

STREET LIGHT STANDARD PLANS

DESCRIPTION

600 SERIES – STREET LIGHT STANDARDS

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GENERAL NOTES:

1. ALL WIRING METHODS AND EQUIPMENT CONSTRUCTION SHALL CONFORM TO THE CURRENT NATIONAL ELECTRICAL CODE.
2. ALL WIRING SHALL BE IN APPROVED CONDUIT. ALL CONDUIT SHALL BE A MINIMUM OF 2" DIAMETER, SCHEDULE 80 P.V.C. (POLYVINYL CHLORIDE), EXCEPT FROM EACH STREET LIGHT TO THE ADJACENT PULL BOX WHICH MAY BE 1" DIAMETER PVC OR METAL, AND SHALL HAVE THE FOLLOWING COVER FROM TOP OF CONDUIT.
 - A. WITHIN SIDEWALK OF PARKWAY AREAS: 2' - 0" MIN.
 - B. WITHIN ROADWAY AREAS: 3' - 0" MIN.
3. ALL METAL CONDUIT AND OTHER METAL PARTS SHALL BE CONTINUOUSLY BONDED AND GROUNDED.
4. ALL BENDS AND/OR OFFSETS SHALL BE MADE WITH FACTORY SECTIONS. 90-DEGREE ELBOWS USED FOR STUB-UPS SHALL BE P.V.C.-COATED RIGID STEEL CONDUIT ELBOWS.
5. UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF PUBLIC WORKS, A NO. 5 PULL BOX (STATE STD. ES-8) SHALL BE USED AT ALL STREET LIGHT STANDARDS.
6. ALL PULL BOXES SHALL BE PER CITY STD. 607.
7. JUNCTION BOXES SHALL BE NOT MORE THAN 250' APART ON LONG RUNS.
8. WHEN PULL BOXES ARE SUBJECT TO VEHICULAR TRAFFIC, THEY SHALL BE SET ON CONCRETE FOOTINGS AND CAST IRON TRAFFIC COVERS SHALL BE INSTALLED.
9. ALL SPLICES SHALL BE MADE WITH APPROVED SOLDERLESS WATERPROOF CONNECTORS OF THE PROPER SIZE PER NEC 300-15. (EXAMPLE: WIRENUT OR SPLIT BOLT PLUS TAPE PLUS COATING.) ALL SPLICES SHALL BE LOCATED IN AN APPROVED BOX.
10. ALL EMPTY CONDUITS SHALL HAVE A 1/4" NYLON PULL ROPE PROVIDED INSIDE.
11. ALL CONDUITS SHALL BE SEALED WITH AN APPROVED DUCT SEAL. CONDUITS STUBBED FOR FUTURE EXTENSION SHALL BE CAPPED.
12. ALL STREET LIGHTING PROJECTS ARE SUBJECT TO APPROVAL BY THE DIRECTOR OF PUBLIC WORKS.
13. ALL PULL BOX COVERS SHALL BE SECURED WITH BRASS HOLD DOWN BOLTS AND INSCRIBED, "STREET LIGHTING".
14. STREET LIGHT SPACING SHALL BE A MAXIMUM OF 200' FOR MINOR/COLLECTOR STREETS AND 100' FOR MAJOR STREETS. STREET LIGHT SPACING SHALL BE STAGGERED AND LOCATED AT PROPERTY LINES WHEN POSSIBLE.
15. THE MINIMUM-AVERAGE MAINTAINED FOOT CANDELLAS AND UNIFORMITY RATIO OF ALL STREET LIGHTING SHALL COMPLY WITH STD. 606.
16. ALL STREET LIGHTS EQUIPPED WITH A PHOTOCELL CONTROL SHALL HAVE THE PHOTOCELL ORIENTED TO THE NORTH.
17. ALL WIRE SHALL BE THHN A.W.G. THE MINIMUM SIZE SHALL BE #8.
18. SHIELDS SHALL BE PROVIDED ON ALL STREETLIGHTS TO PREVENT UNNECESSARY LIGHT POLLUTION, AND ARE SUBJECT TO APPROVAL BY THE DIRECTOR OF PUBLIC WORKS.

SHEET 1 OF 2

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**STREET LIGHTING
GENERAL NOTES**

STD. NO.
600

SCALE: NONE | DRAWN: ERJ | CHK: MGK | APPVD: *Thomas M. Mannett*

DATE: OCT 2009

GENERAL NOTES (CONTINUED):

THE FOLLOWING NOTES DO NOT APPLY TO CITY-FUNDED PROJECTS:

