

Bollards



Atkore[™]
Calpipe
Security

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About Us

Trust The Bollard Experts

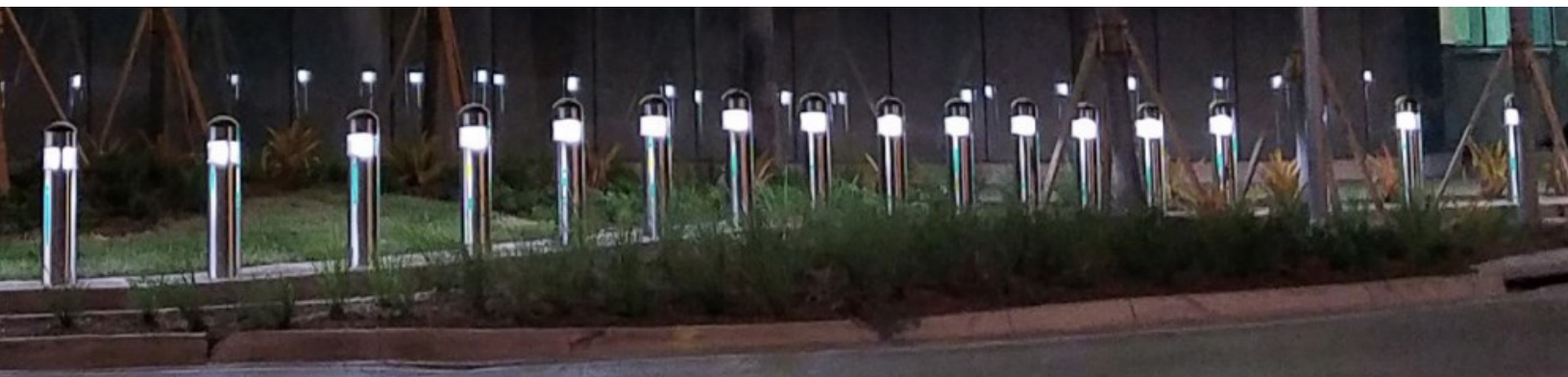
Atkore - Calpipe Security Bollards® is a team of experts working to protect people and property without compromising aesthetics. Since 1998, we have developed smart and attractive designs for highly trafficked and high-profile public spaces around the world, including Times Square, the Santa Monica Pier, and Oracle Park. Our team consults and collaborates with you, delivering solutions to your most challenging projects.

We pride ourselves on our ability to overcome the diverse situations presented with each of our unique partners. In addition to our team of solution experts, we offer one of the widest range of bollards on the market. All our products are manufactured using only the highest quality materials at our Hebron, Ohio facility, so you can rest easy knowing that your product was manufactured in the USA.

Partners From The Start

Bollards are our business. We provide the highest level of support and service, making us one of the most responsive bollard suppliers in the industry. No matter what style, size, color, material, finish, or decorative element your project requires, we are committed to configuring the right bollard for your application.

Our impact-tested and field-certified products have been utilized in commercial, retail, industrial, high-security, government, and military applications. With tens of thousands of bollards installed to date in the United States and abroad, we offer experience and expertise from the early stages of design and specification through final installation.



Bollard Styles



QuickKore™ Storefront Safety

To accommodate the ever-changing perimeter security landscape, Atkore's latest line of crash-rated bollards are designed to protect people and property from low-speed vehicular impacts, with certification to ASTM F3016-19.

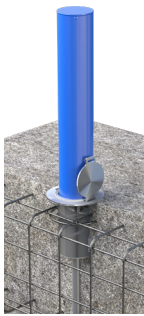
For details, see page 5



PDT

When you're looking for the highest level of safety and security, rated to ASTM F2656. Atkore's line of PDT bollards are a proven solution.

For details, see page 6



PDT Low Speed Certified

For lower threat applications, Atkore offers fixed, removable, and lighted bollards certified to ASTM F3016-14, which addresses a 5,000 lb vehicle traveling up to 30 miles per hour.

For details, see page 7



Fixed Embedded

Look to Atkore when you need a stable and dependable solution. Fixed post bollards provide solid, permanent protection against vehicular incursion.

For details, see page 8



Fixed Baseplate

Let Atkore help protect your valuable merchandise with a trusted bollard system.

For details, see page 9



Removable

When strong, yet removable perimeter safety is needed, Atkore's removable bollards are the best choice.

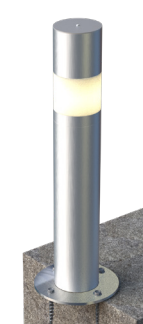
For details, see page 10



Non-Rated Retractable

If you are tasked with designing pedestrian and vehicular flow that offers flexible access points, look no further than Atkore's retractable bollards.

For details, see page 11



Lighted

Whether you are looking to add beauty or need to create a secure perimeter, Atkore has you covered with lighted bollards.

For details, see page 12



QuickKore™ Storefront Safety Bollards



To accommodate the ever-changing perimeter security landscape, Atkore's latest line of crash-rated bollards are designed to **protect people and property** from low-speed vehicular impacts, with **certification to ASTM F3016-19**. Our **short pile foundation design** coupled with **fixed and removable options** provide **more versatility** for both new installations and retrofit projects. This design also allows **installation time to be reduced from days to hours**, helping to make a positive impact to project timelines.

