Lighting Design Analysis Report

Lena Road
Lighting Improvements

Prepared for Manatee County, Florida

By:

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July 2023

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1. Purpose

This report summarizes the results of the roadway and intersection lighting design analysis conducted for the proposed lighting system along Lena Road. This lighting analysis evaluated Lena Road from 44th Avenue E to SR 64. The project location is shown in **Figure 1** and includes analysis for roadway corridor, roundabout, and signalized intersection lighting. The project is designed to meet Manatee County standards for roadway corridor lighting and the Florida Department of Transportation (FDOT) Lighting Criteria for signalized intersections per the Florida Design Manual (FDM) Table 231.2.1.

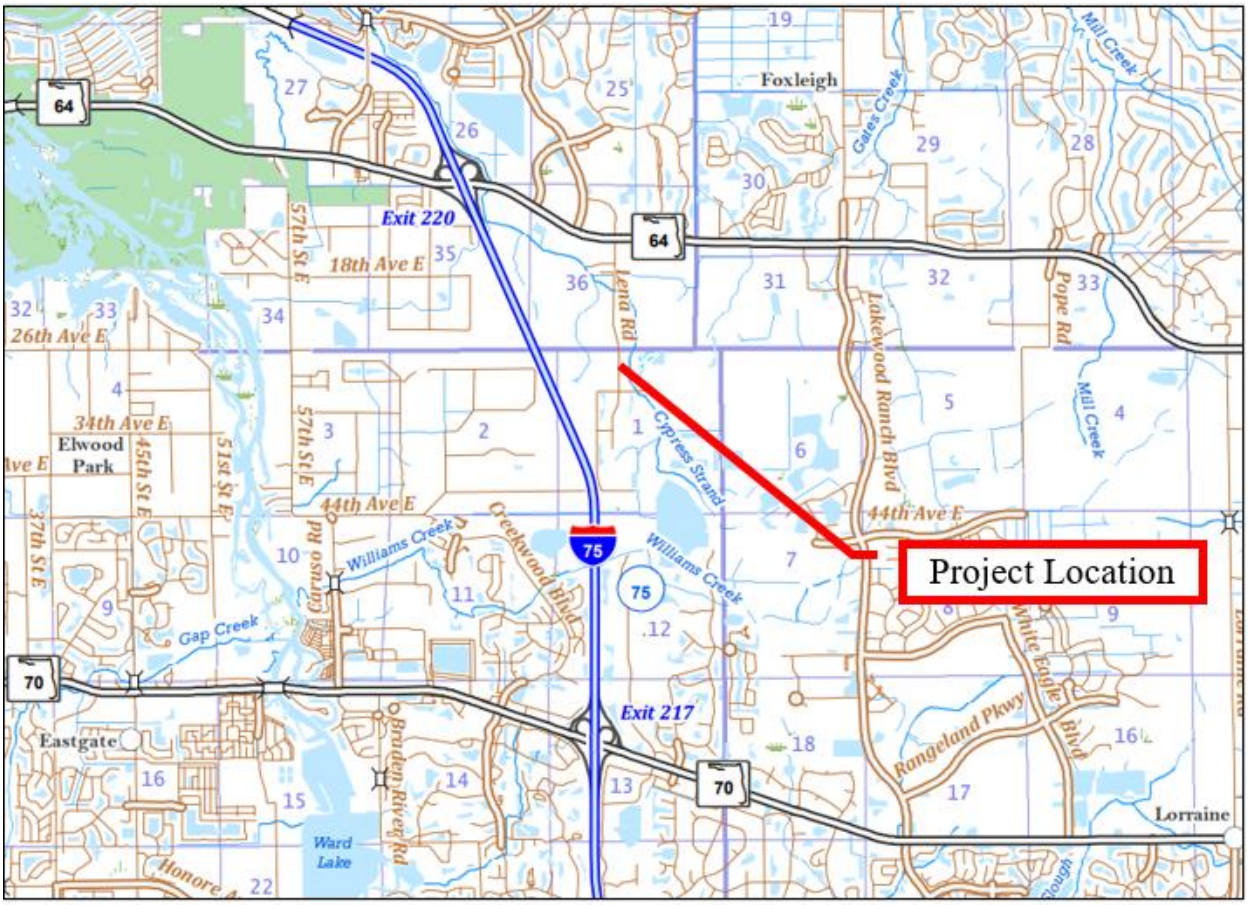


Figure 1 Project Location Map

2. Existing & Proposed Conditions

This project is located in Manatee County, Florida, along Lena Road from 44th Avenue E to SR 64. Lena Road is classified as a major collector with a design speed of 35 miles per hour (mph) and a posted speed of 30 mph. Some of the Lena Road corridor currently exists, while a portion of the roadway is new. Travel lane widths are proposed to be 11' wide throughout the corridor, with 15' lanes within the roundabout. All of the lighting along Lena Road is proposed to be new with light poles staggered on both sides of the roadway. The power company serving the corridor is Florida Power and Light (FPL), but the proposed lighting will be owned and maintained by Mantatee County.

3. Roadway Lighting Criteria

The lighting design criteria used in the photometric analysis for roadway segments, roundabouts, and signalized intersections is shown in **Table 1**. For these lighting improvements, governing lighting criteria comes from Table 8.2-1 of the Manatee County Traffic Engineering Manual for roadway lighting, and Table 231.2.1 of the FDM for signalized intersection lighting.

A wildlife crossing is provided at station 233 along Lena Road. The FDOT Wildlife Crossing Guidelines states that "lighting at the wildlife crossing should be minimized to the greatest extent practical. Refer to Section 231.2.1 Environmental Lighting in the FDOT Design Manual". The FDM horizontal foot-candle requirement for Wildlife-Sensitive lighting exceeds the Manatee County horizontal-foot candle requirement for Urban Collector Roadways. Therefore, in order to keep the lighting at the wildlife crossing to a minimum, Manatee County roadway lighting criteria was used at the wildlife crossing.

Table 1 Level of Illumination for Roadway and Signalized Intersections/Roundabouts

Roadway Classification	Illumination Level Average Foot Candle (Horizontal foot-candles)	Illumination Level Average Foot Candle (Vertical foot-candles)	Illumination Uniformity Ratio (Avg./Min.)	Illumination Uniformity Ratio (Max./Min.)	Veiling Luminance Ratio ($L_{v(MAX)}/L_{AVG}$)
Roadway Corridor Lighting (Urban Collector)	0.8	N/A	4:1 or less	10:1 or less	N/A
Signalized Intersection and Roundabout (New or Reconstruction)	3.0 Std. 1.5 Min.	1.5 Std. 1.2 Min.	4:1 or less	10:1 or less	N/A

Source: Manatee County Traffic Engineering Manual, Table 8.2-1 & the Florida Design Manual, Table 231.2.1, January 1, 2023

4. Roadway Lighting Analysis Methodology

The lighting design and analysis was conducted using AGi32 v20.6 lighting analysis software.

The proposed luminaires chosen for design were the GE Evolve ERL1, ERLH and ERL2 LED roadway luminaires as shown in **Figures 2, 3 and 4**. This design intends to add new luminaires along the roadway to meet Manatee County and FDM lighting criteria.

Figure 2 GE Evolve ERL1 Roadway Luminaire

Figure 3 GE Evolve ERLH Roadway Luminaire

Figure 4 GE Evolve ERL2 Roadway Luminaire

Table 2 details the proposed luminaires used as the basis of design for this project.

Table 2 Proposed Lighting Design .IES File Summary

Manufacturer	Fixture Type/Wattage	Fixture Name	Associated .ies File
GE Evolve	LED Roadway Luminaire/26W	ERL1	ERL1_03D340
GE Evolve	LED Roadway Luminaire/82W	ERLH	ERLH_10D340.ies, ERLH_10D340_-ELSHS-ERL1-BLCK.ies
GE Evolve	LED Roadway Luminaire/149W	ERLH	ERLH_16D340.ies, ERLH_10D340_-ELSHS-ERL1-BLCK.ies
GE Evolve	LED Roadway Luminaire/149W	ERL2	ERL2_19D340.ies, ERL2_19D340_-ELSHS-ERL2-BLCK.ies
GE Evolve	LED Roadway Luminaire/214W	ERL2	ERL2_25D340_-ELSHS-ERL2-BLCK.ies
GE Evolve	LED Roadway Luminaire/214W	ERL2	ERL2_25C340.ies

Roadway Segment Analysis

Lena Road was split into two (2) segments for analysis based on the location of signalized intersections/roundabouts. Both roadway segments are bounded by the project limits and a roundabout at the intersection of Brower Drive/Musgrave Ranch Road and Lena Road. Each direction of travel was analyzed separately consistent with lighting design guidance outlined in the FDM. Segment information is provided in **Table 3** below. An AGi Calculation Name was assigned to each segment for ease of identification on the photometric plans (see **Appendix A**).

Lighting design guidance outlined in FDM 231.2 states, "*Where corridor lighting areas adjoin different areas with higher illumination requirements, the corridor lighting may exceed its illumination requirement only in the portion where light spill from the adjacent brighter area is unavoidable. These short segments may be excluded from the lighting value checks only as necessary to transition between differing requirements.*" There are several areas referred to in this report as "transition analysis zones" where higher signalized intersection or roundabout requirements adjoin a lower corridor lighting requirement. These transition areas were removed from the corridor lighting calculations per FDM guidance and are shown in the photometric plan results in **Appendix A**.

Per coordination with FPL (see **Appendix C**), proposed 230kV transmission lines will be making a jog north and cross the new Lena Road on the south end of this lighting design. In order to meet the 20-foot clearance requirement for these overhead lines, a 14-foot light pole and 14-foot mounting height was used for area north of the 44th Avenue roundabout.

Table 3 Roadway Segments

Segment Number	From	To	AGi Calculation Name
1	44st Ave E	Brower Dr/Musgrave Ranch Rd	1_Horiz_NB Segment 1, 1_Horiz_SB Segment 1
2	Brower Dr/Musgrave Ranch Rd	SR 64 E	2_Horiz_NB Segment 2, 2_Horiz_SB Segment 2

Intersection Analysis

Horizontal photometric analysis zones for intersections were bounded by radial returns, sidewalks, and stop bars per FDOT standards at the intersections below:

1. Brower Drive/Musgrave Ranch Road and Lena Road
2. State Road 64 and Lena Road

Vertical photometric calculations were evaluated for the through movement approach at each crosswalk location along Lena Road and for the roundabout approaches.

5. Results and Conclusions

Roadway Segment Results

Upon completion of the photometric analysis for this corridor, it has been determined that lighting criteria can be met using the proposed luminaires outlined in Section 4 along Lena Road. A full photometric analysis summary for the proposed lighting design is included in **Appendix A**. The proposed luminaires are called out in the lighting plans and will be serviced by FPL load centers. Voltage drop calculations are included as **Appendix D**.

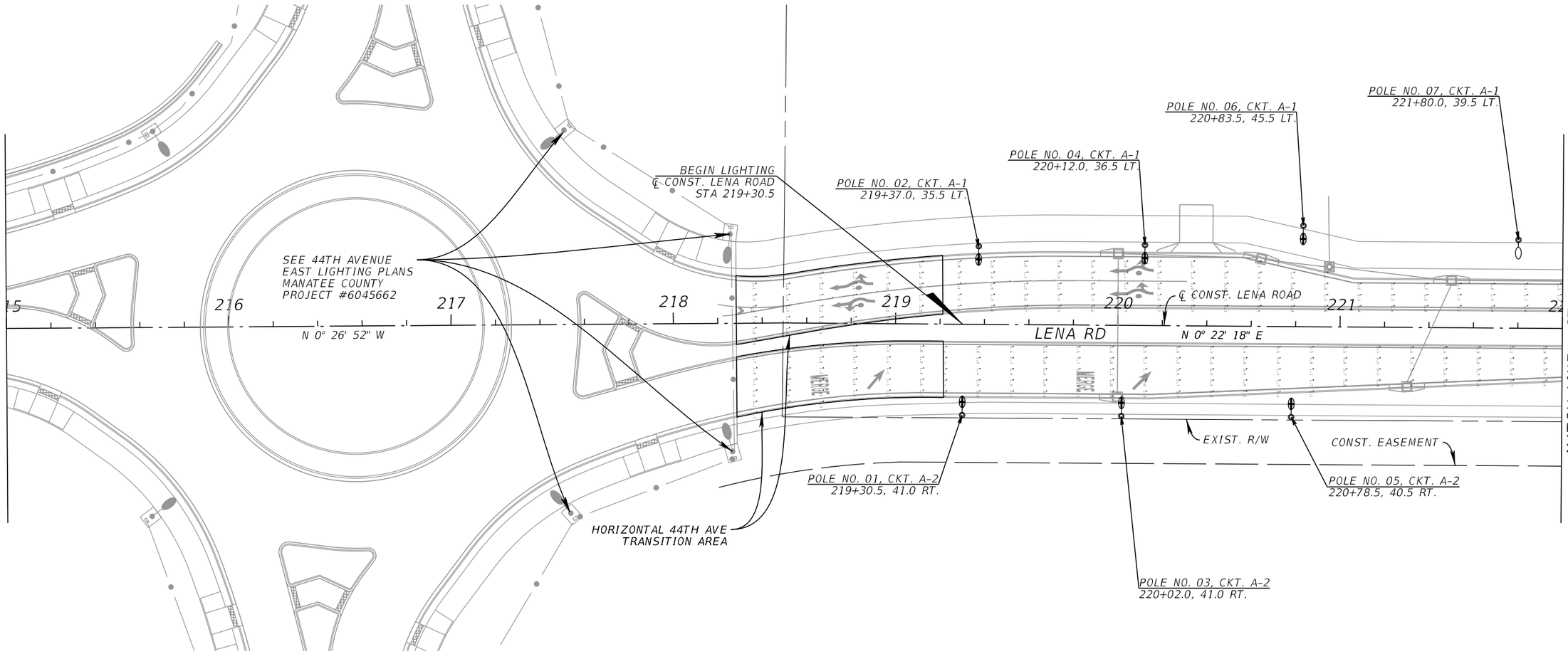
Intersection Results

<u>Brower Drive/Musgrave Ranch Road and Lena Road</u>
Photometric analysis results at the roundabout show that the standard vertical lighting criteria set forth by the FDM can be met. Per county preferences, the horizontal lighting values at the roundabout have been reduced to 2.91 F.C. due to residential homes in the area.

<u>SR 64 and Lena Road</u>
After completing the photometric analysis at the intersection, it has been determined that FDM signalized intersection New or Reconstruction lighting criteria can be met for all of the vertical turning movements at the intersection. As shown in the photometric plans (**Appendix A**), the horizontal intersection calculation does not meet the standard value of 3.0 H.F.C. as outlined in the FDM. The intersection horizontal does meet the FDM minimum of 1.5 H.F.C. Note number 2 in FDM Table 231.2.1 states the following: "*Standard (Std.) values must be met unless doing so raises the accompanying H.F.C. or V.F.C. result in excess of double its required illumination level. For such cases, the Minimum (Min.) value may apply.*" Raising the wattage of the fixtures at the intersection or adjusting the fixture location/angle to meet the 3.0 H.F.C. requirement causes many of the vertical turning movements to exceed double the 1.5 V.F.C. requirement. The right-turning movements are particularly sensitive at this intersection due to the geometry and skew of the side streets. Thus, the minimum criteria was used for horizontal intersection calculations.

A full photometric analysis summary for the proposed lighting design is included in **Appendix A**.

