124	3	0	3	26,268	128	3	0	3	26,594	129	3	0	3			
	FT		27,437	133	3	0	4	28,223	137	3	0	4	28,572	139	3	0	4			
	MG		27,362	133	3	0	3	28,147	137	3	0	3	28,495	138	3	0	3			
	MR		28,975	141	3	0	3	29,806	145	3	0	3	30,175	146	3	0	3			
	NG		28,003	136	4	0	2	28,806	140	4	0	2	29,163	142	4	0	2			
	NR		29,693	144	4	0	2	30,544	148	4	0	2	30,922	150	4	0	2			
	WG		26,091	127	3	0	3	26,839	130	3	0	3	27,172	132	3	0	3			
	WR		27,266	132	3	0	3	28,048	136	3	0	3	28,395	138	3	0	3			
P6	AG	230	30,585	133	5	0	2	31,461	137	5	0	2	31,851	138	5	0	2	0.96	0.95	0.94
	AR		33,120	144	5	0	3	34,069	148	5	0	3	34,491	150	5	0	3			
	FG		28,177	123	3	0	3	28,985	126	3	0	3	29,344	128	3	0	3			
	FT		30,274	132	3	0	4	31,142	135	3	0	4	31,527	137	3	0	4			
	MG		30,192	131	3	0	3	31,058	135	3	0	3	31,442	137	3	0	3			
	MR		31,972	139	3	0	3	32,888	143	3	0	3	33,296	145	3	0	3			
	NG		30,899	134	4	0	2	31,785	138	4	0	2	32,178	140	4	0	2			
	NR		32,764	142	4	0	2	33,703	147	4	0	3	34,120	148	4	0	3			
	WG		28,790	125	4	0	3	29,615	129	4	0	3	29,982	130	4	0	3			
	WR		30,086	131	3	0	3	30,948	135	3	0	3	31,331	136	4	0	3			
P7	AG	255	33,551	132	5	0	3	34,513	135	5	0	3	34,941	137	5	0	3	0.96	0.95	0.93
	AR		36,333	142	5	0	3	37,374	147	5	0	3	37,837	148	5	0	3			
	FG		30,911	121	4	0	4	31,797	125	4	0	4	32,190	126	4	0	4			
	FT		33,211	130	4	0	4	34,163	134	4	0	4	34,586	136	4	0	4			
	MG		33,121	130	4	0	3	34,070	134	4	0	3	34,492	135	4	0	3			
	MR		35,073	138	3	0	3	36,079	141	4	0	3	36,526	143	4	0	3			
	NG		33,897	133	4	0	2	34,868	137	4	0	3	35,300	138	4	0	3			
	NR		35,942	141	4	0	3	36,972	145	4	0	3	37,430	147	4	0	3			
	WG		31,582	124	4	0	3	32,488	127	4	0	3	32,890	129	4	0	3			
	WR		33,004	129	4	0	3	33,950	133	4	0	3	34,371	135	4	0	3			
P8	AG	280	36,380	130	5	0	3	37,423	134	5	0	3	37,887	135	5	0	3	0.95	0.93	0.92
	AR		39,396	141	5	0	3	40,526	145	5	0	3	41,027	147	5	0	3			
	FG		33,517	120	4	0	4	34,478	123	4	0	4	34,905	125	4	0	4			
	FT		36,011	129	4	0	4	37,043	132	4	0	4	37,502	134	4	0	4			
	MG		35,914	128	4	0	3	36,943	132	4	0	3	37,401	134	4	0	3			
	MR		38,031	136	4	0	4	39,121	140	4	0	4	39,605	141	4	0	4			
	NG		36,755	131	4	0	3	37,808	135	4	0	3	38,276	137	4	0	3			
	NR		38,972	139	4	0	3	40,089	143	4	0	3	40,586	145	4	0	3			
	WG		34,245	122	4	0	3	35,227	126	4	0	3	35,663	127	4	0	3			
	WR		35,787	128	4	0	4	36,813	131	4	0	4	37,269	133	4	0	4			

PERFORMANCE DATA — HOUSE SIDE SHIELD OPTION

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P1	AG	105	6,999	67	1	2	2	7,199	69	1	2	2	7,288	69	1	2	2	0.97	0.97	0.96