Attributes/Technical Data

Material(s):

Carbon Steel¹ or 304/316 Stainless Steel²

Surface Finish

- Powder Coated to your color specification¹
- Hot Dipped Galvanized (HDG)¹
- Dual Finish of HDG & Powder Coat Available for greatest corrosion resistance¹
- #4 Brushed Finish for Stainless Steel²

Foundation Depth

32"

Operation Type

Fixed & Manual Removable

Mounting Type

Embedded

Voltage

120-277 VAC **If specifying engineered, lighted bollard models**

LED Globe Style

Stacked Louvre or Refractor

LED Color Temperature

5000K or 3000K

Anti-Ram Rating

S10 & S20 (PDT Chart pg 12-14 for details)

Penetration Rating

P1 & P2

Certifying Agency

ASTM

Test Standard

F3016-19

Min. Array Qty. Requirements

None
(Rated as single units)

Center On Center Spacing Requirement

None
(Rated as single units)

SAFETY Act

YES

Options

Wall Thickness

Sch.80

Locking Type

Internal Locking or Padlocking

Optional Accessories

Viking Reveal. Chain-Eyes. Handles.
Bike Loops. Signage

Style Choices

Diameters



6 inch

Cover Style



Slotted



360 Degree

Lens Style



Clear



Opal

Foundation Type



Short Pile Style

Caps



Flat



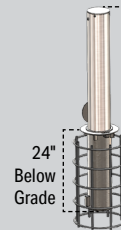
Dome



Knight

Certified Lengths

Note: Custom lengths may be available through engineering validation



36"
Above
Grade

24"
Below
Grade

Color

Note: Additional Colors available upon request¹



RAL #1023
(Safety Yellow
Standard)¹



Natural
Stainless
Steel²

Images in chart are are not to scale

If specifying engineered, lighted bollard models



Suggested Applications

Retail Storefronts | Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Market |
Power Plants | Public Spaces | Venues | Convention Centers | Ampitheatres | Fairgrounds |

Perimeter Defense Technology (PDT) Bollards



When you're looking for the **highest level of safety and security**, Atkore's line of PDT bollards are a proven solution. Our products offer the **highest security rating** available today, meet ASTM F2656 standard, and carry the Department of Homeland Security's **SAFETY Act** Designation. **Work with our team** to create a **flexible and versatile design** that meet the needs of a structure's purpose and environment, as well as meet product requirements.

Attributes/Technical Data

Material(s):

Carbon Steel

Diameters

8" or 10" diameters

Length

Varies by product.
(PDT Chart pg 12-14 for details)
Custom lengths may be available
though engineering validation.

Wall Thickness

Varies by product.
Consult product drawings for detail.

Foundation Type

Trench & Shallow Mount

Foundation Depth

12"-60"

Available Operation Type

Fixed, Lighted, Manual Removable,
Screw-Driven Retractable, Hydraulic
Retractable, Pneumatic Retractable

Mounting

Embedded

Available Anti-Ram Rating

M30, M50, K4, K12
(PDT Chart pg 12-14 for details)

Available Penetration Rating

P1, P2, & L3

Certifying Agency

ASTM & DoS

Test Standard

ASTM F2656-07, DoS: SD-STD-02.01
Rev. A, & PAS68:2010. (PDT Chart
pg 12-14 for details)

Min. Array Qty. Requirements

See PDT Chart pg 12-14 for details

Center on Center Spacing

Requirement
See PDT Chart pg 12-14 for details

SAFETY Act

Yes

Locking Type

Bayonet and Weight-Lock for
removable bollards

Options

Cap Style

Flat, dome, or knight cap available

Surface Finish

- Powder Coated or Hot Dipped Galvanized. Consult product drawings for detail.

Color

- RAL#1023 (Safety Yellow Standard)
- Zinc Rich Primer Gray Powder Coat standard for bollards receiving decorative covers
- Additional Colors available upon request

Lighted Bollard Option

Fixed PDT products are available with optional LED Light Fixture. (PDT Chart pg 12-14 for details on Lighted Bollard availability.)

Voltage

120-277 VAC

LED Globe Style

Stacked Louvre or Refractor

LED Color Temperature

5000K or 3000K

Lens Style

Clear or Opal

Bollard Cover Cut Out Style

360 Degree or Slotted

Optional Accessories

Viking Reveal. Chain-Eyes. Handles. Bike Loops. Consult Calpipe Engineering for applicability.

Other options

- If a modern aesthetic is needed, Perimeter Defense Technology bollards can be installed with a stainless steel cover, while rated retractable bollards can be manufactured with stainless steel sheathing around the operable post.



Suggested Applications

Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Market | Power Plants | Financial Institutions | Governmental Buildings | Airports | High Threat Structures | Military | Public Spaces | Venues | Convention Centers | Ampitheaters | Fairgrounds |

PDT Low Speed Certified Bollards



Need perimeter protection, but a full anti-terror system isn't necessary? For **lower threat applications**, Atkore offers fixed, removable, and lighted bollards **certified to ASTM F3016-14**, which addresses a 5,000 lb vehicle traveling up to 30 miles per hour. Rated as **individual bollard systems**, each of these are capable of **protecting against the designated risk** without the need for arrays.

