

CITY OF WESTWOOD STREETLIGHTING MASTER PLAN



Westwood, Kansas

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INTRODUCTION

This document has been created to establish and outline Streetlighting Standards for the City of Westwood.

EXISTING CONDITIONS:

Fixture Types -

A majority of the streets of Westwood, KS are currently lit by LED cobra heads mounted on either metal poles or wood utility poles. See image 1 and 2 below.



Image 1: Cobra Head on Metal Pole



Image 2: Cobra Head on Wood Utility Pole

The remainder of streets are lit by square LED fixtures on metal poles or decorative LED fixtures on metal poles. See image 3 and 4 below.



Image 3: Square LED Fixture on Metal Pole



Image 4: Decorative LED Fixture on Metal Pole

Re: Appendix A for Existing Conditions Map.

Existing lighting in the City is not uniform as a result of existing cobra heads not spaced at set intervals. Light trespass on residential houses located across the street from existing fixtures was also noted. Light level readings taken under an existing LED cobra head located on a Local/Low roadway are shown in footcandles (fc) on image 5 below.

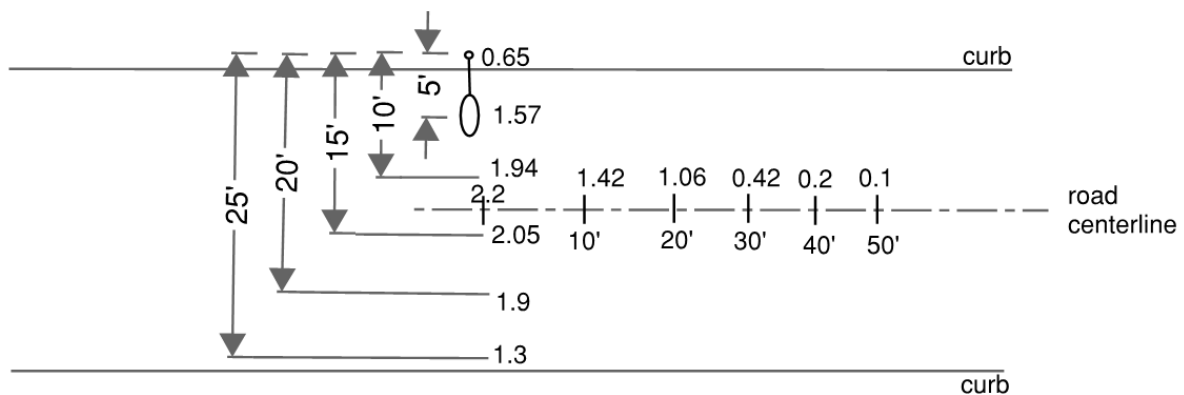


Image 5: Existing LED Cobra Head Light Readings (fc)

Roadway Classifications -

The City of Westwood has multiple roadway types within the city limits. The following roadway classifications are located in Westwood: Local/Low (Residential), Collector/Low & Medium (Collector), and Major/ Medium (Arterial). Re: Appendix B for Roadway Classification Map.

GOALS:

Established in cooperation with the City of Westwood, the streetlighting goals are as follows:

- Create a sense of neighborhood.
 - Establish an identity to the city.
 - Create a uniform aesthetic.
- Create a welcoming environment.
 - Illuminate streets to appropriate levels, meeting ANSI/IES RP-8-14. See Tables 1, 2, and 3 below for target values per ANSI/IES RP-8-14.
 - Minimize light trespass.
- Establish city standard for street lighting.
 - Consistent product
 - LED sources
 - Energy efficiency
 - Guidelines for city wide implementation.

ILLUMINANCE TARGET VALUES FOR STREETS			
STREET CLASSIFICATION	PEDESTRIAN AREA CLASSIFICATION	AVG. ILLUMINANCE Eavg (fc)	ILLUMINANCE UNIFORMITY RATIO (Eavg to Emin)
MAJOR	HIGH	1.7	3 to 1
	MEDIUM	1.3	
	LOW	0.9	
COLLECTOR	HIGH	1.2	4 to 1
	MEDIUM	0.9	
	LOW	0.6	
LOCAL	HIGH	0.9	6 to 1
	MEDIUM	0.7	
	LOW	0.4	

Table 1: Illuminance Target Values for Streets

ILLUMINANCE TARGET VALUES FOR INTERSECTIONS				
FUNCTIONAL CLASSIFICATION	AVERAGE MAINTAINED ILLUMINATION AT PAVEMENT BY PEDESTRIAN AREA CLASSIFICATION (fc)			Eavg/Emin
	HIGH	MEDIUM	LOW	
Major/Major	3.4	2.6	1.8	3
Major/Collector	2.9	2.2	1.5	3
Major/Local	2.6	2	1.3	3
Collector/Collector	2.4	1.8	1.2	4
Collector/Local	2.1	1.6	1	4
Local/Local	1.8	1.4	0.8	6

Table 2: Illuminance Target Values for Intersections

ILLUMINANCE TARGET VALUES FOR WALKWAYS			
PEDESTRIAN AREA CLASSIFICATION	Eavg (fc)	Evmin (fc)	Eavg/Emin
MEDIUM	0.5	0.2	4
LOW	0.4	0.1	4

Table 3: Illuminance Target Values for Walkways

Re: Appendix F, G, and H for photometric studies.

RECOMMENDATIONS:

Streetlighting recommendations are based around the new Westwood, KS standard streetlighting fixture assembly detailed below, spacing would vary for each roadway classifications.

