

SECTION 32 39 13 - MANUFACTURED METAL BOLLARDS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provide and install bollards for restricting vehicular traffic from pedestrian areas and for the protection of facilities.

1.2 SUBMITTALS

- A. The Contractor shall submit the following.
 - 1. Product Data: Provide for each type of bollard, component, finish, and accessory specified.
 - 2. Color Samples: Submit manufacturer's standard colors for selection.
 - 3. Setting Drawings: Show embedded items and cutouts required for work specified in other Specifications.
 - 4. Maintenance Data: Submit manufacturer's field touch-up, cleaning and maintenance instructions.

1.3 QUALITY ASSURANCE AND QUALIFICATIONS

- A. Manufacturer Qualifications:
 - 1. Engage a firm which can show three (3) years of experience in the design, manufacture of steel bollards of the type required under this Section.
- B. All bollards at a particular Metro-North facility shall have a similar appearance.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials:
 - 1. Deliver bollards and all accessories dry and undamaged, with manufacturer's protective coating intact, bearing original intact factory labels.
 - 2. Bollards and/or accessories which are damaged during delivery or while being unloaded shall not be stored on site. Remove such units from site and replace with new, undamaged material.
- B. Storage of Materials:
 - 1. Store bollards and accessory materials under cover and in an area protected from dirt, damage, weather and from the construction activities. Do not store outside or allow items to become wet or soiled in any way while on site.
 - 2. Do not store in contact with concrete, earth or other materials that might cause corrosion, staining, scratching or damage to finish. Do not install system components which become dented, scratched or damaged in any way. Remove such components from site and replace with new, undamaged material.

- C. Handling of Materials:
 - 1. Do not subject bollards and accessory materials to bending or stress.
 - 2. Do not damage edges or handle material in a manner that will cause scratches, warps or dents.

1.5 PROJECT CONDITIONS

- A. Protection: Protect cast-in-place sleeves from debris and water intrusion by use of temporary covers or removable foam inserts.

1.6 Warranty

- A. Provide manufacturer's standard warranty against defects in material and workmanship.
 - 1. Warranty Period:
 - a. Five (5) years from date of invoice.
 - b. Coatings: Two (2) years from date of invoice against peeling, cracking, or significant color change.

PART 2 - PRODUCTS

2.1 Bollards

- A. Corrosion resistant tubular stainless-steel body, with non-directional finish.
- B. 360 degree shroud with two perforation zones located 180 degrees from each other for light transmission.
- C. IP-66 LED Driver enclosure and Class 2 rated output (UL 8750).
- D. 17W LED light engine, with 1545 lumens and 4,000K color temperature.
- E. Optional bolt-on security core embedment for vehicular loading.

PART 3 - EXECUTION

3.1 Examination

- A. Examine paving or other substrates for compliance with manufacturer's requirements for placement and location of embedded items, condition of substrate, and other conditions affecting installation of bollards.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

- A. Installation of materials provided under this Section shall be in accordance with the manufacturer's installation instructions and setting drawings.
- B. Install in accordance with applicable ADA guidelines and Metro North Railroad's accessibility policies.
- C. All fasteners and bolts to be stainless steel or galvanized steel.
- D. Damaged, cracked, chipped, deformed or marred bollards are not acceptable. Field touch-up minor imperfections in accordance with the manufacturer's instructions.

END OF SECTION

Cut Sheet Attached as a Sample Only



LIGHT COLUMN BOLLARD

PRODUCT DATA





LIGHT COLUMN BOLLARD

PRODUCT DATA

Sleek in stainless steel, the Light Column Bollard integrates into a wide range of settings and offers numerous design possibilities. Bollard columns are available in 5" or 6" diameters. Illumination options include LED lamps in white or RGBW, and multiple ways to direct light: no shield for symmetrical lighting, or 180° and 360° shields in standard or custom designs. Non-illuminated and security core variations, and matching Light Column Pathway Bollards and Light Column Pedestrian Lighting make it easy to create a cohesive look across functionalities.

