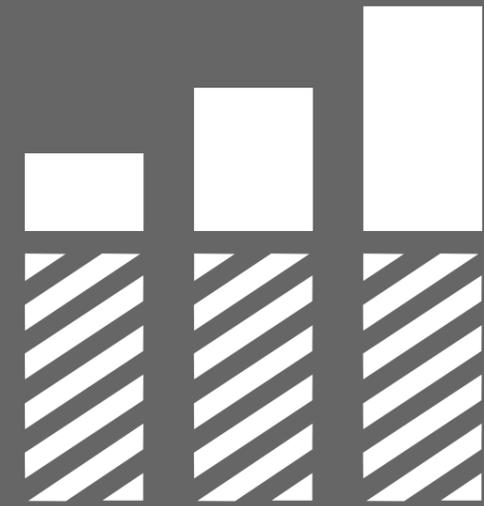


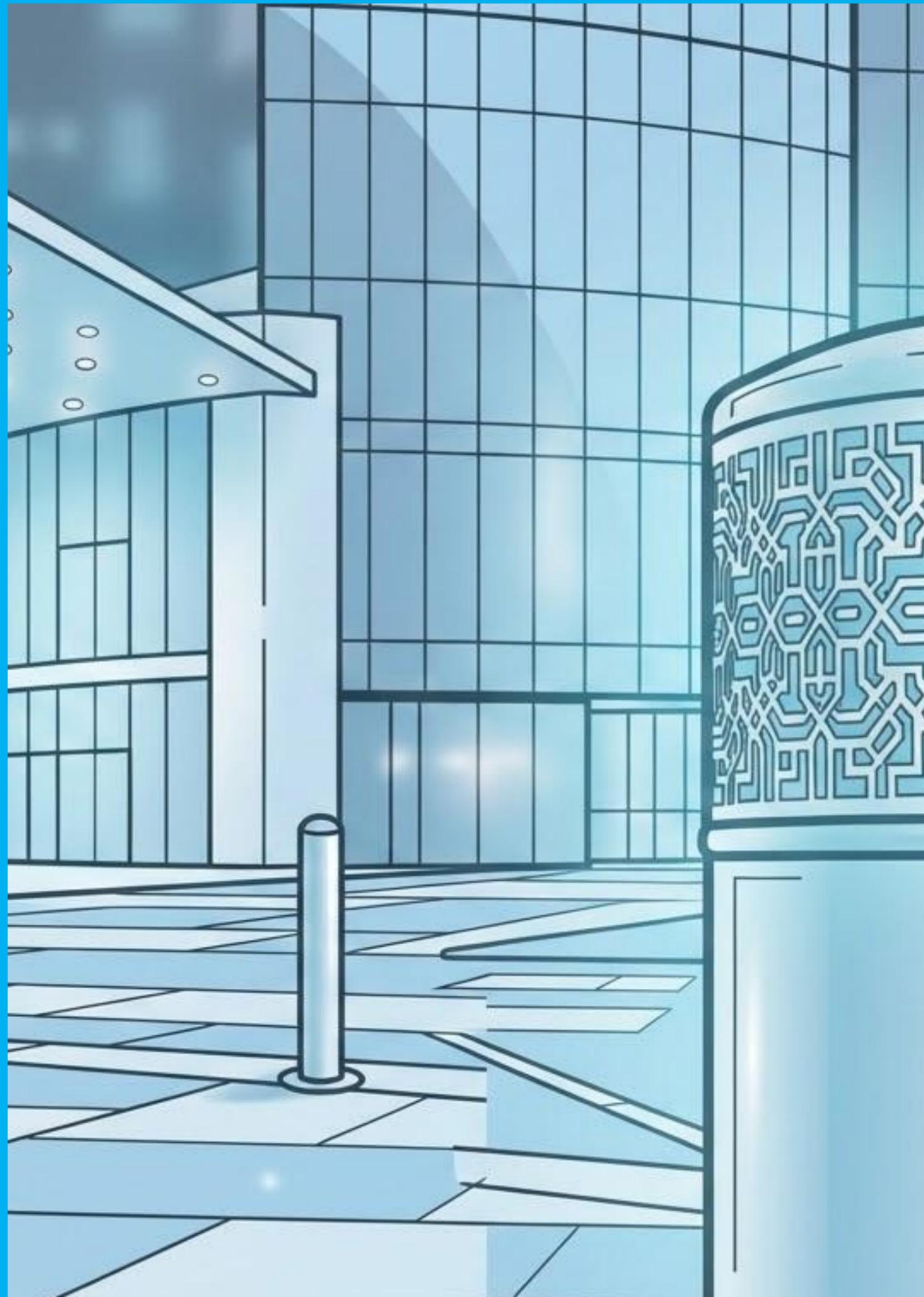
The logo for 'e bollard' features a stylized lowercase 'e' inside a shield-like shape, followed by the word 'bollard' in a lowercase, rounded sans-serif font.



**COMPLETE
RANGE OF**

BOLLARDS

 bollard





STEEL BOLLARDS

01

DEEP FIXED
BOLLARD

02

BOLTED FIXED
BOLLARD

03

SLIDE-OUT REMOVABLE
BOLLARD

04

LIFT-OUT REMOVABLE
BOLLARD

05

IN-GROUND FOLD-DOWN
BOLLARD

06

MANUAL RETRACTABLE
BOLLARD



STAINLESS STEEL BOLLARDS

07

DEEP FIXED
BOLLARD

08

BOLTED FIXED
BOLLARD

09

SLIDE-OUT REMOVABLE
BOLLARD

10

LIFT-OUT REMOVABLE
BOLLARD

11

IN-GROUND FOLD-DOWN
BOLLARD

12

MANUAL RETRACTABLE
BOLLARD



SECURITY BOLLARDS

13

DEEP FIXED
BOLLARD

14

SHALLOW FIXED
BOLLARD

15

DEEP REMOVABLE
BOLLARD

16

SHALLOW REMOVABLE
BOLLARD

17

MANUAL RETRACTABLE
BOLLARD



HIGH SECURITY BOLLARDS

18

DEEP FIXED
BOLLARD

19

SHALLOW FIXED
BOLLARD

20

DEEP REMOVABLE
BOLLARD

21

SHALLOW REMOVABLE
BOLLARD

22

FINISHES OF
BOLLARDS

23

DISTANCE BETWEEN
BOLLARDS



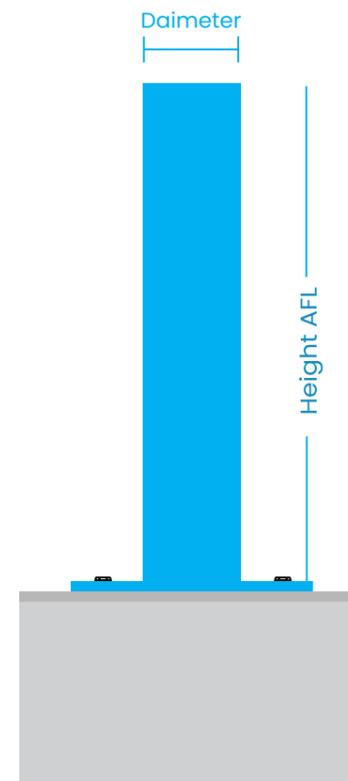
STEEL

BOLLARDS

SGB

STEEL

BOLTED FIXED BOLLARD



| | SGB1 | SGB2 | SGB3 | SGB4 | SGB5 | SGB6 | SGB7 |
|--|--|-------------------------------|-----------------------------|----------------------|-------------------------------------|------------------------------|-----------------------------------|
| Diameter | 101.6 mm 4 inch | 114.3 mm 4.5 inch | 141.3 mm 5.5 inch | 168.3 mm 6.5 inch | 219.1 mm 8.5 inch | 273.0 mm 10.7 inch | 323.9 mm 12.7 inch |
| Wall Thickness (mm) | 2.11 3.05 5.49 | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 | 2.77 3.76 6.35 | 3.40 4.19 4.78 | 3.96 4.57 4.78 |
| Height (mm) | 700 - 800 - 900 - 1000 - 1100 | | | | | | |
| Material | Structural Steel ASTM A500, Grade B | | | | | | |
| Top Cap | Flat or Angle | | | | | | |
| Base Plate Size (mm) | 200 200 10 | 250 250 12 | 300 300 16 | 350 350 20 | 400 400 25 | 450 450 25 | |
| Bolts | 4 M12 100 mm | 4 M16 120 mm | 4 M16 120 mm | 4 M20 150 mm | 4 M20 160 mm | 8 M24 200 mm | 8 M24 200 mm |
| Finish | Galvanizing ASTM A123 / ISO 1461 | | | | Powder Coating ASTM D3359 / B117 | | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 8.5 10.8 16.5 | 11.9 14.5 21.7 | 13.4 16.6 19.7 | 23.0 25.6 | 34.7 39.9 53.6 | 55.0 60.3 64.2 | 72.3 77.2 78.8 |
| Impact Resistance/Car Speed (Kj/KPH) 1.5t Car | 0.6/3.2 0.9/3.8 1.5/4.9 | 0.8/3.6 1.1/4.3 1.9/5.7 | 1.2/4.4 1.7/5.3 2.1/6 | 2.2/6.1 2.7/6.7 | 3.7/8 5/9.2 8.2/11.9 | 7.1/11 8.7/12.2 9.9/13 | 11.6/14.2 13.4/15.2 14/15.5 |