Fixture Assembly Selection -

The standard Streetlighting Fixture for the City of Westwood is the Sternberg Euro open lantern fixture atop the Birmingham Series Pole. The City standard for color temperature is 3000K, and the standard fixture color is textured black. The City standard Euro open lantern fixture (E450LED) is equipped with an SV2 sag lens to minimize the image of each LED diode and to reduce glare; the fixture has the capability to add a house side shield in the field should additional light control be necessary. Each pole will have the City of Westwood's logo cast into the handhole. Poles shall be aluminum. Re: image 6 below, Appendix C and D for Fixture and Pole Manufacturer Cutsheets, and Appendix E for Fixture Shop Drawing.



Image 6: Westwood, KS Streetlighting Standard Fixture Assembly

Local/Low Fixture Layout -

Streets of the local/low classification make up the majority of street in the City of Westwood and would be lit from one (1) side of the street. Fixture assemblies would be located adjacent to the sidewalk and spaced 100' o.c., fixtures would be mounted at 16'. Fixture spacing would vary slightly depending on driveway layouts, trees and other existing conditions. Fixtures at intersections would be spaced closer to meet light level recommendations for intersections. Re: Appendix F the Local/Low Streetlighting Concept Plan and images 7 and 8 below.



Image 7: Local/Low Streetlighting Profile

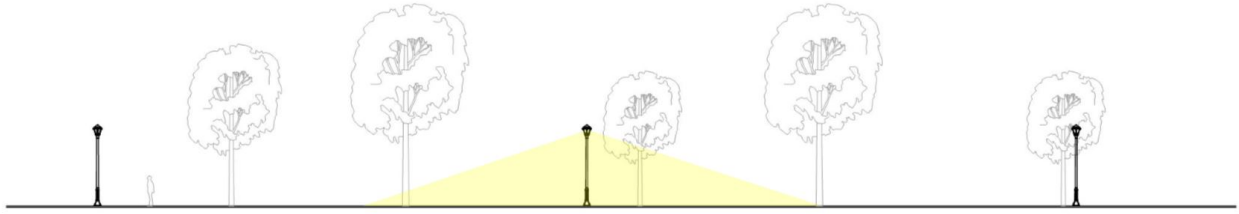


Image 8: Local/Low Streetlighting Elevation

50th Street between Belinder Avenue and Rainbow Boulevard would utilize fixture assemblies located on both sides of the road, see the Collector/Low section for information.

Collector/Low Fixture Layout -

Mission and Belinder are classified as Collector/Low roadways. Since Mission Road is partially in the neighboring city's city limits, this street is not included within the Masterplan. Therefore, this roadway classification will look solely at Belinder Avenue.

Belinder Avenue is the main thoroughfare in the City of Westwood and will therefore portray the most prominence with the streetlighting layout. Fixture assemblies will be located on both sides of the road in an offset pattern. Fixtures would be mounted at 16' spaced at 135' o.c. along each side of the street. To heighten attention of intersections, fixtures will be spaced closer together at intersections so that there is a fixture located just north and just south of the intersections. Re: Appendix G the Collector/Low Streetlighting Concept Plan and images 9 and 10 below.

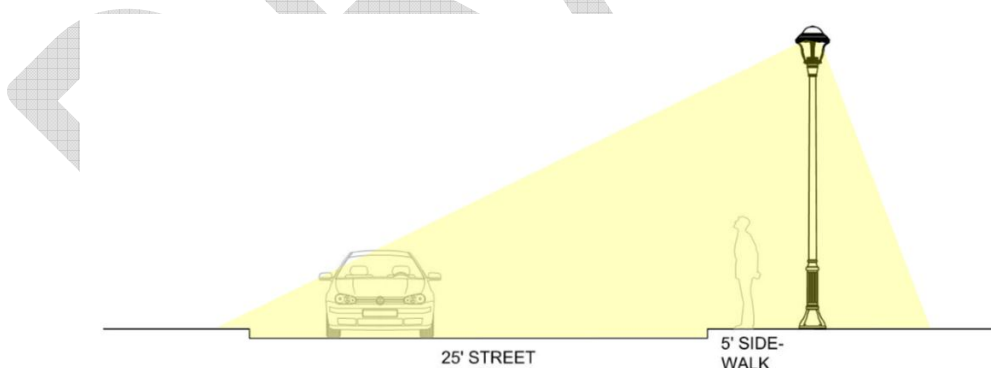


Image 9: Collector/Low – Belinder Streetlighting Profile

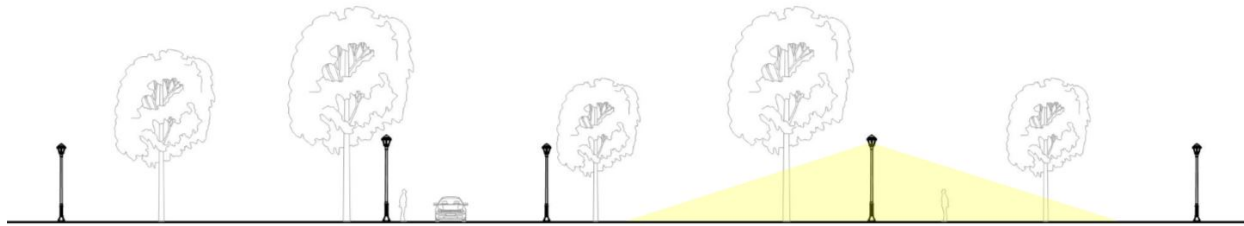


Image 10: Collector/Low – Belinder Streetlighting Elevation

Collector/ Medium Fixture Layout -

47th Avenue and State Line Road are classified as Collector/Medium Roadways. The existing Decorative LED Fixtures on Metal Poles on 47th Avenue located along Woodside Village would remain. The remainder of 47th Avenue would be lit from one (1) side of the street and would utilize the Westwood standard Sternberg Euro open lantern fixture mounted atop 16' poles to illuminate the roadway and sidewalk in the commercial area. Fixture assemblies would be spaced 100' o.c. Re: Appendix H the Collector/Medium Streetlighting Concept Plan and images 11 and 12 below.



