



**CUY-90-14.90**

**PID 77332/85531**

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**APPENDIX TC-12**

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**Lighting Provisions  
(Contract Document)**

State of Ohio  
Department of Transportation  
Jolene M. Molitoris, Director

**Innerbelt Bridge  
Construction Contract Group 1 (CCG1)**

Revision Date: January 6, 2010

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## **GENERAL STREET AND PEDESTRIAN LIGHTING REQUIREMENTS**

### **Street and Pedestrian Lighting**

#### ***Luminaires***

Luminaires shall have an IES Type III distribution and a 400 watt High Pressure Sodium Lamp.

Cast aluminum housing shall house a 400 watt high pressure sodium system. Color shall be Dark Bronze. Housing shall be fitted with NEMA photocontrol receptacle and photoelectric cell with quick disconnects for ease of maintenance. Housing shall be capable of mounting on CPP standard Round Tapered Fiberglass Pole.

Multi-Tap ballast assembly shall be mounted on a removable tray with quick disconnects for ease of installation and maintenance. Multi-tap ballasts shall be wired for 240V operations.

Street and Pedestrian Luminaires shall match in style.

Luminaires shall be one of the following models:

- a. Manufacturer – Kim Lighting (<http://www.kimlighting.com/>)  
Models - The Archetype or Structural
- b. Manufacturer – LSI Industries (<http://www.lsi-industries.com/>)  
Models - Challenger II
- c. Manufacturer – Cooper Lighting (<http://www.cooperlighting.com/>)  
Model - TLM/TLL Talon (TLL Talon Medium) or AVM Vision
- d. Manufacturer – Holophane (<http://www.holophane.com/>)  
Model - Pechina
- e. Manufacturer – GE  
(<https://secure.ge-lightingsystems.com/gels01/r2/productcentral/htmls/home.html>)  
Models - ThinScape or Criterion Area Lighting

#### ***Poles***

Street light poles shall be the 30-foot Cleveland Public Power (CPP) Standard Round Tapered Fiberglass Pole.

Pedestrian light poles shall conform with the CPP Standard Round Tapered Fiberglass Pole requirements except height shall be  $\frac{1}{3}$  to  $\frac{1}{2}$  the height of the Street light pole but no less than 12 feet tall.

#### ***Arrangements***

Luminaires shall have an opposite arrangement with pedestrian lighting poles evenly spaced between street lighting poles.

## CPP DESIGN NOTES

### CLEVELAND PUBLIC POWER STREET LIGHTING STANDARDS

#### DEFINITIONS:

**LUMEN:** A unit measurement of the total, uniform light output, luminous flux, from a light source.

**FOOTCANDLE:** One lumen of luminous flux uniformly falling on an area of one square foot. Occasionally, you will see a measurement of this uniform light called a lux. A lux is metric, i.e., a lumen of luminous flux uniformly falling on an area of one square meter. One footcandle equals approximately 10.76 lux, one lux equals 0.093 footcandles.

**HORIZONTAL FOOTCANDLE:** One footcandle of illumination falling on a horizontal plane such as the roadway pavement.

**UNIFORMITY RATIO:** The ratio of the average intensity to the minimum light intensity. The Illumination Engineers Society of North America (IESNA) recommends that this ratio not exceed 6:1. Cleveland Public Power utilizes a pole spacing and fixture height to overlap lighting patterns for an average ratio of 3:1.

**LLD (Lamp Lumen Depreciation):** The amount the lumen level decreases as a lamp ages, using a factor between 0.0 and 1.0. A mercury vapor lamp, for example, depreciates between 0.3 to 0.7 as the lamp reaches its rated life. Cleveland Public Power installs High Pressure Sodium lamps which have a much better (0.8) LLD.

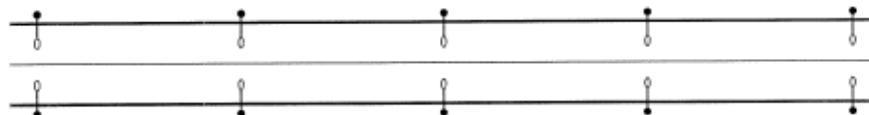
#### LUMINAIRE ARRANGEMENTS:



ONE SIDE: Pavement up to 3 lanes.



STAGGERED: Pavement up to 5 lanes.



OPPOSITE: Wide pavements, intersections or roads requiring high light levels.

**ROADWAY TYPES:**

**ROADWAY CLASSES-**

MAJOR (ARTERIAL): Main network streets. (Ex.: St. Clair Ave., Lorain Ave.) Street width > 45'; pole spacing 150' (400W HPS, Typical). Streets wider than 75' will get custom design work.