Attributes/Technical Data

Material(s):

Carbon Steel

Diameters

6" and 8" diameters

Length

Varies by product.
(PDT Chart pg 12-14 for details)
Custom lengths may be available
though engineering validation.

Wall Thickness

Sch.80

Foundation Type

Trench & Shallow Mount

Foundation Depth

30" & 36"

Available Operation Type

Fixed, Lighted,
Manual Removable

Mounting

Embedded

Available Anti-Ram Rating

S10, S20, S30
(PDT Chart pg 12-14 for details)

Available Penetration Rating

P1

Certifying Agency

ASTM

Test Standard

ASTM F3016-14

Min. Array Qty. Requirements

None (Certified as single
bollard systems)

Center on Center Spacing Requirement

None (Certified as single
bollard systems)

SAFETY Act

Yes

Locking Type

Internal Locking or Bayonet

Options

Cap Style

Flat, dome, or knight cap available

Surface Finish

- Powder Coated or Hot Dipped Galvanized. Consult product drawings for detail.

Color

- RAL#1023 (Safety Yellow Standard)
- Zinc Rich Primer Gray Powder Coat standard for bollards receiving decorative covers
- Additional Colors available upon request

Lighted Bollard Option

PDT06050L-S10 or engineered, fixed PDT products are available with LED Light Fixture. (PDT Chart pg 12-14 for details on Lighted Bollard availability.)

Voltage

120-277 VAC

LED Globe Style

Stacked Louvre or Refractor

LED Color Temperature

5000K or 3000K

Lens Style

Clear or Opal

Bollard Cover Cut Out Style

360 Degree or Slotted

Optional Accessories

Viking Reveal. Chain-Eyes. Handles. Bike Loops. Consult Calpipe Engineering for applicability.

Other options

- If a modern aesthetic is needed, Perimeter Defense Technology bollards can be installed with a stainless steel cover.
- Lighted PDT06050L-S10 bollard is standardly finished with a stainless steel cover. Powder-coated cover is available upon request.



Suggested Applications

Retail Storefronts | Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Market | Power Plants | Financial Institutions | Governmental Buildings | Airports | Military | Venues | Public Spaces | Fairgrounds | Convention Centers | Ampitheatres

Fixed Embedded Bollards



Look to Atkore when you need a stable and dependable solution. Fixed post bollards provide **solid, permanent protection** against vehicular incursion. They create a **physical barrier for pedestrians and buildings** from oncoming vehicles, while allowing **free movement** between the bollards. Available in **stainless steel** or carbon steel, you don't need to sacrifice aesthetics for safety. Pair them with our matching removable bollards for a **seamless system integration**.

Attributes/Technical Data

Material(s):

Carbon Steel¹ or 304/316 Stainless Steel²

Surface Finish

- Powder Coated to your color specification¹
- Hot Dipped Galvanized (HDG)¹
- Dual Finish of HDG & Powder Coat Available for greatest corrosion resistance¹
- #4 Brushed Finish for Stainless Steel²

Foundation Type:

Trench

Foundation Depth

21"-24"

Operation Type

Fixed | Passive

Mounting Type

Embedded














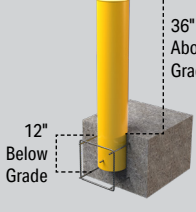
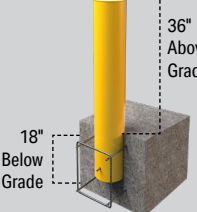
Options

Wall Thickness

Sch.40 or Sch.80 wall thickness available

Optional Accessories

Viking Reveal. Chain-Eye's. Escutcheons. Bike Loops. Signage

Style Choices	
Diameters	
	
	
	
	
3 in.	4 in.
5 in.	6 in.
8 in.	10 in.
12 in.	
Foundation Type	Color
	
Trench	RAL#1023 (Yellow Safety Standard) ¹
	
	Natural Stainless Steel ²
Note: Additional Colors available upon request ¹	
Cap Style	
	
Flat	Dome
	
	Knight
Standard Lengths	
Note: Custom lengths available upon request	
Diameter: up to 8"	Diameter: 10" & 12"
	
12" Below Grade	18" Below Grade
36" Above Grade	36" Above Grade

Images in chart are are not to scale



Suggested Applications

Parking Lots | Parking Structures | Retail Storefronts | Traffic Flow Control | Car Dealerships | Loading Areas | Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Markets | Power Plants | Financial Institutions | Public Spaces | Gas Stations |

Fixed Baseplate Bollards



Let Atkore help protect your valuable merchandise with a trusted bollard system. Surface mounted, baseplate bollards are intended for **asset protection** and effectively **block** designated areas, **guide pedestrian traffic**, **direct and deter vehicular traffic**, and act as a buffer between slow-speed vehicular traffic and merchandise. The surface mounted installation **saves time and space**, while still **shielding** against accidental bumps and impacts once installed.