Image 11: Collector/Medium Streetlighting Profile

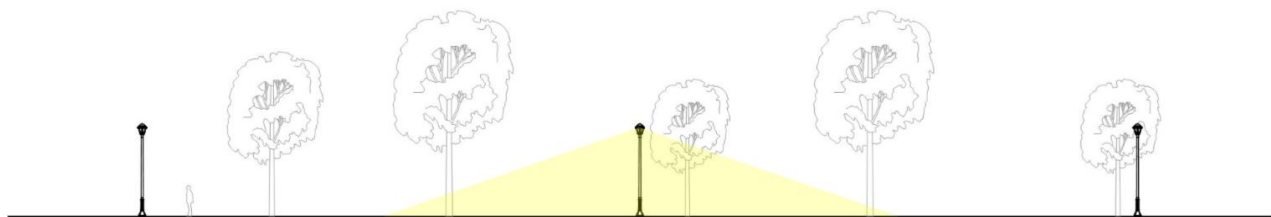


Image 12: Collector/Medium Streetlighting Elevation

Major/Medium Fixture Layout -

All streets classified as Major/Medium Roadways are partially in the neighboring city's city limits, therefore these streets are not included within the Masterplan. Major/Medium Roadways in Westwood, KS include: 47th Street, Rainbow Boulevard, and Shawnee Mission Parkway.

Controller Layout -

A total of five (5) 4-zone controllers would be required to power and control all of the new streetlighting for the City of Westwood as outlined in this Masterplan. The existing 4-zone controller feeding the existing Decorative LED Fixtures on Metal Poles on 47th Avenue located along Woodside Village would remain. Re: Appendix I the Controller Location Plan for additional information.

APPENDIX

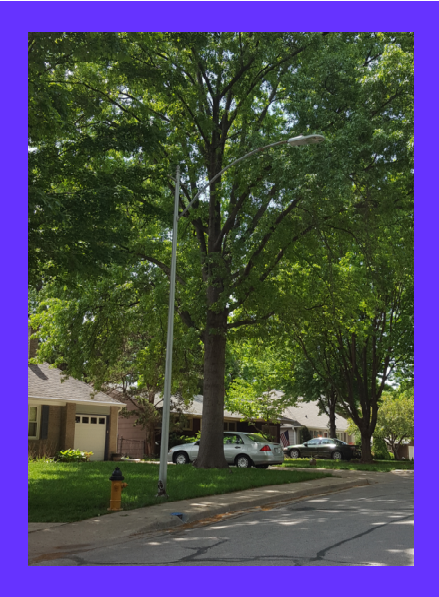
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CONTROLLER LOCATION PLAN	I

EXISTING CONDITIONS MAP



EXISTING FIXTURE TYPES:

COBRA HEAD ON METAL POLE



SQUARE LED FIXTURE ON METAL POLE



COBRA HEAD ATTACHED TO WOOD POLE



DECORATIVE LED FIXTURE ON METAL POLE
(WOODSIDE VILLAGE)




ROADWAY CLASSIFICATION MAP



ILLUMINATION GOALS (PER ANSI/IES RP-8-14):

- WALKWAYS
 - 0.5 FC AVERAGE
 - 4.0 AVG/MIN
- RESIDENTIAL(LOCAL) STREETS
 - 0.5 FC AVERAGE
 - 6.0 AVG/MIN
 - 10.0 MAX/MIN
 - 0.4 MAX VEILING LUMINANCE RATIO
- COLLECTOR STREETS
 - 0.6 FC AVERAGE
 - 3.5 AVG/MIN
 - 6.0 MAX/MIN
 - 0.4 MAX VEILING LUMINANCE RATIO
- ARTERIAL(MAJOR) STREETS
 - 0.9 FC AVERAGE
 - 3.0 AVG/MIN
 - 5.0 MAX/MIN
 - 0.3 MAX VEILING LUMINANCE RATIO



E450LED / E460LED EURO SERIES

LED

EPA

E450LED 1.66 (ft²)
E460LED 2.2 (ft²)

WEIGHT

E450LED 52 LBS
E460LED 52 LBS

7 YEAR WARRANTY

LUMEN RANGE

3,070 - 9,565

LIFE SPAN

L70 UP TO 100,000 HOURS

UL LISTED

CLICK FOR FAQ'S

RATED IP65

JOB NAME

FIXTURE TYPE

MEMO

BUILD A PART NUMBER

ORDERING EXAMPLE: 2A-E450LED-R3-16L45T5-MDL10-SV1-PEC-FHD/EUIPM/3312P5/SCC/BKT

Mounting Config.	Fixture	Fitter	LED	CCT	Type	Driver	Lens	Option Photocontrol	Option Fuse	Option House Side Shield	Arm	Pole	Finish

Mounting Configuration

(Click here to view mounting configuration sheet)

- IW
- PT
- IA
- IAPT
- 2A
- 2A90
- 2APT
- 3A
- 3A90
- 3APT
- 4A
- 4APT
- 1AM
- 2AM
- 550PB

W = Wall Mount

PT = Post Top

A = Arm Mount

AM = Arm Mid-Mount

PB = Pier Base

Fixture

• E450LED • E460LED

Fitter

• R3 • R4

LED

• 16L • 21L • 28L

CCT - Color Temperature (K)

• 27(OO) • 35(OO) • 45(OO)

Type

• T2 • T3 • T4 • T5

Driver

- MDL10¹ (120v-277v, 1000mA)
- MDL14² (120v-277v, 1400mA)
- MDH10¹ (347v-480v, 1000mA)
- MDH14² (347v-480v, 1400mA)

¹ For use with 16L and 21L only.
² For use with 21L and 28L only.