- 19. LIGHT POLES ON ALL STREETS OTHER THAN MINOR STREETS OR CUL-DE-SACS SHALL BE GALVANIZED STEEL STANDARDS IN ACCORDANCE WITH CITY STANDARD PLANS. THE POLE HEIGHTS SHALL BE AS DELINEATED ON THE CITY STANDARDS.
- 20. THE DEVELOPER/ENGINEER SHALL MAKE ARRANGEMENTS FOR SERVICE POINTS WITH P.G.&E. THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED THEREWITH WHICH SHALL BE PAID DIRECTLY TO P.G.& E. THE CONTRACTOR SHALL VERIFY THE STREET LIGHT SERVICE POINT LOCATION(S) WITH P.G.&E. PRIOR TO INSTALLATION.
- 21. DEVELOPMENTS LOCATED OUTSIDE CITY LIMITS SHALL INSTALL ALL CONDUITS, PULL BOXES, AND WIRING FOR THE PROPOSED STREET LIGHT SYSTEM. A FEE PER LIGHT POLE SHALL BE COLLECTED FROM THE DEVELOPER AT THE TIME OF IMPROVEMENT PLAN APPROVAL TO PAY FOR FUTURE INSTALLATION OF FOUNDATIONS, POLES, MAST ARMS, AND LUMINAIRES BY CITY REPRESENTATIVES.
- 22. ALL STREET LIGHT SYSTEMS SHALL BE DESIGNED FOR 120 VOLT SERVICE UNLESS CONNECTING TO AN EXISTING SYSTEM. IN THE LATTER CASE, THE DESIGN SHALL CONFORM TO THE SYSTEM BEING CONNECTED TO AND MUST BE SPECIFICALLY APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
- 23. THE CURRENT TO BE USED TO DETERMINE CONDUCTOR SIZES SHALL BE DETERMINED AS FOLLOWS:

$$\frac{\text{Total Wattage of Fixtures Served}}{\text{Service Voltage}} \times 3.5$$

SHEET 2 OF 2

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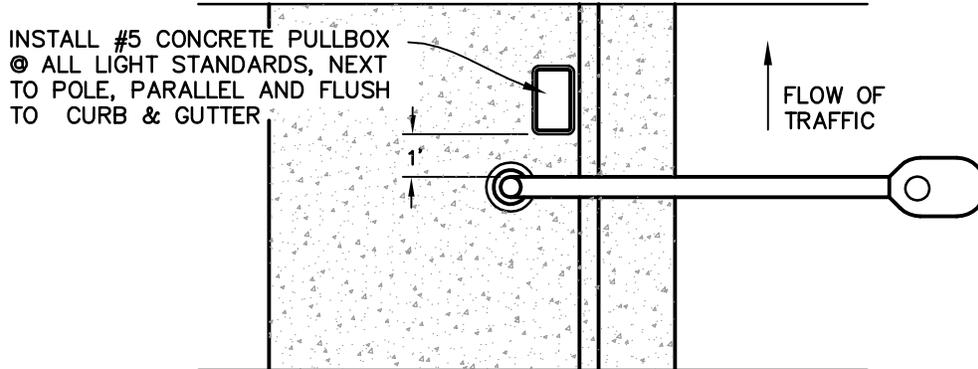
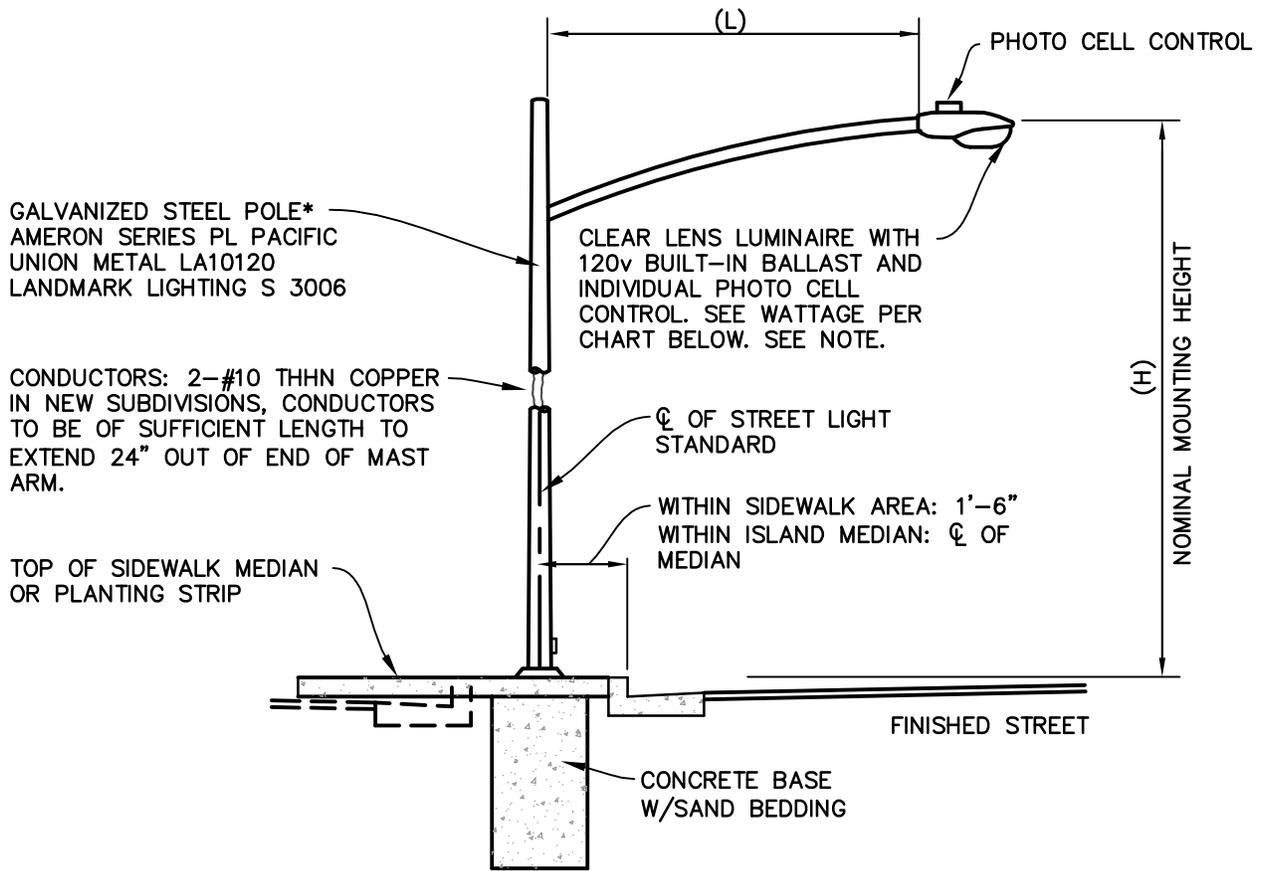
**STREET LIGHTING
GENERAL NOTES**