MATERIAL & CONSTRUCTION DETAILS

CONFIGURATIONS	MATERIALS & FINISHES	LED LAMPS & DRIVER
<ul style="list-style-type: none"> Light Column Bollards are available in two sizes. Series 500 columns are 5" (127 mm) diameter tubular stainless steel; Series 600 columns are 6" (152 mm) diameter tubular stainless steel. To complement the illuminated bollard, a non-illuminated version is also available in both Series 500 and Series 600. Bollards can be specified with a removable base, with the exception of the RGBW option. Weather resistant GFCI outlet for maintenance access is available for Series 600, illuminated, non-RGBW, non-security bollards. Door for optional GFCI outlet is accessed using a flathead screwdriver. See drawings on our website for details. 	<ul style="list-style-type: none"> Illuminated bollards have a tubular stainless steel column, white-frosted acrylic lens, and a stainless steel head cap. Non-illuminated bollards are tubular stainless steel with welded stainless steel cap. Stainless steel is standard with a Satin finish and Ceramiloc treatment. See below for details For optional powdercoat colors see the Forms+Surfaces Powdercoat Chart. Custom RAL colors are available for an upcharge. 	<ul style="list-style-type: none"> Custom LED light engine with Cree® LEDs. Features advanced LED technology with 3000K warm white and 4000K natural white LEDs. 10W LED driver input power is 120-277V, -30°C starting temperature. Driver has forward-phase, reverse-phase and 0-10V dimming capabilities. LED driver certifications include: IP66 (waterproof) enclosure, and Class 2 rated output (UL8750)
		RGBW LED LAMPS & DRIVER
SHIELD OPTIONS	WEIGHT	<ul style="list-style-type: none"> RGBW LED board utilizing Cree® LEDs. RGBW, 4000K white, and dynamic white via DMX512 protocol and onboard decoder interface. Controller to be provided by others. 96W LED driver with 100-277V input power, -30°C starting temperature. LED driver certifications include: IP66 (waterproof) enclosure, and Class 2 rated output (UL8750)
<ul style="list-style-type: none"> Five standard shield designs are available for an upcharge. Refer to page 3 for details. Custom shield designs with either 180° or 360° coverage are also available. Shields are offered for Series 500 and Series 600 illuminated and RGBW bollards. 	<ul style="list-style-type: none"> Series 500, illuminated: 30 lbs (14 kg); non-illuminated: 32-33 lbs (15 kg) Series 600, illuminated: 34 lbs (15 kg); non-illuminated: 34-39 lbs (15-18 kg) Series 600, security core, illuminated: 170 lbs (77 kg); non-illuminated: 177 lbs (80 kg) 	

CERAMILOC TREATMENT

Ceramiloc is an invisible surface treatment that offers significantly enhanced protection from weather and graffiti and increases the maintenance ease of stainless steel. Ceramiloc combines ceramic durability with an unparalleled ability to lock out water spots, fingerprints, graffiti and more. Patented technology bonds nano-silica particles to the surface of the stainless steel. The treatment minimally alters the surface appearance of the stainless and offers numerous benefits:

- Easily Cleaned:** The Ceramiloc treatment creates a surface that simultaneously resists fingerprints and is easy to clean. Water spots, grease marks and more can be quickly wiped away. It also creates an "anti-graffiti" surface – even permanent marker is easily removed with a clean microfiber towel and water.
- Durable:** Ceramiloc-treated materials are abrasion- and scratch-resistant. The treatment is permanent, UV stable, and will not degrade or discolor over time.
- Environmentally Sound:** The Ceramiloc treatment is a no-VOC, water-based process. Because Ceramiloc surfaces are so easily maintained, cleaning solutions and maintenance are kept to a minimum.

