

## SECTION ELEVEN TABLE OF CONTENTS

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**STREET ILLUMINATION**

All new commercial or residential subdivisions, short plats, building site plans shall provide street lights in accordance with the standards for such improvements of the City, unless exempted from this requirement by the City Engineer, in which case underground improvements shall be installed for future lighting. Street illumination shall be owned and operated by the City.

A street lighting plan submitted by the applicant and approved by the Public Works Director shall be required for all street light installations. Type of installation shall be as set forth in the current edition of the WSDOT/APWA Standard Specifications and as directed by the City except where noted herein.

All public street light designs shall be prepared by an engineering firm capable of performing such work. The engineer shall be licensed by the State of Washington. All developments shall submit the lighting plan on a separate sheet. After the system is completed and approved, a set of "as built" mylars shall be submitted to the City as a permanent record.

All street intersections shall have provisions for lighting, so as to provide minimum illumination as set forth in WSDOT Publication M51-02 (Traffic Manual).

All developments shall include conduit installed so as to provide adequate capacity for future installation of complete street lighting as set forth in these standards and in WSDOT Publication M51-02. Positioning of conduit shall be determined by the City engineer. All conduit installed solely to comply with future street lighting upgrade requirements shall have at least a single ground conductor (minimum #10AWG copper stranded type) installed.

All street light electrical installations including wiring conduit and power connections shall be located underground.

The General Notes below need to be included on any plans dealing with street design.

**General Notes (Street Light Construction)**

1. All workmanship, materials and testing shall be in accordance with the current edition of the WSDOT/APWA, MUTCD, National Electrical Code (NEC) or City of Chelan Development Guidelines unless otherwise specified below. In cases of conflict, the most stringent guideline shall apply.
2. Electrical permits and inspections are required for all street lighting installations within the City of Chelan. The contractor is responsible for obtaining said permits prior to any type of actual construction. These permits are available from the State Department of Electrical Inspections (L & I),

Chelan County PUD, and the Department of Planning and Community Development at City Hall.

3. A clearly marked service disconnect shall be provided for every lighting circuit. The location and installation of the disconnect shall conform to NEC and City of Chelan standards, whichever is more stringent. The photo cell window shall face north unless otherwise directed by the City. The service disconnect shall not be mounted on the luminaire pole. (See drawing pg. 11-7) The service panel shall be supplied with PUD approved meter base, galvanized steel NEMA 3R enclosure. The photo electric cell shall be utility grade Intermatic series K4100 or equivalent, installed in a vandal/tamper resistant manner. Enclosure shall have provisions for locking with a City supplied padlock. Test switch shall be commercial grade 120/277 VAC rating Hubbell CS115 or equivalent. GFCI duplex receptacle shall be within main enclosure and be Hubbell 5352-IS or equivalent. Contactor shall be Square D model 8903 type L or equivalent.
4. All lighting wire shall be stranded copper with a minimum size of #10 AWG. All wire shall be suitable for wet locations. All wire shall be installed in schedule 40 PVC conduit with a minimum diameter of 1-1/4 inches. A bushing or bell-end shall be used at the end of a conduit that terminates at a junction box or luminaire pole. Conductor/circuit identification shall be used throughout the system. Equipment grounding conductor shall be a minimum of #8 AWG copper. All splices or taps in pull boxes or made below finish grade shall be made by approved methods utilizing epoxy kits rated at 600 volts (3M Scotch cast 82-A series resin splicing kits or equivalent). All splices shall be made with pressure type connectors (wire nuts will not be allowed). Direct buried wire will not be allowed. All other installation shall conform to NEC, WSDOT/APWA and MUTCD standards.
5. Each luminaire pole shall have an in-line, water tight fuse on each conduit above ground potential located at the base of the pole. Access to these fuses shall be through the hand-hole on the pole. The hand-hole shall be facing away from on-coming traffic. Additional conductor length shall be left inside the pole and pull or junction box equal to a loop having a diameter of one foot. Load side of in-line fuse to luminaire head shall be a minimum of #10 copper, and shall be supported at the end of the luminaire arm by an approved means. Fuse size and grounding in pole shall conform to NEC standards. All junction boxes shall meet or exceed WSDOT and NEC standards. (See drawings pg. 11-14 & 11-15)
6. Approved pull boxes or junction boxes shall be installed when conduit runs are more than 200 feet. In addition, a pull box or junction box shall be located within 10 feet of each luminaire pole and at every road crossing. The luminaire base, where adequate space is available and accessible, may be considered adequate as a pull or junction box. Boxes shall be clearly and

permanently marked as lighting boxes by the legend "L.T." or "LIGHTING". See WSDOT standard plan J-11a.

7. All lighting poles shall have tapered round shafts with a linear taper of between 0.125 and 0.14 inches per foot. All poles shall be Hapco 50700-005 or 50700-006 for single arm and Hapco 50701-010 for twin arm or approved equal. In existing developed areas, the City may approve/require use of other poles to establish consistency within the developed area.
8. Mounting heights, arm length, power source, luminaire, and bolt patterns shall be as indicated on drawings pages 11-9, 11-10, 11-11.
9. Any modification to approved plans shall be reviewed and approved by the City engineer prior to installation.

