



**CITY OF WORCESTER**  
**DEPARTMENT OF PUBLIC WORKS & PARKS**

**STANDARD SPECIFICATIONS**  
**&**  
**DETAILS**

February ??, 2022



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<b>ITEM 210.12</b>	<b>CLEAN AND CCTV 12" PIPE</b>
<b>ITEM 210.15</b>	<b>CLEAN AND CCTV 15" PIPE</b>
<b>ITEM 210.16</b>	<b>CLEAN AND CCTV 16" PIPE</b>
<b>ITEM 210.18</b>	<b>CLEAN AND CCTV 18" PIPE</b>
<b>ITEM 210.20</b>	<b>CLEAN AND CCTV 20" PIPE</b>
<b>ITEM 210.21</b>	<b>CLEAN AND CCTV 21" PIPE</b>
<b>ITEM 210.24</b>	<b>CLEAN AND CCTV 24" PIPE</b>
<b>ITEM 210.27</b>	<b>CLEAN AND CCTV 27" PIPE</b>
<b>ITEM 210.30</b>	<b>CLEAN AND CCTV 30" PIPE</b>
<b>ITEM 210.32</b>	<b>CLEAN AND CCTV 32" PIPE</b>
<b>ITEM 210.33</b>	<b>CLEAN AND CCTV 33" PIPE</b>
<b>ITEM 210.34</b>	<b>CLEAN AND CCTV 34" PIPE</b>
<b>ITEM 210.36</b>	<b>CLEAN AND CCTV 36" PIPE</b>
<b>ITEM 211.08</b>	<b>HEAVY CLEANING 8" PIPE</b>
<b>ITEM 211.10</b>	<b>HEAVY CLEANING 10" PIPE</b>
<b>ITEM 211.12</b>	<b>HEAVY CLEANING 12" PIPE</b>
<b>ITEM 211.15</b>	<b>HEAVY CLEANING 15" PIPE</b>
<b>ITEM 211.16</b>	<b>HEAVY CLEANING 16" PIPE</b>
<b>ITEM 211.18</b>	<b>HEAVY CLEANING 18" PIPE</b>
<b>ITEM 211.20</b>	<b>HEAVY CLEANING 20" PIPE</b>
<b>ITEM 211.21</b>	<b>HEAVY CLEANING 21" PIPE</b>
<b>ITEM 211.24</b>	<b>HEAVY CLEANING 24" PIPE</b>
<b>ITEM 211.27</b>	<b>HEAVY CLEANING 27" PIPE</b>
<b>ITEM 211.30</b>	<b>HEAVY CLEANING 30" PIPE</b>
<b>ITEM 211.32</b>	<b>HEAVY CLEANING 32" PIPE</b>
<b>ITEM 211.33</b>	<b>HEAVY CLEANING 33" PIPE</b>
<b>ITEM 211.34</b>	<b>HEAVY CLEANING 34" PIPE</b>
<b>ITEM 211.36</b>	<b>HEAVY CLEANING 36" PIPE</b>
<b>ITEM 211.42</b>	<b>HEAVY CLEANING 42" PIPE</b>
<b>ITEM 211.48</b>	<b>HEAVY CLEANING 48" PIPE</b>
<b>ITEM 211.54</b>	<b>HEAVY CLEANING 54" PIPE</b>
<b>ITEM 211.60</b>	<b>HEAVY CLEANING 60" PIPE</b>

### **A. GENERAL REQUIREMENTS**

The contractor shall furnish all materials, equipment, gauges, pumps, etc. for performing work under this item. For sewer construction projects (new or rehabilitation), a sketch will be required to show any deviation from the design drawings.

## **B. PIPE CLEANING**

The Contractor may elect to use either high velocity jet, or mechanically powered equipment, as described in the NASSCO Standard Specifications. Selection of equipment shall be based upon field conditions such as access to manholes, quantity of debris, size of sewer, depth of flow, etc.

All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be disposed of in accordance with all applicable regulations and in a method acceptable to the Owner. Pipe cleaning shall be performed in advance of pipe television inspection.

The Contractor shall be responsible for the legal disposal of all debris removed from the sewers during the cleaning operation including any costs incurred. The Contractor shall not expect the Owner to provide a dump site.

Acceptance by the Engineer of the cleaning results will be based on the results of television inspection. If the results are unsatisfactory, the Contractor shall repeat the cleaning until accepted by the Engineer at no additional cost to the Owner.

## **C. HEAVY CLEANING**

Heavy Cleaning shall be defined as any cleaning done after an initial three passes with a jet flusher as required by Clean and CCTV. All sewer lines with remaining debris, roots, or other obstructions shall be Heavy Cleaned until the line is completely clear and able to be fully inspected by a CCTV camera.

The itemization of Heavy Cleaning is detailed in **Items 211**.

## **D. TELEVISION INSPECTION**

The contractor will submit closed circuit television camera inspection (CCTV) digital files and reports to the Department of Public Works and Parks on an external hard drive for review and approval. The external hard drive will become the property of the City of Worcester, Department of Public Works & Parks.

The Contractor shall maintain printed television inspection logs of sewer segments under this contract.

The log sheet(s) at a minimum shall clearly identify:

1. Project Name
2. Street Location, Name, Intersection, Station
3. Date of inspection
4. Total Length of Line Inspected
5. Line Size(s)/Joint Spacing/Type
6. Line and Manhole(s) Condition

Significant observations such as service connections, offset joints, drop joints, broken/cracked pipe, protruding services, roots, collapsed sections, infiltration, presence of scale and corrosion and other discernible features.

The City uses PACP codes to record pipe defects. The City uses IT Pipes as the repository for their CCTV inspection data and imports the data into Lucity (asset management program) with a PACP database. The final format for delivery to the City shall use PACP v6 or greater in a file format that can be directly imported into IT Pipes without further manipulation of any kind by the City.

All observations and defects shall have snapshots taken and the pictures included in the PACP export.

All logs shall be provided to the Engineer in PDF format (one log per PDF file) at the completion of the project.

All television inspection shall be recorded in **MPEG2, MP4 (not MP3), or WMV format** (minimum) in accordance with NASCCO specifications and shall include a PACP exchange database that holds all inspection results including pictures and video for import to the City's maintenance management software, "Lucity". Inspections shall be recorded one at a time with each segment recorded as a separate file on the external hard drive.

The contractor shall provide two (2) original and labeled copies of each external hard drive to the Engineer. All external hard drives shall have a typed label with the following:

All cctv inspection work shall be performed by a NASSCO certified PACP inspector. Licenses shall be made available before the start of the contract.

**[Date work was performed/Contractor/Contract #/]**

Filenames shall contain pipe wASSET\_ID identification numbers. Stationing shall be recorded at a minimum of every foot and at all points of interest, to allow instant access to any given footage. Each street shall be tested in its entirety and all associated reports and videos must be submitted on the same external hard drive.

Filenames for television inspection (video and report files) shall be provided as following:

#### **WASSET\_ID\_Date\_Media\_Iteration**

Where "wASSET\_ID" is the identifying number for the pipe asset, "Date" is in the format "YYYYMMDD", "Media" can be either "Report", "Video", "Picture" or "Sonar", and "Iteration" starts at "1" and increases by one (1) for each subsequent video in the same pipe asset. The "Iteration" does not need to increase if the same wASSET\_ID is inspected on a different day. The date provides the distinction. For example, if pipe wASSET\_ID SM26765 on Dallas Street was inspected on August 1st, 2013, the video file name would be:

**SM26765\_20130801\_Video\_1**

and the Report file name would be:

**SM26765\_20130801\_Report\_1**

In the event of a reverse setup, the next filenames would be:

**SM26765\_20130801\_Video\_2**

**SM26765\_20130801\_Report\_2**

In the event the pipe segment was inspected on August 2nd, the next filenames would be:

**SM26765\_20130802\_Video\_1**

**SM26765\_20130802\_Report\_1**

**All video and snapshot files shall be located in a single folder, as opposed to being stored in a separate folder for each asset.**

#### **E. MEASUREMENT AND PAYMENT**

Payment for work under this item shall be by the linear foot for each complete segment as specified in the contract documents. No payment will be given for incomplete segments unless authorized by the Contracting Officer.

**Under Items 220 - 223 the work specified shall consist of excavation, backfilling and compaction of all materials encountered in the trenching for sewer mains and sewer services and the disposal of any and all surplus material from these excavations, as shown on the plans and specified herein. Unless shown on design plans or specified by the Contracting Officer, excavation and backfill for sanitary and surface sewers will be paid for as a common trench. The pay limits of the trench are those shown on a plan titled Typical Trench.**

<b>ITEM 220.04</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 4" PVC</b>
<b>ITEM 220.06</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 6" PVC</b>
<b>ITEM 220.08</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 8" PVC</b>
<b>ITEM 220.10</b>	<b>TRENCH EXCAVATION AND BACKFILL FURNISH AND INSTALL 10" PVC</b>
<b>ITEM 220.12</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 12" PVC</b>
<b>ITEM 220.15</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 15" PVC</b>
<b>ITEM 220.18</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 18" PVC</b>
<b>ITEM 220.21</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 21" PVC</b>
<b>ITEM 220.24</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 24" PVC</b>
<b>ITEM 221.0812</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 8" PVC &amp; 12" RCP</b>
<b>ITEM 221.0815</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 8" PVC &amp; 15" RCP</b>
<b>ITEM 221.0818</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 8" PVC &amp; 18" RCP</b>
<b>ITEM 221.0821</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 8" PVC &amp; 21" RCP</b>
<b>ITEM 221.0824</b>	<b>TRENCH EXCAVATION AND BACKFILL, FURNISH AND INSTALL 8" PVC &amp; 24" RCP</b>

**ITEM 241                      CATCH BASIN ALTERNATE TYPE**

**ITEM 241.1                  DROP INLET**

**A.    *GENERAL***

The work to be done under Item 241 shall conform to the details shown on a plan titled Catch Basin Alternate Type and shall conform to the applicable provisions of Section 220, (MSSHB).

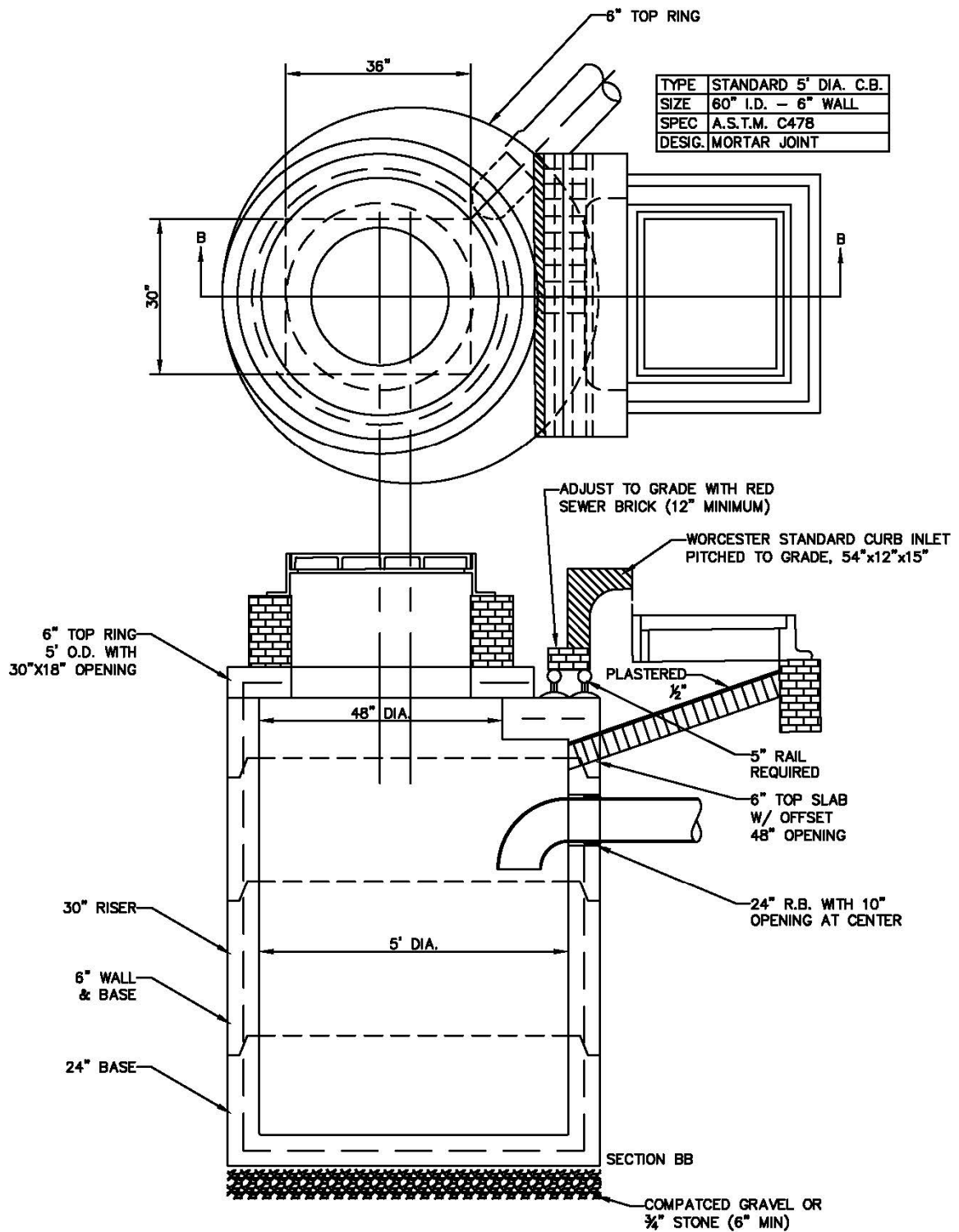
The work to be done under Item 241.1 shall conform to the detail shown on a plan titled Drop Inlet Detail and shall conform to the applicable provisions of Section 220, (MSSHB). The cost for frames and grates and inlet stones, will be paid under Items 235 and 245.