INSTALLATION & MAINTENANCE

INSTALLATION	MAINTENANCE
<ul style="list-style-type: none"> Standard mounting is surface mount with 1/2"-13x18" galvanized steel J-bolt anchors. 1/2" thick stainless steel base plate is slotted for rotational capability. Security bollards have an embedded security core and are available for Series 600 bollards, except for the RGBW option, for an upcharge. All bollards, except for the RGBW option, can be specified with a removable base. RGBW bollards are connected via a daisy-chained hard-wired control signal in and out of each bollard. Installation of a surge protector as part of each units wiring is recommended. Necessary hardware is included for all mounting options. Templates are available upon request. 	<ul style="list-style-type: none"> Metal surfaces can be cleaned as needed using a soft cloth or brush with warm water and a mild detergent. Avoid abrasive cleaners.

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LIGHT COLUMN BOLLARD

PRODUCT DATA

ILLUMINATED BOLLARDS

LAMP DESCRIPTIONS

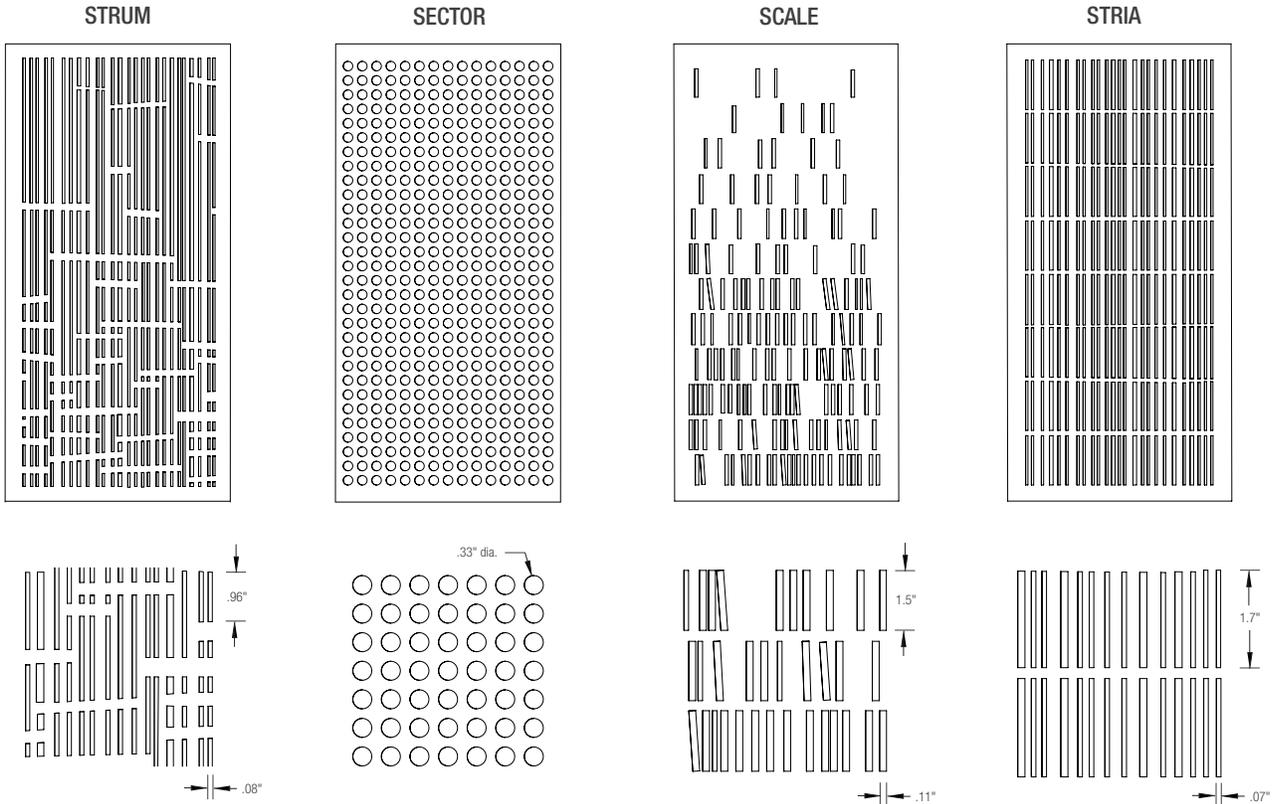
LAMP	DESCRIPTION	LUMINAIRE LUMENS*		B.U.G. RATING	LED STARTING TEMPERATURE °C
		500	600		
3000K LED	10W custom LED light engine	1006	990	B0-U3-G1	-30
4000K LED	10W custom LED light engine	1006	990	B0-U3-G1	-30
RGBW LED	78W custom LED light engine	varies	varies	varies	-30

*Luminaire lumens represents the absolute photometry for the luminaire, and indicates the lumens out of the entire fixture.