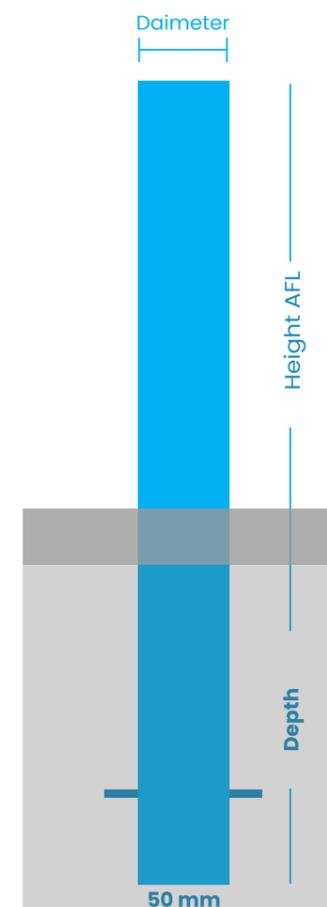
| Options | Reflective band Name Plate/Logo Custom Cap UV resistance | Imm Groove Base Plate cover Chain Holders Dome Top |
|---------|---|---|
|---------|---|---|



SGD

STEEL

DEEP FIXED BOLLARD



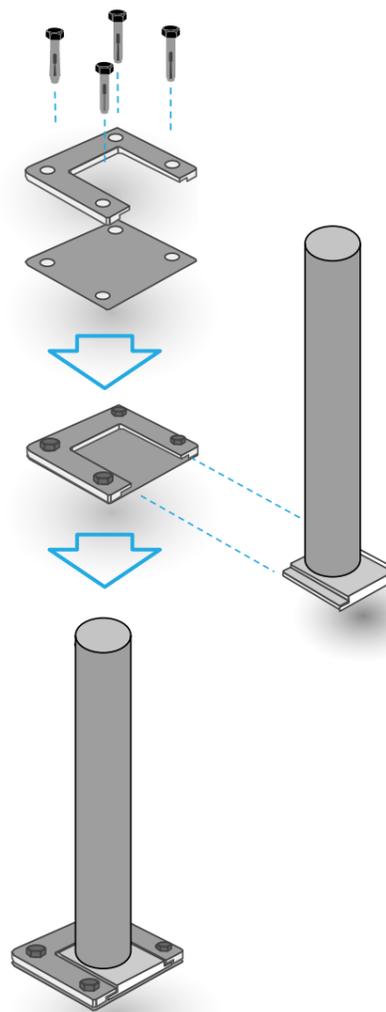
| | SGD1 | SGD2 | SGD3 | SGD4 | SGD5 | SGD6 | SGD7 |
|--|---|-------------------------------|-------------------------------|--|------------------------------|---------------------------------|-------------------------------------|
| Diameter | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch | 273.0 mm 10.7 Inch | 323.9 mm 12.7 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 6.55 | 2.77 3.40 4.78 | 2.77 3.76 6.35 | 3.40 4.19 4.78 | 3.96 4.57 4.78 |
| Foundation Area (mm) | 300 300 mm | 350 350 mm | 400 400 mm | 500 500 mm | 650 650 mm | 800 800 mm | 950 950 mm |
| Height/Depth (mm/mm) | 700/200 - 800/200 - 900/300 - 1000/350 - 1100/400 | | | | | | |
| Material | Structural Steel ASTM A500, Grade B | | | | | | |
| Top Cap | Flat or Angle | | | | | | |
| Finish | Galvanizing ASTM A123 / ISO 1461 | | | Powder Coating ASTM D3359 / B117 | | | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 7.1 10.2 18.7 | 8 11.5 14.8 | 13 15.9 29.1 | 15.6 19 26.5 | 20.3 27.5 45.8 | 31 38.2 43.5 | 43 49.5 51.8 |
| Impact Resistance/ Car Speed (kJ/KPH) 1.5t Car | 0.7/3.2 0.9/3.9 1.6/5.1 | 0.8/3.6 1.1/4.3 1.4/4.9 | 1.6/5.2 1.9/5.7 3.5/7.7 | 2.3/6.2 2.7/6.8 3.8/8 | 3.8/8.1 5.1/9.3 8.4/12 | 7.2/11.1 8.8/12.3 10/13.1 | 11.8/14.3 13.6/15.3 14.2/15.6 |
| Options | Reflective band Name Plate/Logo Custom Cap UV resistance | | | Imm Groove Chain Holders Concrete Filling Trim Ring Dome Top | | | |



RGB

STEEL

SLIDE-OUT REMOVABLE BOLLARD



RGB1

RGB2

| | RGB1 | RGB2 |
|--|--|--|
| Diameter | 88.9 mm 3.5 Inch | 101.6 mm 4 Inch |
| Wall Thickness (mm) | | 2.11 3.05 |
| Height (mm) | 700 - 800 - 900 - 1000 - 1100 | |
| Material | Structural Steel ASTM A500, Grade B | |
| Top Cap | Flat or Angle | |
| Base Plate | Galvanized Steel 160x160x18mm | |
| Bolts | 4 x M12 x 100mm | |
| Finish | Galvanizing ASTM A123 / ISO 1461 | Powder Coating ASTM D3359 / B17 |
| Weight (kg) @ 1000 mm height (per wall thickness) | 8.2 10.2 | 8.5 10.8 |
| Impact Resistance/ Car Speed (kJ/KPH) 1.5t Car | 0.5/2.8 0.7/3.4 | 0.7/3.2 0.9/3.9 |
| Options | Reflective band Name Plate/Logo Custom Cap | Imm Groove Internal Cam Lock Dome Top UV resistance |

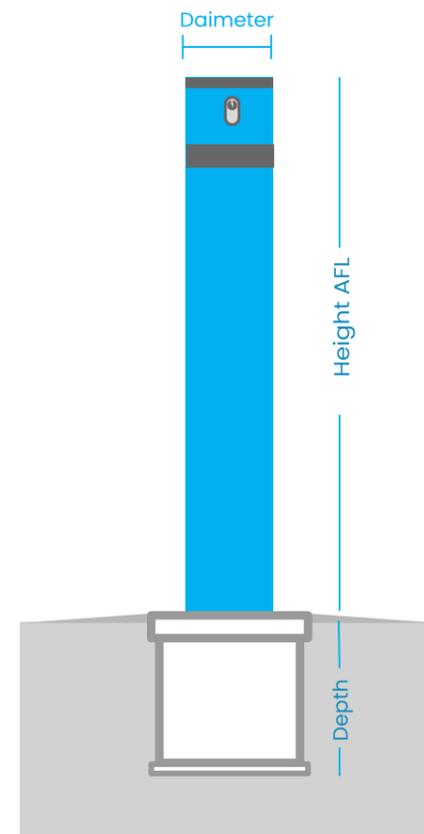




RGD

STEEL

LIFT-OUT REMOVABLE BOLLARD



Drainage
If soil is impermeable or groundwater is high, provide a **positive drain** to a nearby drain/sump (by others).