**B.    *MEASUREMENT AND PAYMENT***

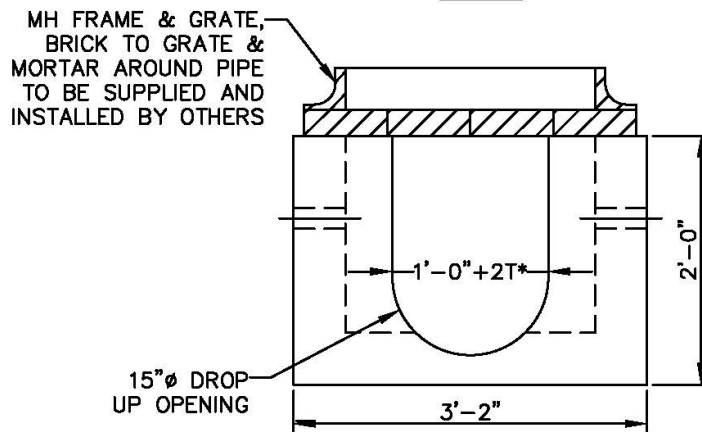
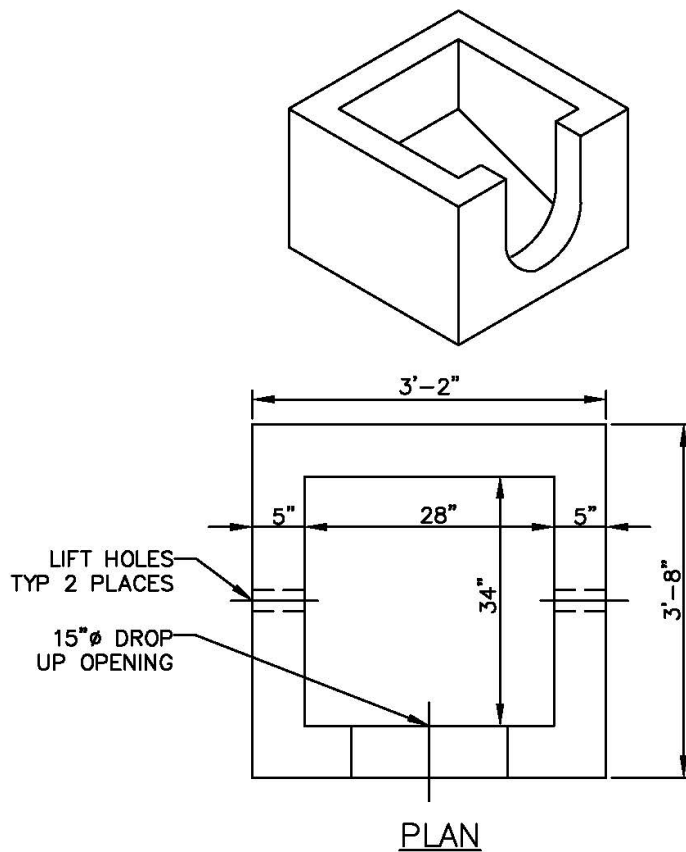
Pay item 241 shall be catch basin (each) and catch basin inlet box (including drop inlet if used), complete in place. The cost for Class B rock, frames and grates, frames and covers, inlet stones, and green traps will be paid under Items 120, 235, 236, 245 and 246.

Pay item 241.1 shall be drop inlet, connection piping, and catch basin alteration complete in place. The cost, frames and grates, frames and covers, inlet stones, and green traps will be paid those appropriate items.

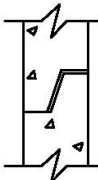
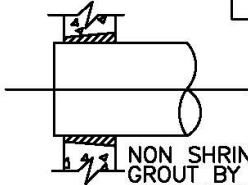


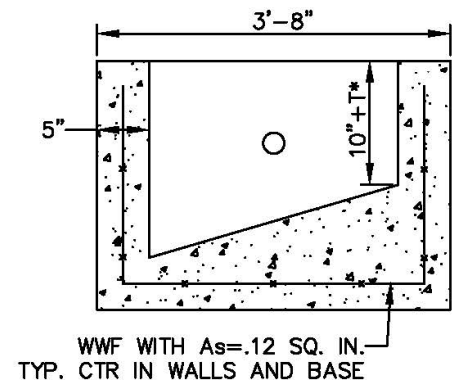


## CATCH BASIN ALTERNATE TYPE



\*T=WALL THICKNESS OF 12" RCP

MORTAR		SECTION JOINT		B1
BY CONTRACTOR	PIPE SIZE	 NON SHRINK GROUT BY CONTRACTOR	C1	
CSI ID #			QUANTITY	
CONCRETE			.38 YDS	
RM-00098			15 LBS	



\*T=WALL THICKNESS OF 12" RCP

## DROP INLET DETAIL

**ITEM 261                      REPAIR, REPLACE OR RELOCATE EXISTING DRAINS**

**A.    GENERAL**

The work to be done under this item shall conform to the applicable provision of Section 230, (MSSHB).

Payment for repairing or replacing existing drains will be made only when authorized by the Contracting Officer.

No payment to the Contractor will be made for repairs due to damage caused by his men or machines.

Drains that do not have sufficient cover (4' minimum) when the final grade is determined shall be lowered and if necessary relocated as directed by the Contracting Officer.

**B.    MEASUREMENT AND PAYMENT**

Payment under this item shall be complete in place by the linear foot, including supplying of all pipe, fittings and materials, including gravel backfill and labor, also handling of water and/or raw sewage.

**ITEM 265                      REMOVE AND DISPOSE OF EXISTING MANHOLE**

**A.    GENERAL**

The Contractor shall furnish all additional labor, materials and equipment required to remove and dispose of existing manholes as directed by the Contracting Officer. The work to be done under this item shall conform to the applicable provisions of Section 140, (MSSHB).

**B.    MEASUREMENT AND PAYMENT**

The unit bid price per each shall be full compensation for all work required including salvage and delivery to the City's Department of Public Works and Parks – 1065 Millbury Street Yard of any castings as directed by the Contracting Officer.

**ITEM 270                      RODENT CONTROL**

**A.    GENERAL**

This section specifies requirements for rodent control activities by the Contractor at all work and laydown (or staging) areas in connection with this Contract.

The Contractor shall retain the services of a licensed rodent exterminator to conduct an inspection of the work and laydown areas and report on the presence of rodents and take any necessary measures to eliminate existing rodent populations prior to start of work.

The Contractor shall begin rodent elimination methods at a minimum of one (1) week in advance of normal construction operations in each area. Rodent elimination methods shall consist of as many treatments as deemed necessary to control the rodents, as deemed necessary by the Engineer and City of Worcester Division of Public Health.

**B.    SUBMITTALS**

Incidental to this item, within ten days after Notice to Proceed, submit to the Engineer and City of Worcester Division of Public Health a written description of rodent control measures to be used and the areas to be included in the program and a complete plan showing the locations of the rodent control measures for approval.

Provide the name and background of the licensed rodent exterminator retained to provide any necessary rodent eradication measures prior to start of work.

**C.    PRODUCTS**

**CONTAINERS:**

Use metal or heavy-duty plastic refuse containers with tight-fitting lids for disposal of all garbage, or trash associated with food. These containers shall not have openings that allow access by rodents. Rodents containers for above and below grade applications shall allow rodents entrance but pets and children cannot access.

**D.    EXECUTION**

**1.0 WORK AND LAYDOWN AREAS WITHIN THE CONTRACT AREA:**

A minimum of one week in advance of normal construction operations, rodent control boxes shall be placed within the project area. Rodent control boxes shall be placed above ground with a spacing of approximately 250 feet, as well as below ground with a spacing of approximately 250 feet. Above ground locations shall

be visible to the public whenever possible. Rodent control box placements shall extend one block radius outside of construction limits.

Before mobilization begins, obtain written verification from the rodent exterminator that rodent populations have been effectively controlled in areas to be occupied and provide to Engineer.

Before excavation, or construction, inspect work and laydown areas and remove all trash, debris, and weeds.

Maintain work and laydown areas free of trash, garbage, weeds, and debris. Provide and enforce proper use of refuse containers to ensure that rodents and other pests are not harbored or attracted.

Designate specific locations as lunch and coffee break areas to prevent random disposal of garbage and trash. Keep those areas free of litter and garbage, and provide refuse containers as described in C, PRODUCTS of this section. Keep refuse containers upright with their lids shut tight.

Have all refuse containers emptied daily to maintain site sanitation.

Notify the Engineer within 24 hours whenever rodents (rats or mice) or signs of rodent activity (burrows or droppings) are observed in work or laydown areas. Take appropriate action to locate and control the rodents.

## **2.0 LAYDOWN AREAS OUTSIDE THE CONTRACT AREA:**

A minimum of one week in advance of normal construction operations, rodent control boxes shall be placed within a one block radius outside of the area in all directions. Rodent control boxes shall be placed above ground with a spacing of approximately 250 feet, as well as below ground with a spacing of approximately 250 feet. Above ground locations shall be visible to the public whenever possible.

Implement pest control at all laydown areas that are not areas of this Contract, but that are used by the Contractor in connection with this Contract. Undertake rodent control at least one week prior to use of the area and with time to ensure that the site is free of rodent populations (rats and mice) prior to site occupancy. Maintain the site free of rodents throughout the duration of its use.

Clear laydown areas of trash, debris, and weeds prior to occupancy. Initiate those actions only after rodent populations have been effectively controlled.

Maintain laydown areas free of trash, garbage, weeds, and debris. Provide and enforce proper use of refuse containers to ensure that rodents and other pests are not harbored or attracted.

Dispose of all garbage or trash associated with food in refuse containers with tight-fitting lids as described in C, PRODUCTS of this Section. Have refuse containers emptied daily to maintain site sanitation.

## **E. MEASUREMENT AND PAYMENT**

Rodent control within the project area shall be measured via lump sum and shall be paid at the contract unit price under the provisions of Item 270 Rodent Control, as listed under this Section. Payment shall constitute full compensation for hiring a licensed rodent exterminator, inspections, furnishing materials and labor for rodent elimination methods, and all work incidental thereto and not specifically included for payment under other items.

**ITEM 416 CURB REMOVE & RESET**

**ITEM 417 COBBLESTONE CURB REMOVE & RESET**

**A. GENERAL**

The work to be done under these items shall conform to the applicable provisions of Section 580, (MSSHB). Any disruption of the roadway caused by the Contractor shall be repaired by the Contractor without extra cost to the City. Driveway curb corners that are reset shall be paid for under this item. Where the street is to be pulverized or ground full depth, the curb shall be reset prior to placement of the binder course. Should the contractor wish to place the binder prior to the resetting of the curb, no payments shall be made for saw cutting, any leveler course(s) required to bring the crown to grade, or replacement of the binder course at the curb.

**B. MEASUREMENT AND PAYMENT**

Payment for Items 416 and 417 shall be measured and installed at the price per linear foot bid therefore in the proposal. Removal and re-setting curb corners will be paid for at the contract unit price per linear foot for curb removed and reset.

**ITEM 418 CURB REMOVAL & STACK**

**A. GENERAL**

The work to be done under this item shall conform to the applicable provisions of Section 580, (MSSHB) and will be transported to the Department of Public Works and Parks, 1065 Millbury Street or as directed by the Contracting Officer.

**B. MEASUREMENT AND PAYMENT**

Payment for Item 418 shall be measured at the price per linear foot bid therefore in the proposal.

**ITEM 419 SAW CUTTING OF GRANITE CURB**

**A. GENERAL**

The contractor shall saw cut the granite curb for the installation of sidewalk ramps as specified by the City of Worcester. The saw cut shall be a smooth and continuous cut. The distance between the bottom of the gutter pan and the saw cut section of the granite curb shall be one quarter inch (1/4 in) or less. The slope of the saw cut shall match the slope of the ramp. The point at the top of the curb where it intersects the saw cut shall be ground off, making it a rounder surface. If the granite curb is saw cut, and the previously noted dimensional requirement is not met as determined by the Engineer, the complete curb and gutter shall be removed and replaced at no additional cost to the City of Worcester.

**B. MEASUREMENT AND PAYMENT**

Payment for this item shall be complete in place, including any necessary regrading, cleanup, and disposal of debris. This item will not relieve the contractor of his responsibility to reset or saw cut the granite curb as required under item 452 or 454. Payment for replacement of the wheel chair ramp surface will be under item 430 Existing Bituminous Concrete Driveway Repair or item 446 Concrete Driveway Repair, when this item is utilized. Payment will be per linear foot, under the item "Saw Cutting of Granite Curb".

**ITEM 420 CURB RESET FROM DPW YARD**

**A. GENERAL**

Work under this item shall consist of the Contractor receiving curbing stored at the Department of Public Works and Parks, 1065 Millbury Street and transporting it to the work site as directed by the Contracting Officer. This curbing will then be reset so as to conform to the applicable provisions of Section 580, (MSSHB) at the desired locations as directed by the Contracting Officer within the work site.

**B. MEASUREMENT AND PAYMENT**

Payment for this item shall be paid for by Item 416 curb R&R price.

**ITEMS 422 - 432 BITUMINOUS CONCRETE**

**ITEM 422.1 SUPERPAVE 9.5 MM LEVEL 2 (TOP COURSE)**

**ITEM 422.2 SUPERPAVE 12.5 MM LEVEL 2 (BINDER COURSE)**

**ITEM 422.3 SUPERPAVE 12.5 MM LEVEL 3 (MODIFIED TOP COURSE)**

**ITEM 422.4 SUPERPAVE 19 MM LEVEL 2 (BINDER COURSE)**

This item of work shall be paid for at the contract unit price bid per each, which price and payment shall constitute full compensation for furnishing and installing all materials, connections, labor, equipment, tools, appurtenances, and incidentals necessary to satisfactorily complete this item of work complete and accepted by the Engineer.

**ITEM 481.2      ORNAMENTAL BOLLARD (REMOVE AND DISPOSE)**

**A.    *GENERAL***

The Contractor shall furnish all additional labor, materials and equipment required to remove and dispose of existing ornamental bollards as directed by the Contracting Officer.

**B.    *MEASUREMENT AND PAYMENT***

The unit bid price per each shall be full compensation for all work required including salvage and delivery to the City's Department of Public Works and Parks – 1065 Millbury Street Yard of any castings as directed by the Contracting Officer.

**ITEM 482      STANDARD 6 INCH STEEL BOLLARD (COMPLETE IN PLACE)**

**A.    *SCOPE OF WORK***

This work shall consist of furnishing and placing bollards at the direction of the Contracting Officer.

**B.    *MATERIALS***

Bollards shall be a 6 inch diameter galvanized steel pipe filled with concrete.

**C.    *DESIGN AND CONSTRUCTION***

Bollard shall be a 6 inch iron pipe filled with cement concrete. Exposed length shall not be less than 4 feet from final grade, and shall be buried for not less than 4 feet. The base around the indicator post will be secured and centered in poured concrete no less than 12 inches in diameter. The bollard shall be painted according to the Contracting Officer's instructions, typically black or yellow.

Bollards shall be located at certain points to serve as a visual and physical barrier for protection from vehicle traffic.

Bollards shall be located within the City right-of-way but not in the traveled way.

**D.    *MEASUREMENT AND PAYMENT***

Bollards will be paid for by EACH complete and installed, including all materials, tools, labor, equipment, and incidentals necessary to complete the work as specified herein.

**ITEM 483      REPLACING GAS BOX, GRAVEL BASE**

**ITEM 484      REPLACING GAS BOX, RIGID BASE**

**A.    *SCOPE OF WORK***

The work to be done under Items 483 and 484 shall consist of the replacement of existing GAS boxes with a gate valve box provided by the gas company of record (Currently Eversource). This work shall include furnishing all necessary labor, materials and equipment, backfilling with bituminous concrete, power tamped in 6" layers, set to designated line and grade, and patching the base course with SUPERPAVE binder course without extra cost to the City. The contractor will also be required to dispose of all old GAS castings, unless otherwise directed by the Contracting Officer. All GAS boxes shall be set in bituminous concrete. The bituminous concrete shall extend a minimum 18" beyond the outside of the GAS box to a depth of 12" so the area can be packed with a plate compactor.

As part of this work, each GAS box and riser will be cleaned of soil and debris with an "air-lance" or equivalent, to accommodate the proper access to the valve. This work will be completed at no additional cost to the City.

**B.    *MEASUREMENT AND PAYMENT***

Measurement shall be at the number of units installed in place and paid for at the unit price for each bid therefore in the proposal. No additional payment will be made for bituminous concrete used in this item.

**ITEM 485      REMOVE AND RETAIN GAS BOX**

**ITEM 486      RETURN AND RESET GAS BOX**

#### **A. SCOPE OF WORK**

Under Item 485 the contractor will remove all GAS boxes from the roadway prior to the excavation and store such boxes in a manner to insure their safe keeping from theft or damage. All excavated areas shall be suitably backfilled by approved compaction methods and the work site shall be left in a neat and clean state.