STD. NO.
600

SCALE: NONE | DRAWN: ERJ | CHK: MGK | APPVD: *Thomas M. Mannett*

DATE: OCT 2009

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NOTE:

EACH LUMINAIRE SHALL BE FITTED WITH A HOUSE-SIDE SHIELD AND SHALL HAVE AN OPTICAL SYSTEM PRODUCING TYPE II OR TYPE III DISTRIBUTION.

* ALTERNATES TO BE SPECIFICALLY APPROVED BY DIRECTOR OF PUBLIC WORKSING.

STREET CLASSIFICATION	POLE HEIGHT(H)	ARM LENGTH(L)	MAXIMUM SPACING
COMMERCIAL	32'-6"	8'-0"	100'
INTERMEDIATE	28'-0"	6'-0"	200'
RESIDENTIAL	27'-6"	4'-0"	200'



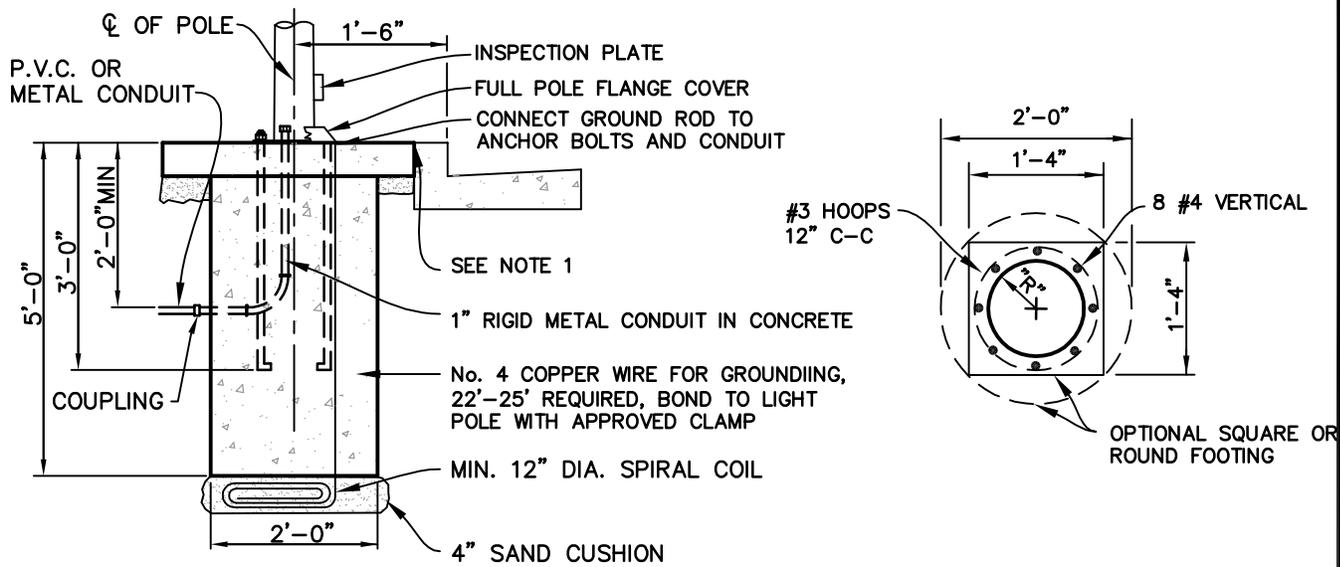
STANDARD STREET LIGHT

STD. NO.
601

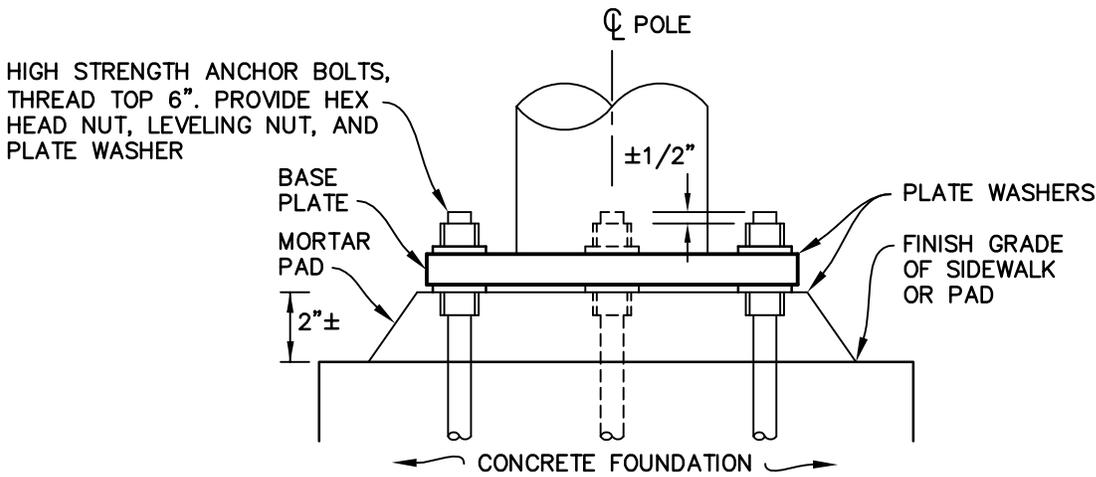
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DATE: OCT 2009

