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SECTION 14

STREET LIGHTING AND TRAFFIC SIGNAL DESIGN STANDARDS

14.1 GENERAL – STREET LIGHTING

This section describes typical design practices for new or modified street lighting systems within the City of Sacramento. This includes street lights proposed for infilling existing residential and commercial areas where required or requested.

Street lighting plans shall indicate, at a minimum, but not limited to, edge of pavement, back of sidewalk, back of curb, existing topography such as fences, street lights, signal poles, planters, pullboxes, fire alarm pedestals, service pedestals, controller cabinets, power poles, median islands and other geometric features and obstructions that may affect the proposed street lighting design. Refer to Appendix B-Drawing Standards.

14.2 DESIGN CRITERIA

Street lighting shall be designed in conformance with these standards, the current edition of the City of Sacramento “Standard Specifications”, the City of Sacramento “Special Provisions”, and the “American National Standard Practice for Roadway Lighting” of the American Standards Institute, except that the minimum horizontal maintained foot-candles for the various street classifications shall be as shown in Appendix A to this section. Data and calculations supporting the requirements shall be submitted for review, or the predetermined design standard included herein shall apply.

14.3 STREET LIGHTS REQUIRED

Street lights shall be required for all lots and parcels being developed or constructed upon unless exempted by Section 14-4. For new or infill subdivision projects, all new street lights shall be the decorative ornamental style unless otherwise approved by the Engineering Services Division. 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. If new curb, gutter and sidewalk is installed, street lights are required. Illustrations of City approved Standard Street lights of Type A, Type B, and the Decorative Ornamental Style I and Style II are shown on Plate 14-1 and thru 14-4 in Appendix A to this section.

14.4 STREET LIGHT EXCEPTIONS

Street lights are not required for a single residence. Streetlights are required for commercial apartment complexes unless otherwise determined by the City Engineer.

14.5 **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 residence or development shall be the responsibility of the homeowner or developer.

14.6 **UTILITY COMPANY APPROVAL**

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

14.7 **STREET LIGHT DESIGN DETAILS**

14.7.1 **Intersections**

Intersections shall have at least one street light.

14.7.2 **Cul-de-sacs**

All cul-de-sacs shall have a street light within the bulb. The location of the street light within the bulb shall conform to Plate 14-5 in Appendix A to this section.

14.7.3 **Downtown Areas**

The number of streets lights designed within the downtown areas shall be the following:

- Residential areas shall have a total of three (3) ornamental street lights per side, per block
- Commercial areas shall have a total of four (4) ornamental street lights per side per block

14.7.4 **Spacing Guidelines**

Maximum street lighting spacing, measured along the street centerline, shall conform to the recommended design guideline in Appendix A to this section.

The proposed location of the street light poles shall conform to Plate 14-6 thru Plate 14-26 in Appendix A to this section.

The City's engineer may approve special designs if the character of the surrounding neighborhood warrants such a layout. The Design engineer shall provide lighting calculations supporting compliance with the required minimum foot-candle level as indicated on the tables shown on Plates 14-6 through Plate 14-26.

14.7.5 Street Light Poles

All Type A and B Street light poles shall be of galvanized steel. All Decorative Ornamental street light poles shall be aluminum. All pole construction and materials shall conform to the standards outlined in the "Standard Specifications", the latest adopted version of the "Special Provisions" and as shown on Plates 14-1 thru 14-4, in Appendix A to this section. Where a conflict occurs between the "Standard Specification" and the "Special Provisions", the "Special Provisions" shall take precedence.

14.7.6 Luminaries

The type of street light and the appropriate lamp wattage shall be specified on the plans. The luminaire type shall be high-pressure sodium (HPS) with internal ballasts:

- 100W HPS coated lamp for Decorative Ornamental
- 100W HPS lamp for Type B, Post Top
- 200W HPS lamp for Type A, Mast Arm

The circuit number and the lighting distribution pattern, ie, Type I or Type II, for each luminaire shall be specified on the plans. Typically, a Type III distribution is used. Type V distribution is typically applied at corners or in cul-de sac. Refer to Section 14.7.2 and Plate 14-5.

14.7.7 Service/Luminaire Schedule

All street lighting systems shall have underground service provided to an unmetered service pedestal for street lights only (metered services for traffic signal – refer to section 14.15). Service points shall be provided within a utility easement immediately adjacent to or within the right-of-way and shall be open and easily accessible to the street frontage.

All services shown shall have a designated service number issued by the City of Sacramento Department of Transportation - Electrical Section. In addition, all services will indicate the circuit numbers and the quantity of lights served for each circuit number, and the location of the service.

14.7.8 Pullboxes

All pullboxes shall be shown and identified on the plans. Pullboxes shall be installed at locations where more than two conduit runs intersect, at critical angle points where shown on the plans, conduit runs more than 200 feet long for power and/or lighting and 400 feet long for fiber and/or communications, and at such locations as directed by the Engineer. A No. 5 pullbox shall be the standard unless otherwise noted on the plans.

Pullboxes shall not be located within driveways or commercial entrances. It shall be the developer's responsibility to relocate, repair, and/or replace existing pullboxes and wiring to the City's satisfaction, should a conflict arise.

14.7.9 Conductors

All conductors shall be identified on the plans indicating the quantity and the size. Unless otherwise specified, all conductors shall be, single conductor rated for 600V with THW insulation, stranded copper, sized in accordance with these standards and the latest adopted version of the National Electric Code.

The conductor size from the Utility Company's designated service point to the City's service pedestal shall be No. 1 A.W.G. with a No. 6 A.W.G. ground conductor in 2" conduit. Conduit material for service runs shall be schedule 40 PVC for underground runs and rigid galvanized steel (RGS) for above ground applications.

All conductors used for street lighting shall be No. 6 A.W.G. with No. 10 A.W.G. ground conductors.

14.7.10 Voltage Drop

The allowable voltage drop along each circuit shall not exceed the percentages shown below, based on a nominal service voltage of 120 volts:

- 5% for 100W luminaries
- 7% for 200W luminaries

If the circuit has a mixture of 100W and 200W luminaries on one circuit, then the voltage drop shall be limited to 5% for that circuit. Calculations shall be submitted, in table form, to verify compliance with the design criteria for every circuit. The calculations shall include the total load, in amperes, of each circuit at the service pedestal and the associated

voltage drop for that circuit. Refer to Plate 14-27, in Appendix A of this section.

14.7.11 Photo Cell

A photocell is required for each service for the lighting system, it shall be connected to the service can with three No. 12 A.W.G. A single twist-lock receptacle suitable for SMUD photocell or a "button" photocell for Ornamentals shall be provided on the luminaire nearest to the service point for each service. As an alternate for Ornamentals, the photocell can be mounted inside the service pedestal.

14.7.12 Conduit

All conduit runs, including the size, shall be shown and identified on the plans. The conduit size and fill shall be determined according to the latest adopted version of the National Electrical Code, with the minimum conduit size of one and one half inch (1 ½") diameter. Main runs shall be 2" conduits, whereas, laterals shall be 1½" conduits. Larger size conduits may be required at the discretion of the City.

14.7.13 Electrical System

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 City of Sacramento.

14.8 MASTER PLANNING

Master planning is the process of laying out street light locations between control points. Control points are defined as the proposed street light locations at the street intersections in accordance with Section 14.7 and existing street lights. The purpose for master planning is to end up with an overall uniform street light system meeting the design requirements. The procedure for master planning is outlined as follows:

1. Determine the nearest intersections each way from the street light locations required. Determine the location of the street lights at these intersections in conformance with these design standards.
2. Determine the existence of any City owned and maintained street lights situated between the adjacent intersections above for inclusion into the overall design.

3. Determine the distance between the adjacent designed intersection street lights above and/or adjacent existing street lights, whichever are nearest to the street light locations being determined.
4. Divide the distance into the most possible equal spaces between lights that can be obtained in conformance with the spacing requirements herein.
5. Compare the light locations to intersecting property line, driveways, pedestrian lanes and utility obstructions as follows:
 - a. If the location falls close to a property line and the street light location can be adjusted to the property line while staying within the maximum spacing allowed, then the adjustment should be made.
 - b. Generally, street lights should be situated at intersecting property lines for residential lots 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.
 - c. Street light locations shall be adjusted to miss driveways and existing utility obstructions by five feet, measured from the base of the pole.

14.9 **GENERAL - TRAFFIC SIGNAL DESIGN**

This section describes typical standards practices for new or modified traffic control systems within the City of Sacramento. It covers typical scenarios encountered in design and serves as a guideline. The material contained herein is a supplement to the City of Sacramento's "Standard Specifications", "Special Provisions", and CalTrans Traffic Manual, latest adopted CalTrans "Standard Plans" and "Standard Specifications", and other current design policies.

Traffic Signal plans shall indicate, at a minimum, but not be limited to, edge of pavement, back of sidewalk, back of curb, existing topography such as fences, street lights, signal poles, planters, pullboxes, fire alarm pedestals, service pedestals, controller cabinets, power poles, median islands and other geometric features and obstructions that may affect the proposed traffic signal design. In addition, new or replaced curb ramps shall indicate the slope and the flow lines. Refer to Appendix B-Drawing Standards.

14.9.1 **Developer Conditioned Traffic Signals**

Developers who are required to install traffic signals as part of the off site improvements, shall design the signal in conformance to the standards in section 14.10, and the latest adopted version of the City's "Special Provisions".

All traffic signal plans designed by the Developer's consultant shall be submitted for review and approval. The submittal shall include pertinent sections of the "Special Provisions" specific to the traffic signal equipment to be installed. The submitted plans shall conform to Appendix B-Drawing Standards. In addition, signal timing for the intersection shall be submitted in a format approved by the City's Traffic Engineering section.

14.10 **DESIGN STANDARDS**

Standard guidelines for traffic signal design are obtained from the following reference books:

1. Federal Highway Administration, "Traffic Control Devices Handbook."
2. Manual on Uniform Traffic Control Devices (MUTCD).
3. Department of Transportation (CalTrans) – California Supplement to MUTCD
4. National Electrical Manufacturer's Association (NEMA) – "Traffic Control Devices."

5. Department of Transportation (CalTrans) – “Standard Specifications”, “Standard Plans” – latest adopted version.
6. National Electrical Code (NEC) Book.
7. City of Sacramento “Standard Specifications” – latest adopted version.

14.11 **CONDUIT**

Installation of conduit shall conform to the requirement of the City “Standard Specifications”. The types of conduit to be used unless the Engineer approves an alternate material are:

1. Rigid Steel Conduit – hot dipped galvanized
2. Rigid Non-Metallic Conduit – Schedule 40 PVC

The choice of conduit size for traffic signal projects shall conform to the following criteria:

14.11.1 **Conduit Size**

Unless otherwise approved, 1-1/2” conduit is the minimum size used for traffic signal and street lighting conduits for a traffic signal system. The size of conduits used for various applications shall be as follows:

1. Signal Wires – 2” minimum
2. Street Crossing – 3”
3. Signal Pole to Pullbox – 2”
4. Detector Cables – 1-1/2” minimum
5. Controller Cabinet to Pullbox – (2) 4”
6. Interconnect Cable (6 or 12 pair # 19) – 2”
7. Fiber Optic Cable – 2”

14.11.2 **Conduit Fill**

The National Electric Code limits the portion of the conduit’s cross section that can be occupied by conductors to the following:

One Conductor	53%
Two Conductors	31%
Three or More conductors	40%

Conduit fills over the limits indicated herein must be approved by the Engineer.

14.11.3 Conduit Layout

Conduit layout for a new signalized intersection shall be per the layout guide shown on Plate 14-28.

14.12 CONTROLLER UNIT AND CABINET

The controller unit shall be as specified in the "Special Provisions" for intersections within the City. In general, the cabinet used for the City's controllers at new or modified installations shall be the Type R cabinet. Intersections on State Routes or selected intersections involved with light rail shall have a State and light rail approved controller unit in conformance with CalTrans specifications. The cabinet used for the State approved controller shall be the Type 332 cabinet in conformance with CalTrans Specifications. Contact the City's DOT – Electrical Section for the complete "Special Provisions".

14.13 PULLBOXES

Pullboxes shall be No. 5 minimum for traffic signal projects unless otherwise specified. In general, a No. 6 pullbox should be used when:

1. Four or more conduits enter the pull box.
2. At conduit junction points located at major street corners.

Pullboxes shall not be placed:

1. Within the ramp and landing areas of a handicapped ramp;
2. On driveways; or
3. In planter areas unless approved by the Engineer.

Pullboxes with steel covers, conforming to CalTrans Standard Plans and Specifications, shall be used when pull boxes have to be placed in shoulders or in areas where there is no sidewalk. Pull boxes with steel covers shall be designated on the Plans with the symbol (T) next to the pull box according to CalTrans Standard Plans and Specifications.

Traffic signal controller pull box shall be N44 or an approved equal.

14.14 EXISTING EQUIPMENT

Where existing systems are to be modified, any existing equipment to be removed and not used shall be salvaged. The Plans or "Special Provisions" shall indicate that the Contractor is to deliver the salvaged equipment to Corporate Center South, 5230-24th Street, Sacramento, California. Conductors removed from existing equipment shall not be salvaged.

14.15 SERVICE

Service equipment enclosures and meter shall meet the requirements of the servicing utility. Service wiring diagrams differing, or not shown on the traffic signal Standard Plan Sheets shall be shown on the electrical plans and shall meet the requirements of the servicing utility. It is required to field review the proposed service point locations with the appropriate utility representation. Arrangement shall be made with the servicing utility to establish or provide a service point for the installation during the design stage or when the preliminary plans are completed.

14.16 VEHICLE SIGNAL FACES

All vehicle signal faces shall have louvered backplates. All signal head mounts (vehicular and pedestrian) shall have terminal compartments without terminal strips. Left turn signal faces shall consist of conventional 12" red arrow, yellow arrow and green arrow sections. Signing shall be revamped when an existing left turn signal face with green arrow, circular yellow and red lenses is to be replaced with an all arrow signal face. Left turn signal faces shall be located as close as practicable to the following:

1. One head in line with the center of a one lane left turn approach.
2. One head in line with the stripe between the two lanes of a 2-lane left turn approach.

Mastarm signal heads for through lanes should be located as close as practicable to the following:

1. One signal head shall be placed in line with the lane stripe between the two through lanes for a 2-lane approach.
2. One head in line with the lane stripe between the No. 1 and No. 2 through lanes for a 3-lane approach with protected left turn phase and a separate left turn lane.
3. One face in line with the center of the No. 2 through lane for a 3-lane approach without protected left turn. If a protected left turn is anticipated for the future, one head should be placed three feet into the left turn lane between the No. 2 through lane and the left turn lane. Also, a side tenon should be placed in line with the lane stripe between the No. 1 and No. 2 through lanes for a future face. In anticipation of future conditions, the proper standard that will support the future mast arm length shall be installed with a shorter arm.
4. Two heads, one in line with the lane stripe between lanes No. 1 and No. 2, the second in line with the lane stripe between lanes No. 3 and No. 4 for a 4-lane approach.

All signal head displays for new and/or modified traffic signals shall be 12" LED modules and shall have a full ball appearance.

A minimum of three (3) signal heads should be provided on each approach for each signal phase. The proposed design should comply with MUTCD, at a minimum, unless otherwise directed by the City's Traffic Engineer.

14.17 **PEDESTRIAN SIGNAL HEADS**

Pedestrian signal heads shall be filled LED, international, hand/walk figure-type in conformance with "State Standard Plans and Specifications"; LED outlines of hand/walk are prohibited. Pedestrian signal heads at crosswalks that are 60 feet or greater shall be the countdown type, and as directed by the City's Traffic Engineering Section.

For modification projects, all existing pedestrian signal heads shall be examined to see if they should be replaced. In general, for modification projects, any existing neon or incandescent pedestrian signal heads should be replaced with the LED type. Pedestrian signal heads shall be placed on the pole nearest the crosswalk. Pedestrian signal heads should be located where there is minimum visibility interference from vehicles stopped at the crosswalk or limit line.

14.18 **VIDEO DETECTION SYSTEM**

Video detection shall be specified in lieu of inductive loops where feasible for new and/or modified traffic signal installations or for loop maintenance replacement. Use of this system shall be for the front and middle vehicle detection; advance (rear) detection of vehicles will be by radar, or as directed by the City's traffic engineer.

14.19 **MODULATED LIGHT SIGNAL DETECTION SYSTEM**

All new and modified traffic signal installations shall have a modulated light pre-emption device installed. Typically, all four directions will have the modulated light detection device installed on the signal mast arm. These devices shall be located in line with the number one lane. The pre-emption convention is as follows: (Refer to Plate 14-29)

- EVA = Phases 1, 6 (eastbound direction)
- EVB = Phases 2, 5 (westbound direction)
- EVC = Phases 3, 8 (northbound direction)
- EVD = Phases 4, 7 (southbound direction)

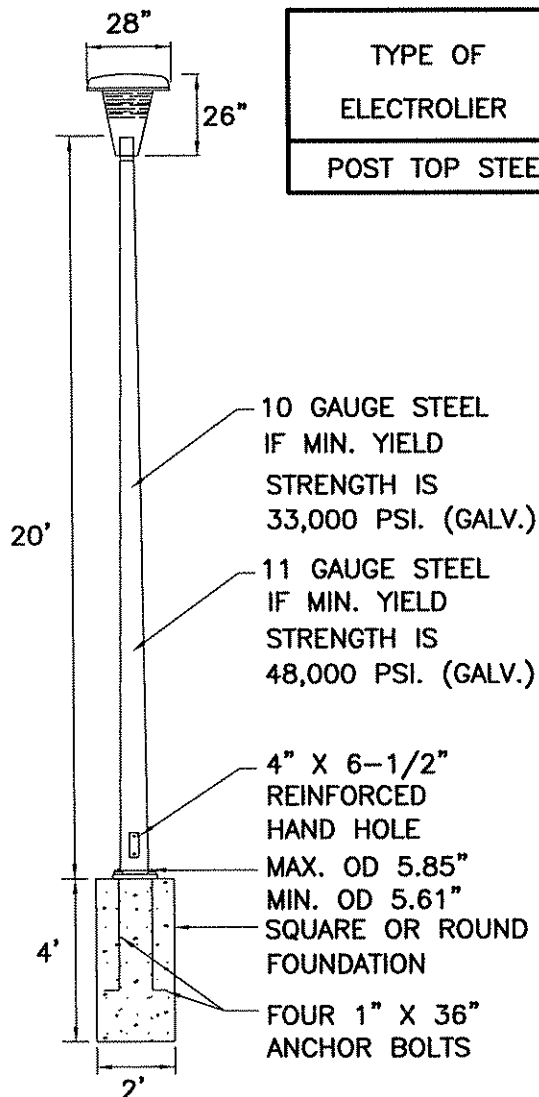
APPENDIX A TO SECTION 14

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APPENDIX A TO SECTION 14

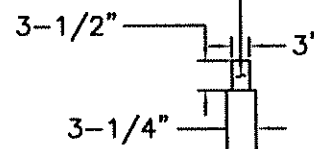
<u>PLATE NO.</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
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Appendix A

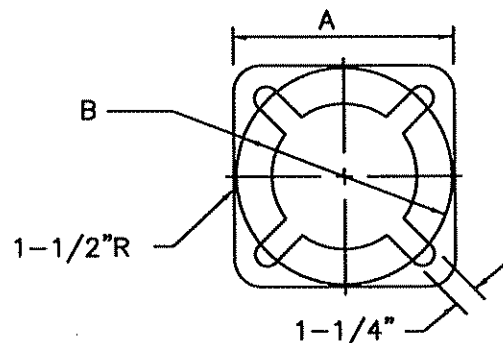


TYPE OF ELECTROLIER	BASE PLATE	
	A	B
POST TOP STEEL	10"	9-1/2"

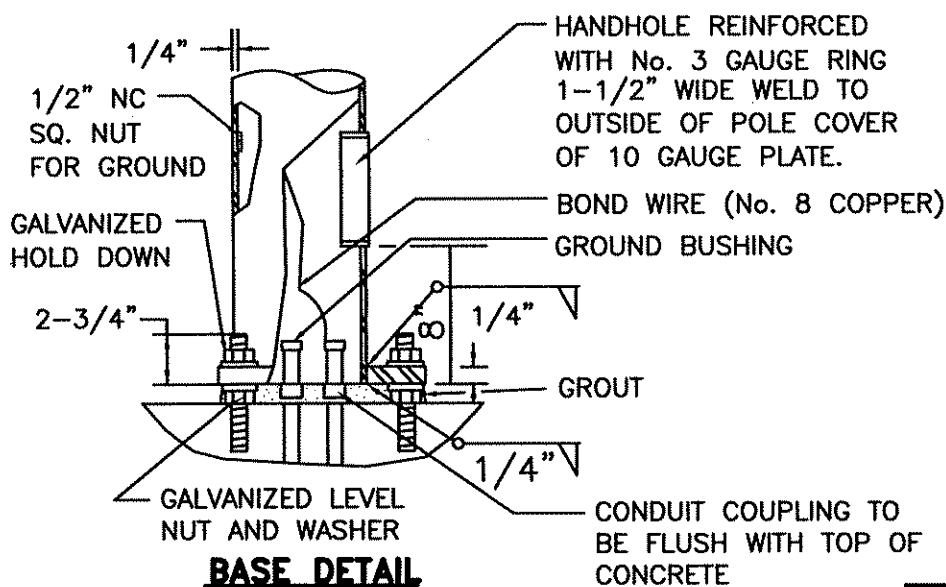
MOLDED TENON 3" x 3-1/2"
(NO TAPER) WITH 16 GAUGE
STEEL SLEEVE CAST ALUMINUM
TENON OR APPROVED DESIGN
IS ALSO AVAILABLE



TENON DETAIL

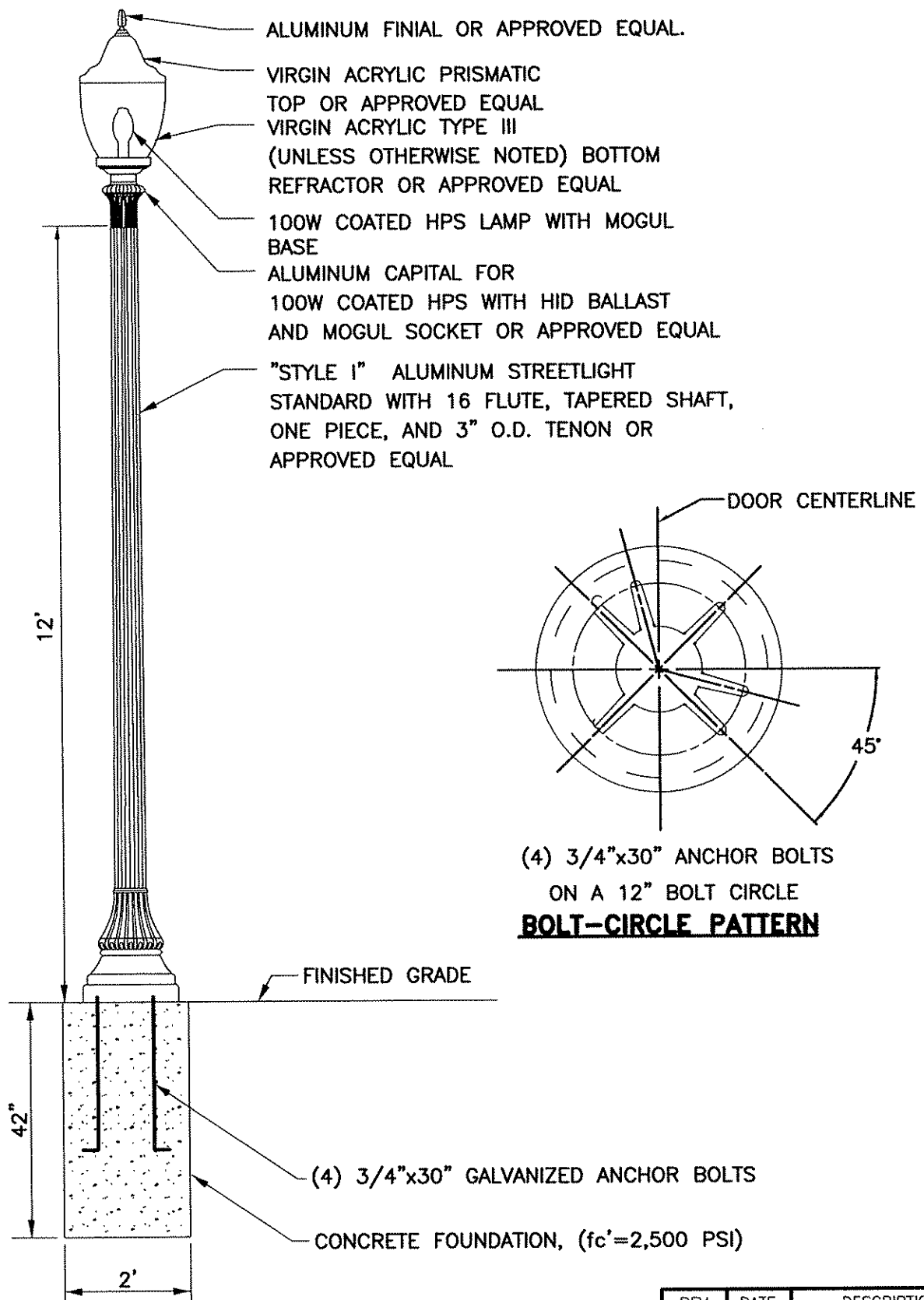


BASE PLATE



BASE DETAIL

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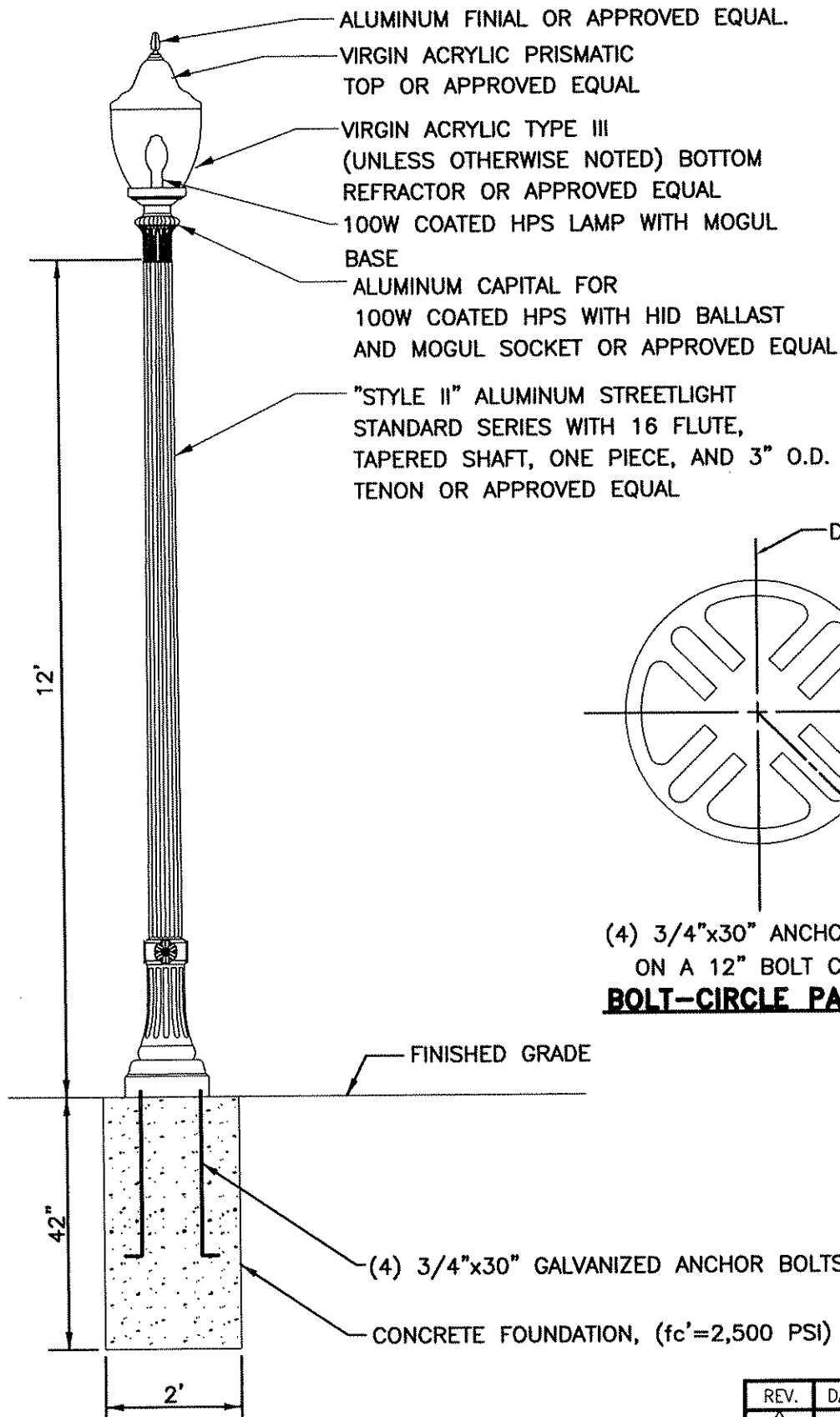