Under Item 486 the Contractor shall return to the job site all undamaged top boxes and covers previously removed under Item 485. It will be the contractor's responsibility to then reset the top boxes as indicated in the specifications of Items 487 & 488 of the contract, taking care as to the clearing of all debris from the bottom box. It will be the Contractor's responsibility to neatly trim or cut the new binder course, excavate, compact and repave the excavated area with SUPERPAVE bituminous concrete binder. Water boxes shall be adjusted to specific line and grade given by the Contracting Officer and shall be set prior to the laying of the top course.

As part of this work, each valve box and riser will be cleaned of soil and debris with an "air-lance" or equivalent, to accommodate the proper access to the valve. This work will be completed at no additional cost to the City.

#### **B. MEASUREMENT AND PAYMENT**

Measurement shall be at the actual number of water boxes removed and retained and returned and reset as applicable. Payment shall be at the respective item bid for each in the proposal.

#### **ITEM 487 GAS BOX ADJUST TO GRADE, GRAVEL BASE**

#### **ITEM 488 GAS BOX ADJUST TO GRADE, RIGID BASE**

##### **A. SCOPE OF WORK**

The work under Items 487 and 488 shall consist of the resetting of the existing GAS boxes and supplemented by the Materials section below.

##### **B. CONSTRUCTION METHODS**

The pay item for this work shall be GAS Boxes Adjust to Grade and shall be full payment for all excavation, trimming or cutting of existing box, bituminous concrete backfill, and placing SUPERPAVE bituminous concrete binder course collar for all labor, equipment, tools and incidental expenses required to locate, maintain in proper working order, and set to finished grade complete in place.

GAS boxes shall be adjusted to line and grade before the top course has been laid. The bituminous concrete binder course shall be thoroughly compacted with a plate compactor.

It shall be the Contractor's responsibility to mark locations of each box and to maintain each and every box in proper working order, free of all dirt and/or debris and in true alignment at all times.

The Contractor shall notify the Contracting Officer immediately of any boxes found in poor, broken or leaking condition. The locations given at start of work in each street shall be preserved by the contractor for use in establishing water box locations after SUPERPAVE base course has been laid. The Contractor shall be responsible for location of all visible GAS boxes at all times during the construction period.

All GAS boxes shall be set in bituminous concrete binder. The bituminous concrete shall extend a minimum of 18" beyond the outside of the valve box to a depth of 12", and compacted in two 6" lifts with a plate compactor.

GAS boxes shall be carefully fitted together and to the valve with minimum overlap of six (6) inches between the box sections when in the most extended position. The soil shall be firmly compacted around bonnet of the valve to prevent settling.

The Contractor shall adjust all existing GAS boxes where indicated on the drawings and detail sheets (If available). When adjusting a GAS box, the Contractor shall be responsible to clear all debris from the bottom box.

Some GAS boxes that are called out to be adjusted may not be able to be adjusted as described above. There may be grade changes that exceed the range of adjustment within the existing box; or the top and bottom sections of the existing box have been fused together due to age and corrosion and cannot be separated or there may be damage to the box sections that is not visible from the surface. If one or more of these conditions exists, the Contracting Officer may deem it necessary to remove and stack the existing box and a new GAS box will be installed. The contractor shall make every effort to separate the sections of the existing box to be adjusted prior to the Contracting Officer contacting the gas company to make the repair.

GAS boxes shall not be trimmed and/or cut. If a new GAS box is required, the contract officer will contact the GAS company to make arrangements to obtain a new GAS box.

The GAS box shall be adjusted to 18 inches below finish grade unless a cement concrete road base exists, in which case the GAS box shall be set in the finished grade of the cement concrete road base. If the Contracting Officer determines that the GAS box to be adjusted is not suitable for re-use, the contract officer will contact the GAS company to make arrangements to obtain a new GAS box.

**C. MEASUREMENT AND PAYMENT**

GAS boxes that are set, removed and stacked or adjusted shall be paid for at the contract unit price per each complete in place. All equipment, tools, Superpave bituminous concrete binder course materials, labor and transportation required to complete all of the above items as specified shall be considered as incidental to the construction and be included in the contract price per each item.

**MEASUREMENT SHALL BE FOR WORK COMPLETED IN PLACE AND PAID FOR AT THE UNIT PRICE EACH BID THEREFORE IN THE PROPOSAL. NO ADDITIONAL PAYMENT WILL BE MADE FOR BITUMINOUS CONCRETE USED IN THIS TIME.**



## ITEM 820 DECORATIVE STREET LIGHTING

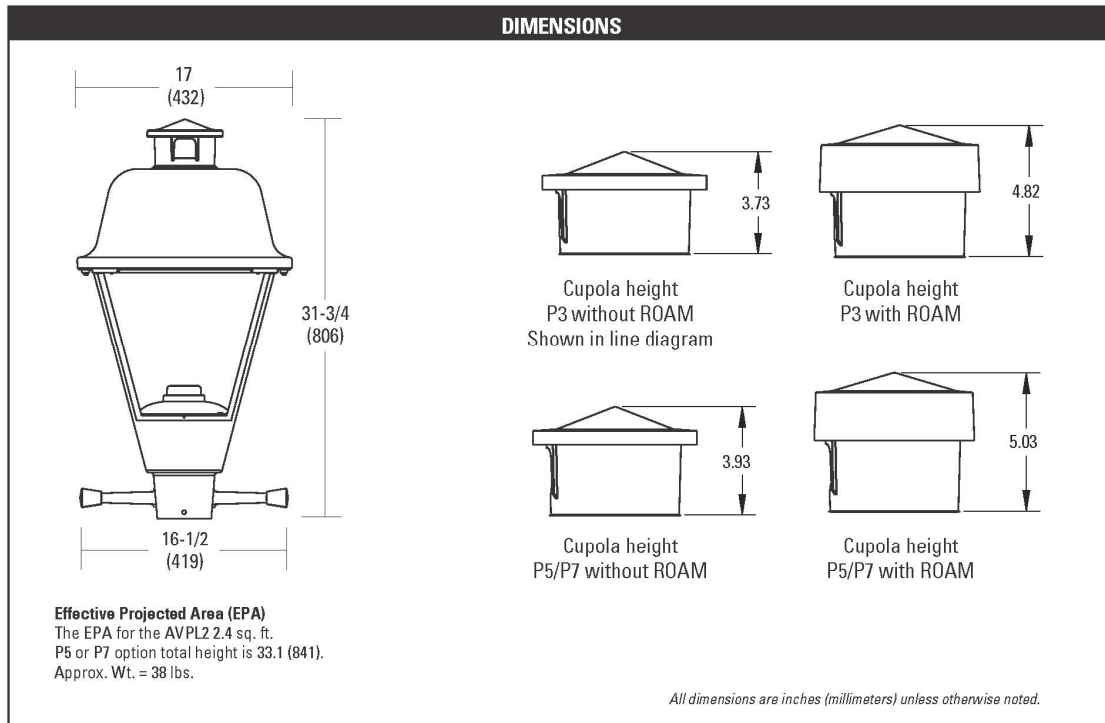
### A. GENERAL

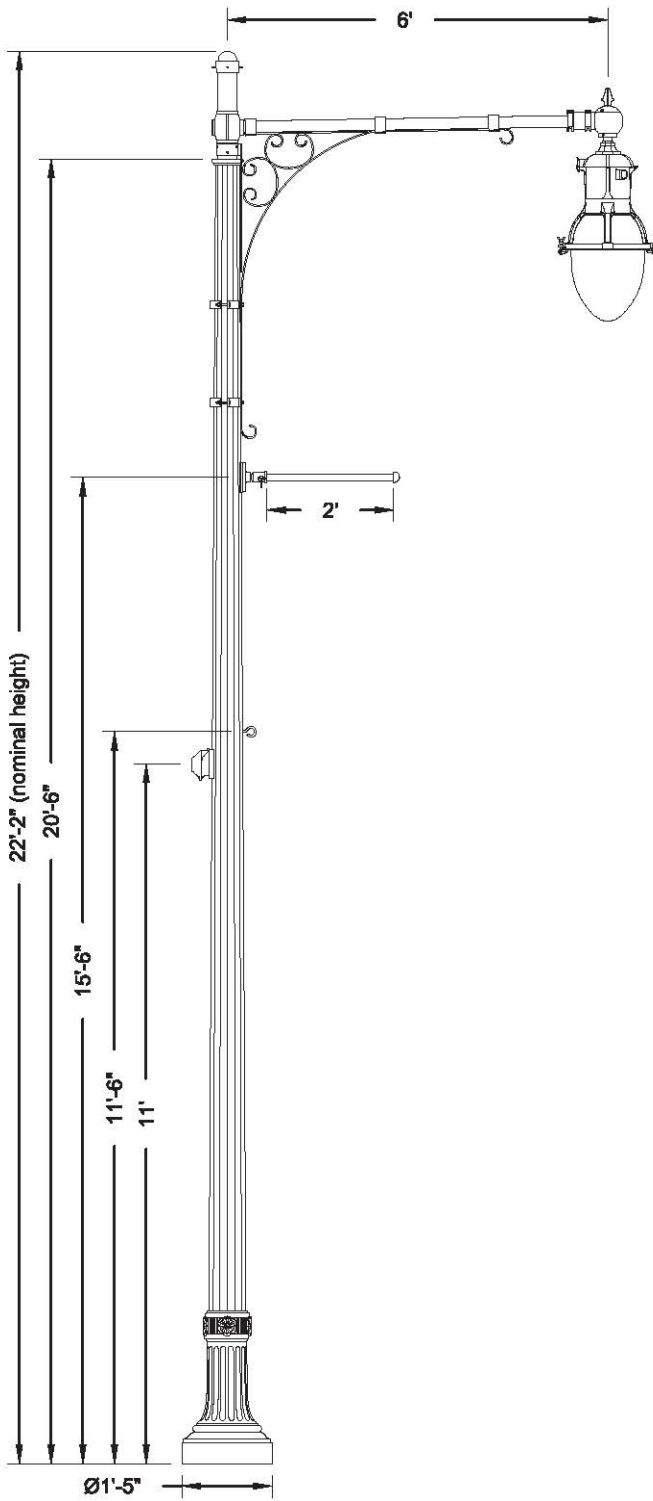
The post, base, arm, luminaire, accessories, and finish shall adhere to the following details or approved equal. For installation of all new utility standard poles and hardware, decorative poles and hardware, mechanical hatches, covers, windows or inspection plates, will be completed using a never seize agent which shall be placed on all hardware screws, bolts or fastening mechanical items which close, open or bolt together as part of its function, (poles, stanchions, handholes, inspection plates).

### B. MEASUREMENT AND PAYMENT

Payment under this item shall be at the contract unit bid price per each location.

Variant LED Series AVPL2 20LEDE70 MVOLT 4K R2 AY P7, NL-RW14 RFD210292





## Specifications

### POST DESCRIPTION

The lighting post shall be cast iron and steel construction, massively tapered with a deep, 16-flute steel shaft and a classic 16-flute cast iron base. The post shall be provided with (1) OUC single arm, 45° from post center to luminaire center, (1) Boston Harbour QSM leveling fitter factory attached to the luminaire, (1) 24" breakaway banner arm, (1) bolt on eyebolt and (1) GFI weatherproof receptacle with large, in-use cover.

### MATERIALS

The post material shall be ASTM A48, Class 30 cast iron, formed true to the pattern with complete detail. All enclosed hardware shall be stainless steel. Anchor bolts to be completely hot dip galvanized. Partially galvanized bolts are not acceptable.

### DIMENSIONS

The post shall be 20'-8" in height with a 17" diameter base. The post shall taper from a Ø7" at the top of the base to a Ø4.5" at the post top. An integral Ø3"x4" tenon shall be provided at the top for arm mounting.

### INSTALLATION

The post shall be provided with four 3/4" DIA, hot dip galvanized L-type anchor bolts. A door shall be provided in the base for anchorage and wiring access. A grounding screw shall be provided inside the base opposite the door.

### FINISH

The entire post assembly shall be standard Holophane black.

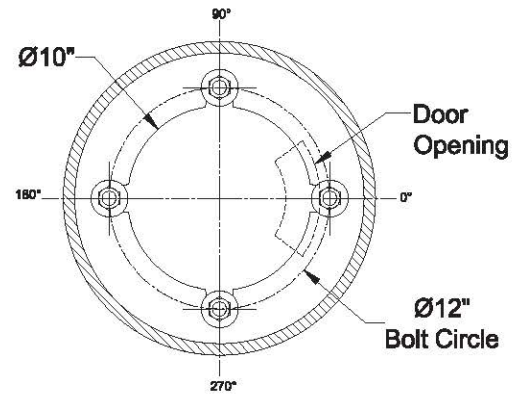
### LUMINAIRE DESCRIPTION

- Memphis Teardrop LED 2 Series
- 12,000 Lumens w/Uplight, 4 COBs, 4000k CCT, Auto-Sensing Voltage (120-277)
- Black finish, Teardrop glass, Type 3 Asymmetric, Quick Lock Stem mount

### Accessory Mounting Detail

	Orientation	Height
BANNER ARM	0°	15'-6"
EYEBOLT	0°	11'-6"
RECEPTACLE	180°	11'-0"