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CONCRETE FOOTING & BASE DETAIL



BASE LEVELING DETAIL

NOTES:

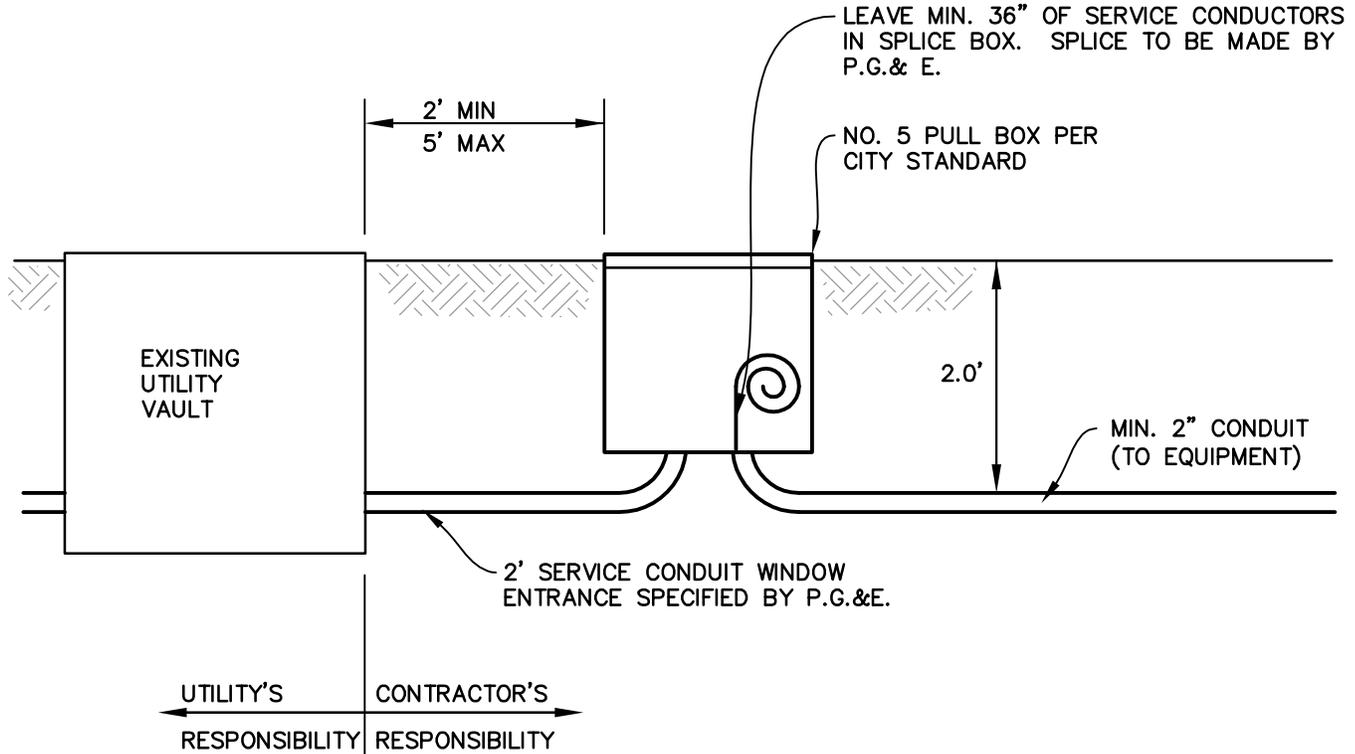
1. IN UNDEVELOPED AREAS, CONSTRUCT A 2'x2' CONC. PAD (4" THICK). IF ROUND FOOTING IS Poured, STOP AT THE ELEVATION OF BOTTOM OF THE SIDEWALK.
2. ANCHOR BOLT DIMENSION "R" AND BOLT PATTERN TO SUIT POLE BASE FURNISHED.
3. CONCRETE SHALL BE CLASS "A" P.C.C. AGAINST UNDISTURBED SOIL.
4. ALTERNATE FOUNDATIONS: QUICKSET MODEL NO. L.F.-54 BROOKS PRODUCTS INC. MODEL NO. 85C-109
5. A MINIMUM OF TWO FULL THREADS TO BE EXPOSED ABOVE ANCHOR BOLT NUTS.
6. FOUNDATION BOLTS SHALL NOT BE CUT OFF FOR ANY REASON. EXTENSION BOLTS WILL NOT BE PERMITTED.