Lens

- CA³ (Clear Acrylic)
- FA³ (Frosted Acrylic)
- FL⁴ (Flat Acrylic Lens)
- SG⁴ (Sag Glass)
- FSG⁴ (Frosted Sag Glass)
- SV1⁴ (Flat Soft Vue Medium Diffuse Acrylic)
- SV2⁴ (Flat Soft Vue Heavy Diffuse Acrylic)

³ For use with E460LED only.
⁴ For use with E450LED only.

Options (Click here to view accessories sheet)

- PEC Electronic Photocontrol (120v-277v)
- PEC4 Electronic Photocontrol (480v)
- FHD⁵ Dual Fuse and Holder
- HSS House Side Shield (external)

⁵ Ships loose for installation in base.

Arm (Click here to view arm website page)

See Arms & Wall Brackets specification sheets.

- HM
- OL
- OM
- VC
- VF
- VL

Pole (Click here to view pole website page)

See Pole specification sheets.

Finish (Click here to view paint finish sheet)

Standard Finishes⁶

- BKT Black Textured
- WHT White Textured
- PGT Park Green Textured
- ABZT Architectural Medium Bronze Textured
- DBT Dark Bronze Textured

⁶ Smooth finishes are available upon request.

Custom Finishes⁷

- CM Custom Match
- OI Old Iron
- RT Rust
- WBR Weathered Brown
- CD Cedar
- WBK Weathered Black
- TT Two Tone

⁷ Custom colors require upcharge.

Sternberg Select Finishes

- VG Verde Green
- SI Swedish Iron
- OWGT Old World Gray Textured

Specifications

Fixture

This large scale contemporary fixture includes a cast aluminum roof, fitter and (4) sweeping support legs. The unit is provided with an acrylic tapered cylindrical molded lens matching the profile of the support legs (E460LED), or a flat acrylic lens allowing for an open body

(E450LED). The top mounted ballast mounting plate shall be cast aluminum and provide tool-less removal from the housing. The Luminaire shall be UL listed in US and Canada.

Fitter

Standard cast aluminum fitter (R3) slips a 3" OD x 3" tall tenon or pole. Optional cast aluminum fitter (R4) slips a 4" OD x 3" tall tenon or pole.

LED's

The luminaire shall use high output, high brightness LED's. They shall be mounted in arrays, on printed circuit boards designed to maximize heat transfer to the heat sink surface. The arrays shall be roof mounted to minimize up-light. The LED's and printed circuit boards shall be 100% recyclable; they shall also be protected from moisture and corrosion by a conformal coating of 1 to 3 mils. They shall not contain lead, mercury or any other hazardous substances and shall be RoHS compliant. The LED life rating data shall be determined in accordance with IESNA LM-80. The High Performance white LED's will have a life expectancy of approximately 100,000 hours with not less than 70% of original brightness (lumen maintenance), rated at 25°C. The High Brightness, High Output LED's shall be 4500K (3500K or 2700K option) color temperature with a minimum CRI of 70. Consult factory for custom color CCT. The luminaire shall have a minimum _____ (see table) delivered initial lumen rating when operated at steady state with an average ambient temperature of 25°C (77°F).

Optics

The luminaire shall be provided with individual, refractor type optics applied to each LED. The luminaire shall provide Type ____ (2, 3, 4 or 5) light distribution per the IESNA classifications. Testing shall be done in accordance with IESNA LM-79.

See next page

E450LED / E460LED EURO SERIES

LED

Electronic Driver

The LED driver shall be U.L. Recognized. It shall be securely mounted inside the fixture, for optimized performance and longevity. It shall be supplied with a quick-disconnect electrical connector on the power supply, providing easy power connections and fixture installation. It shall have overload as well as short circuit protection, and have a DC voltage output, constant current design, 50/60HZ. It shall be supplied with line-ground, line-neutral and neutral-ground electrical surge protection in accordance with IEEE/ANSI C62.41.2 guidelines. It shall be dimmable using a 0-10v signal. The driver shall have a minimum efficiency of 90%. The driver shall be rated at full load with THD<20% and a power factor of greater than 0.90. The driver shall contain over-heat protection.

Photocontrols

Button Style: On a single assembly the photocontrol shall be mounted on the fixture and pre-wired to driver. On multiple head assembly's the photocontrol shall be mounted in the pole shaft on an access plate. The electronic button type photocontrol is instant on with a 5-10 second turn off, and shall turn on at 1.5 footcandles with a turn-off at 2-3 footcandles. Photocontrol is 120-277 volt and warranted for 6 years.

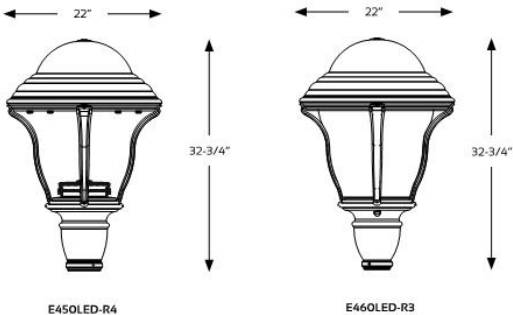
Warranty

Seven-year limited warranty. See product and finish warranty guide for details.

Finish

Refer to website for details.