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Department of
TRANSPORTATION
City of Sacramento

**ORNAMENTAL
STREETLIGHT STYLE I**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-3



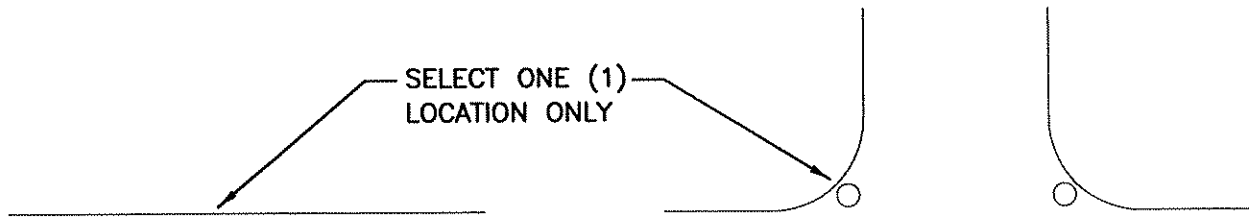
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Department of
TRANSPORTATION
City of Sacramento

**ORNAMENTAL
STREETLIGHT STYLE II**

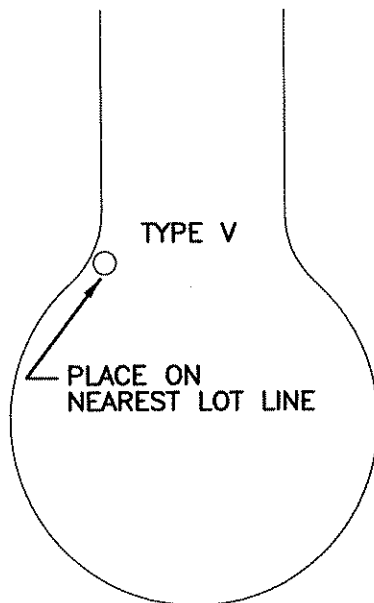
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STREET LIGHT PLACEMENT ON COLLECTOR & RESIDENTIAL STREETS

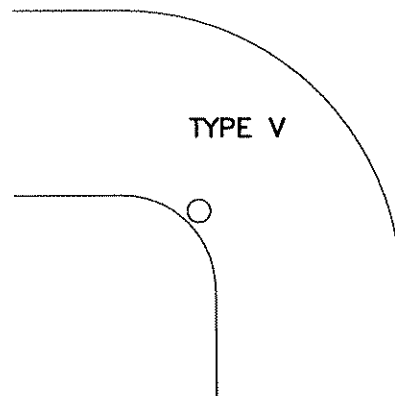


TYPE V

TYPE V

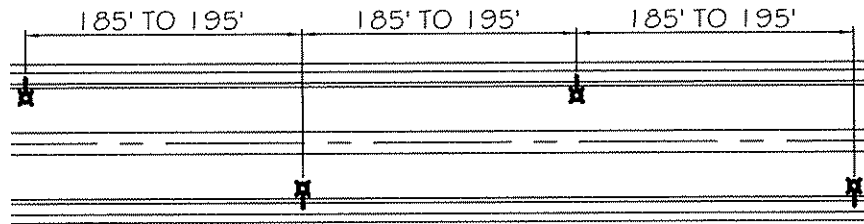


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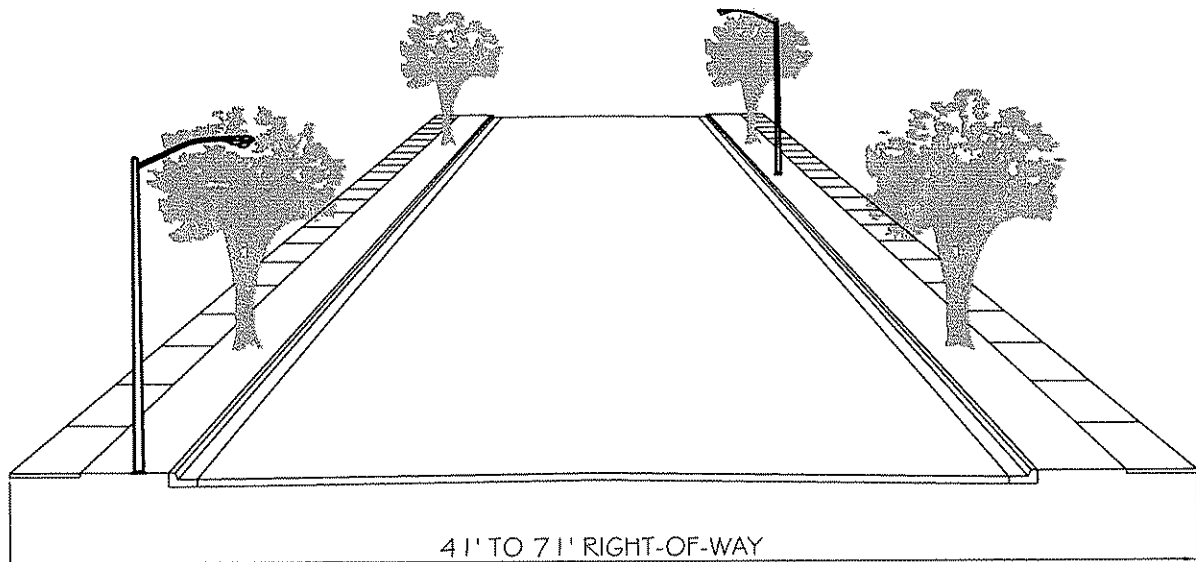


TYPE V

REV.	DATE	DESCRIPTION
△		
△		
△		



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (8')
LAMP	HIGH PRESSURE SODIUM
WATTAGE	200 WATT
POLE HEIGHT	28'-6"
COLOR	NON-PAINTED GALVANIZED
GLOBE	MEDIUM SEMI-CUTOFF
SPACING	185' TO 195'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.2 FOOTCANDLES (MIN.)

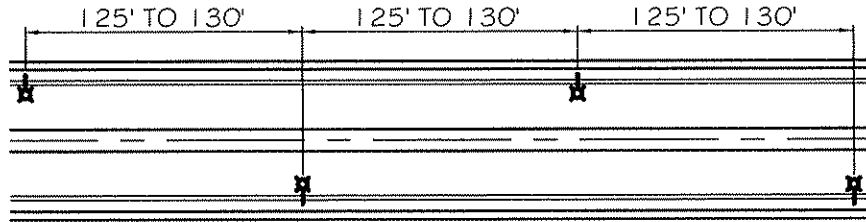


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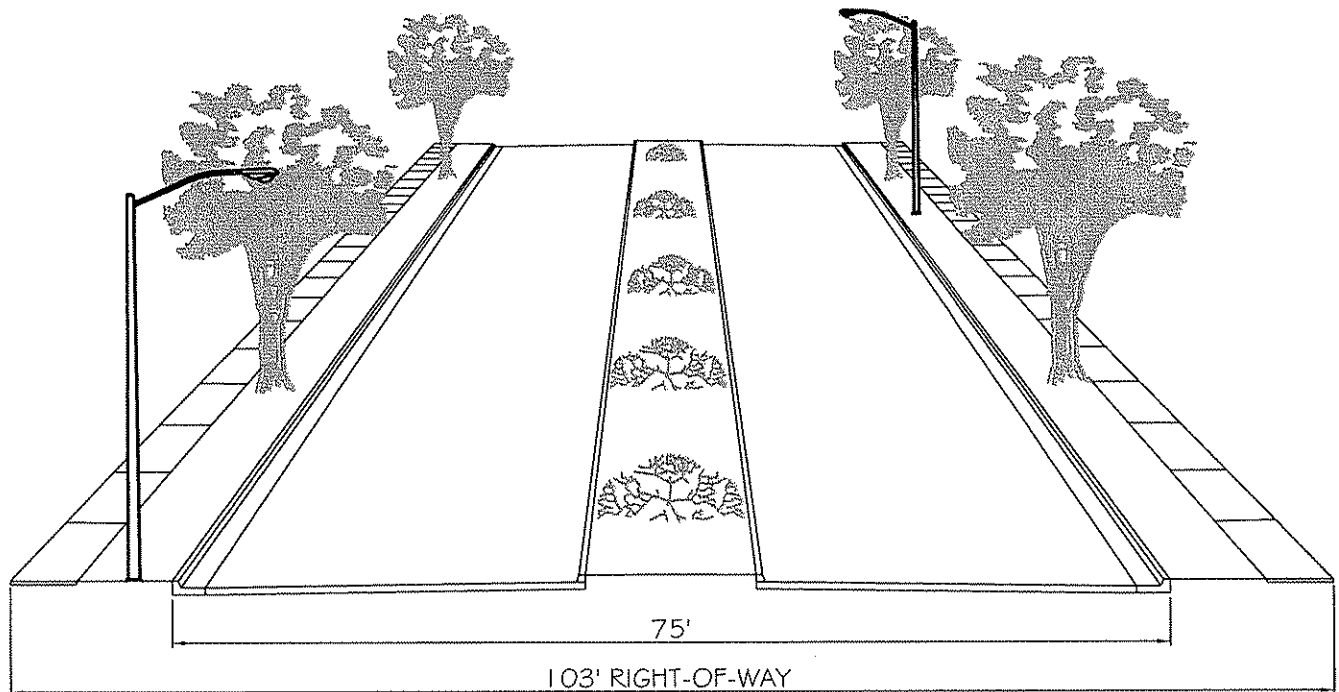
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City of Sacramento

**NON-RESIDENTIAL STREET WITH
TYPE A 41' TO 71' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-6



RECOMMENDED DESIGN CRITERIA	
TYPE	MAST ARM (10')
LAMP	HIGH PRESSURE SODIUM
WATTAGE	200 WATT
POLE HEIGHT	28'-6"
COLOR	NON-PAINTED GALVANIZED
GLOBE	MEDIUM SEMI-CUTOFF
SPACING	125' TO 130'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.2 FOOT CANDLES (MIN.)

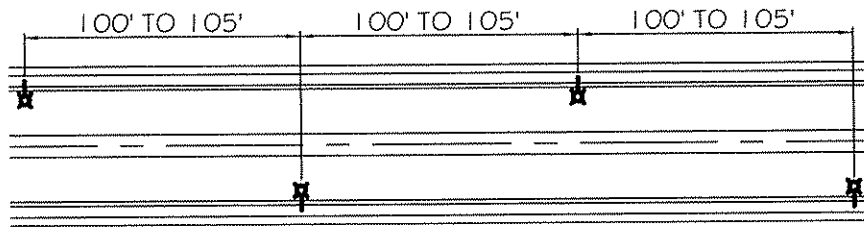


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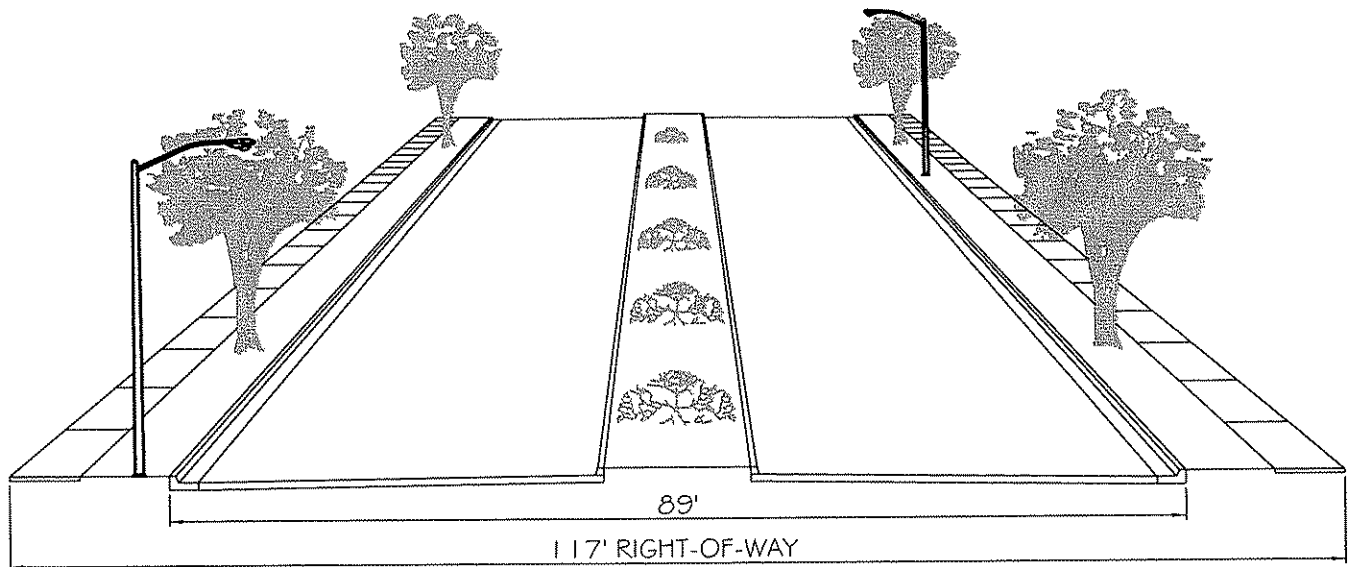
Department of
TRANSPORTATION
City of Sacramento

ARTERIAL STREET
103' ROW

APPROVED BY:  SCALE: NONE
DATE: 12/18/06 PLATE: 14-7



RECOMMENDED DESIGN CRITERIA	
	MAST ARM (15')
LAMP	HIGH PRESSURE SODIUM
WATTAGE	200 WATT
POLE HEIGHT	28'-6"
COLOR	NON-PAINTED GALVANIZED
GLOBE	MEDIUM SEMI-CUTOFF
SPACING	100' TO 105'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.2 FOOTCANDLES (MIN.)

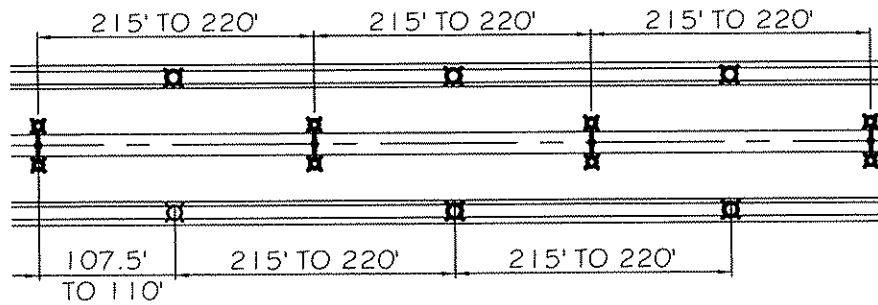


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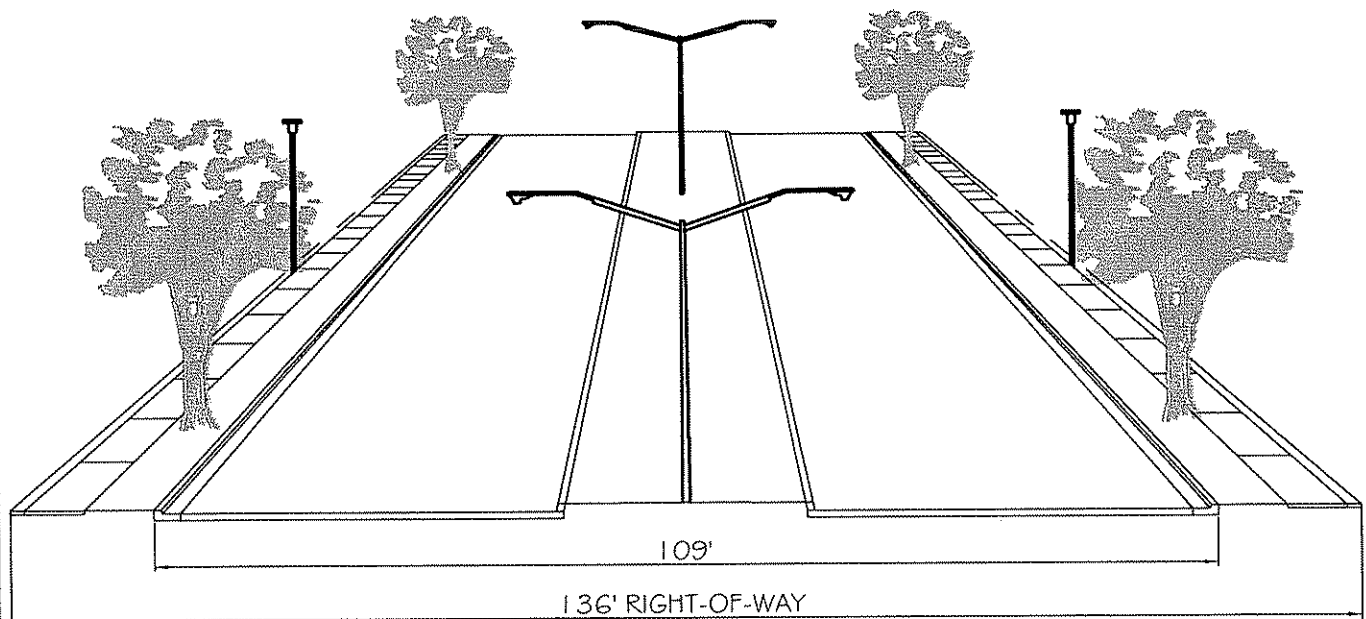
Department of
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City of Sacramento

ARTERIAL STREET
117' ROW

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-8



RECOMMENDED DESIGN CRITERIA		
TYPE	DUAL MAST ARM (15')	POST TOP
LAMP	HIGH PRESSURE SODIUM	HIGH PRESSURE SODIUM
WATTAGE	200 WATT	100 WATT
POLE HEIGHT	28'-6"	20'
COLOR	NON-PAINTED GALVANIZED	NON-PAINTED GALVANIZED
GLOBE	MEDIUM SEMI-CUTOFF	STANDARD PRISMATIC
SPACING	215' TO 220'	215' TO 220'
SPACING PATTERN	CENTERED IN ISLAND	OPPOSITE
DESIGN GUIDELINE	0.2 FOOT CANDLES (MIN.)	



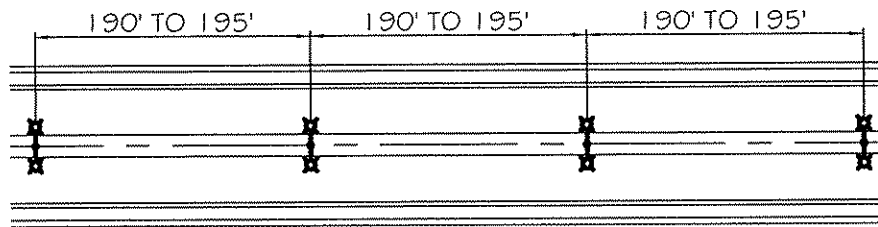
NOTE: THIS DESIGN LAYOUT TO BE USED
IF REQUIRED BY THE CITY.

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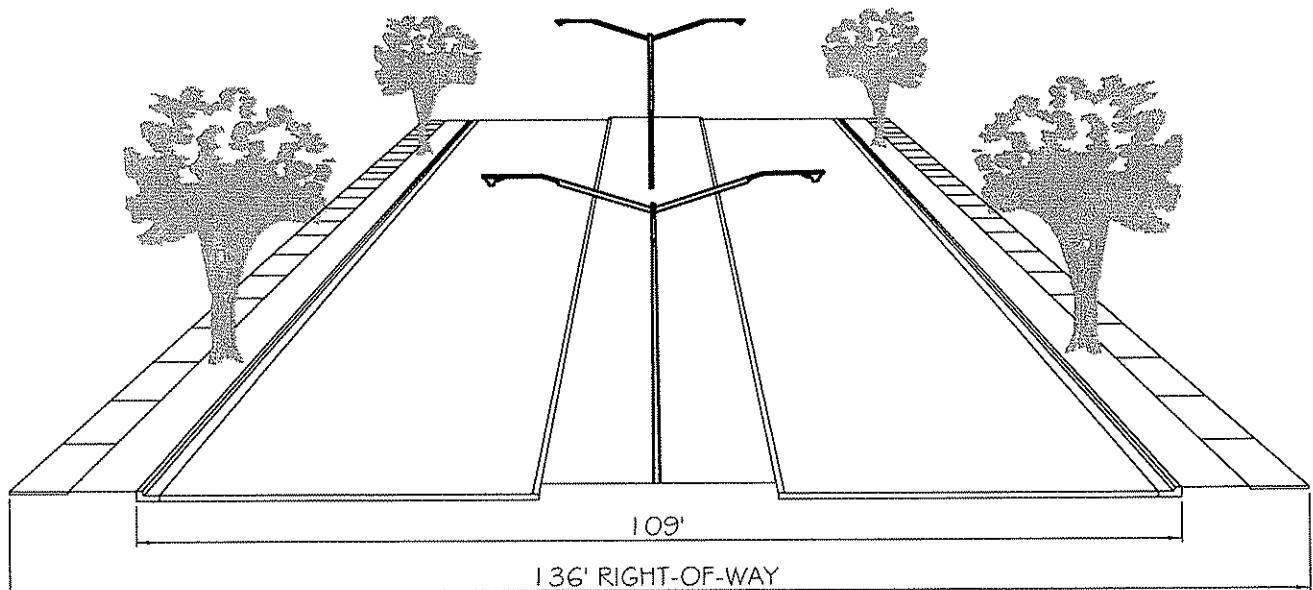
Department of
TRANSPORTATION
City of Sacramento

**ARTERIAL STREET WITH
TYPE A AND TYPE B 136' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-9



RECOMMENDED DESIGN CRITERIA	
TYPE	DUAL MAST ARM (15')
LAMP	HIGH PRESSURE SODIUM
WATTAGE	200 WATT
POLE HEIGHT	28'-6"
COLOR	NON-PAINTED GALVANIZED
GLOBE	MEDIUM SEMI-CUTOFF
SPACING	190' TO 195'
SPACING PATTERN	CENTERED IN MEDIAN
DESIGN GUIDELINE	0.2 FOOTCANDLES (MIN.)