STREET LIGHT DETAILS

STD. NO.
602

SCALE: NONE | DRAWN: ERJ | CHK: MGK | APPVD: *Thomas M. Mennett* | DATE: OCT 2009



NOTES:

1. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
2. CONTRACTOR TO INSTALL CONDUIT INTO UTILITY CO. VAULT WITH UTILITY CO. REPRESENTATIVE IN ATTENDANCE.
3. CONTRACTOR TO INSTALL NO. 5 PULL BOX AND 2" SERVICE CONDUIT (WHEN NONEXISTENT) AND 2" CONDUIT AND CONDUCTORS FROM EQUIPMENT TO PULL BOX.



ELECTRIC SERVICE DETAIL

STD. NO.
603

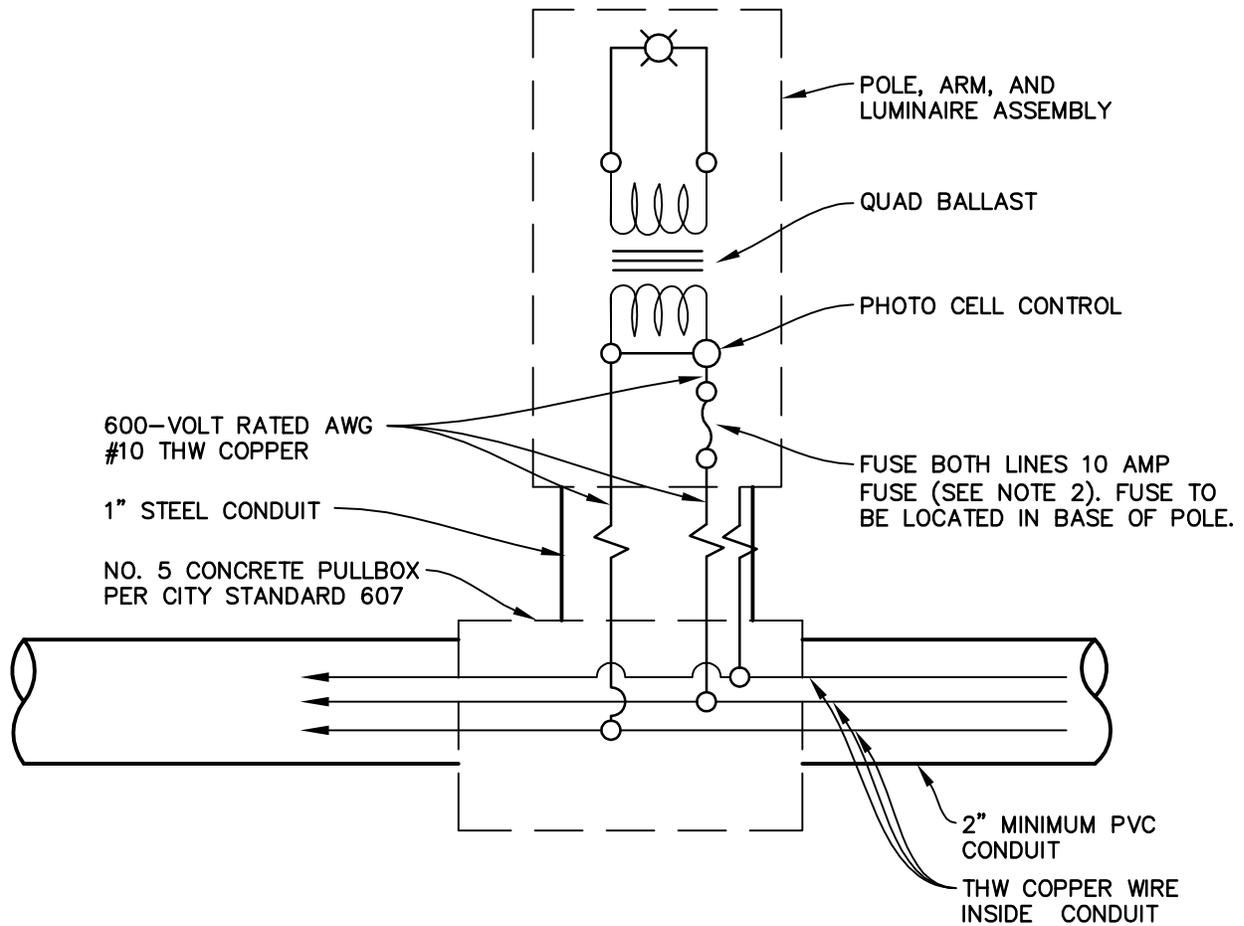
SCALE: NONE

DRAWN: ERJ

CHK: MGK

APPVD: *Thomas M. Mannett*

DATE: OCT 2009



SCHEMATIC STREET LIGHT
WIRING DIAGRAM

NOTES:

1. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
2. 600V 30A IN-LINE WATERPROOF FUSE HOLDER SHALL BE USED.



