SECTION 5
STREET LIGHT DESIGN

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SECTION 5

STREET LIGHT DESIGN

5-1 STREET LIGHTS - REQUIRED -- Street lights shall be required for all lots and parcels being developed or constructed upon unless excepted by Section 5-2. In addition, street lights may be required for lots and parcels containing existing structures which are being improved or altered, depending on the nature and extent of the work. Illustrations of street lights generally required are shown on Standard Drawing 5-1.

5-2 STREET LIGHTS - NOT REQUIRED -- Street lights shall not be required under the following circumstances:

A. Single family residential subdivisions having an average lot street frontage of more than 125 feet will not be required to install a street light system along the streets, but shall as a minimum, be required to install street lights at all intersections, cul-de-sacs, and other locations deemed by the Director to be essential. (e.g. pedestrian tunnel, pedestrian over-crossing, bridges, curves, etc.)

B. For planned developments, residential, commercial, and industrial developments where the internal streets are not offered for dedication, a street lighting system will not be required for the internal non-dedicated streets, but shall be provided by the developer on the external public street frontage.

5-3 DEVELOPER'S RESPONSIBILITY -- Existing street lights which must be relocated or repositioned as a result of the construction of new streets or driveways into a development shall be the responsibility of the developer.

Where a development abuts a collector street, primary residential street, or minor residential street where Standard Drawings 5-5D, 5-5E and 5-5F assume that street lights will be installed on alternate sides of the street, and where the property on the opposite side of the street has developed without street lights, the Director may require the developer to install additional street lights on the frontage of the development to maintain proper street light spacing.

A new service can with a step-down transformer, required as a result of the modification, replacement or relocation of an existing utility service pedestal shall be the responsibility of the developer. The developer shall also be responsible to ensure that power shall remain to existing street lights during the period of any

such modification, replacement or relocation of an existing utility service pedestal.

It shall be the responsibility of the developer to ensure that the power shall remain to the existing street light system until the new street light system is completed and functioning correctly.

5-4 UTILITY COMPANY AUTHORIZATION – The Sacramento Municipal Utility District (SMUD) rate tables for street light service have been modified as follows:

A. The Customer Owned/District Maintained lighting rate is no longer available for new street light installations. This may affect the street light systems on private streets and courts.

B. New Street Light installations on County maintained roadways may require the Developer to install a metered street light electrical service. The use of metered vs flat rate electrical billing shall be determined by the Developer's Engineer in consultation with the utility company prior to improvement plan submittal.

A written notice from the serving utility company, stating that line clearances and services have been checked and are adequate, shall be submitted to the Director for all developments.

5-5 GENERAL PLAN DETAILS -- The plans shall show and identify all street lights to be installed, all existing lights in the immediate vicinity of the project, all conduit and conductor runs, service points, trees, and all applicable provisions and details specified in these standards.

On subdivision plans, the street lights shall be shown separately. In addition to the above, the following shall be required on the street light portion of subdivision plans, even though duplications may be involved:

- A vicinity map or equivalent
- Utility poles and public utility easements
- Names of adjacent subdivisions
- Intersecting property lines of adjacent properties
- A "Symbols" legend conforming to Standard Drawing 5-1
- A North arrow and appropriate scale (1"=10' to 1"=100')
- All existing street lights on both sides of any streets and in the median
- All new tree installations shall be more than 20' from street lights
- All trees within the vicinity of the conduit runs or proposed street lights

5-6 DESIGN STANDARDS -- Street lighting shall be designed in conformance with these specifications, the current edition of the Sacramento County Standard Construction Specifications, and the "American National Standard Practice for Roadway Lighting" of the American Standards Institute, except that the average horizontal maintained foot candles for the various street classifications shall be as shown on Standard Drawings
5-5A through 5-5F. Data and calculations supporting the satisfaction of the above requirements shall be submitted for review, or the predetermined design standards included herein shall apply.

5-7 STREET LIGHT DESIGN DETAILS -- Design details for street lights are as follows:

A. Intersections -- Intersections shall have at least one street light. Intersection street light locations and the number required shall conform to Standard Drawings
5-6 through 5-7.

B. Cul-de-Sacs and Stub-End Streets-- All cul-de-sacs and stub-end streets exceeding 130 feet in length, measured from the street light location at the intersection to the right-of-way line at the end of the cul-de-sac or street, shall have a street light within the bulb, or in the case of a stub-end street, at the end of street barricade. The location of the street light within the cul-de-sac bulb shall conform to Standard Drawing 5-7.

C. Pedestrian Lanes -- Street lights shall be placed at both ends of pedestrian lanes.

D. Spacing -- Maximum street light spacing, measured along the street centerline, shall conform to Standard Drawings 5-5A through 5-5F, except on arterial and thoroughfare streets with a 1,000-foot or smaller radius horizontal curve, in which case the maximum spacing is 170 feet. The actual constructed street type and right-of-way width shall be the controlling factor for determination of street light spacing rather than the street classifications (arterial, collector, etc.).

E. Street Light Poles -- All street light poles shall be galvanized steel, except as provided for by Item "F" below. All pole construction and materials shall conform to the standards outlined in the Standard Construction Specifications, Section 49-2.05, “Standards, Steel Pedestals and Posts”, and the Standard Drawings referenced therein. Poles shall be identified on the plans or in the special provisions. Identification of Type A street light poles shall be by the
“A” series numbering procedure” as shown on Standard Drawing 5-3

The position of the street light poles shall conform to Standard Drawings 5-5A through 5-8.

F. Street Lights on Existing Utility-Owned Poles -- Where there are permanent existing (or necessary planned) utility owned poles adjacent to the roadway, the street lights may be installed upon the utility pole in lieu of the required street light poles. Should the utility pole option be utilized, the following shall apply:

1. In the Sacramento Municipal Utility District (SMUD) service area, the developer shall arrange with SMUD to install Utility owned and maintained street lights on existing utility poles. Proof that SMUD has agreed to the installation of the lights and the SMUD Rate designation shall be submitted to the plan check staff prior to approval of the plans.

2. In the Pacific Gas and Electric Company (PG&E) service area, the developer shall arrange with PG&E to install PG&E owned and maintained street lights on existing utility poles. Proof that PG&E has agreed to the installation of the lights and the PG&E Rate designation shall be submitted to the plan check staff prior to approval of the plans.

3. Spacing of lights may be varied to meet locations of existing utility poles, but shall not exceed the maximum spacing specified by Standard Drawings 5-5A through 5-5F. Street light mounting heights shall be as shown on Standard Drawings 5-5A through 5-5F. All luminaires shall have wattages relating to the street classification requirements shown on Standard Drawings 5-5A through 5-5F

G. Light Emitting Diode Luminaires – All new street light installations shall utilize Light Emitting Diode (LED) luminaires. The luminaire wattages shown on Standard Drawings 5-5A through 5-5F are nominal wattages; system wattages, which include the electronic driver, may be higher. LED luminaires shall conform to the standards outlined in the Standard Construction Specifications, Section 49-6.03, Light Emitting Diode (LED) Luminaires.

H. Service -- All street light systems shall have underground service provided. Service voltage shall be shown on the plans. Service voltage shall be 120 volts. Service voltage may be 277 volts only when 120 volt service is not available. Service points shall be provided within a Public Utility Easement immediately adjacent to the right-of-way, or within the right-of-way, and at a point which is as reasonably near as possible to the

serving utility power source. The service point shall be a pull box which is easily accessible to the street frontage. Types of service are as follows:

1. The Director may approve overhead service in unusual areas when justification is given for why service cannot be provided underground.

2. A direct underground service consists of one light being served from a single service point. New lights on developments adjacent to existing development shall connect to the existing service point. The service point shall be a pull box installed by the developer. See Standard Drawing 5-12 for commercial and residential requirements, and Standard Drawing 5-13 for installation details.

3. Multiple service is two or more lights being served from a single service point installed by the developer. The service point shall be a pull box. Multiple systems shall have an above ground service enclosure which is normally located adjacent to the service point and within the Right of Way and/or Public Utility Easement, between the service point and the light system. The service enclosure shall conform to Standard Drawing 5-30 through 5-33 as appropriate.

4. When five or more lights are connected to a single service point, an above ground, metered service enclosure shall be installed. The metered service enclosure shall be located per item No. 3 above.

I. Pull Boxes -- All pull boxes, including the size, shall be shown and identified on the plans. Pull boxes shall be installed at all locations where more than two conduit runs intersect, where conduit runs are more than 200 feet long, where shown on County Standard Drawings, at critical angle points, at property lines at the end of the required conduit run to the property line (see Section 5-7(L), “Conduit”), behind each light when No. 4 AWG. conductors are used, and at such locations ordered by the Director. Normally a No. 3-1/2 pull box will be allowed when three or fewer conduits of 1-1/2” or smaller size are involved and at the end of the required conduit run to the property line (see Section 5-7(L), “Conduit”).

J. Conductors -- All conductors, including quantity and size, shall be identified on the plans. Unless otherwise specified, conductors shall be single conductor, solid or stranded copper, sized in accordance with these standards and the National Electrical Code.

1. On a direct underground service, the minimum conductor size shall be No. 8 AWG. In general, no conductor shall be larger than No. 4 AWG.

2. On a multiple service, the minimum conductor size from the service point to the service enclosure shall be No. 8 AWG. The size of each conductor from the service enclosure to the luminaires shall be such that the voltage drop along each circuit will not exceed 7% for 2-wire systems and 6% for 3-wire systems of the nominal service voltage to the farthest luminaire. The nominal service voltage to be used is 115 volts. Calculations shall be submitted substantiating the design criteria for every circuit. Calculations shall also be submitted showing the total load in amperes of each circuit at the service enclosure. See Standard Drawing 5-9 or 5-10 for typical voltage drop calculations. When preparing voltage drop calculations for Light Emitting Diode fixtures, utilize the manufacturer's amperage rating for the fixture.

   In a multiple service system, the photo cell shall be connected to the service enclosure with three No. 14 AWG conductors.

K. Photo Cell and Receptacle -- All luminaires shall have a photocell receptacle per Standard Construction Specifications, Section 49-6.03, Light Emitting Diode (LED) Luminaires.On multiple service systems where a photocell is not utilized on every individual luminaire, a rain tight shorting cap shall be installed on the unused receptacles.

L. Conduit -- All conduit runs, including the size, shall be shown and identified on the plans. The conduit size shall be determined using Standard Drawing 5-11 as a guideline, with the minimum size being one and one-half inch diameter conduit.

   For a system designed using the 3-wire system, only 2 circuits (one set of 3 wires) shall be allowed in any conduit. Circuits based on the 2-wire system and the 3-wire system shall not be mixed in any conduit. All circuits may, however, be mixed in the same conduit from the service enclosure to the first pull box.

   The design may include more than two circuits in a conduit if the conductors for each circuit (2-wire) or set of circuits (3-wire) are identified by conductor insulation which is a solid color or a basic color with a permanent colored stripe. The identification stripe shall be continuous over the entire length of the conductor.

   New development shall install one and one-half inch conduit, or larger as required, with one No. 10 AWG stranded pullwire from the last light on each end of the system to the adjacent property line, where the adjacent property has no existing street lighting system.

M. Electrical Equipment and Work -- Control and switching equipment and fusing of all circuits shall meet the requirements of the National Electrical Code, the Basic Electrical Regulations, Title 24, Part 3, of the California Administrative Code, the rules of the National Board of Fire Underwriters, and the County of Sacramento.

N. Decorative Street Lights -- The Director may approve the use of Decorative poles and luminaires if warranted by the character of the surrounding neighborhood. Prior to plan approval, the developer must annex the properties to the appropriate benefit category in County Service Area 1 (CSA1) so that funds sufficient to maintain and replace the Decorative street light poles and luminaires will be collected from the benefitting property owners

Decorative street lights of a post-top design with luminaires having a vertically mounted non cut-off light source will be discouraged. Street light luminaires of a full-cut off or semi-cut off design mounted on a mast arm are preferred. See drawing numbers 5-2, and 5-4A through 5-4C for Decorative street light options.

1. When the use of Decorative street lights other than the styles shown on drawing numbers 5-2, and 5-4A through 5-4C is proposed, the developer shall submit design calculations for the pole spacing, including photometric calculations and plots from an appropriate computer program, for approval by the Director. Design criteria may be obtained from the Sacramento County Department of Transportation Street Light Operations Section.

2. Decorative street light luminaires shall be fitted with house-side shields, if necessary, to prevent glare and light trespass on adjacent residential properties.

3. The materials and specifications used in the manufacture of the Decorative street lights must be approved by the Director. Street light components manufactured of Aluminum alloys containing Silicon or Copper will not be permitted. Powder-coat finishes that cannot be refreshed by cleaning and painting in the field at a future date will not be permitted. A certification from the manufacturer that the above criteria are met may be required by the Director prior to approval.

4. Decorative street light poles and decorative bases having a paint or powder-coat finish must be galvanized inside and out, then painted equipment must be factory finished and delivered wrapped in a

protective layer that will prevent damage to the paint or powder-coat finish during shipping and handling.

5. Decorative street light equipment having a paint or powder-coat finish must be raised at least nine-inches above finished grade on a concrete pedestal. The developer shall supply street light foundation and pedestal details for approval by the Director.

6. When the use of Decorative street lights is approved, the developer shall supply additional street lights (pole, base cover, luminaire, etc.) to the County for future street light replacement. The minimum number of replacement street lights (spares) to be supplied to the County shall be 10% of the lights being installed with any fractional percent rounded up to the next whole number.

7. Installation details and equipment specifications for Decorative street lights, including the equipment manufacturer's name, model and paint numbers, shall be included on the street light plan sheets. The information shall include details for the foundation and pedestal construction and a note indicating the requirement for spares as detailed above.

5-8 MASTER PLANNING -- Master planning is the determination of street light locations between control points. Control points are proposed street light locations at street intersections in accordance with Section 5-7, Standard Drawings 5-6, 5-7, , and existing street lights. The purpose of master planning is to establish an overall uniform street light system meeting minimum requirements. On Arterial and Thoroughfare streets, master planning shall apply to only one side of the street. On all other streets, master planning shall apply to both sides of the street. The procedure for master planning is outlined as follows:

A. Identify the nearest intersections each way from the street light locations being planned. Determine the location of the street lights at the intersections in conformance with the design standards in Section 5-7 above.

B. Identify any existing street lights situated between the intersections.

C. Determine the distance between the adjacent designed intersection street lights and/or adjacent existing street lights, whichever are nearest to the street light locations being planned.

D. Divide the distance into equal spaces between lights not to exceed the maximum spacing requirements specified in Section 5-7 above.

E. Compare the light locations to intersecting property lines, driveways, pedestrian lanes, and other obstructions as follows:

1. If the location falls close to a property line and it can be adjusted to the property line while staying within the maximum spacing allowed, then the adjustment should be made.

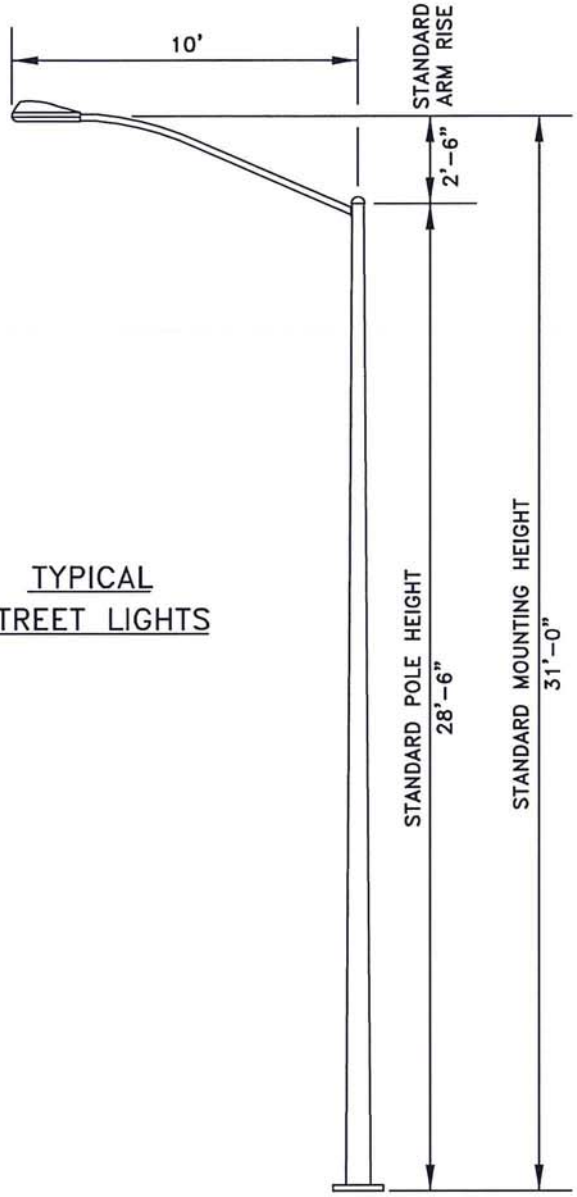
2. Generally, street lights should be situated at intersecting property lines for residential lots and parcels with minimal frontage (75 feet or less). The light spacing may have to be unbalanced, with additional lights being added, to attain this and still comply with the maximum spacing allowed.

3. Street light locations shall be adjusted to miss driveways, existing utility poles, and other obstructions by at least five feet.

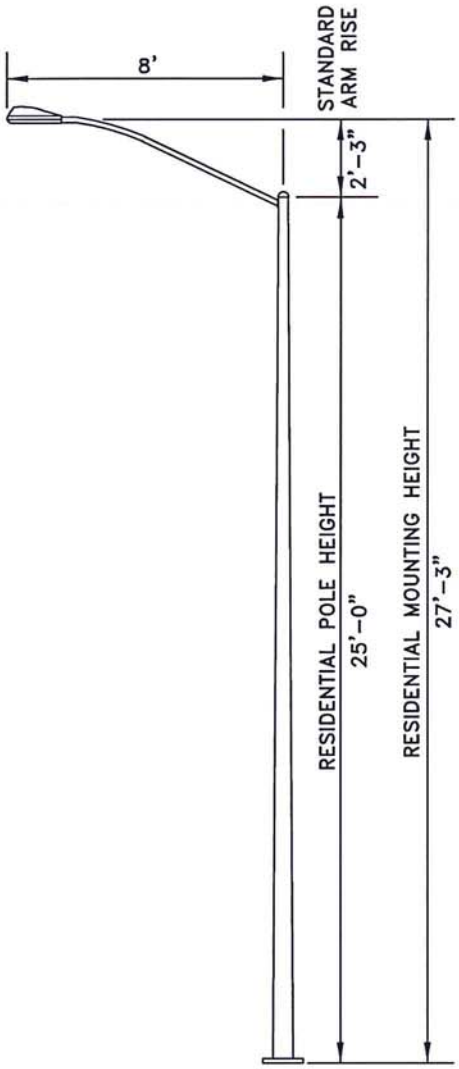
F. Where utility-owned poles with overhead electric power lines exist, the serving utility company shall be contacted to determine if the street lights can be installed on the poles. When a street light location falls within 25 feet of an existing electric power pole, arrangements should be made for the utility company to install the light on their pole in accordance with Section 5-7(F).

G. Street light locations on Arterial and Thoroughfare streets should be adjusted, when possible, to obtain a more uniform light distribution if there are existing street lights on the opposite side of the street.

TYPICAL STREET LIGHTS



STANDARD TYPE "A"



RESIDENTIAL TYPE "A"

SYMBOLS

PROPOSED	EXISTING	
⊡—◯	⊡—◯	TYPE "A" STREET LIGHT
□	□	PULL BOX
SP	SP	SERVICE POINT PULL BOX
———	———	CONDUIT
◪	◪	SERVICE ENCLOSURE (CAN)
⬡	⬡	U.G. UTILITY SERVICE
△	△	TRANSFORMER
—○—	—○—	WOOD POLE

NOTE:
INSTALL IN EACH STREET LIGHT FIXTURE A 10 AMP 500 VAC TIME-DELAY MIDGET FERRULE TYPE FUSE WITH IN-LINE FUSE HOLDER.