### **Staking**

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

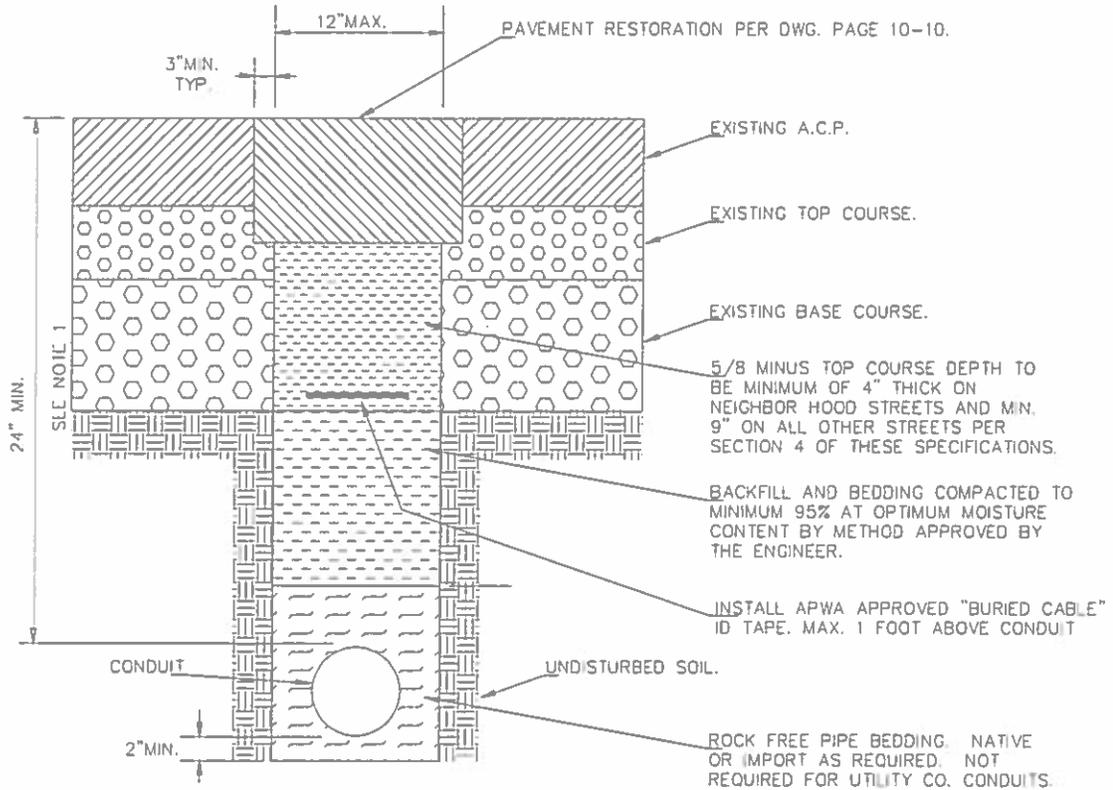
The minimum staking of luminaires shall be as follows:

- A. Location and elevation to the center of every pole base;
- B. Location and elevation of each service disconnect.

### **Testing**

All luminaires shall be subject to an electrical inspection. Lamp, photocell and fixture shall be warranted for a period of two years.

**CONDUIT TRENCHING**

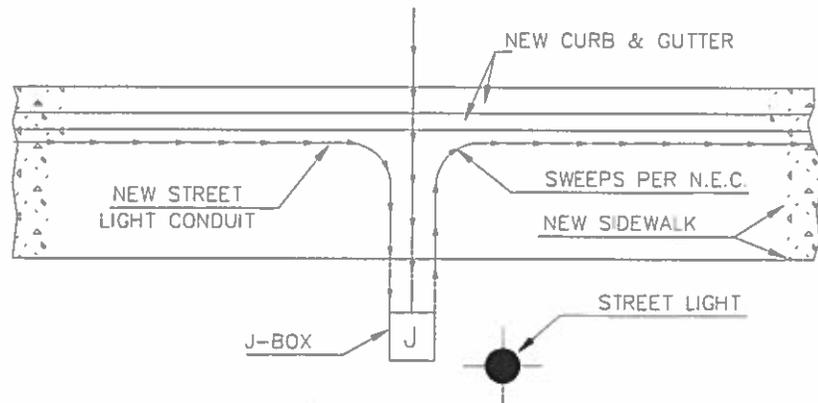


- NOTES:**
- 1) TRENCH DEPTH SHALL PROVIDE A MINIMUM COVER OF 24" OVER TOP OF CONDUIT. G.T.E. AND P.U.D. TO BE MIN. 30" AT NON CURBED STREET CROSSINGS OR AS REQUIRED BY THE PERMIT.
  - 2) MINIMUM ONE-WAY TRAFFIC TO BE MAINTAINED.
  - 3) ALL ROADWAY APPURTENANCES TO BE PROTECTED AND ROAD SIGNS LEFT AS FOUND.
  - 4) PAVEMENT REPAIR TO BE MADE WITHIN 24 HOURS OF TRENCH BACKFILL.
  - 5) PERMIT REQUIRED ON ALL PROJECTS NOT CONTRACT ADMINISTERED BY THE CITY ENGINEER DEPT.