COLLECTOR: Connectors between major and local roads. (Ex.: East 18th St., Coit Rd., lower Fulton Road.) Street width 36' to 45'; pole spacing 140'/150' (250W HPS, Typical).

LOCAL: Roads used for direct access to properties. (Ex.: East 143rd St., West 32nd St.) Street width 25' to 35'; pole spacing 120' (150W HPS, Typical).

ALLEY: Those streets designated as places or courts. Street width usually 25' or less; pole spacing 110' (100W HPS, Typical).

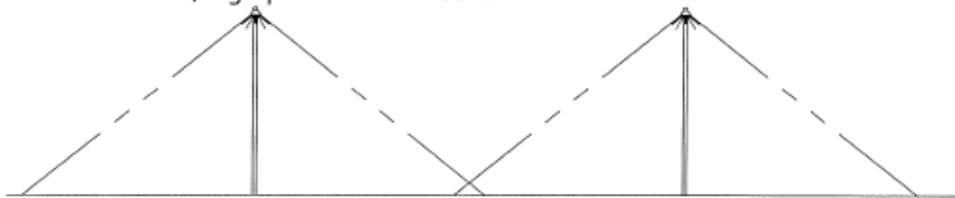
**MAJOR & COLLECTOR MOUNTED AT 30', LOCAL AT 25' ABOVE THE ROADWAY.**  
At the discretion of the Bureau of Streetlighting these mounting heights may be increased to maximize lighting patterns.

**AREA CLASSES-**

RESIDENTIAL: Residential homes or a mix of residential and light commercial, low nighttime parking and pedestrian traffic.

INTERMEDIATE: Moderate nighttime traffic and parking turnover with moderate pedestrian traffic.

COMMERCIAL: High nighttime vehicular use, parking demand and turnover, high pedestrian traffic.



**CLEVELAND PUBLIC POWER FOOTCANDLE STANDARDS**  
**(AVERAGE/MINIMUM)**

	RESIDENTIAL	INTERMEDIATE	COMMERCIAL
MAJOR (ARTERIAL)	2.1/0.7	3.6/1.2	4.0/1.4
COLLECTOR	1.5/0.5	2.7/0.9	3.6/1.2
LOCAL	1.0/0.3	1.8/0.6	2.4/0.8

These standards exceed the standards detailed by the IESNA.

**STREETLIGHT FIXTURE TYPES:**

TYPE	INITIAL LUMENS	LUMENS AT RATED LIFE	RATED LIFE (HRS., AVERAGE)	ACTUAL LIFE (HRS., AVERAGE)
175W MERCURY VAPOR*	8150	2500-5700	24000	30000+
400W MERCURY VAPOR*	22500	6800-16000	24000	30000+
100W HIGH PRESSURE SODIUM	9500	6650	24000	20000
150W HIGH PRESSURE SODIUM	16000	11200	24000	20000
250W HIGH PRESSURE SODIUM	27500	19250	24000	20000
400W HIGH PRESSURE SODIUM	50000	35000	24000	20000
175W METAL HALIDE	14400	10800	10000	10000
250W METAL HALIDE	22000	16000	10000	10000
400W METAL HALIDE	41000	32800	10000	10000
1000W METAL HALIDE	115500	87000	10000	10000

**NOTE:** In the Cleveland area, an average streetlight burns approximately 4100 hours per year.

\* Mercury Vapor is no longer offered for new installations.

**FIXTURE CHARACTERISTICS:**

TYPE	ADVANTAGES	DISADVANTAGES	COLOR TEMPERATURE (degrees Kelvin)
MERCURY VAPOR	Very long life, very little maintenance	Poor lumens to watts ratio, terribly inconsistent light loss as lamp ages	Blue and green spectrum light, "cadaver" glow (3100K to 3700K)
HIGH PRESSURE SODIUM	Excellent lumens to watts ratio, moderate light loss as lamp ages	Higher maintenance fixture, light "cycles" as it ages, life of lamp is shorter than predicted and inconsistent	Yellow spectrum light, yellow tint makes it "easy" to see at night (2100K to 2300K)
METAL HALIDE	Lamp filament is not sensitive to vibration, making it a good choice for bridges, excellent choice for football fields and arenas	Lumens to watt ratio is not as good as HPS, short lamp life, long restrike time (10-12 min.) after a power outage	Very natural spectrum light (3800K to 4300K)

**NOTE:** Sunlight color temperature is approximately 5500 degrees Kelvin.

## **CPP CONSTRUCTION NOTES**

Contact Ohio Utilities Protection Service, two working days prior to start of construction. In Ohio, call toll free 1-800-362-2764. It's The Law.

All power conduit runs are to be constructed by using 2", 4", 5", or 6" pvc schedule EB conduits, encased with a 3" concrete envelope, unless otherwise noted. The concrete envelope is to be 4000psi (City of Cleveland Concrete Mix).