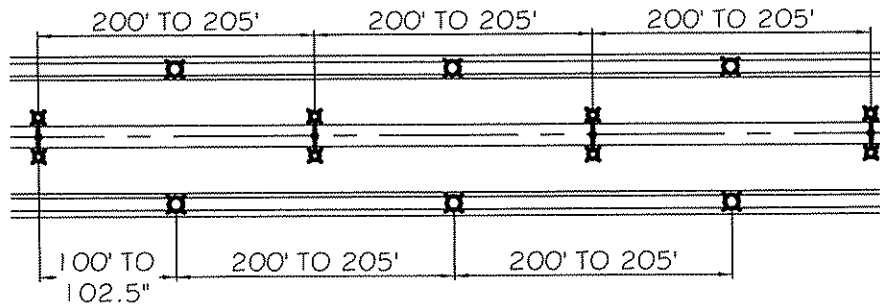


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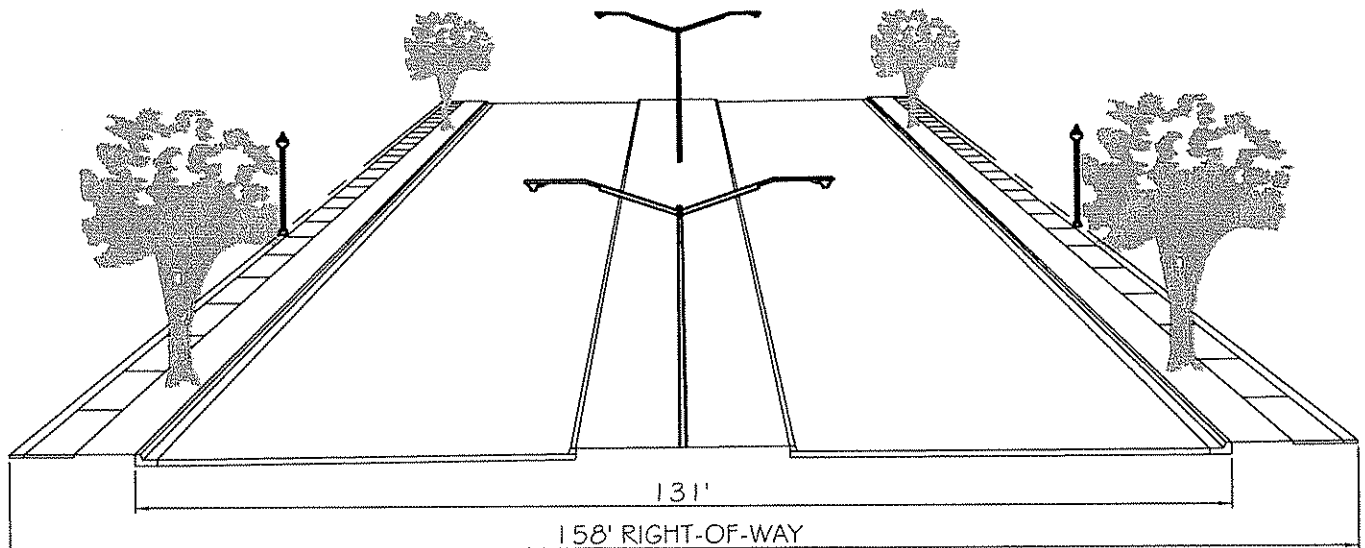
Department of
TRANSPORTATION
City of Sacramento

**ARTERIAL STREET WITH
DUAL TYPE A 136' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/66 PLATE: 14-10



RECOMMENDED DESIGN CRITERIA		
TYPE	DUAL MAST ARM (15')	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM	HIGH PRESSURE SODIUM
WATTAGE	200 WATT	100 WATT
POLE HEIGHT	28'-6"	12'
COLOR	NON-PAINTED GALVANIZED	SEMI-GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	MEDIUM SEMI-CUTOFF	'ACORN' (PRISMATIC)
SPACING	200' TO 205'	200' TO 205'
SPACING PATTERN	CENTERED IN ISLAND	OPPOSITE
DESIGN GUIDELINE	0.2 FOOT CANDLES (MIN.)	



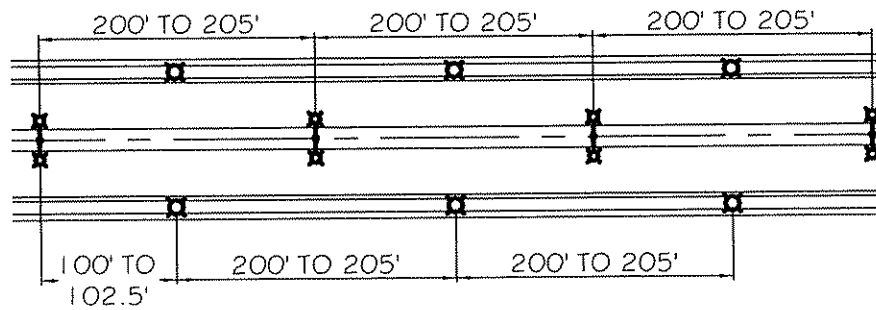
NOTE: THIS DESIGN LAYOUT TO BE USED
IF REQUIRED BY THE CITY.

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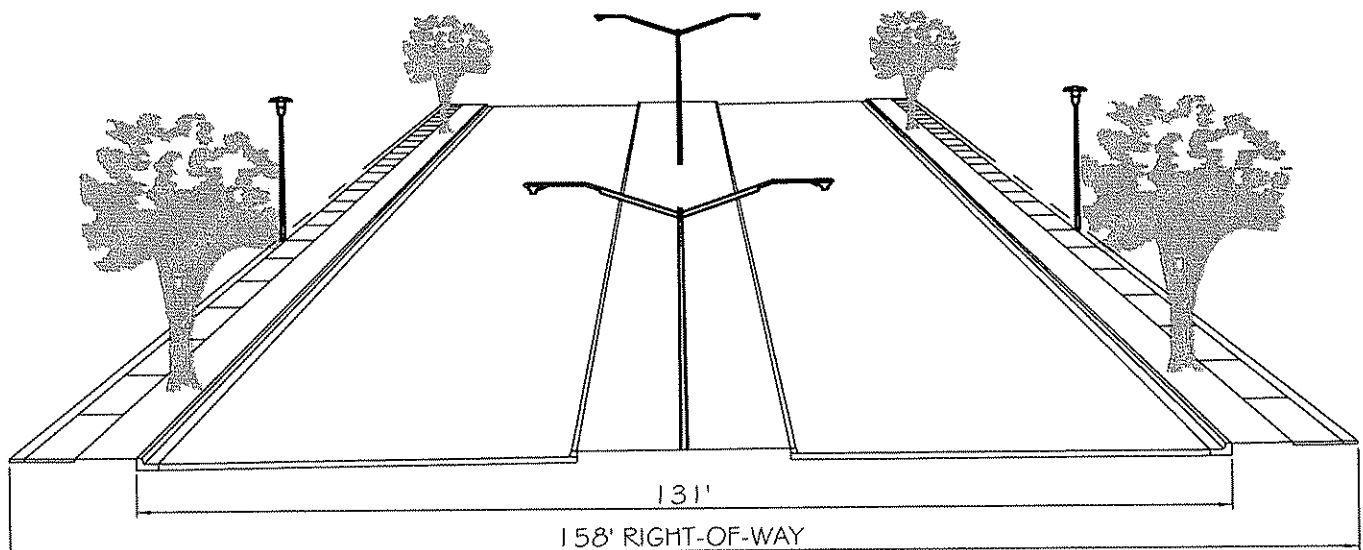
Department of
TRANSPORTATION
City of Sacramento

**ARTERIAL STREET WITH DUAL
TYPE A AND ORNAMENTAL 158' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-11



RECOMMENDED DESIGN CRITERIA		
TYPE	DUAL MAST ARM (15')	POST TOP
LAMP	HIGH PRESSURE SODIUM	HIGH PRESSURE SODIUM
WATTAGE	200 WATT	100 WATT
POLE HEIGHT	28'-6"	20'
COLOR	NON-PAINTED GALVANIZED	NON-PAINTED GALVANIZED
GLOBE	MEDIUM SEMI-CUTOFF	STANDARD PRISMATIC
SPACING	200' TO 205'	200' TO 205'
SPACING PATTERN	CENTERED IN ISLAND	OPPOSITE
DESIGN GUIDELINE	0.2 FOOT CANDLES (MIN.)	



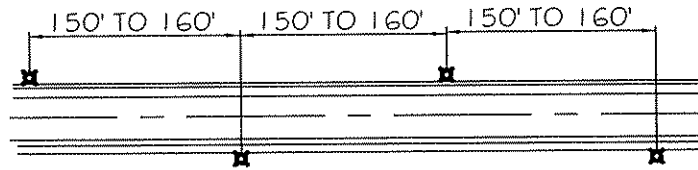
NOTE: THIS DESIGN LAYOUT TO BE USED
IF REQUIRED BY THE CITY.

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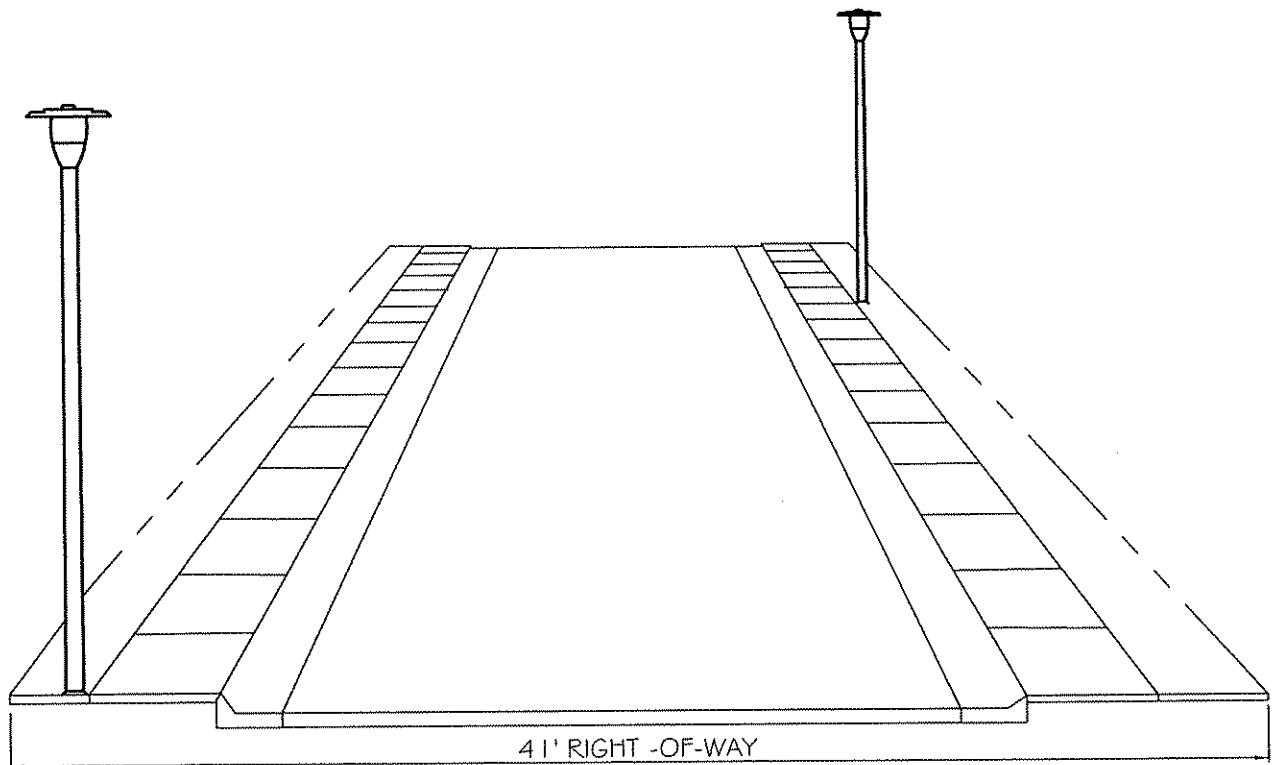
Department of
TRANSPORTATION
City of Sacramento

**ARTERIAL STREET WITH DUAL
TYPE A AND TYPE B 158' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/66 PLATE: 14-12



RECOMMENDED DESIGN GUIDELINE	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	150' TO 160'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT CANDLES (MIN.)

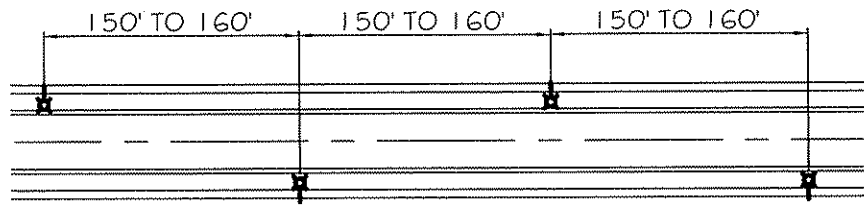


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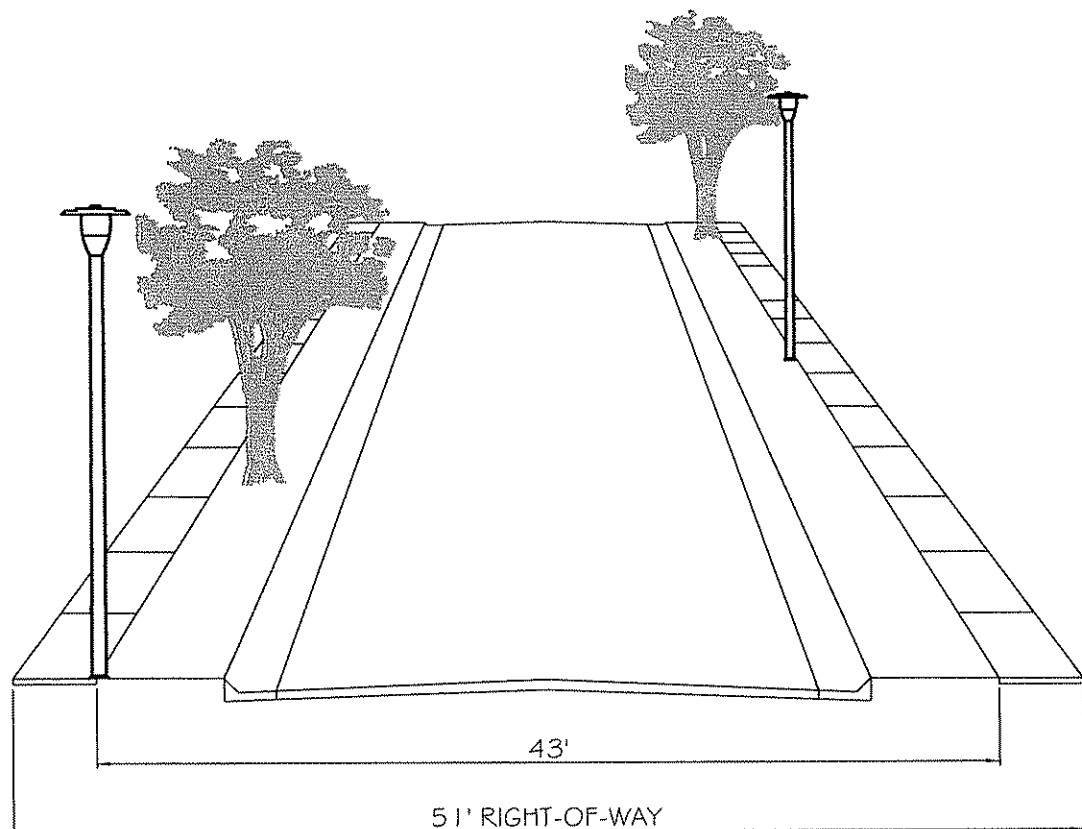
Department of
TRANSPORTATION
City of Sacramento

**LOCAL RESIDENTIAL STREET
TYPE B 41' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-13



RECOMMENDED DESIGN CRITERIA	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON-PAINTED GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	150' TO 160'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT CANDLES (MIN.)

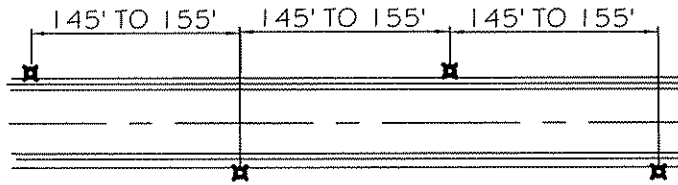


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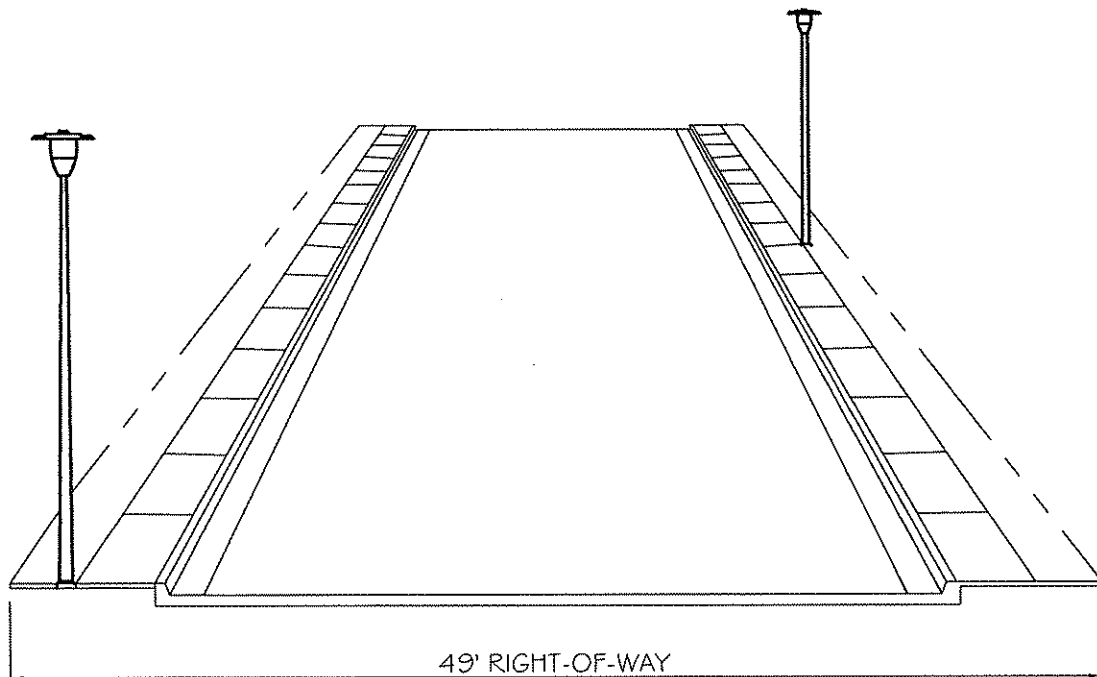
Department of
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City of Sacramento

**LOCAL RESIDENTIAL STREET
TYPE B 51' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-14



RECOMMENDED DESIGN GUIDELINE	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	145' TO 155'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT-CANDLES (MIN.)

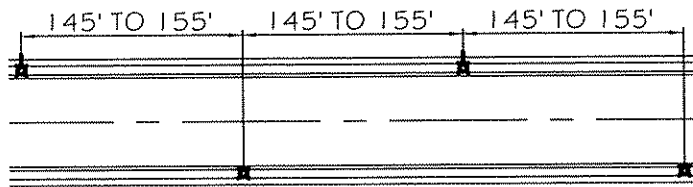


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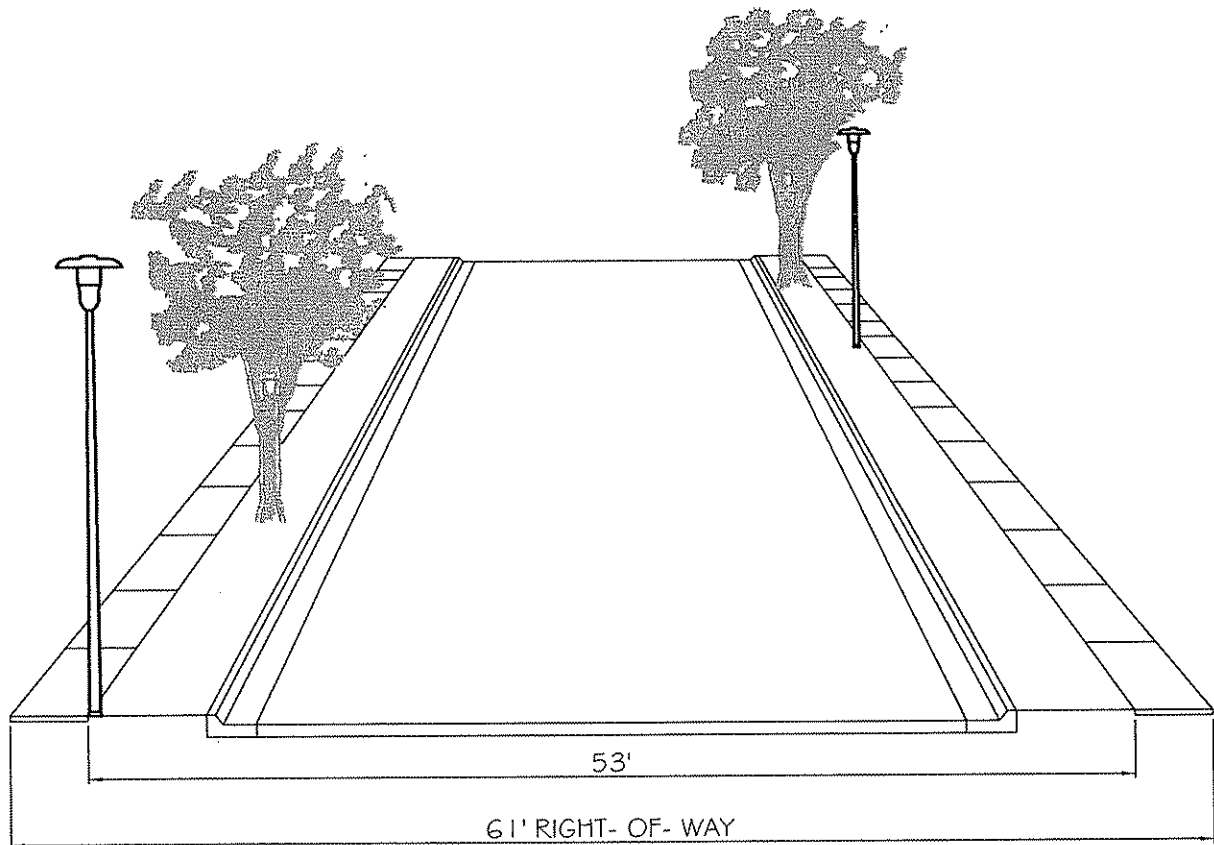
Department of
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City of Sacramento

LOCAL NON - RESIDENTIAL STREET
TYPE B 49' ROW

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-15



RECOMMENDED DESIGN GUIDELINE	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON-PAINTED GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	145' TO 155'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES (MIN.)

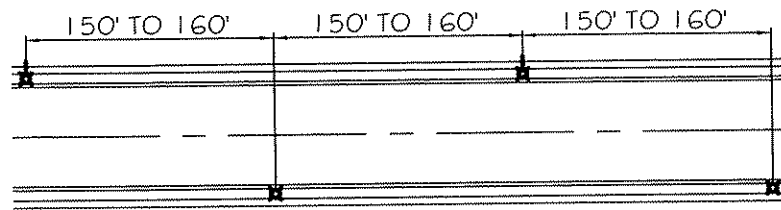


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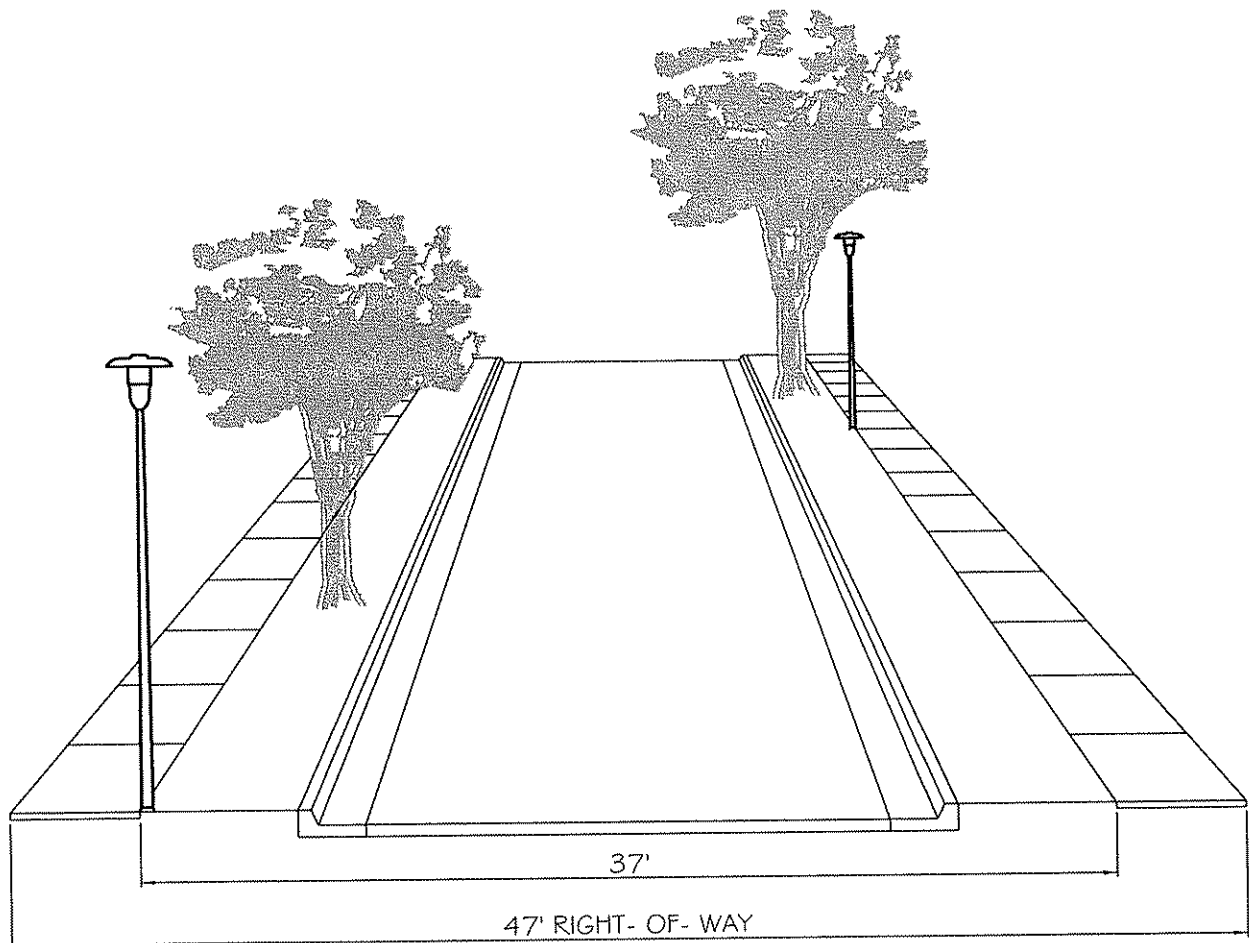
Department of
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City of Sacramento

LOCAL NON - RESIDENTIAL STREET
61' ROW

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 DWG. NO. 14-16



RECOMMENDED DESIGN GUIDELINE	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON-PAINTED GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	150' TO 160'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES (MIN.)