Attributes/Technical Data

Material(s):

Carbon Steel¹ or 304/316 Stainless Steel²

Surface Finish

- Powder Coated to your color specification¹
- Hot Dipped Galvanized (HDG)¹
- Dual Finish of HDG & Powder Coat Available for greatest corrosion resistance¹
- #4 Brushed Finish for Stainless Steel²

Operation Type

Fixed or Passive

Options

Wall Thickness

Sch.40 or Sch.80 wall thickness available

Locking Type

Internal Locking or Padlocking

Optional Accessories

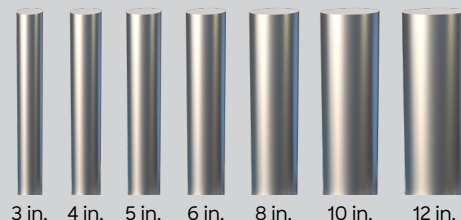
Viking Reveal. Chain-Eye's. Escutcheons. Bike Loops. Signage

Other Options:

Round or Square Baseplate available. Dimensions vary per diameter. Contact sales for more detail.

Style Choices

Diameters



Foundation Type



Surface Mount

Color



RAL#1023
(Yellow Safety
Standard)¹



Natural
Stainless
Steel²

Note: Additional Colors
available upon request¹

Cap Style



Flat



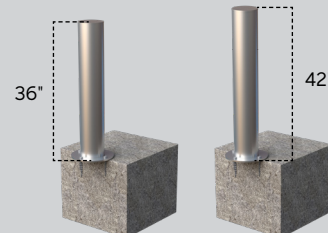
Dome



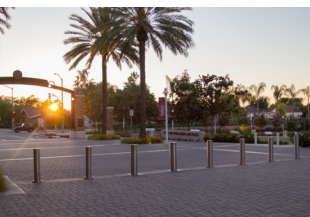
Knight

Standard Lengths

Note: Custom lengths available upon request



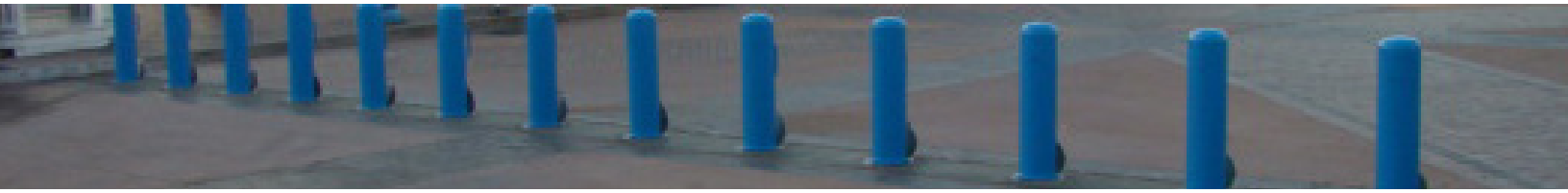
Images in chart are are not to scale



Suggested Applications

Retail Storefronts | Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Market |
Power Plants | Public Spaces | Venues | Convention Centers | Ampitheatres | Fairgrounds |

Removable Bollards



When **strong, yet removable** perimeter safety is needed, Atkore's removable bollards are the best choice. They offer **versatility** and can be used in a **variety of applications** such as parking lots, temporary event sites, and access roads. With both **internal-locking** or **external-locking** systems, you can choose the solution that works best for your situation. Use these in conjunction with fixed bollards to create an **adaptable barrier** system that can allow **strategic access** when needed.

Attributes/Technical Data

Material(s):

Carbon Steel¹ or 304/316 Stainless Steel²

Surface Finish

- Powder Coated to your color specification (Safety Yellow standard)¹
- Hot Dipped Galvanized (HDG)¹
- Dual Finish of HDG & Powder Coat Available for greatest corrosion resistance¹
- #4 Brushed Finish for Stainless Steel²

Foundation Depth
21"-24"

Operation Type
Manual Removable

Mounting Type
Embedded

Options

Wall Thickness

Sch.40 or Sch.80 wall thickness available

Locking Type

- IBR¹/SSR² Series of Internal Locking
- IBP¹/SSP² Series of External Padlocking

Optional Accessories

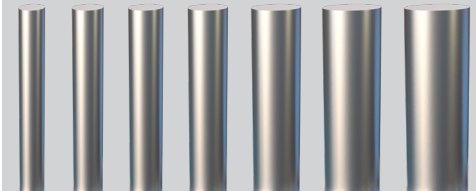
Viking Reveal. Chain-Eye's. Escutcheons. Bike Loops. Signage

Embedment Sleeve Details

- Two lid options for the embedment sleeve (ESR) of the removable bollard are provided to cover openings when bollards are removed: an attached lid that folds down to cover the opening or a removable lid that locks into place. **See accessory page for more detail about embedment sleeves
- ESRs are produced at custom lengths to specifically match the embedment depth of the removable bollard it is storing.

Style Choices

Diameters



3 in. 4 in. 5 in. 6 in. 8 in. 10 in. 12 in.