### Anchorage Detail



DO NOT USE TO SET ANCHOR BOLTS  
CONTACT CUSTOMER SERVICE FOR TEMPLATE

### Catalog #s:

RFD209410

Lum/Lamp: MPL2P20U40KASBKTG3S BHDF13200BKP7 FACT ATT

Arm: CAM72/1CABKH

Pole: NYS21FTB17P05BK R132C S186A E138A

Receptacle: FGIUL-SBKH

Banner Arm: BBA24BOH4MXXBK

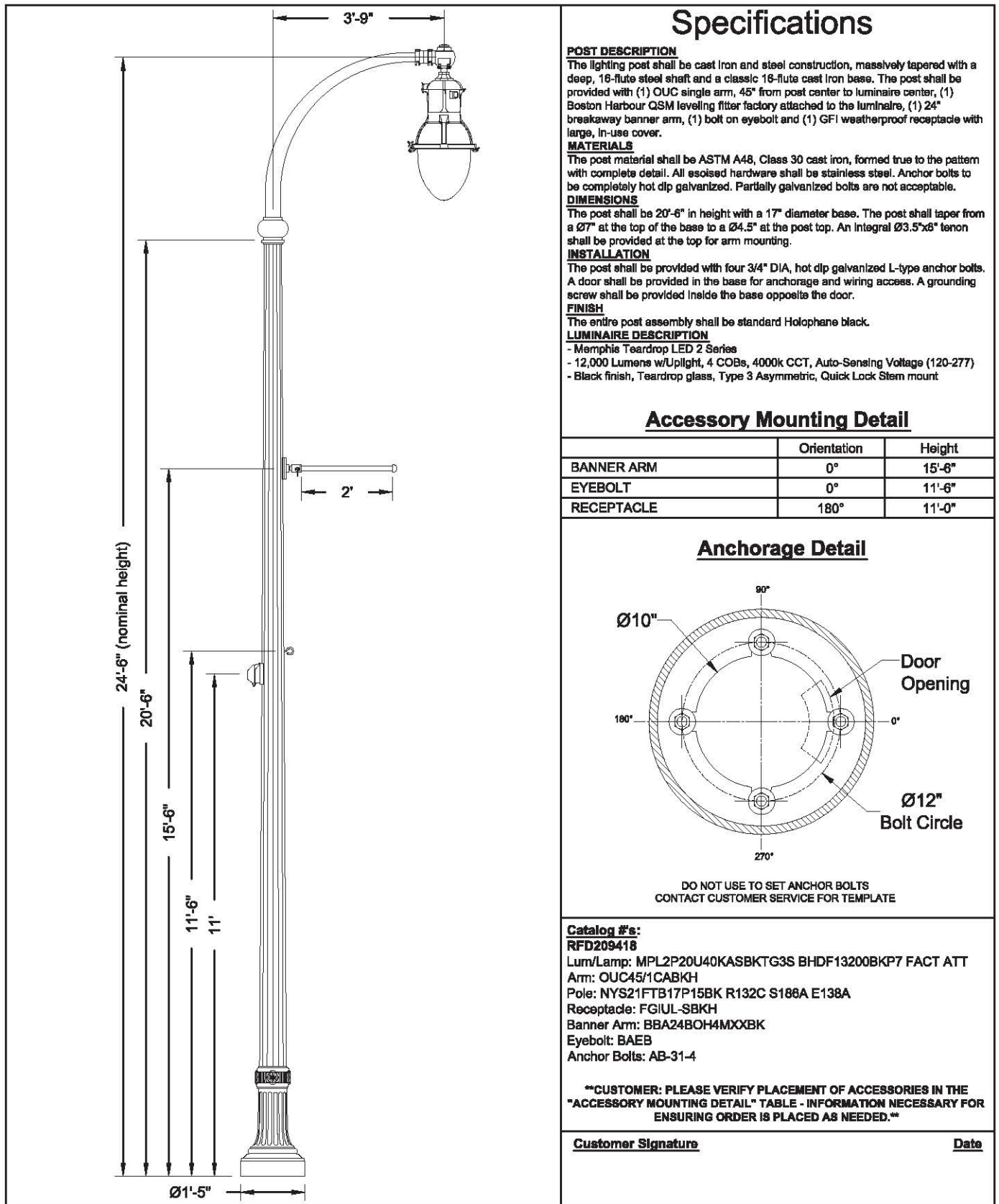
Eyebolt: BAEB

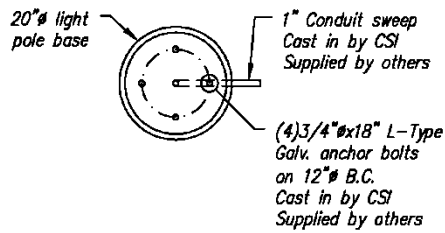
Anchor Bolts: AB-31-4

**\*\*CUSTOMER: PLEASE VERIFY PLACEMENT OF ACCESSORIES IN THE "ACCESSORY MOUNTING DETAIL" TABLE - INFORMATION NECESSARY FOR ENSURING ORDER IS PLACED AS NEEDED.\*\***

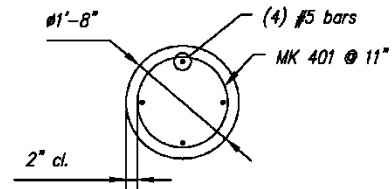
Customer Signature

Date

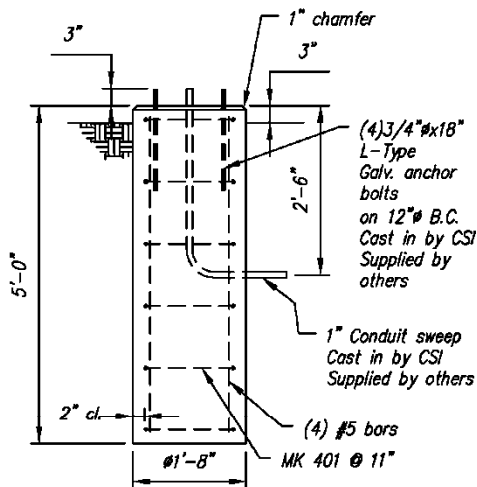




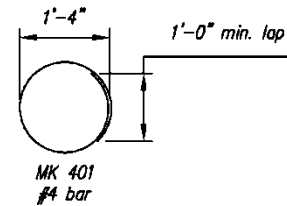
PLAN



REINFORCING DETAIL



ELEVATION



BENDING SCHEDULE

**GENERAL NOTES:**

1. Concrete Strength  $f'_c = 4000$  psi.
2. Reinforcing Steel: ASTM A615 (rebar) grade 60
3. Contractor to supply anchor bolts, template, conduit sweeps and ground wire conduit. Quantity, size and location of conduit sweeps to be provided to CSI upon or prior to approval of this drawing.
4. Contractor to provide a list of variations (if any) of conduit orientations and/or other variations prior to approval of 20"  $\phi$  base.

PRECAST CIRCULAR CONCRETE  
LIGHT POLE BASE



**Shakespeare**

A VALMONT COMPANY

## AS-SERIES

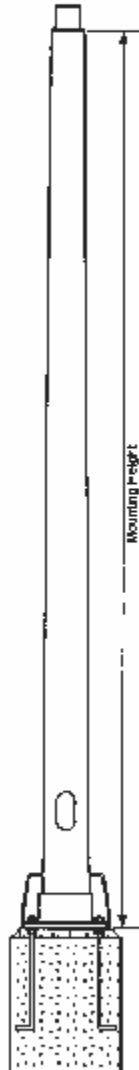
Composite Light Pole

AS-Series

Anchor Base

### ROUND TAPERED COMPOSITE LIGHT POLE ANCHOR BASE INSTALLATION

#### SHAKESPEARE AS-SERIES ANCHOR BASE POLES

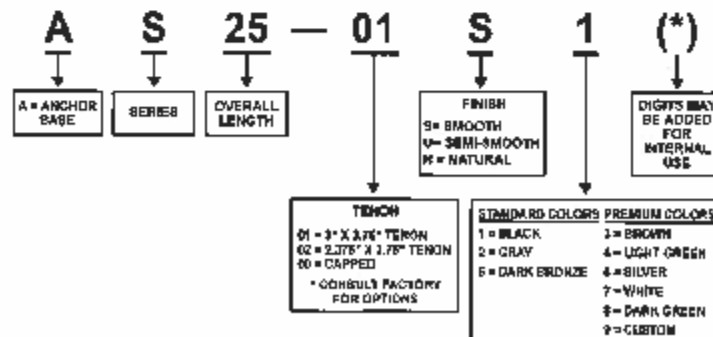


MOUNTING HEIGHT	TIP DIAMETER	GROUNDLINE DIAMETER	WEIGHT
10	2.9	4.8	33
11	2.9	4.8	35
12	2.9	4.9	37
13	2.9	5.0	39
14	2.9	5.2	41
15	2.9	5.3	43
16	2.9	5.5	45
17	2.9	5.6	46
18	2.9	5.7	47
19	2.9	5.9	50
20	2.9	6.0	54
21	2.9	6.2	58
22	2.9	6.3	56
23	2.9	6.4	60
24	2.9	6.6	63
25	2.9	6.7	64
26	4.5	8.2	85
27	4.5	8.3	88
28	4.5	8.4	92
29	4.5	8.5	93
30	4.5	8.5	94
31	4.7	8.5	97
32	4.7	8.5	100
33	4.7	8.5	102
34	4.7	8.5	105
35	4.7	8.5	108

- Mounting heights to 35 feet
- Smooth, semi-smooth or natural finish
- 3 standard and 5 special architectural colors available
- High performance UV and weather-resistant pigmented resin system with an additional pigmented polyurethane coating.
- Tension top or Drilled and Capped
- Standard 2-1/2" x 5" handhole located 12" above grade
- Poles are individually identified with a permanent embossed tag located 9" from tip.
- Sleeved individually for shipment
- Lightweight, easy to install, saves money

POLES LISTED IN SHADED AREA FOR SINGLE POST TOP FIXTURE ONLY AND NOT AVAILABLE CAPPED.

#### ORDERING INFORMATION



SHAKESPEARE - VALMONT COMPOSITE STRUCTURES, INC. 10845 U.S. HIGHWAY 16 • NEWBERRY, SC 29108 USA  
803.278.8004 • 800.800.8008 • FAX: 803.278.8846 SKP-GS.COM

### POLE NUMBER AND REFLECTOR INSTALLATION

This Section covers requirements for installing pole number decals and pole reflectors on all metal and fiberglass lighting poles.

#### Pole Numbers

Every pole shall be numbered using 1½ inch x 3 inch, high intensity white, reflective pole number decals. (STD Item SX20). Pole surface must be clean and dry. Install pole number decals on the roadway side of the pole, 7 feet above finished grade. Install pole number decals horizontal to each other, • not vertical.

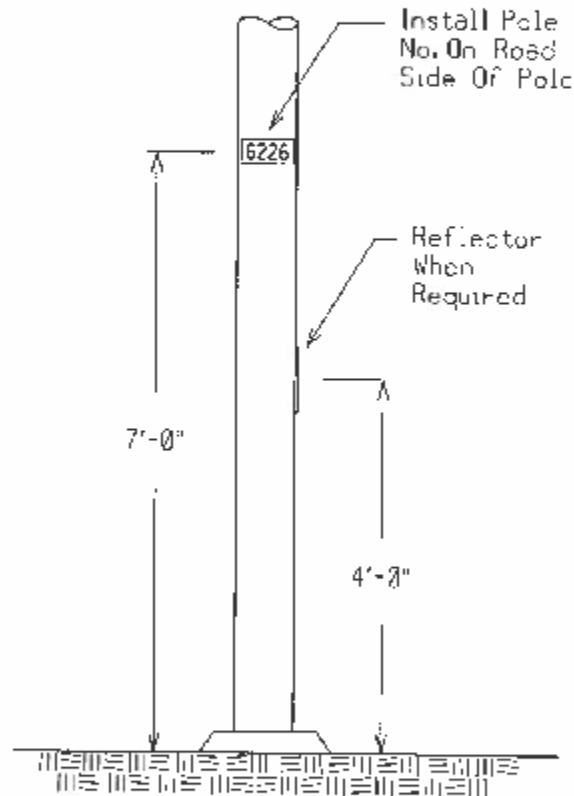
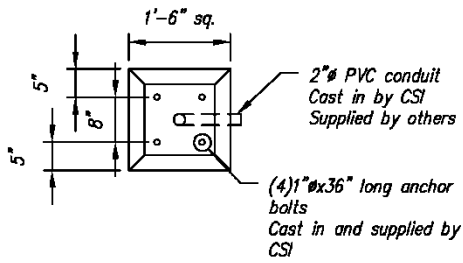


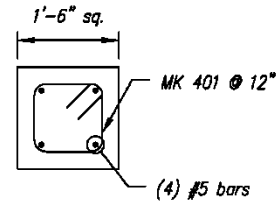
Figure 19  
Pole Number Installation

### POLE NUMBER & REFLECTOR INSTALLATION

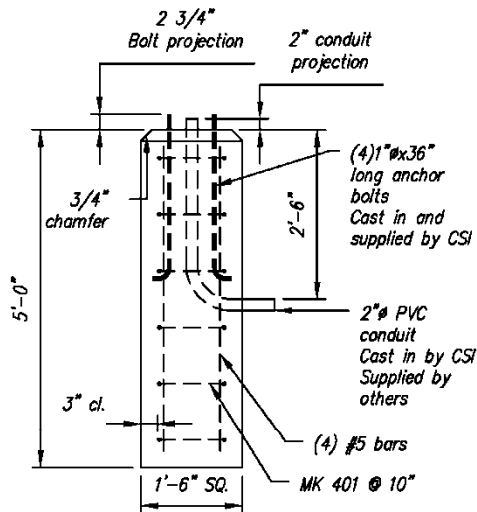
UNDERGROUND  
CONSTRUCTION STANDARD



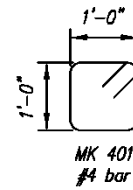
PLAN



REINFORCING DETAIL



ELEVATION



BENDING SCHEDULE

GENERAL NOTES:

1. Concrete Strength  $f'_c = 4000$  psi.
2. Reinforcing Steel: ASTM A615 (rebar) grade 60
3. Sweeps supplied by others, cast in by CSI.

PRECAST SQUARE CONCRETE  
LIGHT POLE BASE

**ITEM 821 STREET LIGHT**

**A. HORIZONTAL ROADWAY LUMINAIRES**



Figure 1 - Semi-cutoff Luminaire

Figure 2 - Cutoff Luminaire





## D-Series Size 0 LED Area Luminaire



### Specifications

**EPA:** 0.95 ft<sup>2</sup>  
(.08 m<sup>2</sup>)

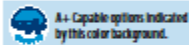
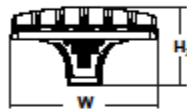
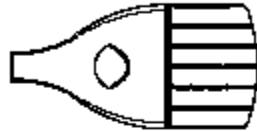
**Length:** 26"  
(66.0 cm)

**Width:** 13"  
(33.0 cm)

**Height<sub>1</sub>:** 3"  
(7.62 cm)

**Height<sub>2</sub>:** 7"  
(17.8 cm)

**Weight (max):** 16 lbs  
(7.25 kg)



A+ Capable options indicated  
by this color background.

### Ordering Information

**EXAMPLE:** DSX0 LED P6 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED					
Series	LEDs	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	<b>Forward optics</b> P1 P4 P7 P2 P5 P3 P6 <b>Rotated optics</b> P10' P12' P11' P13'	30K 3000 K 40K 4000 K 50K 5000 K	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium TSWS Type V very short TSS Type V short TSM Type V medium TSW Type V wide BLC Backlight control <sup>1</sup> LCCO Left corner cutoff <sup>1</sup> RCCO Right corner cutoff <sup>1</sup>	MVOLT <sup>1,2</sup> 120 <sup>3</sup> 208 <sup>3</sup> 240 <sup>3</sup> 277 <sup>3</sup> 347 <sup>3</sup> 480 <sup>3</sup>	<b>Shipped included</b> SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor <sup>4</sup> RPUMBA Round pole universal mounting adaptor <sup>4</sup> <b>Shipped separately</b> KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) <sup>5</sup>
Control options			Other options		Finish (required)
<b>Shipped installed</b> NLTAIR2 nLight AIR generation 2 enabled <sup>6,8</sup> PIRHN Network, high/low motion/ambient sensor <sup>9</sup> PIR NEMA three-lock receptacle only (control ordered separate) <sup>11</sup> PER5 Five-pin receptacle only (control ordered separate) <sup>11,12</sup> PER7 Seven-pin receptacle only (leads exit fixture) (control ordered separate) <sup>11,12</sup> DMG 0-10V dimming extend out back of housing for external control (control ordered separate)			<b>Shipped installed</b> HS House-side shield <sup>16</sup> SF Single fuse (T20, 277, 347V) <sup>4</sup> DF Double fuse (208, 240, 480V) <sup>4</sup> L90 Left rotated optics <sup>1</sup> R90 Right rotated optics <sup>1</sup> DOL Diffused drop lens <sup>16</sup> <b>Shipped separately</b> BS Bird spikes <sup>17</sup> EGS External glare shield <sup>17</sup>		DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLTXD Textured black DNATXD Textured natural aluminum DWTGXD Textured white
			PIR High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5ft <sup>13,14</sup> PIRH High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5ft <sup>13,14</sup> PIR1FC3V High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1ft <sup>13,14</sup> PIRH1FC3V High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1ft <sup>13,14</sup> FAO Field adjustable output <sup>15</sup>		



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DSX0-LED  
Rev. 05/15/19  
Page 1 of 8

1. APPLICATION – Enclosed, horizontal roadway luminaires are the standard luminaires available for use in roadway lighting installations for streets in the City of Worcester.