STREET LIGHT WIRING DIAGRAM

STD. NO.
604

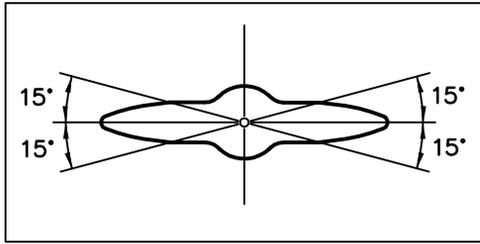
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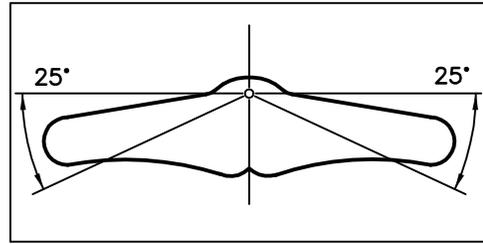
CHK: MGK

APPVD: *Thomas M. Mannett*

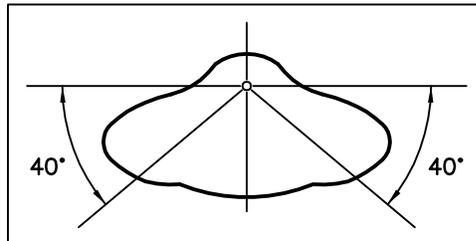
DATE: OCT 2009



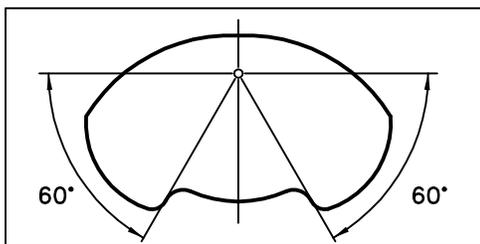
TYPE 1
CENTER OF STREET



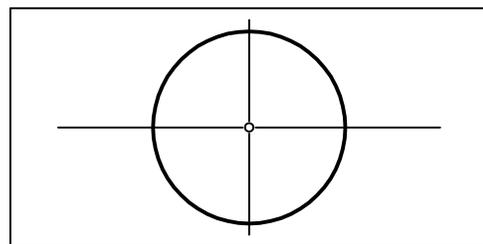
TYPE 2
SIDE MOUNTING
STANDARD FOR LOCAL STREETS
UNLESS NOTED OTHERWISE.



TYPE 3
SIDE MOUNTING
STANDARD FOR COLLECTOR AND MAJOR
STREETS UNLESS NOTED OTHERWISE.



TYPE 4
SIDE MOUNTING



TYPE 5



I.E.S. LIGHT PATTERNS

STD. NO.
605

SCALE: NONE

DRAWN: ERJ

CHK: MGK

APPVD: *Thomas M. Mannett*

DATE: OCT 2009

AREA CLASS.	ROADWAY CLASS.	MIN. AVG. MAINTAINED F.C.	UNIFORMITY RATIO AVG.F.C./MIN.F.C.
RESIDENTIAL	LOCAL	0.20	6:1
	COLLECTOR	0.30	5:1
	MAJOR	0.50	4:1
INTERMEDIATE	LOCAL	0.30	6:1
	COLLECTOR	0.40	4:1
	MAJOR	0.60	3:1
COMMERCIAL	COLLECTOR	0.75	4:1
	MAJOR	1.00	3:1

AVERAGE MAINTAINED F.C. IS:
$$F.C. = \frac{(LL)(MF)(CU)}{(W)(S)}$$

- FC = ILLUMINATION IN FOOTCANDLES
- LL = RATED INITIAL LAMP LUMENS
- MF = MAINTENANCE FACTOR
- CU = COEFFICIENT OF UTILIZATION
- W = STREET WIDTH, CURB TO
- S = CURB SPACING OF LUMINARES

MINIMUM F.C. IS:
$$FC_{min} = (fc)(LF)(MF)(CF)$$

- FC_{min} = MINIMUM POINT FOOTCANDLES
- fc = RAW TOTAL FOOTCANDLES (AT DARKEST POINT)
- LF = LAMP FACTOR
- MF = MAINTENANCE FACTOR
- CF = MOUNTING HEIGHT CORRECTION FACTOR

UNIFORMITY RATIO =
$$\frac{\text{AVERAGE FOOTCANDLES}}{\text{MINIMUM FOOTCANDLES}}$$



ROADWAY ILLUMINATION

STD. NO.
606

SCALE: NONE | DRAWN: ERJ | CHK: MGK | APPVD: *Thomas M. Mannett*

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CONDUIT AND PULL BOXES

SERVICE RUN - 2" MINIMUM.
 UNDER ANY STREET - 2" MINIMUM, 36" TO TOP OF CONDUIT (MINIMUM).
 UNDER SIDEWALK OR PLANTER AREA - 24" TO TOP OF CONDUIT (MINIMUM).