A rugged polyethylene material warning tape capable of resisting high or low ph conditions must be placed above the electrical conduit bank. This warning tape is to be six inches wide, red in color, and imprinted with the words, "DANGER - BURIED HIGH VOLTAGE CABLES BELOW". This tape is to be placed 6" above the newly installed duct bank. This shall conform to the standards as set by Ohio Utilities Protection Service.

As an option, contractor may elect to encase CPP's conduits in red concrete. Both methods are approved by Cleveland Public Power and are recommended by Ohio Utilities Protection Service.

All conduits runs are to be installed at a minimum depth of 2'-6" below the existing and/or proposed grades, or as shown on the profile sheets, except those that are under any railroad or RTA tracks. The conduits will be installed at a minimum depth of 60" below the rail ties. Also, at any railroad crossings, conduits are to be encased in a steel pipe. See drawings issued by Cleveland Public Power for details.

Vertical and horizontal curves shall have a minimum radius of no less than 30 feet. These curves are to be constructed by using the appropriate 5° couplings, and associated chord lengths of conduits as noted on the plan view and/or as shown on the Conduit Curve Construction Chart. Any other curve design, field changes, or the use of preformed radius bends must be approved by the Engineering Department of Cleveland Public Power.

All manhole outside walls and conduits runs are to have a minimum clearance of 5' (face to face), horizontally from all water lines. Vertical clearance shall be at a minimum of 1'-6", or as shown on the profile sheets of the project. Clearance between other utilities shall be 1', unless noted otherwise. CPP's duct bank shall cross over or under other utilities at an angle of no less than 45°.

Any conduit runs that are crossing any steam lines shall have a minimum clearance of 5', or as shown on the profile sheet of the project. In the event that this cannot be accomplished, notify the Engineering Department of Cleveland Public Power prior to the installation of our conduits.

Each newly constructed manhole shall be free of all foreign objects and debris. The contractor shall also provide a pulling line in each of the new conduits. All manhole covers should be inscribed with the Cleveland Public Power logo "CPP".

The contractor shall provide Cleveland Public Power with as-built plans of the newly installed conduit system, showing both vertical and horizontal locations. These locations shall be at 50' intervals. All elevations are to be based on Cuyahoga County Regional Geodetic Surveys.

## **BACKFILL MATERIAL AND BACKFILLING PROCEDURES**

All backfill material used under any pavement shall be crushed limestone or gravel as per ODOT Item 304-Aggregate Base. Crushed air-cooled slag meeting #304 gradation may be used with prior written approval of the Division of Engineering and Construction inspector. The use of sand or #57 aggregate as a premium backfill is prohibited. Sand may only be used as indicated on the plan details for items such as conduit cover. The sand material shall be natural river or bank sand; free of silt, clay, loam, friable or soluble materials and organic matter. The backfill shall be installed in 4 inch (4") lifts and compacted using mechanical means only. Compact to within 12" of sub grade and each layer of backfill to 95% maximum dry density as determined by Standard Proctor Test (ASTM D698). The use of water for compaction is prohibited, e.g. flooding or puddling. Sand used as embankment construction and as backfill around structures shall be ODOT Item 203-Embankment or meeting the requirements of 703-Special Backfill Material of the section.

Employ a placement method that does not disturb or damage conduit encasement.

Do not backfill over wet, frozen or unstable subgrade surfaces.

## **FLOWABLE FILL SPECIFICATIONS FOR UTILITY TRENCHES**

### ***PART I CERTIFICATE OF COMPLIANCE***

Material must come from a plant with a current Certificate of Compliance demonstrating the ability of the mix design to meet the specified requirements. Certificates in excess of one year will not be accepted. Certificates must contain the name of supplier, date, contract number and mix design data on each delivery ticket.

### ***PART II MATERIALS***

All materials shall conform to the applicable requirements stated herein.

1. Cement shall be ASTM C-150 Type I.
2. **The use of Fly Ash is strictly prohibited.**
3. Fine aggregate shall conform to ODOT Specification 703.03 Fine aggregate for Mortar and Grout (ODOT Construction and Materials Specifications most current edition). The use of spent foundry sand or core sand is strictly prohibited.

### ***PART III PERFORMANCE ENHANCING ADMIXTURE***

An air-enhancing admixture shall be incorporated in the mix that will have the effect of lowering the water/cement ratio to between 95 and 105 lbs/cubic foot. The air entrained content for the mix shall be 30% to eliminate/minimize the excessive water and segregation. Compressive strengths shall have a range of 50 PSI to 80 PSI at 28 days will be required if additional excavation by machine or hand is required.