2. SPECIFICATION – All high intensity discharge, horizontal roadway luminaires shall conform to the following specification, including Table I below:

General – Luminaire, high intensity discharge, enclosed, horizontal roadway, Autobahn Series ATBM (or approved equivalent) in accordance with ANSI C136.14, latest issue.

IES Light Distribution – Luminaires shall have a lamp socket setting that provides a light distribution pattern as specified in Tables I – III, and shall be in accordance with the latest edition of RP-8. Photometric data shall be provided to the Standards Engineering Department upon request.

Mounting Provision – Luminaire shall include a slip-fitter designed for attachment to a pipe tenon with an outside diameter of 1-1/4 to 2 inches. Slip-fitter shall have a minimum insertion length of 4-3/4 inches and shall include an internal stop to prevent over insertion. Provision shall be made for adjustment of an installed luminaire a minimum of 3 degrees above or below the horizontal. Mounting hardware shall be mechanically galvanized, zinc chromate plated, or stainless steel, and shall be rigid to prevent slippage or rotation of the luminaire in relation to the tenon.

Housing – Luminaire housing shall be die cast aluminum with a hinged lower door assembly. All housing parts shall fit together without excessive voids or openings. The lower door latch shall provide positive indication that the lower door is securely closed and shall provide no-tool access to the lamp compartment. The lower door hinge shall be designed so that a free-swinging door will not accidentally disengage from the upper housing. The lower door shall be removable without the need for tools.

Finish / Color(s) - Luminaire housing shall be painted, both inside and outside, using powder coat paint. Paint finish shall be smooth, semi-gloss. Color shall be GRAY – (RAL #7038).

Wildlife Guard – Luminaire shall have a factory installed wildlife guard designed to prevent animal entry into the luminaire housing. The wildlife guard shall be designed to be difficult to remove to insure it being in place at the time of installation.

Reflector / Refractor – Luminaire shall include a polished, gasketed, reflector designed so that with the lower luminaire door closed, dirt, dust, bugs, etc., cannot enter the lamp compartment. Luminaire shall have a refractor as specified in Tables I through III, and in accordance with ANSI C136.17, latest issue.

Labeling – Luminaire and ballast shall be labeled in accordance with ANSI C136.22, latest issue, for lamp and ballast wiring diagrams. Wiring diagram shall be mounted in a visible location and shall be permanent. Luminaire shall be externally labeled on the lower housing door with a color-coded wattage label in accordance with ANSI C136.15, latest issue. 240 volt and 277 volt luminaires shall have an additional label on the lower housing door to identify the operating voltage. Pulse start metal halide luminaires shall have an additional label on the lower housing door with the legend “PULSE START”. Manufacturer, date of manufacture, supply voltage, lamp type and wattage, shall be identified on the luminaire nameplate.

Terminal Block – Luminaire shall be provided with a three positions, dead back, terminal block with captive screws and washers and mounted such that #14 to #8 AWG stranded copper source conductors can be easily be installed by a lineperson wearing rubber gloves. Luminaire housing shall be grounded with a green conductor connected to the middle terminal.

Photoelectric Control Receptacle – Luminaire to include a 360° adjustable, twistlock, photoelectric control receptacle in accordance with ANSI C136.10, latest issue, but without photoelectric control. Photoelectric control receptacle shall have tin plated bronze contacts.

Ballast – Luminaire shall include a ballast of the type specified in Tables I – III. All ballast shall conform to ANSI 82.4, latest issue. Ballast shall be capable of starting and operating the lamp within manufacturers' specified limits. During normal lamp failure modes, ballast must protect itself. Ballasts specified as “reactor” shall be capable of operating on circuits regulated to within  $\pm 5\%$  of line voltage. Ballasts specified as “regulated” shall be capable of operating on circuits regulated to within  $\pm 10\%$  of line voltage.

Starting Aid – When required, luminaire shall be provided with a socket and field replaceable plug in solid state starting aid mounted in an easily accessible location.

Capacitor – All capacitors, when used, shall be clearly be labeled “NON-PCB”. Label shall be visible in final capacitor mounting location.

Lamp Socket - Lamp socket shall be a 600-volt class (per ANSI C-136.2, latest edition), mogul base design with a nickel-plated bronze screw shell and center contact. Lamp socket shall be in accordance with ANSI C136.11, latest issue. Screw shell shall prevent lamp unseating from vibration. Lamp socket housing shall be glazed porcelain. Lamp position shall be horizontal.

Shipping – Each luminaire shall be individually boxed and supported during shipment to prevent damage. Shipping carton shall include a label with the luminaire description, manufacturers catalog number, and a one line drawing depicting the shape of the luminaire.

Wireless Controller – A wireless controller shall be attached to each fixture installed, including decorative fixtures. This controller shall be CIMCON Lighting, Inc. iSLC-3100-7P (or equivalent).

3. ITEM ID – Light Emitting Diode Horizontal Roadway Luminaires – See Table I

TABLE I

# Autobahn Series ATBM

## Roadway

### ORDERING INFORMATION

Series	Performance Packages	Voltage	Optics	Mounting
<b>ATBM</b> Autobahn LED Roadway	<b>P05</b> 9,700 lumens <b>P10</b> 11,000 lumens <b>P20</b> 12,800 lumens <b>P30</b> 15,500 lumens <b>P40</b> 17,400 lumens <b>P50</b> 18,700 lumens <b>P60</b> 20,000 lumens <b>P70</b> 21,500 lumens	<b>MVOLT</b> Multi-volt, 120-277V <b>347</b> 347V <b>480</b> 480V	<b>R2</b> Roadway Type II <b>R3</b> Roadway Type III <b>R4</b> Roadway Type IV <b>R5</b> Roadway Type V	<b>(Blank)</b> 2 Bolt Mounting <b>4B</b> 4 Bolt Mounting

Options		
<u>Color Temperature (CCT)</u> <b>(Blank)</b> 4000K CCT, 70 CRI Min. <b>3K</b> 3000K CCT, 70 CRI Min. <b>5K</b> 5000K CCT, 70 CRI Min.  <u>Paint</u> <b>(Blank)</b> Gray <b>BK</b> Black <b>BZ</b> Bronze <b>DDB</b> Dark Bronze <b>GI</b> Graphite <b>WH</b> White  <u>Surge Protection</u> <b>(Blank)</b> Standard 20kV/10kA SPD <b>MP</b> MOV Pack  <u>Miscellaneous Options</u> <b>HSS</b> House Side Shield <b>NL</b> NEMA Label Indicating Wattage <b>XL</b> Not CSA Certified – No Terminal Block Cover <b>UMR-XX</b> 8" Horizontal Arm for Round Pole, Painted to match Fixture <b>UMS-XX</b> 8" Horizontal Arm for Square Pole, Painted to match Fixture <b>UMR-GALV</b> 8" Horizontal Arm for Round Pole, Painted to match Fixture <b>UMS-GALV</b> 8" Horizontal Arm for Square Pole, Painted to match Fixture	<u>Control Options</u> <b>(Blank)</b> 3 Pin NEMA Photocontrol Receptacle <b>P7</b> 7 Pin Photocontrol Receptacle (dimnable driver included) <sup>1</sup> <b>NR</b> No Photocontrol Receptacle <b>A0</b> Field Adjustable Output <sup>3</sup> <b>DM</b> 0-10V Dimmable Driver <sup>2</sup> <b>PCSS</b> Solid-State Lighting Photocontrol <sup>4</sup> <b>PCLL</b> Solid-State Long Life Photocontrol <b>PCCC</b> Solid-State Long Life Photocontrol with remote control on/off <sup>4</sup> <b>SH</b> Shorting Cap  <u>Packages</u> <b>(Blank)</b> Standard Pack <b>JP</b> Job Pack (36/pallet)	<u>Accessories</u> <b>ATBMHSS</b> House Side Shield <b>ATBMLTS</b> Light Trespass Shield <b>RKATBMMVOLTSPD</b> ATBM Acuity SPD, MVOLT <b>RKATBMHVSPD</b> ATBM Acuity SPD, 347/480V <b>RKATBMMVOLTMP</b> ATBM MOV Pack, MVOLT <b>RKATBMHVMP</b> ATBM MOV Pack, 347/480V

#### Notes:

- 1 Dimmable Driver included. Not available with DM or NR.
- 2 Controls by others. Not available with P7 or A0.
- 3 Not available with DM.
- 4 MVOLT only.



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[www.americanelectriclighting.com](http://www.americanelectriclighting.com)  
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**Warranty** Five-year limited warranty. Complete warranty terms located at:  
[www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx)  
 Actual performance may differ as a result of end-user environment and application.  
 Specifications subject to change without notice.

*Please contact your sales representative for the latest product information.*

ATBM

#### 4. ITEM ID – Light Emitting Diode Horizontal Roadway Luminaires – See Table II.

TABLE II

## Autobahn Series ATBM Roadway

P E R F O R M A N C E   P A C K A G E															
Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)					4K/5K (4000K/5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	25k Hours	75k Hours	100k Hours
P05	R2	68	9,396	138	1	0	2	9,718	143	1	0	2	0.93	0.86	0.83
	R3		9,366	138	1	0	3	9,688	142	1	0	3			
	R4		9,030	133	1	0	3	9,340	137	1	0	3			
	R5		10,334	152	3	0	2	10,689	157	3	0	2			
	R2		10,635	131	2	0	3	11,299	139	2	0	3			
P10	R2	81	10,675	132	2	0	3	11,302	140	2	0	3	0.93	0.86	0.83
	R3		10,391	128	2	0	4	10,994	136	2	0	4			
	R4		11,504	142	3	0	2	12,086	149	3	0	2			
	R5		12,073	128	2	0	3	12,874	137	2	0	3			
	R2		12,065	128	2	0	3	12,818	136	2	0	3			
P20	R3	94	11,946	127	2	0	4	12,525	133	2	0	4	0.93	0.86	0.83
	R4		13,085	139	4	0	2	13,776	147	4	0	2			
	R5		14,637	124	2	0	3	15,514	131	2	0	3			
	R2		14,631	124	2	0	3	15,452	131	2	0	3			
	R3		14,317	121	2	0	4	15,151	128	2	0	5			
P30	R4	118	15,775	134	4	0	2	16,685	141	4	0	2	0.93	0.86	0.83
	R5		16,233	120	2	0	3	17,493	130	2	0	3			
	R2		16,402	121	2	0	3	17,367	129	2	0	3			
	R3		15,911	118	2	0	5	17,008	126	2	0	5			
	R4		17,507	130	4	0	2	18,595	138	4	0	2			
P40	R5	135	17,541	115	2	0	3	18,748	123	2	0	3	0.93	0.86	0.83
	R2		17,677	116	2	0	4	18,712	123	2	0	4			
	R3		17,154	113	2	0	5	18,246	120	2	0	5			
	R4		19,008	125	4	0	2	20,088	132	4	0	2			
	R5		18,770	112	2	0	3	20,095	120	3	0	3			
P50	R2	152	18,830	112	2	0	4	20,094	120	3	0	4	0.93	0.86	0.83
	R3		18,369	109	2	0	5	19,648	117	2	0	5			
	R4		20,350	121	4	0	2	21,505	128	4	0	2			
	R5		20,190	106	3	0	3	21,565	114	3	0	3			
	R2		20,142	106	3	0	4	21,504	113	3	0	4			
P60	R3	168	19,660	103	2	0	5	21,024	111	3	0	5	0.93	0.86	0.83
	R4		21,988	116	4	0	2	23,076	121	4	0	2			
	R5														
	R2														
	R3														
P70	R4	190											0.93	0.86	0.83
	R5														
	R2														
	R3														
	R4														

**Note:** Individual fixture performance may vary. Specifications subject to change without notice.

## 5. ITEM ID – Non-Standard Horizontal Roadway Luminaires – See Table III and IV.

TABLE III

### Autobahn Series ATBS Roadway & Security Lighting

#### ORDERING INFORMATION

Series	Performance Packages	Voltage	Optics
<b>ATBS</b> Autobahn LED Roadway & Security	<b>P10</b> 5,500 lumens <b>P20</b> 6,800 lumens <b>P30</b> 8,300 lumens <b>P40</b> 9,400 lumens <b>P50</b> 10,800 lumens <b>P60</b> 11,850 lumens	<b>MVOLT</b> Multi-volt, 120-277V <b>347</b> 347V <b>480</b> 480V	<b>R2</b> Roadway Type II <b>R3</b> Roadway Type III <b>R5</b> Roadway Type V <b>D3</b> Type III, Drop Refractor included <b>D5</b> Type V, Drop Refractor included
Options			
<u>Color Temperature (CCT)</u> <b>(Blank)</b> 4000K CCT, 70 CRI Min. <b>3K</b> 3000K CCT, 70 CRI Min. <b>5K</b> 5000K CCT, 70 CRI Min.	<u>Controls</u> <b>(Blank)</b> 3 Pin NEMA Photocontrol Receptacle <b>NR<sup>1</sup></b> No Photocontrol Receptacle <b>DM<sup>2</sup></b> 0V-10V Dimmable Driver <b>P7</b> 7 Pin Photocontrol Receptacle (dimmable driver included) <b>PCSS<sup>1</sup></b> DTL DSS Photocontrol <b>PCL1<sup>1</sup></b> DTL DLL Photocontrol 120-277V <b>AO</b> Field Adjustable Output <b>SH</b> Shorting Cap	<u>Accessories</u> <b>ATBSREF</b> Drop Refractor for field installation <b>ATBSHSS</b> House Side Shield for field installation <b>ATBSLTS</b> Light Trespass Shield for field installation <b>ATBS LOUVER KIT</b> Louver Kit for field installation <b>ATBSVR-XX</b> Visual Comfort Refractor and painted skirt for field installation	
<u>Paint</u> <b>Blank</b> Gray (Standard) <b>BK</b> Black <b>WH</b> White <b>BZ</b> Bronze	<u>Packages</u> <b>(Blank)</b> Standard Pack <b>JP</b> Job Pack (54/pallet)		
<u>Surge Protection</u> <b>Blank</b> Standard 20kV/10kA SPD <b>MP</b> MOV Pack 10kV/5kA	<u>Install Packages</u> <b>PKGS</b> DTL DSS Photocontrol <b>PKGL</b> DTL DLL Photocontrol Packages ship with selected photocontrol, 24", 1 1/4" diameter arm, 5' of prewire and mounting hardware		
<u>Misc.</u> <b>HS</b> House Side Shield <b>NL</b> NEMA Label <b>XL</b> Not CSA Certified <b>VR<sup>3</sup></b> Visual Comfort Optic <b>UMR-XX</b> 8" Horizontal Arm for Round Pole, Painted to match Fixture <b>UMS-XX</b> 8" Horizontal Arm for Square Pole, Painted to match Fixture <b>UMR-GALV</b> 8" Horizontal Arm for Round Pole, Painted to match Fixture <b>UMS-GALV</b> 8" Horizontal Arm for Square Pole, Painted to match Fixture			