APPENDIX A:
ANALYSIS RESULTS



CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33
HORIZONTAL_SOUTHBOUND 44TH AVE TRANSITION	ILLUMINANCE	FC	1.30	2.1	0.8	1.63	2.63
HORIZONTAL_NORTHBOUND 44TH AVE TRANSITION	ILLUMINANCE	FC	1.41	2.1	1.0	1.41	2.10

No.	REVISIONS	DATE	BY

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MANATEE COUNTY FL

Manatee County FLORIDA

LENA ROAD

LICENSED PROFESSIONAL
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PHOTOMETRIC PLAN (01) HORIZONTAL

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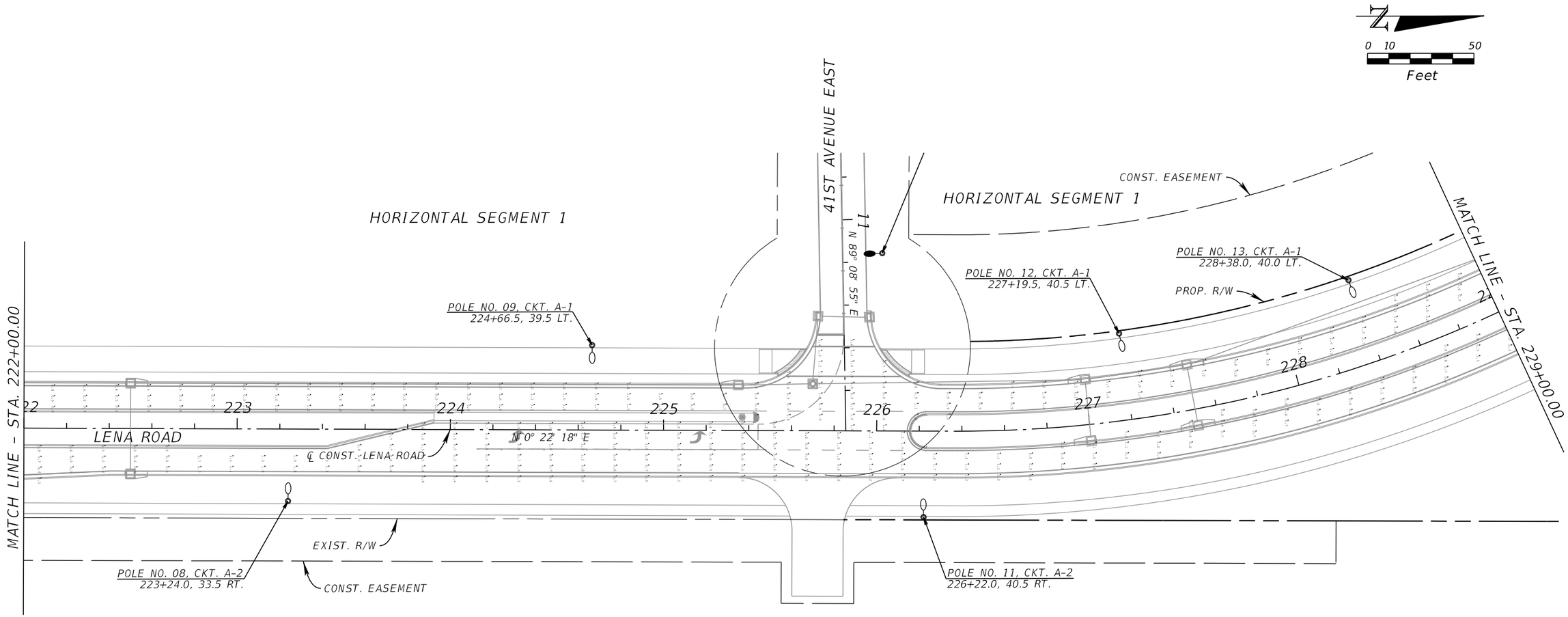

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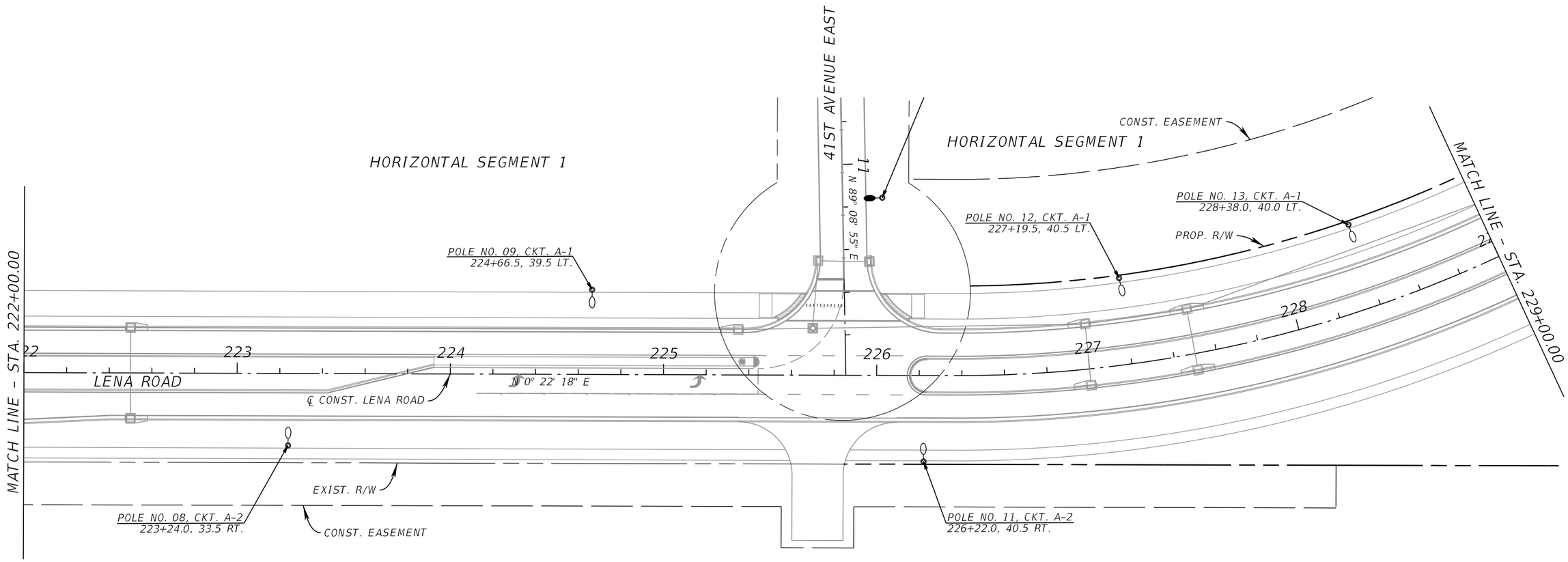

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
VERTICAL_41st AVE E_ EASTBOUND THROUGH	ILLUMINANCE	FC	1.55	N.A.	N.A.	N.A.	N.A.

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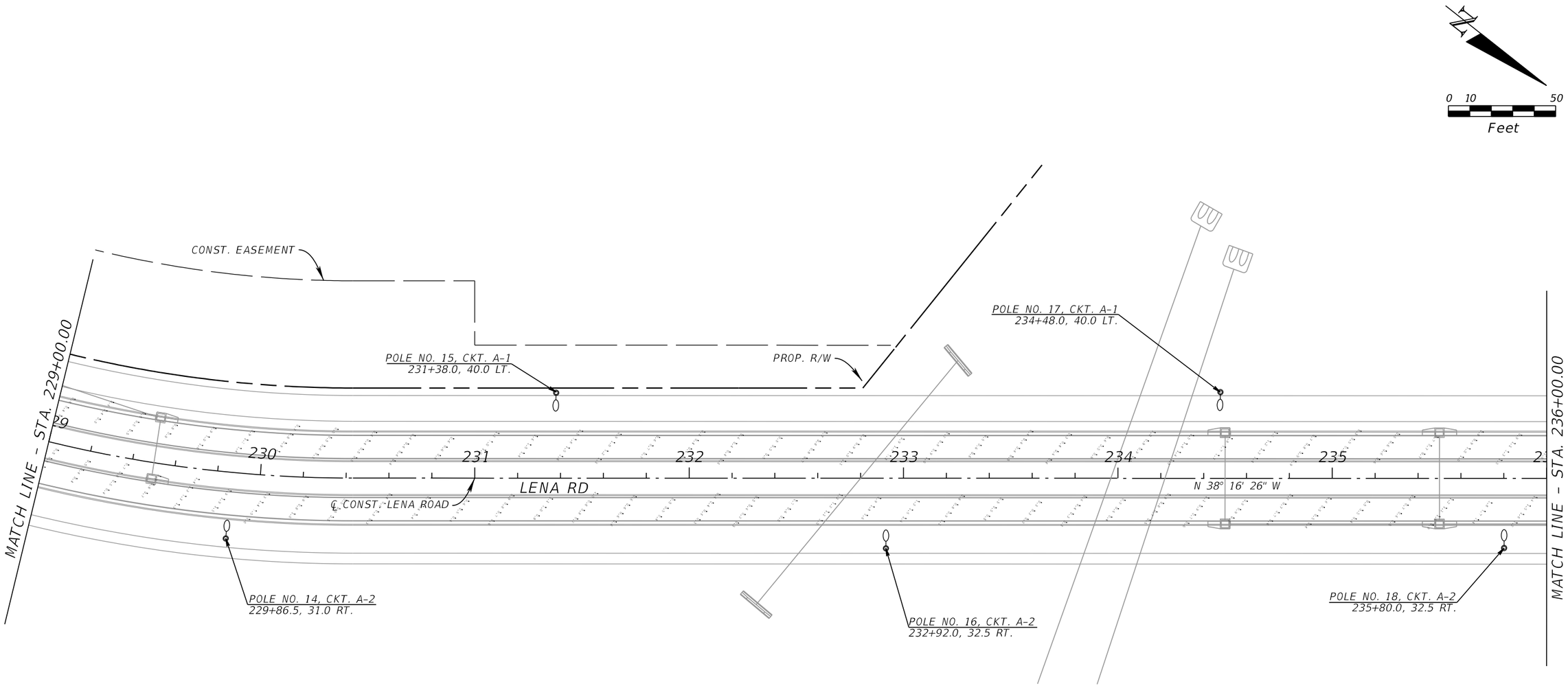

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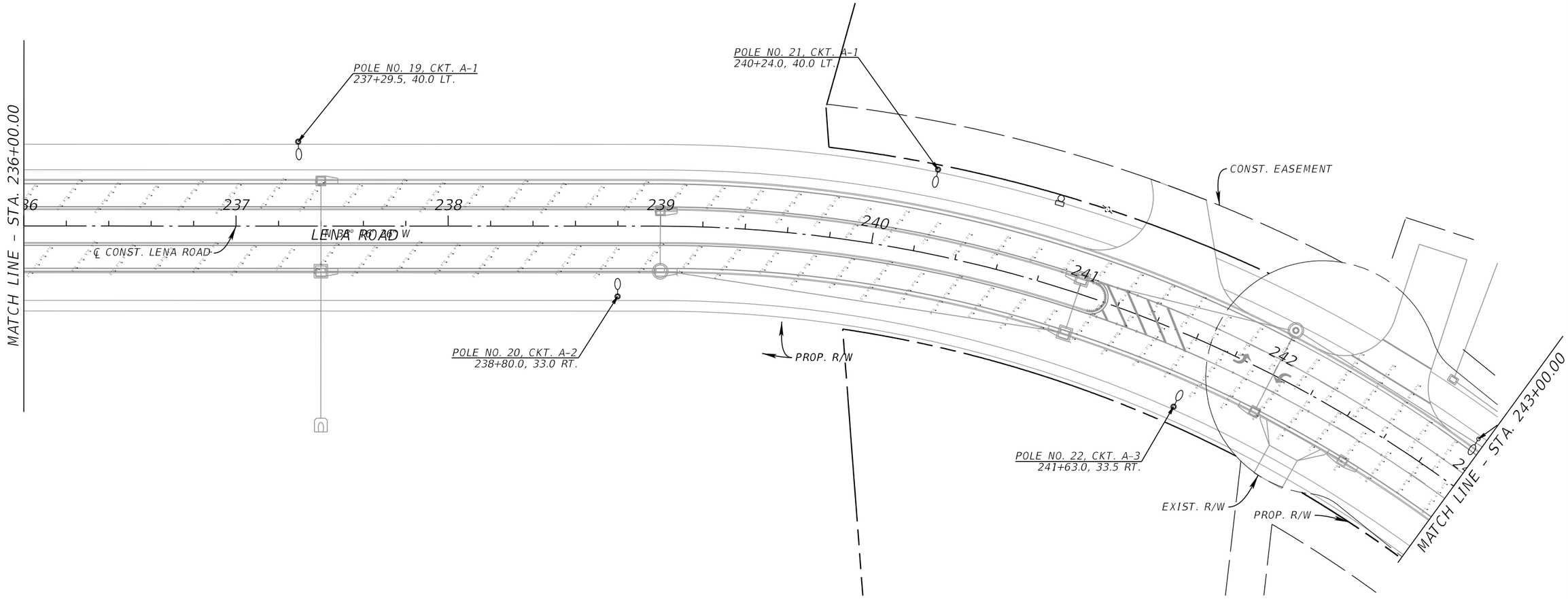

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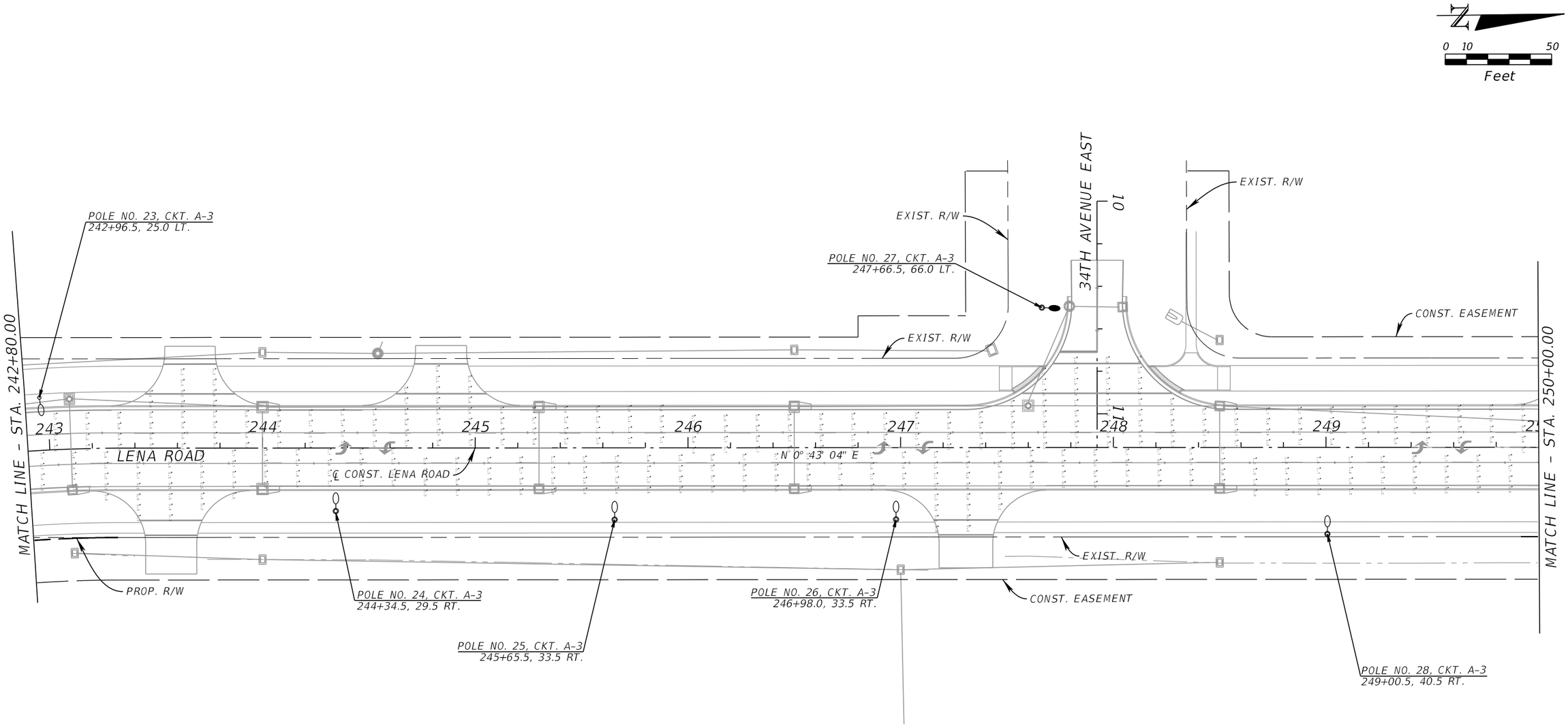

