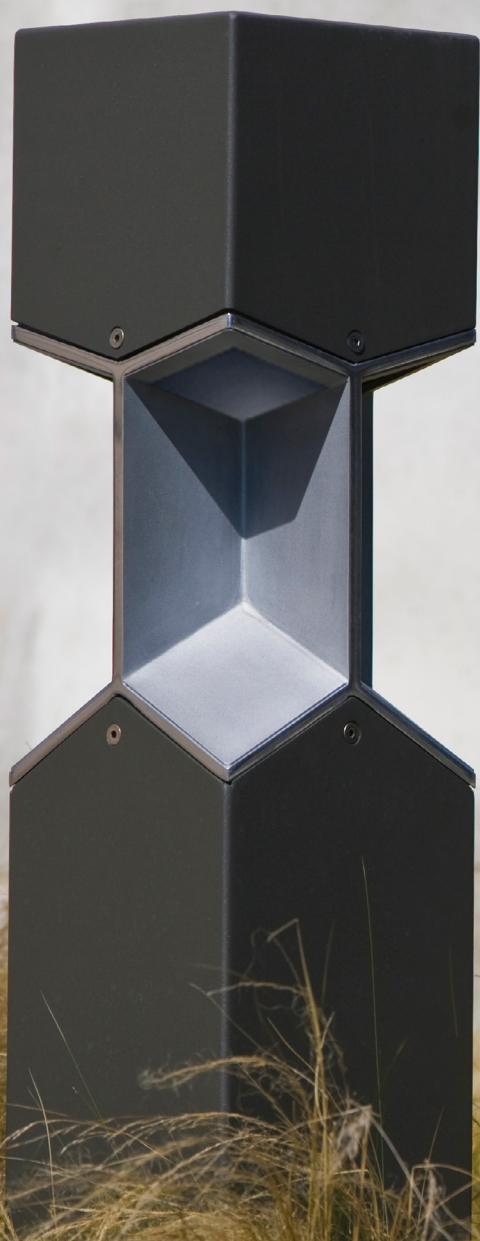




KNIGHT™ BOLLARD

PRODUCT DATA





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Knight Bollards combine rustproof construction, a unique geometric design, and the striking aesthetic of the rest of the Knight family. Fixtures consist of a robust square column with the light source positioned above a beautifully detailed quadrant casting. Bollards can be specified for lighting only or with an optional internal security core designed to protect buildings and public spaces against vehicle infringement. Available with CFL, HID or LED lamping, standard Knight Bollards have a symmetrical lighting pattern.

MATERIAL & CONSTRUCTION DETAILS

COLUMN	FINISHES	FLUORESCENT LAMPS & BALLASTS	INSTALLATION
<ul style="list-style-type: none">Column is 8" x 8" square (203 mm x 203 mm square) extruded aluminum with rounded corners.Standard height is 43.1" (1095 mm); shorter heights down to a minimum of 33" (838 mm) are available on a custom basis.	<ul style="list-style-type: none">For column and head powdercoat options see the Forms+Surfaces Powdercoat Chart for details. Custom RAL colors are available for an upcharge.Quadrant castings are Aluminum Texture powdercoat with polished outer edges. All quadrant casting surfaces are clear-coated.Due to the inherent nature of metal castings, gloss powdercoats are not offered for cast components.	<ul style="list-style-type: none">Standard lamp options are compact fluorescent (CFL) or high intensity discharge (HID). See lamp information on pages 3 and 4.Metal halide lamps are color-improved.Compact fluorescent: electronic, thermally protected, 120/277V combination for 26W or 42W compact fluorescent lamp, less than 10% THD, 0 °F starting temperature.High intensity discharge: F-can ballast, thermally protected, 120/277V, -20°F starting temperature, class B sound rating.	<ul style="list-style-type: none">Standard mounting is surface mount with 1/2"-13x18" galvanized steel J-bolt anchors. Security bollards use an embedded security core, available for an upcharge.Installation of a surge protector as part of each units wiring is recommended.Necessary hardware is included. Templates available upon request.
HEAD	WEIGHT	LED LAMP & DRIVER	MAINTENANCE
<ul style="list-style-type: none">Aluminum quadrant casting with aluminum lamp housing and four borosilicate glass lenses. Lenses can be replaced with opaque shields for asymmetrical distribution, if required.	<ul style="list-style-type: none">45 lbs (20.4 kg)	<ul style="list-style-type: none">Custom LED light engine, featuring advanced LED technology with 16W, 3000K warm white and 4000K natural white LEDs.LED driver has two options: 0-10V dimming (120-277 VAC input power) or phase dimming (120 VAC input power); -40°C to 90°C operating temperature.LED driver certifications include: IP66 (waterproof) enclosure, and Class 2 rated output (UL8750).	<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.