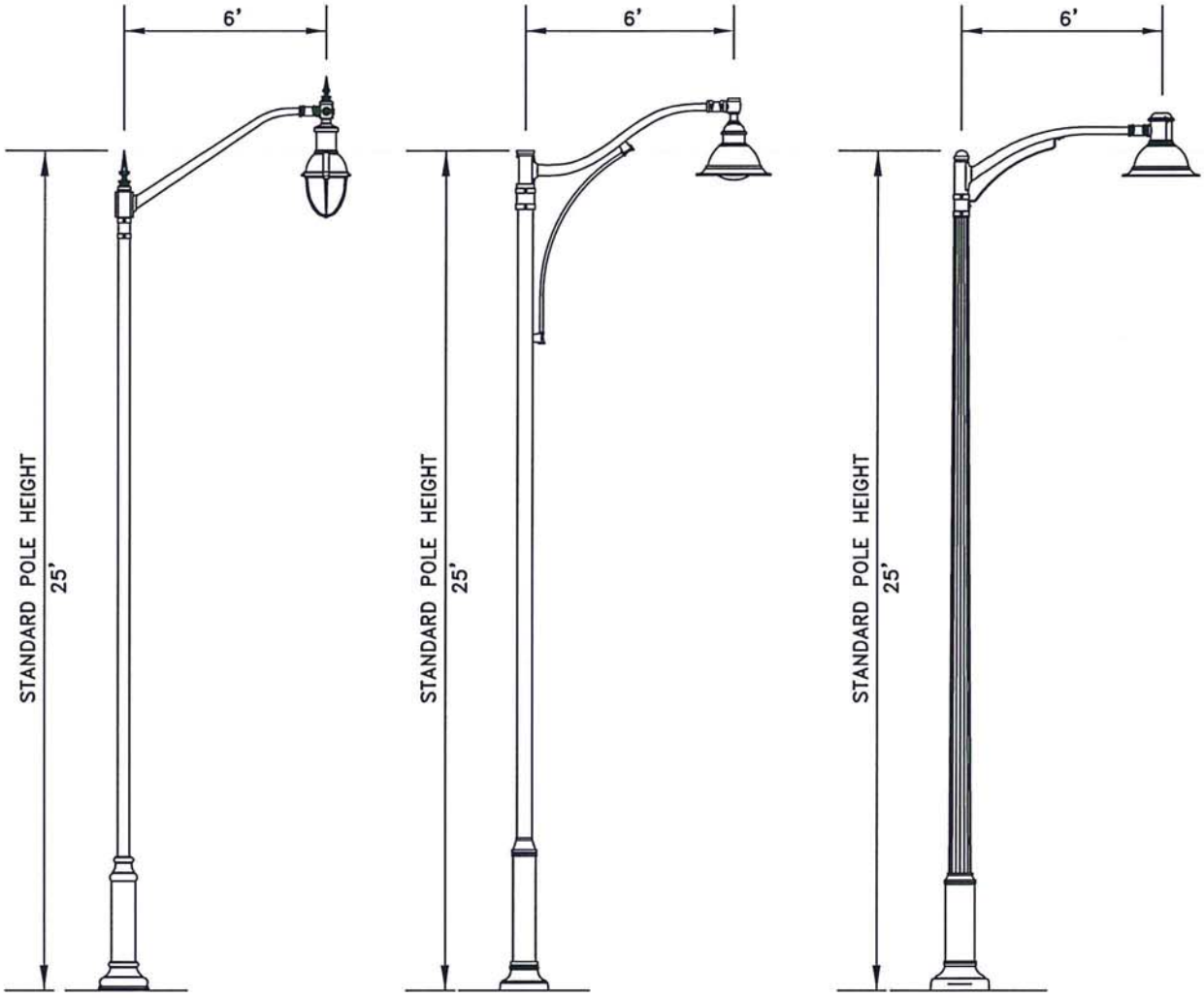
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

STREET LIGHTING POLES AND SYMBOLS

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-1



OPTION "A" OPTION "B" OPTION "C"

NOTE:

INSTALL IN EACH STREET LIGHT FIXTURE A 10 AMP 500 VAC TIME-DELAY MIDGET FERRULE TYPE FUSE WITH IN-LINE FUSE HOLDER.

CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

TYPICAL DECORATIVE STREET LIGHTING POLES

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

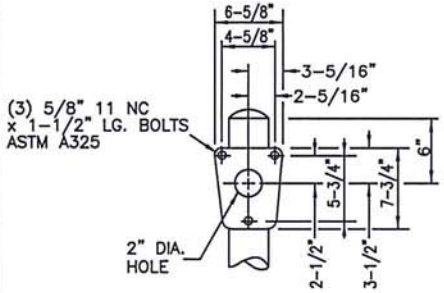
5-2

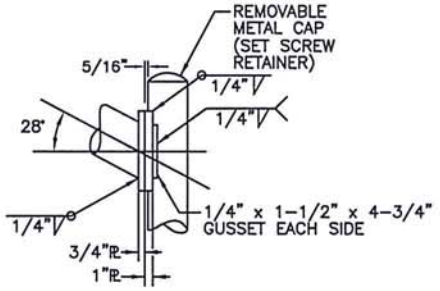
NOTES:

1. 'A' SERIES NUMBERING PROCEDURE

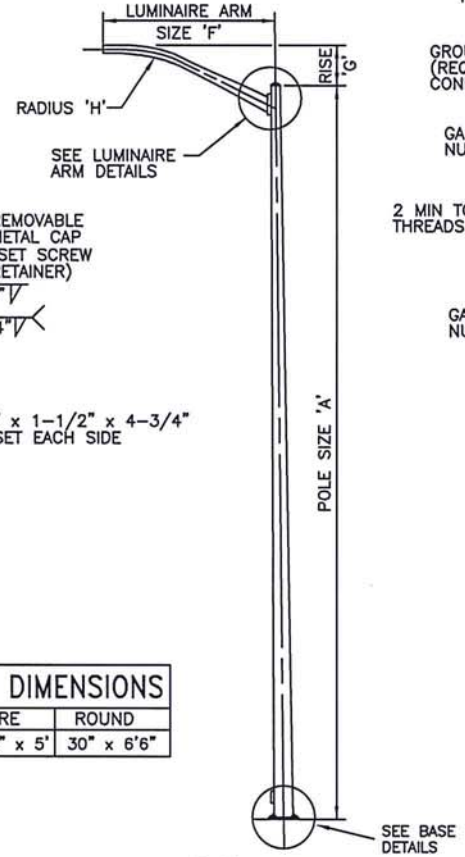
   POLE SIZE 'A'
   A–286–8
   SERIES — LUMINAIRE ARM SIZE 'F'
   (STANDARD UNLESS OTHERWISE SPECIFIED)

2. POLES SHALL NOT HAVE HANDHOLDS

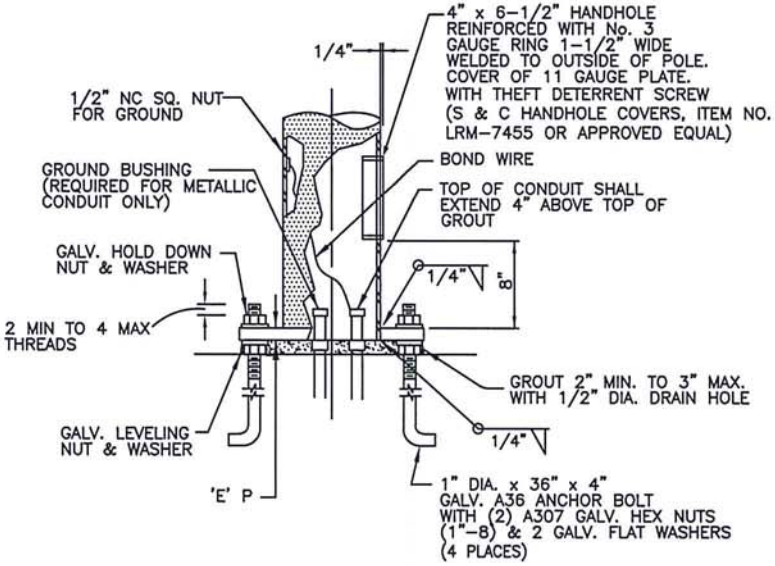


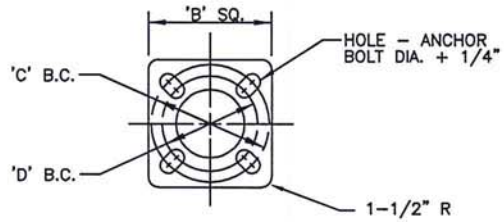


LUMINAIRE ARM DETAILS



'A' SERIES





BASE DETAILS

LUMINAIRE ARM DATA					
'F'	END OD	BASE OD	GA	'G'	'H'
6'–0"	2–3/8"	3–3/8"	10	1'–6"	7'–5"
8'–0"	2–3/8"	3–11/16"	10	2'–3"	7'–5"
10'–0"	2–3/8"	3–7/8"	10	2'–6"	13'–3"
12'–0"	2–3/8"	4–5/16"	10	3'–9"	13'–3"
15'–0"	2–3/8"	4–3/4"	10	4'–3"	13'–3"
18'–0"	2–3/8"	4–3/4"	10	5'–3"	13'–3"

FOUNDATION DIMENSIONS		
	SQUARE	ROUND
'A' SERIES	2'6" x 2'6" x 5'	30" x 6'6"

'A' SERIES									
IDENTIFICATION NUMBER 1	POLE DATA				BASE PLATE DATA				ANCHOR BOLTS
	'A'	TOP OD	BASE OD	GA	'B'	'C'	'D'	'E'	
A–250–'F'	25'–0"	3–7/8"	7–5/16"	11	12"	11–1/2"	11"	1"	1" x 36" x 4"
A–266–'F'	26'–6"	3–7/8"	7–1/2"	11	12"	11–1/2"	11"	1"	1" x 36" x 4"
A–286–'F'	28'–6"	3–7/8"	7–3/4"	11	12"	11–1/2"	11"	1"	1" x 36" x 4"
A–300–'F'	30'–0"	3–7/8"	8"	11	12"	11–1/2"	11"	1"	1" x 36" x 4"

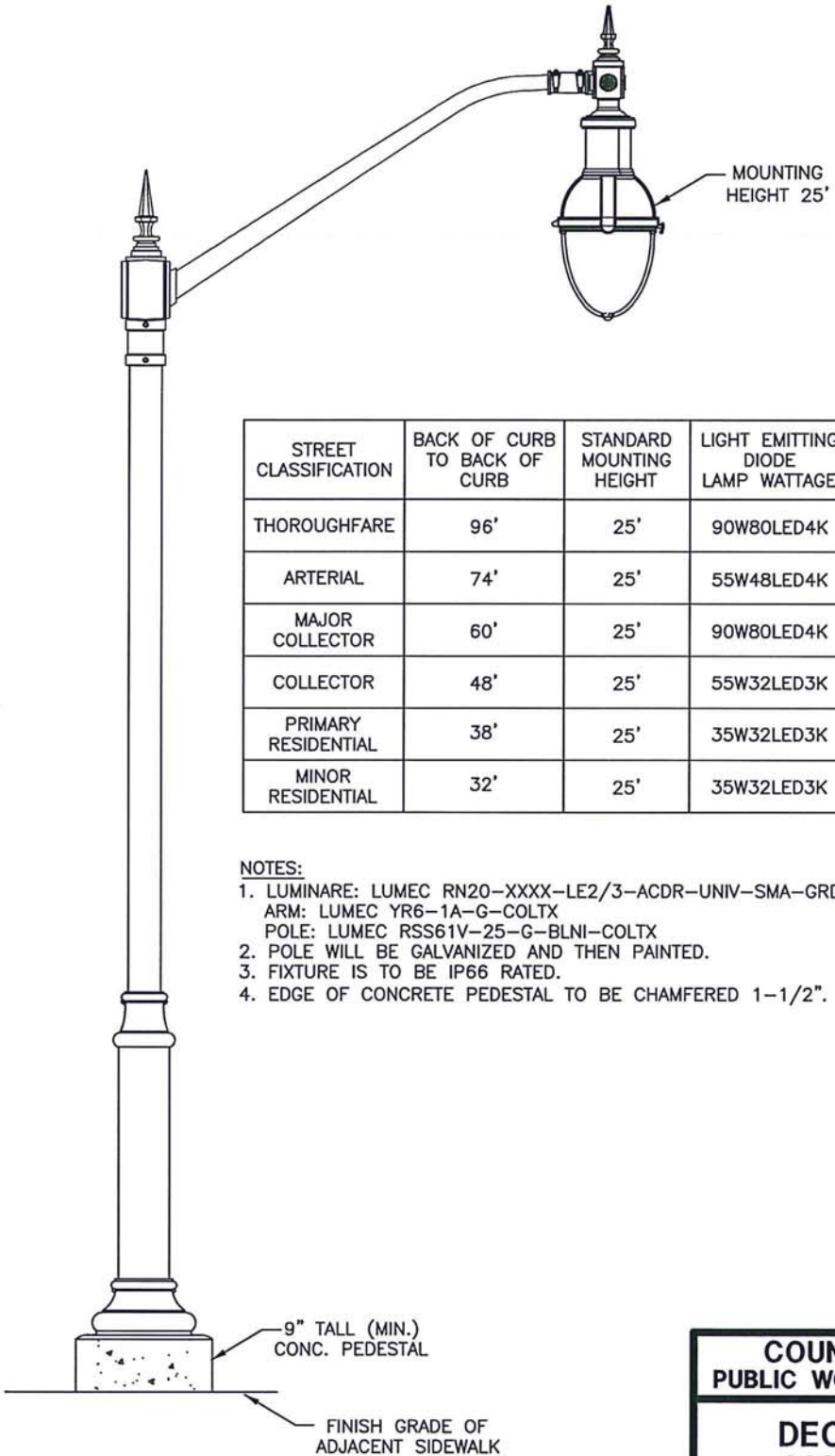
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

SIGNAL, LIGHTING AND ELECTRICAL SYSTEMS TYPE 'A' STREET LIGHT STANDARD

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-3



STREET CLASSIFICATION	BACK OF CURB TO BACK OF CURB	STANDARD MOUNTING HEIGHT	LIGHT EMITTING DIODE LAMP WATTAGE	SPACING (D)
THOROUGHFARE	96'	25'	90W80LED4K	180'
ARTERIAL	74'	25'	55W48LED4K	190'
MAJOR COLLECTOR	60'	25'	90W80LED4K	200'
COLLECTOR	48'	25'	55W32LED3K	180'
PRIMARY RESIDENTIAL	38'	25'	35W32LED3K	190'
MINOR RESIDENTIAL	32'	25'	35W32LED3K	190'

NOTES:
1. LUMINARE: LUMEC RN20-XXXX-LE2/3-ACDR-UNIV-SMA-GRD-COLTX
   ARM: LUMEC YR6-1A-G-COLTX
   POLE: LUMEC RSS61V-25-G-BLNI-COLTX
2. POLE WILL BE GALVANIZED AND THEN PAINTED.
3. FIXTURE IS TO BE IP66 RATED.
4. EDGE OF CONCRETE PEDESTAL TO BE CHAMFERED 1-1/2".

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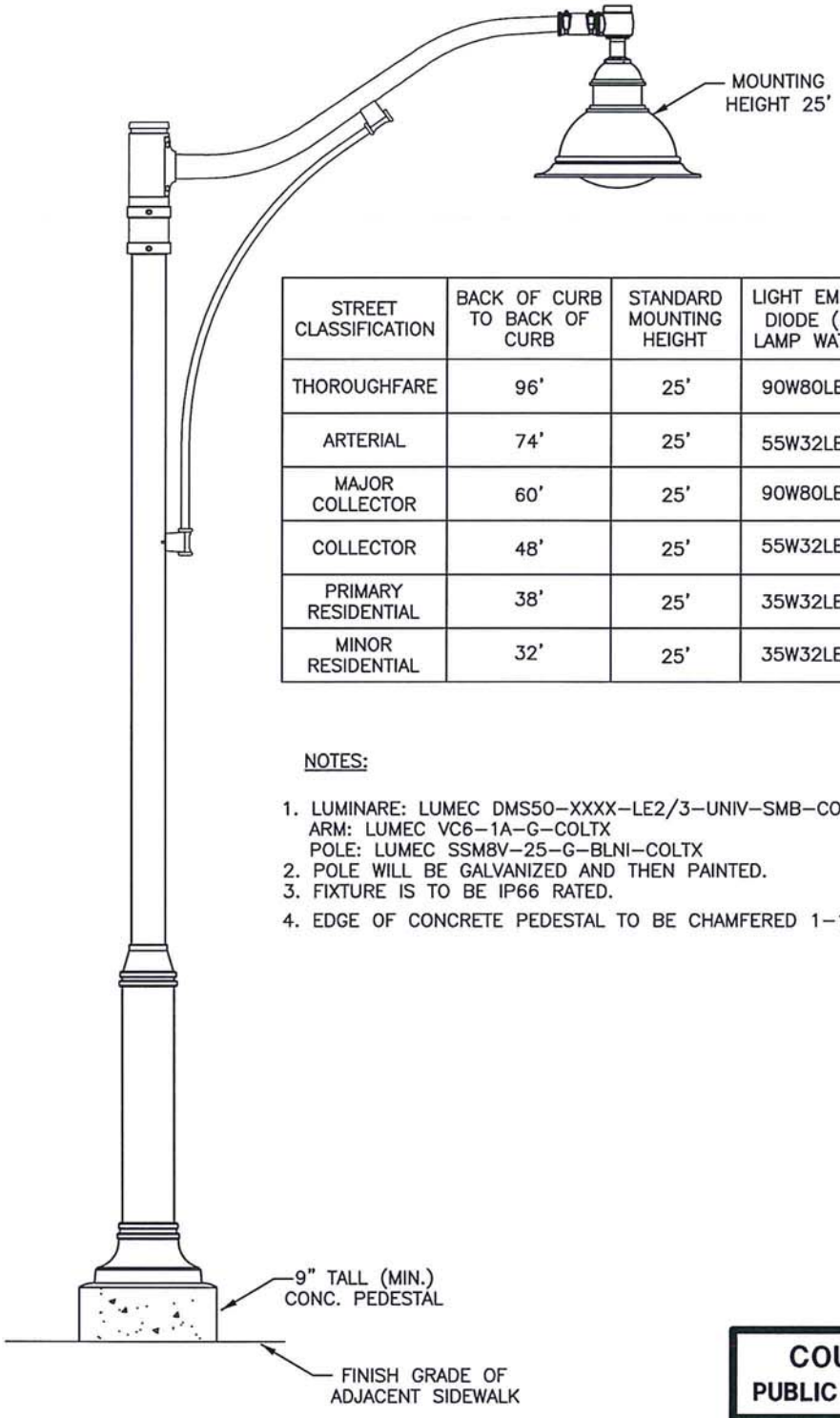
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

DECORATIVE STREET LIGHT ALTERNATIVE OPTION A

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-4A



STREET CLASSIFICATION	BACK OF CURB TO BACK OF CURB	STANDARD MOUNTING HEIGHT	LIGHT EMITTING DIODE (LED) LAMP WATTAGE	SPACING (D)
THOROUGHFARE	96'	25'	90W80LED4K	180'
ARTERIAL	74'	25'	55W32LED4K	190'
MAJOR COLLECTOR	60'	25'	90W80LED4K	200'
COLLECTOR	48'	25'	55W32LED3K	180'
PRIMARY RESIDENTIAL	38'	25'	35W32LED3K	190'
MINOR RESIDENTIAL	32'	25'	35W32LED3K	190'

NOTES:

1. LUMINARE: LUMEC DMS50-XXXX-LE2/3-UNIV-SMB-COLTX
   ARM: LUMEC VC6-1A-G-COLTX
   POLE: LUMEC SSM8V-25-G-BLNI-COLTX
2. POLE WILL BE GALVANIZED AND THEN PAINTED.
3. FIXTURE IS TO BE IP66 RATED.
4. EDGE OF CONCRETE PEDESTAL TO BE CHAMFERED 1-1/2".