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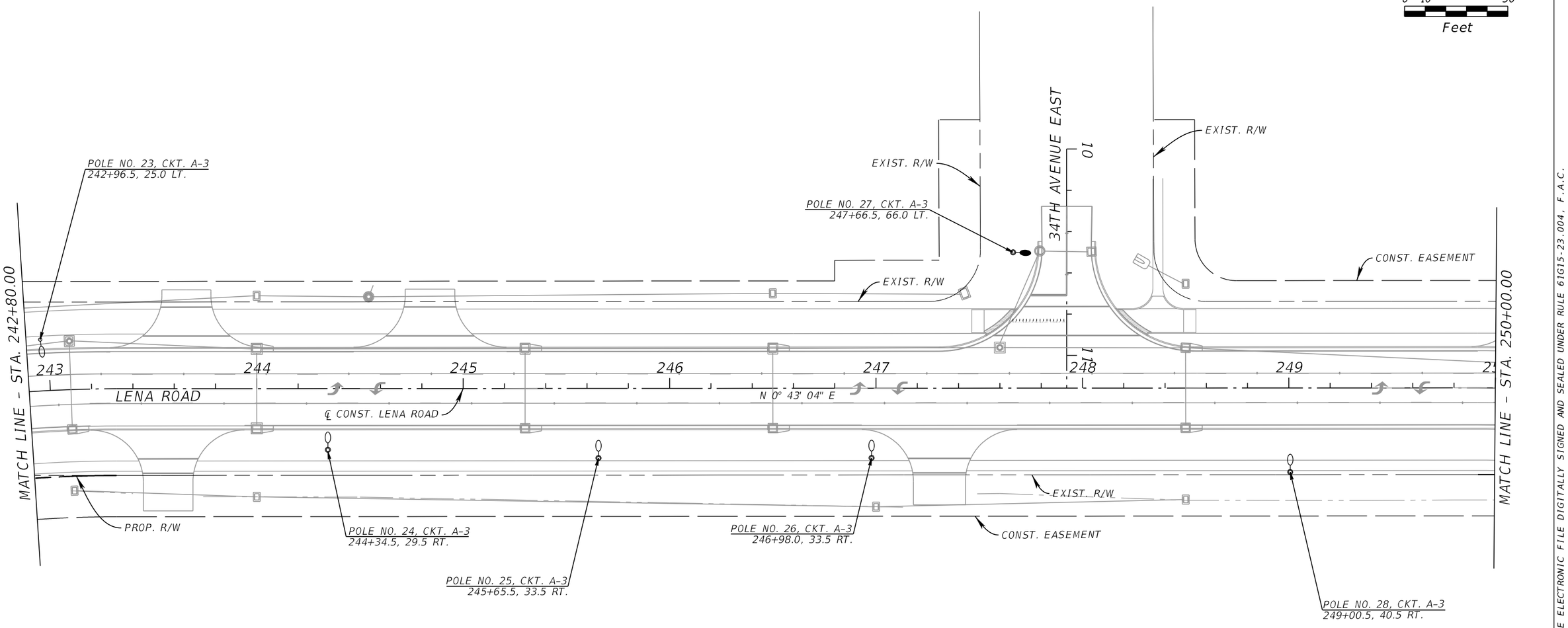

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VERTICAL_34TH AVENUE EAST EASTBOUND THROUGH	ILLUMINANCE	FC	1.51	N.A.	N.A.	N.A.	N.A.

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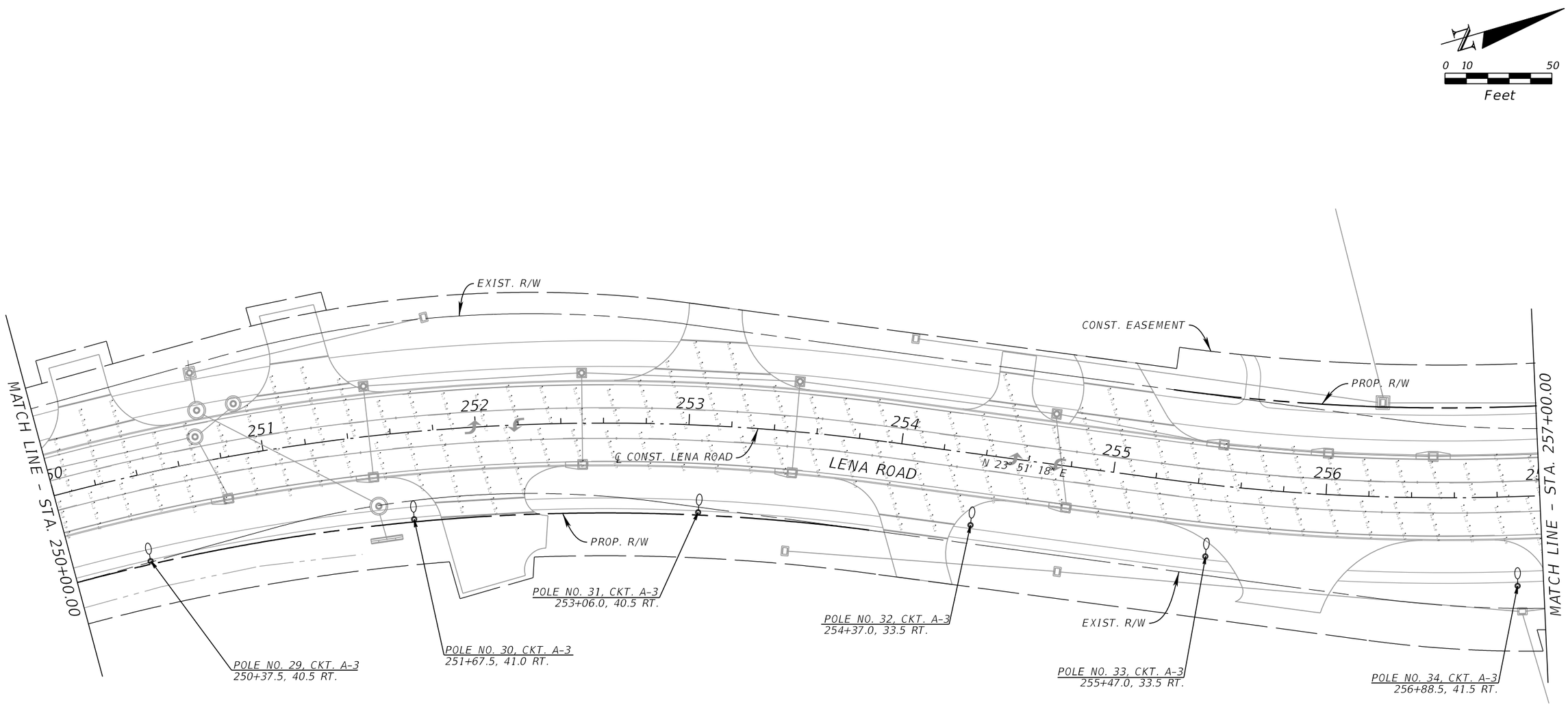

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PHOTOMETRIC PLAN (06) HORIZONTAL

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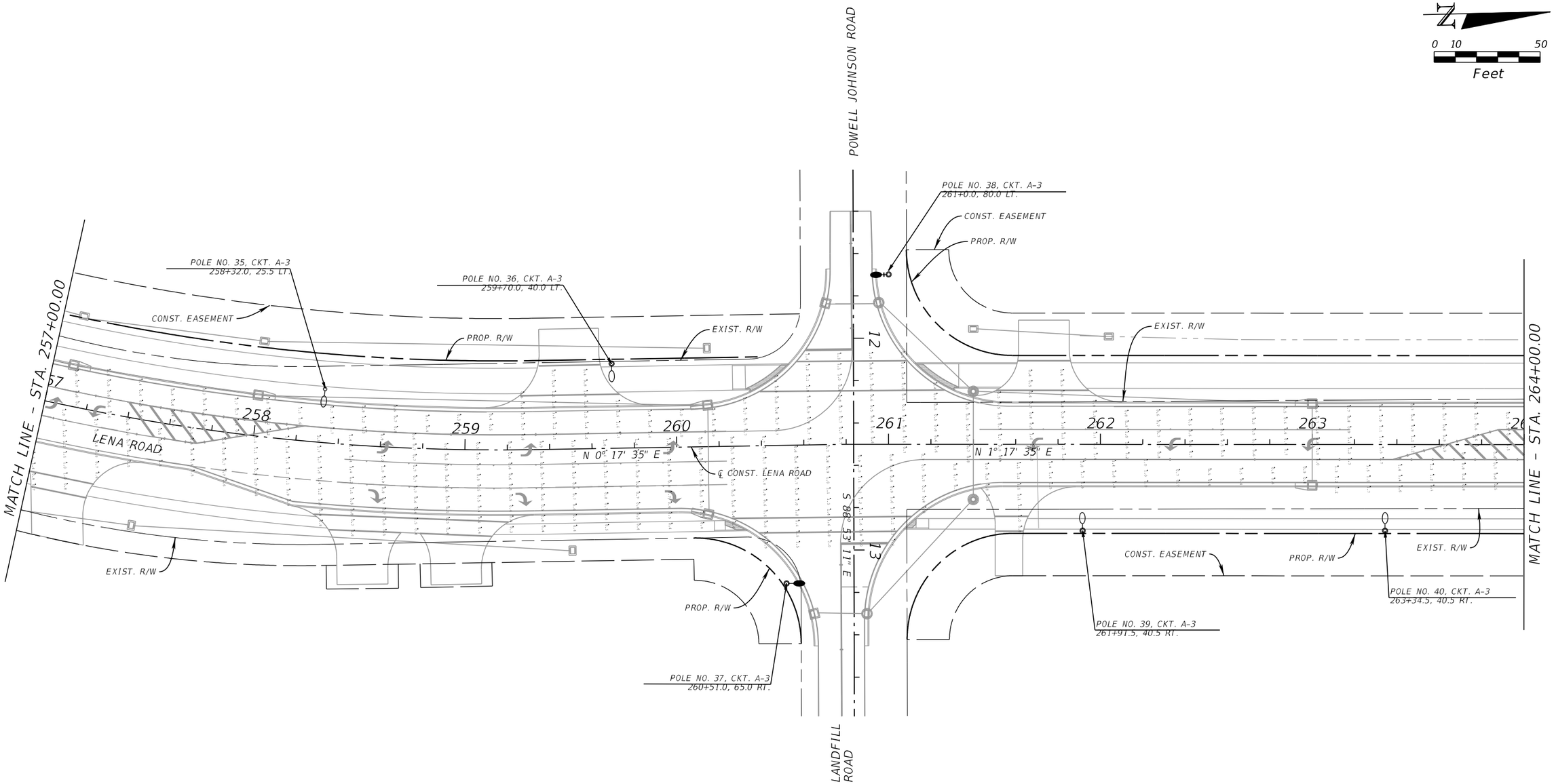

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PHOTOMETRIC PLAN (07) HORIZONTAL

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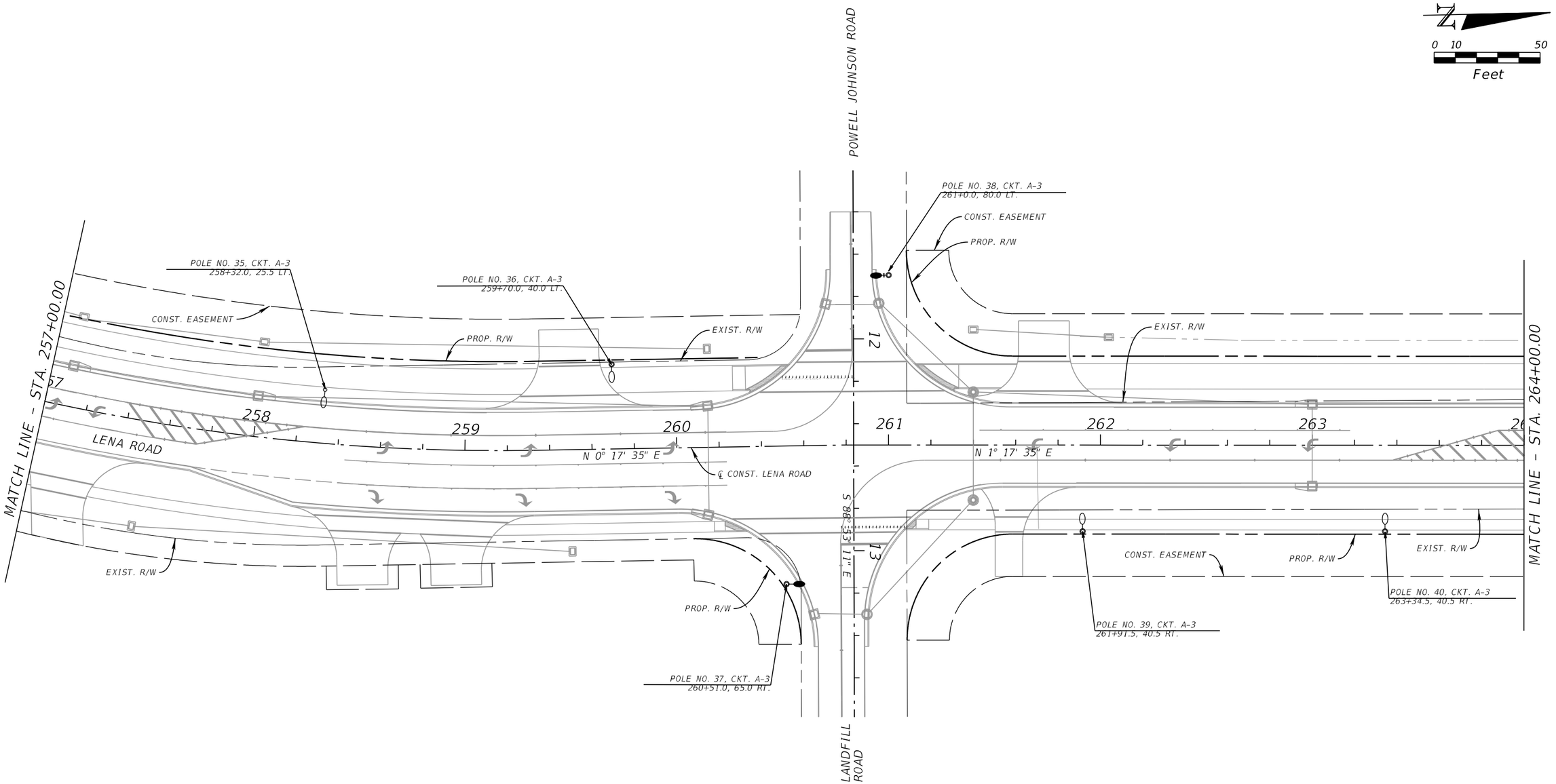

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
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VERTICAL_LANDFILL RD_WBT	ILLUMINANCE	FC	1.54	N.A.	N.A.	N.A.	N.A.