RGD1 **RGD2** **RGD3** **RGD4** **RGD5**

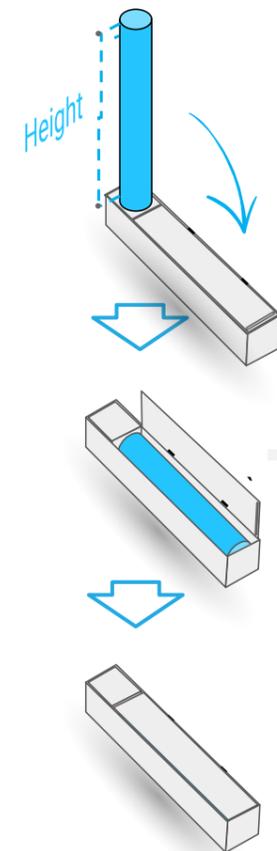
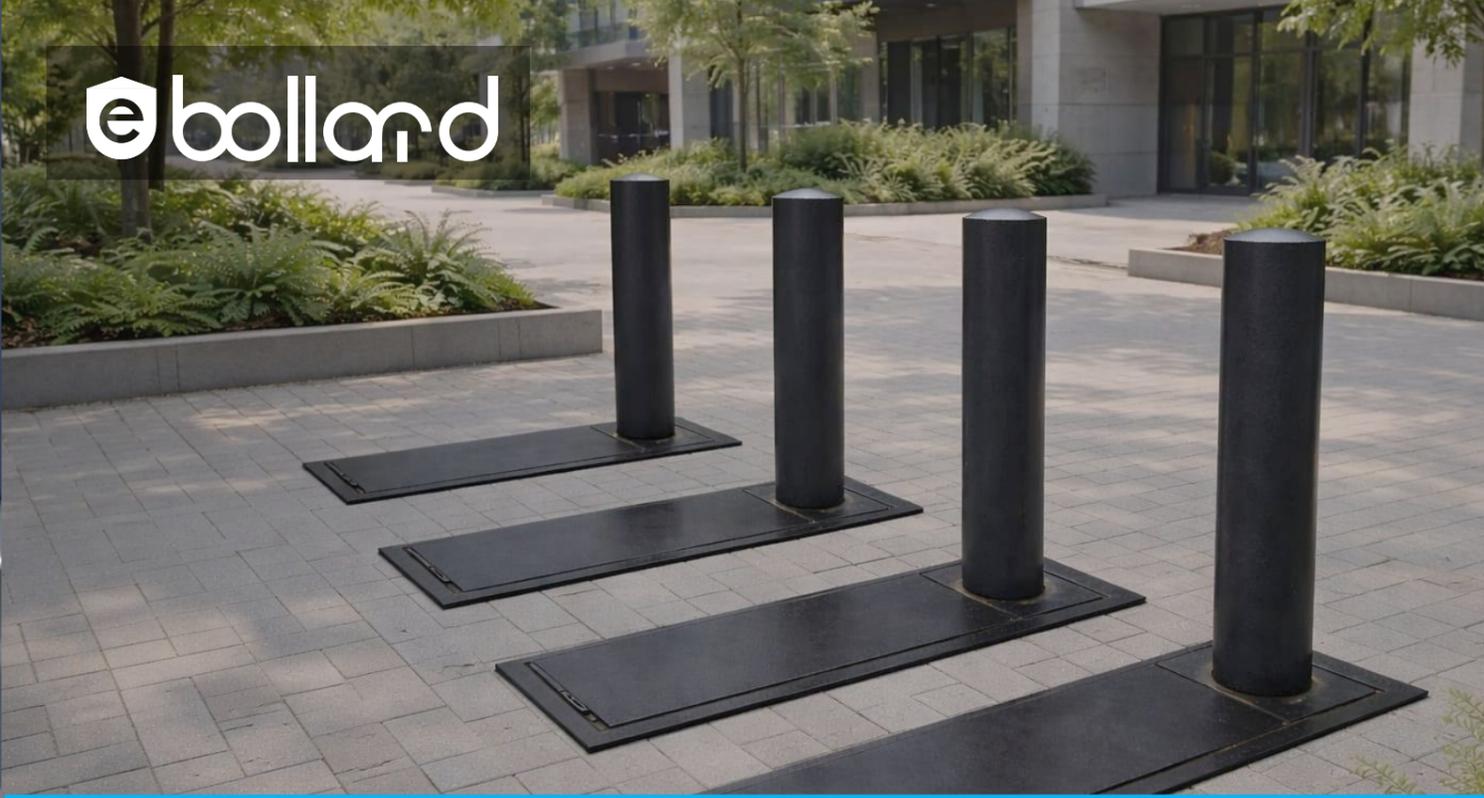
| | RGD1 | RGD2 | RGD3 | RGD4 | RGD5 |
|--|---|-------------------------------|-------------------------------|--|--------------------------------|
| Diameter | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 6.55 | 2.77 3.40 4.78 | 2.77 3.76 6.35 |
| Height/Depth (mm/mm) | 700/200 - 800/200 - 900/250 - 1000/250 - 1100/250 | | | | |
| Material | Structural Steel ASTM A500, Grade B | | | | |
| Top Cap | Flat or Angle | | | | |
| Foundation Area (mm) | 300x300 | 350x350 | 400x400 | 500x500 | 650x650 |
| Finish | Galvanizing ASTM A123 / ISO 1461 | | | Powder Coating ASTM D3359 / B117 | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 11.4 14.3 22.1 | 14.0 17.2 20.3 | 20.6 23.2 36.3 | 27.2 30.4 37.4 | 37.0 43.6 60.7 |
| Impact Resistance/ Car Speed (Kj/KPH) 1.5t Car | 0.5/2.9 0.7/3.5 1.3/4.6 | 0.7/3.2 0.9/3.9 1.2/4.4 | 1.3/4.6 1.5/5.1 2.8/6.9 | 1.8/5.5 2.2/6.1 3/7.2 | 3.1/7.2 4.1/8.4 6.7/10.7 |

| Options | Reflective band Name Plate/Logo Custom Cap UV resistance | Imm Groove Internal Cam Lock Hole Cover Dome Top |
|----------------|---|---|
|----------------|---|---|



FGD STEEL

IN-GROUND FOLD-DOWN BOLLARD



Drainage
If soil is impermeable or groundwater is high, provide a positive drain to a nearby drain/sump (by others).

| | FGD1 | FGD2 | FGD3 | FGD4 | FGD5 | FGD6 |
|--|------|------|------|------|------|------|
|--|------|------|------|------|------|------|

| | | | | | | |
|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Diameter | 73.0 mm 3 Inch | 88.9 mm 3.5 Inch | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.16 | 2.11 3.05 5.49 | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 — | 2.77 3.40 4.78 |

| | | | | | | |
|--------------------|-------------------------------|--|--|--|--|--|
| Height (mm) | 700 - 800 - 900 - 1000 - 1100 | | | | | |
|--------------------|-------------------------------|--|--|--|--|--|

| | | | | | | |
|-----------------|--|--|--|--|--|--|
| Material | Structural Steel ASTM A500, Grade B | | | | | |
|-----------------|--|--|--|--|--|--|

| | | | | | | |
|----------------|---------------|--|--|--|--|--|
| Top Cap | Flat or Angle | | | | | |
|----------------|---------------|--|--|--|--|--|

| | | | | | | |
|---------------|-------------------------------------|--|--|-------------------------------------|--|--|
| Finish | Galvanizing ASTM A123 / ISO 1461 | | | Powder Coating ASTM D3359 / B117 | | |
|---------------|-------------------------------------|--|--|-------------------------------------|--|--|

| | | | | | | |
|----------------|--|--|--|--|--|--|
| Options | Reflective band Name Plate/Logo Custom Cap | | | Imm Groove Internal Cam Lock Dome Top UV resistance | | |
|----------------|--|--|--|--|--|--|

Foundation Size & Bollard Weight

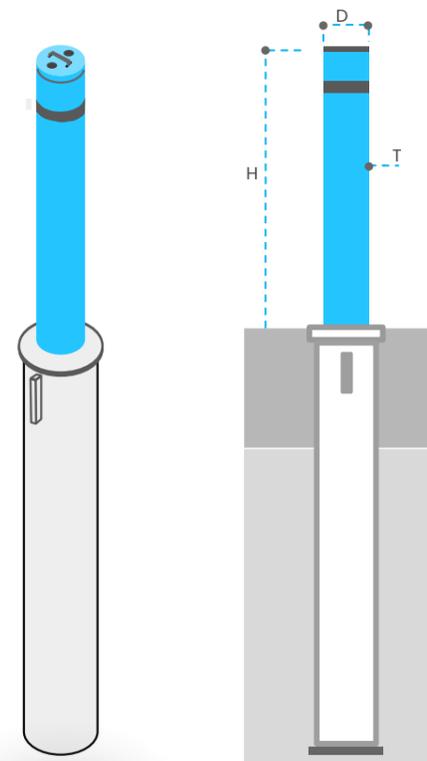
| Model / Height | 700 | 800 | 900 | 1000 | 1100 |
|----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| FGD1 73mm | 1150x475x275 18 kg | 1250x475x275 21 kg | 1350x475x275 23 kg | 1450x475x275 26 kg | 1550x475x275 28 kg |
| FGD2 89mm | 1150x490x290 24 kg | 1250x490x290 27 kg | 1350x490x290 30 kg | 1450x490x290 34 kg | 1550x490x290 37 kg |
| FGD3 102mm | 1150x500x300 28 kg | 1250x500x300 33 kg | 1350x500x300 37 kg | 1450x500x300 41 kg | 1550x500x300 45 kg |
| FGD4 114mm | 1150x515x315 23 kg* | 1250x515x315 26 kg* | 1350x515x315 29 kg* | 1450x515x315 32 kg* | 1550x515x315 36 kg* |
| FGD5 141mm | 1150x540x340 24 kg* | 1250x540x340 28 kg* | 1350x540x340 31 kg* | 1450x540x340 35 kg* | 1550x540x340 38 kg* |
| FGD6 168mm | 1150x570x370 40 kg | 1250x570x370 46 kg | 1350x570x370 52 kg | 1450x570x370 58 kg | 1550x570x370 64 kg |