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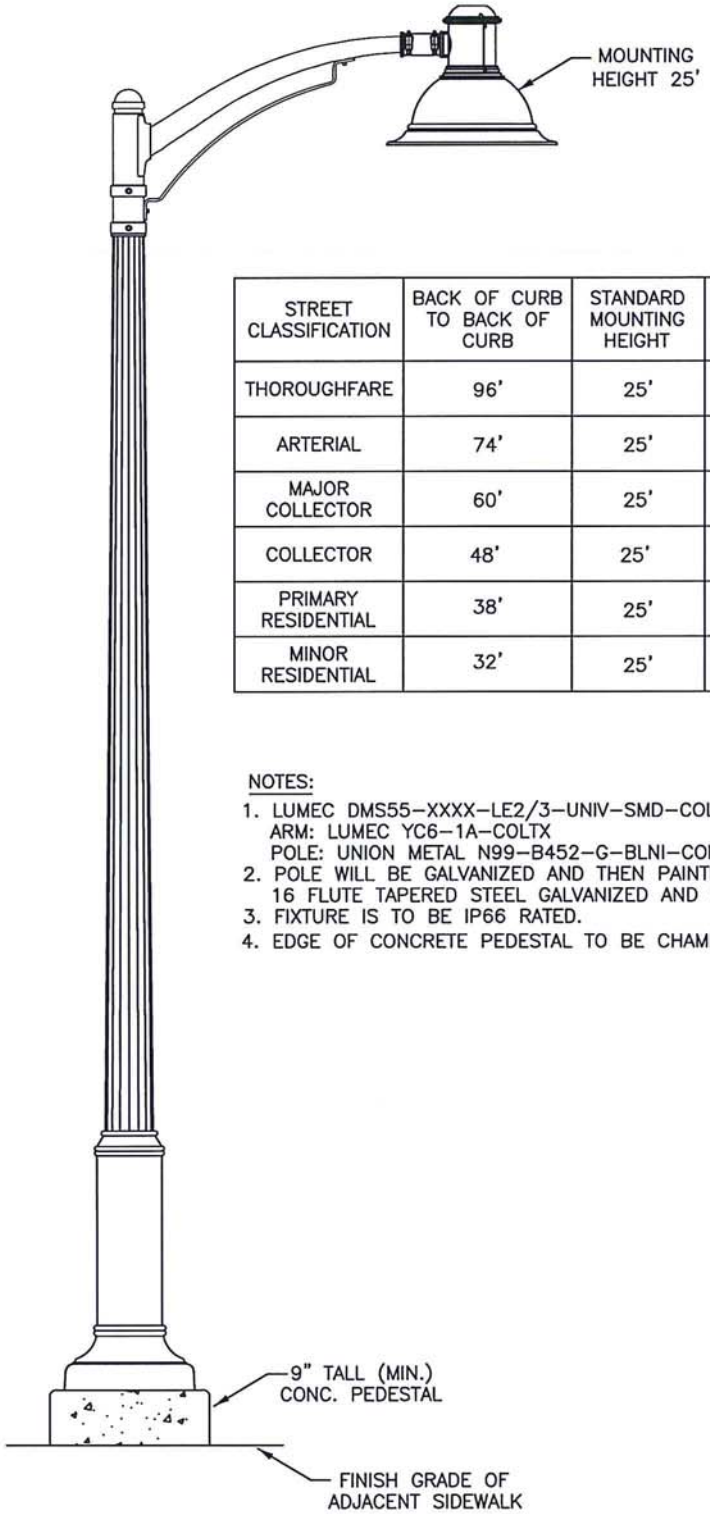
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

DECORATIVE STREET LIGHT ALTERNATIVE OPTION B

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-4B



STREET CLASSIFICATION	BACK OF CURB TO BACK OF CURB	STANDARD MOUNTING HEIGHT	LIGHT EMITTING DIODE LAMP WATTAGE	SPACING (D)
THOROUGHFARE	96'	25'	90W80LED4K	180'
ARTERIAL	74'	25'	90W80LED4K	190'
MAJOR COLLECTOR	60'	25'	90w80LED4K	200'
COLLECTOR	48'	25'	55W32LED3k	180'
PRIMARY RESIDENTIAL	38'	25'	35W32LED3K	190'
MINOR RESIDENTIAL	32'	25'	35W32LED3k	190'

NOTES:

1. LUMEC DMS55–XXXX–LE2/3–UNIV–SMD–COLTX
   ARM: LUMEC YC6–1A–COLTX
   POLE: UNION METAL N99–B452–G–BLNI–COLTX
2. POLE WILL BE GALVANIZED AND THEN PAINTED.
   16 FLUTE TAPERED STEEL GALVANIZED AND PAINTED POLE.
3. FIXTURE IS TO BE IP66 RATED.
4. EDGE OF CONCRETE PEDESTAL TO BE CHAMFERED 1–1/2".

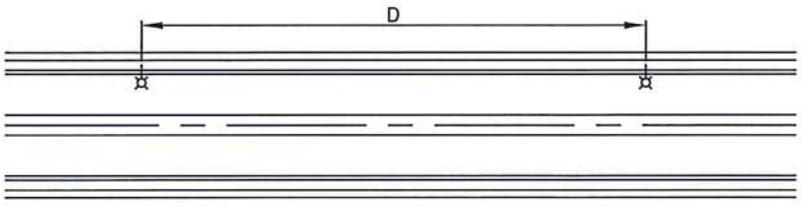
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

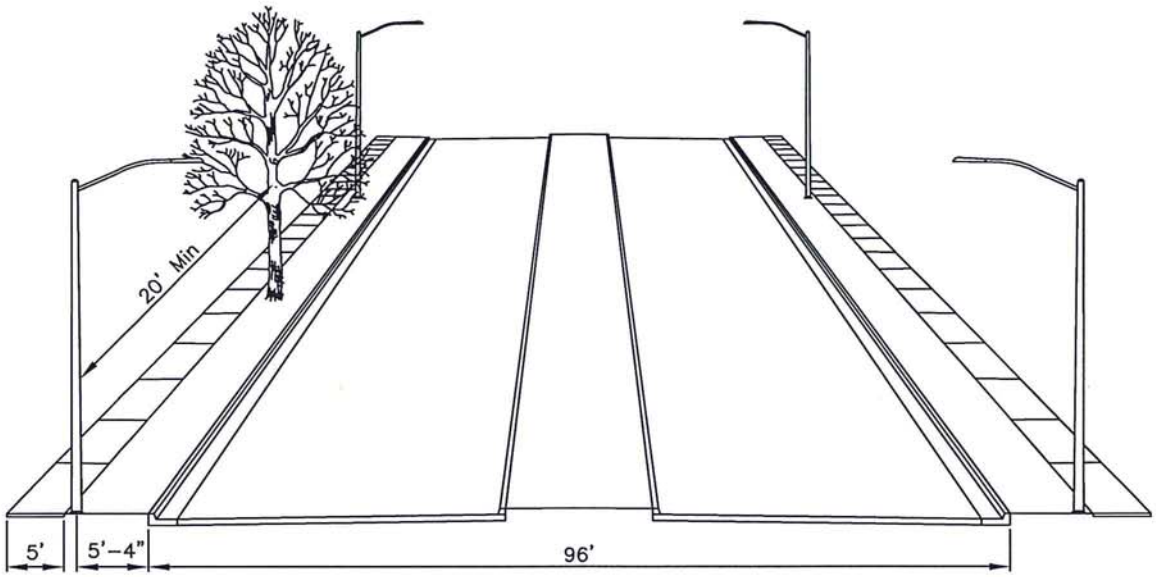
DECORATIVE STREET LIGHT ALTERNATIVE OPTION C

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-4C



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (10')
LAMP	LED
WATTAGE	SEE APPROVED LIST ON DRAWING 5–5G
POLE HEIGHT	28'–6" POLE 31' FIXT.
COLOR	NON–PAINTED GALVANIZED
GLOBE	FULL–CUTOFF
SPACING "D"	180'
SPACING PATTERN	ONE SIDE
LIGHT LOSS FACTOR	0.85
DESIGN GUIDELINE	0.56 FOOT CANDLES (AVG.)



NOTE: LIGHTS ON OPPOSITE SIDES OF THE STREET MAY BE STAGGERED OR OPPOSITE.

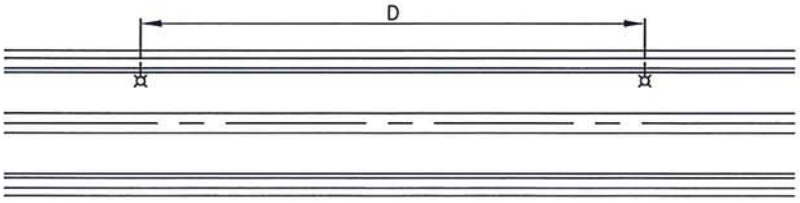
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

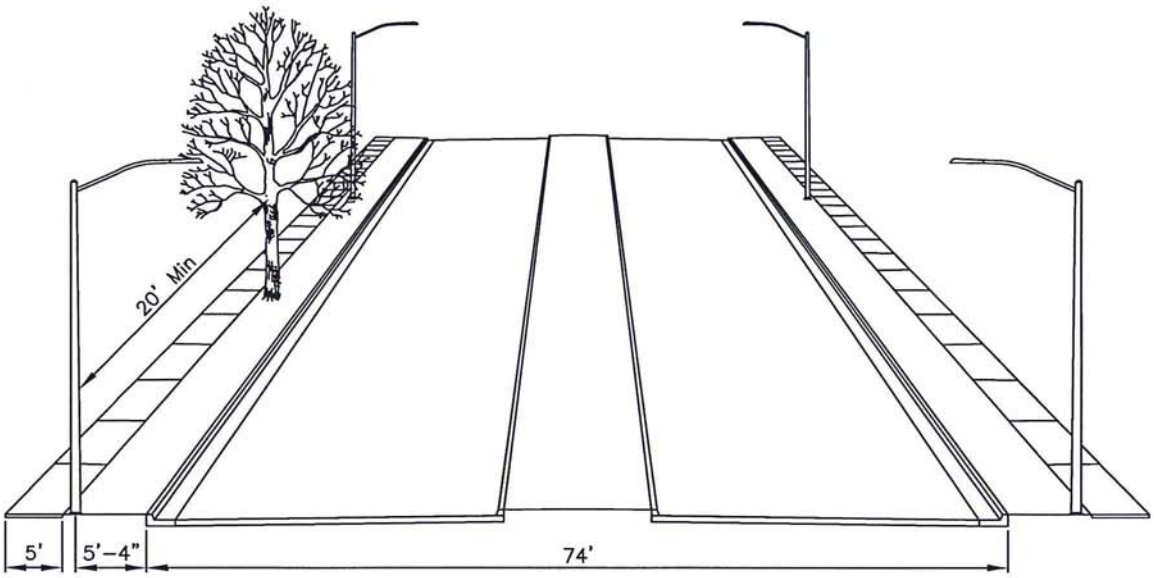
THOROUGHFARE

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5A



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (10')
LAMP	LED
WATTAGE	SEE APPROVED LIST ON DRAWING 5–5G
POLE HEIGHT	28'–6" POLE 31' FIXT.
COLOR	NON–PAINTED GALVANIZED
GLOBE	FULL–CUTOFF
SPACING "D"	220'
SPACING PATTERN	ONE SIDE
LIGHT LOSS FACTOR	0.85
DESIGN GUIDELINE	0.36 FOOT CANDLES (AVG.)



NOTE: LIGHTS ON OPPOSITE SIDES OF THE STREET MAY BE STAGGERED OR OPPOSITE.

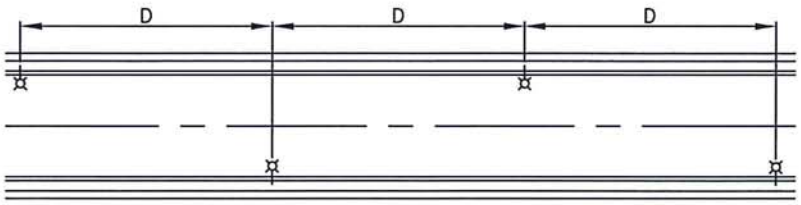
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

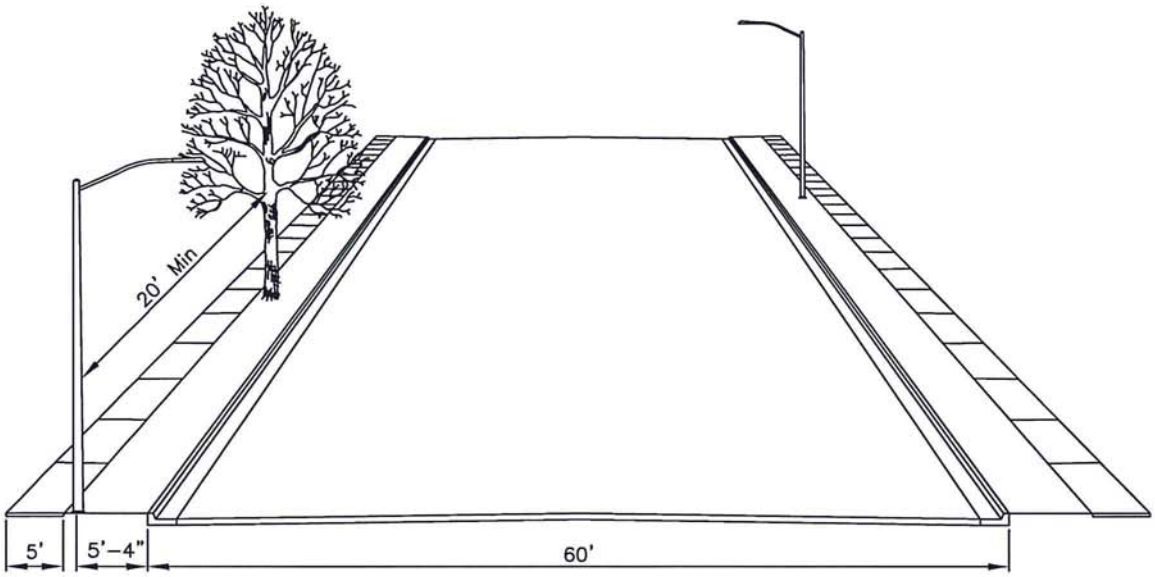
ARTERIAL

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5B



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (10')
LAMP	LED
WATTAGE	SEE APPROVED LIST ON DRAWING 5-5G
POLE HEIGHT	28'-6" POLE 31' FIXT.
COLOR	NON-PAINTED GALVANIZED
GLOBE	FULL-CUTOFF
SPACING "D"	220'
SPACING PATTERN	STAGGERED
LIGHT LOSS FACTOR	0.85
DESIGN GUIDELINE	0.36 FOOT CANDLES (AVG.)



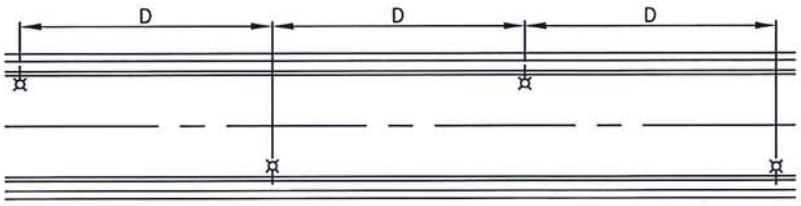
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

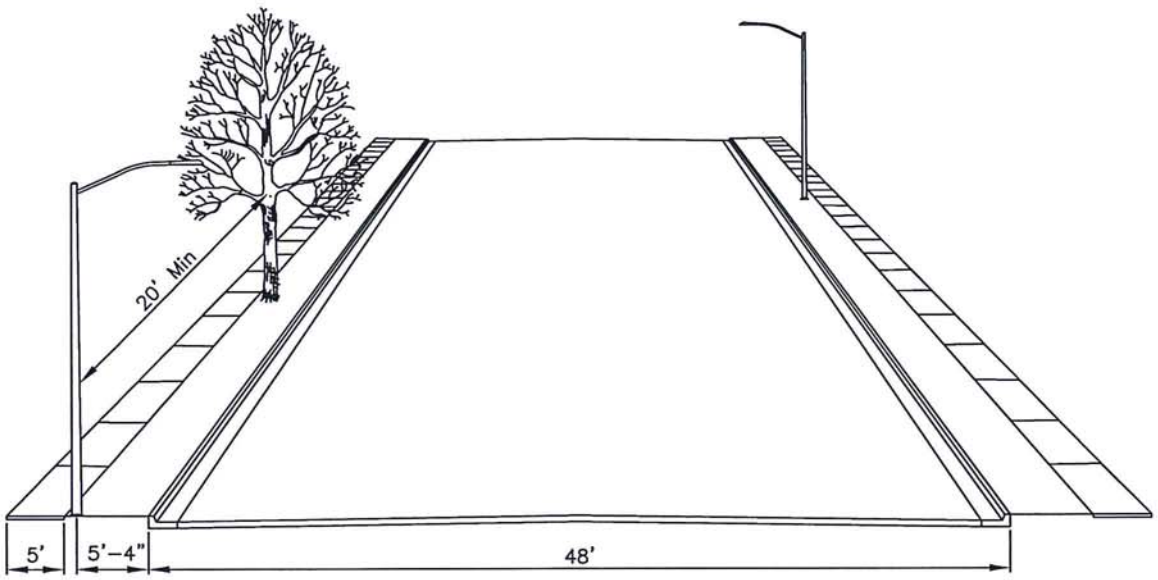
MAJOR COLLECTOR

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5C



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (10')
LAMP	LED
WATTAGE	SEE APPROVED LIST ON DRAWING 5-5G
POLE HEIGHT	28'-6" POLE 31' FIXT.
COLOR	NON-PAINTED GALVANIZED
GLOBE	FULL-CUTOFF
SPACING "D"	180'
SPACING PATTERN	STAGGERED
LIGHT LOSS FACTOR	0.85
DESIGN GUIDELINE	0.26 FOOT CANDLES (AVG.)



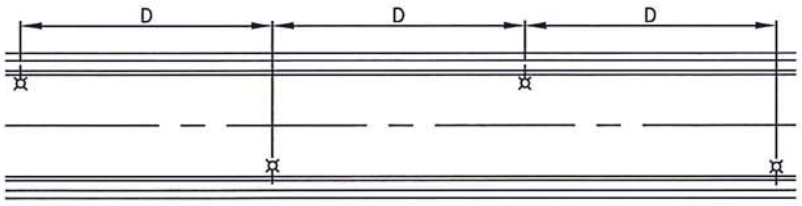
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

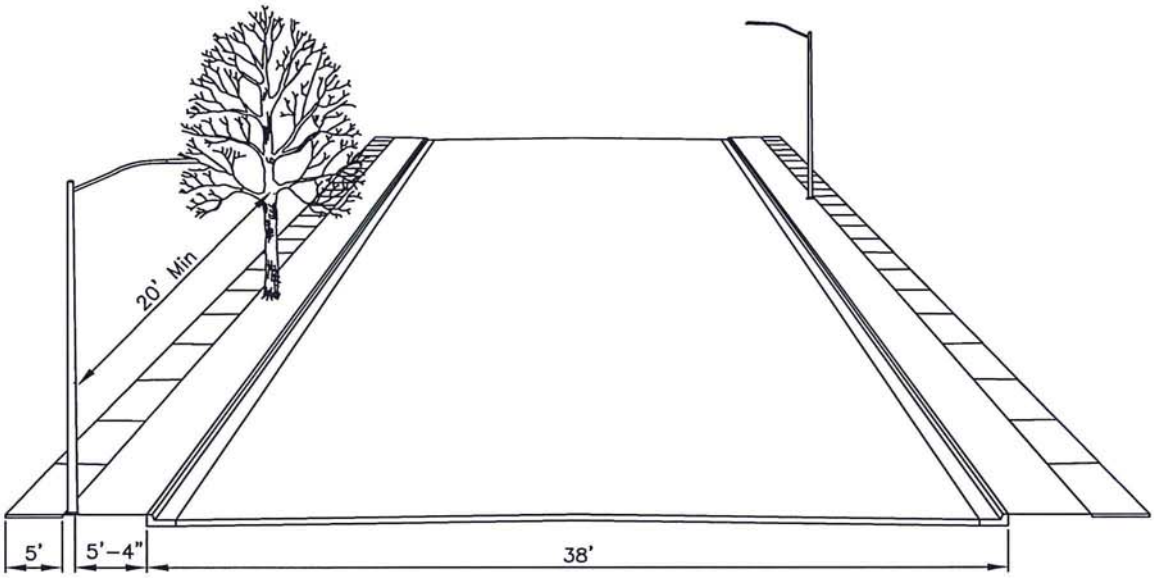
COLLECTOR

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5D



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (8')
LAMP	LED
WATTAGE	SEE APPROVED LIST ON DRAWING 5-5G
POLE HEIGHT	25' POLE - 27'-3" FIXT.
COLOR	NON-PAINTED GALVANIZED
GLOBE	FULL-CUTOFF
SPACING "D"	200
SPACING PATTERN	STAGGERED
LIGHT LOSS FACTOR	0.85
DESIGN GUIDELINE	0.13 FOOT CANDLES (AVG.)