Foundation Type



Trench

Color



RAL #1023
(Yellow Safety
Standard)¹



Natural
Stainless
Steel²

Note: Additional Colors
available upon request¹

Cap Style



Flat



Dome

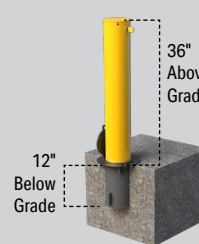


Knight

Standard Lengths

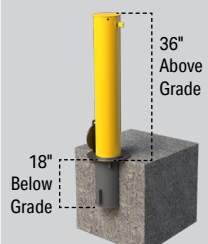
Note: Custom lengths available upon request

Diameter: up to 8"



12" Below Grade

Diameter: 10" & 12"



18" Below Grade

Images in chart are are not to scale



Suggested Applications

Parking Lots | Parking Structures | Retail Storefronts | Traffic Flow Control | Car Dealerships | Loading Areas | Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Markets | Power Plants | Financial Institutions | Public Spaces | Gas Stations |

Non-Rated Retractable Bollards



If you are tasked with designing pedestrian and vehicular flow that offers flexible access points, look no further than Atkore's retractable bollards. We offer **manually operated**, **assisted-lift**, and **automatic retractable** options to suit your site's specific needs. **Work with us** to design the most appropriate bollard operating system and **integrate** with your existing access control system to help create a seamless environment. Whether it is **pedestrian** focused or **high-level traffic**, retractable bollards are an ideal solution. They are manufactured from **stainless steel** for **durability**, **weather-resistance**, and **aesthetics**.

Attributes/Technical Data

Material(s):

304 or 316 Stainless Steel

Surface Finish

#4 Brushed Finish for Stainless Steel

Foundation Type:

Trench or Pier

Foundation Depth

52" - 55.5"

Operation Type

- Manual Retractable
- Assisted-Lift Manual Retractable
- Pneumatic-Automatic Retractable




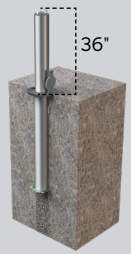




Mounting Type

Embedded

Options

- Optional integrated LED lights available
- LBPA series requires pneumatic operating system for operation.

Style Choices

Diameters			Length
			
4 inch	6 inch	8 inch	
Color			Cap
 Natural Stainless Steel**			 Flat
Operation Type			
			
Automatic Retractable		Manual Retractable	

Images in chart are are not to scale

Suggested Applications

Parking Lots | Parking Structures | Retail Storefronts | Traffic Flow Control | Car Dealerships | Loading Areas | Schools | Hospitals | Malls | Stadiums | Arenas | Colleges | Farmers Markets |

Lighted Bollards



Whether you are looking to add beauty or need to create a secure perimeter, Atkore has you covered with lighted bollards. Our **architectural** lighted bollards provide **aesthetic appeal** while illuminating the surrounding landscape for added safety. Our **security** lighted bollards provide you with the secure protection you need, while still offering a **sleek and sophisticated** look. Depending on the application, our two lighted bollard options can integrate into the design of any landscape or building. The **stainless steel finish** of both options can withstand harsh weather, resulting in **longer product life** and **lower life-cycle costs**.

Attributes/Technical Data

Material(s):

304 or 316 Stainless Steel

Surface Finish

- #4 Brushed Finish for Stainless Steel

Foundation Type:

Surface Mount² or Trench¹

Foundation Depth:

30"-36"¹

Operation Type

Fixed or Passive

Mounting Type

Surface Mount²
or Embedded¹

Voltage

120-277 VAC

LED Globe Style

Stacked Louvre
or Refractor

LED Color Temperature

5000K or 3000K

Options

Length

SSLS¹ Series' standard lengths of 36" or 42" above grade and 12" below grade for diameters up to 8". For 10" & 12" diameters, the below grade is 18". SSLA² Series standard height of 36" or 42" above grade. Custom lengths available upon request

Wall Thickness

1/2", 3/4", or 1" internal post thickness available depending on diameter¹

Special Note

The SSLS Series' finished assembly is comprised of 2 primary pieces: the internal post made from carbon steel, providing the strength and the stainless steel cover polished to a #4 brushed finish.

Style Choices

Diameters



6 in.¹⁻² 8 in.¹⁻² 10 in.¹ 12 in.¹

Lens

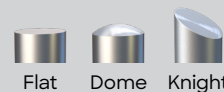


Clear



Opal

Caps



Flat

Dome

Knight

Color

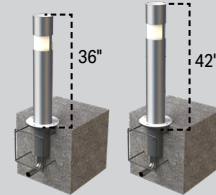


Natural
Stainless
Steel

Standard Lengths

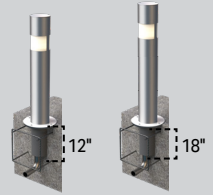
Note: Custom lengths available upon request

Above Grade



For all diameters

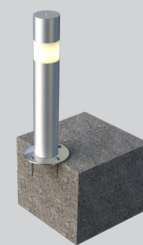
Below Grade



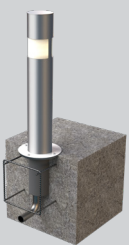
up to 8"
diameters

10" & 12"
diameters

Foundation Type



Surface Mount



Trench

Images in chart are are not to scale

Suggested Applications

Parking Lots | Parking Structures | Hospitals | Retail Storefronts | Car Dealerships | Stadiums |
Traffic Flow Control | Loading Areas | Schools | Financial Institutions | Farmers Market | Arenas |
Malls | Colleges | Power Plants | Public Spaces |

Accessories & Services



Not only does Atkore supply product accessories from **embedment sleeves** to **decorative covers**, Atkore offers a multitude of **design** options that combine **safety, functionality**, and **beauty**. Atkore can also provide **engineering services** to assist with custom product design and/or dimension drawings, preliminary layout drawings, commissioning, and even FEA services all performed **in-house!** Work with our team of **experts** from the design phase to order to after sale service to secure your vision.