	AR		9,980	95	1	2	2	10,266	98	1	2	2	10,393	99	1	2	2			
	FG		9,965	95	1	2	3	10,251	98	1	2	3	10,378	99	1	2	3			
	FT		11,584	110	1	2	3	11,916	113	1	2	3	12,064	115	1	2	3			
	MG		11,335	108	1	2	2	11,660	111	1	2	2	11,804	112	1	2	2			
	MR		12,900	123	1	2	2	13,270	126	1	2	2	13,435	128	1	2	2			
	NG		13,205	126	1	2	2	13,584	129	1	2	2	13,752	131	1	2	2			
	NR		13,221	126	1	2	2	13,599	130	1	2	2	13,768	131	1	2	2			
	WG		10,624	101	1	2	2	10,928	104	1	2	2	11,064	105	1	2	2			
	WR		12,269	117	2	2	3	12,621	120	2	2	3	12,777	122	2	2	3			
P2	AG	126	8,581	68	1	2	2	8,827	70	1	2	2	8,937	71	1	2	2	0.97	0.97	0.96
	AR		12,237	97	1	2	2	12,588	100	1	2	2	12,743	101	1	2	2			
	FG		12,219	97	1	3	3	12,569	100	1	3	3	12,725	101	1	3	3			
	FT		14,204	113	1	2	3	14,611	116	1	3	3	14,792	117	1	3	3			
	MG		13,898	110	1	2	2	14,297	113	1	2	2	14,474	115	1	2	2			
	MR		15,818	126	2	2	2	16,271	129	2	2	2	16,473	131	2	2	2			
	NG		16,191	129	1	2	3	16,655	132	1	2	3	16,861	134	1	2	3			
	NR		16,210	129	1	2	3	16,675	132	1	2	3	16,881	134	1	2	3			
	WG		13,026	103	1	2	3	13,400	106	2	2	3	13,566	108	2	2	3			
	WR		15,043	119	2	2	3	15,475	123	2	2	3	15,666	124	2	2	3			
P3	AG	155	10,144	65	1	2	2	10,434	67	1	2	2	10,564	68	1	2	2	0.97	0.96	0.96
	AR		14,465	93	1	2	3	14,879	96	1	2	3	15,064	97	1	2	3			
	FG		14,443	93	1	3	3	14,857	96	1	3	3	15,041	97	1	3	3			
	FT		16,790	108	1	3	3	17,271	111	1	3	3	17,485	113	1	3	3			
	MG		16,429	106	2	2	2	16,900	109	2	2	3	17,109	110	2	2	3			
	MR		18,698	121	2	2	3	19,233	124	2	2	3	19,472	126	2	2	3			
	NG		19,139	123	2	2	3	19,688	127	2	3	3	19,931	129	2	3	3			
	NR		19,161	124	1	2	3	19,711	127	1	2	3	19,955	129	1	2	3			
	WG		15,398	99	2	2	3	15,839	102	2	3	3	16,035	103	2	3	3			
	WR		17,782	115	2	2	3	18,292	118	2	2	3	18,518	119	2	2	3			
P4	AG	180	11,653	65	1	2	2	11,987	67	1	2	2	12,135	67	1	2	2	0.97	0.96	0.95
	AR		16,617	92	1	2	3	17,093	95	1	2	3	17,305	96	1	2	3			
	FG		16,592	92	1	3	3	17,068	95	1	3	3	17,279	96	1	3	3			
	FT		19,288	107	1	3	4	19,841	110	1	3	4	20,086	112	1	3	4			
	MG		18,873	105	2	3	3	19,414	108	2	3	3	19,655	109	2	3	3			
	MR		21,480	119	2	2	3	22,095	123	2	2	3	22,369	124	2	2	3			
	NG		21,987	122	2	3	3	22,617	126	2	3	3	22,897	127	2	3	3			
	NR		22,012	122	2	2	3	22,643	126	2	2	3	22,924	127	2	2	3			
	WG		17,689	98	2	3	3	18,196	101	2	3	3	18,421	102	2	3	3			
	WR		20,428	113	2	2	3	21,014	117	2	2	3	21,274	118	2	2	3			

PERFORMANCE DATA — HOUSE SIDE SHIELD OPTION (continued)

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P5	AG	206	13,096	64	1	2	2	13,472	65	1	2	2	13,638	66	1	2	2	0.96	0.96	0.95