STREET CUT AND PATCH DETAIL FOR  
TYPICAL TRAFFIC SIGNAL,  
STREET LIGHTING AND  
UTILITY CO. CONDUITS

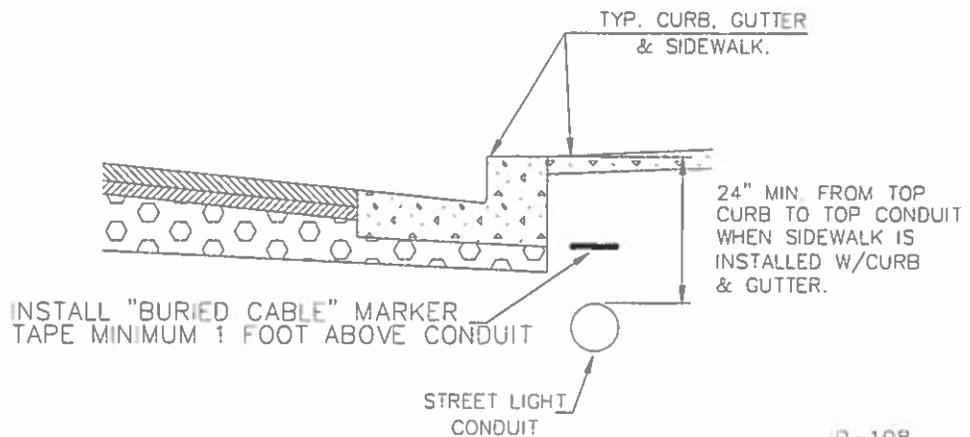
ID-099

**STREET LIGHT CONDUIT LOCATION**



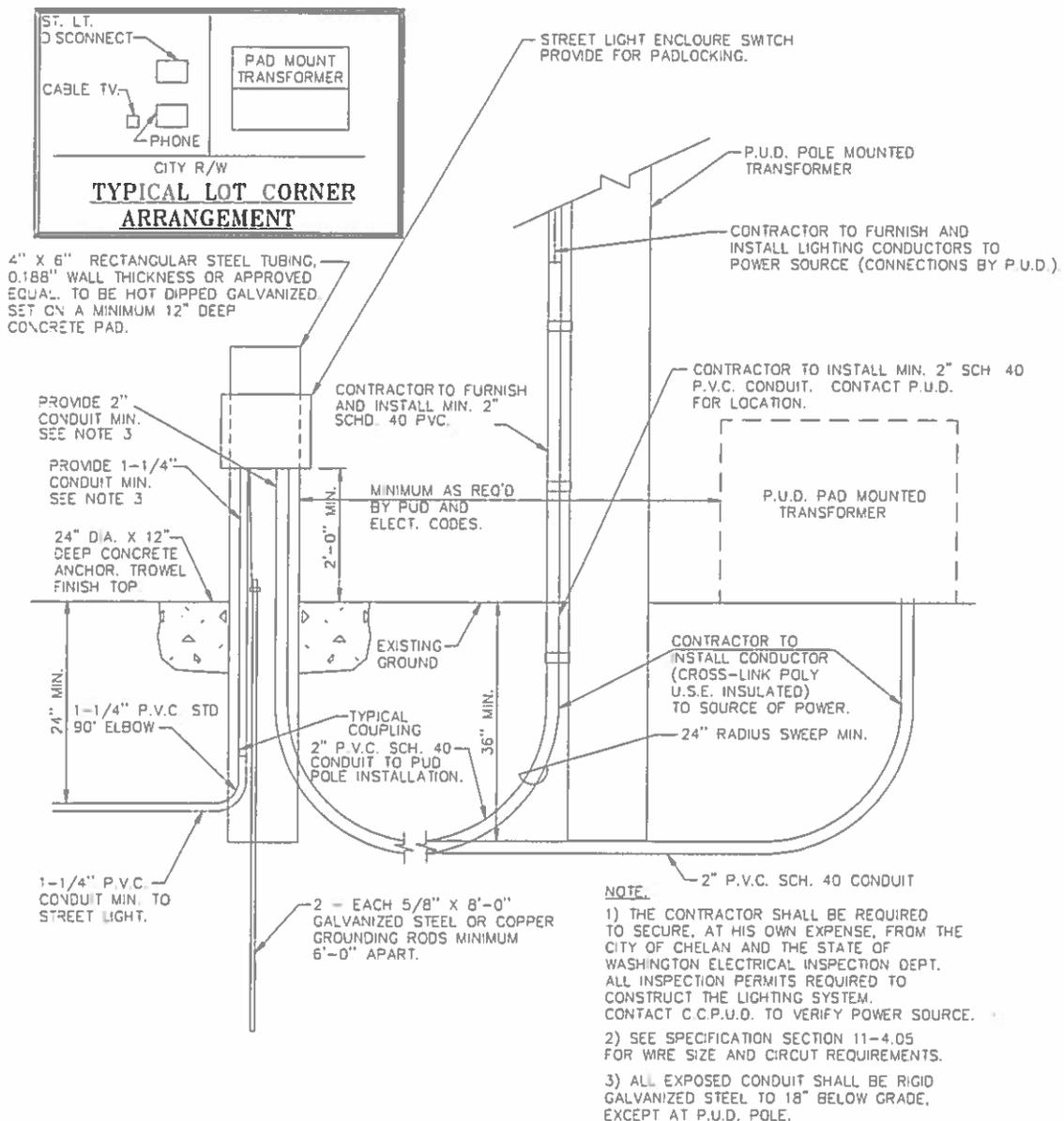
**NOTE:**

A TOTAL OF FOUR 90° BENDS, OR AN EQUIVALENT OF 360° MAXIMUM IS PERMITTED IN A CONDUIT RUN PER NEC SECTION 347-14. SINCE EACH "J" BOX REQUIRES ONE 90° BEND TO ENTER THE BOTTON OF THE BOX, A MAXIMUM OF TWO ADDITIONAL 90° BENDS CAN BE INSTALLED BETWEEN BOXES OR NO MORE THAN 180°