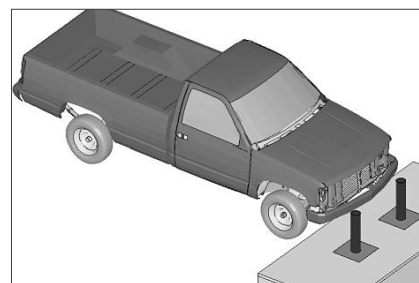
OPTIONAL SECURITY CORE

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.

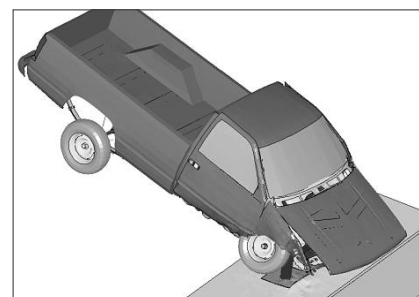
Until now, most security bollards have taken the form of generic pipes and cylinders that offered little in the way of design or lighting functionality. An integral security solution is now available as an optional enhancement to Forms+Surfaces' Knight lighting bollards. By adding a pre-engineered and fully-tested security core to the existing Knight design, we can offer a beautiful and efficient lighting bollard that also meets the stringent hi-impact crash requirements normally attained only with unattractive pipe barriers.

Forms+Surfaces' 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. All of our bollards with the security solution option were tested and passed a very demanding set of impact criteria. Tests were performed using our bollards set in permanent concrete footings spaced 42" apart (to assure a minimum of two bollards being hit) and struck by a vehicle at a 90-degree impact. The impact simulation found the bollards to be successful in stopping a 5,500 lb. vehicle traveling at a minimum test velocity of 40 mph.

In addition to our permanently embedded security bollards, Forms+Surfaces can also provide non-illuminated options. Please contact us to discuss design and installation considerations for Knight bollards with security cores.



Crash scenario with 5,500 lb. pickup truck approaching embedded bollard system at 40 mph