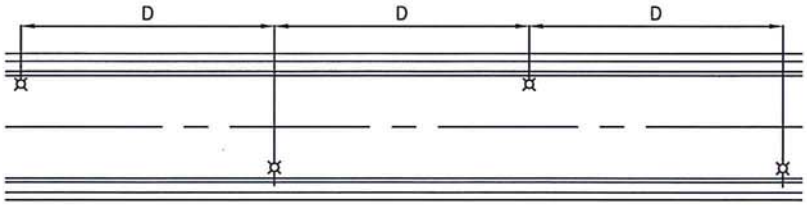
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

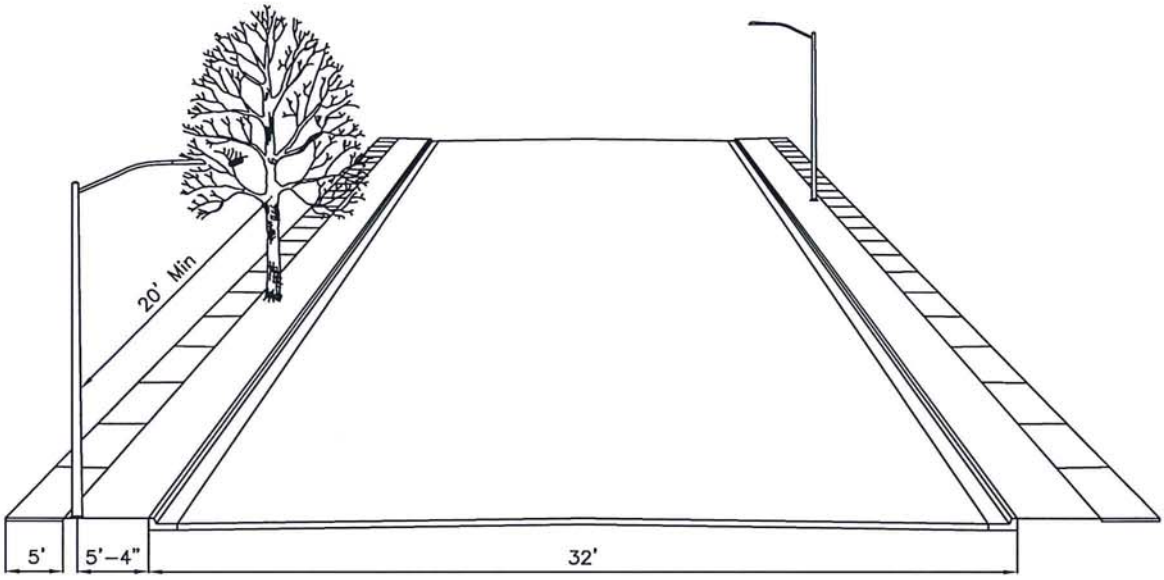
PRIMARY RESIDENTIAL

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5E



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (8')
LAMP	LED
WATTAGE	SEE APPROVED LIST ON DRAWING 5-5G
POLE HEIGHT	25' POLE – 27'-3" FIXT.
COLOR	NON-PAINTED GALVANIZED
GLOBE	FULL-CUTOFF
SPACING "D"	240
SPACING PATTERN	STAGGERED
LIGHT LOSS FACTOR	0.85
DESIGN GUIDELINE	0.12 FOOT CANDLES (AVG.)



CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

MINOR RESIDENTIAL

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5F

THOROUGHFARE (96')
PHILIPS
73W-8745L RFM-72W32LED4K-R2M-UNIV-DMG-RCD7-GY3
LEOTEK
90W-10000L EC4-~~14M2~~-15M2-MV-NW-2-530-GY-PCR7-FDC-WL
AMERICAN ELECTRIC
83W-10457L ATB0-30LEDE85-M-VOLT-R2-PCCL

ARTERIAL (74')
PHILIPS
RFS-54W16LED4K-R2M-UNIV-DMG-RCD7-GY3 53W-6013L
LEOTEK
~~EC4-~~EC3-10M2-MV-NW-2-530-GY-PCR7-FDC-WL 63W-6850L
AMERICAN ELECTRIC
ATB0-30LEDE85-M-VOLT-R2-PCCL 83W-10457L

MAJOR COLLECTOR (60')
PHILIPS
73W-8745L RFM-72W32LED4K-R2M-UNIV-DMG-RCD7-GY3
LEOTEK
90W-10000L EC4-~~14M2~~-15M2-MV-NW-2-530-GY-PCR7-FDC-WL
54W-6210L GCJ2-20H-MV-NW-2R-GY-830-PCR7-FDC-WL

COLLECTOR (48')
PHILIPS
RFS-54W16LED3K-R2M-UNIV-DMG-RCD7-GY3 53W-5674L
LEOTEK
GCJ1-20H-MV-WW-2R-GY-700-PCR7-FDC-WL 46W-5130L

PRIMARY RESIDENTIAL (38')
PHILIPS
38W-4310L RFS-35W16LED3K-R2M-UNIV-DMG-RCD7-GY3
LEOTEK
46W-5130L GCJ1-20H-MV-WW-2R-GY-700-PCR7-FDC-WL

MINOR RESIDENTIAL (32')
PHILIPS
RFS-35W16LED3K-R2M-UNIV-DMG-RCD7-GY3 38W-4310L
LEOTEK
GCJ1-20H-MV-WW-2R-GY-700-PCR7-FDC-WL 46W-5130L

LIGHT DISTRIBUTION PATTERN WILL BE ANSI TYPE 2 EXCEPT AT CUL-DE-SACS, INTERSECTIONS, AND AT ELBOWS (SEE DRAWING 5-7)

CHIEF, DEPT. OF TRANSPORTATION

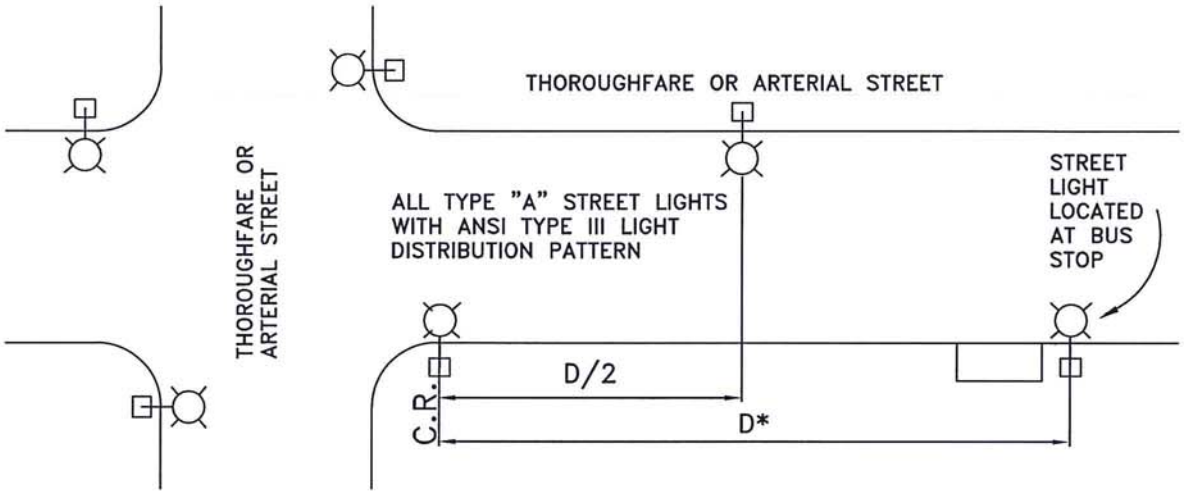
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

APPROVED LUMINAIRE LIST

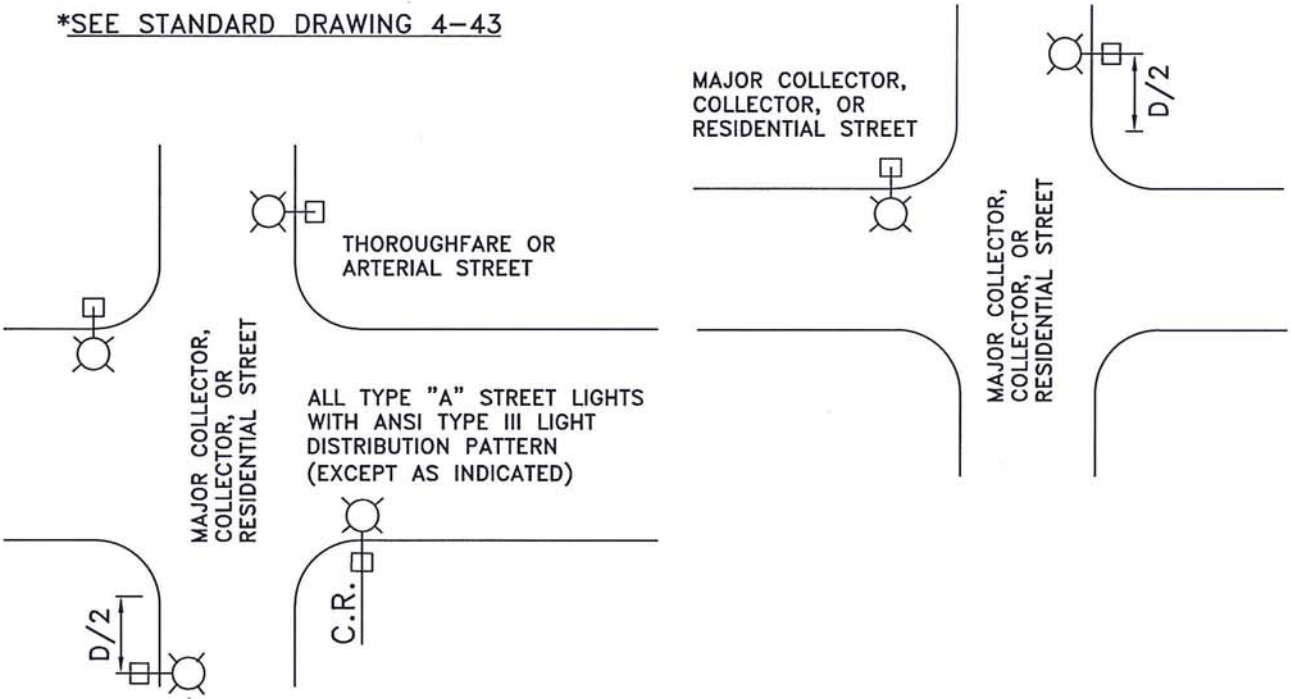
SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-5G

STREET LIGHT PLACEMENT



*SEE STANDARD DRAWING 4-43



CHIEF, DEPT. OF TRANSPORTATION

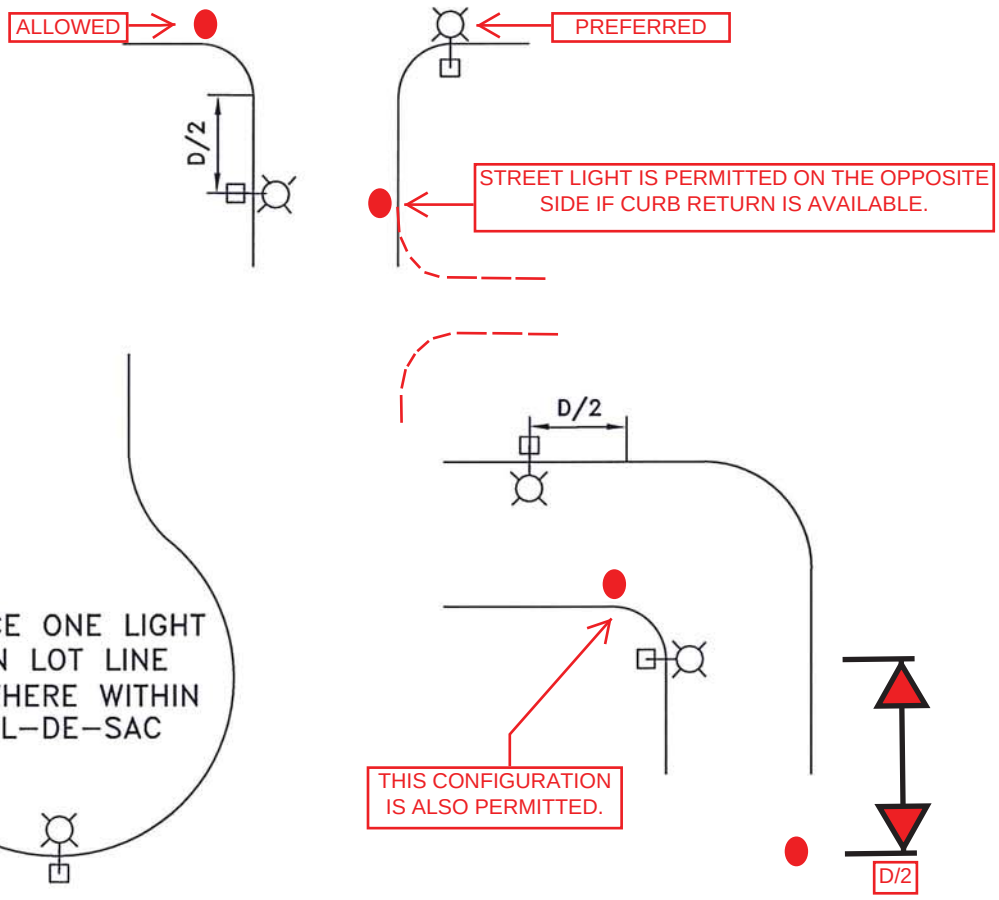
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

TYPICAL STREET LIGHT LOCATIONS THOROUGHFARES, ARTERIALS MAJOR COLLECTOR, COLLECTOR, PRIMARY & MINOR RESIDENTIAL

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-6

STREET LIGHT PLACEMENT ON MAJOR COLLECTOR, COLLECTOR, PRIMARY & MINOR RESIDENTIAL



NOTES:

1. AT CUL-DE-SACS USE TYPE 4 LIGHT DISTRIBUTION PATTERN.

2. AT INTERSECTIONS AND ELBOWS USE ANSI TYPE 3 LIGHT DISTRIBUTION PATTERN.

3. D IS THE SPACING BETWEEN THE POLES. SEE STANDARD DRAWINGS 5-5A THROUGH 5-5F.

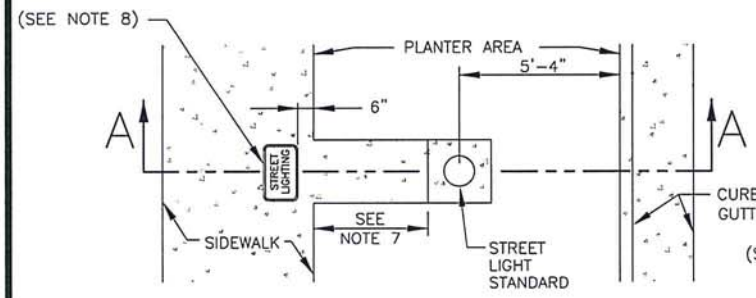
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

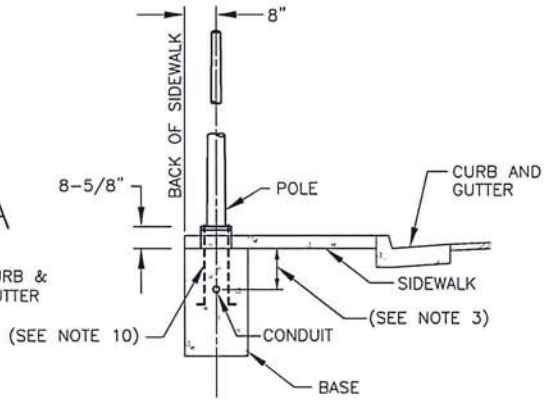
TYPICAL STREET LIGHT LOCATIONS
MAJOR COLLECTOR, COLLECTOR, PRIMARY & MINOR RESIDENTIAL

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

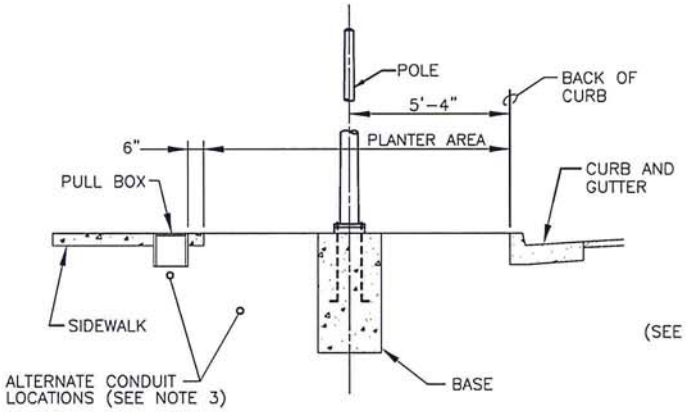
5-7



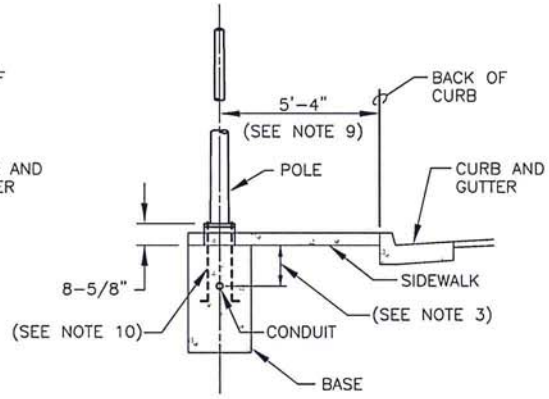
SIDEWALK WITH PLANTER AREA



OVER 6' SIDEWALK



SECTION A-A



5' to 6' SIDEWALK

NOTES:

1. CONDUIT TRENCH BACKFILL SHALL BE COMPACTED TO 90% RELATIVE COMPACTION.
2. LANDSCAPING IN THE AREA OF THE STREET LIGHT STANDARD WILL MATCH BASE ELEVATION AND HAVE A MINIMUM OF 12" OF CLEARANCE FROM THE BASE.
3. CONDUITS LOCATED BENEATH THE SIDEWALK MAY BE PLACED AT 9" DEPTH. CONDUITS IN LANDSCAPE STRIP SHALL BE PLACED AT 18" DEPTH AND 6" FROM THE FACE OF THE SIDEWALK.
4. IF THE PLANTER AREA IS LESS THAN SIX FEET WIDE, THEN PLACE STREET LIGHT STANDARD SO THAT THE BASE PLATE ALIGNS WITH THE EDGE OF SIDEWALK. TOP OF FOUNDATION TO MATCH SIDEWALK GRADE.
5. NO PULL BOXES ARE TO BE PLACED IN THE PLANTER AREA.
6. PULL BOXES LOCATED IN A DRIVEWAY OR WITHIN 5-FEET OF A DRIVEWAY SHALL BE TRAFFIC RATED (SEE STATE STANDARD PLANS FOR TRAFFIC RATED PULL BOXES).
7. IF DIMENSION IS LESS THAN 2-FEET, PLACE 3-1/2" THICK, 2-FOOT WIDE CONCRETE PAD BETWEEN SIDEWALK AND STREET LIGHT FOUNDATION.
8. PULL BOXES SHALL BE INSTALLED AT EACH SERVICE CAN, AND ONLY AT STREET LIGHTS REQUIRING 3 OR MORE CONDUITS. FOR STREET LIGHTS WITH 1 OR 2 CONDUITS, THEY SHALL BE PLACED INTO THE POLE FOUNDATION TO HAVE WIRES SPLICED IN THE HAND HOLE. PULLBOXES THAT ARE INSTALLED SHALL INCLUDE COVERS WITH THEFT DETERRENT PENTA BOLT.
9. FOR DECORATIVE STREET LIGHTS, LOCATE BASE CLEAR OF BACK OF SIDEWALK.
10. EXTEND ANCHOR BOLTS BY 10" MINIMUM EITHER BY USE OF LONGER ANCHOR BOLTS OR BY LAP SPLICED 3/4" RE-BAR EXTENDED 10" BELOW "J" HOOK WITH LAP LENGTH OF 2".