MGD

STEEL

MANUAL RETRACTABLE BOLLARD



MGD1

MGD2

| | | |
|---|---|--|
| Material | Structural Steel ASTM A500, Grade B | |
| Length | Above Ground 900 mm Below Ground 1500 mm | |
| Bollard/Socket Diameter | 101.6/114.3 mm 4 inch/4.5 inch | 114.3/141.3 mm 4.5/5.5 inch |
| Bollard/Socket Wall Thickness (mm) | 2.11/3.05 | |
| Foundation Size | 350x350x1600 mm C40 Concrete | |
| Finish | Galvanizing ASTM A123 / ISO 1461 | Powder Coating ASTM D3359 / B117 |
| Weight | 20 kg | 24 kg |
| Impact Resistance/ Car Speed (Kj/KPH) 1.5t Car | 0.4/2.4 | 0.5/2.7 |
| Options | Reflective band Name Plate/Logo | 1mm Groove Internal Cam Lock UV resistance |





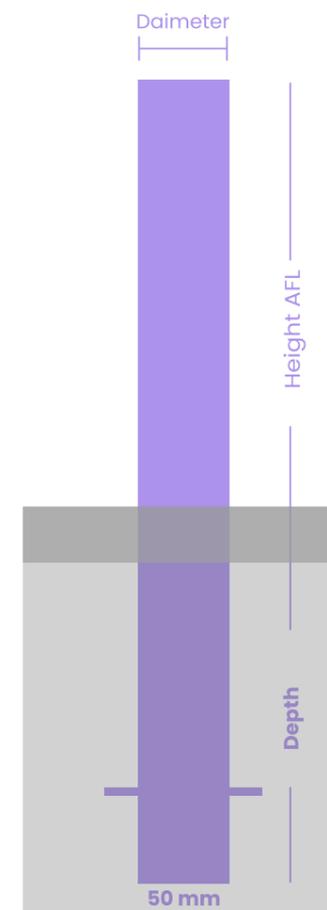
**STAINLESS
STEEL**

BOLLARDS

SSD

STAINLESS STEEL

DEEP FIXED BOLLARD



| | SSD1 | SSD2 | SSD3 | SSD4 | SSD5 | SSD6 | SSD7 |
|--|--|-----------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|-------------------------------|
| Diameter | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch | 273.0 mm 10.7 Inch | 323.9 mm 12.7 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 6.55 | 2.77 3.40 4.78 | 2.77 3.76 6.35 | 3.40 4.19 4.78 | 3.96 4.57 4.78 |
| Foundation Area (mm) | 300 300 mm | 350 350 mm | 400 400 mm | 500 500 mm | 650 650 mm | 800 800 mm | 950 950 mm |
| Height/Depth (mm/mm) | 700/200 - 800/200 - 900/300 - 1000/350 - 1100/400 | | | | | | |
| Material | Stainless Steel, 316 ASTM A312 | | | | | | |
| Top Cap | Flat or Angle | | | | | | |
| Finish | No. 4 (satin), No. 6 (dull satin) or No. 8 (mirror) ASTM A480 | | | | | | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 7.1 10.2 18.7 | 8 11.5 14.8 | 13 15.9 29.1 | 15.6 19 26.5 | 20.3 27.5 45.8 | 31.1 38.2 43.5 | 43 49.5 51.8 |
| Impact Resistance/Car Speed (Kj/KPH) 1.5t Car | 0.5/2.7 0.7/3.2 1.1/4.3 | 0.6/3.1 0.8/3.7 1/4.1 | 1.1/4.3 1.4/4.8 2.5/6.5 | 1.6/5.2 1.9/5.7 2.7/6.7 | 2.7/6.8 3.6/7.9 5.9/10.1 | 5.1/9.4 6.3/10.4 7.1/11 | 8.4/12 9.6/12.8 10/13.1 |

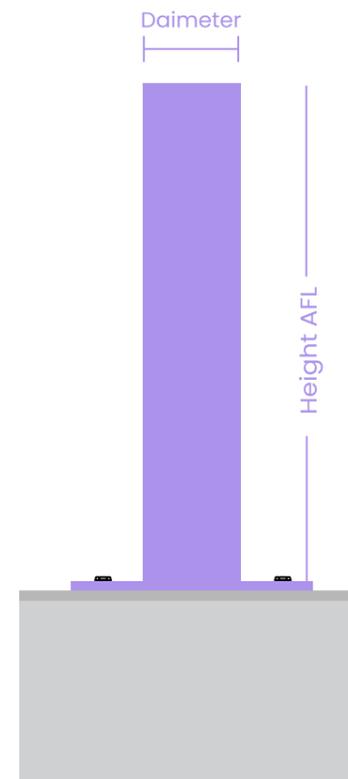
| Options | Reflective band Name Plate/Logo Custom Cap LED Bead-blasted Anti-Fingerprint coating | Imm Groove Chain Holders Concrete Filling Trim Ring Dome Top Powder coated |
|---------|---|---|
|---------|---|---|

Corrosion restoration
Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).

SSB

STAINLESS STEEL

BOLTED FIXED BOLLARD



Corrosion restoration
Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).

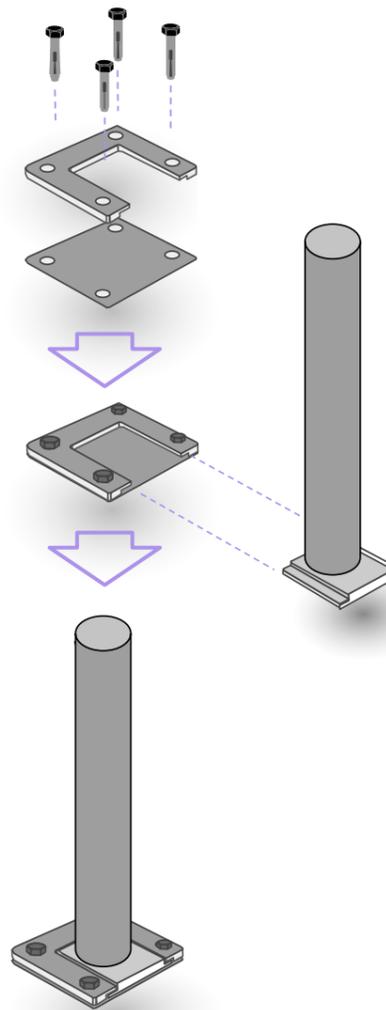
| | SSB1 | SSB2 | SSB3 | SSB4 | SSB5 | SSB6 | SSB7 |
|--|--|-----------------------------|-------------------------------|----------------------|------------------------------|---------------------------|--------------------------------|
| Diameter | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch | 273.0 mm 10.7 Inch | 323.9 mm 12.7 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.49 | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 | 2.77 3.76 6.35 | 3.40 4.19 4.78 | 3.96 4.57 4.78 |
| Height (mm) | 700 - 800 - 900 - 1000 - 1100 | | | | | | |
| Material | Stainless Steel, 316 ASTM A312 | | | | | | |
| Top Cap | Flat or Angle | | | | | | |
| Base Plate Size (mm) | 200 200 10 | 250 250 12 | 300 300 16 | 350 350 20 | 400 400 25 | 450 450 25 | |
| Bolts | 4 M12 100 mm | 4 M16 120 mm | 4 M16 120 mm | 4 M20 150 mm | 4 M20 160 mm | 8 M24 200 mm | 8 M24 200 mm |
| Finish | No. 4 (satin), No. 6 (dull satin) or No. 8 (mirror) ASTM A480 | | | | | | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 8.5 10.8 16.5 | 11.9 14.5 21.7 | 13.4 16.6 19.7 | 23.0 25.6 | 34.7 39.9 53.6 | 55.0 60.3 64.2 | 72.3 77.2 78.8 |
| Impact Resistance/Car Speed (kJ/KPH) 1.5t Car | 0.5/2.7 0.6/3.2 1/4.2 | 0.6/3 0.8/3.6 1.4/4.8 | 0.9/3.7 1.2/4.5 1.5/5.1 | 1.6/5.1 1.9/5.7 | 2.7/6.7 3.5/7.8 5.8/10 | 5/9.3 6.2/10.3 7/11 | 8.2/11.9 9.5/12.8 9.9/13 |

| Options | | |
|---------|--------------------------|------------------|
| | Reflective band | Imm Groove |
| | Name Plate/Logo | Base Plate cover |
| | Custom Cap | Chain Holders |
| | Bead-blasted | Dome Top |
| | Anti-Fingerprint coating | Powder coated |