Approved Admixtures

<u>Manufacturer</u>	<u>Product</u>
a) Mater Builders	Rheofill
b) Axim	Flow Air
c) W.R. Grace	DaraFill
d) Or approved equal	

***PART IV FLOWABLE FILL MIX DESIGN***

The mix design shall be proportioned as follows:

Cement (Type I)	50 lbs/cubic yard
Sand (SSD)	2475 lbs/cubic yard
Water	25 gallons/cubic yard
Admixture (Air)	3 oz/cubic yard

**Variations of the aforementioned mix design are strictly prohibited**

***PART V APPLICATION***

1. Flowable fill shall begin 12 inches above the top of pipe and continue in the trench to the concrete base.
2. Material for pipe bedding and pipe zone to a minimum depth of 12 inches over the top of pipe shall be as specified by the utility.
3. Exposed bolts and valves exposed in the trench should be wrapped with polyethylene material conforming to ODOT 748.07 (8 mil thick).
4. Cover all joints in clay pipe in the trench area with polyethylene material before pouring flowable fill. Repair all observed openings in any pipe or manhole in the trench area prior to backfilling with flowable fill. Repair techniques shall be in accordance with the utility company's standard repair procedures.
5. Contact the respective utility owner for repair procedures.

## **CONCRETE DESIGN MIX (CTIY OF CLEVELAND MIX)**

Under this section of these specifications the contractor is required to submit a separate mix design for each combination of cement type, aggregate type, and concrete supplier they will use under this contract. Each mix shall be designed in accordance with ASTM C94-94 Option C and as herein modified.

### ***REQUIREMENT***

Minimum twenty-eight (28)

4000 PSI for 28 days compressive strength test. Four cylinders will be taken and tested as per ASTM C-39-94. One to be tested at seven days and the remaining three will be tested at twenty-eight days. Acceptance will be based on the average results of the three cylinders.

Minimum Cement Constant

650 lbs. per cubic yard. The cement shall conform to ASTM C-150-94 or C-595-94

Water Cement Ration

0.45 Maximum.

Slump

Nominal three inches (3") as per ASTM C-94-94 (2"-4" actual). The use of chemical admixtures meeting ASTM C-494, to increase the slump to a maximum of 7", may be used with prior written approval of the Division of Engineering and Construction inspector. If this option is selected the admixture and resultant maximum slump shall be submitted for approval.

Air Content

Four percent (4%) to seven and one-half percent (7 1/2 %) ASTM C-173-94 or C-231-94.

Aggregate Size

No. 57 for course aggregate shall be limestone, gravel or crushed air-cooled blast furnace slag. Both course and fine aggregate as per ASTM C 33-94.

If crushed air-cooled blast furnace slag is used it shall meet all of the requirements of ODOT 703.01 and ODOT 703.02. Copies of all tests and certifications for the crushed air-cooled blast furnace slag, if used, shall be submitted as part of the concrete mix design.

When high early strength is required, ASTM C-150-94 Type III A cements or admixtures in accordance with ASTM C-494-94 shall be used.

## **PAVEMENT REPAIR**

### ***Concrete Pavement***

All pavement openings shall be sawed full depth and have smooth vertical faces.

Dowels shall be required as per dowel table.

Concrete repaving shall be performed in such a manner that the entire lane and/or slab in which the repair area is located shall be restored. Should any portion of the repair area extend into an adjacent lane and/or slab, that lane or slab shall also be repaved.

### ***Asphalt Pavement***

All pavement openings shall be sawed full depth and have smooth vertical faces. Dowels shall be required as per dowel table.

Asphalt resurfacing shall be performed in such a manner that the entire lane in which the repairs are located shall be restored. Should any portion of the repair area extend into an adjacent lane, that lane shall also be resurfaced. For pavements with a width of 40' or less, a lane shall be considered 1/2 the pavement width.

Extend over cut in longitudinal direction two feet (2') unto undisturbed subgrade.

### ***Brick Pavement***

All streets within the City of Cleveland that are currently brick paved shall be replaced with brick, or as directed by the inspector representing the Division of Engineering and Construction of the City of Cleveland.

The contractor under this section of the specifications shall construct concrete base, pavement, sidewalk, driveway aprons, curb, curb and gutter sections, handicap ramps, and integral radius curb and walk. This includes the restoration of all adjacent surfaces which are disturbed by this construction at no cost to the City of Cleveland and/or Cleveland Public Power. Contractor shall take any and all measures necessary to ensure concrete is not defaced with graffiti, foot prints, tire tracks, and rocks, etc. by vandals.

## **REGULATIONS GOVERNING THE LAYING OF CONCRETE SIDEWALKS, APRONS, AND CURBING**

Concrete walks shall be of one-course construction and shall be four inches (4") in thickness, except in the downtown district where they must be six inches (6") in thickness. Concrete for walks, curbs, drives, and aprons shall be Class "C" concrete as per item 608 and Special of the "Supplemental to State Specifications for the City of Cleveland-1967".