Full-scale crash 330ms after impact

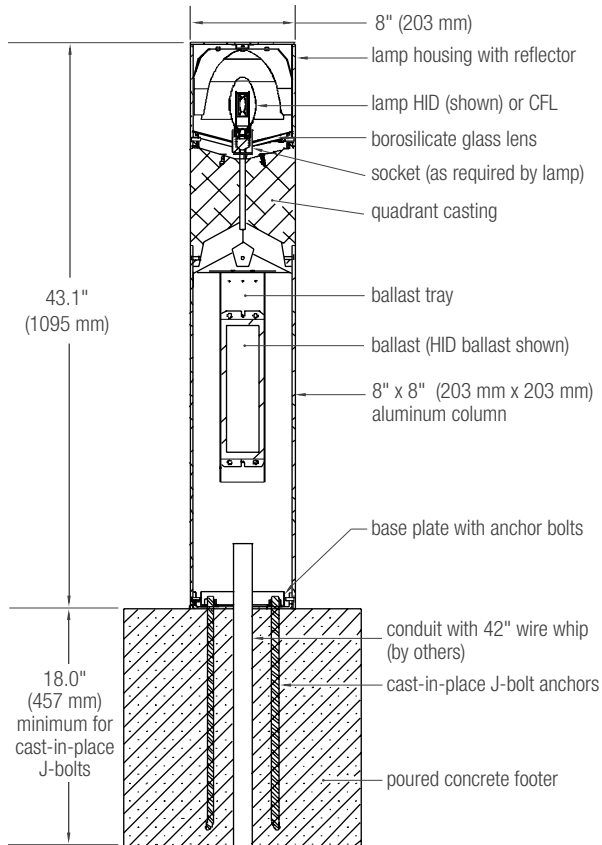
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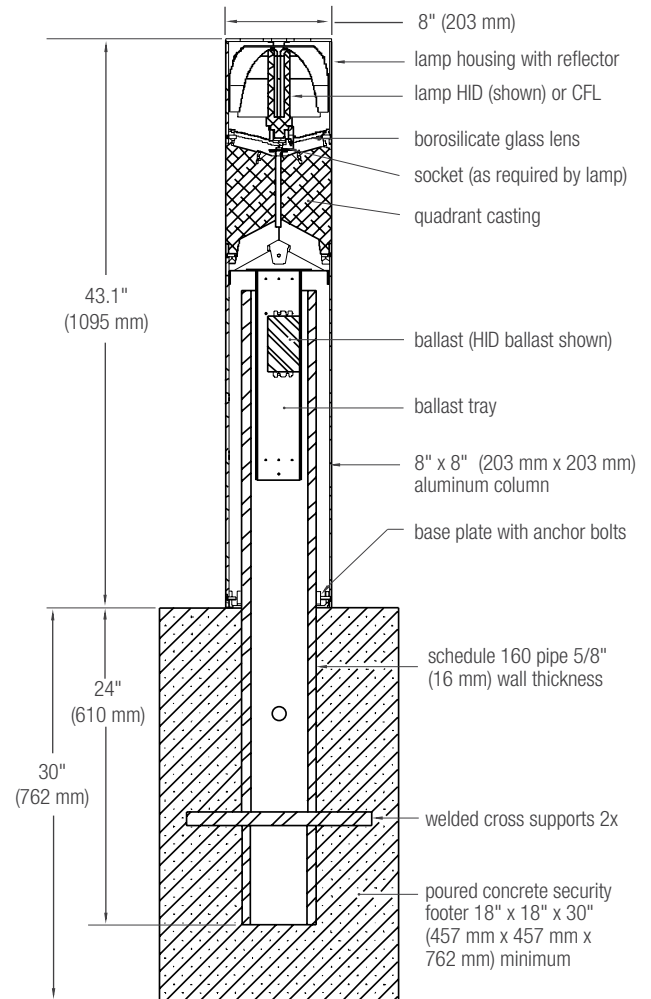
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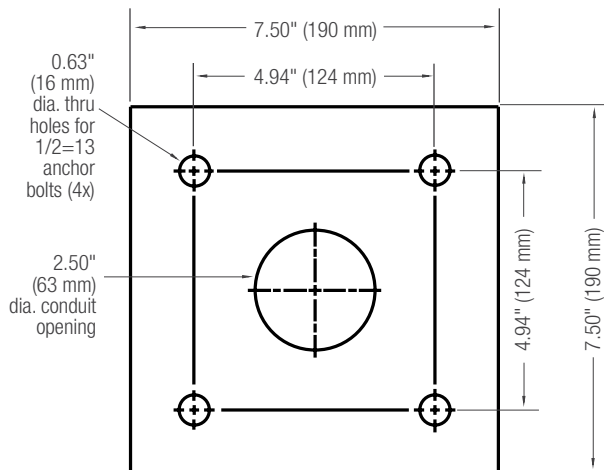
NOMINAL DIMENSIONS (SURFACE MOUNT)



NOMINAL DIMENSIONS (SECURITY CORE)