Fixtures



Performance

LIGHT SOURCE	T2 DELIVERED LUMENS	EFFICACY (LPW)	T3 DELIVERED LUMENS	EFFICACY (LPW)	T4 DELIVERED LUMENS	EFFICACY (LPW)	T5 DELIVERED LUMENS	EFFICACY (LPW)	WATTAGE
28L27T_MDL14	7065	53.1	6860	6860	6825	51.3	7365	55.4	133
28L35T_MDL14	8440	63.5	8195	8195	8155	61.3	8800	66.2	133
28L45T_MDL14	9175	69.0	8910	8910	8865	66.7	9565	71.9	133
21L27T_MDL14	5480	51.2	5430	5430	5315	49.7	5885	55.0	107
21L35T_MDL14	6545	61.2	6485	6485	6366	59.4	7035	65.7	107
21L45T_MDL14	7115	66.5	7050	7050	6905	64.5	7645	71.4	107
21L27T_MDL10	4190	57.4	4070	4070	3960	54.2	4385	60.1	73
21L35T_MDL10	5005	68.6	4860	4860	4730	64.8	5240	71.8	73
21L45T_MDL10	5440	74.5	5285	5285	5140	70.4	5695	78.0	73
16L27T_MDL10	3340	60.7	3145	3145	3070	55.8	3445	62.6	55
16L35T_MDL10	3995	72.6	3760	3760	3670	66.7	4115	74.8	55
16L45T_MDL10	4340	78.9	4085	4085	3990	72.5	4475	81.4	55



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Ornamental Poles

9-553

7700 BIRMINGHAM SERIES

SPECIFICATIONS

GENERAL

The ____ ft tall* decorative post shall be aluminum, one-piece construction. The 16" diameter cast aluminum fluted base shall be constructed with a ____ inch diameter aluminum shaft. The model shall be Sternberg Lighting #7700 or #7700R for candy cane poles. The pole shall be U.L. or E.T.L. listed in U.S. and Canada.

CONSTRUCTION

The base shall be designed with a tall and smoothly curved pedestal bottom section and transition to a tall twelve flute vertical base section and shall be made of heavy wall, 356 alloy cast aluminum. It shall have a large access door and a 1" thick floor cast as an integral part of the base. The shaft shall be double circumferentially welded internally and externally to the base for added strength.

The smooth tapered shaft shall be made of ASTM 6063 extruded aluminum and tempered to a T6 condition.

The smooth straight shaft shall be made of ASTM 6063 extruded aluminum and tempered to a T6 condition.

The straight fluted shaft shall be made of ASTM 6061 extruded aluminum and tempered to a T6 condition. It shall have a decorative fluted 3" O.D. tenon.

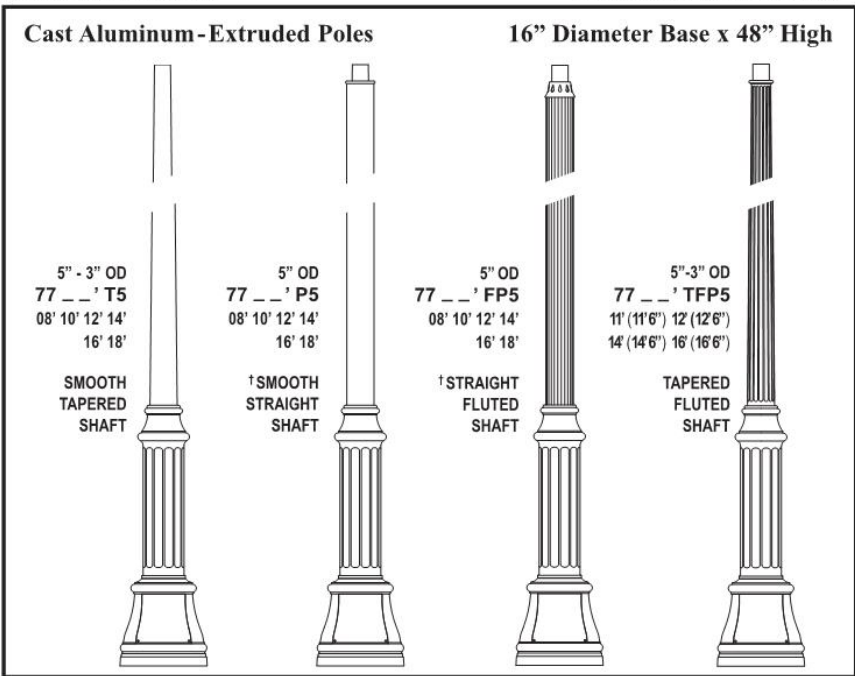
The tapered fluted shaft shall be made of heavy wall, 356 alloy cast aluminum

INSTALLATION

Four 3/4" diameter, hot-dipped galvanized "L" type anchor bolts shall be provided with the post for anchorage. A generously sized door shall be provided for wiring and anchor bolt access. It shall be secured with tamper proof, stainless steel hardware. Post will be provided with a grounding stud mounted on the base floor opposite the access door.

Indicate the type of shaft needed (above)

**See installation template for exact door position. Bolt circle dimensions may change on taller poles.



*For candy cane poles insert ____ AG ft. (feet - above grade height). See diagram on reverse side.

†Tenon not supplied if fixture or arm slips 5" O.D.

11-13



9-554

7700 BIRMINGHAM SERIES

POSTS / OPTIONS / POST CAPS

BUILDING A PART NUMBER

Straight Poles

MODEL / HEIGHT / SHAFT	POST CAP CENTER	OPTIONS	FINISH
77 14 FPS	BCC	FH	BK

Part Number Selections

MODEL	HEIGHT	SHAFT†
77	08' 10' 12' 14' 16' 18'	T5: 5"-3" Tapered Smooth P5: 5" Straight Smooth FP5: 5" Straight Fluted TFP5: 5"-3" Tapered Fluted*

Options Available: GFI, GFB, FH, SBA, DBA, DB Direct Burial, SBAR, DSPA, DHPA, PA478, PCD, SH, SB, WHK, HB Helix Burial

Candy Cane Poles

MODEL / HEIGHT / SHAFT	HEIGHT ABOVE GRADE	OPTIONS	FINISH
77 00 RT5	14 AG		BK

Part Number Selections

MODEL	HEIGHT	SHAFT†
77	00	RT5: 5"-3" Tapered Smooth RP5: 5" Straight Smooth RFP5: 5" Straight Fluted RTFP5: 5"-3" Tapered Fluted*