When concrete walks are laid on clay, and extra excavation to a depth of one-and- one-half inches (1 1/2") must be made and filled with sand or gravel, to act as a foundation to the 4" of sidewalk proper.

No blocks of concrete shall be larger than six feet (6') and the joints must be cut by the use of an approved "Grooving Tool" making a groove one-fourth inch (1/4") deep. All edges shall be rounded with an approved "Edging Tool" to a radius of one-fourth inch (1/4").

Existing aprons and "drive areas" of the walk must be constructed of concrete. Aprons and the area of walk over which vehicles drive must be no less than six inches (6") in thickness, and must be laid in accordance with Supplemental to State Specifications for the City of Cleveland.

At all water-meter covers, gas boxes, hydrants, or other obstructions, neatly fitted openings shall be cut in the sidewalk. No walk shall be laid until all these obstructions have been raised or lowered to the correct elevations.

No obstructions shall be placed in front of any catch-basin, fire hydrant, fire alarm box or letter box, or near enough to the same to interfere with their use.

No change in the width of the walk to be laid shall be made from that of existing walks on the street at the time work is done under this permit, unless specifically permitted by the Director of Public Service. Trees, lawns, and shrubbery shall not be interfered with or destroyed by any work performed by the contractor. Walks must be laid to the same grade as existing walks on the street, unless permission for change of grade is obtained from the Director of Public Service.

Only one-half (1/2) of the sidewalk in the business district can be obstructed at one time, unless contractor has an obstruction permit. Gutters must be left open at all times.

The spacing between the walk and the curb line must be graded to allow water drainage, and must be of a gradual slope from the walk to the curb line.

The Contractor is responsible for removing all dirt and rubbish caused by his work.

**CURBING:** Curbing shall conform to the standards established for size and quality in the district in which it is to be installed. Cast-in-place concrete curbs and integral curbs, where used, shall conform to detail Plan No. ME-246 of the City of Cleveland.

Copies of these specifications and plans for Pavement Repair and Laying of Concrete Sidewalks may be obtained, upon request, from the Division of Engineering and Construction of the City of Cleveland.

## CPP STANDARD STREET LIGHT POLE REQUIREMENTS

### D.1 ROUND, TAPERED FIBERGLASS STREETLIGHT POLES

All poles shall be a hollow, truncated cone of suitable wall thickness and taper. The taper shall be uniform from top to bottom (any section shall be circular). Poles shall have tenon tops.

Any pole provided shall not weigh less than 95% of the manufacturer's advertised or specified weights.

Fiberglass poles furnished as part of this specification shall be capable of being fitted as follows:

#### Standard Streetlight Poles (any or all of the following items)

1. Decorative luminaire or roadway luminaire and mast arm at top of pole.
2. Up to two floodlights at top of pole.
3. Decorative luminaire at fifteen (15) feet above base of pole.
4. Duplex receptacle at seventeen (17) feet above base of pole.
5. Band mounted banner utilizing banner saver brackets (max. 20 square feet for a single banner, 30 square feet for double banners) located in the area between fifteen (15) and twenty-three (23) feet above base of pole.

#### D.1.1 Wind Loading

The poles furnished as part of this specification shall be designed in accordance with 90 MPH (30% gust factor) AASHTO wind loading. Certified mathematical wind load calculations must be submitted with the bid.

#### D.1.2 Material

The reinforcing glass shall be a commercial grade of "E" glass fibers in continuous filament, woven filaments, chopped strand forms or a combination of the same. The glass fibers shall be treated with a coupling agent compatible with the resin used. The pole shall be non-conductive and chemically inert. The

thermosetting resin shall contain ultraviolet inhibitors and pigment throughout.

D.1.3 Surface

The pole exterior surface shall be smooth and uniform in texture and color and should not contain any exposed surface fibers.

A non-woven polyester fabric tape is to be double wrapped over the uncured fiberglass pole. The polyester fabric is to be pre-saturated with polyester resin to impregnate the pole and insure a positive bond. The polyester fabric tape is to be applied to the pole to maintain surface integrity without significant noticeable change in appearance to ultraviolet, chemicals and extreme weather conditions.

The finish coat shall be a highly weather resistant, color pigmented polyurethane and shall have a dry film thickness of 1 1/2 mils minimum. Color, including all standard colors, to be determined at time of order. If not specified at time of order color shall be as follows:

Standard Streetlight Poles -  
Sherwin Williams Cleveland Light Pole Brown, or equal

The surface is to be tested for a minimum of 2,500 hours of accelerated testing in accordance with ASTM G-53, latest revision. The results shall indicate no fiber exposure, crazing, or checking. There may be only slight chalking and color may only dull slightly.