Accessories, Hardware, & Service parts

- **Decorative Bollard Covers**
 - Stainless steel and plastic covers enhance existing fixtures or PDT bollards
- **QuickKore™ Rebar Cages**
- **Lifting Handles**
- **Hardware for Signage**
- **Bike Loops**
- **Escutcheons**
- **Reflective Tape**
- **Touch-Up Aerosol Paint**
- **Stainless Steel Cleaning Kits**
- **Manual Cylinder Lifters**
- **IBR Bollard Keys & Locks**
- **LED Fixtures and associated components**
- **Miscellaneous Service Hardware**
- **Replacement Parts and Components**

Services

- **Engineering Services**
 - Custom Configurations
 - Cut Sheets
 - Preliminary Layout Drawing
- **Design and Application Review**
- **Finite Element Analysis Services**
 - Engineering Validation
 - State Specific PE Stamp
 - Coordination Management
- **Retractable Bollard Commissioning**
- **Installation Management**
- **Installation Supervision**
- **Onsite Bollard Repairs**
- **Mock-up Prototypes**
- **In-plant Bollard Refurbishing**
- **Automated Retractable Bollard Operating System Design**



Speed Rating/ Penetration Rating	Calpipe Security Model #	Description	Rated Configuration	Test Standard
K12 / L3	PDTDS22	Fixed Bollard-Trench Mount 10.75" Diameter 39" Above Grade 44" Embedded Depth Foundation Depth: 47.25"	Minimum Bollard Array: 2 Center on Center Spacing: 59"	DOS: SD-STD-02.01
K12 / L3	PDTDS22R	Removable Bollard-Trench Mount 10.75" Diameter 39" Above Grade 44" Embedded Depth Foundation Depth: 47.25"	Minimum Bollard Array: 2 Center on Center Spacing: 59"	DOS: SD-STD-02.01
K12 *Engineered	PDTDS22L	Lighted Bollard-Trench Mount 11.25" Diameter with Cover 50" Min. Height Above Grade with Cover 44" Embedded Depth Foundation Depth: 47.25"	Minimum Bollard Array: 2 Center on Center Spacing: 59"	DOS: SD-STD-02.01
M50 / P2	PDT10080SMF	Fixed Bollard-Shallow Mount 10.75" Diameter 36" Above Grade 12" Embedded Depth Foundation Depth: 12"	Minimum Bollard Array: 3 Center on Center Spacing: 60"	ASTM: F2656-07
M50 *Engineered	PDT10080SMR	Removable Bollard-Shallow Mount 10.75" Diameter 36" Above Grade 18" Embedded Depth Foundation Depth: 18"	Minimum Bollard Array: 3 Center on Center Spacing: 60"	ASTM: F2656-07
M50 *Engineered	PDT10080SML	Lighted Bollard-Shallow Mount 11.25" Diameter with Cover 45" Min. Height Above Grade with Cover 12" Embedded Depth Foundation Depth: 12"	Minimum Bollard Array: 3 Center on Center Spacing: 60"	ASTM: F2656-07
K12 / L3 V/7500(N3)/80/90:7.1/0.0	PDT1200P	Pneumatic/Automatic Retractable Bollard 10.5" Diameter 36" Deployed Height 58" Embedded Depth Foundation Depth: 60"	Minimum Bollard Array: 3 Center on Center Spacing: 39" Single Bollard Test-PAS68	DOS: SD-STD-02.01 Rev. A BSI: PAS68
K12 / L3 V/7500(N3)/80/90:7.1/0.0	PDT1200H	Hydraulic/Automatic Retractable Bollard 10.5" Diameter 36" Deployed Height 58" Embedded Depth Foundation Depth: 60"	Minimum Bollard Array: 3 Center on Center Spacing: 39" Single Bollard Test-PAS68	DOS: SD-STD-02.01 Rev. A BSI: PAS68
K12 / L3 V/7500(N3)/80/90:7.1/0.0	PDT1200A	Screw Driven-Manual Retractable 10.5" Diameter 36" Deployed Height 58" Embedded Depth Foundation Depth: 60"	Minimum Bollard Array: 3 Center on Center Spacing: 39" Single Bollard Test-PAS68	DOS: SD-STD-02.01 Rev. A BSI: PAS68