NOTE: Polar candela and isofootcandle plots can be found on the Light Column Bollard product page on our website.

STANDARD SHIELD DESIGNS

Shields are available in 180° or 360° configurations with standard or custom designs. Solid 180° shields are also available.





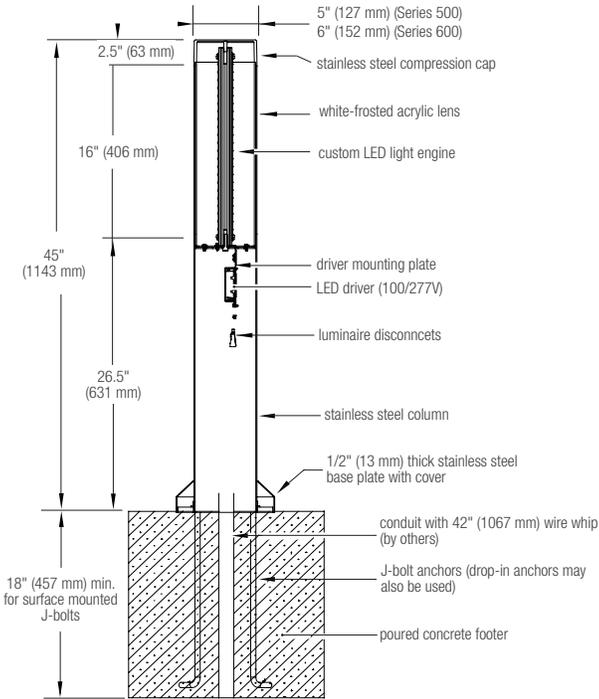
LIGHT COLUMN BOLLARD

PRODUCT DATA

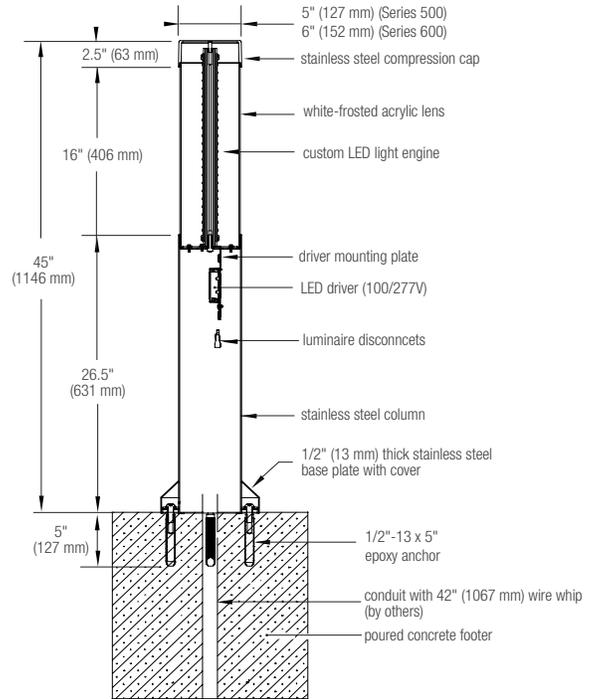
ILLUMINATED BOLLARDS - CONTINUED

NOMINAL DIMENSIONS

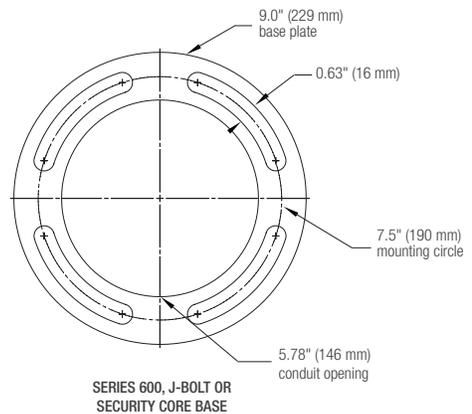
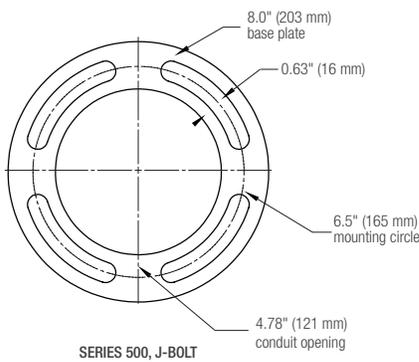
SURFACE MOUNT WITH J-BOLTS



SURFACE MOUNT WITH REMOVABLE BASE*



BASE PLATE MOUNTING DETAILS



* Not Available with RGBW LED option.

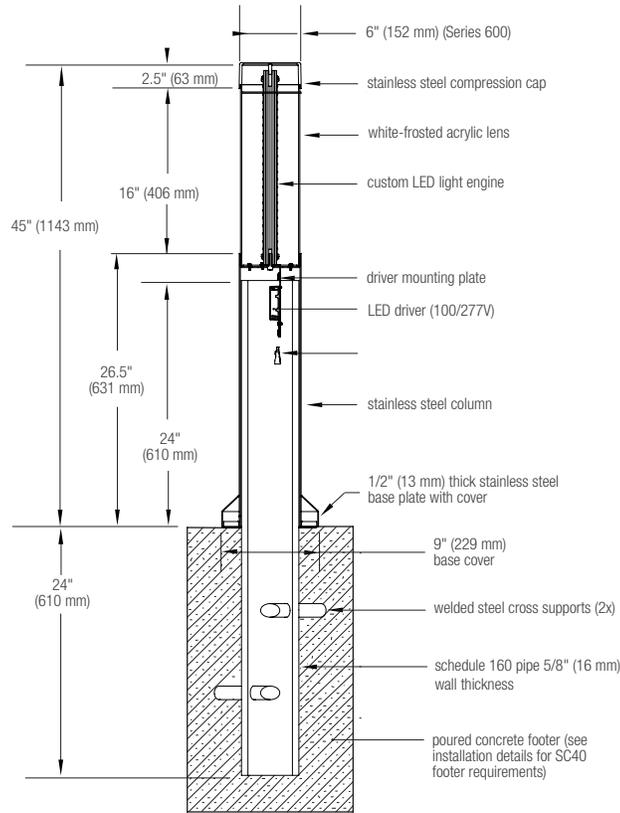


LIGHT COLUMN BOLLARD

PRODUCT DATA

ILLUMINATED BOLLARDS - CONTINUED

NOMINAL DIMENSIONS - EMBEDDED SECURITY CORE*



* Not Available with RGBW LED option.

OPTIONAL SC40-P1 SECURITY CORE

Site security is a major concern in today's unpredictable world. Public and private buildings, government facilities, campuses and public parks are all susceptible to accidental as well as deliberate vehicle infringement. Design professionals, city planners, facilities managers and engineers must now be increasingly sensitive to the safety and security requirements of public and private spaces. Security bollards placed at ingress points are an excellent way to guard against vehicle infringement while still allowing pedestrian access.

Until recently, security bollards have frequently taken the form of generic pipes or cylinders that offer little in the way of design or lighting functionality. Now, an optional enhancement to our Light Column Bollards provides a solution that blends security, performance and style. By adding a pre-engineered security core to our Series 600 design, we're able to respond to the needs of today's public spaces with a beautiful illuminated bollard that meets stringent high-impact crash requirements.