	AR		18,675	91	1	3	3	19,210	93	1	3	3	19,448	94	1	3	3			
	FG		18,647	91	1	3	4	19,182	93	1	3	4	19,419	94	1	3	4			
	FT		21,677	105	1	3	4	22,298	108	1	3	4	22,574	110	1	3	4			
	MG		21,211	103	2	3	3	21,819	106	2	3	3	22,089	107	2	3	3			
	MR		24,140	117	2	2	3	24,832	121	2	2	3	25,139	122	2	2	3			
	NG		24,710	120	2	3	3	25,418	123	2	3	3	25,733	125	2	3	3			
	NR		24,739	120	2	3	3	25,448	124	2	3	3	25,763	125	2	3	3			
	WG		19,880	97	2	3	3	20,450	99	2	3	3	20,703	101	2	3	3			
	WR		22,958	111	2	2	3	23,616	115	2	2	3	23,909	116	3	2	3			
P6	AG	230	14,451	63	1	3	3	14,865	65	1	3	3	15,049	65	1	3	3	0.96	0.95	0.94
	AR		20,606	90	1	3	3	21,197	92	1	3	3	21,459	93	1	3	4			
	FG		20,576	89	1	3	4	21,165	92	1	3	4	21,428	93	1	3	4			
	FT		23,918	104	1	3	4	24,604	107	1	3	4	24,909	108	1	3	4			
	MG		23,404	102	2	3	3	24,075	105	2	3	3	24,373	106	2	3	3			
	MR		26,636	116	2	2	3	27,400	119	2	2	3	27,739	121	2	2	4			
	NG		27,265	119	2	3	3	28,047	122	2	3	3	28,394	123	2	3	3			
	NR		27,297	119	2	3	3	28,079	122	2	3	3	28,427	124	2	3	3			
	WG		21,936	95	2	3	3	22,564	98	2	3	3	22,844	99	2	3	3			
	WR		25,332	110	3	2	3	26,058	113	3	2	3	26,381	115	3	2	4			
P7	AG	255	15,852	62	1	3	3	16,307	64	1	3	3	16,509	65	1	3	3	0.96	0.95	0.93
	AR		22,605	89	1	3	4	23,253	91	1	3	4	23,541	92	1	3	4			
	FG		22,572	89	2	3	4	23,219	91	2	3	4	23,506	92	2	3	4			
	FT		26,239	103	1	3	4	26,991	106	1	3	4	27,325	107	2	3	4			
	MG		25,675	101	2	3	3	26,411	104	2	3	3	26,738	105	2	3	3			
	MR		29,220	115	2	3	4	30,058	118	3	3	4	30,430	119	3	3	4			
	NG		29,910	117	2	3	3	30,767	121	2	3	3	31,148	122	2	3	3			
	NR		29,945	117	2	3	3	30,803	121	2	3	3	31,185	122	2	3	3			
	WG		24,063	94	2	3	3	24,753	97	2	3	3	25,060	98	2	3	3			
	WR		27,790	109	3	3	4	28,586	112	3	3	4	28,940	113	3	3	4			
P8	AG	280	17,189	61	1	3	3	17,682	63	1	3	3	17,901	64	1	3	3	0.95	0.93	0.92
	AR		24,511	88	1	3	4	25,214	90	1	3	4	25,526	91	1	3	4			
	FG		24,475	87	2	3	4	25,176	90	2	3	4	25,488	91	2	3	4			
	FT		28,451	102	2	3	4	29,266	105	2	3	4	29,629	106	2	3	4			
	MG		27,840	99	2	3	3	28,638	102	2	3	3	28,992	104	2	3	3			
	MR		31,684	113	3	3	4	32,592	116	3	3	4	32,996	118	3	3	4			
	NG		32,432	116	2	3	3	33,362	119	2	3	4	33,775	121	2	3	4			
	NR		32,470	116	2	3	3	33,401	119	2	3	3	33,814	121	2	3	3			
	WG		26,092	93	2	3	3	26,840	96	3	3	4	27,173	97	3	3	4			
	WR		30,133	108	3	3	4	30,996	111	3	3	4	31,380	112	3	3	4			

PERFORMANCE DATA — UPLIGHT SKIRT + HOUSE SIDE SHIELD OPTION

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P1	AG	105	8,036	77	1	0	2	8,266	79	1	0	2	8,368	80	1	0	2	0.97	0.97	0.96