ALL PULL BOXES SHALL BE #5 (STATE STD ES-8) EXCEPT THE MAIN PULL BOX WHICH SHALL BE 30" X 48" MINIMUM. COVERS SHALL BE MARKED "TRAFFIC SIGNAL".

PULL BOXES SUBJECTED TO VEHICULAR TRAFFIC SHALL BE INSTALLED WITH "TRAFFIC COVERS".

ALL CONDUITS SHALL BE SCH. 80 PVC.

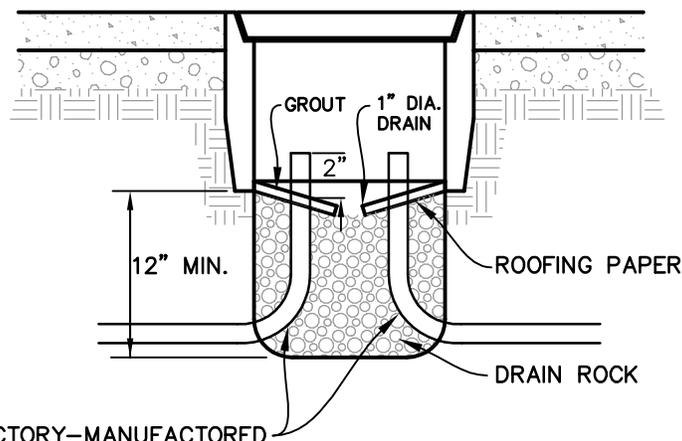
ALL UNDERGROUND CONDUITS AND METAL PARTS SHALL BE CONTINUOUSLY BONDED AND GROUNDED.

ALL BENDS AND/OR OFFSETS SHALL BE MADE WITH FACTORY SECTIONS. 90-DEGREE ELBOWS USED FOR STUB-UPS SHALL BE P.V.C.-COATED RIGID GALVANIZED STEEL.

ALL EMPTY CONDUITS SHALL HAVE A 1/4" NYLON ROPE PROVIDED INSIDE.

ALL PULL BOX COVERS SHALL BE SECURED WITH BRASS HOLD DOWN BOLTS.

ALL CONDUITS SHALL BE SEALED WITH AN APPROVED DUCT SEAL. CONDUITS STUBBED FOR FUTURE EXTENSION SHALL BE CAPPED.



90° FACTORY-MANUFACTURED LONG RADIUS BEND(TYP.)



STREET LIGHT CONDUIT AND PULL BOXES

STD. NO.
607

SCALE: NONE

DRAWN: ERJ

CHK: MGK

APPVD: *Thomas M. Mannett*

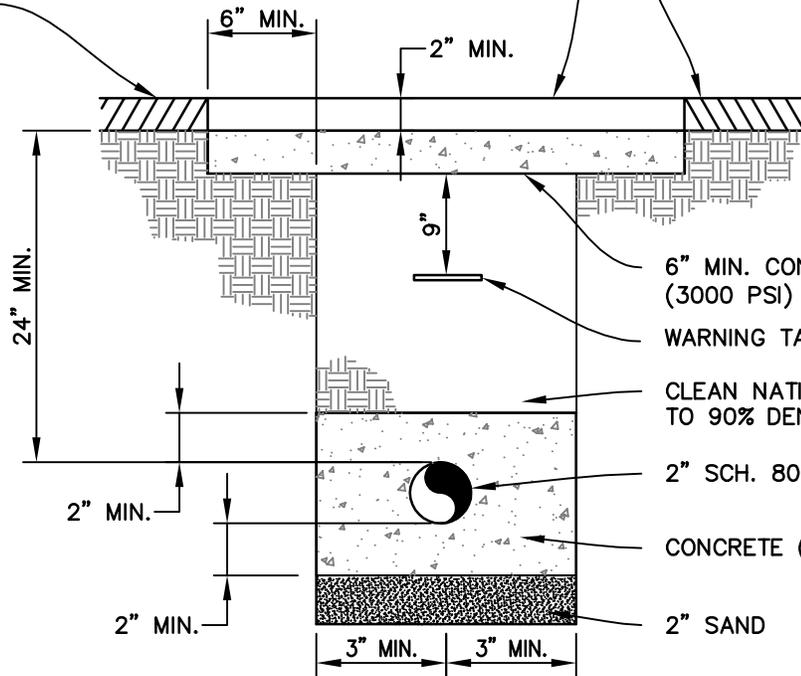
DATE: OCT 2009

SAW CUT (E) MATERIAL
BACK 6" FROM EXCAVATED
AREA SO EDGE OF PATCH
IS ON UNDISTURBED EARTH

REPLACE WITH IDENTICAL MATERIAL
AND FINISH AS (E) PAVING. MINIMUM
THICKNESS OF REPAIRS SHALL MATCH
(E) MATERIAL

EXISTING PAVING TO REMAIN
UNDISTURBED THICKNESS MAY VARY

FINISHED
GRADE



6" MIN. CONCRETE IN PAVED AREAS
(3000 PSI)

WARNING TAPE

CLEAN NATIVE BACKFILL COMPACTED
TO 90% DENSITY

2" SCH. 80 P.V.C. CONDUIT (TYP.)