D-108

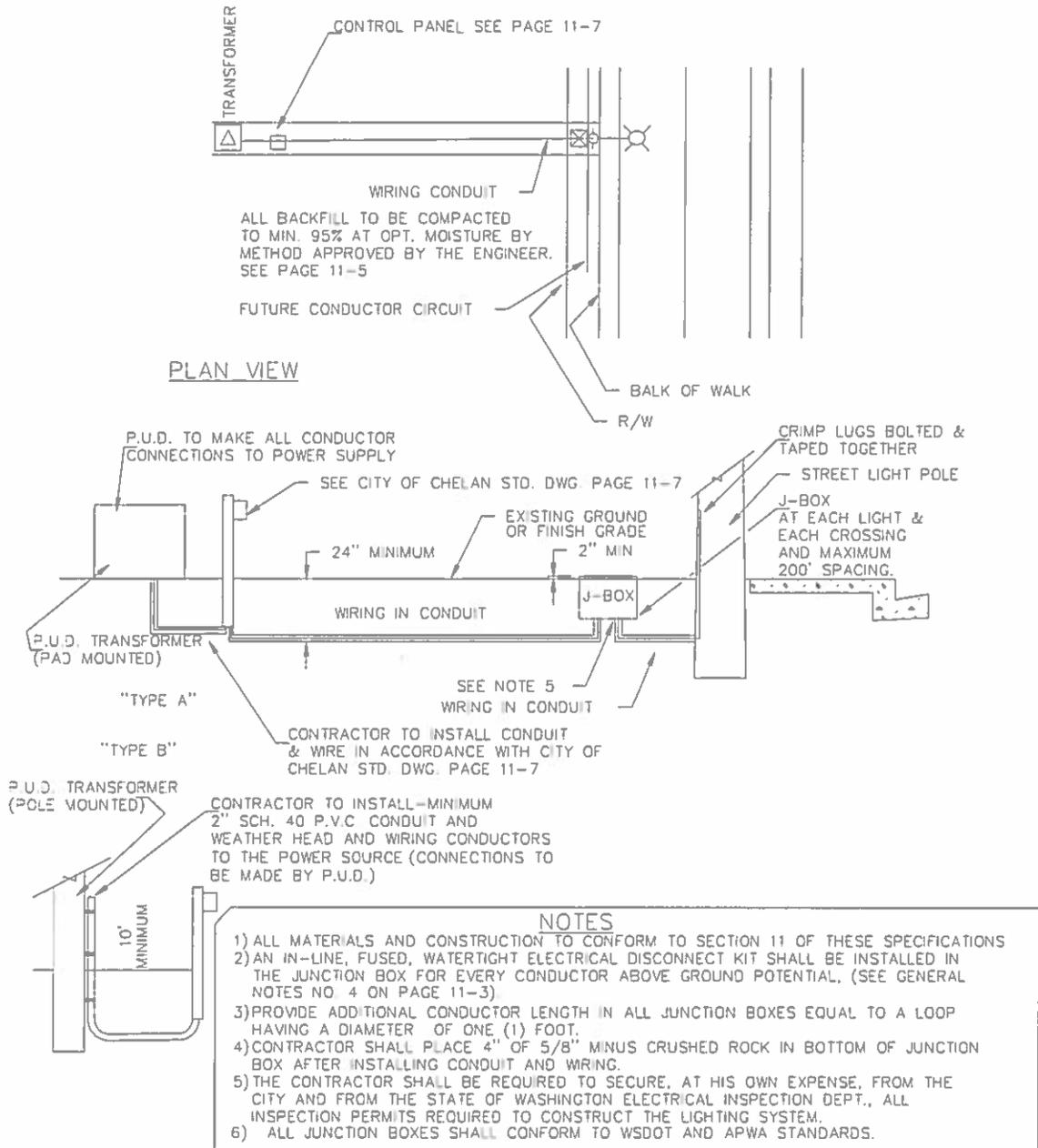
TYPICAL LIGHTING CONTROL PANEL



ID-097

TYPICAL LIGHT CIRCUIT

SINGLE LIGHT CIRCUIT



ID-096

**HIGH PRESSURE SODIUM LUMINAIRE**



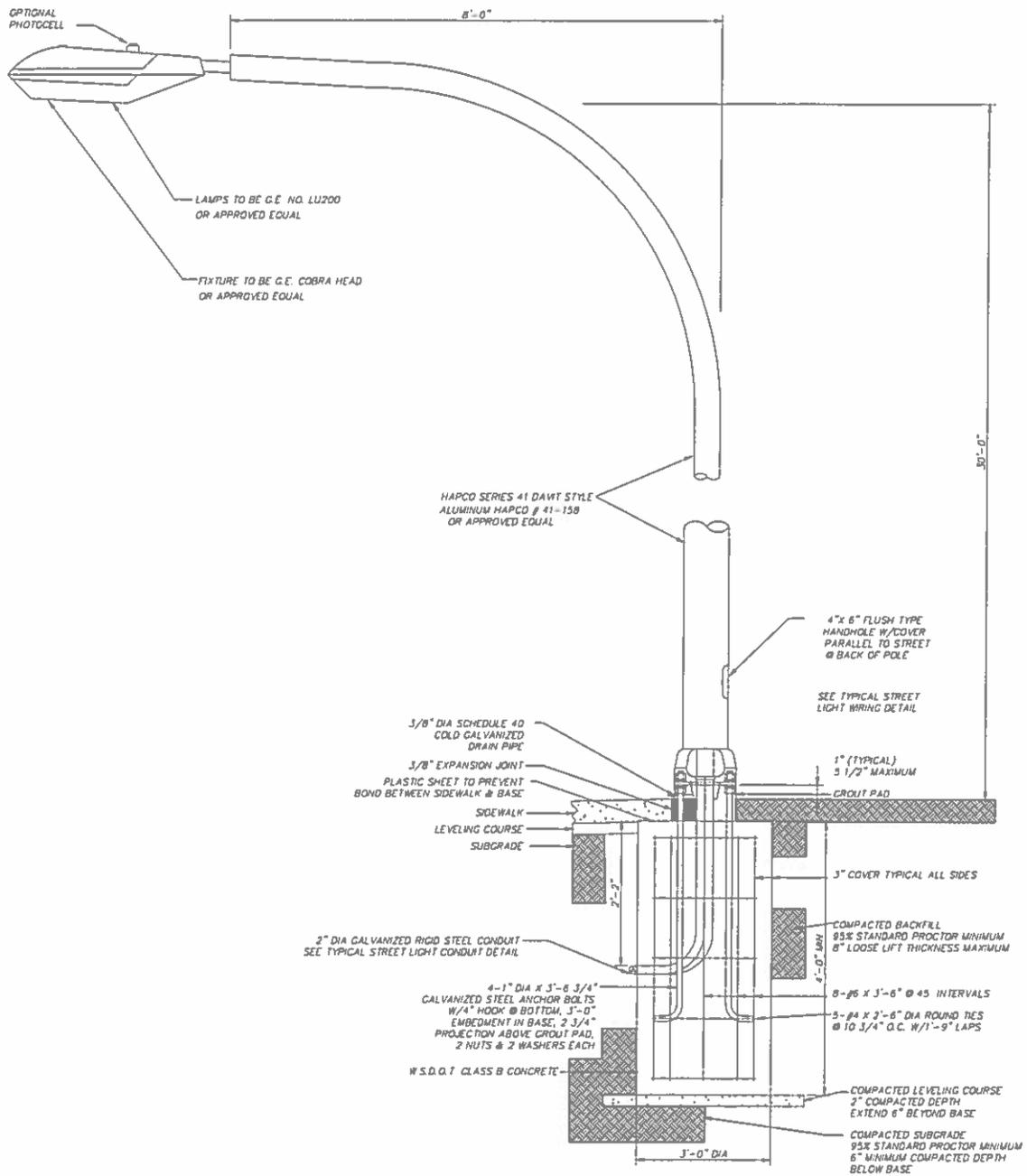
- NOTES:**
- 1) LUMINAIRE SHALL BE COBRA-HEAD CONFIGURATION WITH BALLAST IN HEAD MEETING I.E.S., TYPE III, LIGHT DISTRIBUTION PATTERN WITH CUT OFF OPTICS AND POWER DOOR.
  - 2) LUMINAIRE BALLAST SHALL BE MAGNETIC REGULATOR TYPE AND PROVIDE FOR A  $\pm$  10% INPUT VOLTAGE. PLUG-IN LEADS, PLUG-IN STARTER BOARD.
  - 3) POWER VOLTAGE TO LUMINAIRE SHALL BE VERIFIED WITH CHELAN COUNTY P.U.D. PRIOR TO ORDERING LUMINAIRE. ALL LUMINAIRES SHALL BE 240V IF AVAILABLE.
  - 4) SEE CITY OF CHELAN STANDARD DWG. PAGE 11-10 FOR POLE AND MAST ARM REQUIREMENTS.
  - 5) LUMINAIRE SHALL BE G.E. OR CROUS HEINZ.
  - 6) LUMINAIRE REQUIREMENTS :

STREET WIDTH *	LUMINAIRE MOUNTING HEIGHT	GENERAL STREET CLASSIFICATION	NOTE-3 LAMP WATTAGE	AVERAGE INITIAL LUMENS	MAXIMUM POLE SPACING **
40' MIN.	35.0'	COMMERCIAL	400	50,000	125'
32'	30.0'	MAJOR,MINOR COLLECTORS LOCAL, PRIVATE, RESIDENTAL	250****	9,500 16,000****	300'