Options Available: RT, WBR, CD, WBK, TT, Rust, Weathered Brown, Cedar, Weathered Black, Two Tone

STANDARD FINISHES*

- BKT: Black Textured
- WHT: White Textured
- PGT: Park Green Textured
- ABZT: Architectural Medium Bronze Textured
- DBT: Dark Bronze Textured

CUSTOM FINISHES

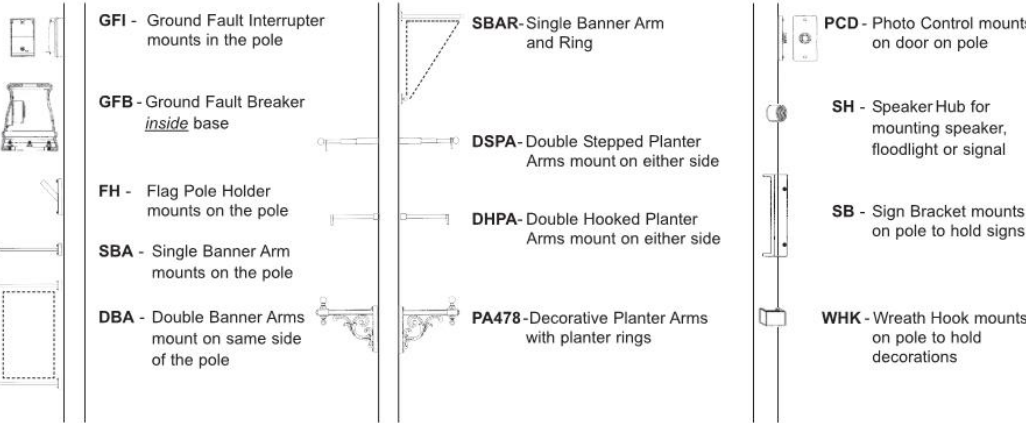
- OI: Old Iron

POST CENTER CAP (If Required)

- BCC: Ball Center Cap
- FCC: Finial Center Cap
- SCC: Spiked Center Cap
- TFCC: Tall Finial Center Cap
- SSCC: Side Spiked Center Cap

OPTIONS AVAILABLE

See Accessories Section for more options and information



POST CENTER CAPS (If Required)



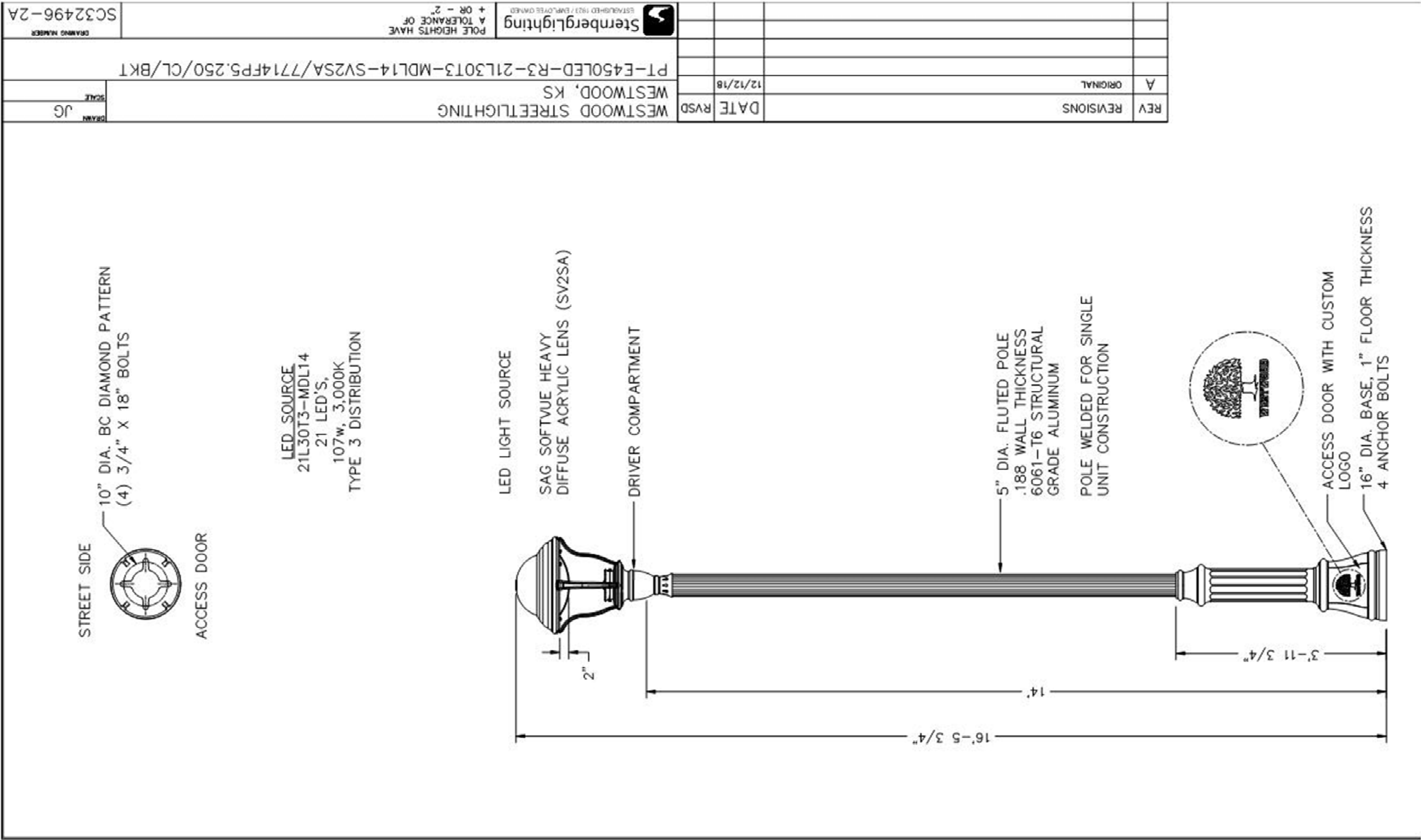
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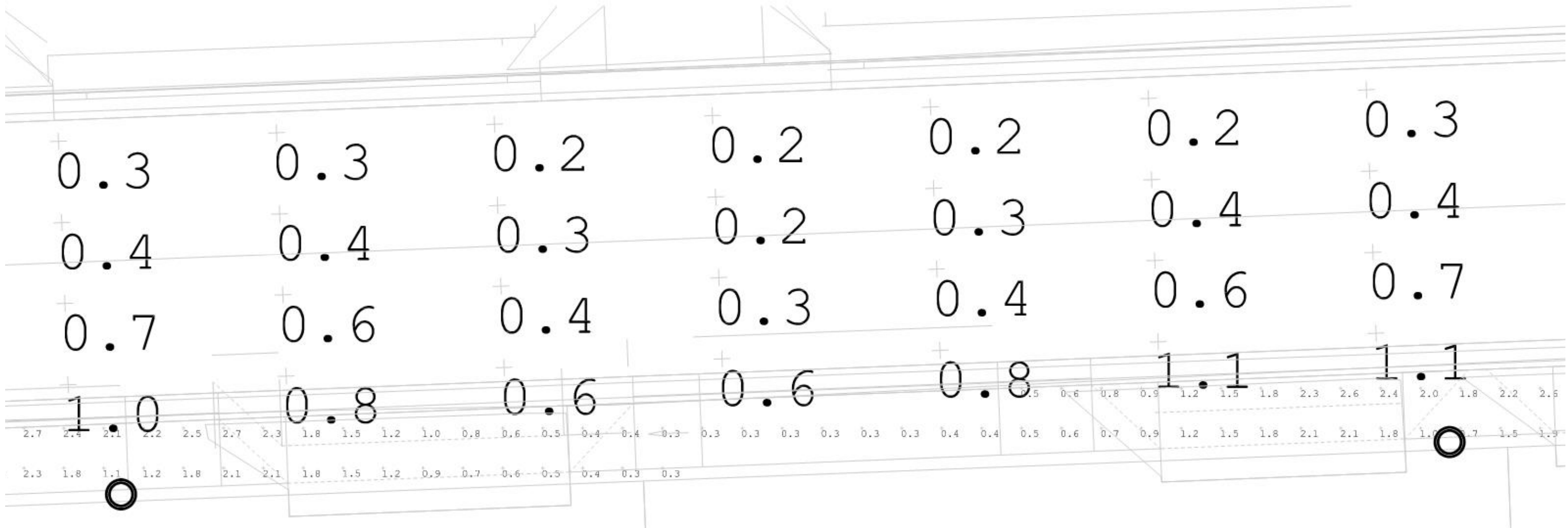
11-13