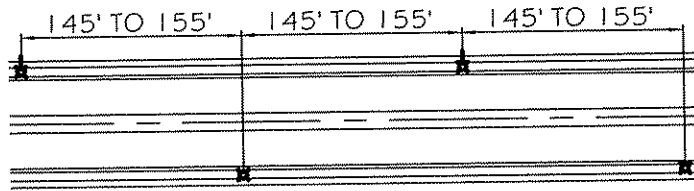


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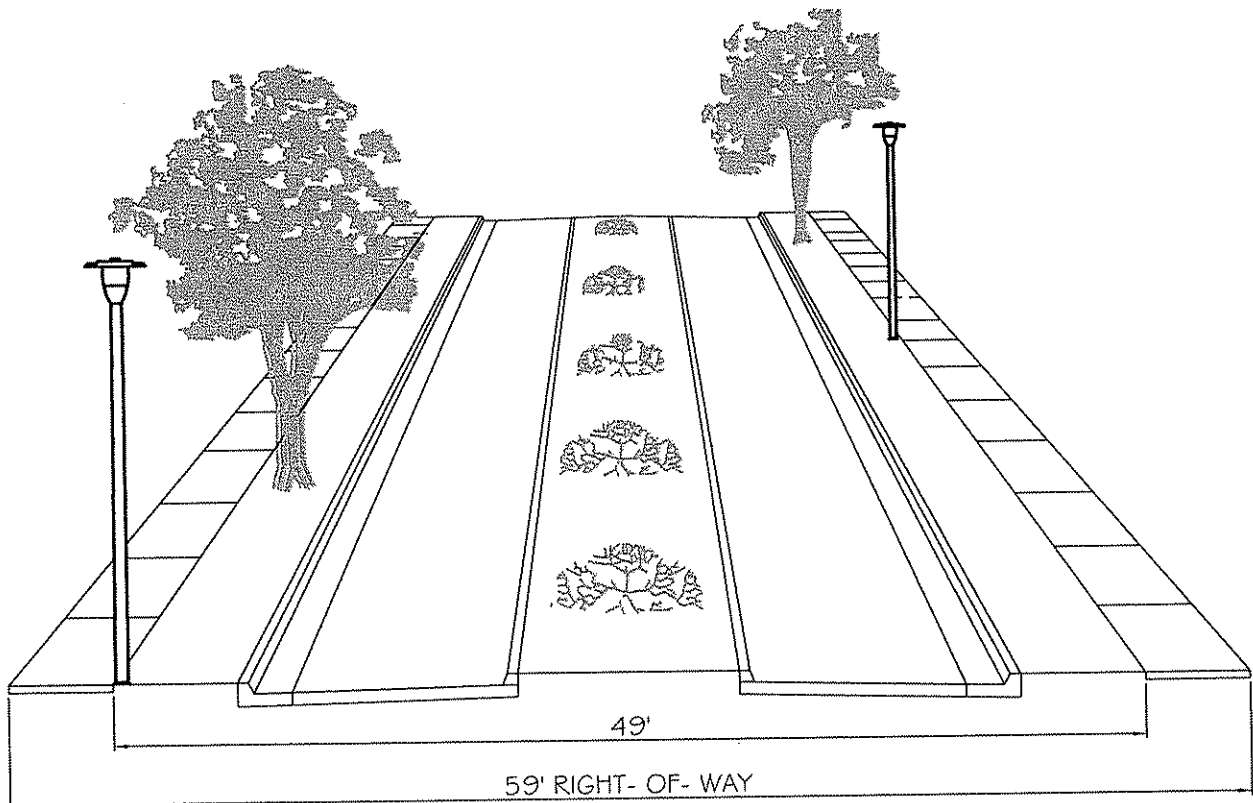
Department of
TRANSPORTATION
City of Sacramento

**COLLECTOR STREET
TYPE B 47' ROW**

APPROVED BY:  SCALE: NONE
DATE: 12/18/66 PLATE: 14-17



RECOMMENDED DESIGN GUIDELINE	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON-PAINTED GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	145' TO 155'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES (MIN.)

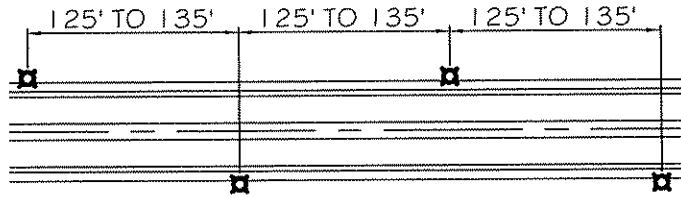


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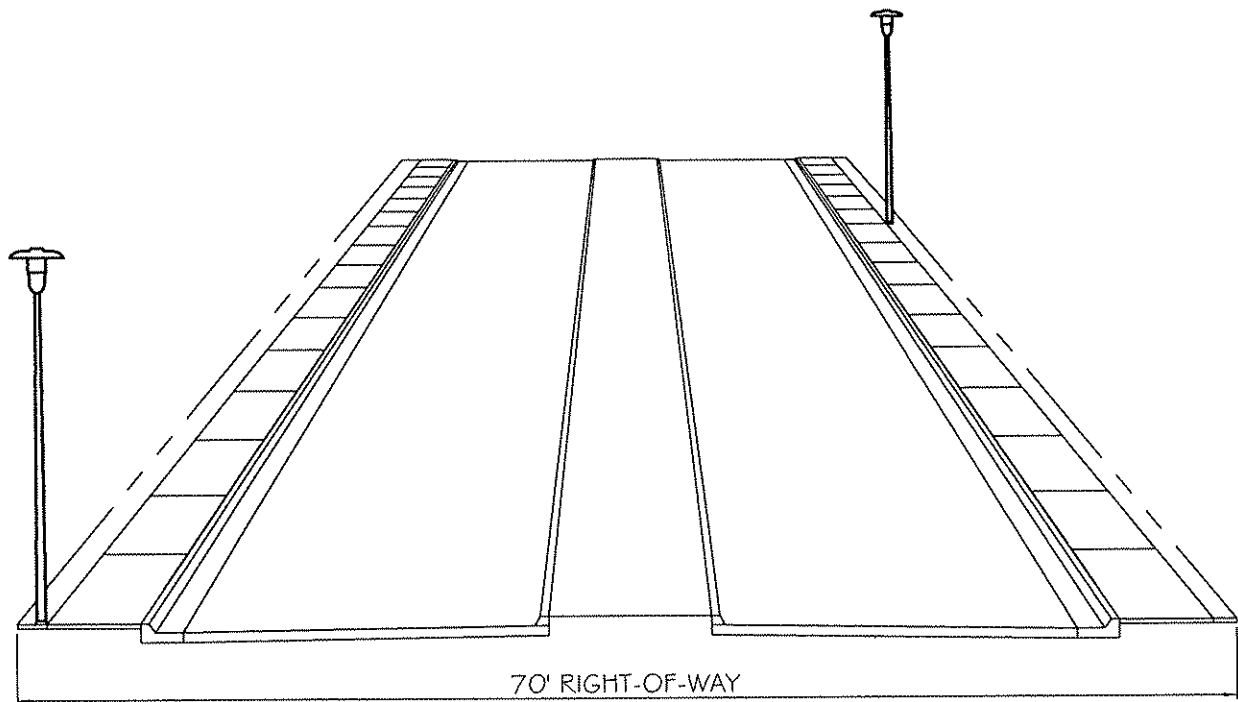
Department of
TRANSPORTATION
City of Sacramento

**COLLECTOR STREET
TYPE B 59' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-18



RECOMMENDED DESIGN GUIDELINE	
TYPE	POST TOP
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	20'
COLOR	NON-PAINTED GALVANIZED
GLOBE	STANDARD PRISMATIC
SPACING	125' TO 135'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES (MIN.)

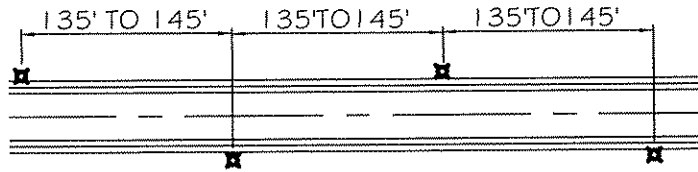


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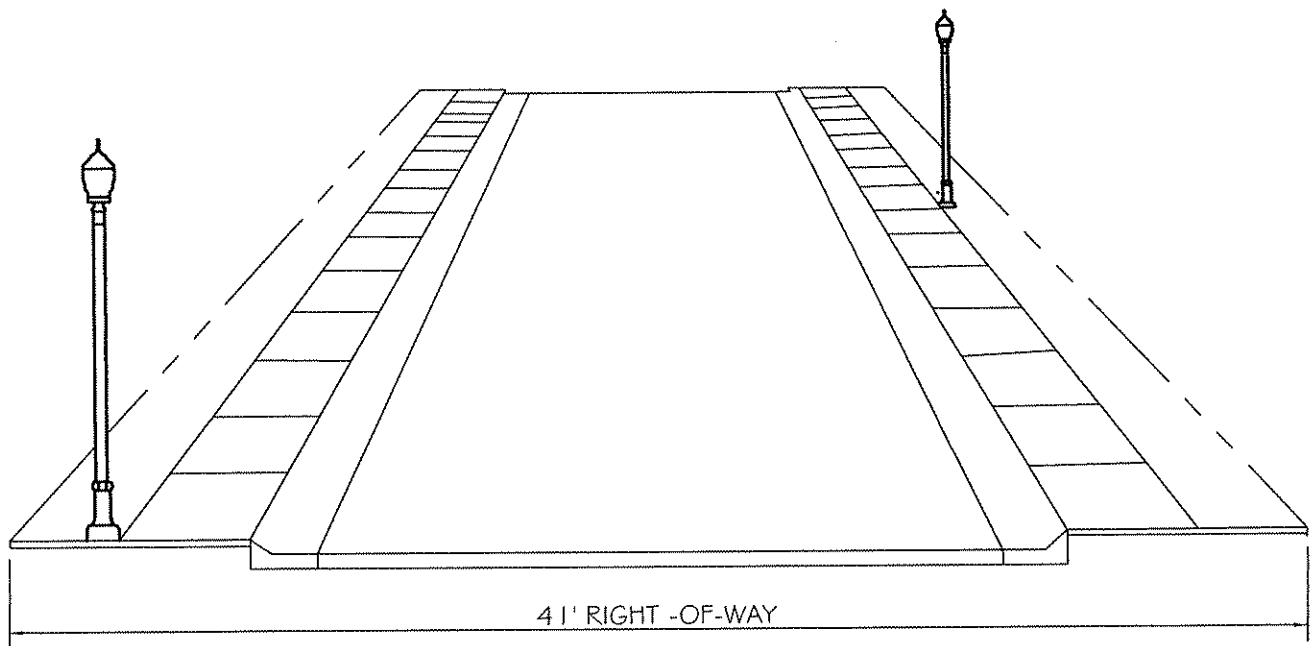
Department of
TRANSPORTATION
City of Sacramento

**MINOR COLLECTOR STREET
TYPE B 70' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-19



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	12'
COLOR	SEMI GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	'ACORN' (PRISMATIC)
SPACING	135' TO 145'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES(MIN)

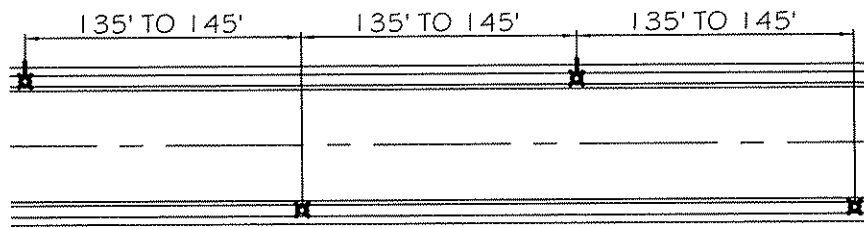


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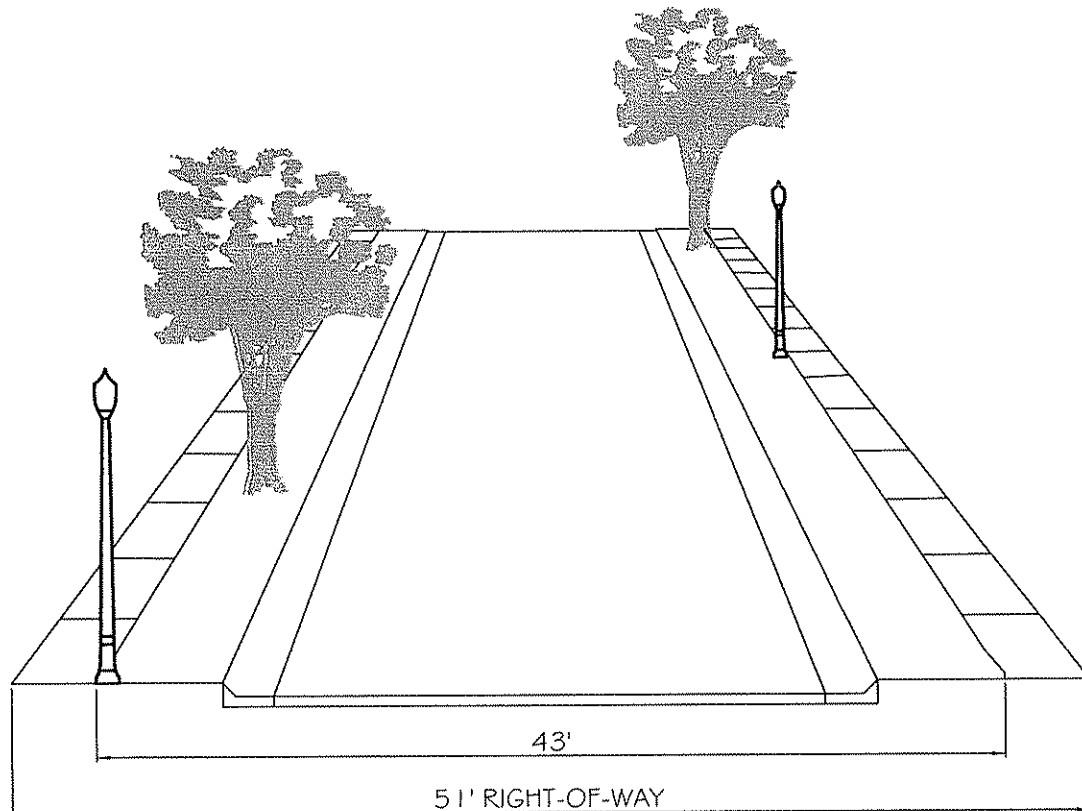
Department of
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City of Sacramento

**LOCAL RESIDENTIAL STREET
ORNAMENTAL 41' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/66 PLATE: 14-20



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	12'
COLOR	SEMI-GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	'ACORN' (PRISMATIC)
SPACING	135' TO 145'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT CANDLES (MIN.)

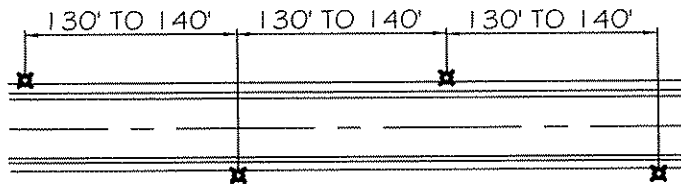


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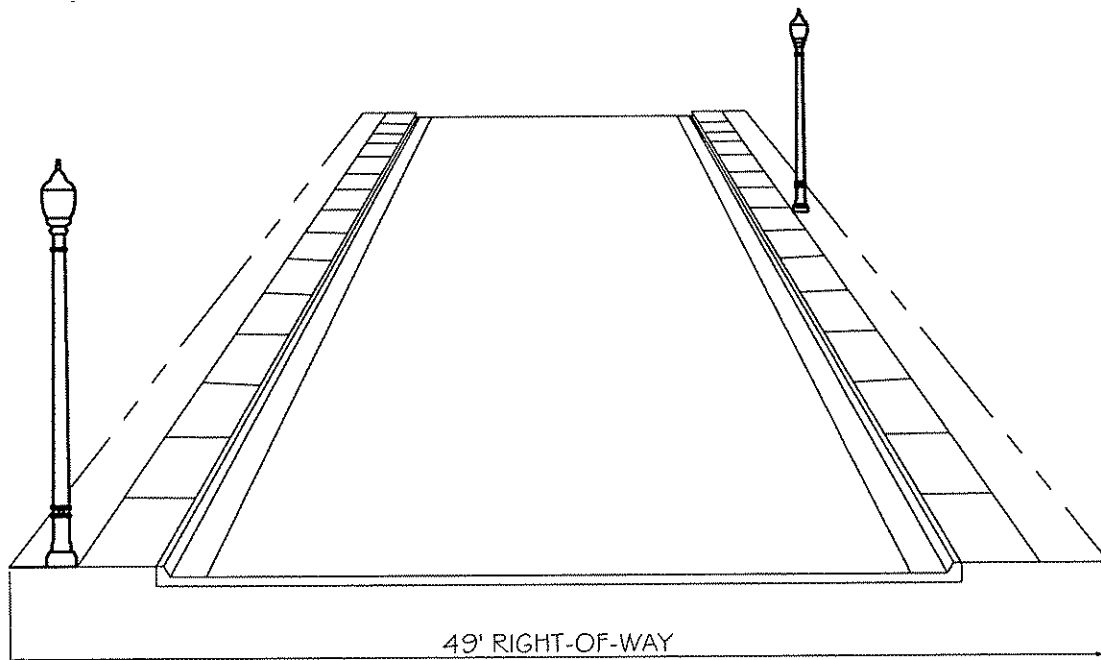
Department of
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City of Sacramento

**LOCAL RESIDENTIAL STREET
ORNAMENTAL 51' ROW**

APPROVED BY: SCALE: NONE
DATE: 12/18/06 PLATE: 14-21



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	12'
COLOR	SEMI-GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	"ACRON" (PRISMATIC)
SPACING	130' TO 140'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT CANDLES (MIN.)

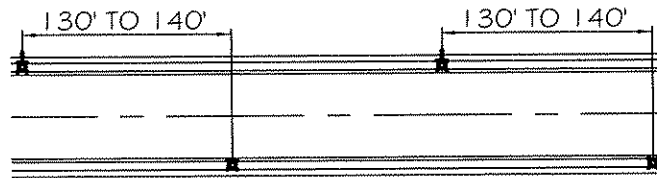


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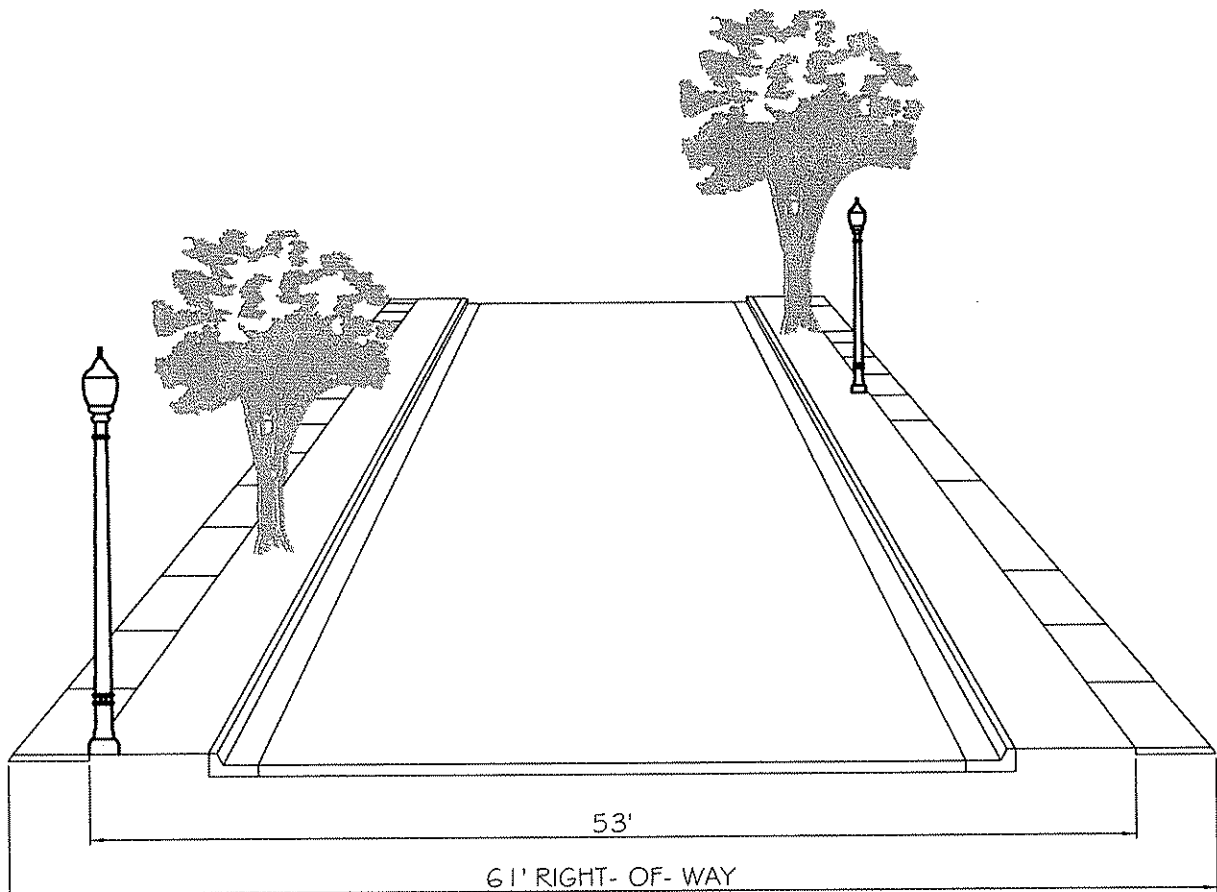
Department of
TRANSPORTATION
City of Sacramento

**LOCAL NON RESIDENTIAL STREET
ORNAMENTAL 49' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-22



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	12'
COLOR	SEMI-GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	"ACORN" (PRISMATIC)
SPACING	130' TO 140'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES (MIN.)

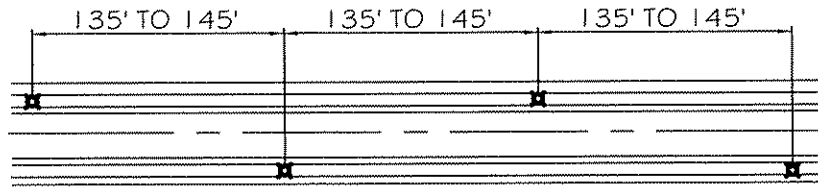


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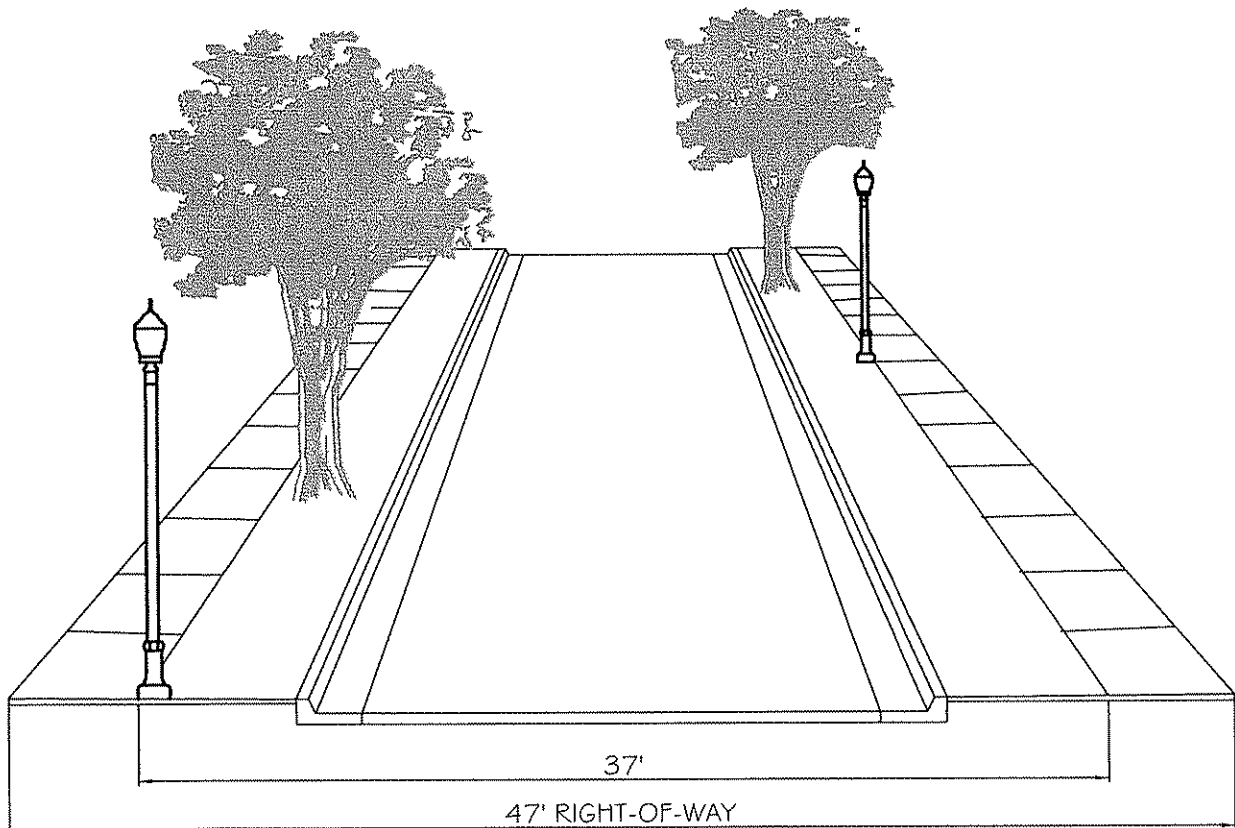
Department of
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City of Sacramento

LOCAL NON - RESIDENTIAL STREET
ORNAMENTAL 61' ROW

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-23



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	12'
COLOR	SEMI-GLOSS BLACK OR ELECT GREEN
GLOBE	'ACORN' (PRISMATIC)
SPACING	135' TO 145'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT-CANDLES (MIN.)