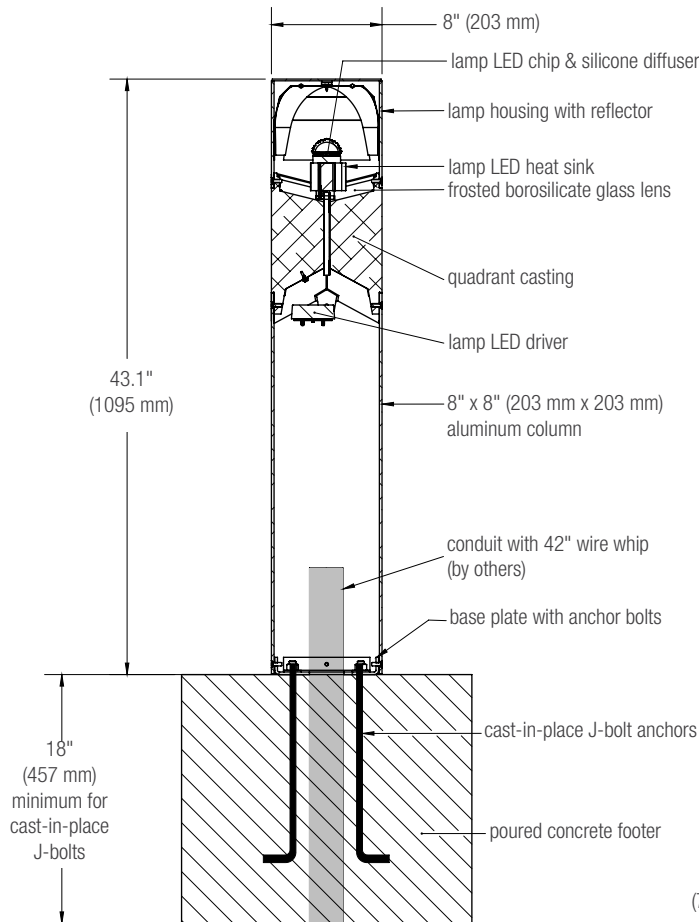


BASE PLATE MOUNTING DETAIL

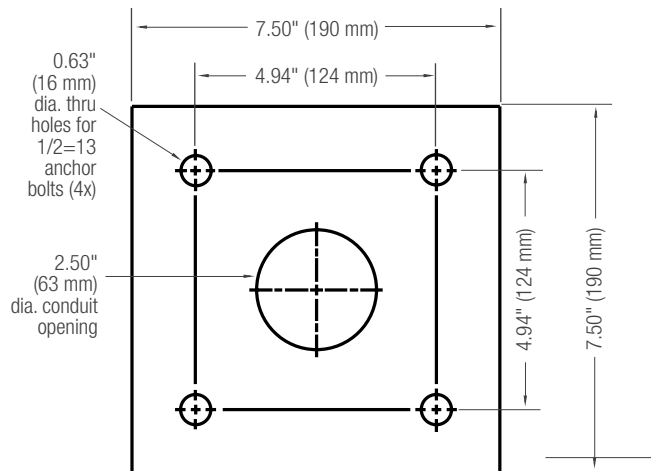




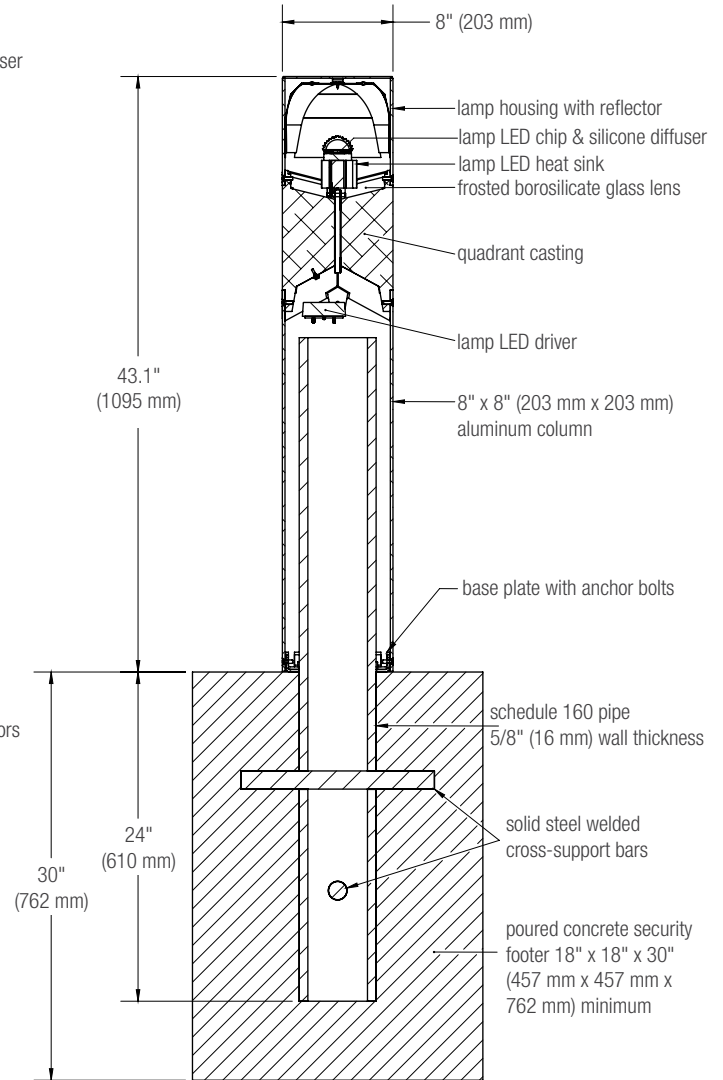
NOMINAL DIMENSIONS (SURFACE MOUNT)



BASE PLATE MOUNTING DETAIL



NOMINAL DIMENSIONS (SECURITY CORE)



**LAMP DESCRIPTIONS**

LAMP	DESCRIPTION	BASE	COLOR TEMPERATURE	LUMINAIRE LUMENS*	B.U.G. RATING	ANSI CODE
3000K LED	16W custom LED light engine	N/A	3,000K	362	B0-U2-G0	N/A
4000K LED	16W custom LED light engine	N/A	4,000K	362	B0-U2-G0	N/A
CFM26	26W triple tube 4-pin compact fluorescent	GX24q-3	4,100K	306	B0-U1-G0	N/A
CFM42	42W triple tube 4-pin compact fluorescent	GX24q-4	4,100K	518	B0-U1-G0	N/A
M70	70W metal halide, high intensity discharge	E26 medium	4,000K	962	B1-U1-G0	M143/M98/E

*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 Knight Bollard product page on our website.

CERTIFICATION, CFL AND HID

- UL and C-UL listed for wet locations (compact fluorescent and metal halide).
- ETL and C-ETL (LED undergoing test)

ENVIRONMENTAL CONSIDERATIONS

- Please refer to the Knight Bollard Environmental Data Sheet for detailed environmental impact information.
- Knight Bollard has high recycled content and is highly recyclable.
- Standard powdercoat finishes are no-VOC; Non-standard powdercoat finishes are no- or low-VOC, depending on color.
- Low maintenance.

MODEL NUMBERS AND DESCRIPTIONS

MODEL	DESCRIPTION
LBKNI-LED	Knight Bollard, custom LED light engine
LBKNI-CF	Knight Bollard, compact fluorescent
LBKNI-HID	Knight Bollard, high intensity discharge

PRODUCT OPTIONS

The following options are available for an upcharge

Upgrade to embedded security core	Custom RAL powdercoat color
Premium Texture Colors from Forms+Surfaces Powdercoat Chart	

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, powdercoat color, lamp, voltage, surface mount or embedded security core. Quote/Order Forms are available on our website to lead you through the specification process in a simple checkbox format.