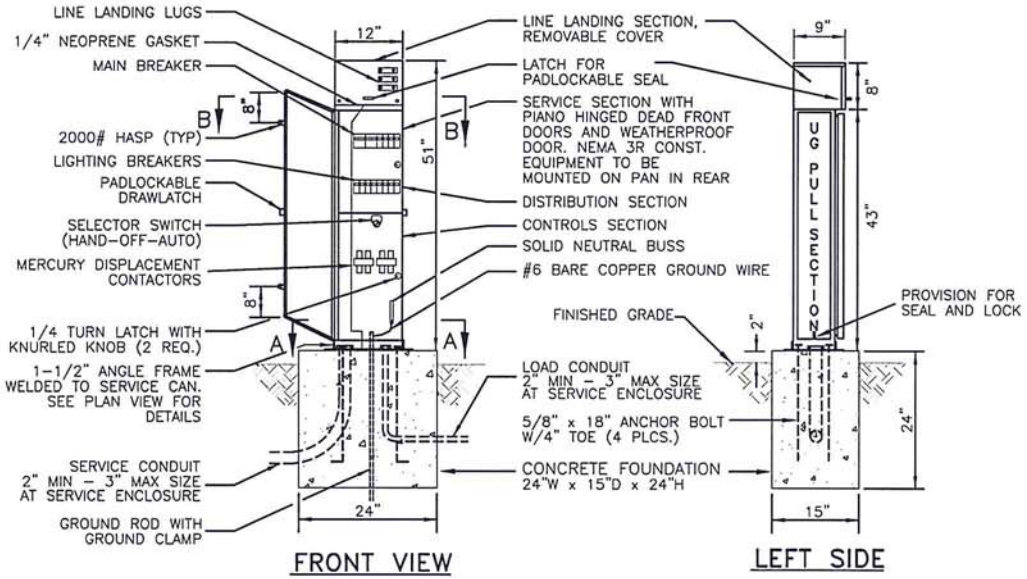
CHIEF, DEPT. OF TRANSPORTATION

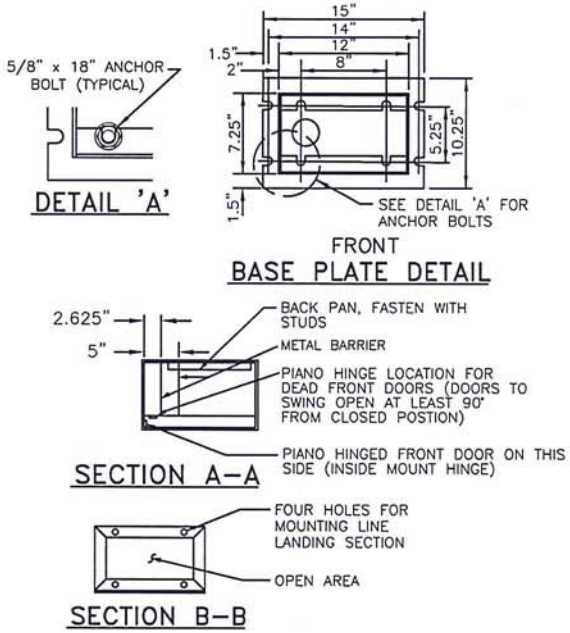
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

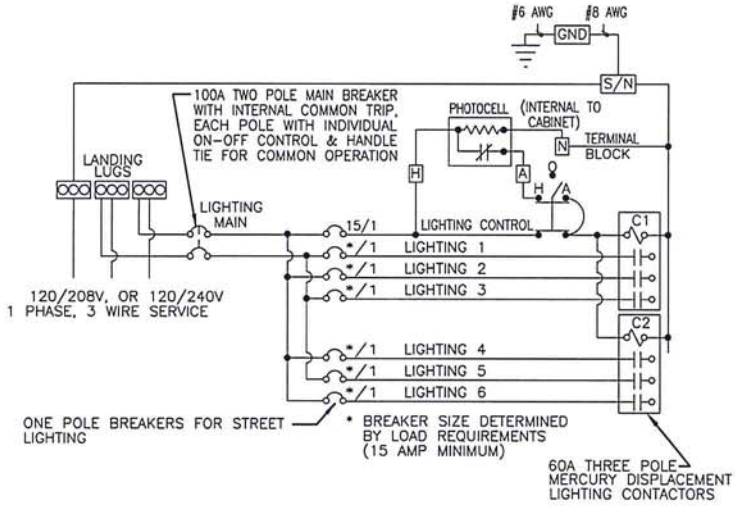
SIGNAL, LIGHTING AND ELECTRICAL SYSTEMS BASE LOCATION FOR STREET LIGHTS

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-8







UNMETERED SERVICE
WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SERVICE ENCLOSURE SHALL BE OF TWO-PIECE CONSTRUCTION.
12. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE CIRCUIT LOAD SHALL BE EQUALLY DIVIDED ACROSS THE LIGHTING MAIN.
13. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.
14. SPECIAL APPROVAL IS REQUIRED BY THE DIRECTOR.

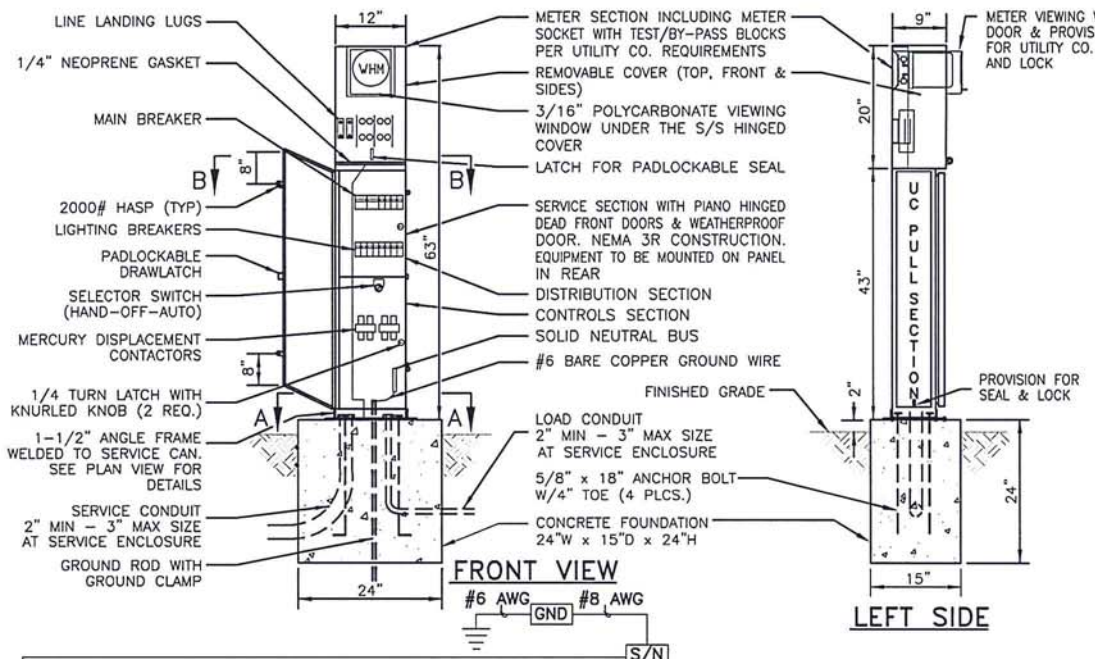
CHIEF, DEPT. OF TRANSPORTATION

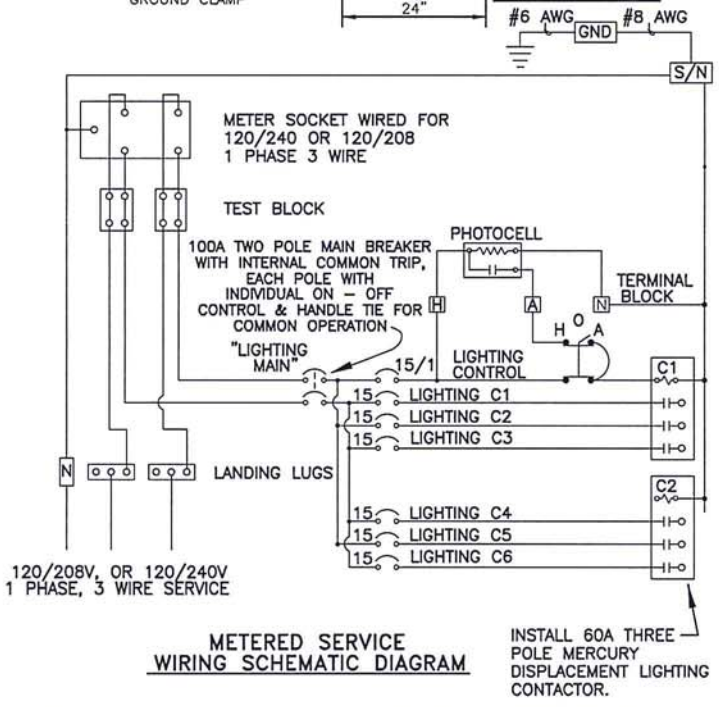
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

LIGHTING AND ELECTRICAL SYSTEMS UNMETERED SERVICE ENCLOSURE CAN (120/208V, 120/240V)

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-9U





METERED SERVICE WIRING SCHEMATIC DIAGRAM

INSTALL 60A THREE POLE MERCURY DISPLACEMENT LIGHTING CONTACTOR.

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SERVICE ENCLOSURE SHALL BE OF TWO-PIECE CONSTRUCTION.
12. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE CIRCUIT LOAD SHALL BE EQUALLY DIVIDED ACROSS THE LIGHTING MAIN.
13. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

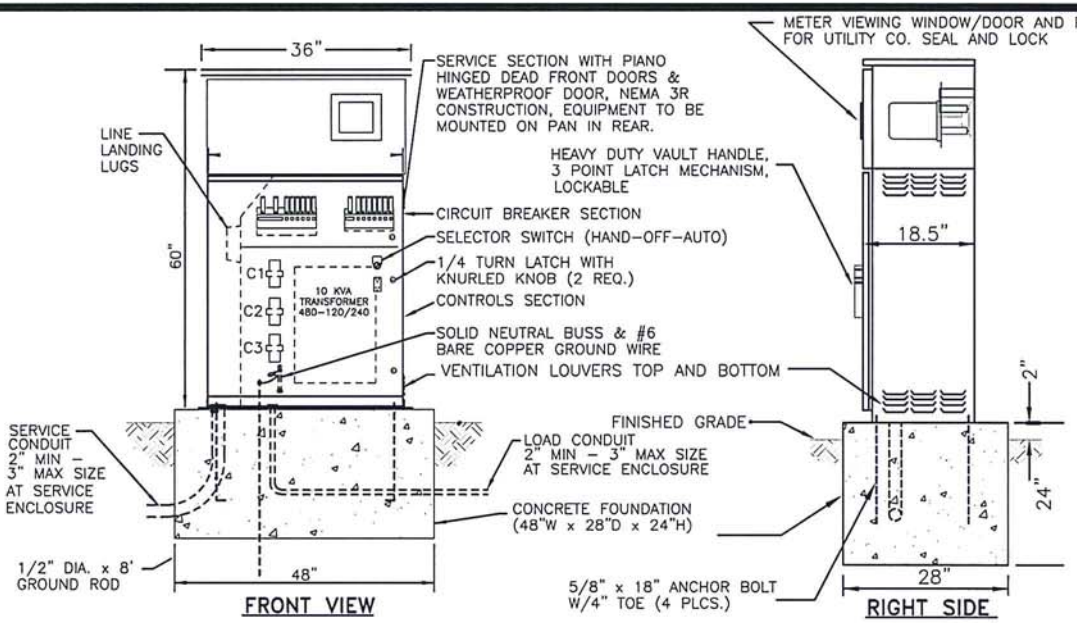
CHIEF, DEPT. OF TRANSPORTATION

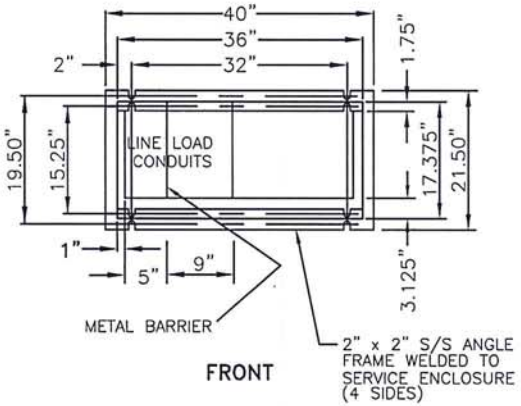
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

LIGHTING AND ELECTRICAL SYSTEMS METERED SERVICE, ENCLOSURE CAN (120/208V, 120/240V)

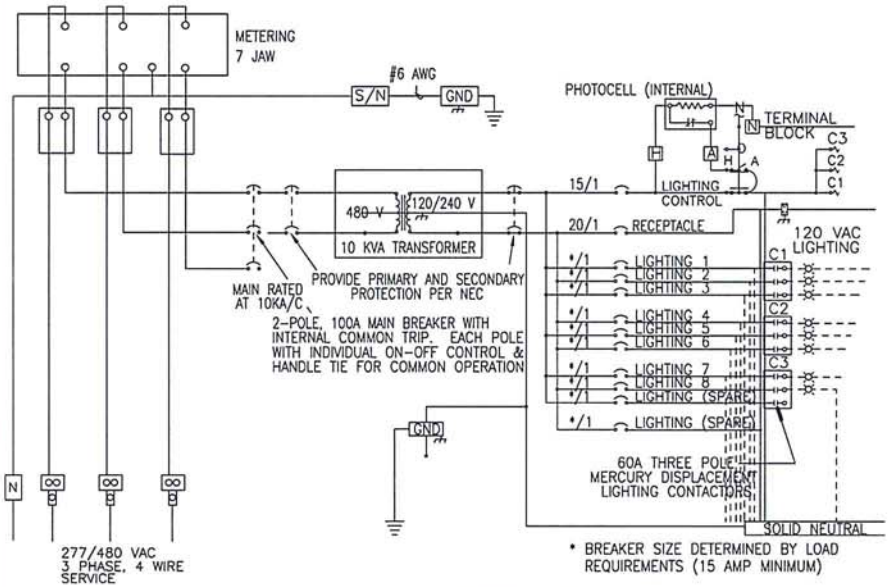
SCALE: NONE
DATE: 03/2018
DRAWN BY: EMB/TRS

5-9M





BASE PLATE DETAIL



METERED SERVICE
WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 10 KVA. PROVIDE PRIMARY AND SECONDARY PROTECTION PER NEC.
12. WHEN CHANGING VOLTAGE ON A RETROFIT PROJECT WHERE A NEW SERVICE ENCLOSURE WITH A STEP-DOWN TRANSFORMER IS REQUIRED, THE NEW SERVICE ENCLOSURE SHALL BE PLACED BETWEEN THE SERVICE POINT AND THE OLD SERVICE ENCLOSURE LOCATED WITHIN THE COUNTY R/W. VOLTAGE OUTPUT FROM THE NEW SERVICE ENCLOSURE MAY BE CONNECTED INTO THE EXISTING CONDUIT SYSTEM.
13. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE ACROSS THE LIGHTING MAIN.
14. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

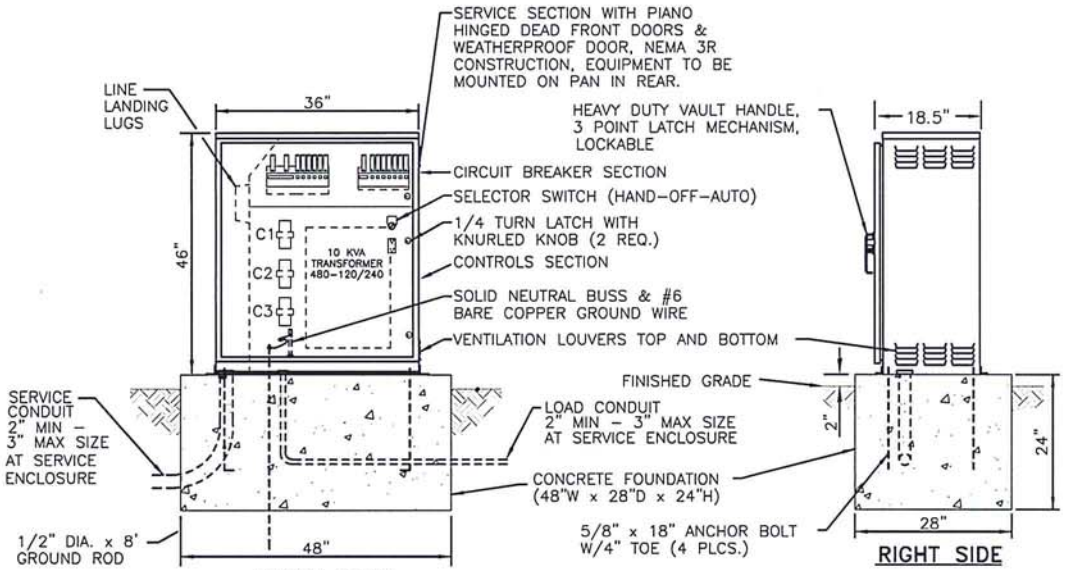
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

SIGNAL, LIGHTING, METERED SERVICE AND ENCLOSURE CAN ELECTRICAL SYSTEMS WITH STEP-DOWN TRANSFORMER (277/480V TO 120/240V)

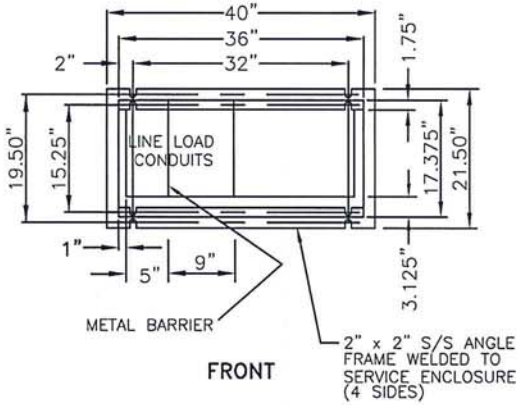
SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-10M



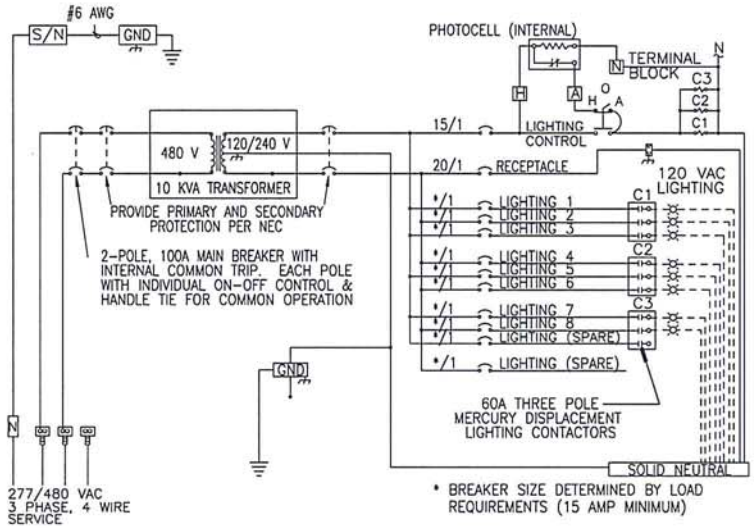
FRONT VIEW

RIGHT SIDE



FRONT

BASE PLATE DETAIL



UNMETERED SERVICE
WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 10 KVA. PROVIDE PRIMARY AND SECONDARY PROTECTION PER NEC.
12. WHEN CHANGING VOLTAGE ON A RETROFIT PROJECT WHERE A NEW SERVICE ENCLOSURE WITH A STEP-DOWN TRANSFORMER IS REQUIRED, THE NEW SERVICE ENCLOSURE SHALL BE PLACED BETWEEN THE SERVICE POINT AND THE OLD SERVICE ENCLOSURE LOCATED WITHIN THE COUNTY R/W. VOLTAGE OUTPUT FROM THE NEW SERVICE ENCLOSURE MAY BE CONNECTED INTO THE EXISTING CONDUIT SYSTEM.
13. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE ACROSS THE LIGHTING MAIN.
14. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.
15. SPECIAL APPROVAL IS REQUIRED BY THE DIRECTOR.