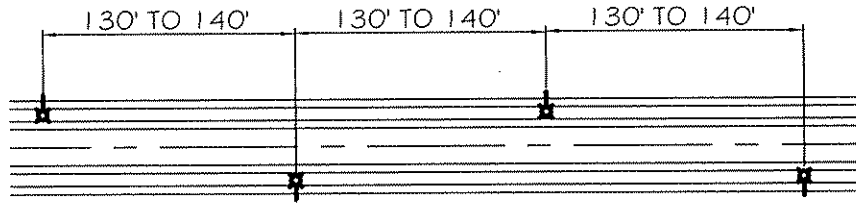


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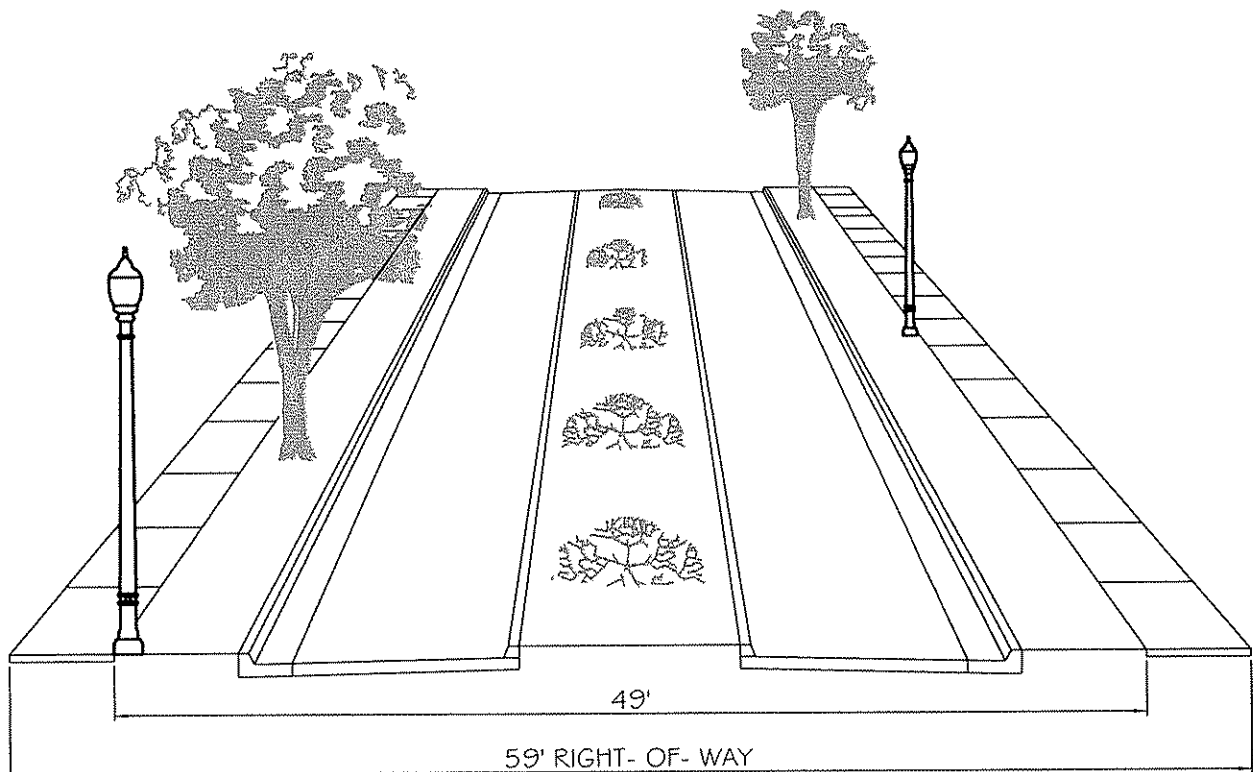
Department of
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City of Sacramento

**COLLECTOR STREET
ORNAMENTAL 47' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-24



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT.
POLE HEIGHT	12'
COLOR	SEMI-GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	'ACORN' (PRISMATIC)
SPACING	130' TO 140'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOT CANDLES (MIN.)

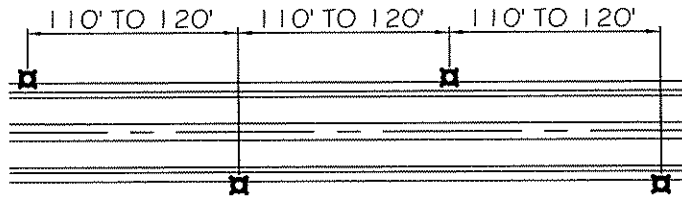


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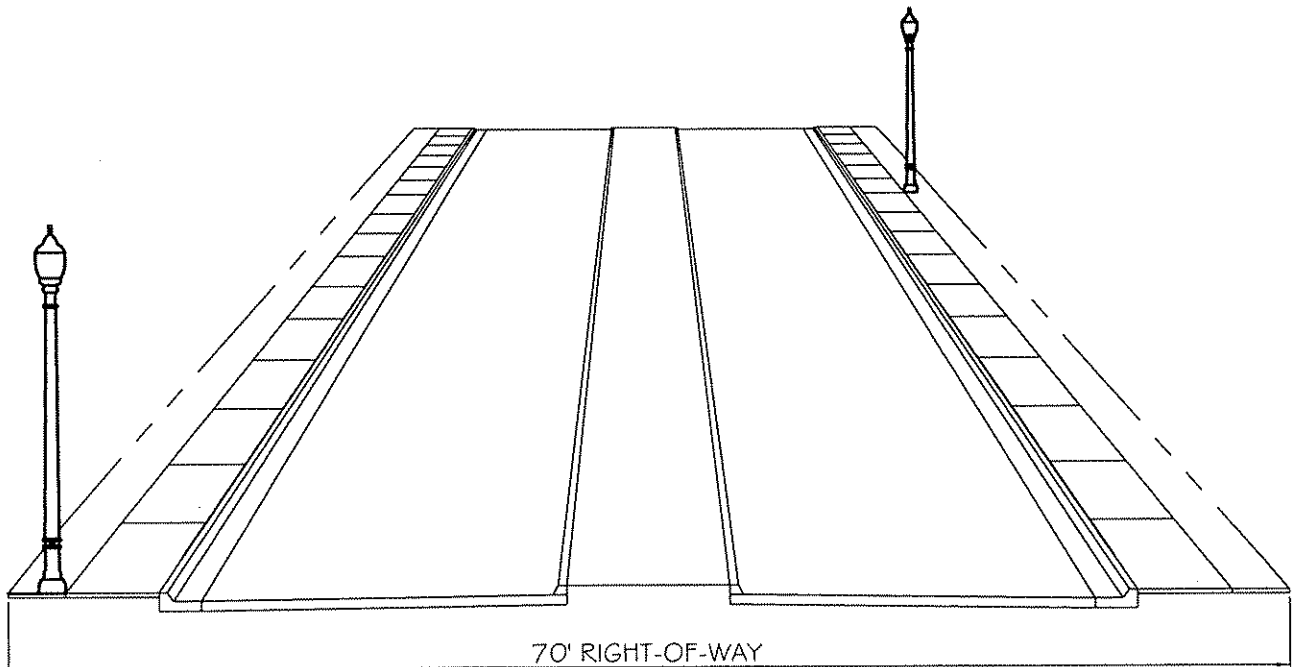
Department of
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City of Sacramento

**COLLECTOR STREET
ORNAMENTAL 59' ROW**

APPROVED BY: SCALE: NONE
DATE: 12/18/06 PLATE: 14-25



RECOMMENDED DESIGN GUIDELINE	
TYPE	ORNAMENTAL DECORATIVE
LAMP	HIGH PRESSURE SODIUM
WATTAGE	100 WATT
POLE HEIGHT	12'
COLOR	SEMI-GLOSS BLACK OR ELECTROLIER GREEN
GLOBE	"ACORN" (PRISMATIC)
SPACING	110' TO 120'
SPACING PATTERN	STAGGERED
DESIGN GUIDELINE	0.1 FOOTCANDLES (MIN.)



REV.	DATE	DESCRIPTION
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Department of
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City of Sacramento

**MINOR COLLECTOR STREET
ORNAMENTAL 70' ROW**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-26

VOLTAGE DROP CALCULATION FOR A THREE WIRE SYSTEM

$$\text{VOLTAGE DROP (IN VOLTS, V)} = I \times R \times D \times N$$

Where; V is the voltage drop along a segment of wire, I is the current through the same length of wire, R is the resistance of the length of wire, D is the distance, and N is the number of poles (fixtures) per segment.

I for any segment of wire is calculated by adding the currents for each luminaire the particular segment of wire feeds (i.e. all the luminaires downstream of the wire).

R for the particular segment of wire is calculated by multiplying the length of the wire (in thousands of feet) in that segment by the resistance per 1000 foot of wire for that particular size and material of wire,

D is the distance from the service to the first luminaire, and between the poles for a particular circuit, except for the neutral,

N is the number of fixtures in the circuit beyond the section.

The total voltage drop to the farthest luminaire is calculated by adding the voltage drops for each segment of wire from the service cabinet to the luminaire for each circuit.

Table 1: AC Resistance for 600V Cables, in Ohms per 1000 Feet

Conductor Material	Conductor Size (AWG)					
	14	12	10	8	6	1
Copper	3.14	1.98	1.24	0.778	0.491	0.154

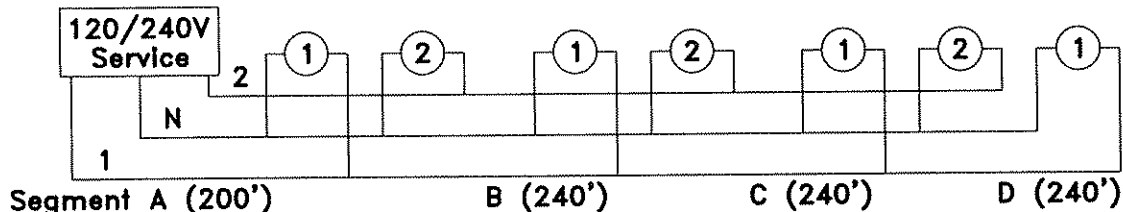
Table 2: Current In Amps for High Pressure Sodium Luminaires

Luminaire Voltage	Lamp Wattage	
	100	200
120	1.05	2.22

Example:

Calculate the voltage drop for the furthest luminaire, with 100W HPS luminaire, using a #6 AWG single conductor wires in a conduit system. This is a 120/240V lighting system. There are 7 lights total on the lighting branch circuit, with the lights wired to alternate phase wires.

Four lights are wired to circuit 1, and three lights are wired to circuit 2. poles are set at 120 feet apart, with the first pole being 200 feet away from the service.



Wire Segment	Distance (ft)	Resistance (Ohms)	No. of Fixtures	Current (Amps)	Drop (Volts)
A	200	0.0982	4	4.2	0.41244
B	240	0.11784	3	3.15	0.371196
C	240	0.11784	2	2.1	0.247464
D	240	0.11784	1	1.05	0.123732
Neutral Wire	920	0.45172	1	1.05	0.474306
Total					1.63 V

$$\text{Maximum permissible} = .05 \times 120 = \underline{6.00 \text{ V}}$$

Notes:

- Maximum voltage drop is 5% from service to the furthest luminaire.
- The voltage drop must be calculated for the phase and neutral, with the neutral conductor carrying the imbalance between circuits 1 and 2. These voltages must be added together to arrive at the total voltage drop.

REV.	DATE	DESCRIPTION
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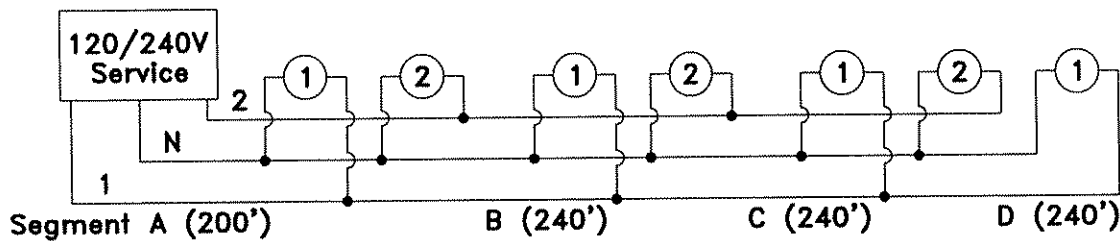
CITY OF SACRAMENTO
DEPARTMENT OF TRANSPORTATION

VOLTAGE DROP
CALCULATION FOR A
THREE WIRE SYSTEM

APPROVED BY: *[Signature]* SCALE: NONE
DATE: DATE 12/18/06 DWG. NO. 14-27

SAMPLE VOLTAGE DROP CALCULATION FOR A THREE WIRE SYSTEM

Calculate the voltage drop to the furthest luminaire, with 100W HPS luminaire, using #6 AWG conductor wires in the conduit system. This is a 120/240V lighting system. There are 7 lights total in the lighting system, with the lights wired to alternate phase wires. The furthest luminaire is on circuit 1, four lights are wired to this circuit. The poles are set at 120 feet apart staggered spacing, with the first pole being 200 feet away from the service.



Wire Segment	Distance (ft)	Resistance (Ohms)	No. of Fixtures	Current (Amps)	Drop (Volts)
A	200	0.0982	4	4.2	0.41244
B	240	0.11784	3	3.15	0.371196
C	240	0.11784	2	2.1	0.247464
D	240	0.11784	1	1.05	0.123732
Neutral Wire	920	0.45172	1	1.05	0.474306
Total					1.63 V

Maximum permissible = $.05 \times 120V =$

6.00 V

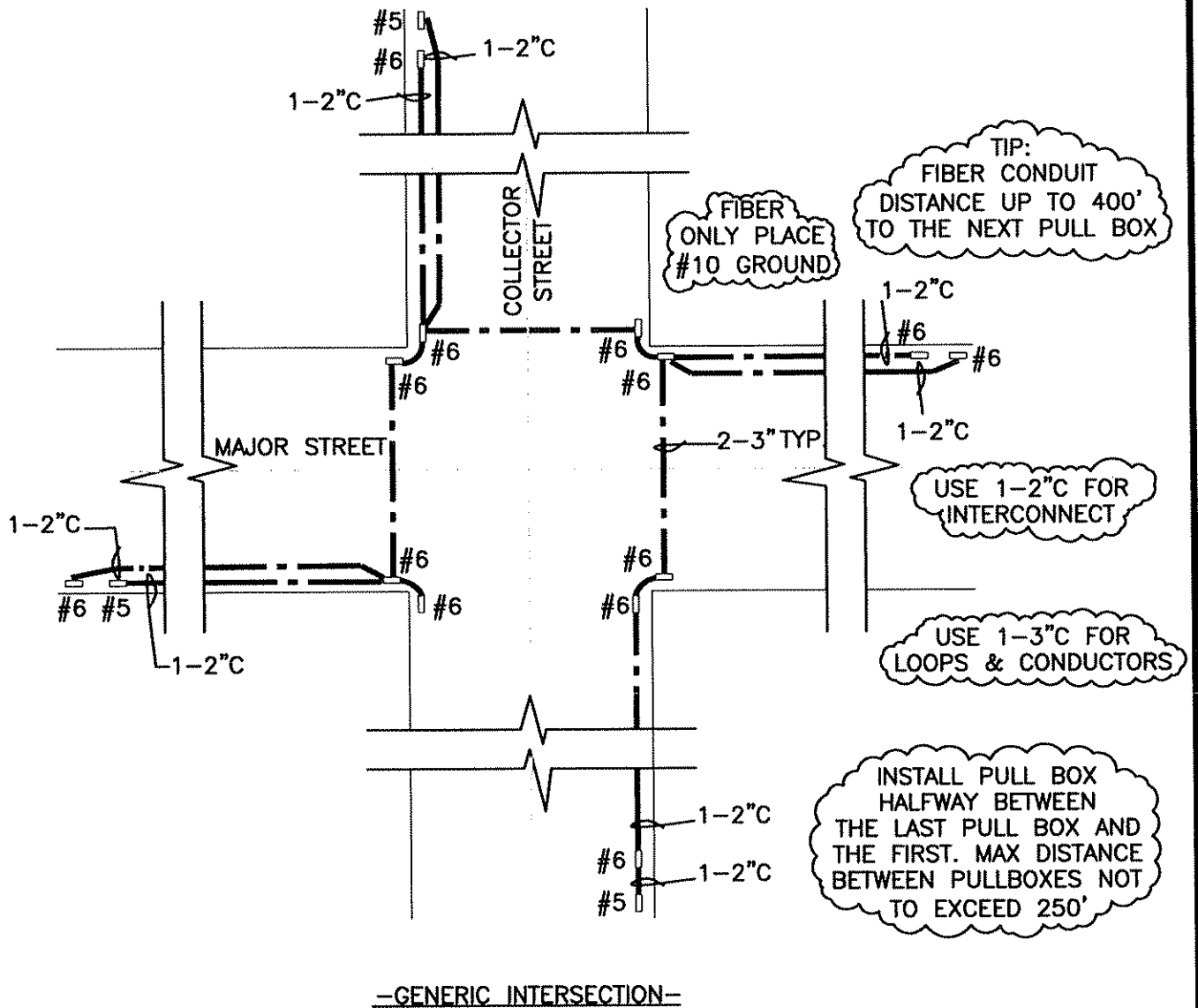
REV.	DATE	DESCRIPTION
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Department of
TRANSPORTATION
City of Sacramento

**VOLTAGE DROP
CALCULATOR FOR A
THREE WIRE SYSTEM**

APPROVED BY: *[Signature]* SCALE: NONE
DATE: *12/18/06* PLATE: 14-27A

PROPOSED CONDUIT LAYOUT FOR TRAFFIC SIGNAL



FOOTNOTE:

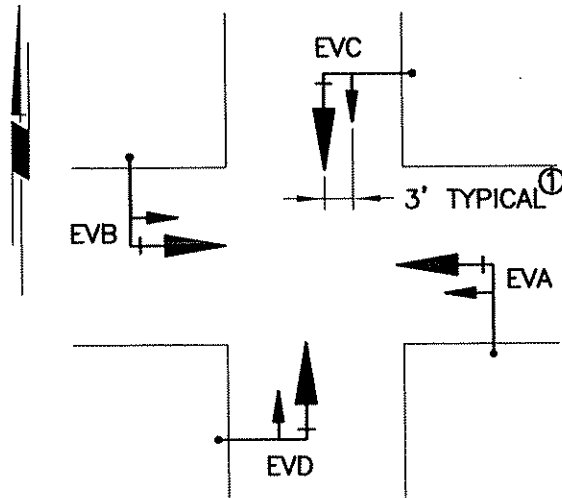
THIS LAYOUT IS TO BE USED AS A GUIDE. ACTUAL CONDUIT ROUTING WILL BE DEPENDANT ON CONTROLLER LOCATION, AND EXISTING FIELD CONDITIONS.

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City of Sacramento

**CONDUIT LAYOUT GUIDE
FOR TRAFFIC SIGNALS**

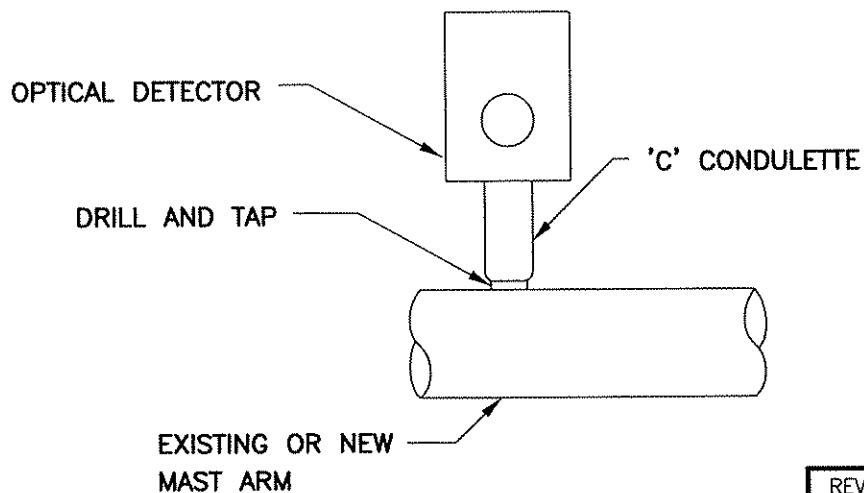
APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-28



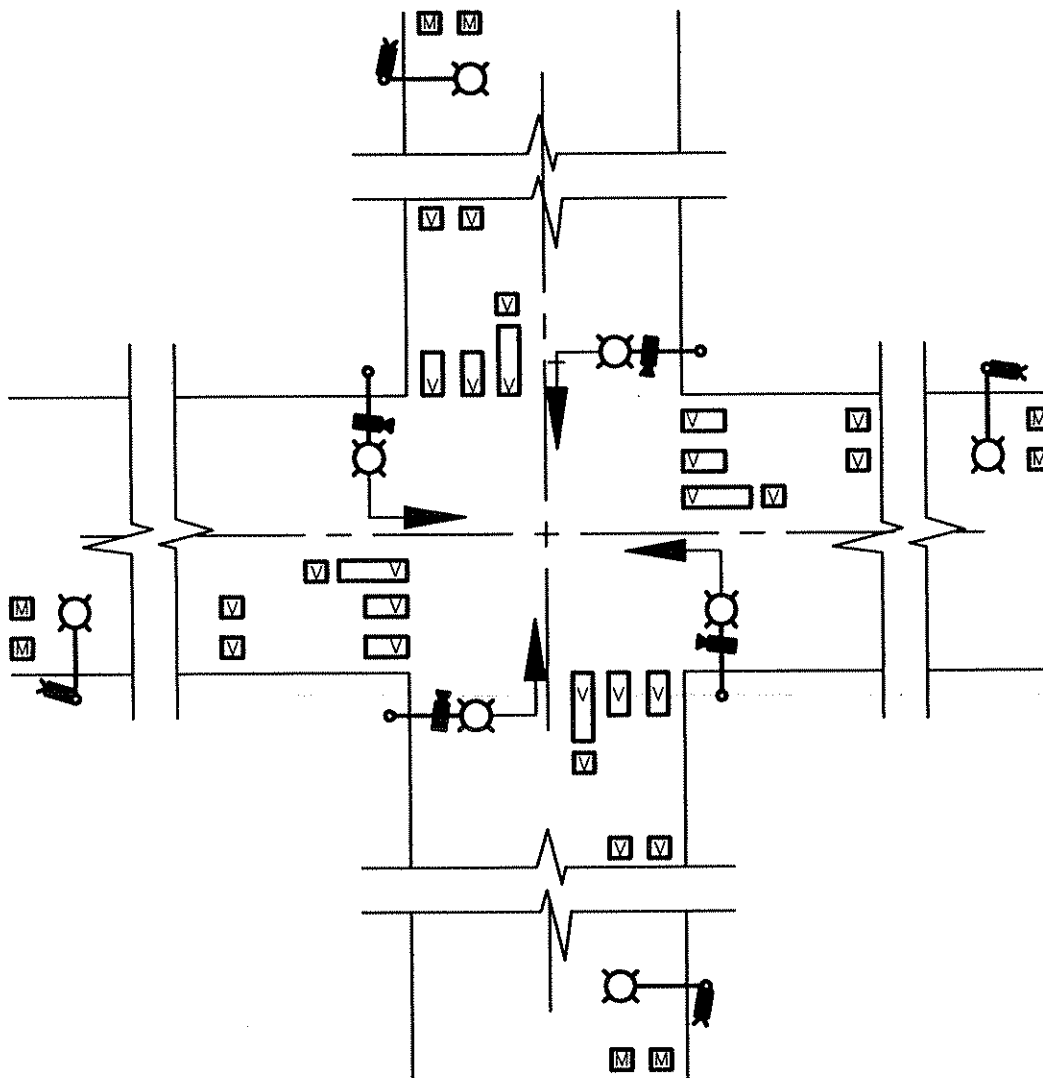
TYPICAL OPTICAL DETECTOR LAYOUT

- ① Actual location of detector head may vary based on the intersection. Refer to 14.18 for placement.

EV	PHASE	DIRECTION
A	1, 6	EASTBOUND
B	2, 5	WESTBOUND
C	3, 8	NORTHBOUND
D	4, 7	SOUTHBOUND



REV.	DATE	DESCRIPTION
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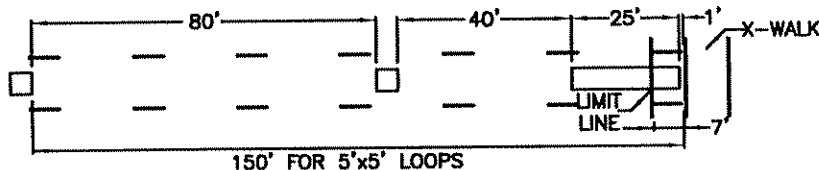
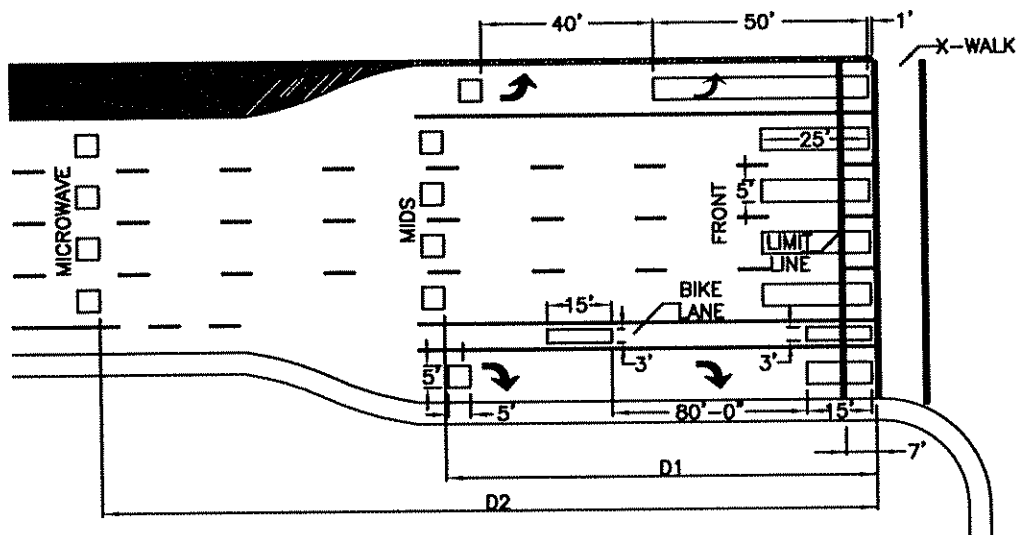
NOTE:

1. SEE TYPICAL DETECTION LOOP LAYOUT FOR LOOP DISTANCES FROM STOP BAR.
2. EXTENSION POLE FOR VIDEO DETECTION CAMERA MAY BE NECESSARY FOR MIDDLE LOOPS.

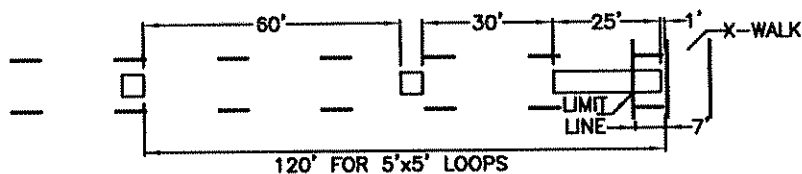
SYMBOLS:

-  VDCS – VIDEO DETECTION CAMERA SYSTEM
-  MVDS – MICROWAVE VEHICLE DETECTION SYSTEM
-  – VIDEO DETECTION ZONE
-  – MICROWAVE DETECTION ZONE

REV.	DATE	DESCRIPTION
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30 MPH



25 MPH

MINOR STREET LOOP DISTANCES

5 SECOND RULE LOOP DISTANCE

MPH	D1	D2
*25	95'	185'
*30	110'	220'
35	130'	260'
40	150'	300'
45	165'	330'
50	185'	370'
55	200'	405'
60	220'	440'

'*' INDICATES DISTANCES TO BE USED IF 25 AND 30 MPH STREETS ARE MAIN STREETS. IF NOT MAIN STREETS, SEE MINOR STREET LOOP DISTANCE DETAIL ON THIS SHEET.