\* MEASURED FROM FACE OF CURB TO FACE OF CURB.  
 \*\* SPACING TO BE STAGGERED OPPOSITE SIDE OF STREET INTERVALS, EXCEPT ON CURVES WHERE SPACING SHALL BE DETERMINED USING GUIDELINES SET FORTH IN WSDOT PUB. M51-02  
 \*\*\* SEE CITY OF CHELAN STANDARD DRAWING 11-11 FOR LAMP REQUIREMENTS.  
 \*\*\*\* USE TO BE DETERMINED BY CITY ENGINEER.

ID-094

**STREET LIGHT STANDARD**



STREET LIGHT STANDARD

ID-093

**HIGH PRESSURE SODIUM VAPOR LAMP**

See City of Chelan Standard drawing page 11-9 for luminaire housing requirements.

**General**

These lamps shall be used in the luminaires specified on City of Chelan Standards drawing page 11-9.

**Marking**

Manufacturer's name or symbol, catalog number, and wattage rating shall be printed on each lamp.

**Packaging**

Lamps shall be packaged in containers which will prevent shipping and handling breakage.

Each container shall be marked with the manufacturer's name, name of item, wattage, and catalog number.

**Failed Lamps**

Lamps in service for less than one year are under warranty and shall be returned for replacement.