CONCRETE (3000 PSI)

2" SAND

NOTES:

1. REFER TO STD NO. 223 FOR LOCATION OF JOINT
UTILITY TRENCH WITHIN THE PUBLIC RIGHT-OF-WAY.



STREET LIGHT CONDUIT

STD. NO.
608

SCALE: NONE

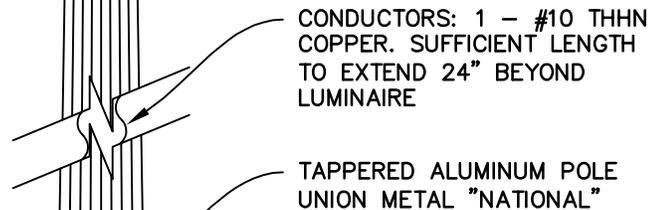
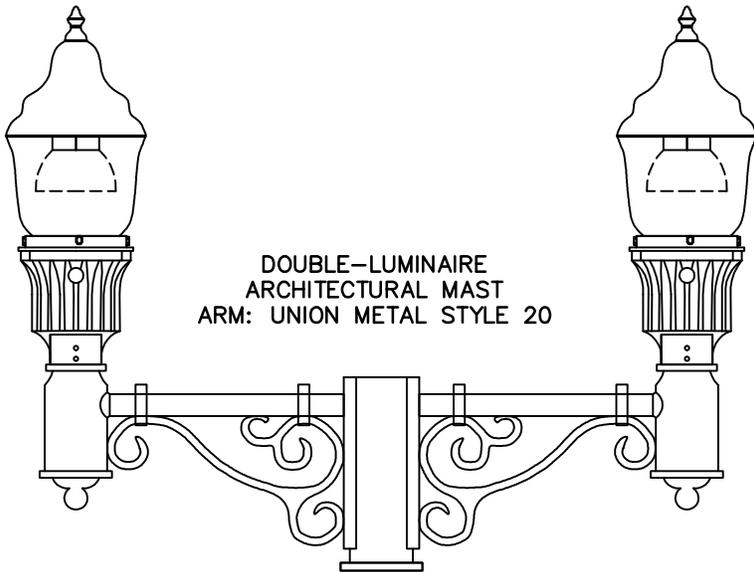
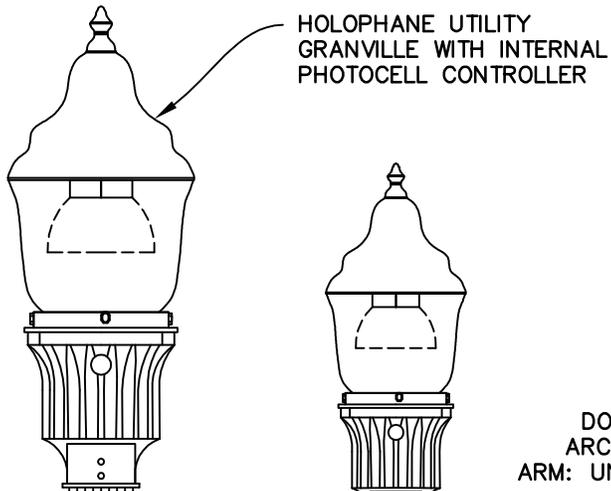
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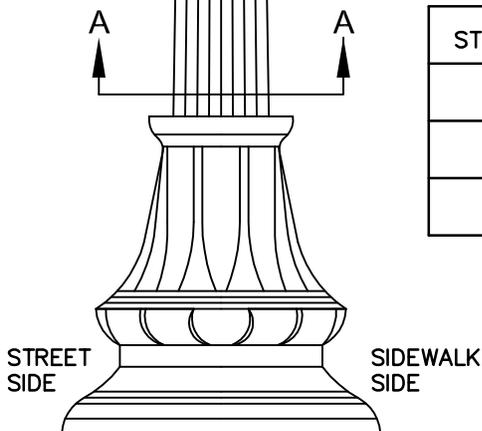
APPVD: *Thomas M. Mannett*

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SECTION A-A
12 FLUTE



STREET CLASSIFICATION	POLE HEIGHT (H)	MAXIMUM SPACING
COMMERCIAL	14'-6"	100'
INTERMEDIATE	11'-0"	100'
RESIDENTIAL	8'-6"	100'



ARCHITECTURAL STREET LIGHT

STD. NO.
609

SCALE: NONE

DRAWN: ERJ

CHK: MGK

APPVD: *Thomas M. Mannett*

DATE: OCT 2009