Light Column security bollards have been tested using a Finite Element Analysis (FEA) by a professional engineering consultant. FEA is a software-based tool commonly used in the automotive industry and used extensively for crash test simulations. Tests were performed using our bollard set in permanent concrete footings and struck by a vehicle at a 90 degree impact. The impact simulation found the bollards to be successful in stopping a 2,420 lb. small passenger vehicle going 40 mph with less than one meter penetration.

In addition to our illuminated security bollards, we can also provide non-illuminated variations. Refer to page 5 for details. Note that security cores are not available with the RGBW LED option. Please contact us to discuss design and installation considerations for Light Column Bollards with security cores.

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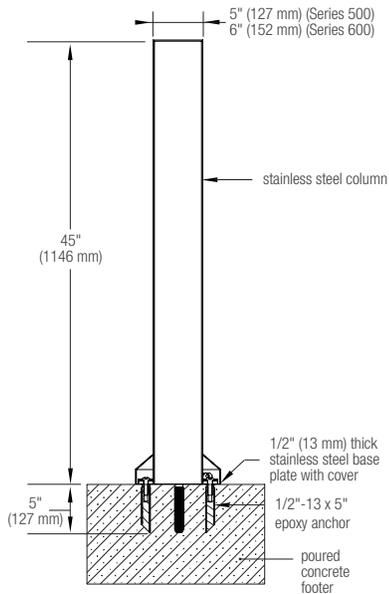
LIGHT COLUMN BOLLARD