LIGHTWORKS INC.
DESIGN+ENGINEERING



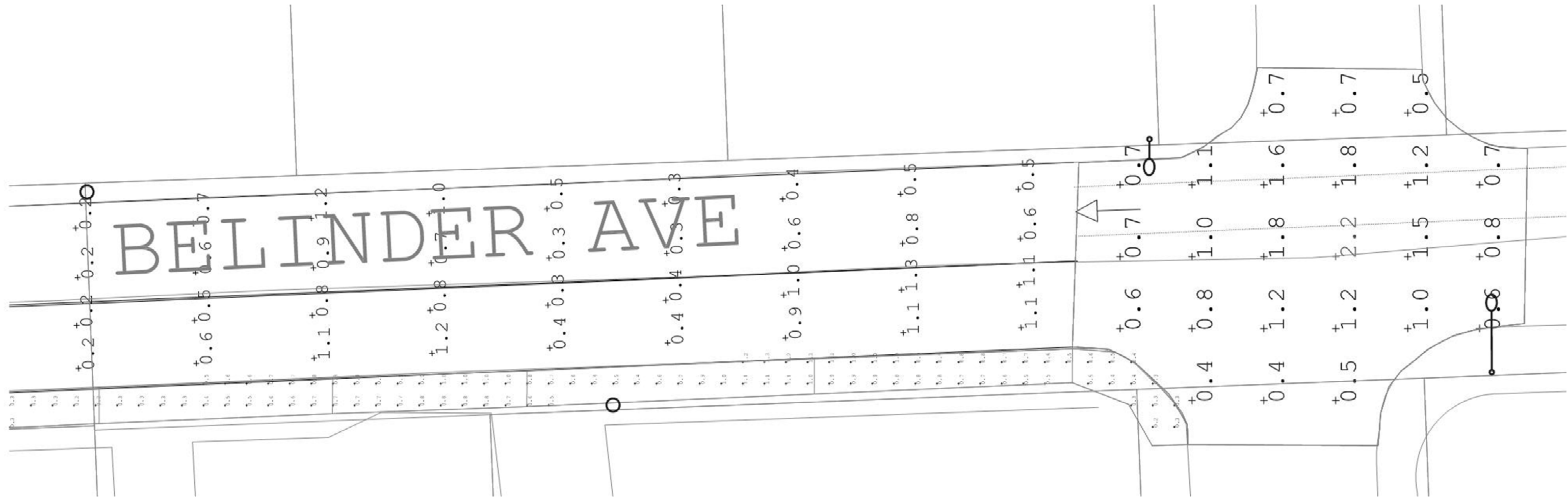
REV	REVISIONS	DATE	RVS	DATE	RVS
A	ORIGINAL	12/12/18			
WESTWOOD STREETLIGHTING					
WESTWOOD, KS					
SCALE					
JG					
PT-E450LED-R3-21L30T3-MDL14-SV2SA/7714FP5.250/CL/BKT					
DRAWING NUMBER					
SC32496-2A					