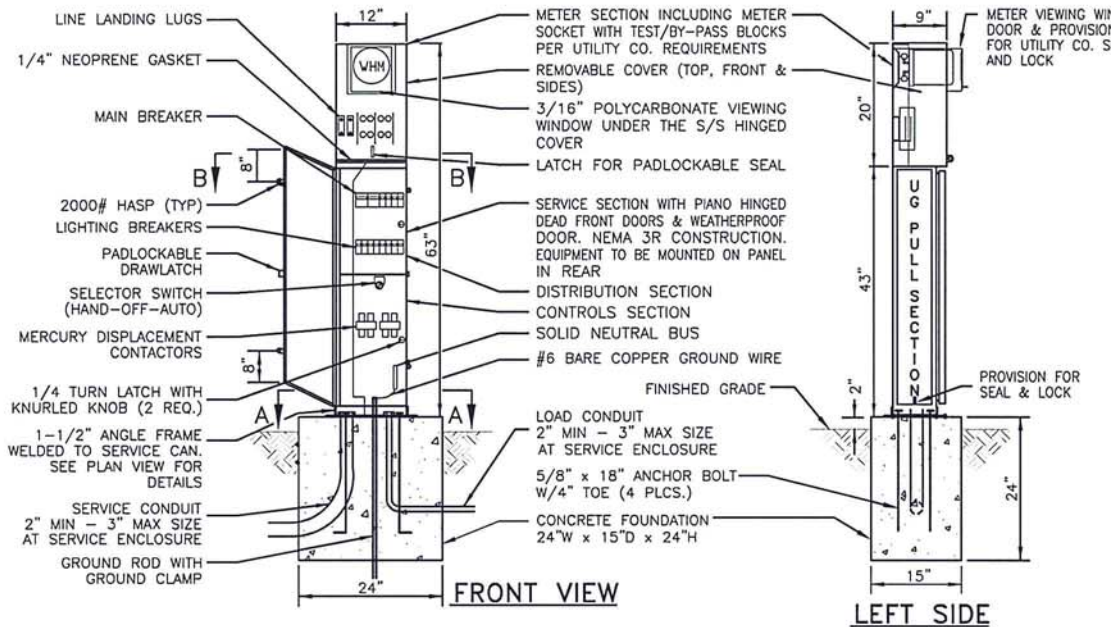
CHIEF, DEPT. OF TRANSPORTATION

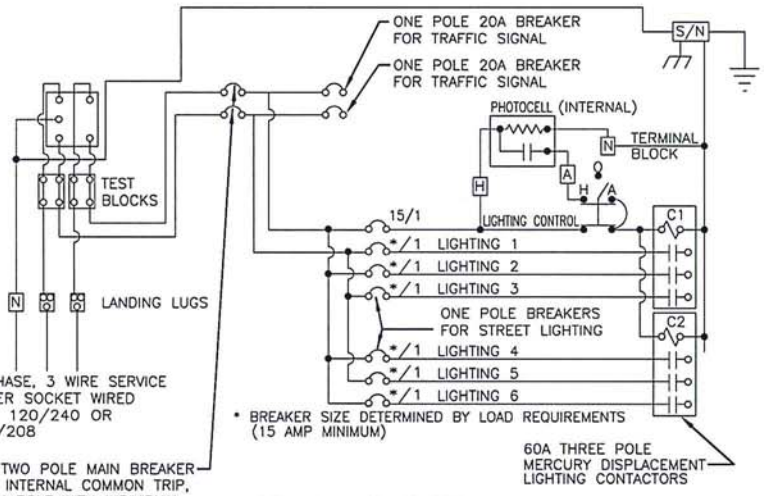
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

LIGHTING, UNMETERED SERVICE AND ENCLOSURE CAN ELECTRICAL SYSTEMS WITH STEP-DOWN TRANSFORMER (277/480V TO 120/240V)

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-10U





SIGNAL AND LIGHTING
METERED SERVICE
WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 10 KVA. PROVIDE PRIMARY AND SECONDARY PROTECTION PER NEC.
12. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE ACROSS THE LIGHTING MAIN.
13. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

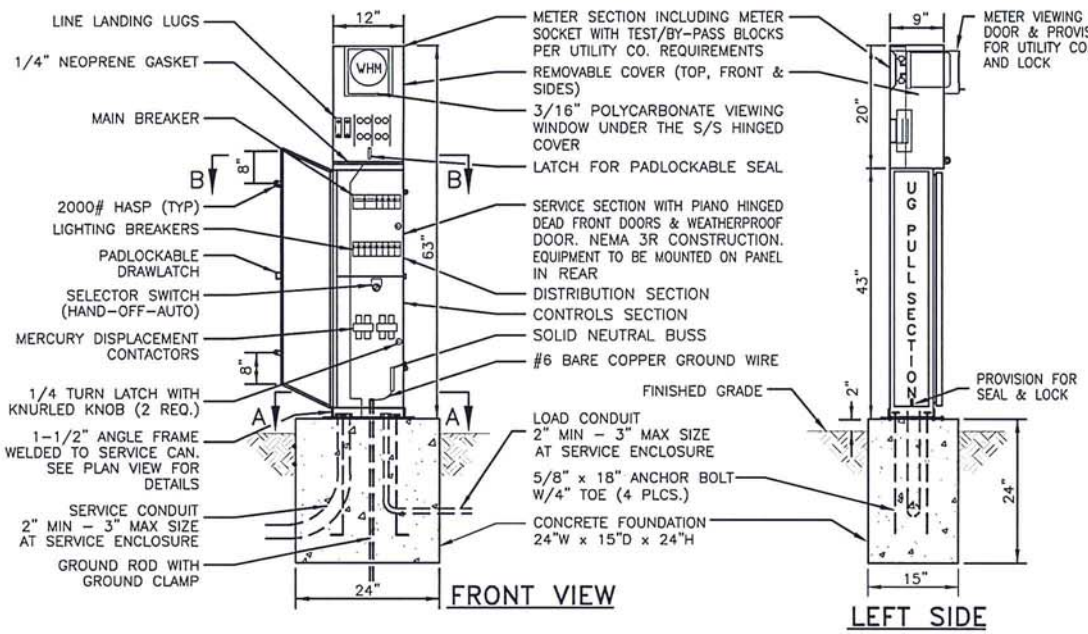
CHIEF, DEPT. OF TRANSPORTATION

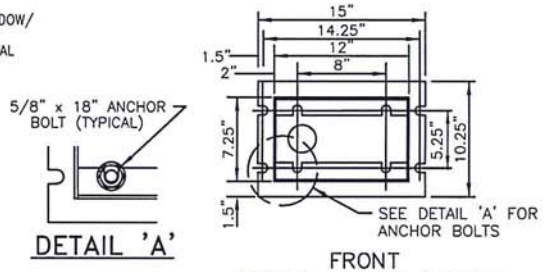
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

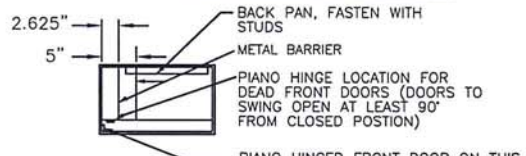
SIGNAL, LIGHTING, METERED SERVICE AND ENCLOSURE CAN ELECTRICAL SYSTEMS (120/208V, 120/240V)

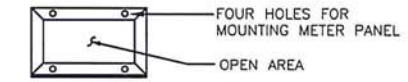
SCALE: NONE
DATE: 03/2018
DRAWN BY: TRS

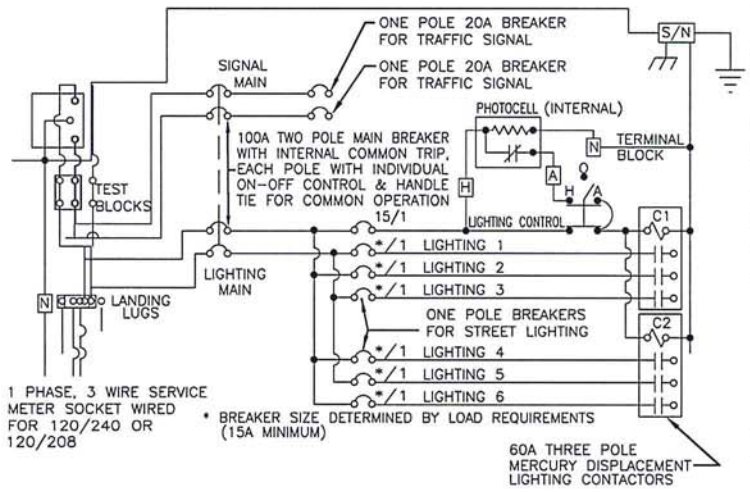
5-11M











METERED SIGNAL, UNMETERED LIGHTING
WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 10 KVA. PROVIDE PRIMARY AND SECONDARY PROTECTION PER NEC.
12. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE ACROSS THE LIGHTING MAIN.
13. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.
14. SPECIAL APPROVAL IS REQUIRED BY THE DIRECTOR.

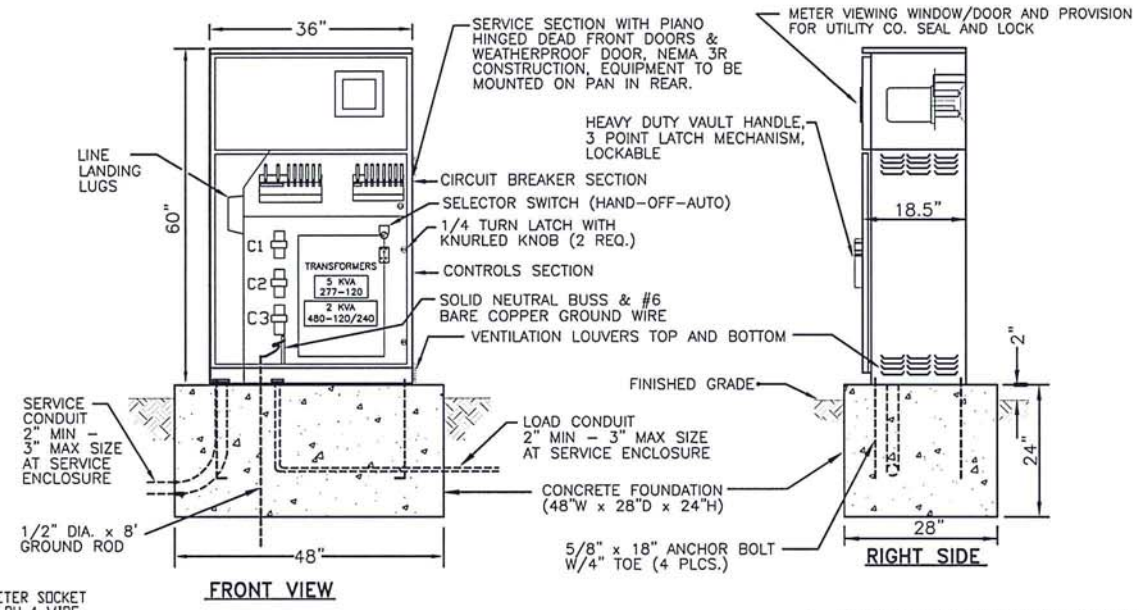
CHIEF, DEPT. OF TRANSPORTATION

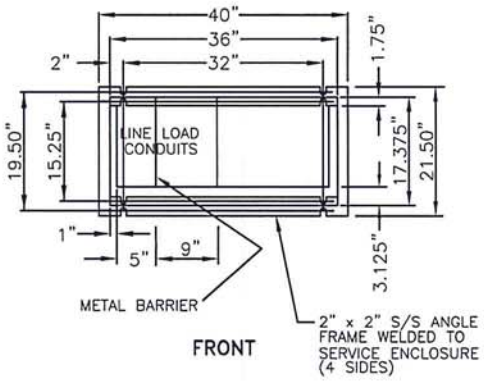
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

METERED SIGNAL, UNMETERED LIGHTING AND ENCLOSURE CAN ELECTRICAL SYSTEMS (120/280V, 120/240V)

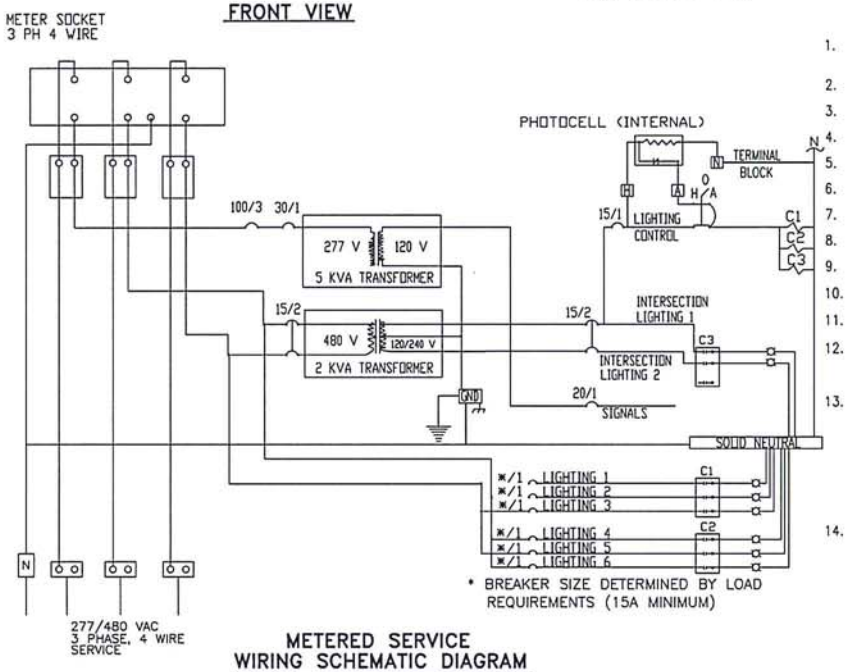
SCALE: NONE
DATE: 03/2018
DRAWN BY: EMB/TRS

5-11U





BASE PLATE DETAIL



METERED SERVICE WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 5 KVA. SIZE OF TRANSFORMER FOR 120 V INTERSECTION LIGHTING SHALL BE 2 KVA.
12. WHEN CHANGING VOLTAGE ON A RETROFIT PROJECT WHERE A NEW SERVICE ENCLOSURE WITH A STEP-DOWN TRANSFORMER IS REQUIRED, THE NEW SERVICE ENCLOSURE SHALL BE PLACED BETWEEN THE SERVICE POINT AND THE OLD SERVICE ENCLOSURE LOCATED WITHIN THE COUNTY R/W. VOLTAGE OUTPUT FROM THE NEW SERVICE ENCLOSURE MAY BE CONNECTED INTO THE EXISTING CONDUIT SYSTEM.
13. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE CIRCUIT LOAD SHALL BE EQUALLY DIVIDED ACROSS THE LIGHTING MAIN.
14. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

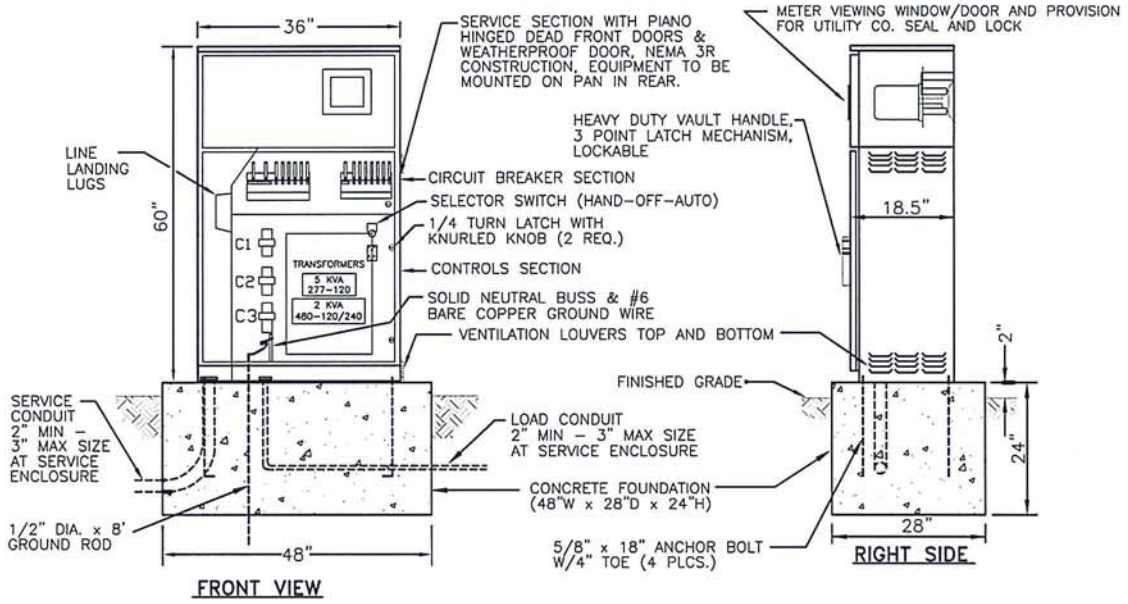
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

SIGNAL, LIGHTING, METERED SERVICE AND ENCLOSURE CAN ELECTRICAL SYSTEMS WITH STEP-DOWN TRANSFORMER (277/480V TO 120/240V)

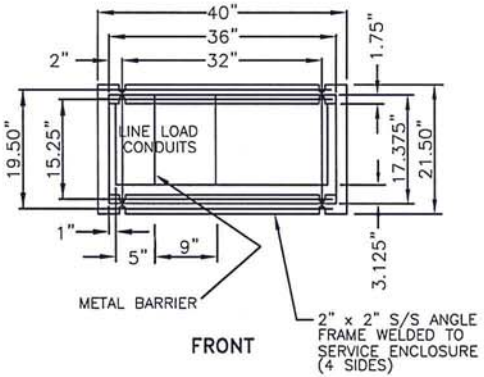
SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-12M



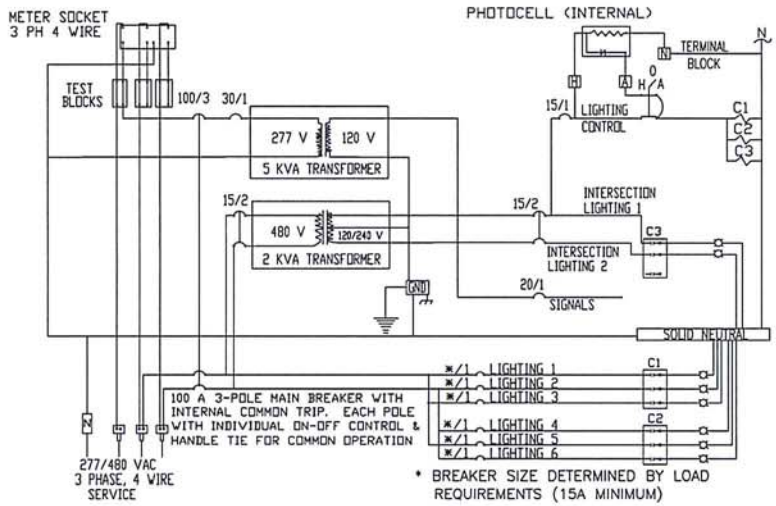
FRONT VIEW

RIGHT SIDE



FRONT

BASE PLATE DETAIL



METERED SERVICE
WIRING SCHEMATIC DIAGRAM

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
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3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
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9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 5 KVA. SIZE OF TRANSFORMER FOR 120 V INTERSECTION LIGHTING SHALL BE 2 KVA.
12. WHEN CHANGING VOLTAGE ON A RETROFIT PROJECT WHERE A NEW SERVICE ENCLOSURE WITH A STEP-DOWN TRANSFORMER IS REQUIRED, THE NEW SERVICE ENCLOSURE SHALL BE PLACED BETWEEN THE SERVICE POINT AND THE OLD SERVICE ENCLOSURE LOCATED WITHIN THE COUNTY R/W. VOLTAGE OUTPUT FROM THE NEW SERVICE ENCLOSURE MAY BE CONNECTED INTO THE EXISTING CONDUIT SYSTEM.
13. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE CIRCUIT LOAD SHALL BE EQUALLY DIVIDED ACROSS THE LIGHTING MAIN.
14. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.
15. SPECIAL APPROVAL IS REQUIRED BY THE DIRECTOR.