Speed Rating/ Penetration Rating	Calpipe Security Model #	Description	Rated Configuration	Test Standard
M30 *Engineered	PDT8080F	Fixed Bollard-Trench Mount 8.625" Diameter 36" Above Grade 36" Embedded Depth 48" Foundation Depth	Minimum Bollard Array: 2 Center on Center Spacing: 48"	ASTM: F2656-07
M30 *Engineered	PDT8080R	Removable Bollard-Trench Mount 8.625" Diameter 36" Above Grade 36" Embedded Depth 48" Foundation Depth	Minimum Bollard Array: 2 Center on Center Spacing: 48"	ASTM: F2656-07
M30 *Engineered	PDT8080L	Lighted Bollard-Trench Mount 9.5" Diameter with Cover 46" Min. Height Above Grade with Cover 36" Embedded Depth Foundation Depth: 48"	Minimum Bollard Array: 3 Center on Center Spacing: 48"	ASTM: F2656-07
M30 / P2	PDT8080SMF	Fixed Bollard-Shallow Mount 8.625" Diameter 36" Above Grade 12" Embedded Depth Foundation Depth: 12"	Minimum Bollard Array: 3 Center on Center Spacing: 48"	ASTM: F2656-07
M30 / P2	PDT8080SMR	Removable Bollard-Shallow Mount 8.625" Diameter 36" Above Grade 12" Embedded Depth Foundation Depth: 12"	Minimum Bollard Array: 3 Center on Center Spacing: 48"	ASTM: F2656-07
M30 *Engineered	PDT8080SML	Lighted Bollard-Shallow Mount 9.5" Diameter with Cover 45" Min. Height Above Grade with Cover 12" Embedded Depth Foundation Depth: 12"	Minimum Bollard Array: 3 Center on Center Spacing: 48"	ASTM: F2656-07
S10 / P1	PDT06080CR-S10	QuickKore™ Bollard-Removable 6.625" Diameter 36" Above Grade 24" Embedded Depth Foundation Depth: 32"	Single Bollard	ASTM: F3016-19
S20 / P2	PDT06080CR-S20	QuickKore™ Bollard-Removable 6.625" Diameter 36" Above Grade 24" Embedded Depth Foundation Depth: 32"	Single Bollard	ASTM: F3016-19
S10 / P1	PDT06080CF-S10	QuickKore™ Bollard-Fixed 6.625" Diameter 36" Above Grade 24" Embedded Depth Foundation Depth: 32"	Single Bollard	ASTM: F3016-19



Speed Rating/ Penetration Rating	Calpipe Security Model #	Description	Rated Configuration	Test Standard
S20 / P2	PDT06080CF-S20	QuickKore™ Bollard-Fixed 6.625" Diameter 36" Above Grade 24" Embedded Depth Foundation Depth: 32"	Single Bollard	ASTM: F3016-19
S10 / P1	PDTL06050-S10	Lighted Bollard 7" Diameter with Cover 42" Min. Height Above Grade with Cover 18" Embedded Depth Foundation Depth: 30"	Single Bollard	ASTM: F3016-14
S10 / P1	PDT06080R-S10	Removable Bollard 6.625" Diameter 36" Above Grade 12" Embedded Depth Foundation Depth: 30"	Single Bollard	ASTM: F3016-14
S20 / P1	PDT06080R-S20	Removable Bollard 6.625" Diameter 36" Above Grade 18" Embedded Depth Foundation Depth: 36"	Single Bollard	ASTM: F3016-14
S30 / P1	PDT08080SMR-S30	Removable Bollard 8.625" Diameter 36" Above Grade 12" Embedded Depth Foundation Depth: 36"	Single Bollard	ASTM: F3016-14

DOS standard SD-STD-02.01 Rev. A dated 2003: The rating of a barrier is determined when a 15,000 lb. vehicle impacts a barrier from a perpendicular direction. Barriers on the current DOS Certified Anti-Ram Vehicle Barriers List are considered also to be DOD Certified. The following ratings apply under this standard for vehicle impact speed ("K") and penetration distance resulting in the vehicle being arrested ("L"). ("K") indicates the DOS certified barrier speed ratings' maximum vehicle impact speed achieved when a vehicle traveling at a nominal speed is successfully arrested by the barrier from a perpendicular direction.

Note that the DOS SD-STD-02.01 has been superseded by ASTM F2656 Crash Testing of Vehicle Security Barriers

- K4 = 30 mph, K8 = 40 mph, K12 = 50 mph
- L3 = 3 ft. or less, L2 = 3 ft. to 20 ft., L1 = 20 ft. to 50 ft.

ASTM International Designation F2656-07 is a test method providing a structured procedure to establish a penetration rating for perimeter barriers subject to a perpendicular 15,000 lb. vehicle impact. The following ratings apply under this method for impact speed ("M") and penetration distance resulting in the vehicle being arrested ("P"):

- M30 = 30 mph, M40 = 40 mph, M50 = 50 mph
- P1 = 3.3 ft. or less, P2 = 3.3 ft. to 23 ft., P3 23.1 ft. to 98.4 ft., P4 = 98 ft. or greater.

ASTM International Designation F3016-14 and F3016-19 area Standard Test Methods for Surrogate Testing (5,000 lbs.) of Vehicle Impact Protective Devices at Low Speeds. The following ratings apply under this method for impact speed ("S") and penetration distance resulting in the vehicle being arrested ("P"):

- S10 = 10 mph, S20 = 20 mph, S30 = 30 mph
- P 1 = 1 ft. or less, P2 = 1 ft. to 4 ft., Failure = Greater than 4 ft.

** The barrier penetration rating does not imply that a barrier will perform as rated in all site conditions, approach routes, and topography**

PAS 68 is the British Standards Institution's ("BSI") specification for vehicle security barriers. It identifies the impact test methods, tolerances, test vehicle type, and vehicle performance criteria to be met and is considered to be the UK Standard.