RSB

STAINLESS STEEL

SLIDE-OUT REMOVABLE BOLLARD



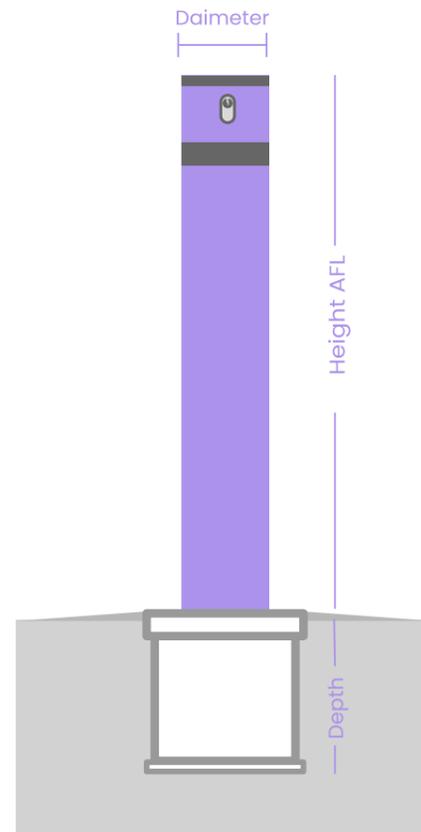
Corrosion restoration
Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).

| | RSB1 | RSB2 |
|--|--|--|
| Diameter | 88.9 mm 3.5 Inch | 101.6 mm 4 Inch |
| Wall Thickness (mm) | 2.11 3.05 | |
| Height (mm) | 700 - 800 - 900 - 1000 - 1100 | |
| Material | Stainless Steel, 316 ASTM A312 | |
| Top Cap | Flat or Angle | |
| Base Plate | Galvanized Steel 160x160x18mm | |
| Bolts | 4 x M12 x 100mm | |
| Finish | No. 4 (satin), No. 6 (dull satin) or No. 8 (mirror) ASTM A480 | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 8.2 10.2 | 8.5 10.8 |
| Impact Resistance/ Car Speed (kJ/KPH) 1.5t Car | 0.4/2.4 0.5/2.8 | 0.5/2.7 0.7/3.2 |
| Options | Reflective band Name Plate/Logo Custom Cap Anti-Fingerprint coating | 1mm Groove Internal Cam Lock Dome Top Bead-blasted Powder coated |

RSD

STAINLESS STEEL

LIFT-OUT REMOVABLE BOLLARD



RSD1 **RSD2** **RSD3** **RSD4** **RSD5**

| | RSD1 | RSD2 | RSD3 | RSD4 | RSD5 |
|--|--|-------------------------------|-----------------------------|-----------------------------|---------------------------|
| Diameter | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 6.55 | 2.77 3.40 4.78 | 2.77 3.76 6.35 |
| Height/Depth (mm/mm) | 700/200 - 800/200 - 900/250 - 1000/250 - 1100/250 | | | | |
| Material | Stainless Steel, 316 ASTM A312 | | | | |
| Top Cap | Flat or Angle | | | | |
| Foundation Area (mm) | 300x300 | 350x350 | 400x400 | 500x500 | 650x650 |
| Finish | No. 4 (satin), No. 6 (dull satin) or No. 8 (mirror) ASTM A480 | | | | |
| Weight (kg) @ 1000 mm height (per wall thickness) | 11.4 14.3 22.1 | 14.0 17.2 20.3 | 20.6 23.2 36.3 | 27.2 30.4 37.4 | 37.0 43.6 60.7 |
| Impact Resistance/Car Speed (Kj/KPH) 1.5t Car | 0.4/2.4 0.5/2.9 0.9/3.9 | 0.5/2.7 0.7/3.3 0.8/3.7 | 0.9/3.9 1.1/4.3 2/5.8 | 1.3/4.6 1.6/5.1 2.1/6 | 2.2/6.1 2.9/7 4.8/9 |

Drainage
If soil is impermeable or groundwater is high, provide a **positive drain** to a nearby drain/sump (by others).

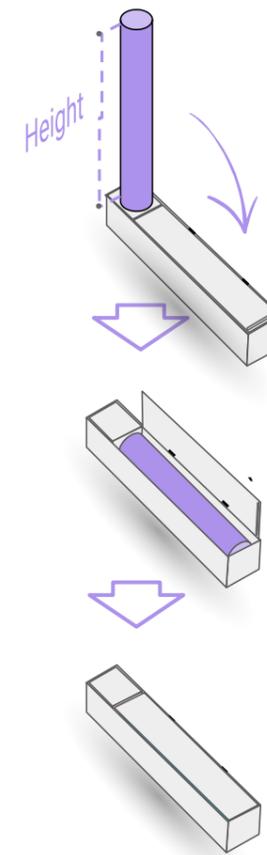
Corrosion restoration
Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).

| Options | Reflective band Name Plate/Logo Custom Cap Bead-blasted Anti-Fingerprint coating | 1mm Groove Internal Cam Lock Hole Cover Dome Top Powder coated |
|----------------|--|--|
|----------------|--|--|

FSD

STAINLESS STEEL

IN-GROUND FOLD-DOWN BOLLARD



| | FSD1 | FSD2 | FSD3 | FSD4 | FSD5 | FSD6 |
|----------------------------|--|----------------------|----------------------|--|----------------------|----------------------|
| Diameter | 73.0 mm 3 Inch | 88.9 mm 3.5 Inch | 101.6 mm 4 Inch | 114.3 mm 4.5 Inch | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Wall Thickness (mm) | 2.11 3.05 5.16 | 2.11 3.05 5.49 | 2.11 3.05 5.74 | 2.11 3.05 3.96 | 2.77 3.40 — | 2.77 3.40 4.78 |
| Height (mm) | 700 - 800 - 900 - 1000 - 1100 | | | | | |
| Material | Stainless Steel, 316 ASTM A312 | | | | | |
| Top Cap | Flat or Angle | | | | | |
| Finish | No. 4 (satin), No. 6 (dull satin) or No. 8 (mirror) ASTM A480 | | | | | |
| Options | Reflective band Name Plate/Logo Custom Cap Anti-Fingerprint coating | | | 1mm Groove Internal Cam Lock Dome Top Powder coated | | |

| | | 700 | 800 | 900 | 1000 | 1100 |
|----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------|
| FSD1 73mm | 1150x475x275 18 kg | 1250x475x275 21 kg | 1350x475x275 23 kg | 1450x475x275 26 kg | 1550x475x275 28 kg | |
| FSD2 89mm | 1150x490x290 24 kg | 1250x490x290 27 kg | 1350x490x290 30 kg | 1450x490x290 34 kg | 1550x490x290 37 kg | |
| FSD3 102mm | 1150x500x300 28 kg | 1250x500x300 33 kg | 1350x500x300 37 kg | 1450x500x300 41 kg | 1550x500x300 45 kg | |
| FSD4 114mm | 1150x515x315 23 kg* | 1250x515x315 26 kg* | 1350x515x315 29 kg* | 1450x515x315 32 kg* | 1550x515x315 36 kg* | |
| FSD5 141mm | 1150x540x340 24 kg* | 1250x540x340 28 kg* | 1350x540x340 31 kg* | 1450x540x340 35 kg* | 1550x540x340 38 kg* | |
| FSD6 168mm | 1150x570x370 40 kg | 1250x570x370 46 kg | 1350x570x370 52 kg | 1450x570x370 58 kg | 1550x570x370 64 kg | |

Drainage
If soil is impermeable or groundwater is high, provide a positive drain to a nearby drain/sump (by others).

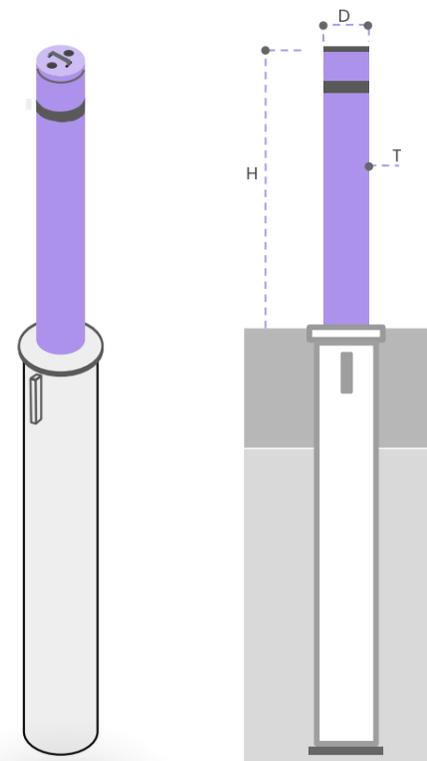
Corrosion restoration
Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).



MSD

STAINLESS STEEL

MANUAL RETRACTABLE BOLLARD



Drainage

If soil is impermeable or groundwater is high, provide a **positive drain** to a nearby drain/sump (by others).