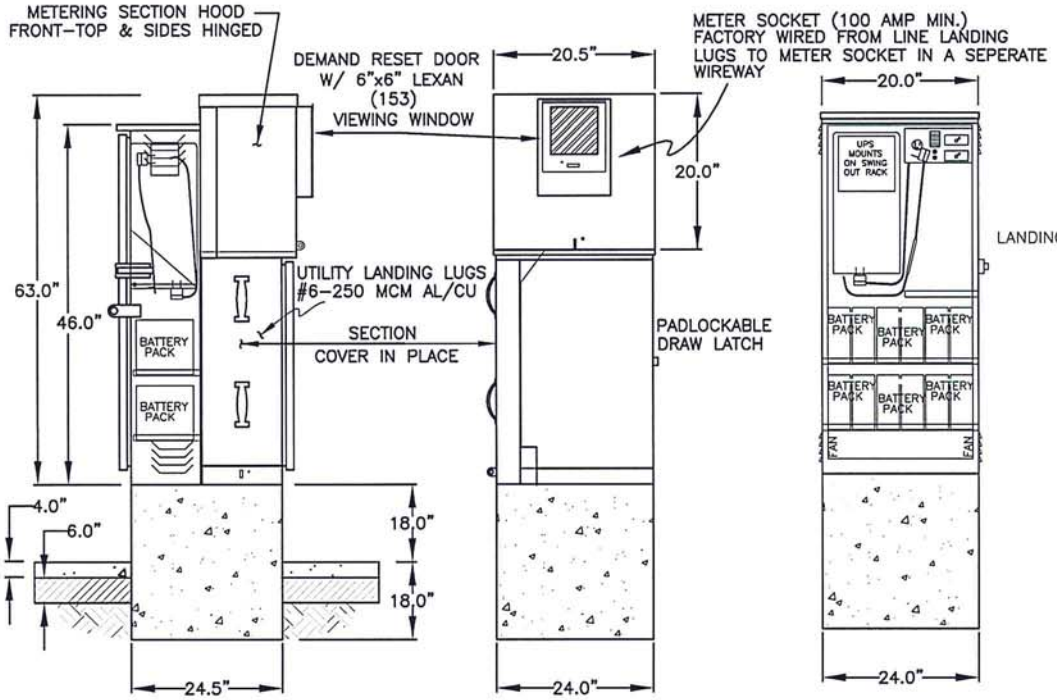
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

METERED SIGNAL, UNMETERED LIGHTING, ENCLOSURE CAN ELECTRICAL SYSTEMS WITH STEP-DOWN TRANSFORMER (277/480V TO 120/240V)

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-12U

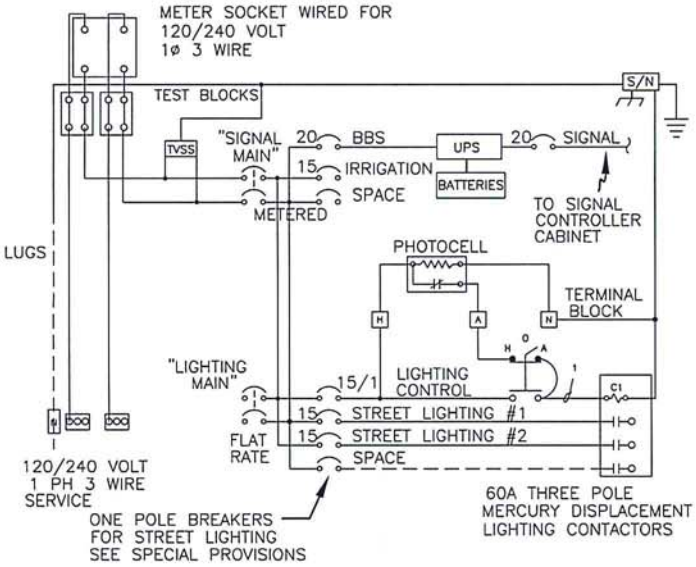


LEFT SIDE

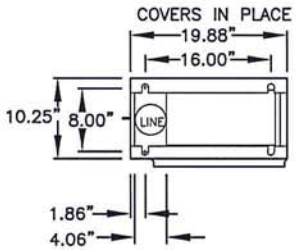
COVERS IN PLACE MOUNTED ON PAD

FRONT VIEW

REAR VIEW



WIRING SCHEMATIC DIAGRAM



BASE PLAN

ENCLOSURE CONSTRUCTION NOTES

1. EXTERIOR, 1/8" ALUMINUM, AND INTERIOR 14 GA COLD ROLLED STEEL ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION WILL BE NEMA 3R, RAINTIGHT.
3. ALL NUTS, BOLTS AND SCREWS WILL BE STAINLESS STEEL.
4. NUTS, BOLTS & SCREWS WILL NOT BE VISIBLE FROM OUTSIDE OF ENCLOSURE.
5. NAMEPLATES WILL BE PROVIDED AS REQUIRED.
6. CONTROL WIRING WILL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM WILL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. ENCLOSURE WILL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA AND UL508A STANDARDS.
9. ANODIZE AFTER FABRICATION.

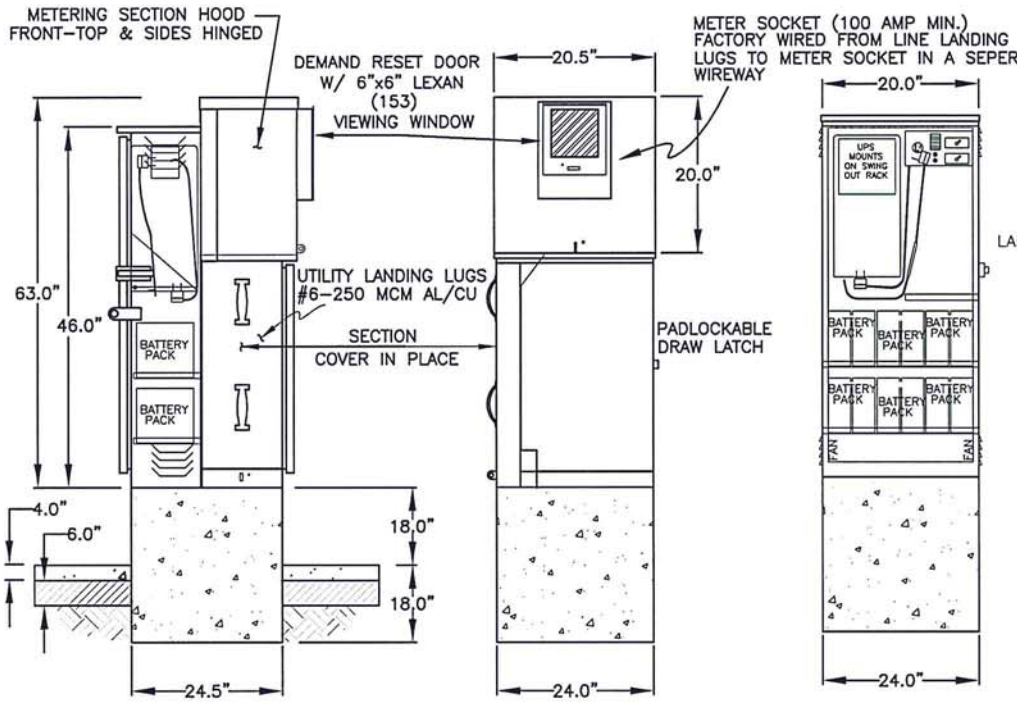
CHIEF, DEPT. OF TRANSPORTATION

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

METERED SERVICE ENCLOSURE WITH BATTERY BACKUP (120/240V)

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-13M

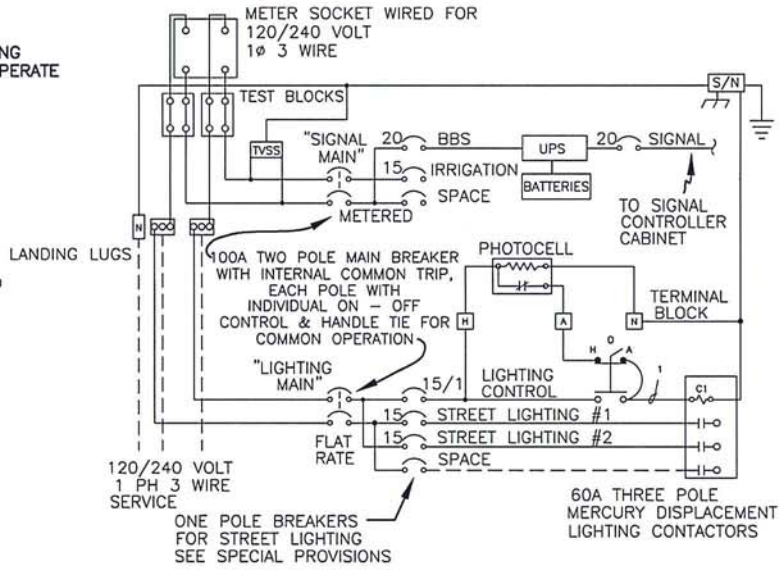


LEFT SIDE

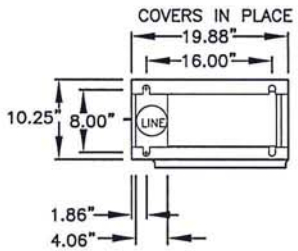
COVERS IN PLACE MOUNTED ON PAD

FRONT VIEW

REAR VIEW



WIRING SCHEMATIC DIAGRAM



BASE PLAN

ENCLOSURE CONSTRUCTION NOTES

1. EXTERIOR, 1/8" ALUMINUM, AND INTERIOR 14 GA COLD ROLLED STEEL ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION WILL BE NEMA 3R, RAINTIGHT.
3. ALL NUTS, BOLTS AND SCREWS WILL BE STAINLESS STEEL.
4. NUTS, BOLTS & SCREWS WILL NOT BE VISIBLE FROM OUTSIDE OF ENCLOSURE.
5. NAMEPLATES WILL BE PROVIDED AS REQUIRED.
6. CONTROL WIRING WILL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM WILL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. ENCLOSURE WILL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. ANODIZE AFTER FABRICATION.
10. SPECIAL APPROVAL IS REQUIRED BY THE DIRECTOR.

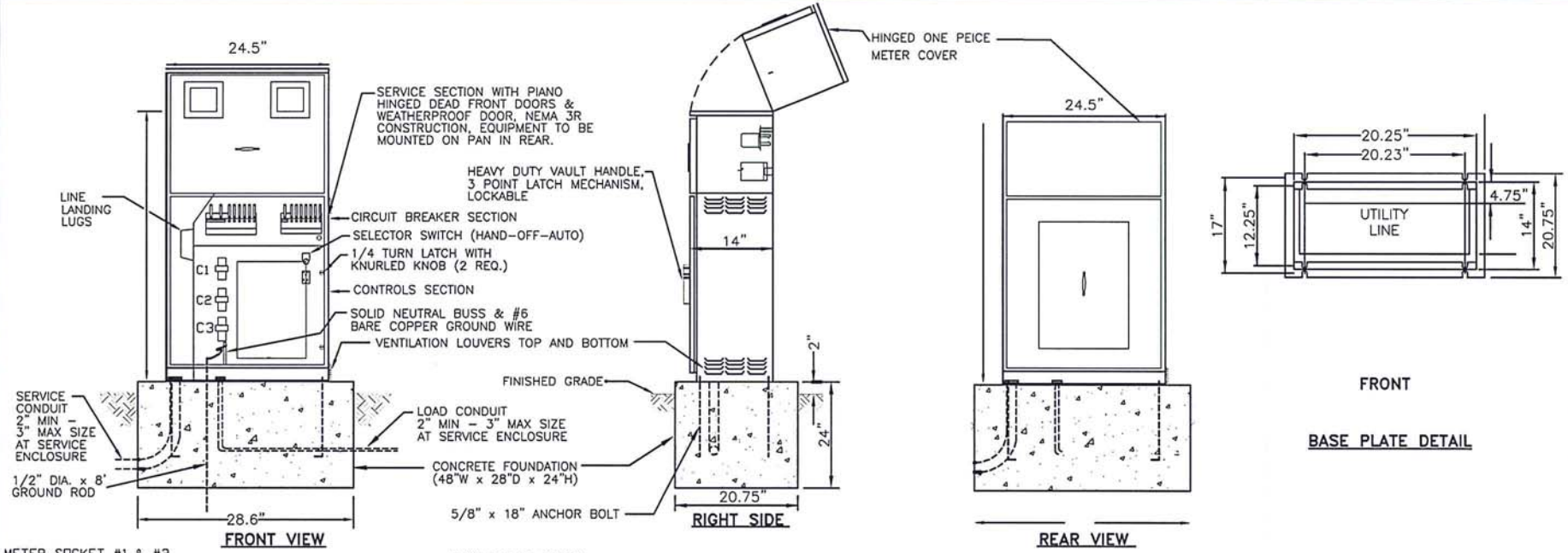
CHIEF, DEPT. OF TRANSPORTATION

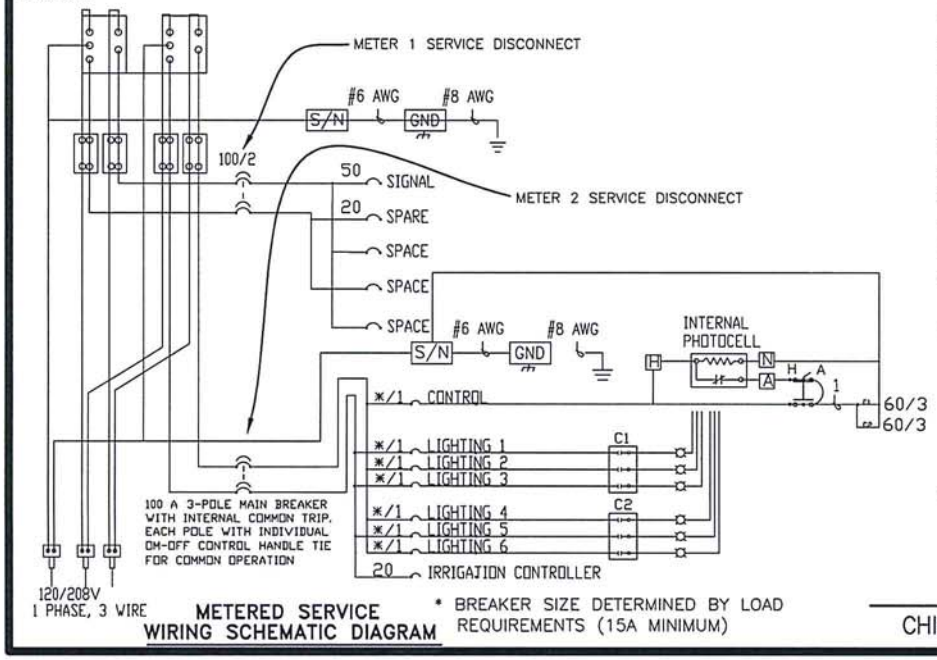
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

METERED SERVICE, UNMETERED LIGHTING AND ENCLOSURE WITH BATTERY BACKUP (120/240V)

SCALE: NONE
DATE: 03/2018
DRAWN BY: JAS

5-13U





METERED SERVICE WIRING SCHEMATIC DIAGRAM

* BREAKER SIZE DETERMINED BY LOAD REQUIREMENTS (15A MINIMUM)

1. EXTERIOR SHALL BE 14 GAUGE #304D STAINLESS STEEL. INTERIOR DEAD FRONT PANEL AND BACK PAN SHALL BE 14 GAUGE STEEL, PAINTED WHITE. ENCLOSURE SHALL BE ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAINTIGHT AND DUSTTIGHT.
3. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
4. NUTS, BOLTS AND SCREWS SHALL NOT BE USED ON THE OUTSIDE OF THE SERVICE ENCLOSURE.
5. PHENOLIC NAMEPLATES SHALL BE USED TO IDENTIFY ALL OPERATOR CONTROLS.
6. CONTROL WIRING SHALL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. SERVICE ENCLOSURE SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
9. SERVICE ENCLOSURE SHALL BE U.L. LISTED AS INDUSTRIAL CONTROL PANELS U.L. 508 FILE NO. E62062
10. WIRING BETWEEN CIRCUIT BREAKER AND CONTACTOR SHALL BE #6 THWN OR THHN MINIMUM.
11. SIZE OF TRANSFORMER SHALL BE 5 KVA. SIZE OF TRANSFORMER FOR 120 V INTERSECTION LIGHTING SHALL BE 2 KVA.
12. WHEN CHANGING VOLTAGE ON A RETROFIT PROJECT WHERE A NEW SERVICE ENCLOSURE WITH A STEP-DOWN TRANSFORMER IS REQUIRED, THE NEW SERVICE ENCLOSURE SHALL BE PLACED BETWEEN THE SERVICE POINT AND THE OLD SERVICE ENCLOSURE LOCATED WITHIN THE COUNTY R/W. VOLTAGE OUTPUT FROM THE NEW SERVICE ENCLOSURE MAY BE CONNECTED INTO THE EXISTING CONDUIT SYSTEM.
13. THE WIRING SCHEMATIC DIAGRAM AS SHOWN IS FOR A 2-WIRE STREET LIGHTING SYSTEM. IF THE SERVICE ENCLOSURE WILL BE USED FOR A 3-WIRE STREET LIGHTING SYSTEM, THEN THE LIGHTING BREAKERS SHALL CONSIST OF 2-POLE BREAKERS WITH INTERNAL COMMON TRIP, EACH POLE WITH INDIVIDUAL ON-OFF CONTROL AND HANDLE TIE FOR COMMON OPERATION. FOR EACH 2-POLE BREAKER, THE CIRCUIT LOAD SHALL BE EQUALLY DIVIDED ACROSS THE LIGHTING MAIN.
14. SEE STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

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COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

SIGNAL, LIGHTING AND ELECTRICAL SYSTEMS
METERED SERVICE ENCLOSURE CAN WITH DUAL METER (120/208V)

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-14

CONDUIT SIZING

CONDUCTOR	EQUIVALENT NUMBER OF #14 AWG CONDUCTORS FOR USE IN CONDUIT SIZING
#12 CONDUCTOR	1.2
#10 CONDUCTOR	1.5
#8 CONDUCTOR	2.3
#6 CONDUCTOR	3
#4 CONDUCTOR	4
#2 CONDUCTOR	5.3
#0 CONDUCTOR	11.5
INTERCONNECT CABLE	18
DETECTOR LEAD-IN CABLE	2.5
EMERGENCY VEHICLE DETECTOR CABLE	2

CONDUIT SIZE	1.5"	2"	2.5"	3"	3.5"	4"
MAXIMUM NUMBER OF #14 AWG CONDUCTORS	19	31	44	69	91	113

CIRCUIT BREAKER SIZING

CONDUCTOR SIZE (AWG)	MAXIMUM CIRCUIT BREAKER AMPERAGE
#6	50
#8	40
#10	30
#12	20
#14	15

SERVICE CONDUCTOR MAXIMUM LENGTHS

FOR TRAFFIC SIGNALS

WIRE SIZE	LENGTH
#0	576'
#2	360'
#4	224'

NOTE:

THE BREAKER SIZE SHALL BE DETERMINED BY THE LOAD REQUIREMENTS. MINIMUM BREAKER SIZE IS 15 AMPS.

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COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

CONDUIT, SERVICE WIRE AND BREAKER SIZING

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-15

TYPICAL VOLTAGE DROP CALCULATION FOR 2-WIRE SYSTEM

$$\text{VOLTAGE DROP (COPPER CONDUCTOR)} = \frac{D \times A \times N \times 22}{\text{Circular Mils}}$$

D = Length of section, in feet.

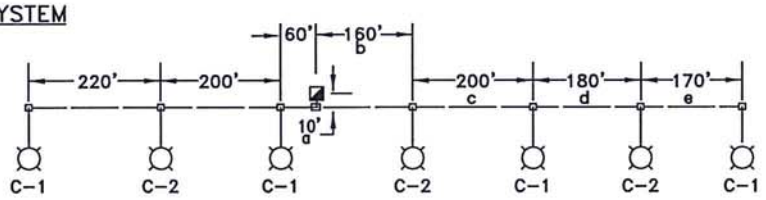
A = Line operating amperes drawn by one light.

N = Number of lights in the circuit beyond the section.

WIRE SIZE (AWG)	AREA (Circular Mils)
14	4,110
12	6,530
10	10,380
8	16,510
6	26,250
4	41,740

DRIVER MAXIMUM INPUT AMPS FOR LIGHT EMITTING DIODE LED LUMINAIRES (AT 115 VOLTS)
ALL FIXTURES ..... 1.25 Amps

TYPICAL MULTIPLE STREET LIGHTING SYSTEM



EXAMPLE CALCULATION:

FIND TOTAL VOLTAGE DROP IN CIRCUIT #1:
(115 volt system)

NOTE:

Dimension "a" is the distance between the service can and the adjacent load pull box. Use "a"=10' for standard installations where the load pull box is immediately adjacent to the service can.

Voltage drop calculations

$$\text{Section a} = \frac{10\ (1.25 \times 4)\ (22)}{10{,}380} = 0.11$$

$$\text{Section b + c} = \frac{360\ (1.25 \times 2)\ (22)}{10{,}380} = 1.91$$

$$\text{Section d + e} = \frac{350\ (1.25 \times 1)\ (22)}{10{,}380} = 0.93$$

TOTAL VOLTAGE DROP = 2.95

NOTES:

1. Design must be based on a two (2) wire system, even though three (3) wires (w/ a single common wire) are actually used.
2. Maximum voltage drop allowed in 115 volt system = 8.05 volts.