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PHOTOMETRIC PLAN (07) VERTICAL

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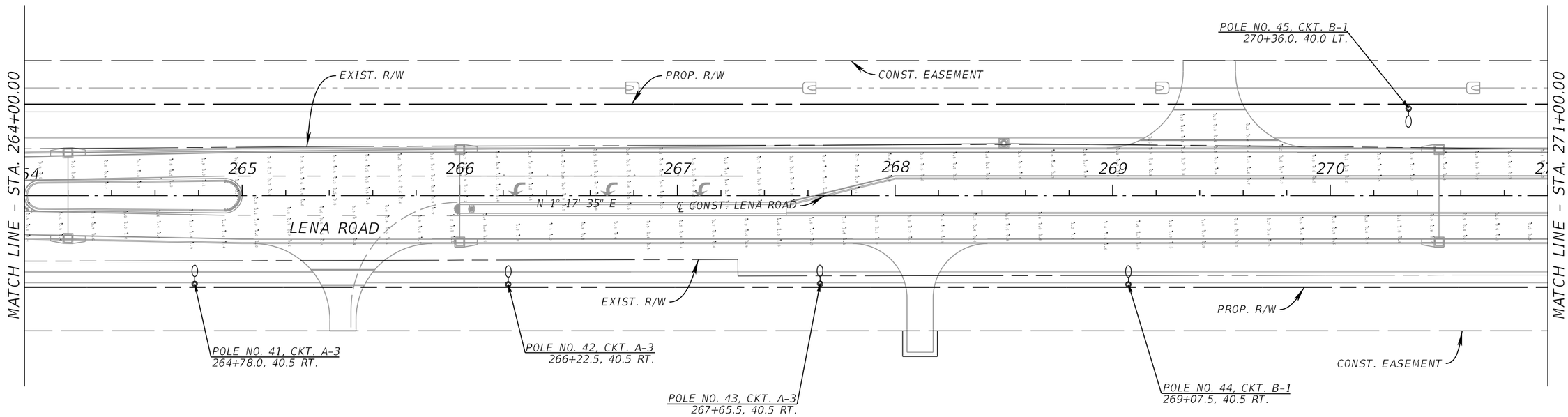

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33

No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: (813) 635-5514
WWW.KIMLEY-HORN.COM

KHA PROJECT 148400100
DATE JULY 2023
SCALE AS SHOWN
DESIGNED BY TJP
DRAWN BY MAZ
CHECKED BY TJP

MANATEE COUNTY — Manatee County FLORIDA — LENA ROAD — FL

LICENSED PROFESSIONAL
TIFFANY J. PARKER DOS SANTOS, P.E.
FL LICENSE NUMBER 87920
DATE:

PHOTOMETRIC PLAN (08) HORIZONTAL

SHEET NUMBER

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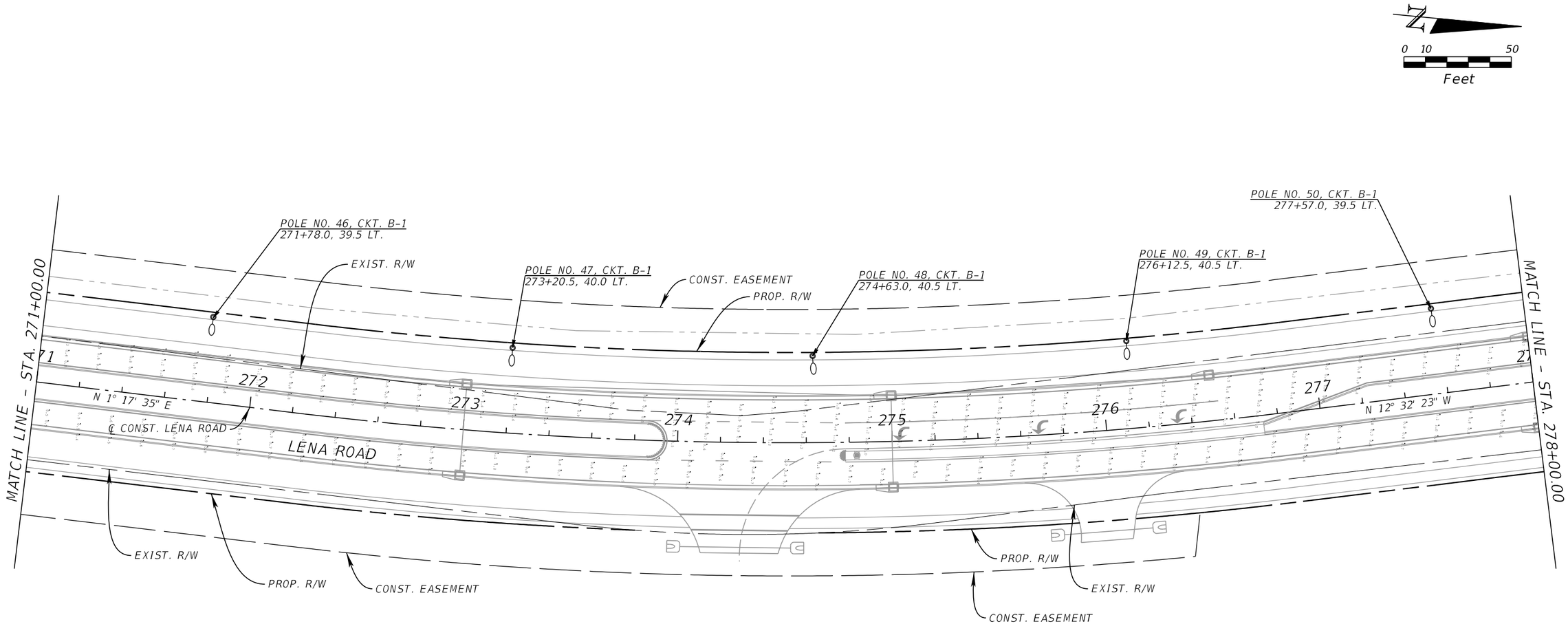
marissa.zdunkiewicz 7/25/2023 11:40:56 AM Default \\sarfp02\FL_SAR2\SAR_Roadway\TAM_Lena Road\12345615201\lighting\LDAR\PLANLT08.dgn



CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33

No.	REVISIONS	DATE	BY

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MANATEE COUNTY
Manatee County FLORIDA
LENA ROAD
FL

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FL LICENSE NUMBER 87920
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PHOTOMETRIC PLAN (09) HORIZONTAL

SHEET NUMBER

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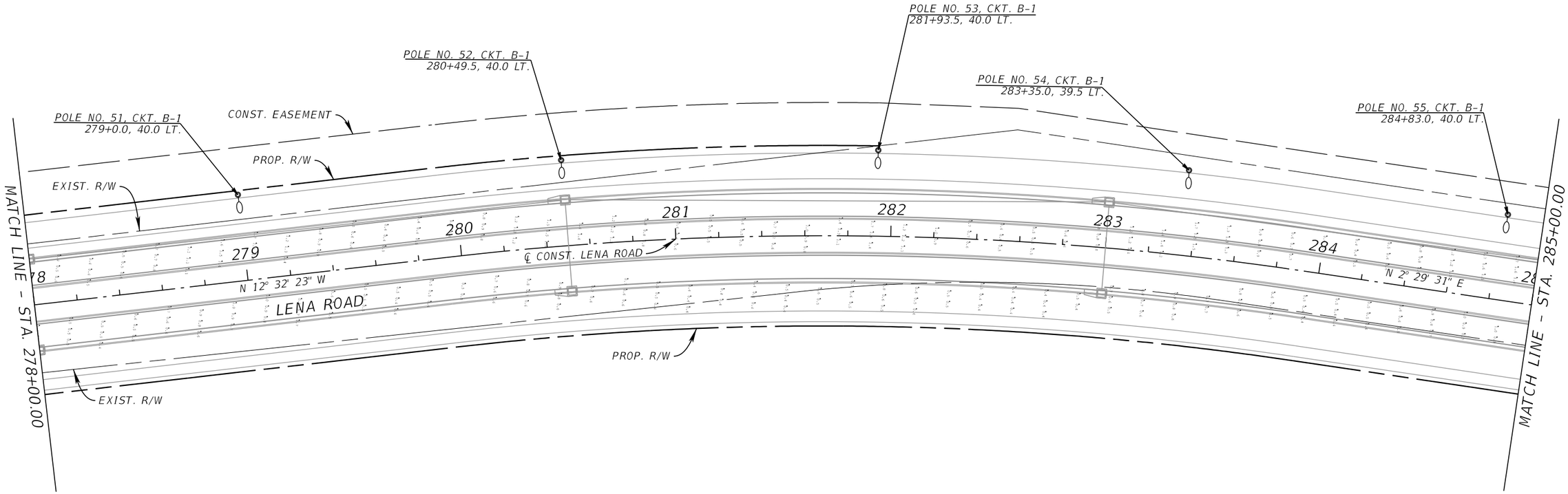

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33

No.	REVISIONS	DATE	BY

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Manatee County FLORIDA

LENA ROAD

LICENSED PROFESSIONAL
TIFFANY J. PARKER
DOS SANTOS, P.E.
FL LICENSE NUMBER
87920
DATE:

PHOTOMETRIC PLAN (10)
HORIZONTAL

SHEET NUMBER

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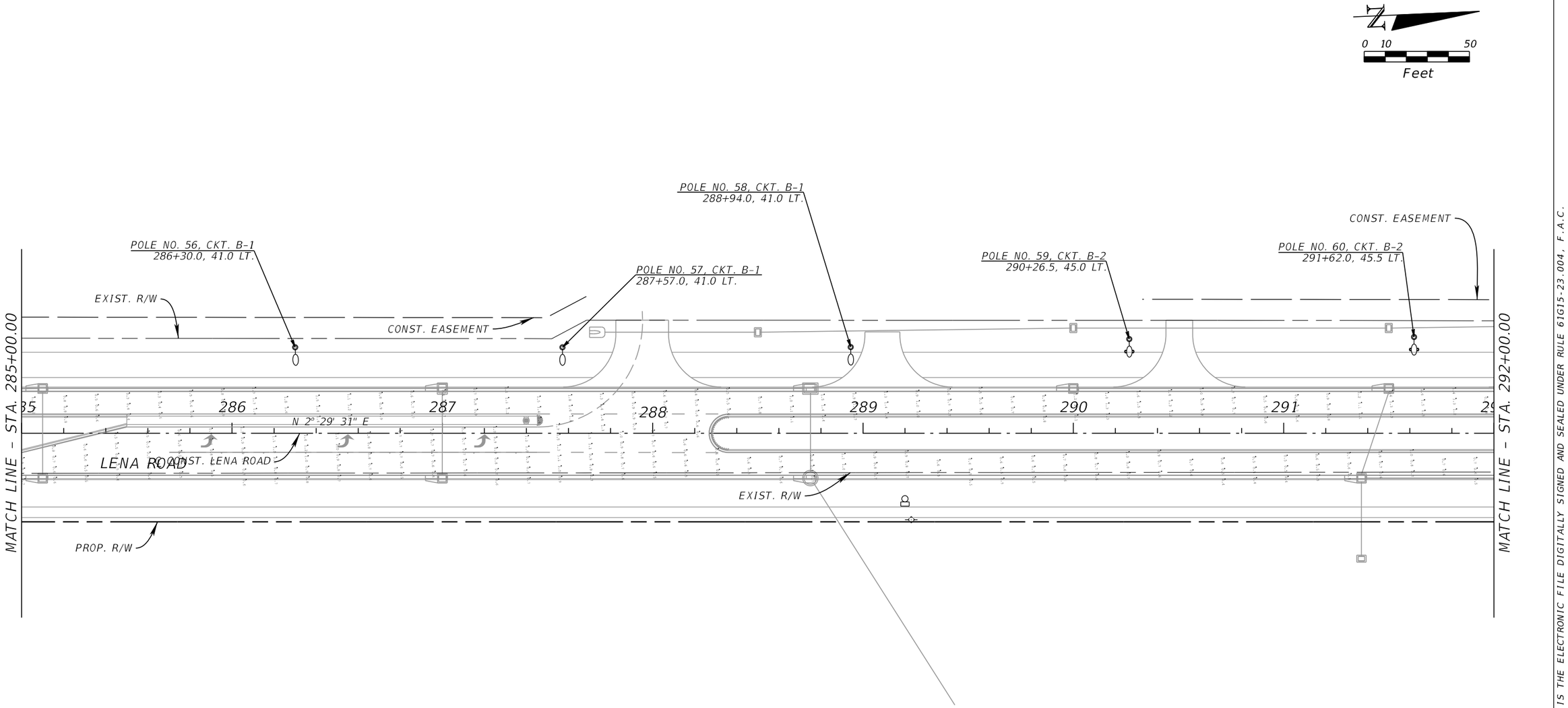

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33

No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: (813) 635-5514
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Manatee County FLORIDA

LENA ROAD

LICENSED PROFESSIONAL

TIFFANY J. PARKER DOS SANTOS, P.E.
FL LICENSE NUMBER 87920
DATE:

PHOTOMETRIC PLAN (1') HORIZONTAL

SHEET NUMBER

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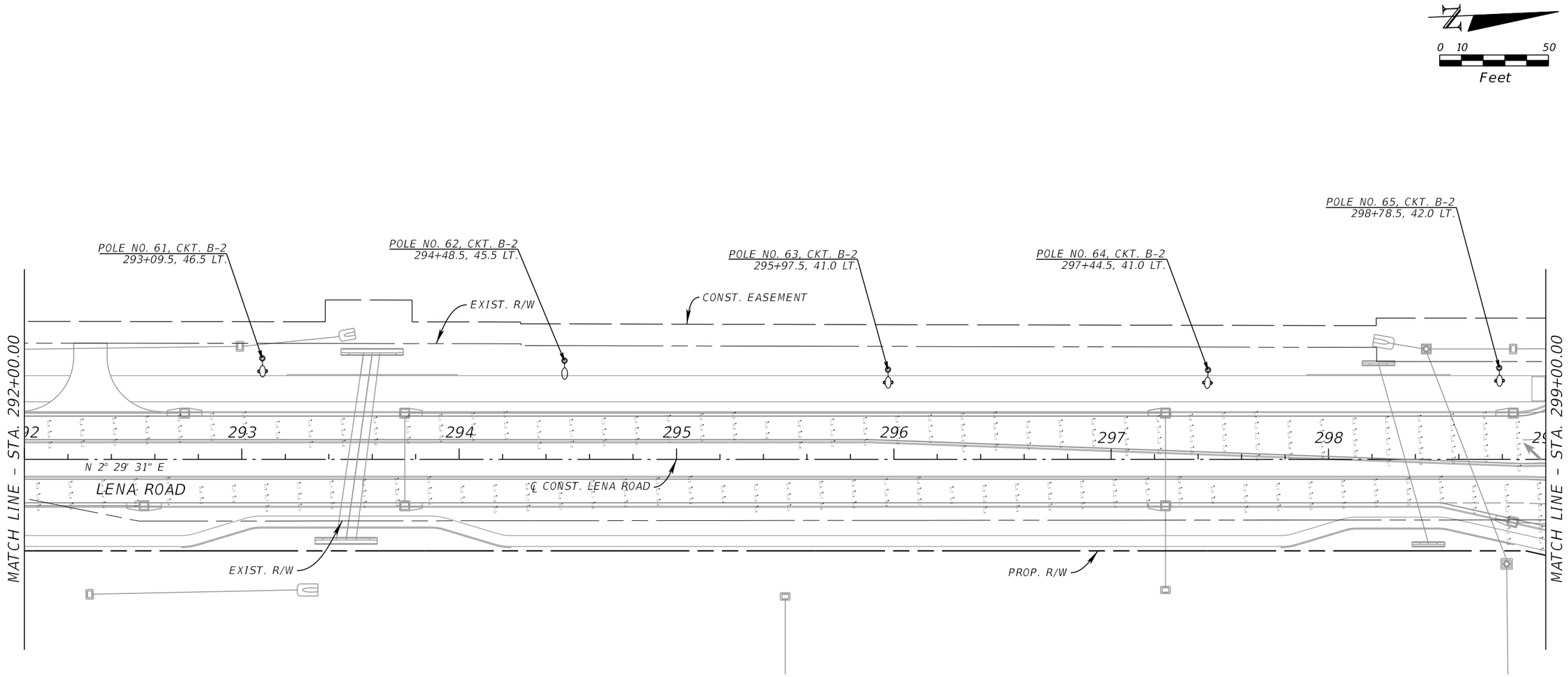

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33

No.	REVISIONS	DATE	BY

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DATE JULY 2023
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MANATEE COUNTY — Manatee County FLORIDA — FL

LENA ROAD

LICENSED PROFESSIONAL
TIFFANY J. PARKER DOS SANTOS, P.E.
FL LICENSE NUMBER 87920
DATE:

PHOTOMETRIC PLAN (12) HORIZONTAL

SHEET NUMBER

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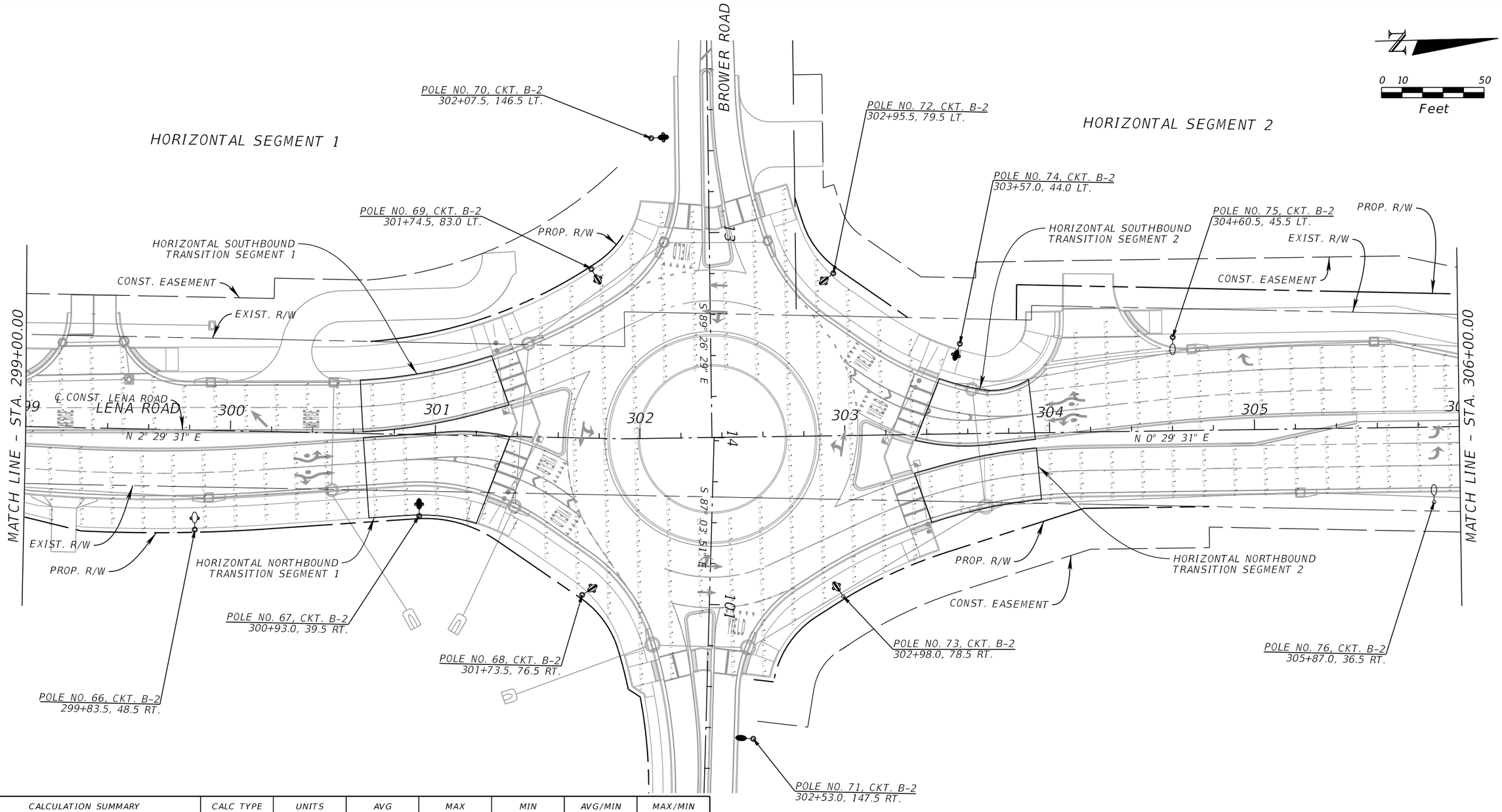

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.87	2.9	0.3	2.90	9.67
HORIZONTAL_NORTHBOUND SEGMENT 1	ILLUMINANCE	FC	0.83	2.8	0.3	2.77	9.33
HORIZONTAL_SOUTHBOUND TRANSITION RAB SEG 1	ILLUMINANCE	FC	1.37	2.0	0.9	1.52	2.22
HORIZONTAL_NORTHBOUND TRANSITION RAB SEG 1	ILLUMINANCE	FC	2.03	3.0	0.5	4.06	6.00
HORIZONTAL_SOUTHBOUND TRANSITION RAB SEG 2	ILLUMINANCE	FC	2.18	3.0	1.4	1.56	2.14
HORIZONTAL_NORTHBOUND TRANSITION RAB SEG 2	ILLUMINANCE	FC	1.10	1.6	0.7	1.57	2.29
HORIZONTAL_SOUTHBOUND SEGMENT 2	ILLUMINANCE	FC	0.86	2.0	0.3	2.87	6.67
HORIZONTAL_NORTHBOUND SEGMENT 2	ILLUMINANCE	FC	0.88	1.9	0.3	2.93	6.33
HORIZONTAL_RAB	ILLUMINANCE	FC	2.91	5.4	0.8	3.64	6.75

No.	REVISIONS	DATE	BY

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PHOTOMETRIC PLAN (13) HORIZONTAL

SHEET NUMBER

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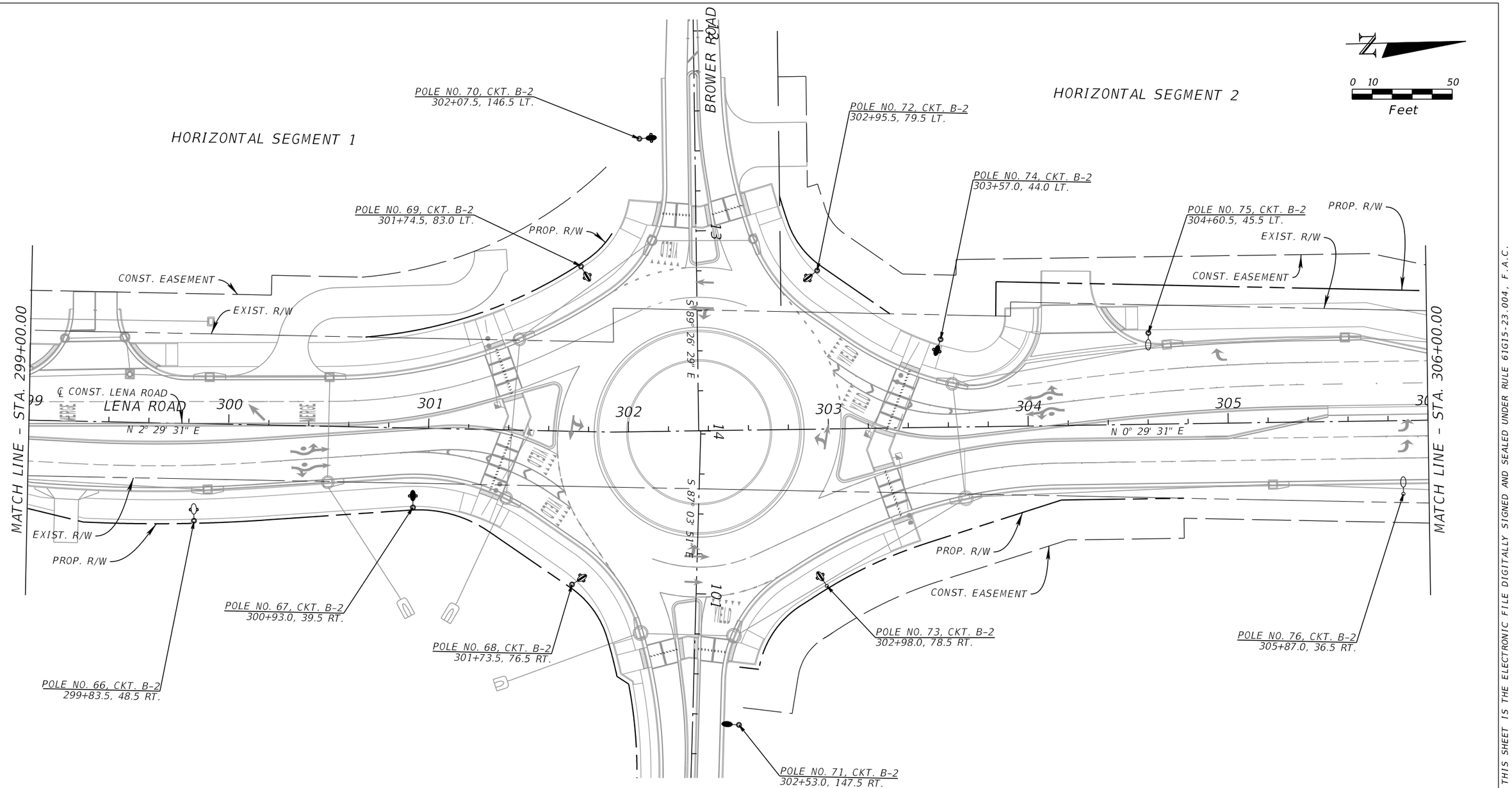

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
VERTICAL_RAB NBT	ILLUMINANCE	FC	1.65	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB NBR	ILLUMINANCE	FC	1.54	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB SBT	ILLUMINANCE	FC	1.57	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB SBR	ILLUMINANCE	FC	1.53	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB EBT	ILLUMINANCE	FC	1.59	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB EBR	ILLUMINANCE	FC	1.60	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB WBT	ILLUMINANCE	FC	1.54	N.A.	N.A.	N.A.	N.A.
VERTICAL_RAB WBR	ILLUMINANCE	FC	1.60	N.A.	N.A.	N.A.	N.A.

No.	REVISIONS	DATE	BY

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LENA ROAD
FL

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FL LICENSE NUMBER 87920
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PHOTOMETRIC PLAN (13) VERTICAL

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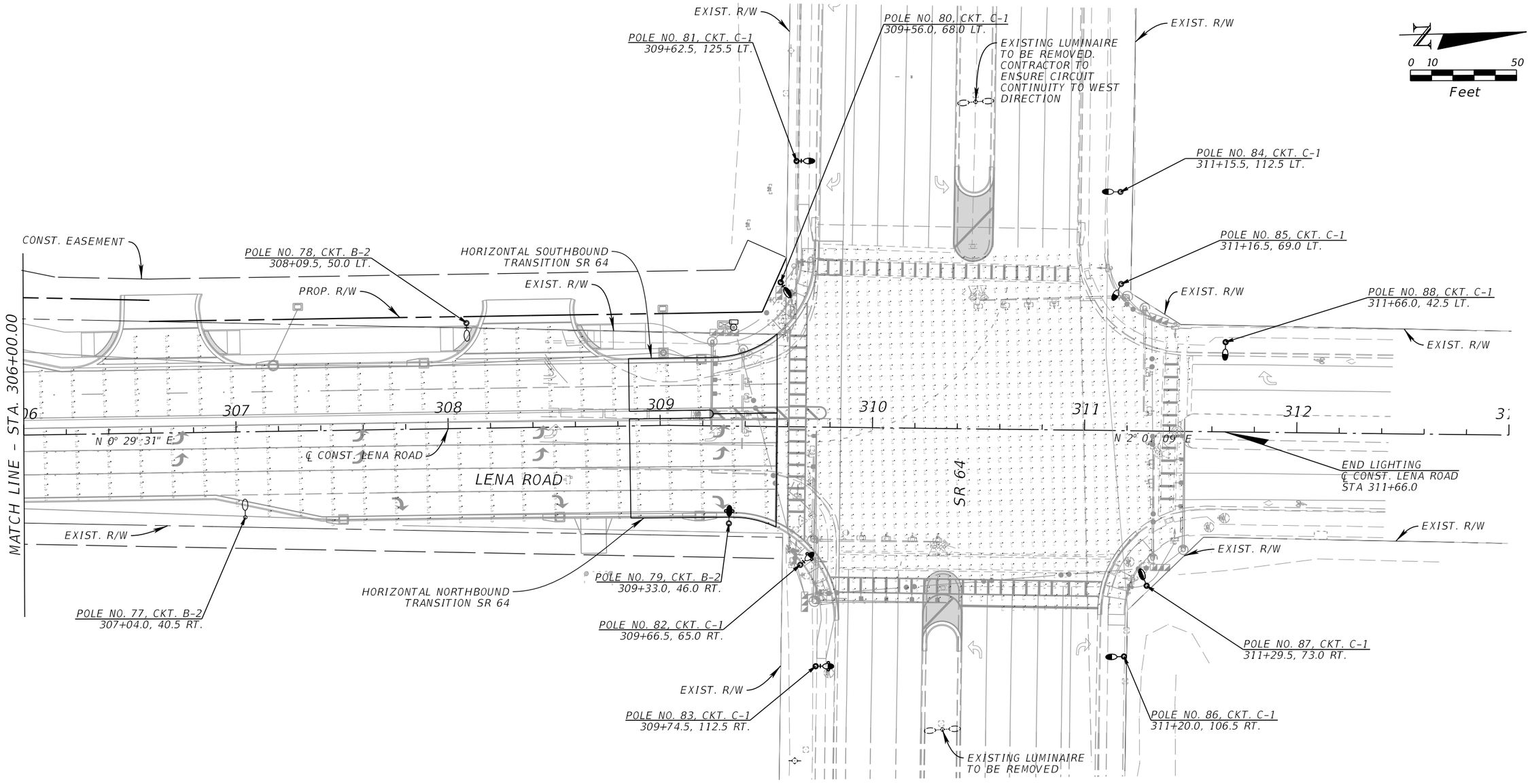

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
HORIZONTAL_SOUTHBOUND SEGMENT 2	ILLUMINANCE	FC	0.86	2.0	0.3	2.87	6.67
HORIZONTAL_NORTHBOUND SEGMENT 2	ILLUMINANCE	FC	0.88	1.9	0.3	2.93	6.33
HORIZONTAL_SOUTHBOUND TRANSITION SR 64	ILLUMINANCE	FC	1.93	2.8	0.7	2.76	4.00
HORIZONTAL_NORTHBOUND TRANSITION SR 64	ILLUMINANCE	FC	2.50	3.9	0.8	3.13	4.88
HORIZONTAL_SR 64	ILLUMINANCE	FC	2.87	5.2	1.0	2.87	5.20

No.	REVISIONS	DATE	BY

Kimley»Horn

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TIFFANY J. PARKER DOS SANTOS, P.E.
FL LICENSE NUMBER 87920
DATE:

PHOTOMETRIC PLAN (14) HORIZONTAL

SHEET NUMBER

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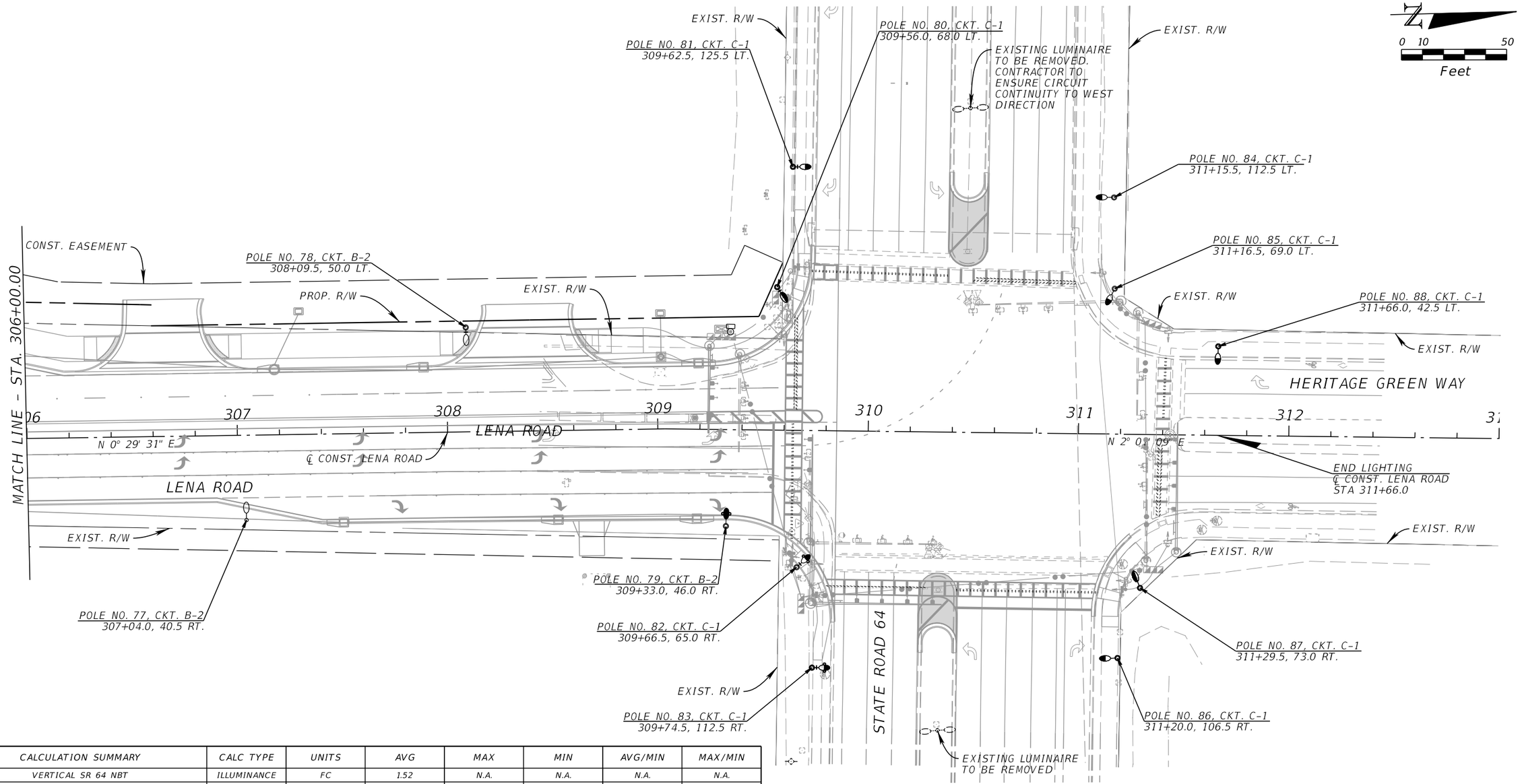

CALCULATION SUMMARY	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
VERTICAL SR 64 NBT	ILLUMINANCE	FC	1.52	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 NBR	ILLUMINANCE	FC	2.17	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 NBL	ILLUMINANCE	FC	1.50	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 SBT	ILLUMINANCE	FC	1.50	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 SBR	ILLUMINANCE	FC	1.92	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 SBL	ILLUMINANCE	FC	1.51	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 EBT	ILLUMINANCE	FC	1.51	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 EBR	ILLUMINANCE	FC	2.13	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 EBL	ILLUMINANCE	FC	1.51	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 WBT	ILLUMINANCE	FC	1.53	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 WBR	ILLUMINANCE	FC	1.82	N.A.	N.A.	N.A.	N.A.
VERTICAL SR 64 WBL	ILLUMINANCE	FC	1.52	N.A.	N.A.	N.A.	N.A.