#### Notes

1. Not available with Install Packages.
2. Not available with AO option.
3. Not available with D3 or D5 option.



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TABLE IV

## Autobahn Series ATBS

### Roadway & Security Lighting

#### P E R F O R M A N C E   P A C K A G E

#### ATBS

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)					4K/5K (4000K/5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P10	R2	40	5,360	134	1	0	2	5,577	139	1	0	2	0.92	0.89	0.85
	R3		5,287	132	1	0	1	5,524	138	1	0	1			
	R5		5,576	139	3	0	1	5,758	144	3	0	1			
	D3		4,963	124	1	3	3	5,163	129	1	3	3			
	D5		5,372	134	2	3	3	5,590	140	2	3	3			
P20	R2	50	6,707	134	1	0	2	6,809	136	1	0	2	0.92	0.89	0.85
	R3		6,687	134	2	0	2	6,760	135	2	0	2			
	R5		6,926	139	3	0	1	7,108	142	3	0	1			
	D3		6,496	130	2	3	4	6,244	125	1	3	4			
	D5		7,032	141	3	4	4	7,317	146	3	4	4			
P30	R2	60	8,092	135	2	0	2	8,067	134	1	0	1	0.92	0.89	0.85
	R3		7,971	133	2	0	2	8,328	139	2	0	2			
	R5		8,470	141	3	0	2	8,760	146	3	0	2			
	D3		7,491	125	2	3	4	7,795	130	2	3	4			
	D5		8,110	135	3	4	4	8,438	141	3	4	4			
P40	R2	70	9,138	131	2	0	2	9,533	136	2	0	2	0.92	0.89	0.85
	R3		9,136	131	2	0	2	9,355	134	2	0	2			
	R5		9,868	141	3	0	2	9,710	139	3	0	2			
	D3		8,460	121	2	3	4	8,802	126	2	3	5			
	D5		9,158	131	3	4	5	9,529	136	3	4	5			
P50	R2	82	10,628	130	2	0	3	10,829	132	2	0	3	0.92	0.89	0.85
	R3		10,624	130	2	0	2	10,826	132	2	0	2			
	R5		11,450	140	4	0	2	11,181	136	4	0	2			
	D3		10,143	124	2	4	5	10,553	129	2	4	5			
	D5		10,651	130	3	4	5	11,082	135	3	4	5			
P60	R2	92	11,060	120	2	0	3	11,848	129	2	0	3	0.92	0.89	0.85
	R3		10,911	119	2	0	2	11,862	129	2	0	2			
	R5		12,199	133	4	0	2	12,756	139	4	0	2			
	D3		10,230	111	2	4	5	10,644	116	2	4	5			
	D5		11,074	120	3	4	5	11,523	125	3	4	5			

#### ATBS with VR

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)					4K/5K (4000K/5000K CCT, 70 CRI)					LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours
P10	R2 with VR	40	4,450	111	1	0	1	4,561	114	1	0	1	0.92	0.89	0.85
	R3 with VR		4,273	107	1	0	1	4,605	115	1	0	1			
	R5 with VR		4,539	113	2	0	1	4,679	117	2	0	1			
P20	R2 with VR	50	5,491	110	1	0	1	5,550	111	1	0	1	0.92	0.89	0.85
	R3 with VR		5,379	108	1	0	1	5,582	112	2	0	1			
	R5 with VR		5,647	113	2	0	1	5,692	114	2	0	1			
P30	R2 with VR	60	6,479	108	2	0	1	6,530	109	2	0	1	0.92	0.89	0.85
	R3 with VR		6,400	107	2	0	1	6,564	109	2	0	1			
	R5 with VR		6,703	112	3	0	1	6,693	112	2	0	1			
P40	R2 with VR	70	7,307	104	2	0	1	7,561	108	2	0	1	0.92	0.89	0.85
	R3 with VR		7,347	105	2	0	1	7,638	109	2	0	1			
	R5 with VR		7,693	110	3	0	1	7,749	111	3	0	1			
P50	R2 with VR	82	8,552	104	2	0	2	8,711	106	2	0	2	0.92	0.89	0.85
	R3 with VR		8,494	104	2	0	1	8,814	107	2	0	1			
	R5 with VR		8,895	108	3	0	1	8,911	109	3	0	1			
P60	R2 with VR	92	8,989	98	2	0	2	9,815	107	2	0	2	0.92	0.89	0.85
	R3 with VR		8,899	97	2	0	1	9,857	107	2	0	2			
	R5 with VR		9,309	101	3	0	1	10,256	111	3	0	1			

**Note:** Individual fixture performance may vary. Specifications subject to change without notice.

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## 6. ITEM ID – Non-Standard Horizontal Roadway Luminaires – See Table V and VI.

TABLE V

# Autobahn Series ATBX Roadway & Security Lighting

## ORDERING INFORMATION

Series	Performance Packages	Voltage	Optics
<b>ATBX</b> Autobahn LED Roadway & Security	<b>P10</b> 2,000 lumens <b>P20</b> 2,500 lumens <b>P30</b> 3,200 lumens <b>P40</b> 3,900 lumens <b>P50</b> 5,600 lumens <b>P60</b> 6,600 lumens <b>P70</b> 7,400 lumens	<b>MVOLT</b> Multi-volt, 120-277V	<b>R2</b> Roadway Type II <b>R3</b> Roadway Type III <b>R4</b> Roadway Type IV <b>R5</b> Roadway Type V <b>D3</b> Type III, Drop Refractor included <b>D5</b> Type V, Drop Refractor included

Options		
<u>Color Temperature (CCT)</u> <b>(Blank)</b> 4000K CCT, 70 CRI Min. <b>3K</b> 3000K CCT, 70 CRI Min. <b>5K</b> 5000K CCT, 70 CRI Min.  <u>Paint</u> <b>Blank</b> Gray (Standard) <b>BK</b> Black <b>WH</b> White <b>BZ</b> Bronze  <u>Surge Protection</u> <b>Blank</b> Standard 20kV/10kA SPD <b>MP</b> MOV Pack  <u>Misc.</u> <b>VR</b> Visual Comfort Refractor <b>HSS</b> House Side Shield <b>NL</b> NEMA Label <b>XL</b> Not CSA Certified	<u>Controls</u> <b>(Blank)</b> 3 Pin NEMA Photocontrol Receptacle <b>NR<sup>1</sup></b> No Photocontrol Receptacle <b>DM<sup>2</sup></b> 0V-10V Dimmable Driver <b>P7</b> 7 Pin Photocontrol Receptacle (dimmable driver included) <b>PCSS<sup>1</sup></b> DTL DSS Photocontrol <b>PCLL<sup>1</sup></b> DTL DLL Photocontrol 120-277V <b>AO</b> Field Adjustable Output <b>SH</b> Shorting Cap  <u>Packages</u> <b>(Blank)</b> Standard Pack <b>JP</b> Job Pack  <u>Install Packages</u> <b>PKGS</b> DTL DSS Photocontrol <b>PKGL</b> DTL DLL Photocontrol Packages ship with selected photocontrol, 24", 1 1/4" diameter arm, 5' of prewire and mounting hardware	<u>Accessories</u> <b>ATBXREF</b> Drop Refractor for field installation <b>ATBXHSS</b> House Side Shield for field installation <b>ATBXLTS</b> Light Trespass Shield for field installation <b>ATBXVR-XX</b> Comfort Refractor & Uplight Skirt, Select Paint (XX) to Match Fixture

### Notes

1. Not available with Install Packages.
2. Not available with AO option.



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TABLE VI

# Autobahn Series ATBX

## Roadway & Security Lighting

PERFORMANCE PACKAGE															
Performance Package	Distribution	Input Watts	3000K CCT, 70 CRI					4000K & 5000K CCT, 70 CRI					LLD @ 25C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50K Hours	75K Hours	100K Hours
P10	R2	14	1,956	140	1	0	1	2,030	145	1	0	1	0.92	0.89	0.85
	R3		1,955	140	0	0	1	2,011	144	0	0	1			
	R4		1,982	142	1	0	1	1,974	141	1	0	1			
	R5		2,145	153	1	0	0	2,160	154	1	0	0			
	D3		1,908	136	1	2	1	1,963	140	1	2	1			
	D5		2,077	148	1	2	1	2,092	149	1	2	1			
P20	R2	18	2,455	136	1	0	1	2,575	143	1	0	1	0.92	0.89	0.85
	R3		2,473	137	1	0	1	2,547	142	1	0	1			
	R4		2,505	139	1	0	1	2,497	139	1	0	1			
	R5		2,715	151	2	0	0	2,735	152	2	0	0			
	D3		2,414	134	1	2	1	2,486	138	1	2	1			
	D5		2,629	146	1	2	1	2,648	147	1	2	1			
P30	R2	23	3,102	135	1	0	1	3,243	141	1	0	1	0.92	0.89	0.85
	R3		3,125	136	1	0	1	3,232	141	1	0	1			
	R4		3,153	137	1	0	1	3,150	137	1	0	1			
	R5		3,422	149	2	0	1	3,431	149	2	0	1			
	D3		3,050	133	1	2	1	3,155	137	1	2	1			
	D5		3,314	144	1	2	1	3,322	144	1	2	1			
P40	R2	28	3,603	129	1	0	1	3,790	135	1	0	1	0.92	0.89	0.85
	R3		3,705	132	1	0	1	3,890	139	1	0	1			
	R4		3,640	130	1	0	2	3,817	136	1	0	2			
	R5		3,971	142	2	0	1	4,167	149	2	0	1			
	D3		3,617	129	1	2	2	3,797	136	1	2	2			
	D5		3,845	137	2	2	1	4,035	144	2	2	1			
P50	R2	41	5,426	132	2	0	2	5,425	132	2	0	2	0.92	0.89	0.85
	R3		5,248	128	1	0	2	5,615	137	1	0	2			
	R4		5,300	129	1	0	2	5,462	133	1	0	2			
	R5		5,647	138	3	0	1	6,033	147	3	0	1			
	D3		5,123	125	1	3	2	5,481	134	1	3	2			
	D5		5,468	133	2	3	2	5,842	142	2	3	2			
P60	R2	51	6,392	125	2	0	2	6,416	126	2	0	2	0.92	0.88	0.84
	R3		6,208	122	1	0	2	6,635	130	1	0	2			
	R4		6,207	122	1	0	2	6,432	126	1	0	2			
	R5		6,690	131	3	0	1	7,127	140	3	0	1			
	D3		6,059	119	1	3	2	6,477	127	1	3	2			
	D5		6,478	127	2	3	2	6,901	135	3	3	2			
P70	R2	60	7,133	140	2	0	2	7,246	142	2	0	2	0.92	0.88	0.84
	R3		6,967	137	1	0	2	7,449	146	1	0	2			
	R4		6,957	136	1	0	2	7,235	142	1	0	2			
	R5		7,492	147	3	0	1	7,939	156	3	0	1			
	D3		6,800	133	2	3	2	7,271	143	2	3	2			
	D5		7,255	142	3	3	2	7,688	151	3	3	2			



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TABLE VI (cont.)

## Autobahn Series ATBX

### Roadway & Security Lighting

PERFORMANCE DATA with VISUAL COMFORT REFRACTOR															
Performance Package	Distribution	Input Watts	3000K CCT, 70 CRI					4000K & 5000K CCT, 70 CRI					LLD @ 25C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50K Hours	75K Hours	100K Hours
P10	R2 with VR	14	1,686	120	1	0	1	1,747	125	1	0	1	0.92	0.89	0.85
	R3 with VR		1,669	119	1	0	1	1,698	121	1	0	1			
	R4 with VR		1,602	114	1	0	1	1,626	116	1	0	1			
	R5 with VR		1,814	130	1	0	1	1,862	133	1	0	1			
P20	R2 with VR	18	2,124	118	1	0	1	2,205	123	1	0	1	0.92	0.89	0.85
	R3 with VR		2,104	117	1	0	1	2,138	119	1	0	1			
	R4 with VR		2,019	112	1	0	1	2,053	114	1	0	1			
	R5 with VR		2,290	127	1	0	1	2,346	130	1	0	1			
P30	R2 with VR	23	2,684	117	1	0	1	2,788	121	1	0	1	0.92	0.89	0.85
	R3 with VR		2,659	116	1	0	1	2,699	117	1	0	1			
	R4 with VR		2,553	111	1	0	1	2,594	113	1	0	1			
	R5 with VR		2,892	126	2	0	1	2,969	129	2	0	1			
P40	R2 with VR	28	3,240	116	1	0	1	3,369	120	1	0	1	0.92	0.89	0.85
	R3 with VR		3,204	114	1	0	1	3,261	116	1	0	1			
	R4 with VR		3,081	110	1	0	2	3,124	112	1	0	2			
	R5 with VR		3,495	125	2	0	1	3,584	128	2	0	1			
P50	R2 with VR	41	4,633	113	1	0	2	4,818	118	1	0	2	0.92	0.89	0.85
	R3 with VR		4,499	110	1	0	2	4,617	113	1	0	2			
	R4 with VR		4,343	106	1	0	2	4,504	110	1	0	2			
	R5 with VR		4,869	119	2	0	1	5,117	125	2	0	1			
P60	R2 with VR	51	5,495	108	2	0	2	5,710	112	2	0	2	0.92	0.88	0.84
	R3 with VR		5,330	105	1	0	2	5,490	108	1	0	2			
	R4 with VR		5,145	101	1	0	2	5,328	104	1	0	2			
	R5 with VR		5,771	113	3	0	1	6,061	119	3	0	1			
P70	R2 with VR	60	6,167	121	2	0	2	6,396	125	2	0	2	0.92	0.88	0.84
	R3 with VR		5,978	117	1	0	2	6,110	120	1	0	2			
	R4 with VR		5,772	113	1	0	2	5,962	117	1	0	2			
	R5 with VR		6,482	127	3	0	1	6,799	133	3	0	2			



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Actual performance may differ as a result of end-user environment and application.  
All values are design or typical values, measured under laboratory conditions at 25 °C.  
Specifications subject to change without notice.

**Please contact your sales representative for the latest product information.**

**B. PRECAST CONCRETE STREET LIGHTING FOUNDATION 11½" BOLT CIRCLE – FOR ROADWAY CLASS POLES**

**Specifications**

**1. APPLICATION** - This STANDARD covers precast concrete street lighting foundations used for mounting all anchor bases, roadway class street lighting poles that have an 11-1/2" bolt circle.

**2. SPECIFICATION** - All precast concrete foundations with an 11-1/2" bolt circle shall conform to the following specification, including Figure 1.