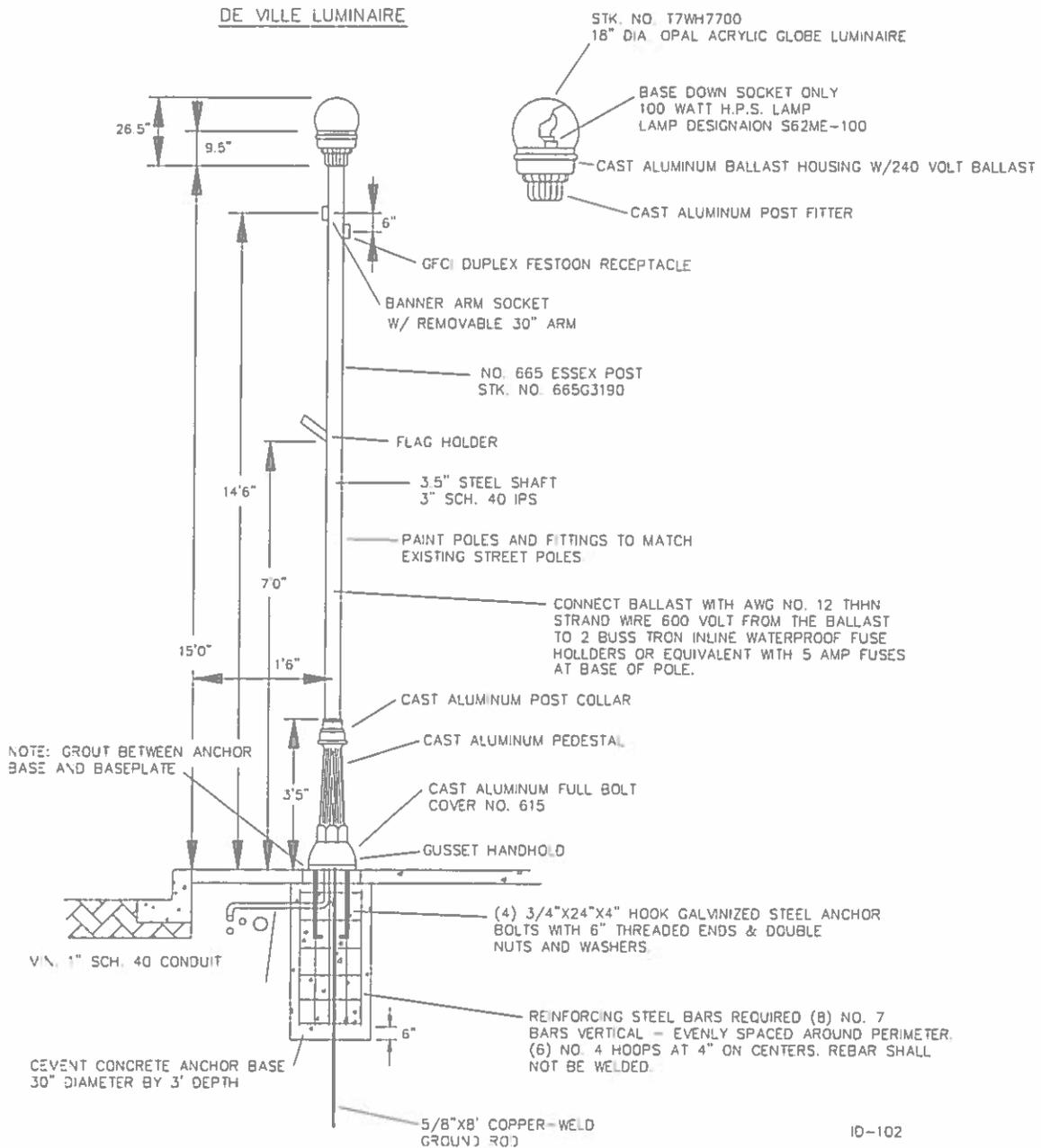
**Manufacturer and Catalog Numbers**

100 Watt	OSRAM Sylvania #LU100 S54*
200 Watt	OSRAM Sylvania #LU200 S66* Philips #C200 S66
400 Watt	OSRAM Sylvania #LU400 S51* Philips #C400 S51

\* ANSI Ballast Reference

**PEDESTRIAN LIGHTING**

Pedestrian light luminaires shall be 18" round globe, 100 watt high pressure sodium vapor with constant wattage ballast, rated 240v when available.. The luminaires shall be as manufactured by Welsback Lighting, Inc., Deville Model T7WH7700 with cast aluminum ballast housing and cast aluminum post fitter, or approved equal. Ballast housing and post fitter to be painted with Benjamin Moore Color PV-61 Blue or approved equal via EP-S system.