PRODUCT DATA

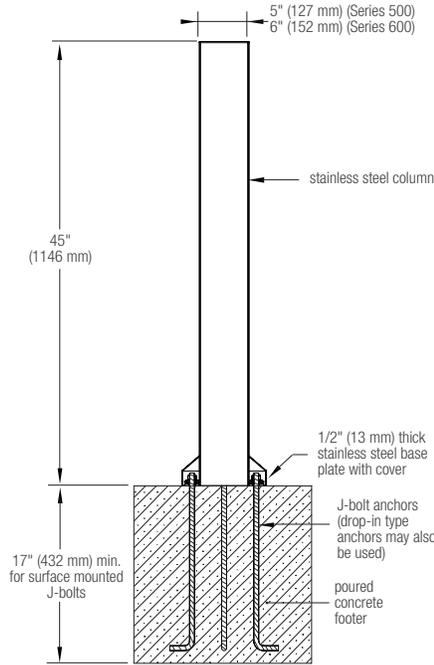
NON-ILLUMINATED BOLLARDS

NOMINAL DIMENSIONS

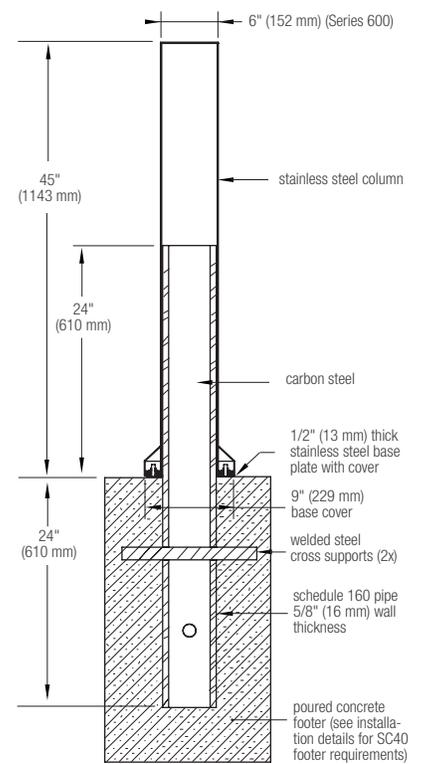
SURFACE MOUNT WITH REMOVABLE BASE



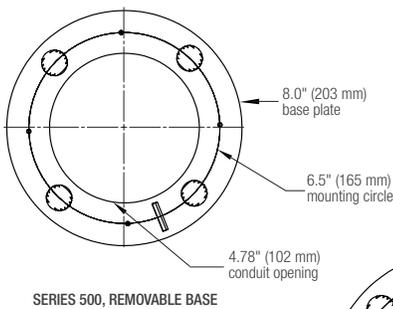
SURFACE MOUNT WITH J-BOLTS



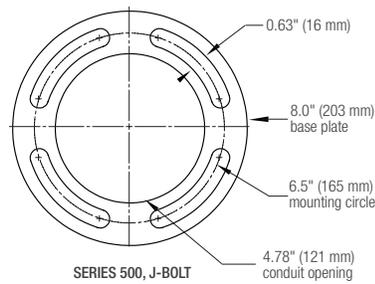
EMBEDDED SECURITY CORE



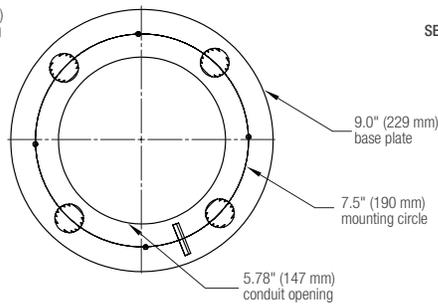
BASE PLATE MOUNTING DETAILS



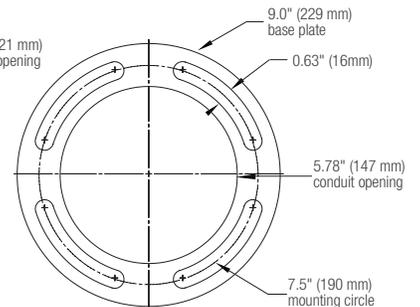
SERIES 500, REMOVABLE BASE



SERIES 500, J-BOLT



SERIES 600, REMOVABLE BASE



SERIES 600, J-BOLT OR SECURITY CORE BASE

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LIGHT COLUMN BOLLARD

PRODUCT DATA

CERTIFICATIONS

- ETL and C-ETL listed for wet locations.

ENVIRONMENTAL CONSIDERATIONS

- Please refer to the Light Column Bollard Environmental Data Sheets for detailed environmental impact information.
- Light Column Bollard has high recycled content and is highly recyclable.
- Powdercoat finishes are no- or low-VOC, depending on color.
- Low maintenance.

MODEL NUMBERS AND DESCRIPTIONS

MODEL	DESCRIPTION
LBLCB-504	Light Column Bollard, Series 500, illuminated
LBLCB-604	Light Column Bollard, Series 600, illuminated
LBLCB-504-RGBW	Light Column Bollard, Series 500, illuminated, RGBW
LBLCB-604-RGBW	Light Column Bollard, Series 600, illuminated, RGBW
LBLCB-504-N	Light Column Bollard, Series 500, non-illuminated
LBLCB-604-N	Light Column Bollard, Series 600, non-illuminated

PRODUCT OPTIONS

The following options are available for an upcharge

Upgrade to embedded security core (available for Series 600)*	Add 360° custom shield (customer-supplied artwork)
Upgrade to removable base*	Add GFCI outlet (available for Series 600, illuminated, non-security bollards)*
Add 180° shield in standard designs	Add powdercoat color from Forms+Surfaces Powdercoat Chart
Add 360° shield in standard designs	Custom RAL powdercoat color
Add 180° custom shield (customer-supplied artwork)	Custom fixture height

*Not available with RGBW LED option.

LEAD TIME: 6 to 8 weeks. Shorter lead times may be available upon request. Please contact us to discuss your specific timing requirements.

PRICING: Please contact us at **800.451.0410** or **sales@forms-surfaces.com**. At Forms+Surfaces, we design, manufacture and sell our products directly to you. Our sales team is available to assist you with questions about our products, requests for quotes, and orders. Territory Managers are located worldwide to assist with the front-end specification and quoting process, and our in-house Project Sales Coordinators follow your project through from the time you place an order to shipment.

TO ORDER SPECIFY: Quantity, model, finish, lamp, shield (if applicable), and mounting. Quote/Order Forms are available on our website to lead you through the specification process in a simple checkbox format.

NOTE: Because different computers will render colors and textures differently, actual colors and finishes may vary slightly from those shown here.