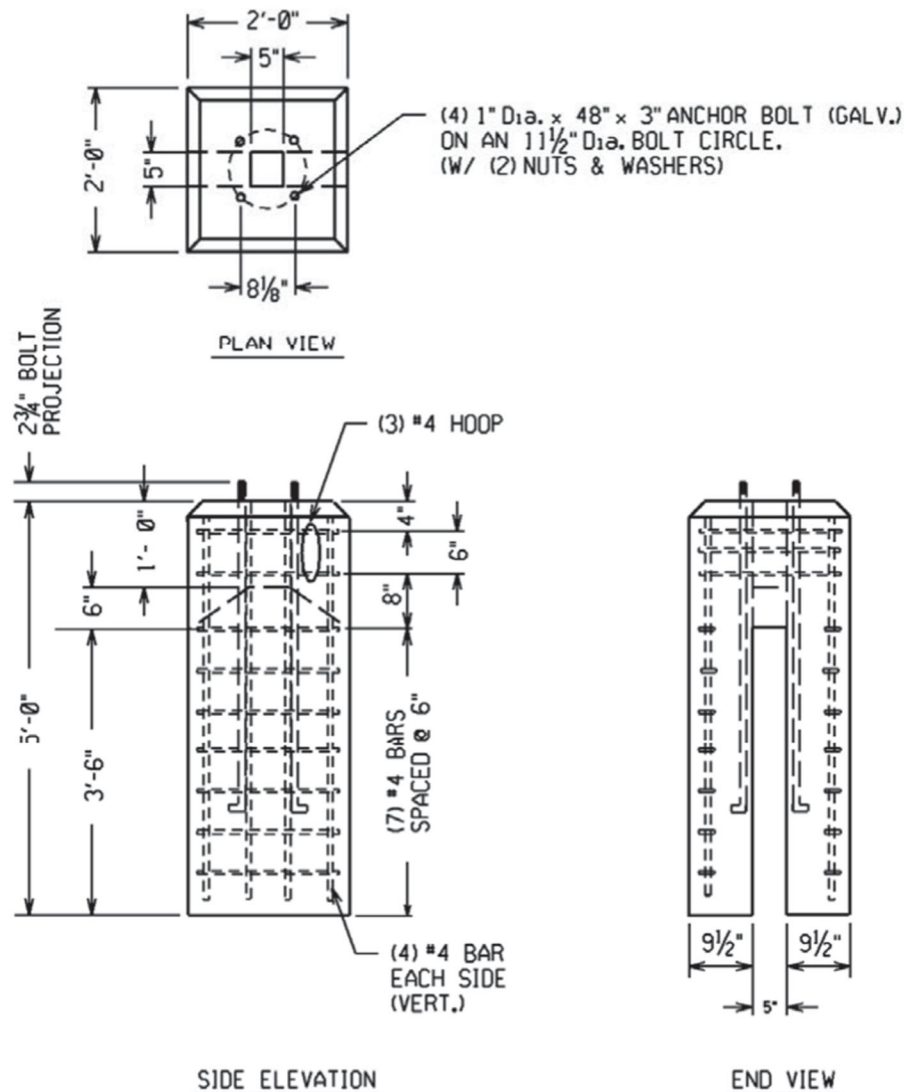


Figure 1 – Precast Concrete Street Lighting Foundation - 11½" Bolt Circle

**General** - Precast concrete street lighting foundation, overall size = 24 inch square x 60" depth, with 45 degree chamfer around top edge. Approximate weight = 2,500 pounds.

**Minimum Concrete Strength** - 5,000 PSI @ 28 days. Type III.

**Steel Reinforcement** - Steel reinforcement rods shall be #4 bars – ASTM A615 Grade 60, and in accordance with Figure 1.

**Anchor Bolt Detail** - Provide four 1-inch diameter x 48" x 3" "L" shaped galvanized steel anchor bolts, each one with (2) heavy hex head nuts and (2) round washers. All hardware shall conform to ASTM A36, A563, and F844, respectively and shall be hot-dip galvanized per A153. Bolt circle diameter shall be 11-1/2-inch. Each

anchor bolt shall have a minimum 12-inch thread length and shall project 2-3/4-inches above the top of the foundation.

Wiring Access - Provide a 5-inch x 5-inch opening in the center of the foundation for conduit installation by others, as shown in Figure 1.

3. ITEM ID - See Table I.

TABLE I

Standard Item	Item ID	Description
SF10	5821035	Precast Concrete Street Lighting Foundation – for roadway class poles with an 11-1/2” bolt circle.

**C. ANCHOR BASE, PENDANT ARM, STREET LIGHTING POLES, ALUMINUM SPECIFICATIONS**

1. APPLICATION – Anchor base, aluminum, pendant streetlighting poles are available for outdoor lighting installations supplied by underground wiring. Typical applications are in commercial "downtown" areas and along main highways.

2. SPECIFICATIONS - All anchor base, aluminum, pendant streetlighting poles shall conform to the following specifications, including Figures 1, 2, 3, 4, and Table 1.

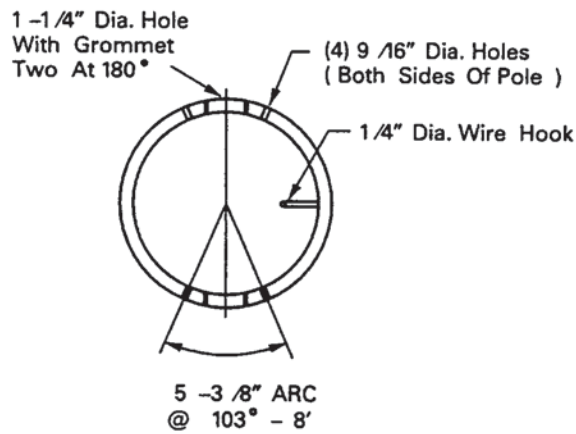


Figure 1 – Pole Top Detail  
(Top View)

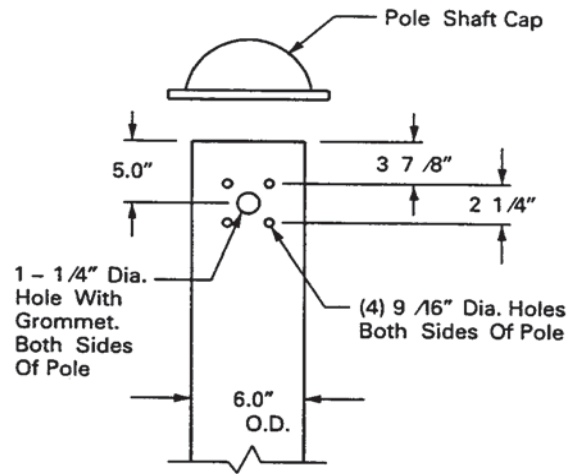


Figure 2 – Pole Top Detail  
(Side View)

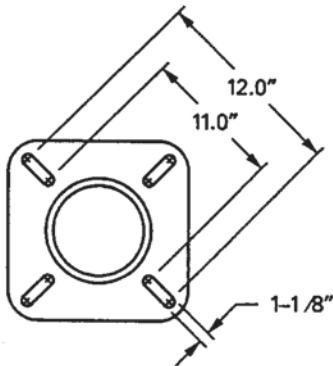


Figure 3 – Base Flange Detail

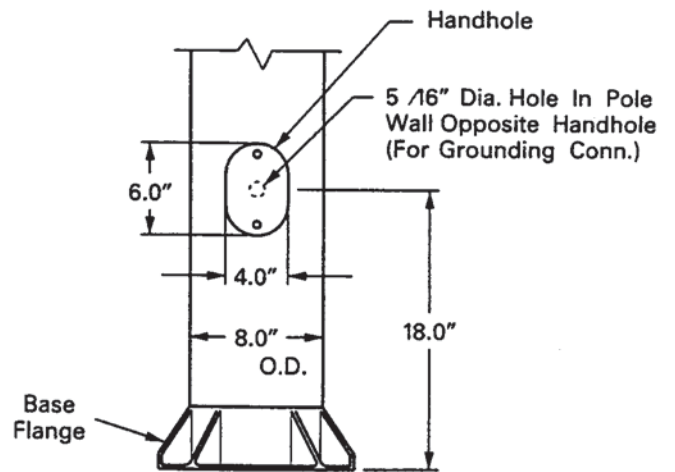


Figure 4 – Handhole Detail

General - Pole, aluminum, anchor base, pendant, for roadway lighting use. Includes base flange, handhole, grounding provision, shaft cap, and arm attachment hardware. Pole height as specified.

Base Flange - The base flange shall be a one piece cast aluminum alloy, joined to the shaft by complete circumferential welding. The base flange shall include four 1 $\frac{1}{8}$ " diameter slotted holes, to enable pole installation on a precast concrete foundation with four 1" diameter anchor bolts arranged in an 11 $\frac{1}{2}$ " bolt circle. Anchor bolts are to be supplied by others. Four 1/16" aluminum shims and four aluminum anchor bolt covers, including stainless steel attachment hardware shall be included with every pole. The anchor bolt covers shall provide adequate inside clearance to cover 1" diameter anchor bolts with a 2 $\frac{3}{4}$ " projection above the top of the precast concrete foundation. The central area of the base flange shall be open to allow wiring access.

Handhole - Every pole shall be provided with a 4" x 8" oval shaped handhole centered 18 inches above the bottom of the shaft, and located 90 degrees from the plane of the luminaire arms as viewed from the pole top. Handhole shall be reinforced with a cast aluminum frame. Handhole cover shall be secured by two stainless steel pinned Allen head attachment screws.

Grounding - Pole shall be furnished with one 5/16" hole positioned opposite the center line of the handhole and one Fargo # 5006-P connector for grounding purposes.

Shaft: The pole shaft shall be a seamless, round tapered tube, and shall be full length heat treated after welding to produce a T6 temper. The outside diameter shall be 8.0" at the base and taper to 6.0" at the top. See Table 1 for nominal wall thickness. A  $\frac{1}{4}$ " diameter wire hook shall be welded to the inside of the shaft, at the pole top, to provide mechanical support for the luminaire wiring.

Finish / Color - The shaft shall have a satin etched finish, free of dents and scratches and requiring no surface preparation, painting, or maintenance.

Festoon Outlet - When specified, pole shall be provided with a single outlet box mounted in a welded frame with a weatherproof hinged cover located 15'-0" above the base flange on the same face of the pole as the handhole. Electrical receptacle shall be provided by others.

Strength - Pole shall meet latest AASHTO requirements for intended use. At minimum, pole shall be capable of supporting two horizontal roadway style luminaires (each one with an effective projected area of 2.0 square feet and weighing 80 pounds), each one mounted on a 12-foot truss style arm, when subjected to a sustained 90-MPH wind.

Welding - All welding shall be shop welded using the inert gas shielded metal arc method with consumable electrode in accordance with AWS Specification D1.2, Structural Welding Code – Aluminum.

Arm Attachment - The shaft shall be factory drilled to enable installation of two luminaire arms mounted 180 degrees apart. Factory drilling for each arm shall include four 9/16" holes for arm attachment and one 1 $\frac{1}{4}$ " diameter grommotted hole for wiring access. See Figures 1 and 2 for arm attachment details. An aluminum plate shall be provided which blanks off one set of arm attachment holes in the event only one arm is to be installed. The plate shall be provided attached in place on the pole using (4)  $\frac{1}{2}$ " x 1-1/2" long stainless steel hex head bolts, nuts, washers, & lock washers.

Shaft Cap - A cast aluminum cap shall be provided with each pole. The cap shall be attached to the pole shaft by means of three stainless steel screws mounted 120 degrees apart.

Identification - Every pole shall be identified with the manufacturer's I.D. on the base flange in a location where the manufacturer can easily be determined when the pole is installed on a precast concrete foundation.

Shipping / Protection - Poles shall be blocked, supported, and protected during shipment to prevent warping, excessive flexure, abrasion or damage to the finish. All hardware, fasteners, handhole doors, and accessory attachments shall be shipped installed in place. All poles shall be shipped on a flatbed truck.

Drawings - Manufacturer shall provide detailed drawing(s) of the pole with all component parts. Drawing shall include one general drawing depicting the pole with all critical dimensions and materials identified; a list identifying the quantity and description of all accessory materials, and when appropriate, an exploded view of all to-be-assembled parts showing the proper sequence of assembly. Drawing shall also include information to enable the user to identify the pole's maximum capacity with respect to arm and luminaire effective projected area and weight loading when subjected to a sustained 90 MPH wind. Drawing shall also include the weight in pounds of the pole. When requested, manufacturer shall submit product samples for Standards Department evaluation.

3. ITEM ID – See Table I.

TABLE I

STANDARD	ITEM ID	DESCRIPTION	NOMINAL WALL
ST01F	0811022	25 Foot, Anchor Base, Aluminum, Pendant, Street Lighting Pole	0.156 inches
ST01F1	0810919	25 Foot, Anchor Base, Aluminum, Pendant, Street Lighting Pole with Festoon Outlet	0.188 inches
ST01G	5821833	30 Foot, Anchor Base, Aluminum, Pendant, Street Lighting Pole	0.188 inches
ST01G1	9202005	30 Foot, Anchor Base, Aluminum, Pendant, Street Lighting Pole with Festoon Outlet	0.250 inches
ST01H	5821834	35 Foot, Anchor Base, Aluminum, Pendant, Street Lighting Pole	0.250 inches

#### D. ***STREETLIGHT ARMS FOR ALUMINUM PENDANT POLES, SPECIFICATIONS***

1. APPLICATION – Aluminum streetlight arms are used to install horizontal roadway luminaires on aluminum pendant poles.
2. SPECIFICATIONS - All aluminum streetlight arms for aluminum pendant poles shall conform to the following specifications, including Figures 1 and 2 and Table I.

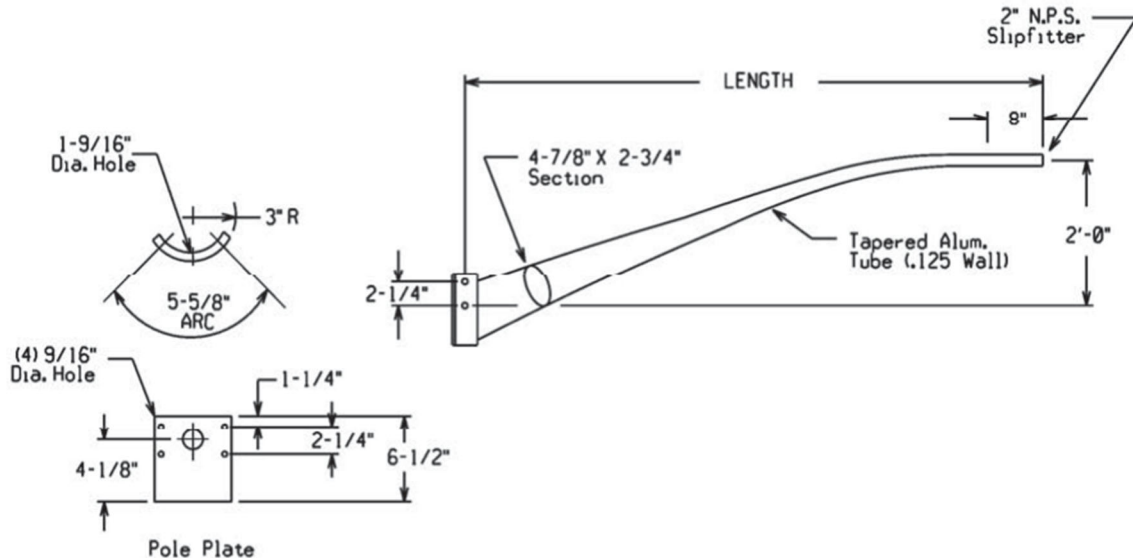


Figure 1 – Tapered Elliptical Aluminum Arm

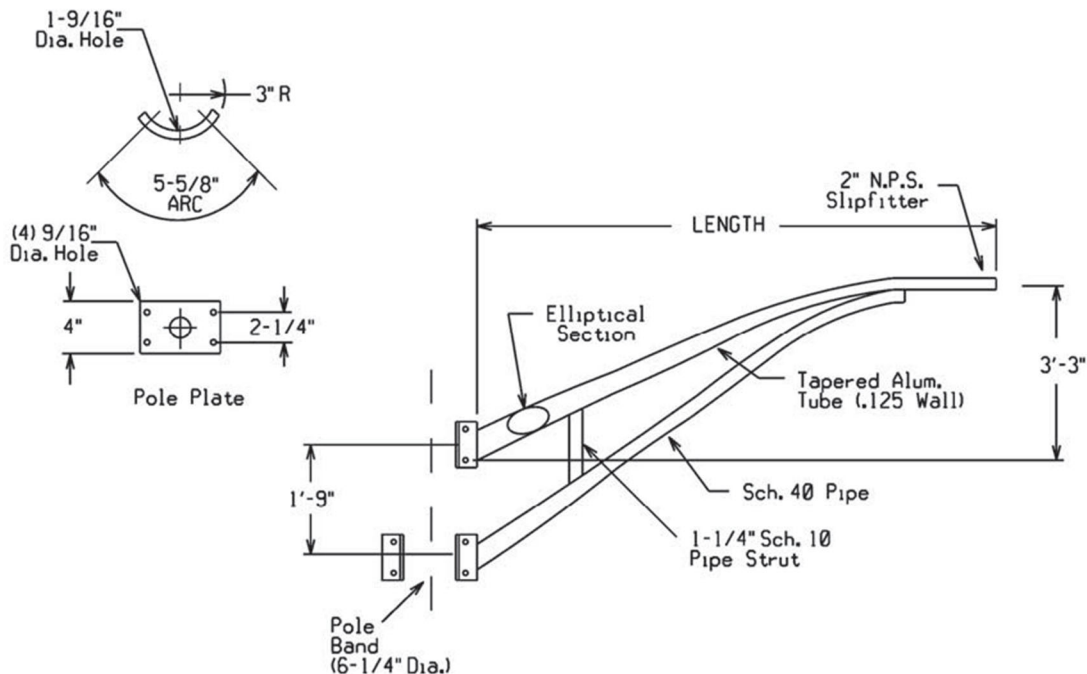


Figure 2 – Tapered Truss Aluminum Arm

General - Arm, streetlight, aluminum, for installation on aluminum pendant pole. Arms shall be in accordance with Figures 1 or 2, and Table 1.