**JUNCTION BOX DETAILS**

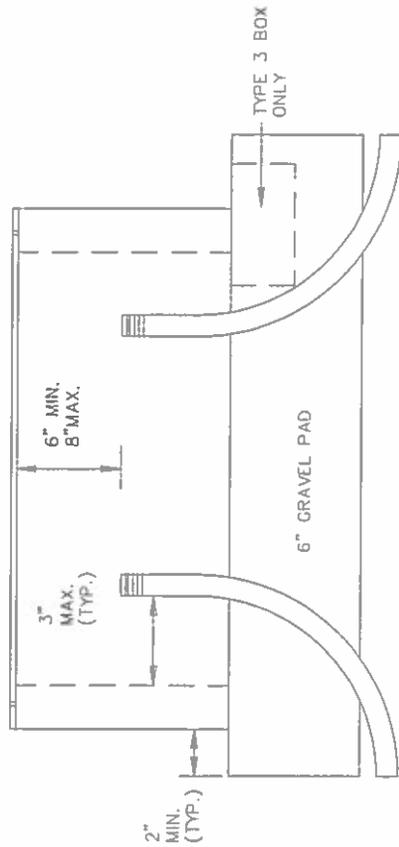
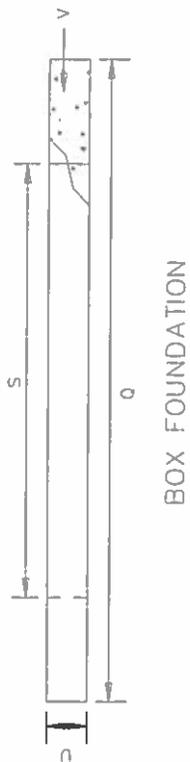
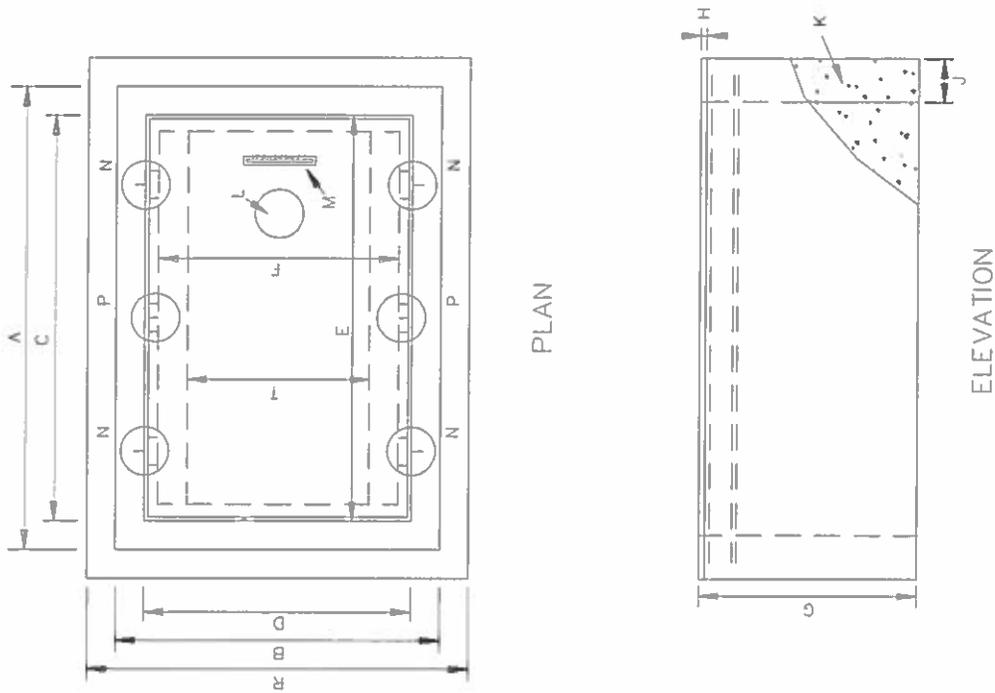
Junction Box Dimension Table

M A R K	ITEM	BOX TYPE			
		TYPE 1		TYPE 2	TYPE 3
		ALTERNATIVE 1	ALTERNATIVE 2		
A	Box outside length	22"	22"	33"	42"
B	Box outside width	17"	17"	22-1/2"	30"
C	Box inside length	18"	18"	28"	36"
D	Box inside width	13"	14"	17"	24"
E	Lid length	18"	18"	26-1/2"	38"
F	Lid width	13"	13"	17"	26"
G	Box depth	12"	12"	12"	12"
H	Lid and frame depth	5/16"	5/16"	5/16"	1/2"
J	Wall thickness (Minimum)	1-1/2"	1-1/2"	1-1/2"	3"
K	Wire reinforcement	W-3	W-2.5	W-2.5	W-5
L	Legend	See Detail	See Detail	See Detail	See Detail
M	Handle	N/A	N/A	N/A	See Detail
N	Frame slot mark	N/A	N/A	N/A	See Detail
P	Lid hook mark	N/A	N/A	N/A	See Detail
Q	Foundation outside length	N/A	N/A	N/A	48"
R	Foundation outside width	N/A	N/A	N/A	36"
S	Foundation inside length	N/A	N/A	N/A	36"
T	Foundation inside width	N/A	N/A	N/A	20"
U	Foundation depth (Minimum)	N/A	N/A	N/A	3"
V	Foundation reinforcement	N/A	N/A	N/A	2-W-5
	Capacity - Conduit Diameter	6"	6"	12"	24"
Note: a 1% tolerance is allowed.					

## Notes:

1. All box dimensions are minimum. Exact configurations vary among different manufacturers.
2. The noted lid thicknesses are overall minimums. The diamond pattern for Type 1 or Type 2 boxes shall be 28% minimum of overall thickness. The diamond pattern for Type 3 boxes shall be 3/32" minimum thick.
3. Lid support members shall be welded to the frame.
4. When noted in the contract, Type 2 and Type 3 boxes shall be provided with 12" deep extension boxes.
5. When noted in the contract, Type 2 boxes shall be provided with a 10" x 27-1/2", 10 gage divider plate complete with fasteners.
6. Non-concrete boxes may be submitted for approval. Evaluation will include an H-20 load test.