NOTE:

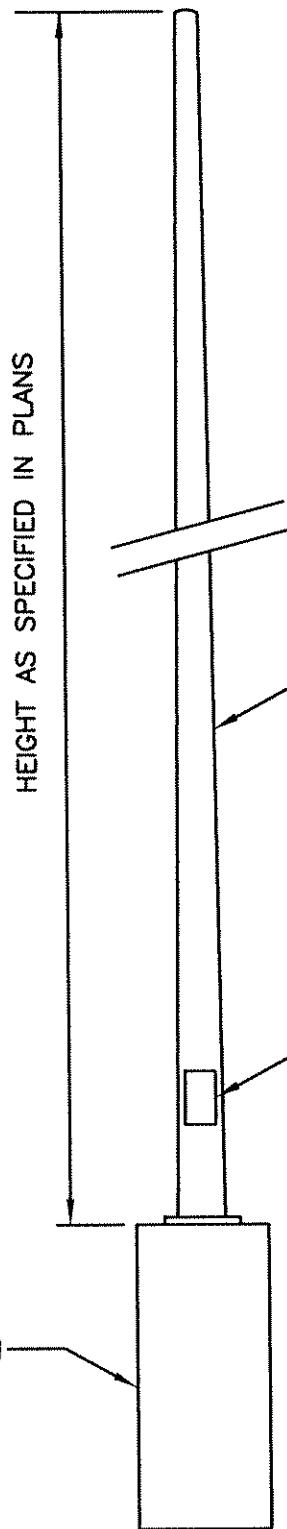
1. NOMINAL VIDEO LOOP SIZE TO BE 5'x5'.
2. DRIVEWAYS WITH LOWER APPROACH SPEEDS MAY USE LESS DISTANCE TO BACK MOST DETECTION.
3. BIKE DETECTORS SHALL BE PLACE NORMALLY 80 FEET APART.

REV.	DATE	DESCRIPTION
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Department of
TRANSPORTATION
City of Sacramento

TYPICAL DETECTION ZONE LAYOUT

APPROVED BY: *[Signature]* SCALE: NONE
DATE: 12/18/06 PLATE: 14-31



HEIGHT AS SPECIFIED IN PLANS

ALL POLE AND BASE PLATE DATA AND OTHER DIMENSIONS ARE PER CALTRANS SPECIFICATIONS FOR TYPE-15 POLE.

HANDHOLE PER CALTRANS SPECIFICATIONS FOR TYPE-15 POLE.

CIDH PILE FOUNDATION PER CALTRANS SPECIFICATIONS FOR TYPE-15 POLE.

REV.	DATE	DESCRIPTION
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Department of
TRANSPORTATION
City of Sacramento

**MODIFIED
TYPE-15 POLE**

APPROVED BY:
DATE: 12/18/06 SCALE: NONE
PLATE: 14-32

Appendix B

Drawing Standards

CITY OF SACRAMENTO

DEPARTMENT OF TRANSPORTATION

STREETLIGHT, TRAFFIC SIGNAL, AND SIGNING AND STRIPING DRAWING STANDARDS



FOR DRAWING STANDARDS NOT ADDRESSED IN
THIS PAMPHLET, SEE CURRENT CALTRANS
STANDARD PLANS.

REV.	DATE	DESCRIPTION
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Department of
TRANSPORTATION
City of Sacramento

**DRAWING
STANDARDS**

DATE:

APPROVED BY: _____

TABLE OF CONTENTS

<u>PAGE</u>	<u>DESCRIPTION</u>
3-5	SYMBOL INDEX - STREETLIGHTS AND TRAFFIC SIGNALS
6	SYMBOL INDEX - CIVIL IMPROVEMENTS
7-8	SCHEDULES, DIAGRAMS AND NOTES - STREETLIGHTS AND TRAFFIC SIGNALS
9	TEXT STYLES - STREETLIGHTS AND TRAFFIC SIGNALS
10	LAYER STANDARDS
11	LINE WIDTHS AND APPEARANCE - STREETLIGHTS AND TRAFFIC SIGNALS
12-14	SYMBOL INDEX - SIGNING AND STRIPING
15	STREET NAME SIGN SPECIFICATIONS
EXAMPLES	SAMPLES AND DIRECTIONS

THE FOLLOWING FILES SHOULD ACCOMPANY THIS PAMPHLET:

ELECTRICALplot-SLTS.CTB	STANDARD DETAIL 1.PDF
PlotConfigACAD2002.PC2	STANDARD DETAIL 2.PDF
PROTO-ELECTRICAL.DWG	SIGNING & STRIPING.PDF
ROMAND.SHX	STRIPING_LEGEND.DWG
ROMANS.SHX	THESTSNS.DWG
ARLRDBD.TTF	STRIPING_EXAMPLE.DWG
HELVBOLD.SHX	
STREET LIGHTING - COVER.PDF	
STREET LIGHTING - E2.PDF	
STREET LIGHTING - E3.PDF	
STREET LIGHTING - RELOCATE.PDF	
TRSFFFIC SIGNAL - COVER.PDF	
TRAFFIC SIGNAL - E2.PDF	
TRAFFIC SIGNAL - E3.PDF	
INTERCONNECT.PDF	

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SYMBOL INDEX

STREETLIGHTS AND TRAFFIC SIGNALS

PROPOSED ELECTRICAL

<u>SYMBOLS</u>	<u>BLOCK NAME</u>	<u>DESCRIPTION</u>
	MA	PROPOSED MAST ARM W/ CIRCUIT NUMBER **
	PB	PROPOSED PULL BOX
	* CIRCLE, DIA=6'	PROPOSED ORNAMENTAL W/ CIRCUIT NUMBER **
	PT	PROPOSED POST TOP W/ CIRCUIT NUMBER **
	FIREAL	RELOCATED FIRE ALARM
	SERV	PROPOSED SERVICE
	CONTRL	PROPOSED TRAFFIC SIGNAL CONTROLLER
	* POLYLINE	PROPOSED CONDUIT, POLYLINE WIDTH = 0.4' AT SCALE OF 1" = 10'
	SMUDPOLE	RELOCATED SMUD WOOD POLE
	SMUDPB	SMUD PULL BOX
	* 5'X5' OR 6'X6'	PROPOSED LOOP
	FLASHER	FLASHER
	EV	EMERGENCY VEHICLE SENSOR

* NO BLOCK NAME
 ** SEE TEXT INSTRUCTIONS P. 9
 THESE SYMBOLS ARE EMBEDDED IN
 PROTO-ELECTRICAL.DWG

REV.	DATE	DESCRIPTION
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SYMBOL INDEX

TRAFFIC SIGNALS

PROPOSED ELECTRICAL

<u>SYMBOLS</u>	<u>BLOCK NAME</u>	<u>DESCRIPTION</u>
	20A	PROPOSED SIGNAL HEAD W/ BACK PLATE
	20AT	PROPOSED LEFT TURN SIGNAL HEAD
	20AT-UTURN	PROPOSED U TURN SIGNAL HEAD
	20AT-RIGHT	PROPOSED RIGHT TURN SIGNAL HEAD
	PEDSIG	PROPOSED PEDESTRIAN SIGNAL HEAD X: A = AUDIBLE C = COUNTDOWN
	* CIRCLE, DIA=0.5'	PROPOSED 1-B POLE OR HAND HOLE

* NO BLOCK NAME
 ** SEE TEXT INSTRUCTIONS P. 9
 THESE SYMBOLS ARE EMBEDDED IN
 PROTO-ELECTRICAL.DWG

REV.	DATE	DESCRIPTION
		
		
		

SYMBOL INDEX

STREETLIGHTS AND TRAFFIC SIGNALS

EXISTING ELECTRICAL

<u>SYMBOLS</u>	<u>BLOCK NAME</u>	<u>DESCRIPTION</u>
	E-PT	EXISTING POST TOP, CIRCUIT NUMBER **
	E-FLASHER	EXISTING FLASHER
	E-MA	EXISTING MAST ARM, CIRCUIT NUMBER **
	E-PB	EXISTING PULL BOX
	* CIRCLE DIA=6'	EXISTING ORNAMENTAL, CIRCUIT NUMBER **
	E-FIREAL	EXISTING FIRE ALARM
	E-SERV	EXISTING SERVICE
	E-CONTRL	EXISTING TRAFFIC SIGNAL CONTROLLER
	SMUDPOLE	EXISTING SMUD WOOD POLE
	SMUDPB	EXISTING SMUD PULL BOX
	E-PEDSIG	EXISTING PEDESTRIAN SIGNAL HEAD
	E-EV	EXISTING EMERGENCY VEHICLE SENSOR
	E-20A	EXISTING SIGNAL HEAD W/ BACK PLATE
	E-20AT	EXISTING LEFT TURN SIGNAL HEAD
	* CIRCLE DIA=0.5'	EXISTING 1-B POLE OR HAND HOLE
	* 5'X5' OR 6'X6'	EXISTING LOOP
	* POLYLINE	EXISTING CONDUIT, POLYLINE WIDTH = 0

* NO BLOCK NAME
 ** SEE TEXT INSTRUCTIONS P. 9
 THESE SYMBOLS ARE EMBEDDED IN
 PROTO-ELECTRICAL.DWG

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City of Sacramento

**SYMBOL
INDEX**

DATE:

APPROVED BY: _____

SYMBOL INDEX

CIVIL IMPROVEMENTS

(NOTE: BOTH PROPOSED AND EXISTING CIVIL SYMBOLS WILL APPEAR AS EXISTING ON ELECTRICAL SHEETS)

SYMBOLS

BLOCK NAME

DESCRIPTION



TREE

EXISTING TREE

EXRV

EXISTING AIR RELEASE VALVE



EXDROP

EXISTING DROP INLET



EXFH

EXISTING FIRE HYDRANT



EXGV

EXISTING GAS VALVE



GWIRE

EXISTING GUY WIRE



M-BOX

MAILBOX

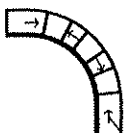


*CIRCLE,
DIA=2'

EXISTING MAN HOLE



PROPOSED AND EXISTING BACK
OF WALK, FACE OF CURB,
PLANTERS AND WALKWAYS
AND OTHER CONCRETE FEATURES



SLOPE
INDICATORS

CURBRAMP

CURB RAMP WITH SLOPE INDICATORS

*NO BLOCK NAME

REV.	DATE	DESCRIPTION
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Department of
TRANSPORTATION
City of Sacramento

**SYMBOL INDEX (CIVIL
IMPROVEMENTS)**

DATE:

APPROVED BY: _____

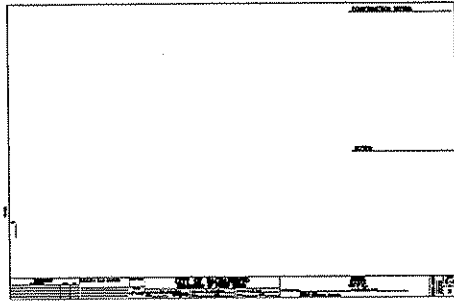
SCHEDULES, DIAGRAMS, AND NOTES

STREETLIGHTS AND TRAFFIC SIGNALS

SYMBOLS

BLOCK NAME

DESCRIPTION



THE TITLE

PLAN SHEET BORDER FOR "D"
SIZE, 22" X 34"

NUMBER SHEETS AS E-1 OF X
(WHERE X=TOTAL ELECTRICAL
SHEETS), E-2 OF X, ETC.



SQ

SQUARE FOR CONSTRUCTION
NOTES. (USE DTEXT AND
JUSTIFY MIDDLE CENTER THE
NOTE NUMBER)

EXAMPLE:



CIRCUIT NUMBERS SHALL BE
4/5 THE SIZE OF REGULAR
TEXT. CENTER JUSTIFY CIRCUIT
NUMBERS.

AUXILIARY DETECTOR			
AUXILIARY PLAN #	DETECTOR	PRINCE	DIRECTION
1	8151*	01	7 E-10
2	8201*	02	7 E-10
3	8301*	03	7 E-10
4	8401*	04	7 E-10
5	8501*	05	7 E-10
6	8601*	06	7 E-10
7	8701*	07	7 E-10
8	8801*	08	7 E-10

AUXDET

AUXILIARY DETECTOR
SCHEDULE

POLE SCHEDULE									
LOCATION	STANDARD	TYPE	SIZE	TYPE	SIZE	TYPE	SIZE	TYPE	SIZE
1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
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94									
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98									
99									
100									

SCHPOLE

POLE SCHEDULE

** TEXT INSTRUCTIONS: USE DTEXT AND JUSTIFY
CENTER THE NOTE.

THESE SYMBOLS ARE EMBEDDED IN
PROTO-ELECTRICAL.DWG

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City of Sacramento

**SCHEDULES, DIAGRAMS,
AND NOTES**

DATE:

APPROVED BY: _____

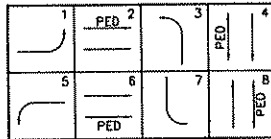
SCHEDULES, DIAGRAMS, AND NOTES

STREETLIGHTS AND TRAFFIC SIGNALS

SYMBOLS

BLOCK NAME

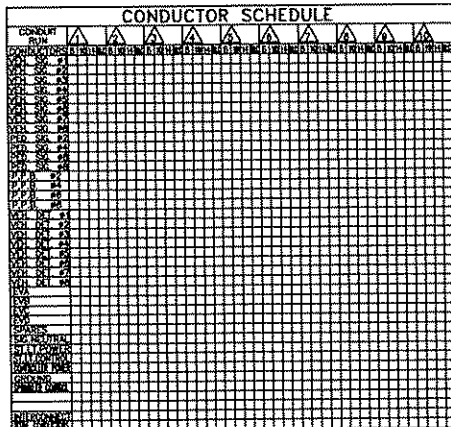
DESCRIPTION



PHASE DIAGRAM

PHASDIAG

PHASE DIAGRAM



SCHCOND

CONDUCTOR SCHEDULE



TRI

CONDUCTOR SCHEDULE NOTE



N-ARROW

NORTH ARROW

LUMINAIRE SCHEDULE:

NEW SERVICE No. 0000 IS LOCATED ON THE NORTHWEST CORNER OF 0000000 STREET AND 0000000 STREET

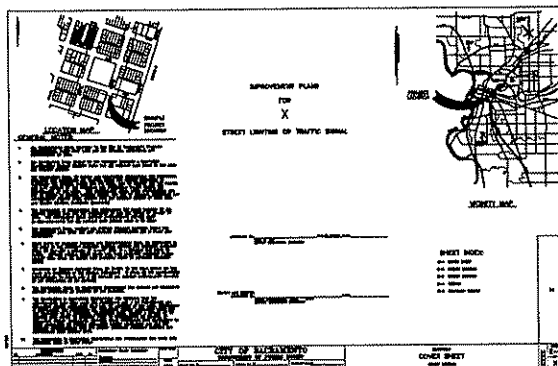
CIRCUIT NUMBER	EXIST. 200W HPS MAST ARM	NEW 200W HPS MAST ARM
1	0	0
2	0	0
3	0	0
4	0	0

TOTAL NEW: 0 0

NEW SERVICE IS 120/208 VOLT, 1P, 3 WIRE. CONNECT NEW LUMINAIRES TO 120 VOLT CIRCUITS.

SCHLUM

LUMINAIRE SCHEDULE



COV-SHEET

PROJECT COVER SHEET

THESE SYMBOLS ARE EMBEDDED IN
PROTO-ELECTRICAL.DWG

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TRANSPORTATION
City of Sacramento

**SCHEDULES, DIAGRAMS,
AND NOTES**

DATE:

APPROVED BY: _____

TEXT STYLES

STREETLIGHTS AND TRAFFIC SIGNALS

<u>TEXT STYLE</u>	<u>EXAMPLE</u>	<u>DESCRIPTION</u>
RS	ABC123	CONSTRUCTION NOTES, GENERAL NOTES, EXISTING LUMINAIRES (FADED TEXT). HEIGHT EQUAL TO 0.125" ON PAPER. EXAMPLE: SCALE 1"=20', MODEL SPACE TEXT WOULD BE 2.50 CREATED FROM TEXT SHX FILE ROMAN S.
RS	ABC123	CIRCUIT NUMBER. JUSTIFY AND CENTER CIRCUIT NUMBER. CIRCUIT NUMBER SHALL BE EQUAL TO 0.10" ON PAPER. EXAMPLE: SCALE 1"=10', MODEL SPACE TEXT WOULD BE 1.00.
RD	ABC123	DETAIL HEADER, CONSTRUCTION NOTES HEADER, GENERAL NOTES HEADER, TITLE AND SHEET NUMBERS. 0.25" ON PAPER. CREATED FROM TEXT SHX FILE ROMAN D.
BOLD	BOLD	PLAN TITLE ON COVER SHEET. 0.3" ON PAPER. CREATED FROM TRUE TYPE FONT FILE ARLRDBD.TTF OR TEXT FILE HELVBOLD.SHX

MOST OF THESE TEXT STYLES ARE EMBEDDED IN PROTO-ELECTRICAL.DWG, SOME WILL NEED TO COPIED TO AUTODESK'S DIRECTORY ON YOUR HARD DRIVE

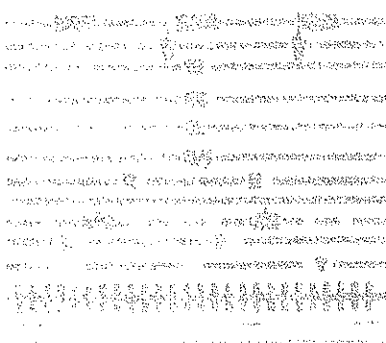
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LAYER STANDARDS

STREETLIGHTS, TRAFFIC SIGNALS, SIGNING AND STRIPING

(PEN #) COLOR	LAYER NAME (PROTO-ELECTRICAL.DWG)	USE
(1) RED	RW or ROW	RIGHT OF WAY
(2) YELLOW	ICOND	TITLE BLOCK, PROP. EQUIP, INTERCONNECT CONDUIT
(3) GREEN	PEQUIP and PCOND	PROPOSED EQUIPMENT and PROPOSED CONDUIT
(4) CYAN	EEQUIP and CL	EXISTING EQUIPMENT and CENTERLINE
(5) BLUE		TITLE BLOCK and MISC. THICK LINES
(6) MAGENTA	ECOND	EXISTING CONDUIT
(7) WHITE	TEXT	TEXT (HEIGHT OF 1/8") and CIRCUIT No. (1/10" TALL)
(8) DARK GRAY	XCGS	CONCRETE (CGS)

PENS 9 - 249



XTELE, XWTR,
XSS, XSD, XTREE,
XGAS, XSMUD,
XCTV, XFIBER,
XTRACKS, XFENCE,
ETC.

UNDERGROUND UTILITIES,
OVERHEAD WIRES, ETC.

WIDTH FOR STRIPES 1=1

THESE LAYERS ARE EMBEDDED IN
PROTO-ELECTRICAL.DWG

REV.	DATE	DESCRIPTION
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Department of
TRANSPORTATION
City of Sacramento

**LAYER
STANDARDS**

DATE:

APPROVED BY: _____

LINE WIDTHS AND APPEARANCE

STREETLIGHTS AND TRAFFIC SIGNALS

THE FOLLOWING LINE WIDTHS ARE FOR ALL CITY OF SACRAMENTO DEPARTMENT OF TRANSPORTATION STREET LIGHT AND TRAFFIC SIGNAL PROJECTS PLOTTED ON D SIZE SHEETS, AND ARE EQUIVALENT TO AUTOCAD 2000 PLOTTER SETTINGS. THESE LINE WIDTHS ARE EMBEDDED IN ELECTRICAL-SLTS.CTB (PLOT FILE). PLEASE CONVERT AS REQUIRED FOR SOFTWARE OTHER THAN AUTODESK.

(PEN #)	COLOR	LINETYPE	PEN WIDTH (mm) /PLOT COLOR	USE
(1)	RED	PHANTOM	0.068/7	RIGHT OF WAY
(2)	YELLOW	SOLID or CENTER	0.43/7	TITLE BLOCK or PROPOSED INTERCONNECT CONDUIT
(3)	GREEN	SOLID and CENTER	0.43/7	PROPOSED EQUIPMENT & PROPOSED CONDUIT
(4)	CYAN	TINYDASH and CENTERLINE	0.20/7	EXISTING EQUIPMENT & CENTERLINE
(5)	BLUE	CONTINUOUS	0.63/7	TITLE BLOCK and MISC. THICK LINES
(6)	MAGENTA	CENTER2	0.43/7	EXISTING CONDUIT
(7)	WHITE	CONTINUOUS	0.38/7	TEXT
(8)	DARK GRAY	CONTINUOUS	0.33/8	CONCRETE (CGS)
PENS 9 - 12		UTILITIES (LINETYPE VARIES)	0.25/251	UNDERGROUND UTILITIES, OVERHEAD WIRES

REV.	DATE	DESCRIPTION
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SYMBOLS

SIGNING AND STRIPING

<u>SYMBOLS</u>	<u>DESCRIPTION</u>
✱	INSTALL ROADSIDE SIGN
◆	REMOVE ROADSIDE SIGN
●	EXISTING ROADSIDE SIGN TO REMAIN
▲	RELOCATE ROADSIDE SIGN
✕	REPLACE ROADSIDE SIGN
⌋	EXISTING ROADSIDE SIGN LOCATION (ONE POST)
⌋⌋	EXISTING ROADSIDE SIGN LOCATION (TWO POST)
⌋	NEW ROADSIDE SIGN LOCATION
GSP	GALVANIZED STEEL POST
SSBM	STRAP AND SADDLE BRACKET METHOD
MAS	MAST ARM MOUNTED SIGN
B/B	BACK TO BACK (DOUBLE SIDED SIGN, SIDE MOUNT)
SNS	STREET NAME SIGN
BUS	BUS STOP SIGN
///	REMOVE EXISTING STRIPING OR MARKING

THESE SYMBOLS ARE EMBEDDED IN
STRIPING_LEGEND.DWG

REV.	DATE	DESCRIPTION
△		
△		
△		

SYMBOLS

SIGNING AND STRIPING

<u>SYMBOLS</u>	<u>BLOCK NAME</u>	<u>DESCRIPTION</u>
	AAHEAD	PAINTED "AHEAD" TRAFFIC MARKER
	AARRO-10	PAINTED DIRECTION INDICATOR MARKING
	AARRO-7L	PAINTED DIRECTION INDICATOR MARKING
	ABIKELAN	BIKE LANE MARKING
	AL-TURN	LEFT TURN ARROW
	AONLY	"ONLY" MARKING
	ARR-CR	RAILROAD CROSSING MARKING
	AR-TURN	RIGHT TURN TRAFFIC MARKING
	ASIGNAL	"SIGNAL" TRAFFIC MARKING
	ASTOP	"STOP" TRAFFIC SIGNAL MARKING
	AYIELD	"YIELD" TRAFFIC SIGNAL MARKING

THESE SYMBOLS ARE EMBEDDED IN
STRIPING_LEGEND.DWG

REV.	DATE	DESCRIPTION
		
		
		

Department of
TRANSPORTATION
City of Sacramento

SYMBOLS
SIGNING AND STRIPING

DATE:

APPROVED BY: _____

SYMBOLS

SIGNING AND STRIPING

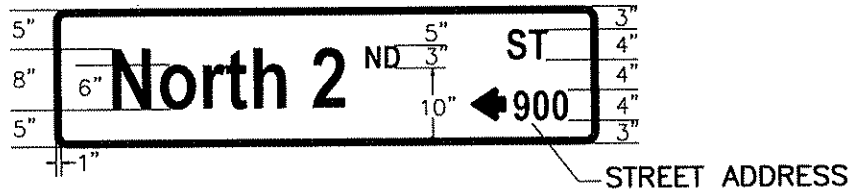
<u>SYMBOLS</u>	<u>DESCRIPTION</u>
	PAVEMENT MARKING DETAIL NO.
	CHANNELIZERS/DELINEATORS/MARKERS
	CHANGE IN PAVEMENT DELINEATION DETAIL
	BEG. AND END OF PAVEMENT DELINEATION TRANSITION
	TYPE IV PAVEMENT ARROW
	TYPE VI PAVEMENT ARROW
	TYPE VII PAVEMENT ARROW
	TYPE 1 (10) PAVEMENT ARROW
	NEW SIGNAL POLE (OPEN – EXISTING)
	NEW MAST ARM POLE (OPEN – EXISTING)
	NEW STREET LIGHT
	EXISTING STREET LIGHT
	BIKE LANE MARKINGS (SEE DETAIL)
	CALTRANS DETAIL NUMBER

THESE SYMBOLS ARE EMBEDDED IN
STRIPING_LEGEND.DWG

REV.	DATE	DESCRIPTION
		
		
		

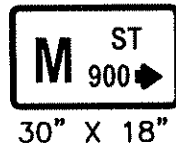
STREET NAME SIGN SPECIFICATIONS

STANDARD DIMENSIONS

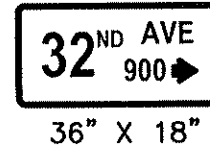


NOTE:
CONTRACTOR SHALL VERIFY EXACT STREET ADDRESS
FOR PLACEMENT ON STREET NAME SIGNS.