D.1.4 Reinforcing

Poles shall be reinforced in the area between fourteen (14) feet and twenty-four (24) feet above the ground line to allow band mounting of holiday ornaments or banners.

D.1.5 Duplex Receptacle

A weatherproof 120 V electrical duplex outlet shall be installed at seventeen (17) feet above the base on the Standard Streetlight Poles. Blank covers shall be provided to plug holes in cases where receptacles are not installed.

D.1.6 Pole Top

The pole top for the Standard Streetlight Poles 27', 30', 32' and 35' in height shall be a 3" O.D. x 3 1/2" long tenon. The tenon shall be aluminum or steel permanently attached to the pole shaft. The tenon shall be straight with no taper and coated with matching urethane finish. Standard Streetlight Poles shall also be supplied with a tenon cap.

D.1.7 Pull Wires

Poles shall have pull wires installed to facilitate installation of conductors.

D.1.8 Hand Hole

Each pole shall have a hand hole with a non-metallic, removable, lockable cover and seal. The cover shall be the same color and texture as the pole. The hand hole shall be 2-1/2" x 5".

D.1.9 Shipping

Each pole shall be individually wrapped with plastic shrink film or poly-bagged for protection during shipping and storage.

D.1.10 Base Plate and Cover for Anchor Base Poles

A one piece, steel (hot-dipped galvanized) anchor base casting shall be provided which is permanently attached to the bottom of the pole. The base shall be adhesively bonded to the pole and shall also be mechanically locked to the pole in such a manner that it cannot come loose even if the adhesive bond fails. The anchor base casting shall be capable of covering a bolt circle range of 11" to 15".

A removable clam-shell style elastomeric urethane cover of the same color as the pole shall be provided that completely surrounds the base.

D.1.11 Anchor Rods for Anchor Base Poles

One set of four (4) galvanized 1 inch anchor rods 40 (36 + 4) inches in length, each with two nuts and two washers, shall be furnished with each pole assembly. Anchor bolts shall conform to latest ASTM specification for high strength, galvanized anchor bolts, 50,000 psi minimum.

D.1.12 Loading Test

The manufacturer shall provide one (1) set of shop drawings for the pole and certified test data for deflection and ultimate strength shall also be submitted with the bid. All testing is to be performed on the pole with the appropriate size hand hole located on the compression side.

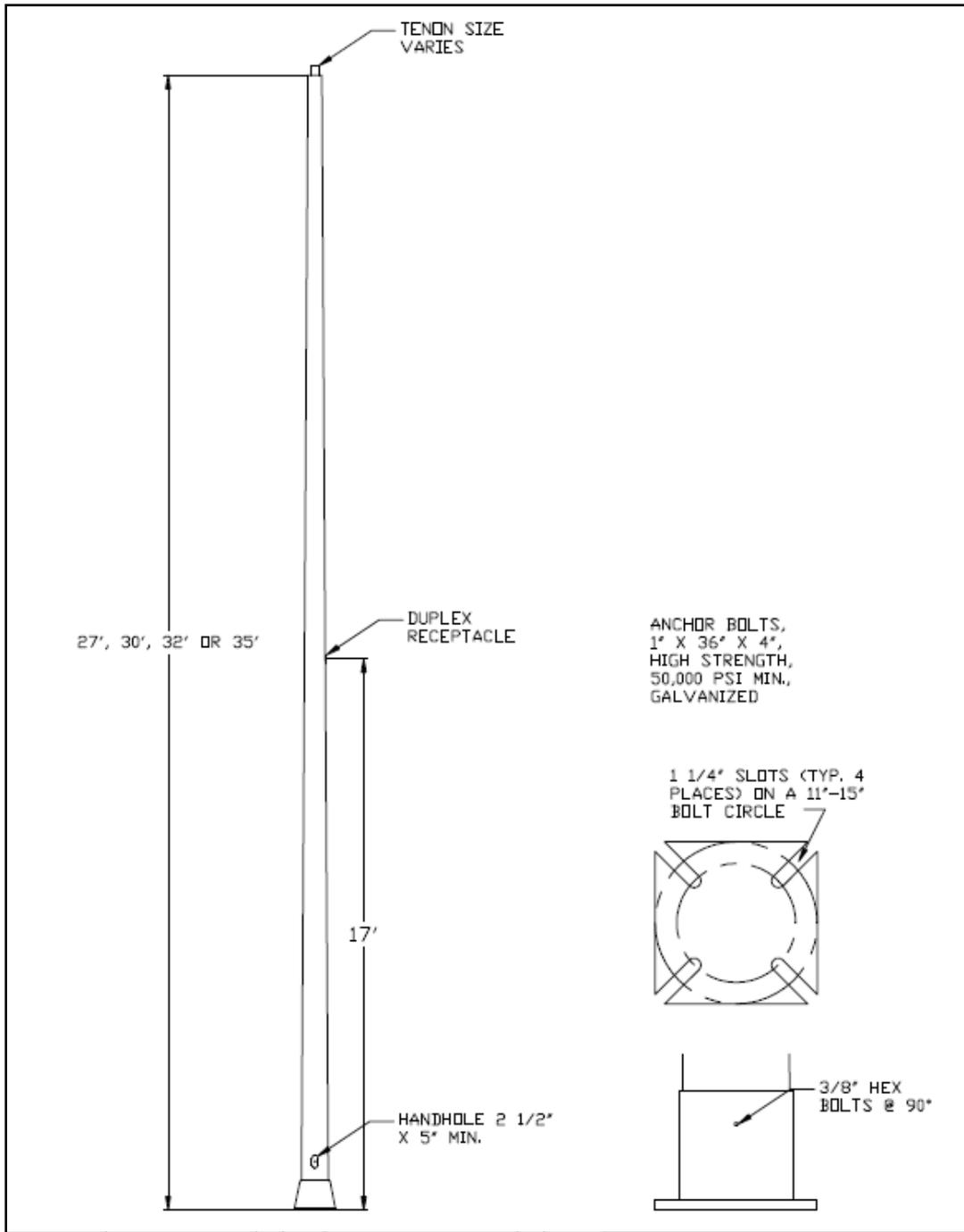
1.A horizontal load is to be applied in 100 pound increments at a point 12 inches from the top until an ultimate top load of 1,400 pounds has been applied. The pole shall withstand a minimum of 1,400 pounds of horizontal load before failure.