No.	REVISIONS	DATE	BY

Kimley»Horn

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FL LICENSE NUMBER 87920
DATE:

PHOTOMETRIC PLAN (14) VERTICAL

SHEET NUMBER

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APPENDIX B:

EXCERPT FROM MANATEE COUNTY TRAFFIC ENGINEERING MANUAL

e. Conclusion
    1. Adjusted Lighting vs Existing Lighting
f. Appendices
    i. Analysis Luminaire Information
    ii. Lighting Analysis for Existing Lighting
    iii. Lighting Analysis for Adjusted Lighting

8.2 Roadway Lighting Plans

All lighting plans are to be prepared per FDOT PPM Chapter 25. Table 6.2.-1 contains Lighting Standard design values based on AASHTO Lighting Design Guide. Project-specific Lighting Standard Design values shall be pursuant to Table 8.2-1.

Table 8.2-1 Street Lighting Standard Design Values

Road Classification (per Manatee County Comprehensive Plan Table 5-1)	Average Maintained Illuminance (foot-candles)	Illuminance Uniformity Ratios	
		Avg/Min	Max/Min
Principal Arterials (301 Blvd / 15th St E)	1.0	4:1 or less	10:1 or less
Minor Arterials	1.0	4:1 or less	10:1 or less
Rural Minor Arterials (CR 39)	1.0	4:1 or less	10:1 or less
Urban Collectors	0.8	4:1 or less	10:1 or less
Rural Major Collectors	0.8	4:1 or less	10:1 or less
Rural Minor Collectors	0.6	4:1 or less	10:1 or less

Source: AASHTO Lighting Design Guide Table 3-5a

The County Traffic Design staff will interpret and provide project specific design values to the project design engineer.

8.3 Intersection Lighting Plans

All lighting plans are to be prepared per FDOT Design Manual Chapter 231. Table 231.2.1., while making sure the lighting design doesn't create dark and bright spot scenario for roadway users along the corridor.

Clearzone requirements for lighting pole placement shall follow FDOT Design Manual Standards. It is County's preference to place the poles outside the sidewalk if practicable, while making sure residences and businesses adjacent to the corridor are not adversely affected by the corridor/intersection lighting.

APPENDIX C:
COORDINATION

Parker, Joshua

From: Chris Stafford <cstafford@elementeg.com>
Sent: Friday, July 14, 2023 1:30 PM
To: Barnwell, Shari
Cc: Hoke, Mason; Parker, Joshua; Reid, Phil; Parker, Tiffany; Mike Hammer
Subject: RE: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

Categories: External

Shari,

I submitted the updated lighting plans to FP&L Distribution on Wednesday and requested follow up to the questions/information asked in previous emails. I have not yet heard back, but will continue to follow up with him to have this early next week.

FP&L Transmission provided a response to the questions below. Please see their response:
As I am sure that you are aware, our transmission conductor heights vary under a number of day to day conditions. This relocation is also still being designed. Therefore I cannot give you specifics to the exact conductor heights. We encourage everyone to use conflict lighting fixtures with mount heights <14 ft tall in areas near the corridor. While mounting heights over 14 ft may not be an OSHA or NESC clearance issue, the conflict lighting fixtures are the best option for safety and maintenance.
You can have your lighting EOR contact our Design Engineer (Justin Jacob – cc'd) if he needs any additional information.

I will continue to follow up next week once I have additional information to provide.

Thank you,

CHRIS STAFFORD | UTILITY COORDINATOR

ELEMENT
ENGINEERING GROUP

ELEMENT ENGINEERING GROUP, LLC
1713 E. 9th AVENUE | TAMPA, FL 33605
P: 813.8521888 | **F:** 813.386.2106 | **TF:** 866.381.6664
CSTAFFORD@ELEMENTEG.COM | WWW.ELEMENTEG.COM
TRANSPORTATION | CIVIL | UTILITY COORDINATION
SURVEYING & MAPPING
SUBSURFACE UTILITY ENGINEERING
CERTIFIED MBE | DBE

From: Barnwell, Shari <Shari.Barnwell@kimley-horn.com>
Sent: Tuesday, July 11, 2023 1:13 PM
To: Chris Stafford <cstafford@elementeg.com>
Cc: Hoke, Mason <Mason.Hoke@kimley-horn.com>; Parker, Joshua <Joshua.Parker@kimley-horn.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Mike Hammer <mhammer@elementeg.com>
Subject: RE: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

CAUTION: [EXTERNAL] This Email Originated From Outside The Organization. Do Not Click Links or Open Attachments Unless You Recognize The Sender And Know The Content Is Safe.

Chris,

Please see additional questions / information needed from FPL, from our Lighting EOR.
Please request as well.

Thank-you,

Shari K. Barnwell, P.E.
Kimley-Horn | 201 North Franklin St., Suite 1400, Tampa, FL 33602
Direct: 813 635 5514 | Mobile: 813 426 5415

From: Parker, Tiffany <Tiffany.Parker@kimley-horn.com>
Sent: Tuesday, July 11, 2023 11:35 AM
To: Barnwell, Shari <Shari.Barnwell@kimley-horn.com>; Reid, Phil <Phil.Reid@kimley-horn.com>
Cc: Hoke, Mason <Mason.Hoke@kimley-horn.com>; Parker, Joshua <Joshua.Parker@kimley-horn.com>
Subject: RE: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

Shari,

A few questions regarding the below email:

1) Can FPL Transmission provide us a markup so that we have a more accurate snapshot of where these lines will be?
2) Can they also provide us the heights of the proposed transmission lines? 230kv lines have a larger clearance requirement so we need to be sure that we meet this.
3) We need more detail on what they are looking for with a 14' mounting height. Do they want the fixture itself mounted no higher than 14 feet? Or do they want the conflict pole upright to be <14 feet?

a. If it is the former, we will have to use something that looks like this: 

b. If it is the latter, we may have to discuss further.

Note that the 14' mounting height requirement either way is going to make quite an aesthetic difference in this area of the corridor. I'd really like to see a PDF markup of the transmission lines because maybe we can avoid them altogether.

Thank you,

Tiffany Parker, P.E.
Kimley-Horn | 189 S. Orange Avenue, Suite 1000 | Orlando, FL 32801
Direct: 407 459 8146 | Main: 407 898 1511
Connect with us: Twitter | LinkedIn | Facebook | YouTube

From: Barnwell, Shari <Shari.Barnwell@kimley-horn.com>
Sent: Tuesday, July 11, 2023 8:24 AM
To: Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Reid, Phil <Phil.Reid@kimley-horn.com>
Cc: Hoke, Mason <Mason.Hoke@kimley-horn.com>
Subject: FW: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

Tiffany and Phil,

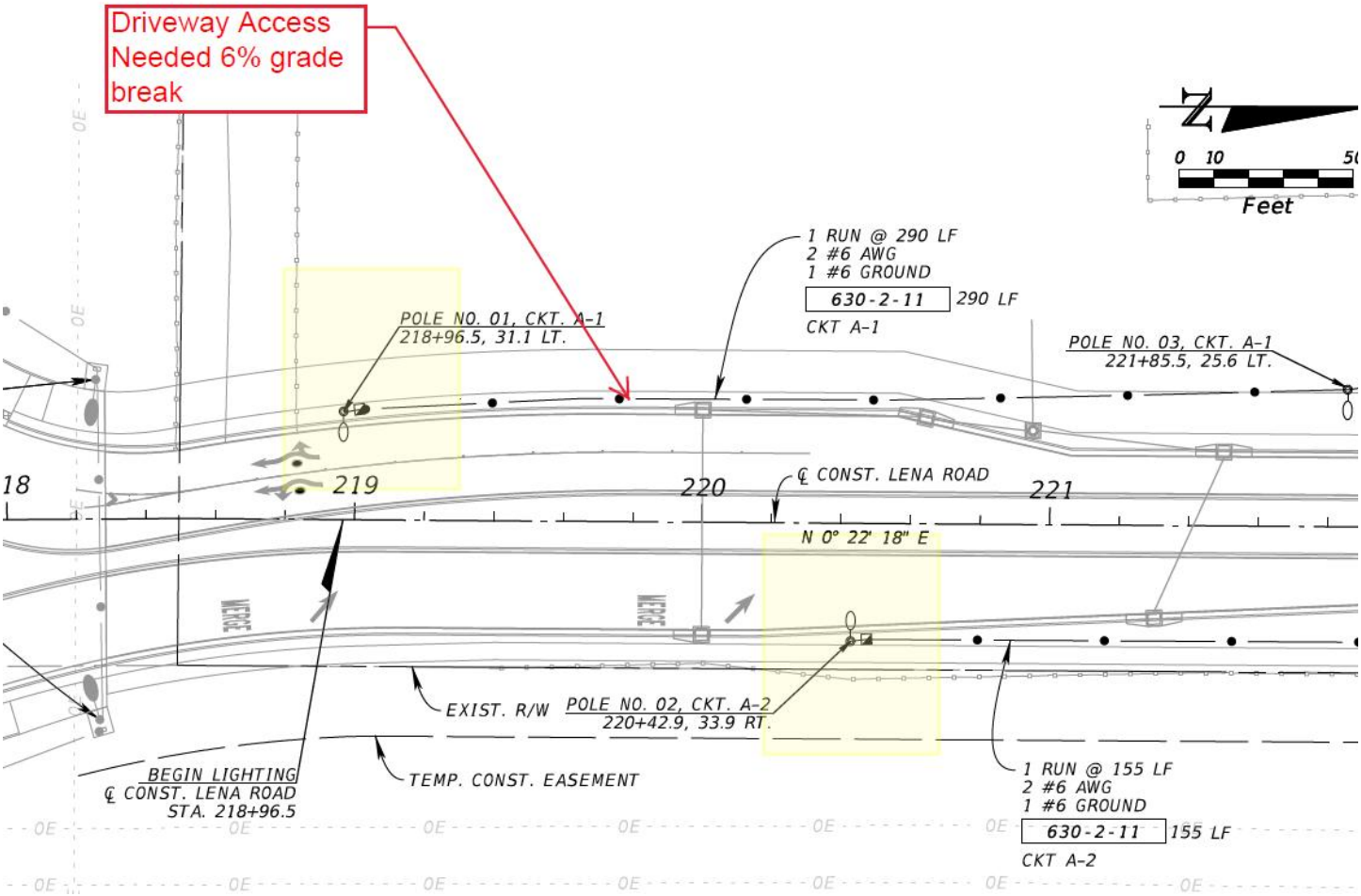
Please makes sure FLD requests are addressed in the plans.

Shari K. Barnwell, P.E.
Kimley-Horn | 201 North Franklin St., Suite 1400, Tampa, FL 33602
Direct: 813 635 5514 | Mobile: 813 426 5415

From: Ledbetter, Craig <Craig.Ledbetter@fpl.com>
Sent: Tuesday, July 11, 2023 8:01 AM

To: Coker, Gregory <Gregory.Coker@fpl.com>; Barnwell, Shari <Shari.Barnwell@kimley-horn.com>
Cc: Chris Stafford <cstafford@elementeg.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Schooley, Cris <Cris.Schooley@kimley-horn.com>; jerry.varghese@mymanatee.org; Mosolf, Scott <Scott.Mosolf@fpl.com>; anthony.russo@mymanatee.org; Crenshaw, Cameron <Cameron.Crenshaw@fpl.com>; Mike Hammer <mhammer@elementeg.com>; Starr, Jason <Jason.Starr@hdrinc.com>
Subject: RE: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

All:
FP&L Transmission is working with the county on the 6045662 44th Avenue Roundabout project. Please be aware that the two active 230kv Transmission lines will be making a jog to the north and cross the new Lena Road at approx. Station #s 219+00 – 220+00. We ask that conflict lighting in this are be installed with mounting heights <14 ft at the locations shown below near the corridor.
We are also working with Jason Starr of HDR to plan our access into the new corridor. This will require a driveway cut at approx. 219+80 RT per the determination of Mr. Starr. Please use FDOT Index 522-003 for a concrete flared driveway min width of 14 ft. for commercial traffic.



Please let me know if you have any questions or concerns.

Regards,

Craig B Ledbetter | PE

Senior Engineer - T/S
Florida Power & Light Company
Office: 561.803.7942
Cell: 561.532.7082

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From: Coker, Gregory <Gregory.Coker@fpl.com>
Sent: Monday, July 10, 2023 5:08 PM
To: Barnwell, Shari <Shari.Barnwell@kimley-horn.com>
Cc: Chris Stafford <cstafford@elementeg.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Ledbetter, Craig <Craig.Ledbetter@fpl.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Schooley, Cris <Cris.Schooley@kimley-horn.com>; jerry.varghese@mymanatee.org; Mosolf, Scott <Scott.Mosolf@fpl.com>; anthony.russo@mymanatee.org; Crenshaw, Cameron <Cameron.Crenshaw@fpl.com>; Mike Hammer <mhammer@elementeg.com>
Subject: RE: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

All,

Since I just returned today from vacation (6/21-7/9), a 20' upright is acceptable in this case. Regarding the proposed FPL OE heights, it will vary from span to span based on length & FPL equipment installed on each adjacent pole.

Many thanks for any feedback!

Greg Coker
Contractor – Working on Behalf of
Florida Power & Light
Whitfield Service Center
1253 12th Ave E | Palmetto, FL 34221
813-422-8232 cell |Gregory.Coker@FPL.com

Please contact me with any questions or concerns. If you cannot reach me, feel free to contact my Engineering Leader Ray Vargas at (o) 941-927-4262, (c) 941-266-3118 or Ray.Vargas@fpl.com.

*Visit the new **FPL Project Portal** at FPL.com/construction to manage your FPL residential and commercial construction projects.*

FPL Electric Service Standards https://www.fpl.com/partner/builders/service-standards.html

---

From: Barnwell, Shari <Shari.Barnwell@kimley-horn.com>
Sent: Monday, July 10, 2023 4:30 PM
To: Coker, Gregory <Gregory.Coker@fpl.com>
Cc: Chris Stafford <cstafford@elementeg.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Ledbetter, Craig <Craig.Ledbetter@fpl.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Schooley, Cris <Cris.Schooley@kimley-horn.com>; jerry.varghese@mymanatee.org; Mosolf, Scott <Scott.Mosolf@fpl.com>; anthony.russo@mymanatee.org; Crenshaw, Cameron <Cameron.Crenshaw@fpl.com>; Mike Hammer <mhammer@elementeg.com>
Subject: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

Greg and Mike,

I am following up with you on the request below.
Please advise.