	AR		9,275	88	1	0	2	9,541	91	1	0	2	9,659	92	1	0	2			
	FG		8,948	85	1	0	2	9,204	88	1	0	2	9,318	89	1	0	2			
	FT		10,422	99	1	0	2	10,720	102	1	0	2	10,853	103	1	0	2			
	MG		10,580	101	1	0	2	10,884	104	1	0	2	11,018	105	1	0	2			
	MR		12,257	117	1	0	2	12,609	120	1	0	2	12,765	122	1	0	2			
	NG		11,030	105	1	0	2	11,347	108	1	0	2	11,487	109	1	0	2			
	NR		12,554	120	1	0	2	12,914	123	1	0	2	13,074	125	1	0	2			
	WG		9,525	91	1	0	2	9,798	93	1	0	2	9,919	94	1	0	2			
	WR		10,983	105	1	0	2	11,298	108	1	0	2	11,438	109	1	0	2			
P2	AG	126	9,853	78	1	0	2	10,135	80	1	0	2	10,261	81	1	0	2	0.97	0.97	0.96
	AR		11,373	90	1	0	2	11,699	93	1	0	2	11,844	94	1	0	2			
	FG		10,971	87	1	0	2	11,286	90	1	0	2	11,425	91	1	0	2			
	FT		12,778	101	1	0	2	13,145	104	1	0	2	13,307	106	1	0	2			
	MG		12,973	103	1	0	2	13,345	106	1	0	2	13,510	107	1	0	2			
	MR		15,029	119	1	0	2	15,460	123	1	0	2	15,651	124	1	0	2			
	NG		13,525	107	1	0	2	13,912	110	1	0	2	14,085	112	1	0	2			
	NR		15,393	122	1	0	2	15,835	126	1	0	2	16,031	127	1	0	2			
	WG		11,678	93	1	0	2	12,013	95	1	0	2	12,162	97	1	0	2			
	WR		13,467	107	2	0	2	13,853	110	2	0	2	14,024	111	2	0	2			
P3	AG	155	11,647	75	1	0	2	11,981	77	1	0	2	12,129	78	1	0	2	0.97	0.96	0.96
	AR		13,444	87	1	0	2	13,829	89	1	0	2	14,000	90	1	0	2			
	FG		12,969	84	1	0	2	13,340	86	1	0	2	13,506	87	1	0	2			
	FT		15,105	97	1	0	3	15,538	100	1	0	3	15,730	101	1	0	3			
	MG		15,335	99	1	0	2	15,774	102	1	0	2	15,970	103	2	0	2			
	MR		17,765	115	2	0	2	18,275	118	2	0	2	18,501	119	2	0	2			
	NG		15,987	103	1	0	2	16,445	106	1	0	2	16,649	107	1	0	2			
	NR		18,196	117	1	0	2	18,718	121	1	0	2	18,949	122	1	0	2			
	WG		13,805	89	2	0	2	14,200	92	2	0	2	14,376	93	2	0	2			
	WR		15,918	103	2	0	2	16,375	106	2	0	2	16,577	107	2	0	2			
P4	AG	180	13,380	74	1	0	2	13,452	75	1	0	2	13,934	77	1	0	2	0.97	0.96	0.95
	AR		15,444	86	1	0	3	15,457	86	1	0	3	16,083	89	1	0	3			
	FG		14,898	83	1	0	2	15,253	85	1	0	2	15,515	86	1	0	2			
	FT		17,352	96	1	0	3	17,705	98	1	0	3	18,071	100	1	0	3			
	MG		17,617	98	2	0	2	17,937	100	2	0	2	18,346	102	2	0	2			
	MR		20,409	113	2	0	3	20,784	115	2	0	3	21,254	118	2	0	3			
	NG		18,366	102	2	0	2	18,649	104	2	0	2	19,126	106	2	0	2			
	NR		20,903	116	2	0	2	21,201	118	2	0	2	21,769	121	2	0	2			
	WG		15,859	88	2	0	2	16,313	91	2	0	2	16,515	92	2	0	2			
	WR		18,287	102	2	0	2	18,617	103	2	0	2	19,044	106	2	0	2			

PERFORMANCE DATA — UPLIGHT SKIRT + HOUSE SIDE SHIELD OPTION (continued)

Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)					40K (4000K CCT, 70 CRI)					50K (5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P5	AG	206	15,037	73	1	0	2	15,468	75	1	0	2	15,659	76	1	0	2	0.96	0.96	0.95
	AR		17,356	84	1	0	3	17,854	87	1	0	3	18,075	88	1	0	3			
	FG		16,743	81	2	0	3	17,223	84	2	0	3	17,437	85	2	0	3			
	FT		19,501	95	1	0	3	20,060	97	2	0	3	20,309	99	2	0	3			
	MG		19,798	96	2	0	2	20,366	99	2	0	2	20,618	100	2	0	2			
	MR		22,936	111	2	0	3	23,594	115	2	0	3	23,886	116	2	0	3			
	NG		20,641	100	2	0	2	21,232	103	2	0	2	21,495	104	2	0	2			
	NR		23,492	114	2	0	2	24,166	117	2	0	2	24,465	119	2	0	2			
	WG		17,823	87	2	0	2	18,333	89	2	0	2	18,561	90	2	0	2			
	WR		20,552	100	2	0	2	21,141	103	2	0	3	21,403	104	2	0	3			
P6	AG	230	16,592	72	1	0	2	17,067	74	1	0	2	17,279	75	1	0	2	0.96	0.95	0.94
	AR		19,151	83	1	0	3	19,700	86	1	0	3	19,944	87	1	0	3			
	FG		18,475	80	2	0	3	19,005	83	2	0	3	19,240	84	2	0	3			
	FT		21,518	94	2	0	4	22,135	96	2	0	4	22,409	97	2	0	4			
	MG		21,846	95	2	0	2	22,472	98	2	0	2	22,750	99	2	0	2			
	MR		25,308	110	2	0	3	26,034	113	2	0	3	26,356	115	2	0	3			
	NG		22,775	99	2	0	2	23,428	102	2	0	2	23,718	103	2	0	2			
	NR		25,922	113	2	0	2	26,665	116	2	0	3	26,995	117	2	0	3			
	WG		19,666	86	2	0	2	20,229	88	2	0	2	20,480	89	2	0	2			
	WR		22,677	99	2	0	3	23,327	101	2	0	3	23,616	103	2	0	3			
P7	AG	255	18,201	71	1	0	3	18,723	73	2	0	3	18,955	74	2	0	3	0.96	0.95	0.93
	AR		21,009	82	1	0	3	21,611	85	1	0	3	21,879	86	1	0	3			
	FG		20,267	79	2	0	3	20,848	82	2	0	3	21,106	83	2	0	3			
	FT		23,606	93	2	0	4	24,282	95	2	0	4	24,583	96	2	0	4			
	MG		23,965	94	2	0	3	24,652	97	2	0	3	24,957	98	2	0	3			
	MR		27,763	109	2	0	3	28,559	112	2	0	3	28,913	113	2	0	3			
	NG		24,984	98	2	0	2	25,701	101	2	0	2	26,019	102	2	0	2			
	NR		28,436	112	2	0	3	29,251	115	2	0	3	29,614	116	2	0	3			
	WG		21,573	85	2	0	2	22,192	87	2	0	2	22,467	88	2	0	2			
	WR		24,877	98	2	0	3	25,590	100	2	0	3	25,907	102	2	0	3			
P8	AG	280	19,736	70	2	0	3	20,302	73	2	0	3	20,553	73	2	0	3	0.95	0.93	0.92
	AR		22,781	81	2	0	3	23,434	84	2	0	4	23,724	85	2	0	4			
	FG		21,976	78	2	0	3	22,606	81	2	0	3	22,886	82	2	0	3			
	FT		25,596	91	2	0	4	26,330	94	2	0	4	26,656	95	2	0	4			
	MG		25,986	93	2	0	3	26,730	95	2	0	3	27,062	97	2	0	3			
	MR		30,104	108	2	0	3	30,967	111	2	0	4	31,351	112	3	0	4			
	NG		27,091	97	2	0	2	27,868	100	2	0	2	28,213	101	2	0	2			
	NR		30,834	110	2	0	3	31,718	113	2	0	3	32,111	115	2	0	3			
	WG		23,393	84	2	0	2	24,063	86	2	0	3	24,361	87	2	0	3			
	WR		26,975	96	3	0	3	27,748	99	3	0	3	28,091	100	3	0	3			