Under the same test procedure, the maximum deflection under 100 pound loading shall be 4% of the above ground length of the pole.

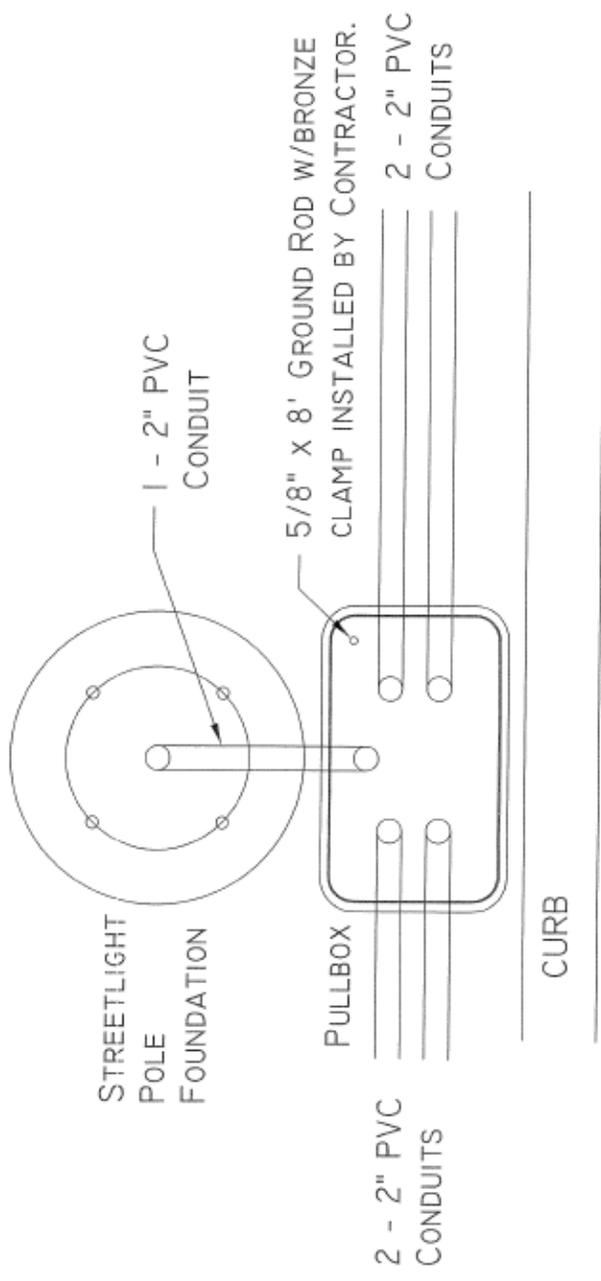
2.A horizontal load is to be applied in 100 pound increments at a point 12 inches from the top of the pole. The load is to be held for five (5) minutes without pole failure and the pole is to have no more than 1% permanent deflection after unloading.

# CPP STANDARD DRAWINGS

Note on number of conduits. Number of conduits provided shall be per ODOT requirements.