Corrosion restoration

Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).

| | MSD1 | MSD2 |
|---|--|--|
| Material | Stainless Steel, 316 ASTM A312 | |
| Length | Above Ground 900 mm Below Ground 1500 mm | |
| Bollard/Socket Diameter | 101.6/114.3 mm 4 Inch/4.5 Inch | 114.3/141.3 mm 4.5/5.5 Inch |
| Bollard/Socket Wall Thickness (mm) | 2.11/3.05 | |
| Foundation Size | 350x350x1600 mm C40 Concrete | |
| Finish | No. 4 (satin), No. 6 (dull satin) or No. 8 (mirror) ASTM A480 | |
| Weight | 20 kg | 24 kg |
| Impact Resistance/ Car Speed (Kj/KPH) 1.5t Car | 0.3/2 | 0.3/2.3 |
| Options | Reflective band Name Plate/Logo Anti-Fingerprint coating | Imm Groove Internal Cam Lock Bead-blasted Powder coated |

Corrosion restoration

Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).



SECURITY

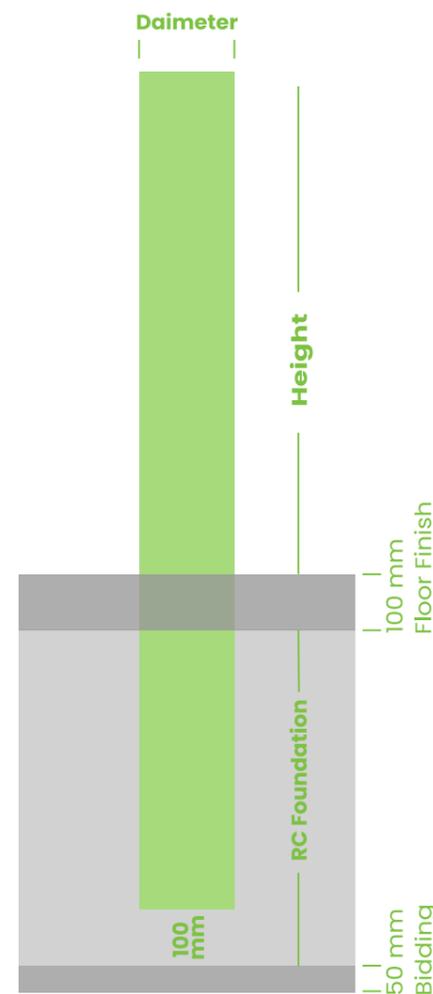
BOLLARDS



SDL

SECURITY

DEEP FIXED BOLLARD



| | SDL1 | SDL2 |
|--|---|--|
| Diameter Core Bollard | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Diameter Bollard Cover / SS Sleeve (optional) | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 500 mm | Above Ground 1000 mm Below Ground 650 mm |
| Wall Thickness Core Bollard | 9.5 mm | 11 mm |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight Core Bollard | 44 kg | 64 kg |
| Foundation (Not Included) | 600x600x600 mm C40 Concrete | 600x600x750 mm C40 Concrete |
| Impact Resistance (kj) | 25 | 100 |
| Equivalent to International Standard | PAS 170 2500 kg @ 16 kph ASTM F3016 5000 lb @ 10 mph | PAS 170 2,500 kg @ 32 kph ASTM F3016 5000 lb @ 20 mph |

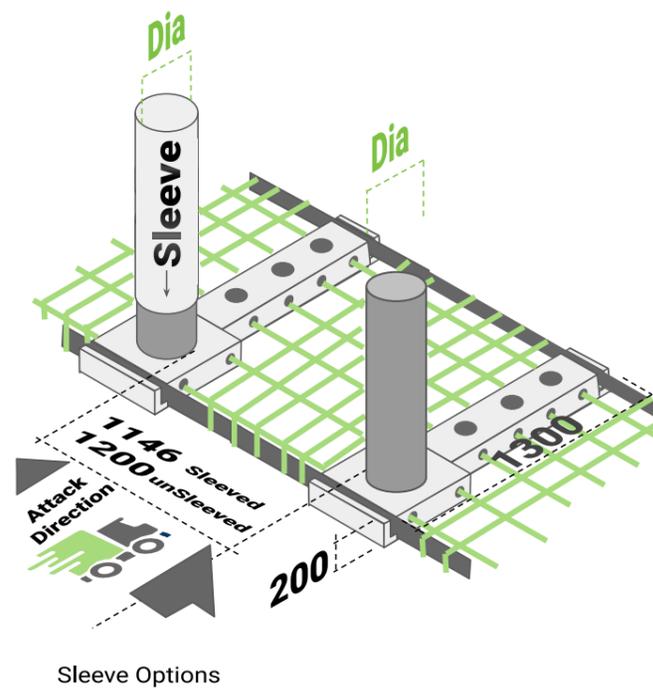
Must be installed within an approved, reinforced concrete foundation



SSL

SECURITY

SHALLOW FIXED BOLLARD



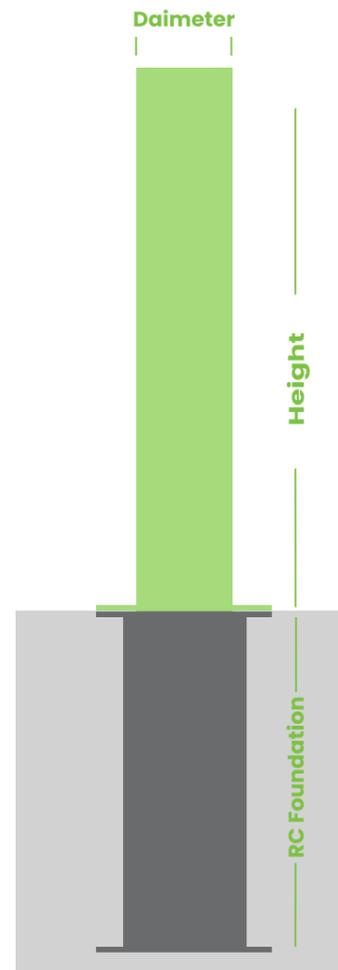
| | SSL1 | SSL2 |
|--|---|--|
| Diameter Core Bollard | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Diameter Bollard Cover / SS Sleeve (optional) | 168.3 mm 6.5 Inch | 219.1 mm 8.5 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 200 mm | Above Ground 1000 mm Below Ground 200 mm |
| Wall Thickness Core Bollard | 9.5 mm | 11 mm |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight Core Bollard | 44 kg | 64 kg |
| Impact Resistance (kj) | 25 | 100 |
| Equivalent to International Standard | PAS 170 2500 kg @ 16 kph ASTM F3016 5000 lb @ 10 mph | PAS 170 2,500 kg @ 32 kph ASTM F3016 5000 lb @ 20 mph |