FIXTURE/LAYOUT INFORMATION:
14' POLE WITH POST TOP LUMINIAIRE
FIXTURE MOUNTING HEIGHT: 16'
100' O.C. POLE SPACING
FIXTURES ON ONE SIDE OF THE STREET

STREET ILLUMINATION	
CALCULATED VALUES:	TARGET VALUES:
0.76 FC AVERAGE	0.5 FC AVERAGE
3.80 AVG/MIN	6.0 AVG/MIN
13.00 MAX/MIN	10.0 MAX/MIN
2.55 MAX VEILING LUMINANCE RATIO	0.4 MAX VEILING LUMINANCE RATIO

WALKWAY ILLUMINATION	
CALCULATED VALUES:	TARGET VALUES:
1.07 FC AVERAGE	0.5 FC AVERAGE
5.35 AVG/MIN	4.0 AVG/MIN



FIXTURE/LAYOUT INFORMATION:

- 14' POLE WITH POST TOP LUMINAIRE
- FIXTURE MOUNTING HEIGHT: 16'
- 135' O.C. POLE SPACING
- OFFSET FIXTURES ON BOTH SIDES OF THE STREET

STREET ILLUMINATION

CALCULATED VALUES:	TARGET VALUES:
1.10 FC AVERAGE	0.6 FC AVERAGE
2.20 AVG/MIN	3.5 AVG/MIN
4.40 MAX/MIN	6.0 MAX/MIN
0.67 MAX VEILING LUMINANCE RATIO	0.4 MAX VEILING LUMINANCE RATIO

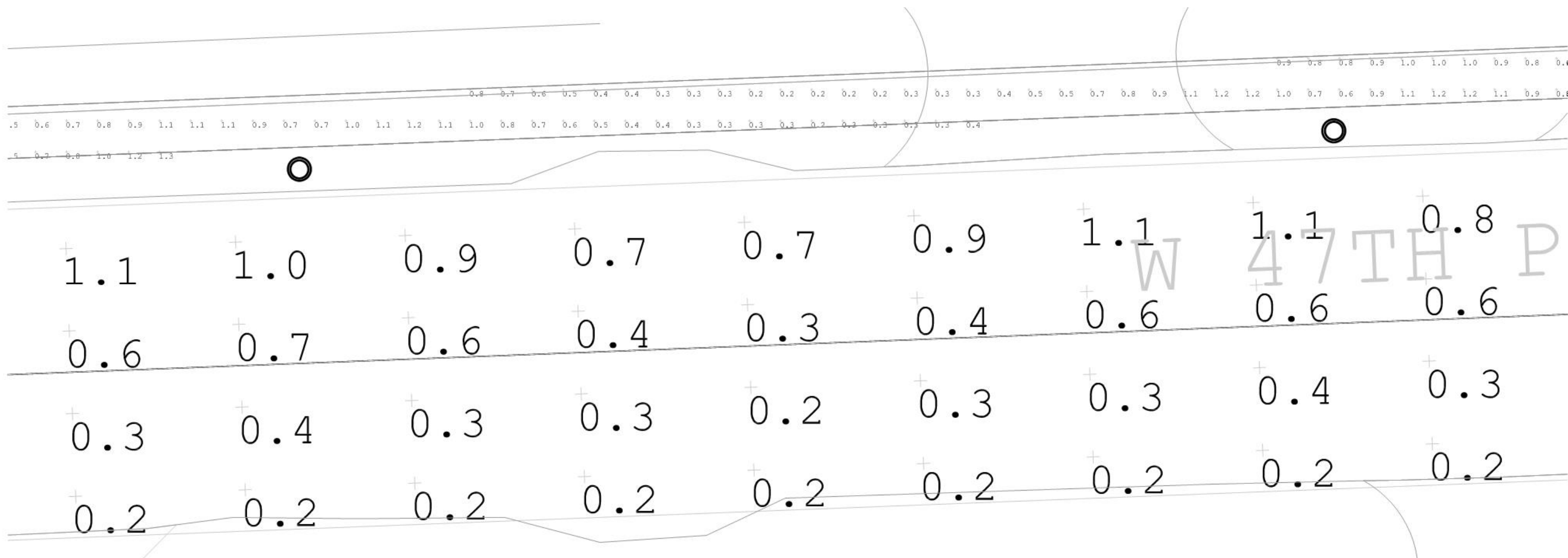
WALKWAY ILLUMINATION

CALCULATED VALUES:	TARGET VALUES:
0.90 FC AVERAGE	0.5 FC AVERAGE
2.25 AVG/MIN	4.0 AVG/MIN

INTERSECTION ILLUMINATION

CALCULATED VALUE:	TARGET VALUE:
1.13 FC AVERAGE	0.83-1.1 FC AVERAGE

COLLECTOR/MEDIUM STREET LIGHTING CONCEPT PLAN



FIXTURE/LAYOUT INFORMATION:
16' POLE WITH POST TOP LUMINAIRE
FIXTURE MOUNTING HEIGHT: 18'
100' O.C. POLE SPACING
FIXTURES ON ONE SIDE OF THE STREET

STREET ILLUMINATION	
CALCULATED VALUES:	TARGET VALUES:
0.69 FC AVERAGE	0.6 FC AVERAGE
3.45 AVG/MIN	3.5 AVG/MIN
10.0 MAX/MIN	6.0 MAX/MIN
1.11 MAX VEILING LUMINANCE RATIO	0.4 MAX VEILING LUMINANCE RATIO

WALKWAY ILLUMINATION	
CALCULATED VALUES (EAST/WEST):	TARGET VALUES:
0.63 FC AVERAGE	0.5 FC AVERAGE
3.15 AVG/MIN	4.0 AVG/MIN



CONTROLLER LOCATION PLAN