*Engineered - No crash testing performed; speed rating assigned per technical specifications; penetration rating undetermined

Calpipe Security offers an extensive range of bollard options, each built to deliver stability, safety, and security to your valued spaces. Choosing the right one for your needs may seem challenging, but our experts are here to guide you. Explore the FAQs below for clarity on the bollards we manufacture and how they can enhance both security and aesthetics

1	<p>Q. What type of bollards should I use?</p> <p>A. Many factors go into the decision of what type of bollards should be used for a particular application. A few questions to consider before selecting a bollard would be: What am I trying to accomplish? Is it access control or traffic deterrence? Is it a safety or security issue? If it is a safety or security issue, what size vehicle do I want to stop and how fast could it be traveling? Asking these questions and utilizing a vehicle vector analysis when conducting a risk assessment can help the decision making greatly. If you're still unsure of which route to take, contact Calpipe Security's team of experts for even more help!</p>
2	<p>Q. What bollard styles do you offer?</p> <p>A. There are 5 categories of bollards. Fixed/embedded, base plate/surface mount, locking-removable, lighted, and retractable. Of course, Calpipe Security has a variety of products that fall under these families detailed in this catalog.</p>
3	<p>Q. What type of footing or embedment do I need to use?</p> <p>A. Different applications, environments, use cases, and identified risks call for different footings. Calpipe Security generally recommends a strip footing with rebar reinforcement for those bollards that are not engineered to rating or crash-certified. For those rated bollards, Calpipe Security provides detailed specifications on our product drawings for the foundation designed to work cooperatively with the bollards themselves. Please contact our team of experts for more information on these systems and how they can help you design against the risk of vehicular incursion.</p>
4	<p>Q. What if there are utilities and underground pipes which I am not aware of?</p> <p>A. Prior to the installation process, it is always recommended that you perform a Ground Penetrating Radar (GPR) survey of the area that will be excavated. In the case of underground utilities or other areas with depth restrictions, you can select shallow-mount bollards. These bollards use a shallow 12" embedment base design in order to overcome depth restrictions found in conventional bollard installations. If there are any concerns, please contact us regarding a custom engineered solution.</p>
5	<p>Q. I have a need to shut down certain sections of a street at specific times for farmer's markets, events, parades, etc. What should I use?</p> <p>A. Calpipe Security recommends our line of QuickKore™ line of crash-certified removable bollards to provide safety and security from vehicles while still allowing for easy same day setup and removal. QuickKore™ removable bollards are tested and certified to ASTM's F3016-19 crash test standard for a 5,000lb. vehicle traveling at 10 and 20mph and utilize a short pile foundation that can be easily installed in a matter of hours and not days without the need for additional surveying in part because of the slim, cylindrical foundation design which can simply be prepped by core-drilling into the ground. When a street closure is called for, the bollards are inserted into our proprietary embedment sleeve and locked in place using either a security key or a padlock. When the event is over, the bollards are removed, and the embedment lid is locked in place.</p>

6	<p>Q. What are the differences or advantages of an internal locking bollard versus an external locking bollard?</p> <p>A. The most obvious difference is that an internal locking bollard is virtually tamper proof. Another feature of the internal locking bollard is that when in place, it will look the same as the embedded bollard. The lock is waist high on the internal locking bollard, so there is no kneeling on the ground to unlock the padlock. The padlock bollard can be preferred in industrial applications or where Police or Fire Departments need access to the protected space.</p>
7	<p>Q. Is a base plate mounted bollard as strong as a fixed/embedded or locking removable bollard?</p> <p>A. The base plate bollard should be used when there is either a suspended slab or underground utilities that cannot be disturbed, or inside of warehouses and distribution centers. The base plate bollard is only as strong as the bolts it is mounted with. Please contact Calpipe Security for more information on which of our 6" baseplate bollards comply with IBC 1607.8.3 in accordance with Section 4.5.3 of ASCE 7 for a 6kips static load at 25" above finished floor.</p>
8	<p>Q. Are the bollards manufactured in the United States?</p> <p>A. Yes, Calpipe Security manufactures our bollards in the United States, out of our Hebron, Ohio plant.</p>
9	<p>Q. Do I need to fill the bollard with concrete?</p> <p>A. Yes, if specified as part of one of our anti-ram rated bollard systems. Calpipe Security does not recommend filling a thin-walled bollard with concrete as it can lead to unhelpful rigidity and/or brittleness that may lead to a bollard shearing off grade. While it is commonly thought that a cement filled bollard makes it stronger, it may only be that cement makes it heavier. The inherent strength of the bollard comes from the combination of material selection, foundation type and its reinforcement. Calpipe Security always recommends that you consult your engineer as local site conditions can vary.</p>
10	<p>Q. What sort of precautions should be taken when handling removable bollards?</p> <p>A. Personnel should always consider and follow all safety precautions as put forth at the specific project, such as use of appropriate PPE and observing safe operating procedures. General guidelines include metal safety shoe covering for the toe and top of the foot, back braces, and keeping the hinged lid in the closed position except for placement and extraction of the removable parking bollards. The total weight of the removable bollards varies depending on the diameter, wall thickness and length of the bollards, therefore the safety supervisor at your company should review these considerations. It could be beneficial for a company to have two personnel extract and place the bollards. We recommend the use of bollard storage racks. We also recommend that you consult with your safety supervisor prior to ordering the removable traffic bollards.</p>

Notes

[illegible]



**BUILDING BETTER
TOGETHER**

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