RDL SECURITY

DEEP REMOVABLE BOLLARD



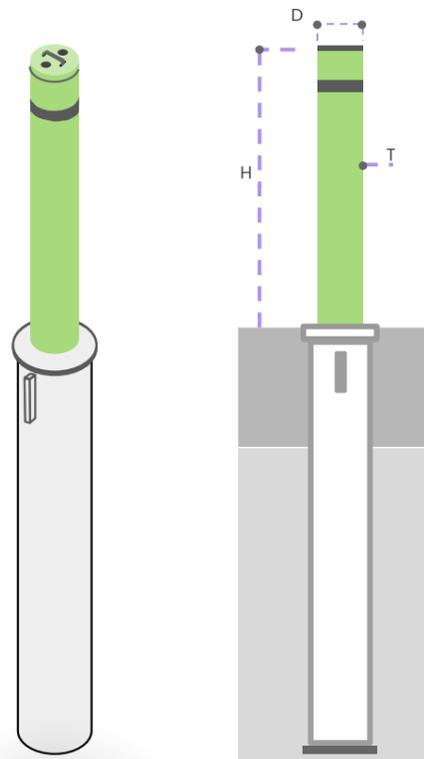
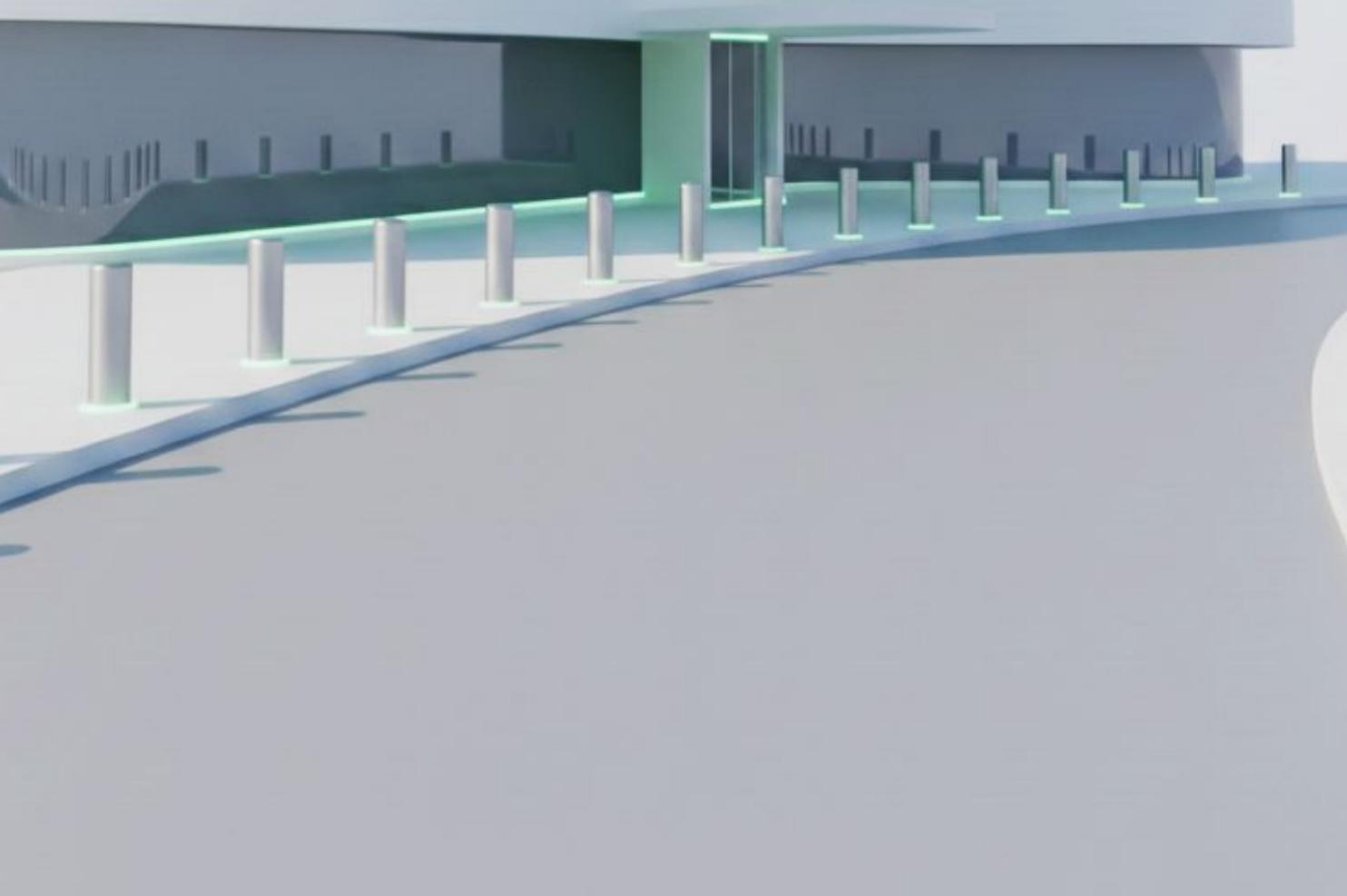
| | RDL1 | RDL2 |
|---|---|--|
| Diameter Core Bollard | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 500 mm | Above Ground 1000 mm Below Ground 600 mm |
| Wall Thickness Core Bollard | 9.5 mm | 11 mm |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight Core Bollard | 57 kg | 82 kg |
| Foundation (Not Included) | 650x600x650 mm C40 Concrete | |
| Impact Resistance (kj) | 25 | 100 |
| Equivalent to International Standard | PAS 170 2500 kg @ 16 kph ASTM F3016 5000 lb @ 10 mph | PAS 170 2,500 kg @ 32 kph ASTM F3016 5000 lb @ 20 mph |





MDL SECURITY

MANUAL RETRACTABLE BOLLARD



| | MDL1 | MDL2 |
|---|---|--|
| Diameter Core Bollard | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 1500 mm | |
| Wall Thickness Core Bollard | 9.5 mm | 11 mm |
| Foundation Size | 600x600x1600 mm C40 Concrete | |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight Core Bollard | 85 kg | 100 kg |
| Foundation (Not Included) | 600x600x16000 mm C40 Concrete | |
| Impact Resistance (kj) | 25 | 100 |
| Equivalent to International Standard | PAS 170 2500 kg @ 16 kph ASTM F3016 5000 lb @ 10 mph | PAS 170 2,500 kg @ 32 kph ASTM F3016 5000 lb @ 20 mph |

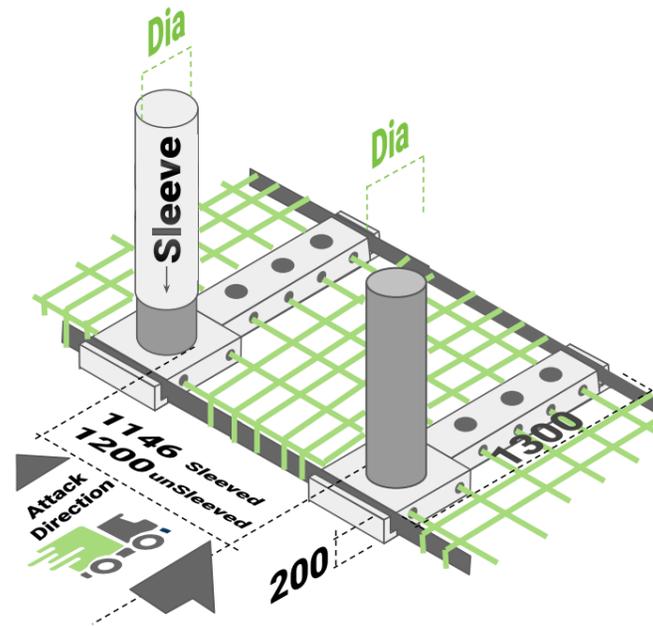
Drainage
If soil is impermeable or groundwater is high, provide a **positive drain** to a nearby drain/sump (by others).

Corrosion restoration
Heat tint/free-iron removal and passivation in accordance with ASTM A967 (ref. ASTM A380).



RSL SECURITY

SHALLOW REMOVABLE BOLLARD



Sleeve Options



RSL1

RSL2

| | | |
|---|---|--|
| Diameter Core Bollard | 141.3 mm 5.5 Inch | 168.3 mm 6.5 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 200 mm | Above Ground 1000 mm Below Ground 200 mm |
| Wall Thickness Core Bollard | 9.5 mm | 11 mm |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight Core Bollard | 44 kg | 64 kg |
| Impact Resistance (kj) | 25 | 100 |
| Equivalent to International Standard | PAS 170 2500 kg @ 16 kph ASTM F3016 5000 lb @ 10 mph | PAS 170 2,500 kg @ 32 kph ASTM F3016 5000 lb @ 20 mph |

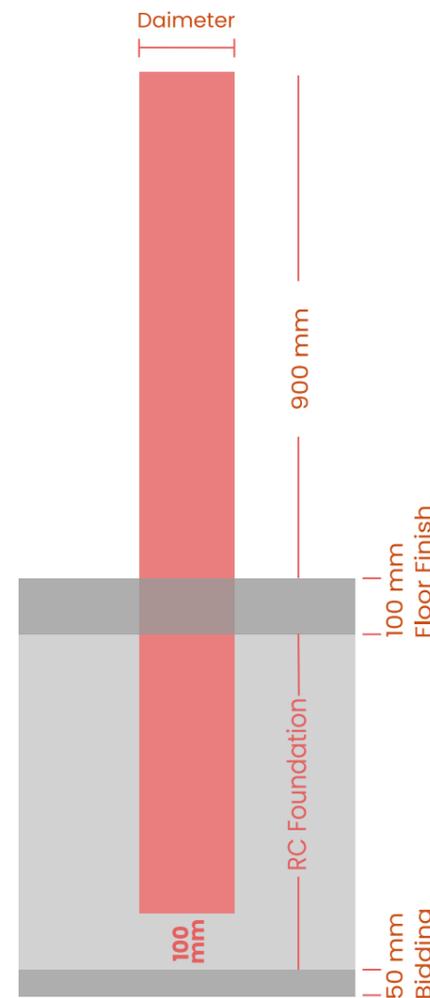
Must be installed within an approved, reinforced concrete foundation



**HIGH
SECURITY**

BOLLARDS

SDH
HIGH SECURITY
DEEP FIXED BOLLARD



| | SDH1 | SDH2 |
|--|---|--|
| Diameter Core Bollard | 219.1 mm 8 Inch | 273mm 10 Inch |
| Diameter Bollard Cover / SS Sleeve (optional) | 273mm 10 Inch | 323.9mm 12 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 500 mm | Above Ground 1000 mm Below Ground 650 mm |
| Wall Thickness Core Bollard | 30 mm (Optional sleeve 6.35 mm) | |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight (kg) Core Bollard | 209 | 245 |
| Foundation (Not Included) | 600x600x600 mm C40 Concrete | 600x600x750 mm C40 Concrete |
| Impact Resistance (kj) | 700 | 1800 |
| Equivalent to International Standard | K4 PAS 68 7500 kg @ 48 kph IWA 14 7200 kg @ 48 kph ASTM F2656 M30 15000 lb @ 30 mph | K12 PAS 68 7500 kg @ 80 kph IWA 14 7200 kg @ 80 kph ASTM F2656 M50 15000 lb @ 50 mph |