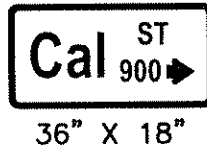
LETTERED STREETS



NUMBERED STREETS



TWO TO THREE LETTERS IN STREET NAME



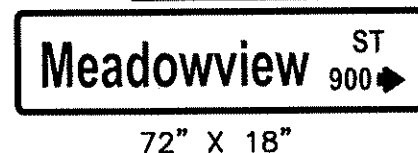
FOUR TO SIX LETTERS IN STREET NAME



AT LEAST ONE STREET IS MORE THAN SIX LETTERS LONG



MORE THAN SIX LETTERS IN STREET NAME



THESE DRAWINGS ARE EMBEDDED IN
theSTSIGNS.DWG

REV.	DATE	DESCRIPTION
△		
△		
△		

Department of
TRANSPORTATION
City of Sacramento

**STREET NAME SIGN
SPECIFICATIONS**

DATE:

APPROVED BY: _____

STANDARD DRAWING EXAMPLES

STANDARD DRAWING SAMPLES

<u>PAGE</u>	<u>DESCRIPTION</u>
EXAMPLE-1	STANDARD DRAWING EXAMPLES TABLE OF CONTENTS, DIRECTIONS
EXAMPLE-2	STREET LIGHTING - COVER
EXAMPLE-3	STREET LIGHTING - E2
EXAMPLE-4	STREET LIGHTING - E3 (ADDITIONAL PLAN SHEET EXAMPLE)
EXAMPLE-5	STREET LIGHTING - RELOCATE
EXAMPLE-6	TRAFFIC SIGNAL - COVER
EXAMPLE-7	TRAFFIC SIGNAL - E2
EXAMPLE-8	TRAFFIC SIGNAL - E3
EXAMPLE-9	INTERCONNECT
EXAMPLE-10	STANDARD DETAIL 1
EXAMPLE-11	STANDARD DETAIL 2
EXAMPLE-12	STANDARD DETAIL FOR STREETLIGHTS
EXAMPLE-13	STANDARD DETAIL FOR ORNAMENTAL STREETLIGHTS
EXAMPLE-14	SIGNING & STRIPING

STREET LIGHTING

SCALE TO BE 1"=40' FOR CITY CAPITAL IMPROVEMENT PROJECTS AND 1"=100' FOR DEVELOPER'S SUBDIVISIONS, CONSULT CITY OF SACRAMENTO DESIGN PROCEDURES MANUAL OR CONTACT THE CITY OF SACRAMENTO STAFF AT (916) 808-8300 FOR STREETLIGHT SPACING AND DESIGN CRITERIA. EXISTING STREETLIGHTS AND SERVICE CANS SHALL BE LABELED WITH THE CITY IDENTIFYING NUMBER ON PLAN SHEETS.

STREETLIGHT RELOCATIONS

SCALE TO BE 1"=20' UNLESS PROJECT WILL NOT FIT ON ONE SHEET, THEN 1"=40' OR LARGER OKAY. OBTAIN THE STREETLIGHT NUMBER FROM CITY STAFF AND PLACE ON SHEET. STREET AND NEAREST CROSS STREET SHALL BE SHOWN.

TRAFFIC SIGNALS

TRAFFIC SIGNALS SHALL HAVE A COVER SHEET, A 1"=20' SCALE DRAWING, AND A 1"=40' SCALE DRAWING. INTERCONNECT SHALL BE SHOWN AT A MINIMUM OF 1"=100'.

SIGNING AND STRIPING

SIGNING AND STRIPING SHALL BE A MINIMUM SCALE OF 1"=40'. FOR QUESTIONS REGARDING SIGNING AND STRIPING CALL CITY STAFF AT (916) 808-5307.

NOTE:

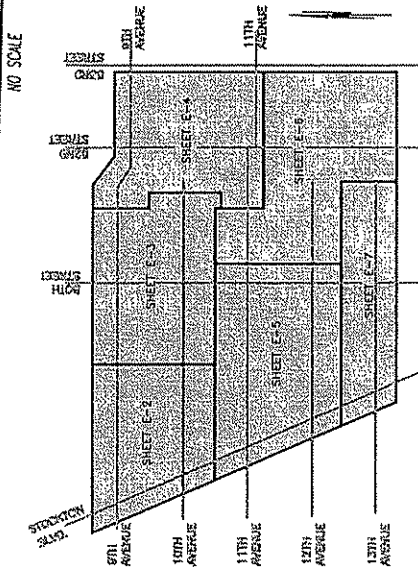
SCALES OTHER THAN THOSE SPECIFIED HEREIN SHALL BE REVIEWED AND APPROVED BY THE ELECTRICAL SECTION PRIOR TO THE FIRST SUBMITTAL.

REV.	DATE	DESCRIPTION
△		
△		
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STREET LIGHTING EXAMPLES

EXAMPLE-2 THROUGH EXAMPLE-5

LOCATION MAP / SHEET INDEX:



GENERAL NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF SACRAMENTO STANDARD SPECIFICATIONS, DATED JUNE 1989 AND ALL UPDATES, ADDENDUMS AND MEMORANDUMS TO THEM.
2. THE CONTRACTOR SHALL SUBMIT TO THE RESIDENT ENGINEER A COMPLETED CONSTRUCTION STAKING REQUEST FORM TWO (2) WORKING DAYS PRIOR TO THE NEED FOR PROJECT STAKING.
3. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL TRAFFIC CONTROL DEVICES, SIGNS, AND THE GENERAL PUBLIC AND THE WORK, AND TO PROVIDE FOR THE PROPER AND SAFE FLOW OF THE VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE USE OF FLAG MEN, BARRICADES AND CONSTRUCTION SIGNING SHALL COMPLY WITH THE CURRENT EDITION OF WORK AREA AND TRAFFIC CONTROL HANDBOOK (W.A.T.C.H.).
4. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES AND FOR THE PROTECTION OF AND THE REPAIR OF DAMAGE TO THEM. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (1-800-642-2444) TWO (2) WORKING DAYS BEFORE WORK IS TO BEGIN.
5. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAINAGE FACILITIES WITHIN THE CONSTRUCTION AREA UNTIL THE NEW DRAINAGE IMPROVEMENTS ARE IN PLACE AND FUNCTIONING.
6. EXISTING UTILITIES OF PAVEMENT REMOVAL AND RECONSTRUCTION SHALL BE DETERMINED IN THE FIELD BY THE RESIDENT ENGINEER. EXISTING ASPHALT AND CONCRETE PAVEMENT SHALL BE SAW-CUT A MINIMUM OF 2-1/2" DEEP IN A STRAIGHT LINE PRIOR TO PAVING. EXPOSED VERTICAL EDGES WHICH WILL HAVE ASPHALTIC CONCRETE PLACED AGAINST THEM SHALL BE TACKED WITH EMULSION PRIOR TO ASPHALTIC CONCRETE PAVING.
7. DEMOLITION OF EXISTING FEATURES SHALL BE LIMITED TO THE ITEMS SHOWN ON THE PLANS AND DESCRIBED IN THE SPECIAL PROVISIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND / OR REPLACE ALL EXISTING IMPROVEMENTS DAMAGED BY HIS OPERATIONS, AT HIS EXPENSE.
8. THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR CAPPING AND RELOCATING EXISTING SPRINKLERS AS DIRECTED BY THE ENGINEER.
9. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR VERIFYING THAT THE ARRANGEMENTS HAVE BEEN MADE FOR PRESERVING AND / OR PERPETUATING ALL PERMANENT SURVEY MONUMENTS THAT WILL BE AFFECTED BY THE WORK. CONTRACTOR IS RESPONSIBLE FOR PRESERVING ALL EXISTING SURVEY MONUMENTS. IF ANY MONUMENTS ARE FOUND TO BE DAMAGED OR MISSING, THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 10 WORKING DAYS NOTICE TO ENGINEER PRIOR TO DISTURBANCE OR REMOVAL OF PERMANENT SURVEY MONUMENTS. ENGINEER SHALL COORDINATE WITH CONTRACTOR TO RESET MONUMENTS OR PROVIDE PERMANENT WITNESS MONUMENTS AND FILE THE REQUIRED DOCUMENTATION WITH THE COUNTY SURVEYOR PURSUANT BUSINESS AND FILE PROFESSIONS CODE SECTION 8771.
10. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR COORDINATING CIVIL WORK WITH ELECTRICAL WORK IN THESE PLANS.



APPROVED BY: DATE: 5/1/01 P.E.: E-13281 DATE: 5/1/01
 SENIOR ELECTRICAL ENGINEER

SHEET INDEX:

- E-1 COVER SHEET
- E-2 50TH STREET BETWEEN 9TH & 10TH AVENUES (SERVICE NO. 1706)
- E-3 9TH AVENUE, 10TH AVENUE & 50TH STREET (SERVICE NO. 1708)
- E-4 52ND STREET, 9TH AVENUE TO 11TH AVENUE (SERVICE NO. 1705)
- E-5 50TH STREET, 11TH AVENUE TO 12TH AVENUE (SERVICE NO. 1704)
- E-6 52ND STREET, 11TH AVENUE TO 12TH AVENUE
- E-7 50TH STREET TO 13TH AVENUE (SERVICE NO. 1707)
- E-8 HISTORICAL ORNAMENTAL STREET LIGHT DETAILS
- E-9 STANDARD DETAILS

CITY OF SACRAMENTO
 DEPARTMENT OF PUBLIC WORKS

ELECTRICAL
 COVER SHEET
 STREET LIGHTING

SM69
 E-1
 9

NO.	REVISIONS	DATE	BY	RESEARCH PLAN NUMBERS	FIELD BOOK	SCALE	NTS
1	DESIGN	5/1/01	BY	E-2314			
2	DESIGN	5/1/01	BY	E-2315			
3	DESIGN	5/1/01	BY	E-2316			
4	DESIGN	5/1/01	BY	E-2317			
5	DESIGN	5/1/01	BY	E-2318			
6	DESIGN	5/1/01	BY	E-2319			
7	DESIGN	5/1/01	BY	E-2320			
8	DESIGN	5/1/01	BY	E-2321			
9	DESIGN	5/1/01	BY	E-2322			
10	DESIGN	5/1/01	BY	E-2323			

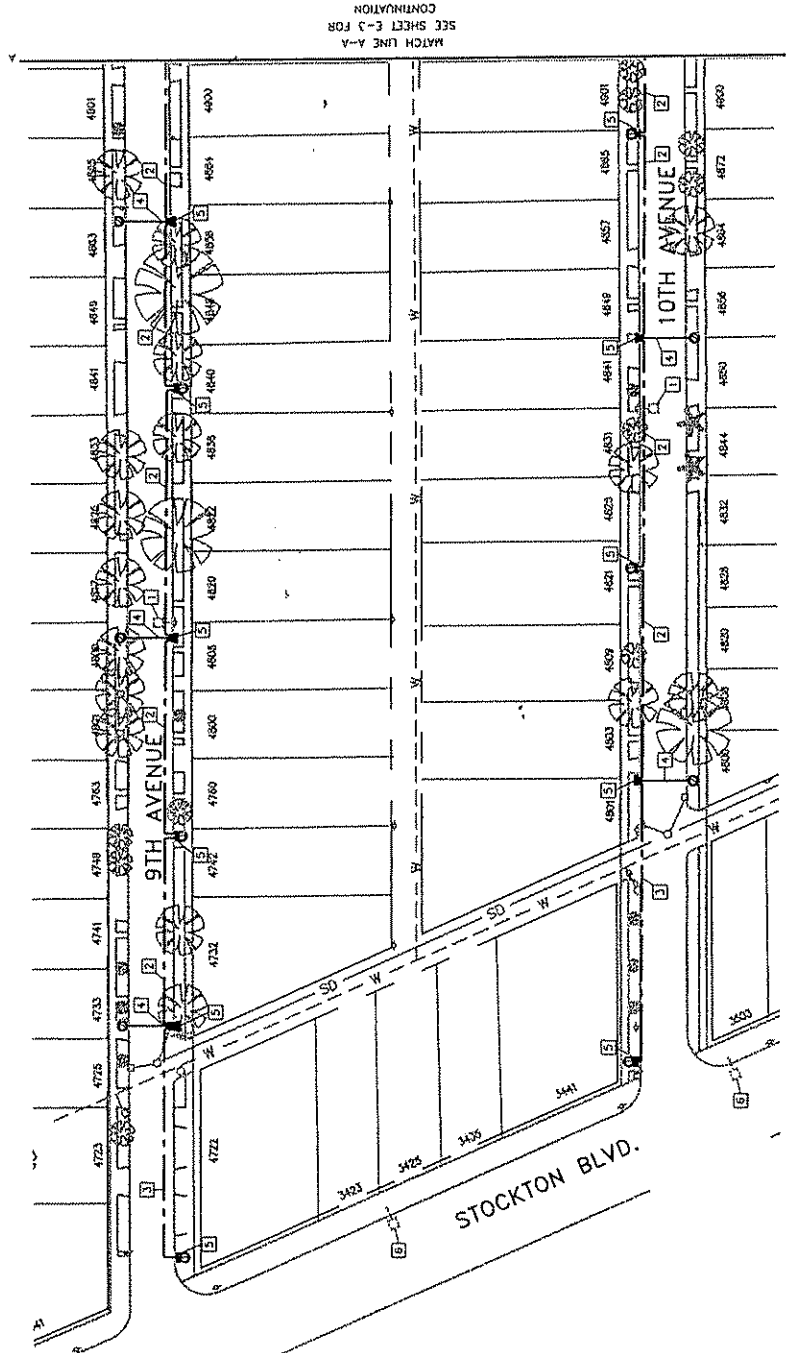
DESIGNED BY: A. DEL CARMEN
 CHECKED BY: E. TOP
 DATE MAY 2001
 P.C.E. DATE

CONSTRUCTION NOTES:

1. EXISTING SHAD. SAFETY LIGHT: TO BE REMOVED BY SHAD AFTER THE NEW STREET LIGHTS ARE OPERATIONAL.
2. PLACE 2" C-3/8 THW AND 1/10 THW GROUND.
3. PLACE 2" C-2/8 THW AND 1/10 THW GROUND.
4. PLACE 1 1/2" C-2/8 THW AND 1/10 THW GROUND.
5. PLACE NEW #5 PULL BOX
6. EXISTING TO REMAIN.

NOTES:

1. SEE SHEETS E-8 AND E-9 FOR STREET LIGHTING DETAILS AND LEGEND.
2. PLACE ELECTROLYERS AT FACE OF SIDEWALK UNLESS OTHERWISE NOTED. PROVIDE 6" COLLAR AROUND PULL BOX WHEN PLACED IN A PLANTER. SEE DETAILS ON SHEET E-6.
3. ALL THE LUMINAIRES TO BE INSTALLED SHALL BE INSPECTED BY THE ENGINEER PRIOR TO INSTALLATION.
4. ALL NEW PULL BOXES LOCATED AT STREET CORNERS SHALL BE PLACED IN THE SIDEWALK AREA THREE FEET AWAY FROM THE END OF THE RADIUS (OUTSIDE OF THE CURB RAMP AREA) UNLESS OTHERWISE NOTED.
5. THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.
6. ALL CONDUITS SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE SPECIFIED. FOR LOCATIONS WHERE NEW CONDUIT IS TO BE SPliced TO EXISTING CONDUIT, THE CONDUIT SHALL BE OF THE SAME TYPE AND SIZE AS THE EXISTING TYPE.
7. ALL LUMINAIRES AND PULL BOXES SHALL BE PLACED NO LESS THAN 5' FROM DRIVEWAYS.



CITY OF SACRAMENTO DEPARTMENT OF PUBLIC WORKS

TAHOE PARK WEST STREET LIGHTING

SHEET
E-2
69MS
9

P.E. E-13283, DATE: _____

APPROVED BY: E. J. HALE
STREET ELECTRICAL ENGINEER

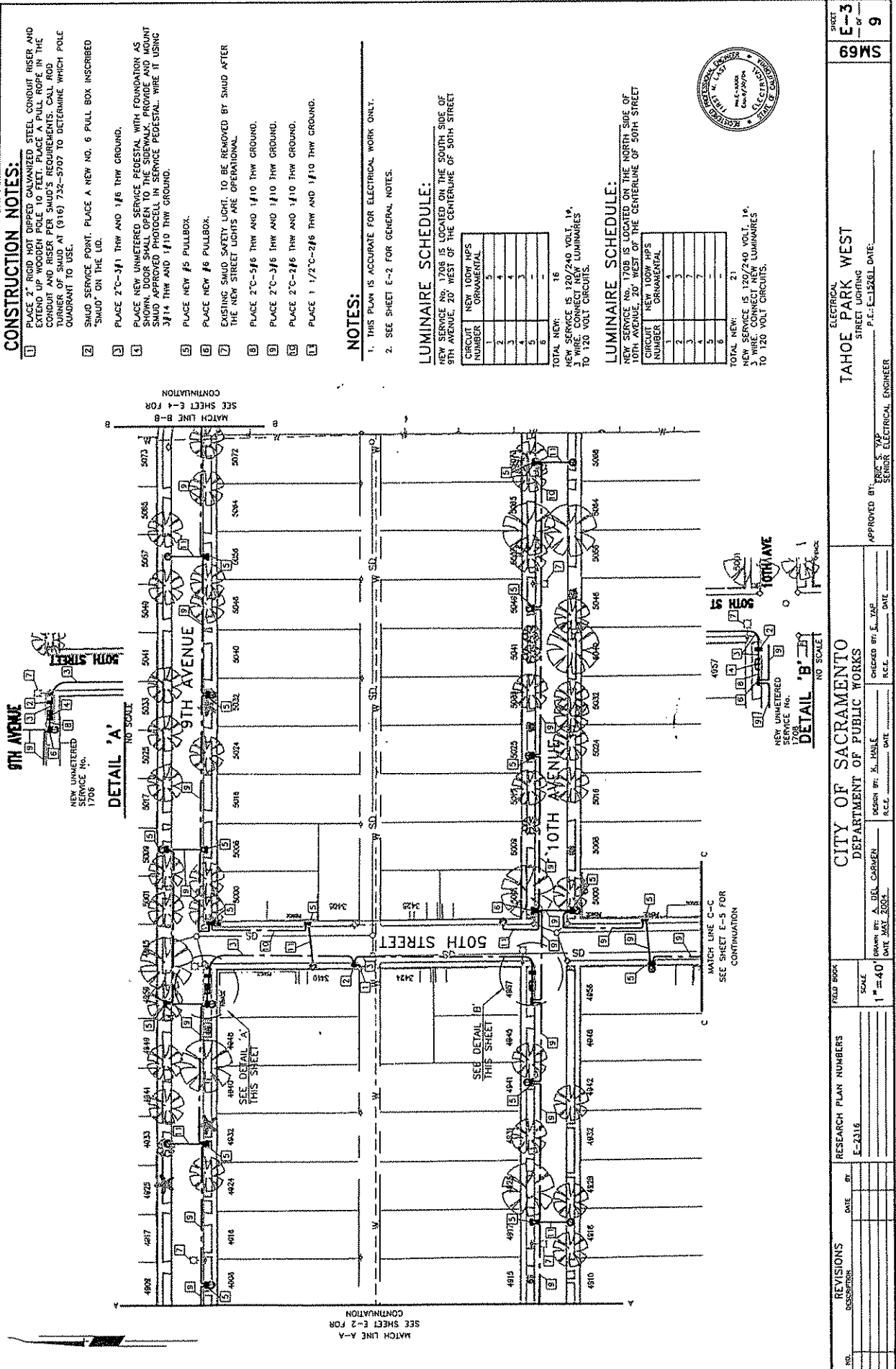
DESIGNED BY: E. J. HALE
DATE: 11/11/2004

DESIGNED BY: K. HALE
DATE: _____

NO.	REVISIONS	DATE	BY

RESEARCH PLAN NUMBERS
E-2315

FIELD BOOK
SCALE
1" = 40'



CONSTRUCTION NOTES:

- 1. PLACE 2" RIGID HOT DIPPED GALVANIZED STEEL CONDUIT RISER AND EXTEND UP WOODEN POLE 10 FEET. PLACE A PULL ROPE IN THE CONDUIT AND RISER PER SHAD'S REQUIREMENTS. CALL ROD TURNER OF SHAD AT (916) 732-5707 TO DETERMINE WHICH POLE QUADRANT TO USE.
- 2. SHAD SERVICE POINT. PLACE A NEW NO. 6 PULL BOX INSCRIBED "SHAD" ON THE LID.
- 3. PLACE 2" C-3/1 THW AND 1/8 THW GROUND.
- 4. PLACE NEW UNMETERED SERVICE PEDESTAL WITH FOUNDATION AS SHOWN. DOOR SHALL OPEN TO THE SIDEWALK. PROVIDE AND MOUNT SHAD APPROVED PHOTOCELL IN SERVICE PEDESTAL WIRE IT USING 3/14 THW AND 1/10 THW GROUND.
- 5. PLACE NEW #5 PULLBOX.
- 6. PLACE NEW #6 PULLBOX.
- 7. EXISTING SHAD SAFETY LIGHT. TO BE REMOVED BY SHAD AFTER THE NEW STREET LIGHTS ARE OPERATIONAL.
- 8. PLACE 2" C-5/6 THW AND 1/10 THW GROUND.
- 9. PLACE 2" C-3/6 THW AND 1/10 THW GROUND.
- 10. PLACE 2" C-2/6 THW AND 1/10 THW GROUND.
- 11. PLACE 1 1/2" C-2/6 THW AND 1/10 THW GROUND.

NOTES:

- 1. THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.
- 2. SEE SHEET E-2 FOR GENERAL NOTES.

LUMINAIRE SCHEDULE:

NEW SERVICE NO. 1708 IS LOCATED ON THE SOUTH SIDE OF 9TH AVENUE, 20' WEST OF THE CENTERLINE OF 50TH STREET

CIRCUIT NUMBER	NEW 100W HPS ORNAMENTAL
1	5
2	4
3	4
4	3
5	5
6	-

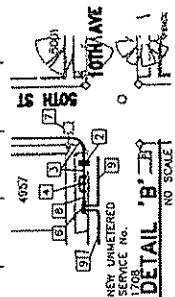
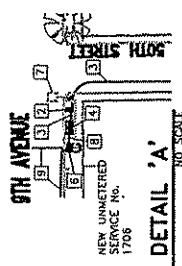
TOTAL NEW: 16
NEW SERVICE IS 120/240 VOLT, 1A.
3 WIRE. CONNECT NEW LUMINAIRES TO 120 VOLT CIRCUITS.

LUMINAIRE SCHEDULE:

NEW SERVICE NO. 1708 IS LOCATED ON THE NORTH SIDE OF 10TH AVENUE, 20' WEST OF THE CENTERLINE OF 50TH STREET

CIRCUIT NUMBER	NEW 100W HPS ORNAMENTAL
1	4
2	3
3	7
4	7
5	-
6	-

TOTAL NEW: 21
NEW SERVICE IS 120/240 VOLT, 1A.
3 WIRE. CONNECT NEW LUMINAIRES TO 120 VOLT CIRCUITS.



REVISIONS		DATE	BY	RESEARCH PLAN NUMBERS	FIELD WORK	CITY OF SACRAMENTO DEPARTMENT OF PUBLIC WORKS		ELECTRICAL TAHOE PARK WEST STREET LIGHTING P.C. 151361 DATE: _____		SM69	E-3	9	
NO.				SCALE 1" = 40'		DESIGNED BY: A. DEL CARMEN DATE: MAY 2002		CHECKED BY: J. JASLE DATE: _____		APPROVED BY: ERIC S. YAP SENIOR ELECTRICAL ENGINEER			

RELOCATE EXISTING STREETLIGHT AS SHOWN WITH NEW FOUNDATION AND ADJUST STREETLIGHT TO NEW GRADE.
ABANDON EXISTING FOUNDATION.

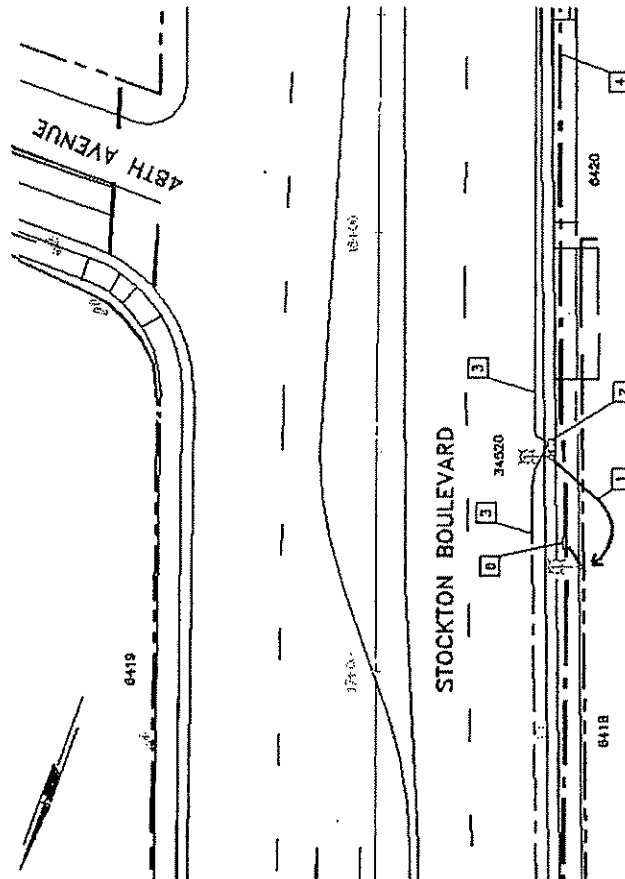
- 1 RELOCATE EXISTING STREETLIGHT AS SHOWN WITH NEW FOUNDATION AND ADJUST STREETLIGHT TO NEW GRADE. ABANDON EXISTING FOUNDATION.
- 2 REMOVE EXISTING FULL BOX.
- 3 ABANDON EXISTING CONDUIT AND REMOVE CONDUCTORS.
- 4 PLACE 2" - 349 THW AND 1/10 THW GROUND.
- 5 PLACE NEW No. 5 FULL BOX AND ADJUST TO GRADE.

EXISTING SERVICE No. 98751 IS LOCATED ON THE WEST SIDE SIDE OF STOCKTON BLVD APPROXIMATELY 500' SOUTH OF 45TH AVENUE.

CIRCUIT NUMBER	EXISTING 200W MAST ARM
1	7
2	5
3	
4	
5	
6	

EXISTING SERVICE IS 120/240 VOLT, 1P, 3 WIRE.
CONNECT NEW LUMINAIRES TO 120 VOLT CIRCUITS.

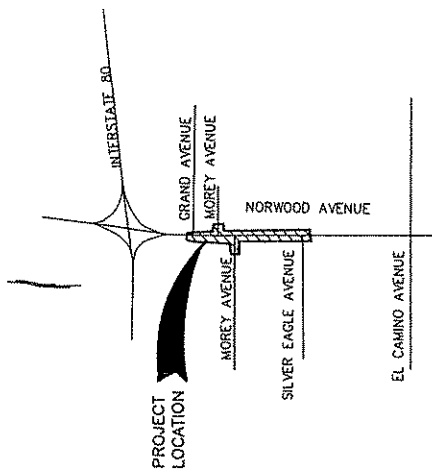
1. THIS SHEET IS ACCURATE FOR ELECTRICAL WORK ONLY.
2. SEE SHEET E-1 FOR GENERAL NOTES.