Shari K. Barnwell, P.E.
Kimley-Horn | 201 North Franklin St., Suite 1400, Tampa, FL 33602
Direct: 813 635 5514 | Mobile: 813 426 5415

From: Barnwell, Shari
Sent: Wednesday, June 21, 2023 5:43 PM
To: Coker, Gregory <Gregory.Coker@fpl.com>; Cameron.Crenshaw@FPL.com
Cc: Mike Hammer <mhammer@elementeg.com>; Chris Stafford <cstafford@elementeg.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Ledbetter, Craig <Craig.Ledbetter@fpl.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Schooley, Cris <Cris.Schooley@kimley-horn.com>; jerry.varghese@mymanatee.org; scott.mosolf@fpl.com; cameron.crenshaw@flp.com; anthony.russo@mymanatee.org
Subject: RE: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

Resending to Cameron, had incorrect email address.

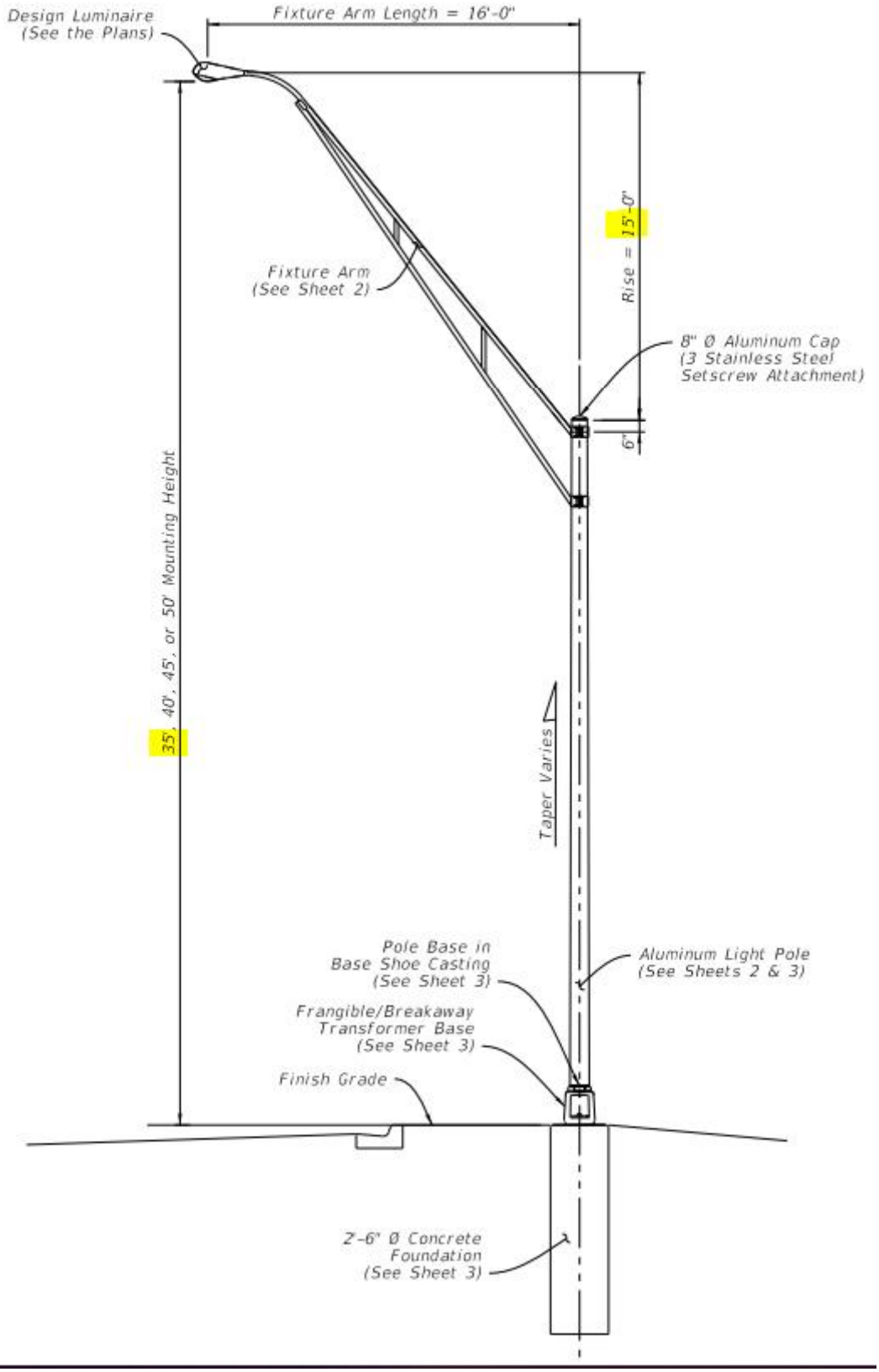
Shari K. Barnwell, P.E.
Kimley-Horn | 201 North Franklin St., Suite 1400, Tampa, FL 33602
Direct: 813 635 5514 | Mobile: 813 426 5415

From: Barnwell, Shari
Sent: Wednesday, June 21, 2023 3:33 PM
To: Coker, Gregory <Gregory.Coker@fpl.com>
Cc: Mike Hammer <mhammer@elementeg.com>; Chris Stafford <cstafford@elementeg.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Ledbetter, Craig <Craig.Ledbetter@fpl.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Parker, Tiffany <Tiffany.Parker@kimley-horn.com>; Schooley, Cris <Cris.Schooley@kimley-horn.com>; jerry.varghese@mymanatee.org; scott.mosolf@fpl.com; cameron.crenshaw@flp.com; anthony.russo@mymanatee.org
Subject: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING | Lena Road

Greg,

We have run our photometrics based on the request made by FPL to have the upright at 18-ft which is non-standard. Per Index 715-003 the minimum is 20' upright, with 15' for the arm height, (for a total 35').
Implementing the non-standard lower height of the 18-ft upright, is creating hot spots and not meeting the photometric uniformity ratios required at the current spacing shown in the plans (attached)

- We would like to ask FPL, if the 20-ft standard mounting height would be acceptable? See below.
- What is the proposed height of overhead electric lines?



Shari K. Barnwell, P.E.
Kimley-Horn | 201 North Franklin St., Suite 1400, Tampa, FL 33602
Direct: 813 635 5514 | Mobile: 813 426 5415

From: Coker, Gregory <Gregory.Coker@fpl.com>
Sent: Friday, March 31, 2023 3:34 PM
To: Chris Stafford <cstafford@elementeg.com>; anthony.russo@mymanatee.org; jerry.varghese@mymanatee.org; eric.shroyer@mymanatee.org; Barnwell, Shari <Shari.Barnwell@kimley-horn.com>; Schooley, Cris <Cris.Schooley@kimley-horn.com>; Reid, Phil <Phil.Reid@kimley-horn.com>; Spang, Maile <Maile.Spang@kimley-horn.com>; Parker, Joshua <Joshua.Parker@kimley-horn.com>; Mumea, Thomas E <Thomas.Mumea@charter.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Hutton, Denise <denise.hutton@ftr.com>; McFarlane, Alex <AMcFarlane@tecoenergy.com>; Barra, James <james.barra1@verizonwireless.com>; Ledbetter, Craig <Craig.Ledbetter@fpl.com>
Cc: Mike Hammer <mhammer@elementeg.com>
Subject: FPL FEEDBACK REGARDING PROPOSED POADWAY LIGHTING E: Phase II Meeting Minues | Lena Road from 44th Avenue East to SR 64 | Manatee County - Meeting Minutes-Sign in Sheet-Updated Utility Plans

Chris,

Attached is a preliminary FPL mark-up showing the planned relocated FPL OE distribution (in brown). It shows that conflicts will exist at the following proposed County light pole locations….31-39, 44, 46, 52,56, 60, 70 and 71. Additionally, conflicts will very likely exist at 48, 50, 53-55, 57-59 and 63. Please have your lighting design team reconsider the current roadway light placement to see how these conflicts can best be eliminated. Use of “conflict style” poles would be an easy fix in many cases (i.e. 18’ max pole height, with angled davit up & out over roadway).

While FPL poles will typically be set with field side as close as possible to the R/W, the actual energized 23kv conductors will overhang into the R/W a distance of approx. 3-5 ft. The lowest energized conductor will be approx. 29-30 ft above existing grade worst case (midspan).

Many thanks for any feedback!

Greg Coker
Contractor – Working on Behalf of
Florida Power & Light
Whitfield Service Center
1253 12th Ave E | Palmetto, FL 34221
813-422-8232 cell |Gregory.Coker@FPL.com

Please contact me with any questions or concerns. If you cannot reach me, feel free to contact my Engineering Leader Ray Vargas at (o) 941-927-4262, (c) 941-266-3118 or Ray.Vargas@fpl.com.

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FPL Electric Service Standards https://www.fpl.com/partner/builders/service-standards.html

From: Chris Stafford <cstafford@elementeg.com>
Sent: Thursday, March 30, 2023 10:07 AM
To: anthony.russo@mymanatee.org; jerry.varghese@mymanatee.org; eric.shroyer@mymanatee.org; Shari Barnwell <Shari.Barnwell@kimley-horn.com>; cris.schooley@kimley-horn.com; Reid, Phil <Phil.Reid@kimley-horn.com>; Maile.Spang@kimley-horn.com; joshua.parker@kimley-horn.com; Mumea, Thomas E <Thomas.Mumea@charter.com>; Bruce Herrington <Bruce.Herrington@Cobbfendley.com>; Terry Young <Terry.Young@uniti.com>; Cesar Mendoza <cmendoza@tepgroup.net>; Hutton, Denise <denise.hutton@ftr.com>; McFarlane, Alex <AMcFarlane@tecoenergy.com>; Barra, James <james.barra1@verizonwireless.com>; Coker, Gregory

<Gregory.Coker@fpl.com>; Ledbetter, Craig <Craig.Ledbetter@fpl.com>
Cc: Mike Hammer <mhammer@elementeg.com>
Subject: Phase II Meeting Minues | Lena Road from 44th Avenue East to SR 64 | Manatee County - Meeting Minutes-Sign in Sheet-Updated Utility Plans

Good morning all,

Please find attached with this email the Phase II meeting minutes from the utility meeting that was held Wednesday, March 22, 2023, from 2-3pm.

Please also see attached for the utility meeting sign in sheet, as well as the working set of the utility relocation plans.

Please call me with any questions or comments. Phase II deliverables are due by April 6, 2023.

Thank you,

CHRIS STAFFORD | UTILITY COORDINATOR

ELEMENT
ENGINEERING GROUP

ELEMENT ENGINEERING GROUP, LLC
1713 E. 9th AVENUE | TAMPA, FL 33605
P: 813.8521888 | **F:** 813.386.2106 | **TF:** 866.381.6664
CSTAFFORD@ELEMENTEG.COM | WWW.ELEMENTEG.COM
TRANSPORTATION | CIVIL | UTILITY COORDINATION
SURVEYING & MAPPING
SUBSURFACE UTILITY ENGINEERING
CERTIFIED MBE | DBE

Signals, Lighting, and Electrical Coordination Meeting

Meeting Summary

59th Street West
From Cortez Rd to Manatee Ave
Manatee County, Florida
Project No. 6108360

Lena Road
From North of 44th Avenue East to SR 64
Manatee County, Florida
Project No. 6107560

Meeting Date: October 19, 2022
Meeting Time: 11:00 AM to 12:00 PM
Meeting Place: Conference Call – Microsoft Teams

---

1. Introductions

a. Manatee County
   i. Tony Russo
   ii. Jerry Verghese
   iii. Aaron Burkett
   iv. Mukunda Gopalakrishna
   v. Neil Byrne
b. Florida Power and Light
   i. Greg Coker
c. Kimley-Horn & Associates (KH)
   i. Faisal Awan
   ii. Shari Barnwell
   iii. Cris Schooley
   iv. Nicole Heck
   v. Jacob Rehm
   vi. Phil Reid
   vii. Maile spang

2. Project Overview

a. 59th Street W
b. Lena Road

3. Lighting Design:

County Preferences:

Lighting Design Criteria:

a. The county stated they are in favor of using the GE Evolve light if it is still on the FDOT Approved Product Listing.
b. 59th Street is an urban collector; per Manatee County Traffic Engineering Manual a 0.8 illuminance will be used.
c. The county noted that anything above 0.8 will need to be evaluated for shielding.

Light Poles:

d. Jacob Rehm (JR) confirmed that conflict poles can be used as needed where utility conflicts occur.
e. Aaron Burkett (AB) stated that the mounting heights should be within 30 to 40 feet, but anything outside of that range will need to be confirmed with the County. County bucket trucks have an arm with a maximum length of 50 feet so the mounting height will need to be well within that range.
f. JR stated that the bracket arm length will be within the 10-12 feet range
g. AB confirmed the poles will need to be aluminum spun, non-painted.

Design Variation Memo:

h. Kimley-Horn will be providing light poles within the proximity to the shared use path on both projects, any locations where light poles are within 2' of the shared use path will be provided in the design variation memo.

FPL Items:

Voltage Along Corridor:

a. The voltage of distribution lines along 59th Street W is 13kV
b. Greg Coker (GC) noted that all distribution in the state of Florida is below 50 kV.
c. GC confirmed that FPL has provided green lines for Lena Road, but not yet for 59th Street

Transformer and Load Center Locations:

d. For both roadways (Lena Road and 59th Street W), GC confirmed FPL will likely have the flexibility to provide power service anywhere along the corridor. Kimley-Horn will just need to provide requested locations and FPL will confirm if they can provide service.
e. Nicole Heck (NH) confirmed that existing signal power service points will be used where possible. AB stated that the power service points at the existing locations will need to be converted to metered service points.

4. Signal Design:

Lena Road

SR 64 Signal Modifications:

a. NH confirmed proposed signal mast arms in the southeast (SE) and southwest (SW) corners of SR 64 intersection with a modification to existing mast arm in the northeast (NE) corner.
b. NH stated that luminaires will be provided on the mast arms (also applicable to 59th Street W-as needed).
c. The county will be providing the contact information for Vicky Warmer; she will provide block numbers for street name signs (also applicable to 59th Street W).

Rectangular Rapid Flashing Beacons (RRFB) at the Roundabout:

a. AB confirmed that the RRFB's do not need to be tied into the interconnect system (also applicable to 59th Street W).
b. Manatee County Traffic Design Group confirmed that solar power for the RRFB systems is preferred (also applicable to 59th Street W).
c. NH confirmed that as-builts for structural information have been provided by the department.

Field Review:

a. AB confirmed that we should reach out to him to coordinate field review efforts with the County for both projects (Lena Road and 59th Street W).

59th Street West

HAWK Signal at Sugg Middle School, 31st Avenue W/33rd Avenue Dr:

RRFB's at 17th Avenue W Roundabout:

a. AB confirmed that the HAWK's using 1 mast arm for both directions is acceptable.
b. NH acknowledged that the County will send the email to Kimley-Horn justifying need for HAWK signals. Vishal Kakkad (VK) concurred and stated that no justification memo or email is necessary to justify installation of RRFBs at the proposed roundabout.

29th Avenue W and 11th Avenue W Signal Replacement:

a. Preemption will be provided at the 29th Avenue W emergency signal. County is following up to confirm if emergency preemption will be required at 21st Avenue W due to the proximity to the hospital. Emergency preemption will not be provided at 11th Avenue W.

County Preferences

a. Bluetoad will not be included as part of these projects.
b. Mukunda Gopalakarishna (MG) to provide CCTV locations to Kimley-Horn.
c. Kimley-Horn will provide a cabinet wiring and cabinet mounting diagrams. AB confirmed at this time no additional wiring diagrams will be needed for this effort.
d. MB confirmed he will send over the most recent Traffic Infrastructure Design Guide.

5. Interconnect Design:

Lena Road

a. AB requested that an additional MVDS be provided at station 223+00.
b. MG will be following up with the fiber coordination with NH to determine where to tie in MVDS systems.