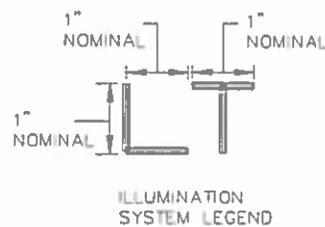
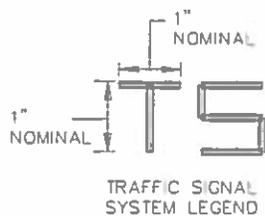
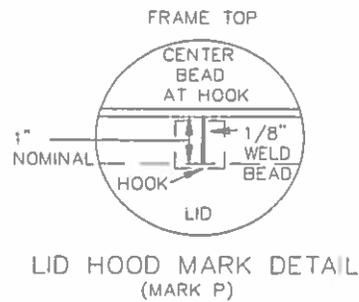
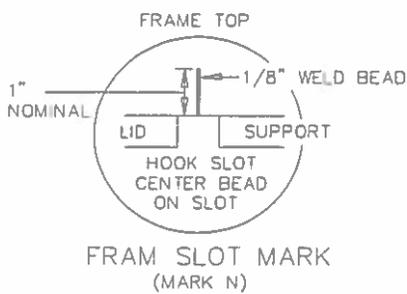
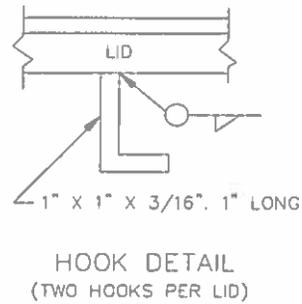
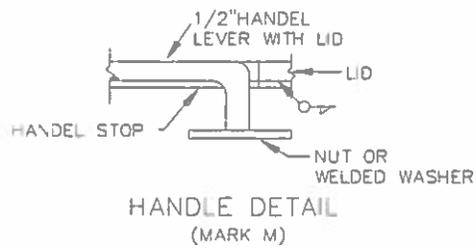
JUNCTION BOX DETAILS, Cont.



TYPICAL JUNCTION BOX INSTALLATION DETAILS

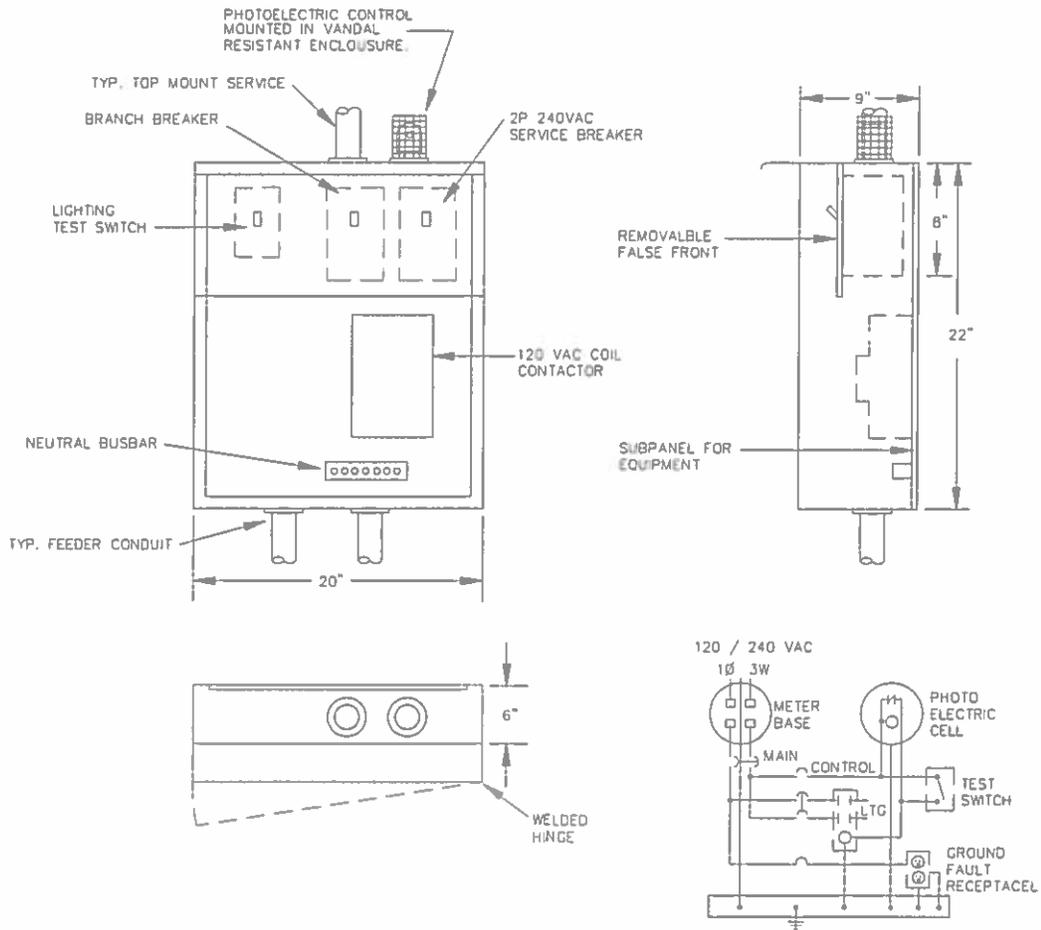
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JUNCTION BOX DETAILS, Cont.



LEGEND DETAIL  
FORM LETTERS WITH 1/8" WELD BEAD  
GRIND OFF DIAMOND PATTERN  
BEFORE FORMING LETTERS

## TYPICAL SERVICE LIGHTING DETAILS



ID-117

## Notes:

1. The contractor shall verify the requirements of the utility prior to installing the service equipment.
2. All service pole conduit shall be secured to the pole with conduit strap at minimum 5' centers.
3. All risers and service equipment shall be installed on side of pole that is away from traffic.
4. Where required by the serving utility, service breakers shall be installed above the meter socket in a separate rain tight enclosure.
5. Attach all conduit to pole within 1' of enclosure. See drawing page 11-7
6. For service wiring diagram, use Standard Plan, page 11-7.
7. Submit breaker schedule in contract for breaker and contactor sizes.
8. All exposed conduit to be rigid galvanized steel to 18" below grade.