Pole Attachment - All arms shall be designed to be attached to an aluminum pole with an outside diameter of 6.0 inches.



**TAPERED ELLIPTICAL ARMS** - These arms shall have one welded, fixed pole plate. This plate shall accommodate attachment to the aluminum pole with (4) ½" x 1½" long, stainless steel, hex head bolts, nuts, washers, and lock washers. All hardware is to be provided attached in place on the arm.

**TAPERED TRUSS ARMS** - Each truss member shall have a fixed, welded pole plate. The upper pole plate shall accommodate attachment to the aluminum pole with four ½" x 1½" long, stainless steel, hex head bolts, nuts, washers and lock washers. The lower pole plate shall clamp around the perimeter of the pole using a pole band and (4) ½" x 2½" long stainless steel, hex head, bolts, nuts, washers and lock washers. All hardware is to be provided attached in place on the truss arm.

**Luminaire Attachment** - The luminaire end of all arms shall accommodate a horizontal roadway style luminaire. The arm tenon shall be 2" O.D. and be in accordance with ANSI C136.3, latest issue.

**Finish / Color** - All arms shall have a natural finish, free of dents and scratches, and requiring no surface preparation, painting, or maintenance.

**Wiring Access** - All arms shall accommodate internal wiring. All pipe ends which will carry conductors shall be chamfered to avoid cutting or nicking the wiring insulation. Tapered truss arms shall use the upper truss member as the wiring path.

**Welding** – All aluminum welding shall be shop welded using inert metal-arc welding process in accordance with A. W. S. Specification D10.7, latest issue. Filler metal shall conform to the A. W. S. Specification A5.10, latest issue.

**Strength** - All arms shall be rated capable of supporting a horizontal roadway luminaire with a maximum weight of 80 pounds and a maximum effective projected area of 2.0 square feet when subjected to a sustained 90 MPH wind.

**Identification** - All arms shall be permanently stamped in a field readable location near the pole end with the manufacturer I.D. and date of manufacturer.

**Shipping / Protection** – Arms shall be blocked, supported, and protected during shipment to prevent any damage to the arm.

**Drawings** – Manufacturer shall submit detailed drawings of each arm with all component parts. Drawing shall include all dimensions, material specifications, manufacturing and welding procedures. Drawing shall also include a table showing the maximum effective projected area and maximum weight luminaire that each arm can support based on a sustained 90 MPH wind. Drawing shall also include the weight, in pounds, of each arm. When requested, manufacturer shall submit product samples for Standards Department evaluation.

**3. ITEM ID** - See Table I.

TABLE I

**E. MEASUREMENT AND PAYMENT**

STANDARD	ITEM ID	DESCRIPTION
ST01X1	0811023	6 Foot Tapered Elliptical Arm for Aluminum Pendant Pole
ST01X2	0811024	8 Foot Tapered Elliptical Arm for Aluminum Pendant Pole
ST01X3	0811026	10 Foot Tapered Truss Arm for Aluminum Pendant Pole
ST01X4	0811025	12 Foot Tapered Truss Arm for Aluminum Pendant Pole
ST01X5	9202269	16 Foot Tapered Truss Arm for Aluminum Pendant Pole

Payment for this item shall be paid per each, complete in place.

**ITEM 821.20 STREET LIGHTING CONTROL LOAD CENTER (EACH)**

**A. GENERAL**

The work under this item shall conform to the relevant portions of Section 820 (MSSHB) and the following:

The work shall include the furnishing and installation of Street Lighting Control Load Center with all control equipment for the street lighting system in accordance with the plans and as directed by the Engineer.

The quantity of street lighting control load center estimated under this pay item is for the comparison of bids only and is not guaranteed by the Engineer; it may be increased or decreased by the Engineer depending upon the actual conditions encountered as provided for in Section 4.06 (MSSHB).

**B. MATERIALS**

Refer to the plans for all specific materials associated with the street lighting control load center. All material is as stated on the plans or approved equal.

**C. CONSTRUCTION METHODS**

Street lighting control load center shall be installed per Section 820 (MSSHB), and per applicable codes, using the material specified or approved equals.

**D. MEASUREMENT AND PAYMENT**

Street Lighting Control Load Center will be measured for payment by each complete, functioning unit in place.

Street Lighting Control Load Center will be paid for at the contract unit bid price per each, which price shall include all labor, material, tools and equipment, for furnishing and installing NEMA Cabinet, main breaker panel with main breaker, service panel with all required breakers, lighting contactor, lightening arrestor, conduit, time clock, auto-control switch, grounding, wire ways, light, switches, receptacles, meter socket, and all incidental costs required to complete the work.

## EL743BR Series ITS Equipment Cabinet



### Description

The Eagle EL743BR series is designed to house and protect equipment for ITS installations. The cabinet is constructed from aluminum and designed for protection from all weather conditions.

### Features

- 3/16" thick 5052-H32 Aluminum Construction
- 19" rack rails for equipment mounting
- Three-point latching system with #2 lock
- Continuously welded seams for maximum protection against contaminants
- Double-flanged cabinet shell for increased water protection
- Sun shield to help regulate cabinet and equipment temperature
- Side and back equipment mounting panels for additional mounting space
- Thermostatically controlled ventilation fan and air filter
- NEMA 3R rated and UL-approved design



EL743BR Series ITS Equipment Cabinet

*Eagle Traffic Control Systems continues our 80+ year history of providing excellence in the ever evolving traffic industry. All of Eagle's products are developed with the highest standards of engineering and manufacturing. Eagle maintains a superior level of integrity in interactions with all of our business partners and customers. We also take tremendous pride in being model corporate citizens.*

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### ITEM 822 SPOT DIGS (EACH)

#### A. GENERAL

A Spot Dig includes all work related to an excavation to repair a streetlight cable fault. This includes the investigation of and finding the fault, laying out the excavation work, mobilization of the excavation crew, saw cutting/jack hammering, excavating, repairing the fault, road plating (if necessary), verifying the problem is fixed, proper and appropriate backfill and compaction or control density fill (when necessary). Includes all labor, all materials, all latent subsurface conditions and any time needed to coordinate or work in conjunction with National Grid or their designee when necessary.

## B. **MEASUREMENT AND PAYMENT**

Payment under this item shall be at the contract unit bid price per each location.

### **ITEM 823 STREET LIGHT AS-BUILT PLANS (LUMP SUM)**

#### A. **GENERAL**

As-built Street Lighting Layout Plans

It will be the responsibility of the Contractor to provide the Contract Officer with as-built street lighting layout plans indicating all changes made during the construction. The plans shall indicate the location of all street light equipment installed including, light posts, controller cabinets, conduit, pull boxes, and service connections. The plans shall also indicate the final configuration of the load center panel board, with circuits appropriately labeled, and meter number.

Electronic files of as-built drawings of the street light system shall be provided in the latest version of AutoCAD. These files shall be submitted prior to final acceptance of the project.

As-built photos shall include internal components of the load center cabinet.

In addition to the above the Contractor shall provide an Operation and Maintenance Manual.

Upon completion of the work of this Contract, deliver to the Contract Officer two (2) copies of an Operation and Maintenance (O & M) Manual. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl covered binders, with pocket folders for folded sheet information. Include a separate section for each system or sub-system. Sections shall be separated by heavy plastic dividers with tabs that identify the material in each section. Place a permanent label or title block on each binder for identification.

The information to be provided is considered incidental to the lighting installation.

1. Include the following information on the label:
  - a. O & M Manual for \_\_\_\_\_ (Project name)
  - b. Date
  - c. Name and address of Engineer
  - d. Name and address of Contractor
  - e. Name and address of Sub-Contractor
2. Provide the following in each manual:
  - a. Table of Contents
  - b. Listing of all service agents with addresses and telephone numbers
  - c. Description of systems operation
  - d. Emergency instructions for equipment and/or systems where appropriate
  - e. Wiring diagrams and piping diagrams specific to systems installed.
  - f. Manufacturers' operating and maintenance instructions for each piece of equipment installed
  - g. Inspection procedures
  - h. Spare parts list
  - i. Copies of all panelboard circuit indexes.
  - j. Copies of all warranties and guarantees.
  - k. Copies of submittals and shop drawings.
3. Provide the following information, in Microsoft Excel format, for each installed street light pole, as they are installed:

Street Name	
Pole Number	
Pole Type (Wood, Metal, Decorative)	

Source Type (Underground Overhead)	
SLC Number	
SLC MAC ID	
Replacement Fixture Type (Type, Wattage)	

**B. MEASUREMENT AND PAYMENT**

Payment under this item shall be at the contract unit bid price per lump sum.

**ITEM 824 SAFETY BASE SPECIFICATIONS**

1-800-257-9441 Rocky Mount, NC

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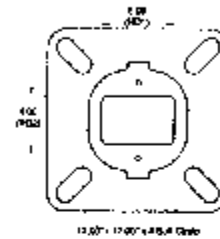
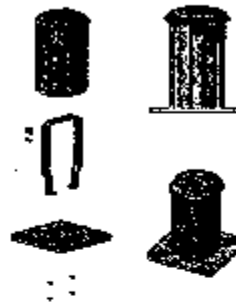
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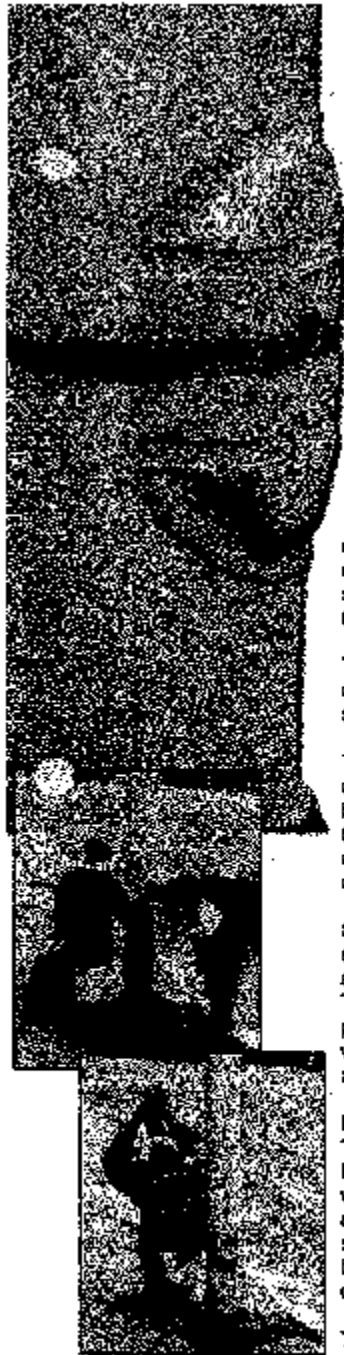
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2/2/2016

## ITEM 825 U-COVERS SPECIFICATIONS



# Universal Hand Hole Cover

## Reduce your costs & liability

Covering hand holes and restricting access to the dangerous high voltage wires within light poles is a problem for all utility companies and municipalities.

Emergency crews often encounter metal hand hole covers with oxidized screws, requiring the crews to break or pry the cover off the pole. The crew is then unable to secure a cover on the hand hole because of the broken screw tabs or stripped threads.

The U-Cover was invented by an emergency crew supervisor who was faced with this situation day after day.

The patented design of the U-Cover allows crews to use one inventory item to secure hand holes on flanged and unflanged poles 6" to 12" in diameter. The universal design eliminates the need to stock several size covers for various size poles or hand holes.

Storekeepers and crews can easily manage stock and ensure every effort is made to safe-guard the public from exposed wires. The durable high impact no-break co-polymer polypropylene U-Cover stands up to harsh weather conditions, extreme temperatures, and vandals.

### Installation

The U-Cover is easily installed by one person. Place over the hand hole and keep in place with your knee, the stainless steel band surrounds the pole and cover. A Penta head security bolt is placed through the holes in the band (different holes accommodate the different diameter poles).

The Penta bolt threads into a brass nut molded into the bottom of the cup on the U-Cover. As the bolt is tightened, the strap secures the U-Cover tightly to the pole.

The molded plastic encases the bolt on the inside of the Cover, avoiding any risk of the bolt conducting electricity.



Angel Guard Products, Inc.  
128 Southland Boulevard Dr.  
Worcester, MA 01603  
508-855-0532  
www.angelguardproducts.com  
Patented



## The Benefits of U-Cover

- Easily secured by one person
- Adapts to 6" to 12" diameter light poles
- Adapts to different style and size hand holes
- A quick and efficient S.O.P.
- Secures from the outside with no exposed metal inside
- Durable, reusable and water resistant
- Vandal resistant
- Reduces Liability
- An excellent light duty assignment
- Save on Inventory
- An economical solution to reduce inventory needs



There is no exposed metal within the pole that could create electrical hazards for crews or pedestrians.

As the Penta bolt is tightened, the strap secures the U-Cover tightly and flush to the pole.



# U-Cover

UNIVERSAL HAND HOLE COVER

## ITEM 826 WOODEN UTILITY POLE SPECIFICATIONS

All wood poles will be a CLASS 4, with a 35 foot minimum pole subject to conditions of installation.



## **SECTION 900 - LUMP SUM RESERVE**

### **ITEM 900      LUMP SUM RESERVE FOR CITY USE**

#### **A. GENERAL**

1. **Lump Sum Reserve for Contingency Work** - The Contractor is advised that the lump sum reserve for contingency work shall be utilized, as required by the City of Worcester, for additional work that may be required by the City and agreed to by the Contractor. Any reserve balance remaining at the end of the contract will return to the City of Worcester.
2. **Lump Sum Reserve for Testing** - The Contractor is advised that, where indicated by the City of Worcester, independent laboratory tests may be required of materials incorporated into the project. The tests will be performed by an independent laboratory selected by the City and compensated for directly by the City under the Lump Sum Reserve for Testing items. The Contractor is to cooperate fully with the City to make available any material and samples necessary to perform the independent tests. Upon completion of the contract all amount not utilized will return to the City of Worcester.
3. **Lump Sum Reserve for Traffic Police** - The Contractor is advised that the City of Worcester will designate the number and need for Traffic Police throughout the duration of the contract. The City will compensate directly for Traffic Police, as ordered, under the Lump Sum Reserve for Traffic Police. Upon completion of the contract all amount not utilized will return to the City of Worcester.