59TH Street West

a. NH confirmed Kimley-Horn plans to replace the MVDS near the 21st Avenue W intersection. The county will provide any additional locations where MVDS is requested.

**Note: If you have any comments, please provide them to Kimley-Horn within five (5) business days otherwise the meeting summary will be considered final.*

Project: 59 Street W from Cortez Road to Manatee Avenue

Signal,Lighting Coordination Mtg with FPL,Manatee County Meeting Sign In Sheet

Date: 10/19/2022 Time: 11:00 AM to 12:00 PM

Name	Company	Phone	Email	Meeting Attendance
Anthony Russo	Manatee County	941.708.7450 x7349	anthony.russo@mymanatee.org	Yes
Jerry Varghese	Manatee County		jerry.varghese@mymanatee.org	Yes
Vishal Kakkad	Manatee County		vishal.kakkad@mymanatee.org	Yes
Aaron Burkett	Manatee County		anthony.russo@mymanatee.org	Yes
Neil Byrne	Manatee County		Neil.Byrne@mymanatee.org	Yes
Mukunda Gopalakrishna	Manatee County		Mukunda.Gopalakrishna@mymanatee.org	Yes
Kristin Hall	Manatee County		kristin.hall@mymanatee.org	Yes
Gregory Coker	Manatee County		Gregory.Coker@fpl.com	Yes
Faisal Awan	Kimley-Horn and Associates		faisal.awan@kimley-horn.com	Yes
Cris Schooley	Kimley-Horn and Associates		cris.schooley@kimley-horn.com	Yes
Shari Barnwell	Kimley-Horn and Associates		shari.barnwell@kimley-horn.com	Yes

Project: 59 Street W from Cortez Road to Manatee Avenue

Signal,Lighting Coordination Mtg with FPL,Manatee County Meeting Sign In Sheet

Date: 10/19/2022 Time: 11:00 AM to 12:00 PM

Name	Company	Phone	Email	Meeting Attendance
Nicole Heck	Kimley-Horn and Associates		nicole.heck@kimley-horn.com	Yes
Jacob.Rehm	Kimley-Horn and Associates		jacob.rehm@kimley-horn.com	Yes
Phil Reid	Kimley-Horn and Associates		phil.reid@kimley-horn.com	Yes
Maile. Spang	Kimley-Horn and Associates		maile.spang@kimley-horn.com	Yes

APPENDIX D:
VOLTAGE DROP CALCULATIONS

Client: Manatee County
Project: Lena Road

Load Center : "A" **Ckt A-1**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
A-1	1.7	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.4

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 21	82.00	0.17		55.0	1.67	55.0	479.9	55		
		82 W										
2	A	Pole No. 19	82.00	0.17		305.0	1.498	305.0	479.5	360		
		82 W										
3	A	Pole No. 17	82.00	0.17		305.0	1.327	305.0	479.2	665		
		82 W										
4	A	Pole No. 15	82.00	0.17		315.0	1.156	315.0	478.8	980		
		82 W										
5	A	Pole No. 13	82.00	0.17		290.0	0.985	290.0	478.6	1270		
		82 W										
6	A	Pole No. 10	149.00	0.31		145.0	0.815	145.0	478.5	1415		
		149 W										
7	A	Pole No. 9	82.00	0.17		160.0	0.504	160.0	478.4	1575		
		82 W										
8	A	Pole No. 7	82.00	0.17		295.0	0.333	295.0	478.3	1870		
		82 W										
9	A	Pole No. 6	26.00	0.05		105.0	0.163	105.0	478.3	1975		
		82 W										
10	A	Pole No. 4	26.00	0.05		80.0	0.108	80.0	478.3	2055		
		26 W										
11	A	Pole No. 2	26.00	0.05		80.0	0.054	80.0	478.3	2135		
		26 W										
12	A											
13	A											
14	A											
15	A											
16	A											

Client: Manatee County
Project: Lena Road

Load Center : "A" **Ckt A-2**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
A-2	1.2	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.3

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 20	82.00	0.17		280.0	1.19	280.0	479.7	280		
		82 W										
1	A	Pole No. 18	82.00	0.17		310.0	1.017	310.0	479.4	590		
		82 W										
2	A	Pole No. 16	82.00	0.17		290.0	0.846	290.0	479.2	880		
		82 W										
3	A	Pole No. 14	82.00	0.17		315.0	0.675	315.0	479.0	1195		
		82 W										
4	A	Pole No. 11	82.00	0.17		395.0	0.504	395.0	478.9	1590		
		82 W										
5	A	Pole No. 8	82.00	0.17		305.0	0.333	305.0	478.8	1895		
		82 W										
6	A	Pole No. 5	26.00	0.05		250.0	0.163	250.0	478.7	2145		
		26 W										
7	A	Pole No. 3	26.00	0.05		80.0	0.108	80.0	478.7	2225		
		26 W										
8	A	Pole No. 1	26.00	0.05		75.0	0.054	75.0	478.7	2300		
		26 W										
	A											
11	A											
12	A											
13	A											
14	A											
15	A											
16	A											

Client: Manatee County
Project: Lena Road

Load Center : "A" **Ckt A-3**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
A-3	4.7	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	1.4

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 22	82.00	0.17		155.0	4.69	155.0	479.4	155		
		82 W										
2	A	Branch 1	82.00	0.17		130.0	4.519	130.0	478.8	285		
3	A	Pole No. 24	82.00	0.17		135.0	4.348	135.0	478.3	420		
		82 W										
4	A	Pole No. 25	82.00	0.17		140.0	4.177	140.0	477.8	560		
		82 W										
5	A	Pole No. 26	82.00	0.17		145.0	4.006	145.0	477.3	705		
		82 W										
6	A	Branch 2	149.00	0.31		75.0	3.835	75.0	477.0	780		
7	A	Pole No. 28	82.00	0.17		135.0	3.525	135.0	476.6	915		
		82 W										
8	A	Pole No. 29	82.00	0.17		140.0	3.354	140.0	476.2	1055		
		82 W										
9	A	Pole No. 30	82.00	0.17		135.0	3.183	135.0	475.8	1190		
		82 W										
10	A	Pole No. 31	82.00	0.17		135.0	3.013	135.0	475.5	1325		
		82 W										
11	A	Pole No. 32	82.00	0.17		140.0	2.842	140.0	475.1	1465		
		82 W										
12	A	Pole No. 33	82.00	0.17		115.0	2.671	115.0	474.9	1580		
		82 W										
13	A	Pole No. 34	82.00	0.17		155.0	2.500	155.0	474.5	1735		
		82 W										
14	A	Branch 3	559.00	1.16		145.0	2.329	145.0	474.2	1880		
15	A	Pole No. 37	149.00	0.31		230.0	1.165	230.0	474.0	2110		
		149 W										
16	A	Pole No. 39	82.00	0.17		140.0	0.854	140.0	473.9	2250		
		82 W										

Client: Manatee County
Project: Lena Road

Load Center : "A" **Ckt A-3**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
A-3	0.2	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	(feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 23	82.00	0.17		65.0	0.17	65.0	480.0	65		
		82W										
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
9	A											
	A											
	A											
1	A											
2	A											

Client: Manatee County
Project: Lena Road

Load Center : "A" **Ckt A-3**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
A-3	0.3	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	(feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 27	149.00	0.31		100.0	0.31	100.0	480.0	100		
		149W										
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
9	A											
	A											
	A											
1	A											
2	A											

Client: Manatee County
Project: Lena Road

Load Center : "A" **Ckt A-3**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
A-3	1.2	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.1

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 35	82.00	0.17		70.0	1.16	70.0	479.9	70		
		82W										
2	A	Pole No. 36	82.00	0.17		140.0	0.994	140.0	479.8	210		
		82W										
3	A	Pole No. 34	82.00	0.17		120.0	0.823	120.0	479.7	330		
		82W										
4	A	Pole No. 35	82.00	0.17		130.0	0.652	130.0	479.6	460		
		82W										
5	A	Pole No. 36	82.00	0.17		165.0	0.481	165.0	479.6	625		
		82W										
6	A	Pole No. 38	149.00	0.31		155.0	0.310	155.0	479.5	780		
		149W										
	A											
	A											
	A											
	A											
	A											
9	A											
	A											
	A											
1	A											
2	A											

Client: Manatee County
Project: Lena Road

Load Center : "B" **Ckt B-1**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
B-1	2.6	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.5

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 58	82.00	0.17		115.0	2.56	115.0	479.7	115		
		82 W										
2	A	Pole No. 57	82.00	0.17		145.0	2.392	145.0	479.4	260		
		82 W										
3	A	Pole No. 56	82.00	0.17		135.0	2.221	135.0	479.2	395		
		82 W										
4	A	Pole No. 55	82.00	0.17		160.0	2.050	160.0	478.9	555		
		82 W										
5	A	Pole No. 54	82.00	0.17		155.0	1.879	155.0	478.6	710		
		82 W										
6	A	Pole No. 53	82.00	0.17		150.0	1.708	150.0	478.4	860		
		82 W										
7	A	Pole No. 52	82.00	0.17		155.0	1.538	155.0	478.2	1015		
		82 W										
8	A	Pole No. 51	82.00	0.17		160.0	1.367	160.0	478.0	1175		
		82 W										
8	A	Pole No. 50	82.00	0.17		150.0	1.196	150.0	477.8	1325		
		82 W										
9	A	Pole No. 49	82.00	0.17		150.0	1.025	150.0	477.7	1475		
		82 W										
11	A	Pole No. 48	82.00	0.17		150.0	0.854	150.0	477.6	1625		
		82 W										
12	A	Pole No. 47	82.00	0.17		145.0	0.683	145.0	477.5	1770		
		82 W										
13	A	Pole No. 46	82.00	0.17		145.0	0.513	145.0	477.4	1915		
		82 W										
14	A	Pole No. 45	82.00	0.17		155.0	0.342	155.0	477.4	2070		
		82 W										
15	A	Pole No. 44	82.00	0.17		215.0	0.171	215.0	477.4	2285		
		82 W										
16	A											

Client: Manatee County
Project: Lena Road

Load Center : "B" **Ckt B-2**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
B-2	5.2	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	1.3

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 59	82.00	0.17		180.0	5.21	180.0	479.2	180		
		82 W										
2	A	Pole No. 60	82.00	0.17		145.0	5.044	145.0	478.5	325		
		82 W										
3	A	Pole No. 61	82.00	0.17		160.0	4.873	160.0	477.8	485		
		82 W										
4	A	Pole No. 62	82.00	0.17		140.0	4.702	140.0	477.3	625		
		82 W										
5	A	Pole No. 63	82.00	0.17		160.0	4.702	160.0	476.6	785		
		82 W										
6	A	Pole No. 64	82.00	0.17		155.0	4.531	155.0	476.6	780		
		82 W										
7	A	Pole No. 65	82.00	0.17		145.0	4.360	150.0	476.1	930		
		82 W										
8	A	Branch 1	808.00	1.68		105.0	4.190	105.0	475.7	1035		
8	A	Pole No. 69	214.00	0.45		205.0	2.506	205.0	475.2	1240		
		214W										
9	A	Pole No. 70	149.00	0.31		85.0	2.060	85.0	475.1	1325		
		149 W										
10	A	Pole No. 72	214.00	0.45		105.0	1.750	105.0	474.9	1430		
		214 W										
11	A	Pole No. 74	149.00	0.31		80.0	1.304	80.0	474.8	1510		
		149 W										
12	A	Pole No. 75	82.00	0.17		110.0	0.994	110.0	474.7	1620		
		82 W										
13	A	Branch 2	313.00	0.65		140.0	0.823	140.0	474.6	1760		
14	A	Pole No. 78	82.00	0.17		220.0	0.171	220.0	474.6	1980		
		82 W										
15	A											
16	A											

Client:	Manatee County	Load Center :	"B"	B-2, Branch 1
Project:	Lena Road	Conductor Type:	XHHW copper	
		Circuit Type:	240/480 VAC, 1 Phase, 3 wire	
		Maximum Voltage Drop:	5%	
		Minimum Fault Current Ratio:	5:1	

CKT #	Load Amps	BRKR Amps
B-2	1.7	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.1

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	(feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 66	82.00	0.17		95.0	1.68	95.0	479.9	95		
		82 W										
2	A	Pole No. 67	149.00	0.31		120.0	1.513	120.0	479.7	215		
		149 W										
3	A	Pole No. 68	214.00	0.45		95.0	1.202	95.0	479.6	310		
		214 W										
4	A	Pole No. 71	149.00	0.31		120.0	0.756	120.0	479.5	430		
		149 W										
5	A	Pole No. 73	214.00	0.45		95.0	0.446	95.0	479.5	525		
		214 W										
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
1	A											
2	A											

Client: Manatee County
Project: Lena Road

Load Center : "B" **B-2, Branch 2**
Conductor Type: XHHW copper
Circuit Type: 240/480 VAC, 1 Phase, 3 wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
B-2	0.7	20

PHASE-TO-PHASE VOLTAGE =	480
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	(feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	A	Pole No. 76	82.00	0.17		100.0	0.65	100.0	479.9	100		
		82 W										
2	A	Pole No. 77	82.00	0.17		120.0	0.481	120.0	479.9	220		
		82 W										
3	A	Pole No. 79	149.00	0.31		235.0	0.310	235.0	479.8	455		
		149 W										
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
	A											
1	A											
2	A											

Client: Manatee County
Project: Lena Road

Load Center : "C" **Ckt C-1**
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

CKT #	Load Amps	BRKR Amps
C	12.3	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	2.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Branch 1 + 4	1471.00	12.26		10.0	12.26	10.0	119.9	10		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 1

CKT #	Load Amps	BRKR Amps
C	5.5	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.5

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Branch 1 +2+3+14	661.00	5.51		30.0	5.51	30.0	119.9	30		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 2

CKT #	Load Amps	BRKR Amps
C	1.8	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 80	214.00	1.78		10.0	1.78	10.0	120.0	10		
		214W										

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 3

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.1

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 81	149.00	1.24		65.0	1.24	65.0	119.9	65		
		149 W										

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 4

CKT #	Load Amps	BRKR Amps
C	6.8	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	1.4

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)
1	C	Branch 4+5+6	810.00	6.75		130.0

Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
6.75	130.0	119.2	130		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 5

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 82	149.00	1.24		15.0	1.24	15.0	120.0	15		
		149 W										

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 6

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 83	149.00	1.24		35.0	1.24	35.0	120.0	35		
		149 W										

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 7

CKT #	Load Amps	BRKR Amps
C	4.3	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.7

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)
1	C	Branch 8+9+10	512.00	4.27		165.0

Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
4.27	165.0	119.4	165		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 8

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 85 149 W	149.00	1.24		50.0	1.24	50.0	119.9	50		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 9

CKT #	Load Amps	BRKR Amps
C	1.8	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 87	214.00	1.78		15.0	1.78	15.0	120.0	15		
		214 W										

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 10

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.1

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Branch 11	149.00	1.24		120.0	1.24	120.0	119.9	120		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 11

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)
1	C	Pole 88 149 W	149.00	1.24		40.0

Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1.24	40.0	120.0	40		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 12

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)
1	C	Pole 85 149 W	149.00	1.24		45.0

Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1.24	45.0	120.0	45		

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 13

CKT #	Load Amps	BRKR Amps
C	1.2	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.0

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)	Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
1	C	Pole 84	149.00	1.24		5.0	1.24	5.0	120.0	5		
		149 W										

Client: Manatee County
Project: Lena Road

Load Center : "C"
Conductor Type: XHHW copper
Circuit Type: 120/240 VAC, 1 Phase, 3 Wire
Maximum Voltage Drop: 5%
Minimum Fault Current Ratio: 5:1

Ckt C-1
Branch 14

CKT #	Load Amps	BRKR Amps
C	2.5	20

PHASE-TO-NEUTRAL VOLTAGE =	120
CONDUCTOR SIZE =	6
GROUND SIZE =	6
CALCULATED % VOLTAGE DROP =	0.3

Load #	CKT #	Load Descr.	Load (VA)	Load (amps)	Dist.-Previous load (meters)	Dist.-Previous load (feet)
1	C	Branch 12+13	298.00	2.48		170.0

Segment Load	Segment Dist. (ft)	Actual Voltage	Total Run Distance		
2.48	170.0	119.6	170		