LEGEND

- 115W LIGHT EMITTING DIODE Luminaire
- C-1 — Circuit #1
- Service Can
- Conduit w/ #10 AWG Conductors

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COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

2-WIRE STREET LIGHT SYSTEM WIRE SIZE AND VOLTAGE DROP CALCULATION

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-16

TYPICAL VOLTAGE DROP CALCULATION FOR 3-WIRE SYSTEM

$$\text{VOLTAGE DROP (COPPER CONDUCTOR)} = \frac{D \times A \times N \times 11}{\text{Circular Mils}}$$

D = Length of section, in feet.

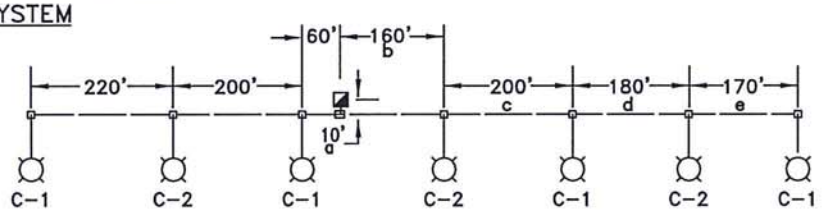
A = Line operating amperes drawn by one light.

N = Number of lights in the circuit beyond the section.

WIRE SIZE (AWG)	AREA (Circular Mils)
14	4,110
12	6,530
10	10,380
8	16,510
6	26,250
4	41,740

DRIVER MAXIMUM INPUT AMPS FOR LIGHT EMITTING DIODE (LED) LUMINAIRES (AT 115 VOLTS)
ALL FIXTURES ..... 1.25 Amps

TYPICAL MULTIPLE STREET LIGHTING SYSTEM



EXAMPLE CALCULATION:

FIND TOTAL VOLTAGE DROP IN CIRCUIT #1:
(115 volt system)

NOTE:

Dimension "a" is the distance between the service can and the adjacent load pull box. Use "a"=10' for standard installations where the load pull box is immediately adjacent to the service can.

Voltage drop calculations

$$\text{Section a} = \frac{10\ (1.25 \times 4)\ (11)}{6{,}530} = 0.08$$

$$\text{Section b + c} = \frac{360\ (1.25 \times 2)\ (11)}{6{,}530} = 1.52$$

$$\text{Section d + e} = \frac{350\ (1.25 \times 1)\ (11)}{6{,}530} = 0.34$$

TOTAL VOLTAGE DROP = 2.34

NOTE:

Maximum voltage drop allowed in 115 volt system = 6.90 volts.

LEGEND

C-1	115W LIGHT EMITTING DIODE Luminaire
C-1	Circuit #1
◪	Service Can
_____	Conduit w/ #12 AWG Conductors

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COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

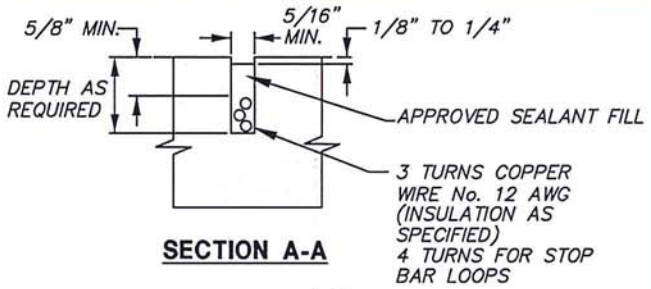
3-WIRE STREET LIGHT SYSTEM WIRE SIZE AND VOLTAGE DROP CALCULATION

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

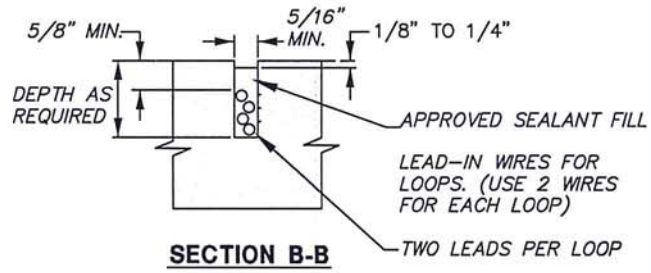
5-17

LOOP INSTALLATION PROCEDURE

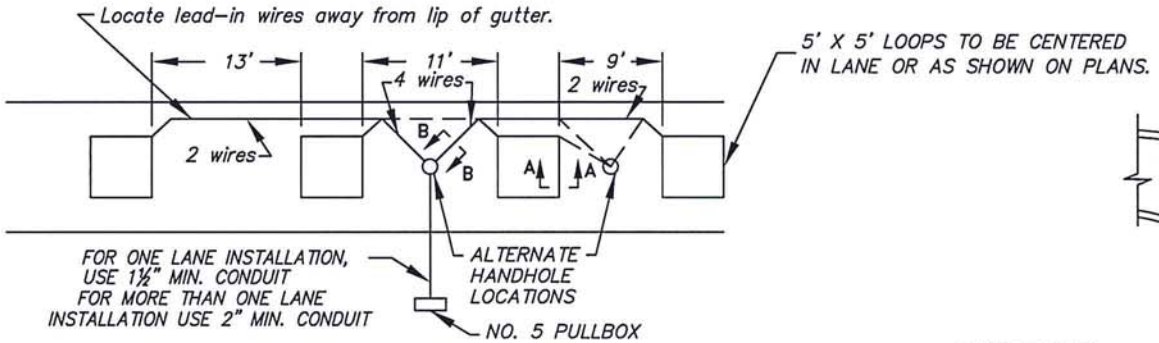
1. Test each loop circuit at controller cabinet (or, if these are not installed, test at termination pull box) before filling slots. Perform a resistance test between each circuit and ground. Insulation resistance shall not be less than 100 mega ohms. Test each loop circuit for continuity. Loop circuit resistance shall not exceed 0.5 ohms plus 0.35 ohms per 100 feet of lead-in cable.
2. Distance between side of loop and lead-in saw cut shall be 1'-0" minimum.
3. Width of saw cuts shall be 1/8" to 3/16" wider than thickness of the conductor.
4. Depth of saw cuts shall be such that the minimum sealant cover shall be 1/2" with an additional 1/8" to 1/4" gap between top of sealant and surface of pavement.
5. Loops and lead-in cuts shall be located a minimum of 2 feet from the nearest edge of manhole cover and valve boxes.
6. Loop installation 250' or more from stop bar, shall have 4 turns.
7. See State Standard drawing ES-5A and ES-5D for additional details.



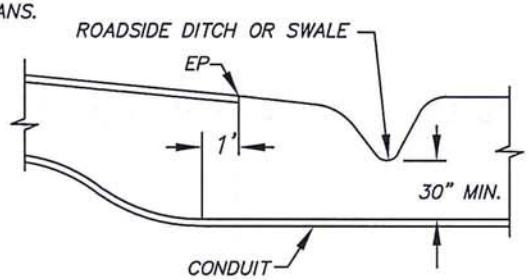
SECTION A-A



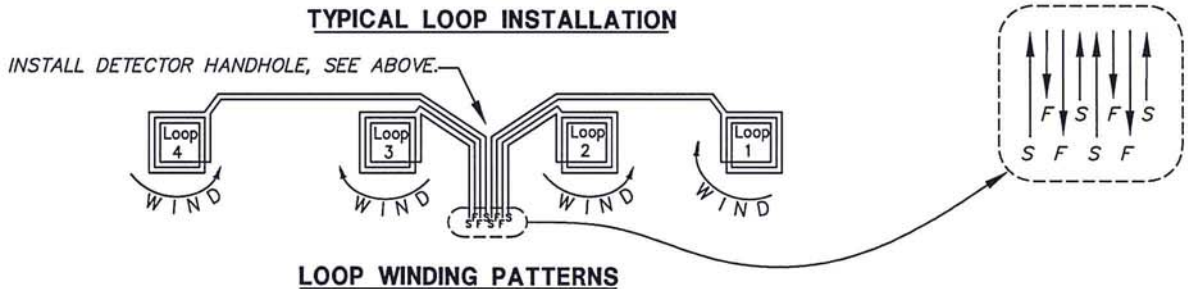
SECTION B-B



TYPICAL LOOP INSTALLATION



CONDUIT DETAIL FOR CLASS "C" STREET



LOOP WINDING PATTERNS

Conductor identification shall include the following:
1. Sensor number and phase 2. Loop number 3. Start (S) or finish (F)
2. See dwg. 5-19 for placement of loops.
3. Stop Bar Loops require 4 Turns instead of 3 and a separate DLC.
4. Modified Type D Loop require 3 Turns only. See Dwg. 5-19 for location.

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COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

LOOP DETECTORS

SCALE: NONE
DATE: 03/2018
DRAWN BY: JTW

5-18

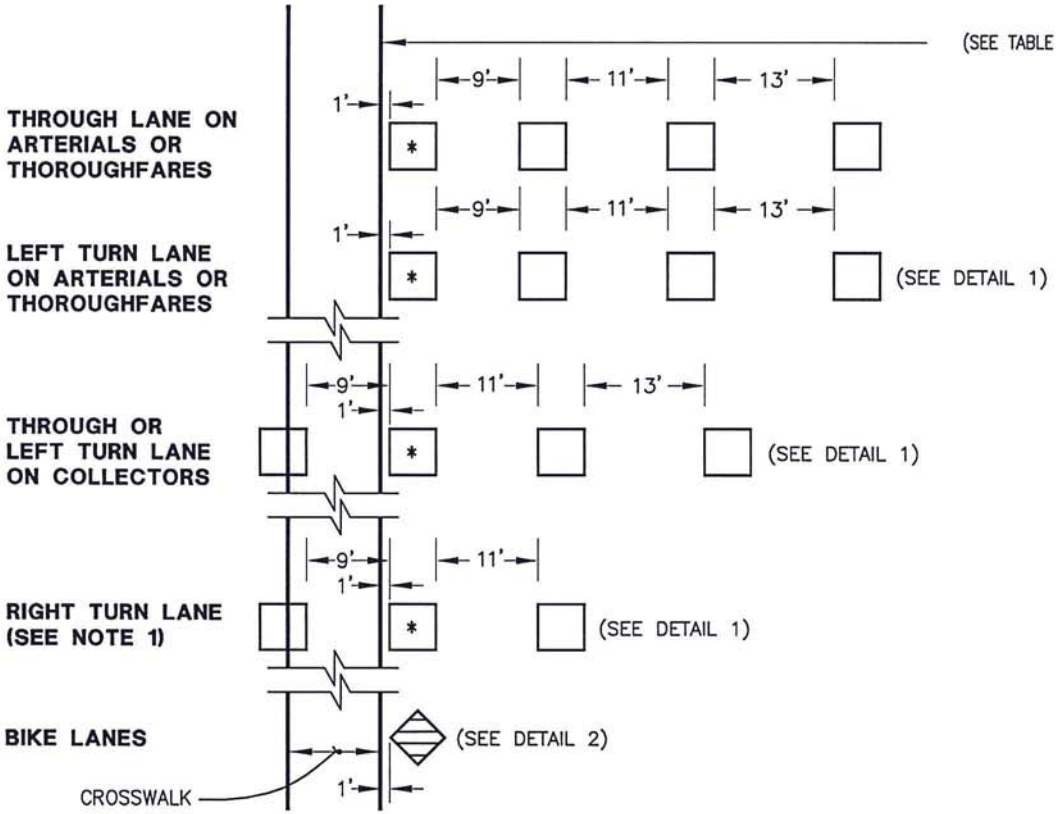
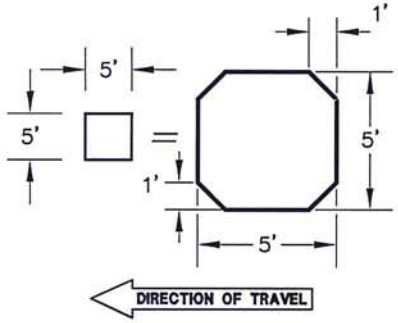


TABLE 1: DENSITY DETECTION	
Design Speed (mph)	**Distance (feet)**
40	250
45	300
50	350
55	400
60	450

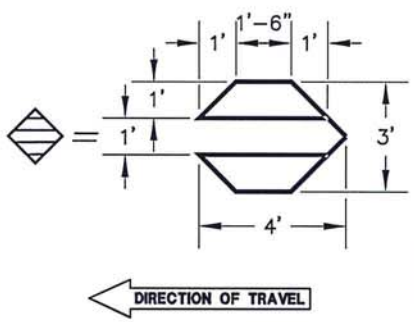
NOTES:

1. LOOP DETECTORS ON RIGHT TURN LANES ARE NOT NECESSARY FOR ARTERIAL OR THOROUGHFARE STREETS WHERE THE CROSS STREET IS A COLLECTOR.
2. SEE DWG. 5-18 FOR LOOP WINDING REQUIREMENTS.
3. USE THIS INFORMATION ONLY IF PLANS CALL FOR INSTALLATION OF LOOP DETECTORS. COUNTY STANDARD IS VIDEO DETECTION WHICH DOES NOT REQUIRE INSTALLATION OF LOOPS.



MODIFIED TYPE A DETECTOR LOOP PER COUNTY STD DWG 5-18 & CALTRANS STD PLAN ES-5A

DETAIL 1



MODIFIED TYPE D DETECTOR LOOP PER COUNTY STD DWG 5-18 & CALTRANS STD PLAN ES-5B

DETAIL 2

* LOOP DETECTOR AT STOP BAR TO HAVE 4 TURNS AND SHALL BE CONNECTED TO ITS OWN DETECTOR LEAD-IN CABLE (DLC). ALL OTHER PRESENSE LOOPS IN THE SAME LANE SHALL BE CONNECTED TO ANOTHER DETECTOR LEAD-IN CABLE (DLC).

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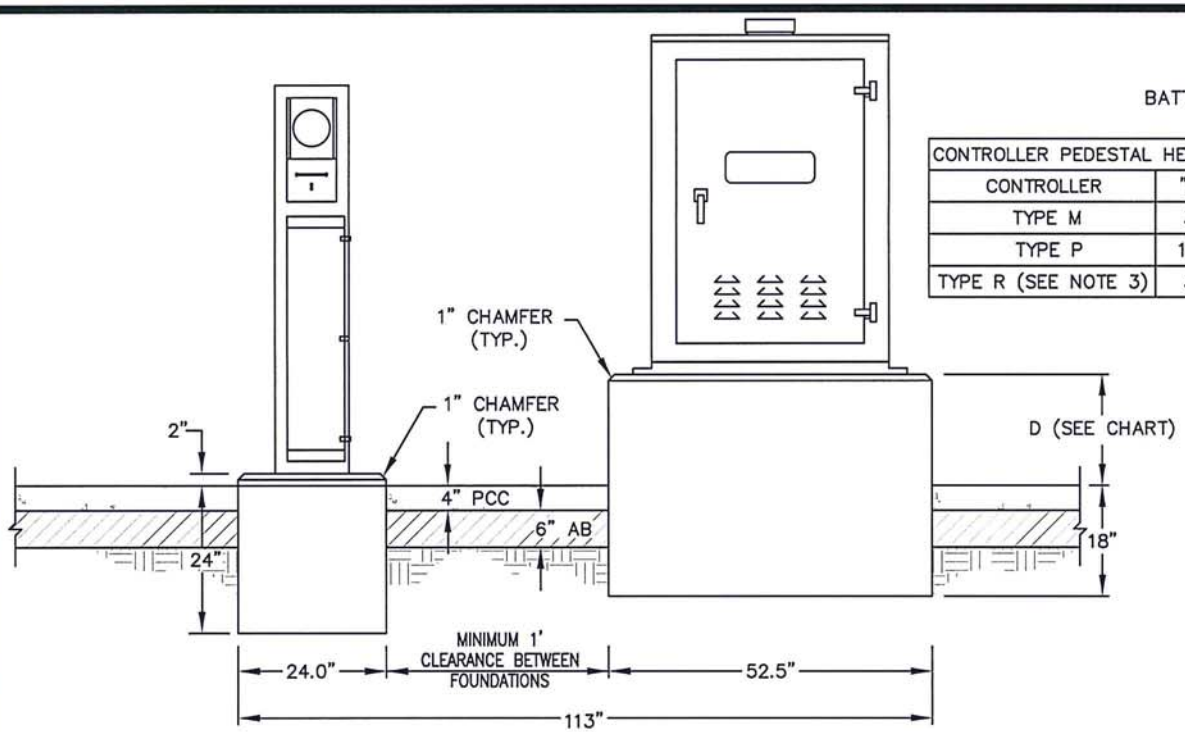
COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

DETECTOR LOOP LOCATION DETAILS

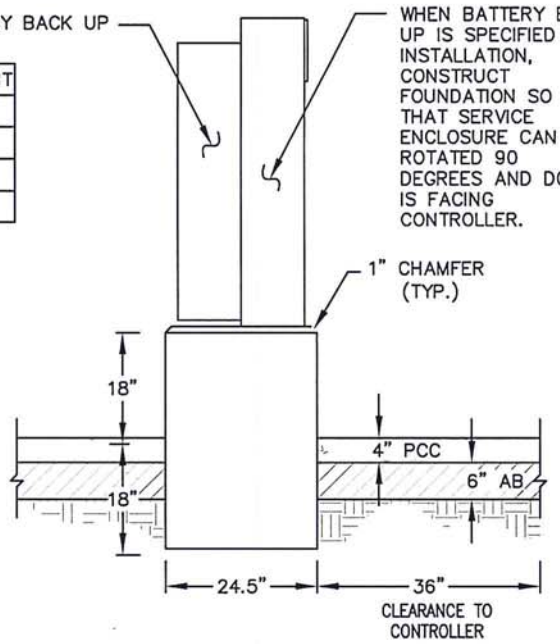
SCALE: NONE
DATE: 03/2018
DRAWN BY: TRS

5 - 19



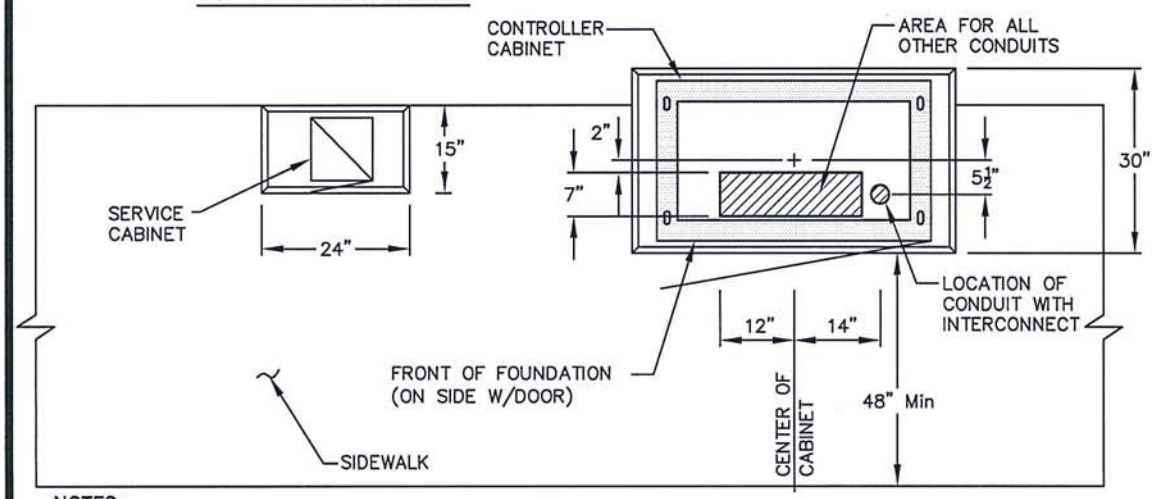
CONTROLLER PEDESTAL HEIGHT	
CONTROLLER	"D"
TYPE M	3"
TYPE P	18"
TYPE R (SEE NOTE 3)	3"

WITHOUT BATTERY BACK UP



WITH BATTERY BACK UP

SEE NOTE 2



CHIEF, DEPT. OF TRANSPORTATION

NOTES:

1. INSTALLATION OF CABINET FOUNDATION PARTIALLY BEHIND BACK OF WALK MAY REQUIRE ADDITIONAL RIGHT-OF-WAY OR EASEMENT.
2. USE OF BATTERY BACK UP SHALL ONLY BE USED WHEN SPECIFIED ON PROJECT PLANS.
3. TYPE R CABINET IS STANDARD UNLESS OTHERWISE APPROVED BY THE DIRECTOR.

COUNTY OF SACRAMENTO
PUBLIC WORKS & INFRASTRUCTURE

TRAFFIC SIGNAL CONTROLLER CABINET AND SERVICE CAN WITH BATTERY BACKUP FOUNDATIONS

SCALE: NONE
DATE: 03/2018
DRAWN BY: JAS

5 - 20