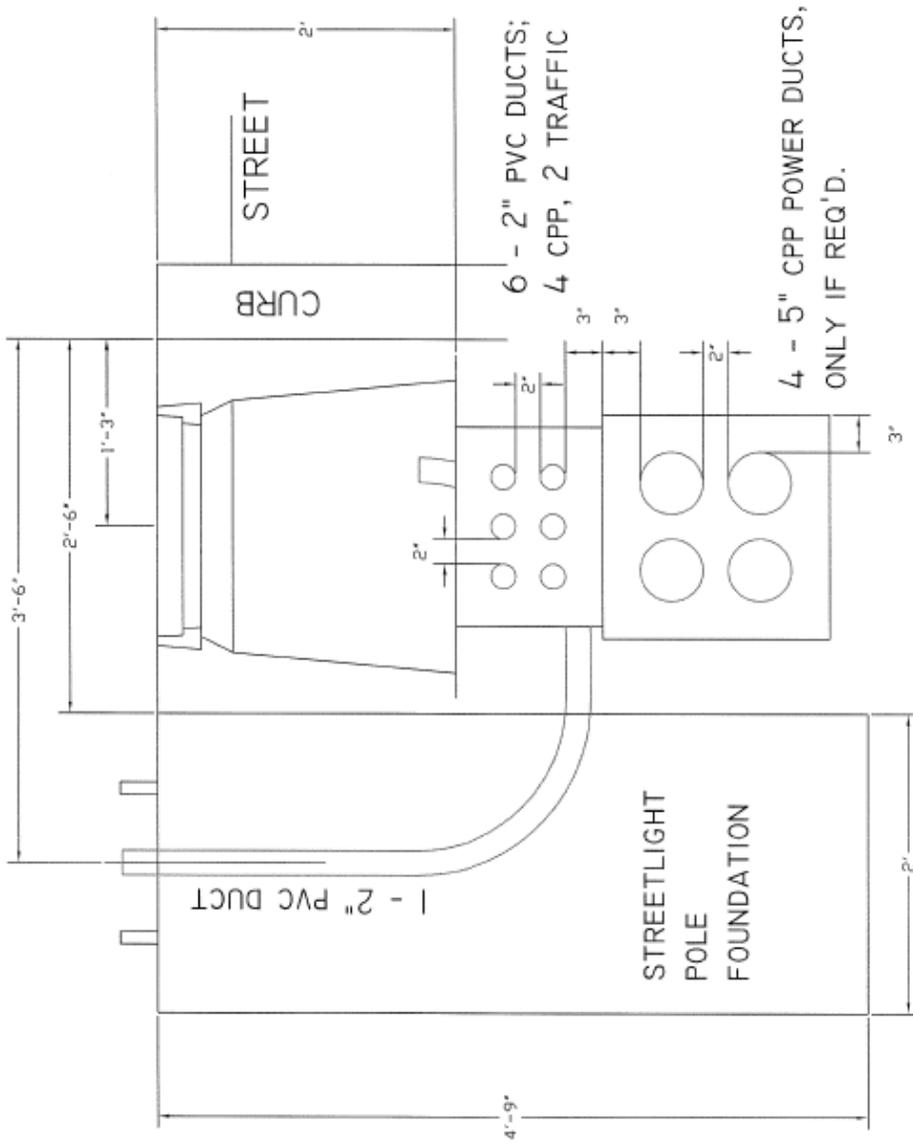


					<b>CLEVELAND PUBLIC POWER ENGINEERING DEPARTMENT</b>				
						STANDARD ROUND TAPERED FIBERGLASS POLE			
					DRAWN BY: D. TURKOVICH SCALE: NTS DATE: 7/8/84	DRAWING NUMBER: <b>7316</b>			
DESIGN	DATE	REVISION	BY	APP'D	REFERENCE DRAWING	NO.	DATE	REV.	CHK'D BY:



NOTE: GROUNDING STRAP PROVIDED AND INSTALLED BY CPP.

				<b>CLEVELAND PUBLIC POWER ENGINEERING DEPARTMENT</b>			
				ST.LTG. PULLBOX INSTALLATION			
NO. 1		10/16/06		CORRECTED CONDUITS, ADDED GROUND ROD		BT	
DRAWN BY: E. TURKOVICH		SCALE: 1" = 4'		DATE: 10/16/06		DRAWING NUMBER: 7826-3	
CHECKED BY:							



 <b>CLEVELAND PUBLIC POWER ENGINEERING DEPARTMENT</b>									
<b>ST.LTG. PULLBOX INSTALLATION</b>									
DRAWN BY: <b>D. TURKOVICH</b>					SCALE: <b>1" = 8'-0"</b>		DRAWING NUMBER:		
REVISION	DATE	DESCRIPTION	BY	APP'D.	REFERENCE DRAWING	HL	DATE	CHK'D BY:	DATE