REVISIONS DATE BY		FIELD BOOK SCALE 1"=20'		CITY OF SACRAMENTO DEPARTMENT OF TRANSPORTATION		STOCKTON BLVD BEAUTIFICATION PHASE III ELECTRICAL STRUCTURE		PN: 1751 REVISED 9	
MC. DATE BY		RESEARCH PLAN NUMBERS		DOON ST. A. DE. CERRIL DATE STOCKTON BLVD. J. L. MATTHEA DATE		STOCKTON BLVD. J. L. MATTHEA DATE STOCKTON BLVD. J. L. MATTHEA DATE		STOCKTON BLVD. J. L. MATTHEA DATE STOCKTON BLVD. J. L. MATTHEA DATE	

TRAFFIC SIGNAL EXAMPLES

EXAMPLE-6 THROUGH EXAMPLE-11



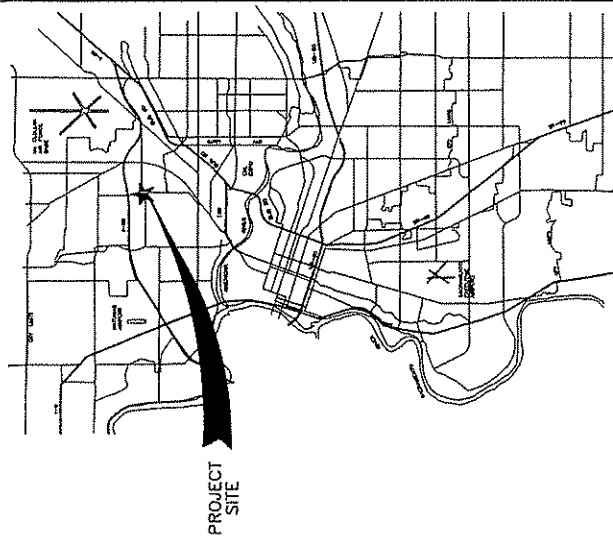
LOCATION MAP

GENERAL NOTES:

1. THE CONTRACTOR SHALL CONFORM TO THE CITY OF SACRAMENTO STANDARD SPECIFICATIONS, DATED JUNE, 1989.
2. THE CONTRACTOR SHALL SUBMIT TO THE RESIDENT ENGINEER A COMPLETED CONSTRUCTION STAKING REQUEST FORM TWO (2) WORKING DAYS PRIOR TO THE NEED FOR PROJECT STAKING.
3. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND TO PROVIDE FOR THE PROPER AND SAFE ROUTING OF THE VEHICULAR TRAFFIC THROUGH THE PROJECT AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE USE OF FLAGMEN, BARRICADES AND CONSTRUCTION SCHEDING SHALL COMPLY WITH THE CURRENT EDITION OF WORK AREA AND TRAFFIC CONTROL HANDBOOK. (W.A.T.C.H.).
4. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES AND FOR THE PROTECTION OF AND THE REPAIR OF DAMAGE TO THEM. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (1-800-452-2444) TWO (2) WORKING DAYS BEFORE WORK IS TO BEGIN.
5. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAINAGE FACILITIES WITHIN THE CONSTRUCTION AREA UNTIL THE NEW DRAINAGE IMPROVEMENTS ARE IN PLACE AND FUNCTIONING.
6. EXACT LIMITS OF PAVEMENT REMOVAL AND RECONSTRUCTION SHALL BE DETERMINED IN THE FIELD BY A MINIMUM OF 2'-1/2" DEEP IN A STRAIGHT LINE PRIOR TO PAVING EXPOSED VERTICL EDGES WHICH WILL HAVE ASPHALT CONCRETE PLACED AGAINST THEM SHALL BE TACKED WITH EMULSION PRIOR TO ASPHALT CONCRETE PAVING.
7. DEMOLITION OF EXISTING FEATURES SHALL BE LIMITED TO THE ITEMS SHOWN ON THE PLANS AND DESCRIBED IN THE SPECIAL PROVISIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE ALL EXISTING IMPROVEMENTS DAMAGED BY HIS OPERATIONS. AT HIS EXPENSE.
8. THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR CAPPING AND RELOCATING EXISTING SPRINKLERS AS DIRECTED BY THE ENGINEER.

FOR
TRAFFIC SIGNAL PLANS

NORWOOD AVENUE
AND
MOREY AVENUE



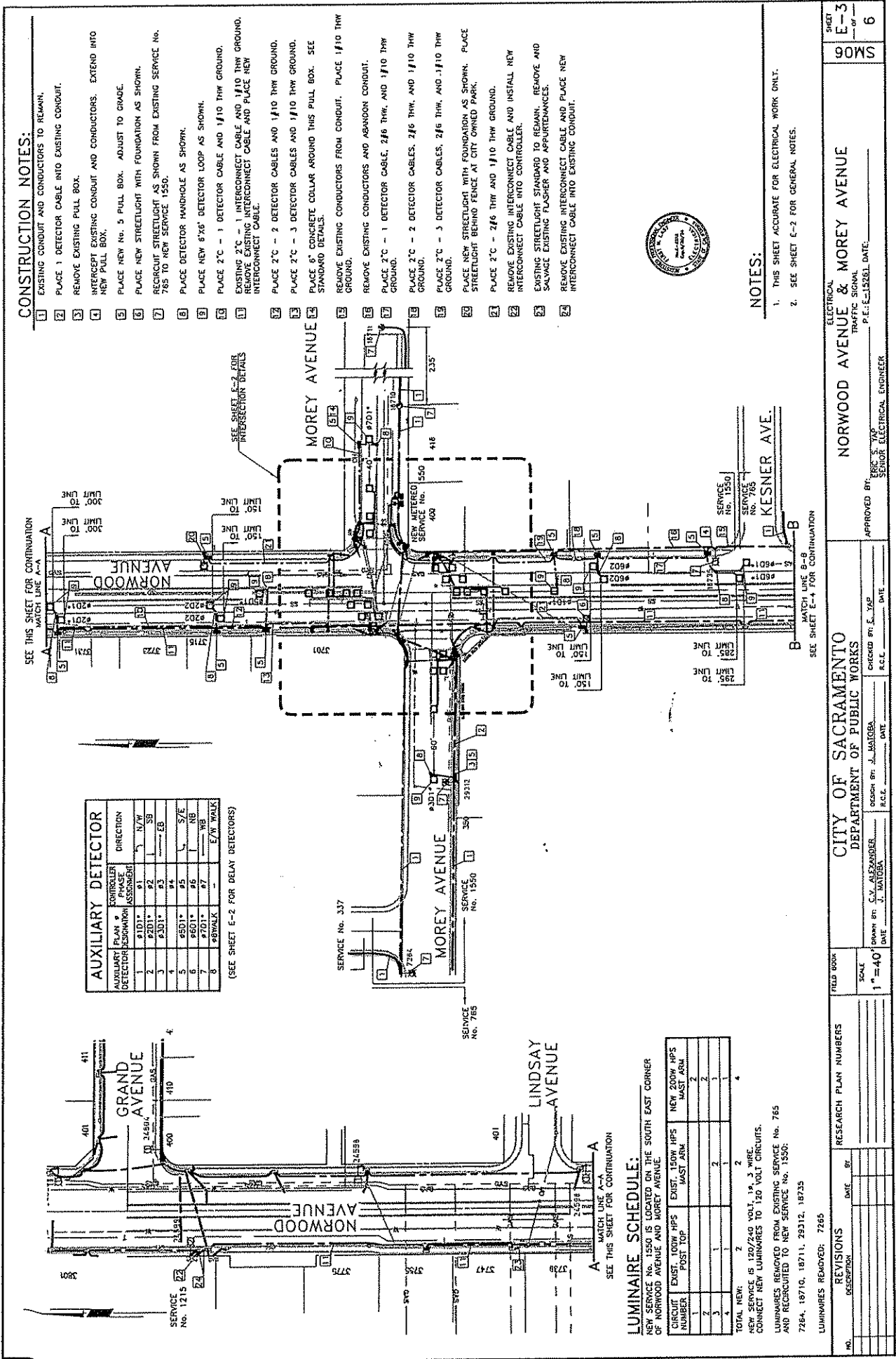
SHEET INDEX: X3DN133HS

- E-1 COVER SHEET
- E-2 NORWOOD AVE & MOREY AVE TRAFFIC SIGNAL PLAN 1"= 20'
- E-3 NORWOOD AVE & MOREY AVE TRAFFIC SIGNAL PLAN 1"= 40'
- E-4 NORWOOD AVE & MOREY AVE TRAFFIC SIGNAL PLAN 1"= 40'
- E-5 STANDARD DETAILS No. 1 TRAFFIC SIGNALS/STREET LIGHTING
- E-6 STANDARD DETAILS No. 2 TRAFFIC SIGNALS/STREET LIGHTING
- S-1 SIGNING AND STRIPING

APPROVED BY: _____ DATE: _____
ERIC S. YAP; PE: E-15261
SENIOR ENGINEER

DATE: _____
 ANGIE LOUIE-FONG, R.E.L. 2153
 CITY TRAFFIC ENGINEER

[illegible]



CONSTRUCTION NOTES:

- 1. EXISTING CONDUIT AND CONDUCTORS TO REMAIN.
- 2. PLACE 1 DETECTOR CABLE INTO EXISTING CONDUIT.
- 3. REMOVE EXISTING PULL BOX.
- 4. INTERCEPT EXISTING CONDUIT AND CONDUCTORS. EXTEND INTO NEW PULL BOX.
- 5. PLACE NEW No. 5 PULL BOX. ADJUST TO GRADE.
- 6. PLACE NEW STREETLIGHT WITH FOUNDATION AS SHOWN.
- 7. RECURUIT STREETLIGHT AS SHOWN FROM EXISTING SERVICE No. 765 TO NEW SERVICE 1550.
- 8. PLACE DETECTOR HANDHOLE AS SHOWN.
- 9. PLACE NEW 6"X6" DETECTOR LOOP AS SHOWN.
- 10. PLACE 2" - 1 DETECTOR CABLE AND 1/10 THW GROUND.
- 11. EXISTING 2" - 1 INTERCONNECT CABLE AND 1/10 THW GROUND. REMOVE EXISTING INTERCONNECT CABLE AND PLACE NEW INTERCONNECT CABLE.
- 12. PLACE 2" - 2 DETECTOR CABLES AND 1/10 THW GROUND.
- 13. PLACE 2" - 3 DETECTOR CABLES AND 1/10 THW GROUND.
- 14. PLACE 5" CONCRETE COLLAR AROUND THIS PULL BOX. SEE STANDARD DETAILS.
- 15. REMOVE EXISTING CONDUCTORS FROM CONDUIT. PLACE 1/10 THW GROUND.
- 16. REMOVE EXISTING CONDUCTORS AND ABANDON CONDUIT.
- 17. PLACE 2" - 1 DETECTOR CABLE, 2/6 THW, AND 1/10 THW GROUND.
- 18. PLACE 2" - 2 DETECTOR CABLES, 2/6 THW, AND 1/10 THW GROUND.
- 19. PLACE 2" - 3 DETECTOR CABLES, 2/6 THW, AND 1/10 THW GROUND.
- 20. PLACE NEW STREETLIGHT WITH FOUNDATION AS SHOWN. PLACE STREETLIGHT BEHIND FENCE AT CITY OWNED PARK.
- 21. PLACE 2" - 2/6 THW AND 1/10 THW GROUND.
- 22. REMOVE EXISTING INTERCONNECT CABLE AND INSTALL NEW INTERCONNECT CABLE INTO CONTROLLER.
- 23. EXISTING STREETLIGHT STANDARD TO REMAIN. REMOVE AND SALVAGE EXISTING FLAGGER AND APPURTENANCES.
- 24. REMOVE EXISTING INTERCONNECT CABLE AND PLACE NEW INTERCONNECT CABLE INTO EXISTING CONDUIT.

NOTES:

- 1. THIS SHEET ACCURATE FOR ELECTRICAL WORK ONLY.
- 2. SEE SHEET E-2 FOR GENERAL NOTES.



AUXILIARY DETECTOR		CONTRIBUTOR		DIRECTION	
AUXILIARY PLAN #	DETECTOR DESIGNATION	ASSIGNMENT	PLAN #	N/W	S/B
1	#101	#1	#1	N/W	S/B
2	#201	#2	#2	N/W	S/B
3	#301	#3	#3	N/W	S/B
4	#401	#4	#4	N/W	S/B
5	#501	#5	#5	N/W	S/B
6	#601	#6	#6	N/W	S/B
7	#701	#7	#7	N/W	S/B
8	#801	#8	#8	N/W	S/B

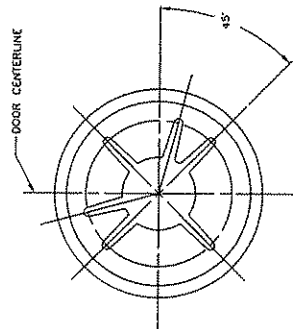
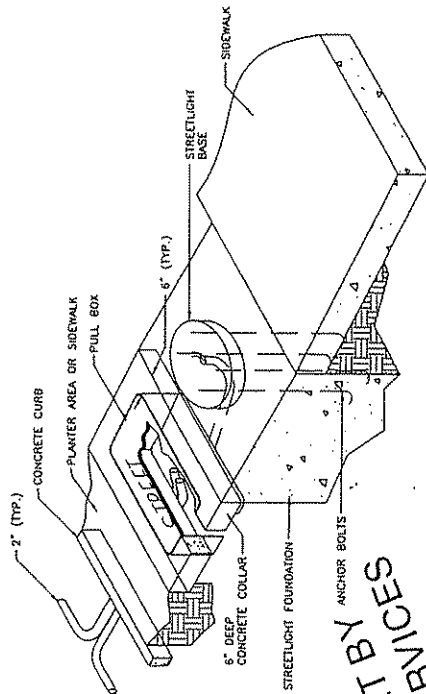
(SEE SHEET E-2 FOR DELAY DETECTORS)

LUMINAIRE SCHEDULE:

NEW SERVICE No. 1550 IS LOCATED ON THE SOUTH EAST CORNER OF NORWOOD AVENUE AND MOREY AVENUE.		NEW 200W HPS	
CIRCUIT NUMBER	POST TOP	EXIST. 150W HPS	WAST ARM
1	1	2	2
2	1	2	2
3	1	2	2
4	1	2	2
TOTAL NEW:		2	2

NEW SERVICE IS 120/240 VOLT, 15 AMP, 3 WIRE.
CONNECT NEW LUMINAIRES TO 120 VOLT CIRCUITS.
LUMINAIRES REMOVED FROM EXISTING SERVICE No. 765
AND RECURUITED TO NEW SERVICE No. 1550:
7284, 18710, 18711, 25312, 18725
LUMINAIRES REMOVED: 7265

CITY OF SACRAMENTO DEPARTMENT OF PUBLIC WORKS		NORWOOD AVENUE & MOREY AVENUE		SHEET E-3 OF 6
Drawn by: C.V. ALEXANDER	Checked by: J. MATOBA	Approved by: ERIC S. YAP	Senior Electrical Engineer	DATE: P.E. E-15261
Field Book	Research Plan Numbers	Scale: 1"=40'	Field Notes	
Revisions	NO.	DESCRIPTION	DATE	BY



ELECTRICAL EQUIPMENT PLACEMENT NO SCALE

NO ESCAPE

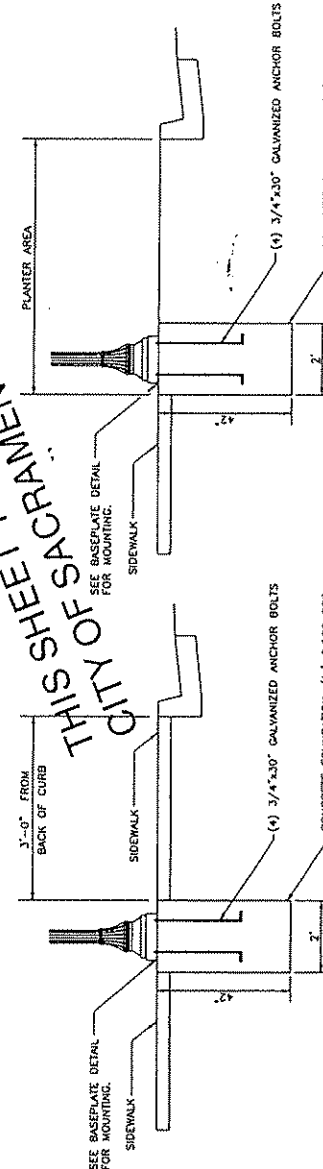
(4) 3/4"x30" ANCHOR BOLTS
ON A 12" BOLT CIRCLE

BOLT-CIRCLE PATTERN
1/8" SCALE

PLANTER AREA

SEE BASEPLATE DETAIL FOR MOUNTING.

TOP OF FOUNDATION

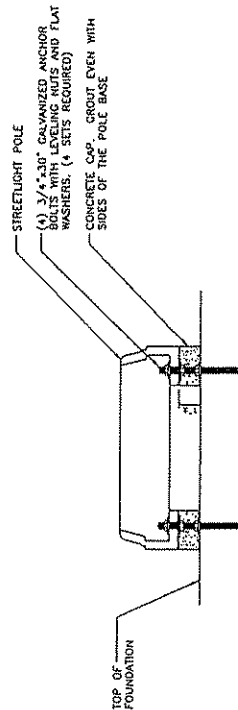


STREETLIGHT IN SIDEWALK NO SCALE

1455

STREETLIGHT IN PLANTER

NO SCALE



BASEPLATE

STOPS ON

NOTE:

1. ALL LEVELING NUTS MUST BE LEVEL AND EVEN PRIOR TO INSTALLING THE POLES. CARE MUST BE TAKEN WHEN TIGHTENING BOLTS TO NOT CRACK OR BREAM BASE PLATE.
2. ALL ANCHOR BOLTS SHALL BE ASTM A-307, ALL STRUCTURAL STEEL SHALL BE ASTM A-36.

[illegible]

SIGNING AND STRIPING EXAMPLES

EXAMPLE-14

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH CITY OF SACRAMENTO DESIGN & PROCEDURES MANUAL, DATED MAY 1990, STANDARD SPECIFICATIONS, DATED JULY 1989, CALTRANS STANDARD PLANS, DATED JULY 1992, THE LATEST ENGLISH UNIT EDITION OF THE CALTRANS TRAFFIC MANUAL, AND CALTRANS SIGN SPECIFICATIONS.
2. SEE CALTRANS STANDARD PLANS, SHEET A204-A24E FOR STRIPING DETAILS. ALL SIGNS SHALL MEET THE REQUIREMENTS FOR STRIPING AND PAINT SPECIFICATIONS. SIGN POLES SHALL BE 2-INCH GALVANIZED STEEL, UNLESS OTHERWISE NOTED.
3. ALL SIGNING, STRIPING, AND MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. CONFLICTS BETWEEN EXISTING AND PROPOSED SHALL BE RESOLVED BY RESIDENT ENGINEER.
4. EXACT POSITION AND LOCATION OF ALL ROADSIDE SIGNS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. OVERHEAD STREET NAME SIGNS SHALL BE PLACED ON SIGNAL MAST ARMS.
5. REMOVAL OF EXISTING STRIPING AND PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY SANDBLASTING OR OTHER APPROVED GRINDING METHOD.
6. ALL STRIPING AND TRAFFIC MARKINGS SHALL BE THERMOPLASTIC.
7. CROSSWALKS SHALL BE 12 FEET WIDE INCLUDING THE 12" SOLID PAVEMENT MARKINGS AND SHALL BE WHITE UNLESS OTHERWISE NOTED.
8. ALL SIGNING AND STRIPING WORK SHALL BE DONE BY THE CONTRACTOR AND SHALL BE COORDINATED WITH THE ELECTRICAL WORK AS DIRECTED BY THE ENGINEER.
9. EXISTING SIGNS NOT SHOWN ON THESE PLANS SHALL BE REMOVED OR RELOCATED AS DIRECTED BY THE ENGINEER.
10. CONTRACTOR SHALL VERIFY WITH THE PROJECT MANAGER OR ENGINEER THE EXACT STREET NAME AND STREET ADDRESS FOR PLACEMENT ON STREET NAME SIGNS PRIOR TO ORDERING SIGNS.
11. MOUNT SIGNS USING BANDING ON SIGNAL AND STREET LIGHT POLES WHERE FEASIBLE. SEE ELECTRICAL PLANS FOR POLE LOCATIONS.
12. TRAFFIC SIGNS SHALL BE INSTALLED BEHIND THE SIDEWALK WHEN THE SIDEWALK IS IMPEDIMENT ADJACENT TO THE CURB. SIGNS SHALL BE INSTALLED BETWEEN THE CURB AND SIDEWALK WHEN THE SIDEWALK IS DETACHED. SIGNS IN PEDESTRIAN AREAS SHALL BE 5 FEET CLEARANCE FROM THE GROUND OF AT LEAST SEVEN FEET. IF THIS CLEARANCE REQUIREMENT IS NOT SATISFIED AFTER THE INSTALLATION OF ADDITIONAL SIGN PANELS, CONTRACTOR SHALL INSTALL A NEW SIGN POST.
13. AT SIGNALIZED LOCATIONS, REMOVE EXISTING STOP SIGNS. STOP LEGENDS AND STANCHIONS AT THE TIME SIGNAL IS TURNED ON.
14. LANE WIDTHS ADJACENT TO CURBS ARE MEASURED TO THE FACE OF CURB.
15. THIS PLAN IS ACCURATE FOR SIGNING AND STRIPING WORK ONLY.
16. ALL SIGNS REGULATING PARKING SHALL BE DOUBLE SIDED AND SIDE MOUNTED.
17. ALL STREET NAME (INCLUDING 675D, R1, R2, V SERIES, AND SCHOOL ZONE) SIGNS SHALL BE DOUBLE SIDED. ALL STOP SIGNS FOR ALL OTHER SIGNS, USE ASHP TYPE I OR TYPE III SKEWED. ALL SCHOOL ZONE SIGNAGE SHALL BE FLUORESCENT YELLOW-GREEN WHERE YELLOW IS INDICATED IN THE CALTRANS TRAFFIC MANUAL.

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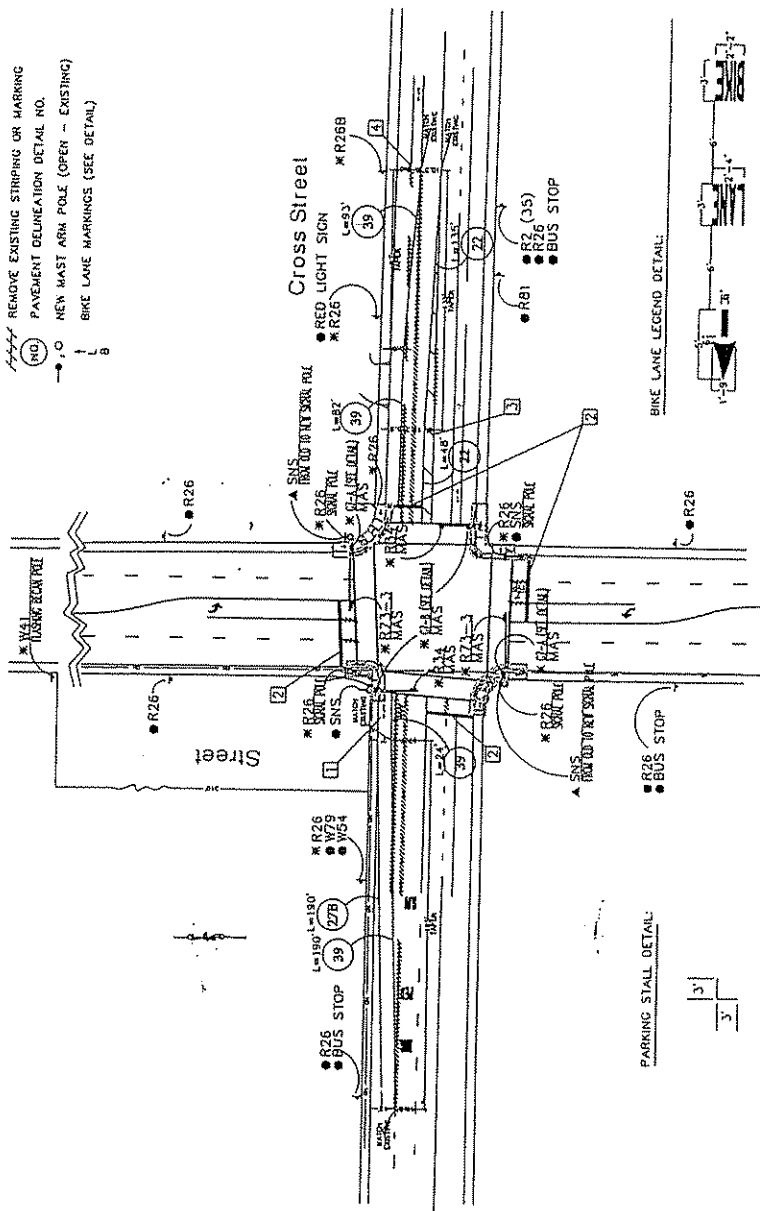
Street 15

Street 15

- 1 INSTALL BIKE LANE LEGEND PER A240 AT 3/4 SCALE (SEE DETAIL)
- 2 INSTALL 24" WIDE STOP BAR WITH 7' CLEAR SPACE
- 3 INSTALL 4" YELLOW CROSSHATCH @ 45° WITH 15' SPACING
- 4 INSTALL 4" WHITE PARKING STALL (SEE DETAIL)

LEGEND:

- | | |
|------|--|
| X | INSTALL ROADSIDE SIGN |
| f | REMOVE ROADSIDE SIGN |
| • | EXISTING ROADSIDE SIGN TO REMAIN |
| ▲ | RELOCATE ROADSIDE SIGN |
| f | EXISTING ROADSIDE SIGN LOCATION (ONE POST) |
| f | ROADSIDE SIGN LOCATION |
| MAS | MAST ARM MOUNTED SIGN |
| SNS | STREET NAME SIGN |
| / | REMOVE EXISTING STRIPING OR MARKING |
| (NO) | PAYMENT DELINEATION DETAIL NO. |
| LO | NEW MAINT ARM POLE (OPEN - EXISTING) |
| L | BRIKE LAWE MARKINGS (SEE DETAIL) |



PARKING STALL DETAIL:

BIKE LANE LEGEND DETAIL:

CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS

SIGNING & STRIPING PLANS FOR

STREET & CROSS STREET

PROJ# 151