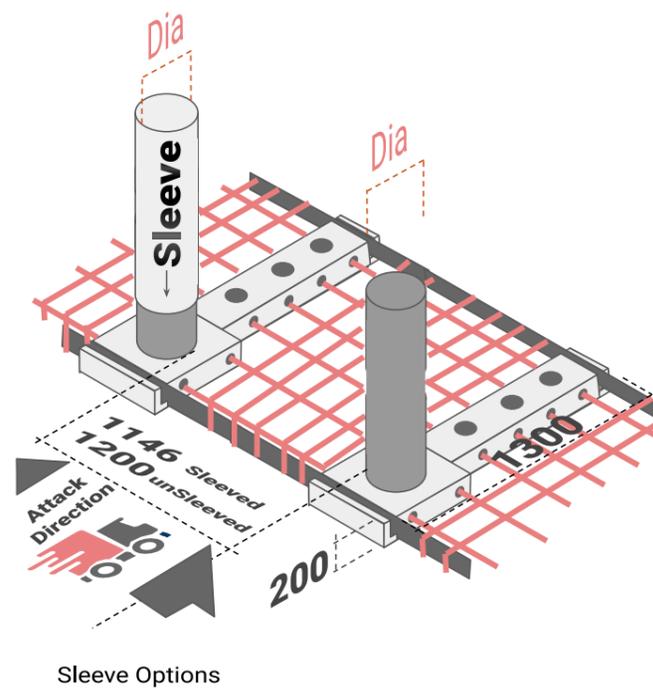
Must be installed within an approved, reinforced concrete foundation



SSH

HIGH SECURITY

SHALLOW FIXED BOLLARD



| | SSH1 | SSH2 |
|---|---|--|
| Diameter Core Bollard | 219.1 mm 8 Inch | 273mm 10 Inch |
| Diameter Bollard Cover / SS Sleeve (optional) | 273mm 10 Inch | 323.9mm 12 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 200 mm | Above Ground 1000 mm Below Ground 200 mm |
| Wall Thickness Core Bollard | 30 mm (Optional sleeve 6.35 mm) | |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight (kg) Core Bollard | 209 | 245 |
| Impact Resistance (kj) | 700 | 1800 |
| Equivalent to International Standard | K4 PAS 68 7500 kg @ 48 kph IWA 14 7200 kg @ 48 kph ASTM F2656 M30 15000 lb @ 30 mph | K12 PAS 68 7500 kg @ 80 kph IWA 14 7200 kg @ 80 kph ASTM F2656 M50 15000 lb @ 50 mph |

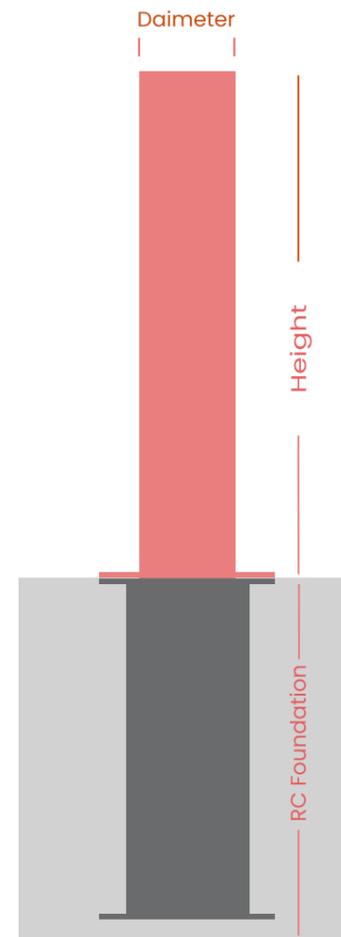
Must be installed within an approved, reinforced concrete foundation



RDH

HIGH SECURITY

DEEP REMOVABLE BOLLARD



| | RDH1 | RDH2 |
|---|---|--|
| Diameter Core Bollard | 219.1 mm 8 Inch | 273mm 10 Inch |
| Material Core Bollard | Steel (EN 10219 S355J) | |
| Bollard Length Core Bollard | Above Ground 900 mm Below Ground 400 mm | Above Ground 900 mm Below Ground 400 mm |
| Wall Thickness Core Bollard | 30 mm | |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight (kg) Core Bollard | 235 | 267 |
| Foundation (Not Included) | 600x600x600 mm C40 Concrete | 600x600x750 mm C40 Concrete |
| Impact Resistance (kj) | 700 | 1800 |
| Equivalent to International Standard | K4 PAS 68 7500 kg @ 48 kph IWA 14 7200 kg @ 48 kph ASTM F2656 M30 15000 lb @ 30 mph | K12 PAS 68 7500 kg @ 80 kph IWA 14 7200 kg @ 80 kph ASTM F2656 M50 15000 lb @ 50 mph |

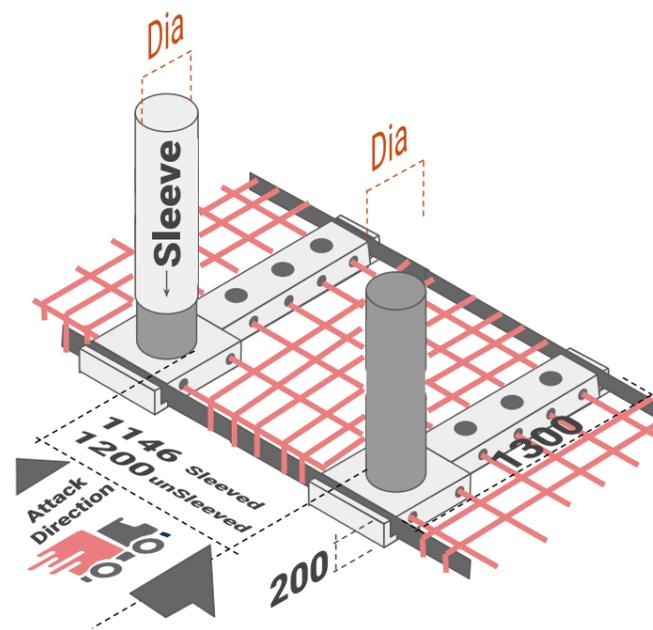
Must be installed within an approved, reinforced concrete foundation.
Designed to be removed only using the designated lifting tools.



RSH

HIGH SECURITY

SHALLOW REMOVABLE BOLLARD

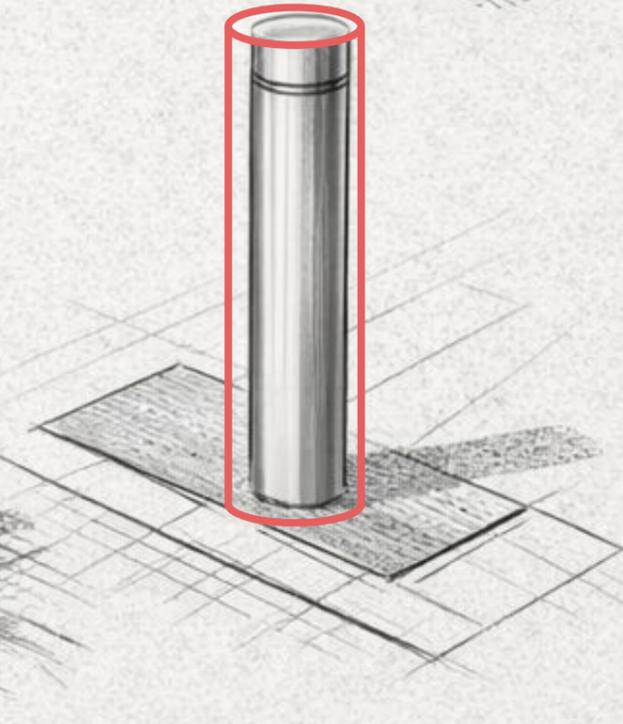
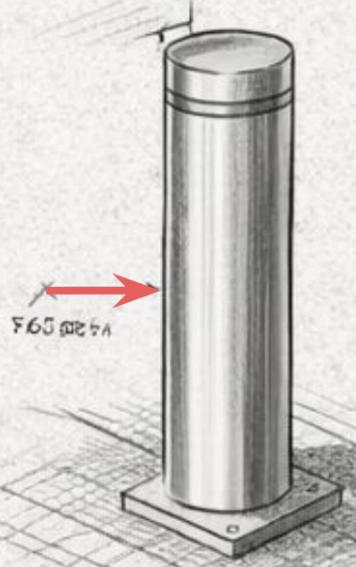
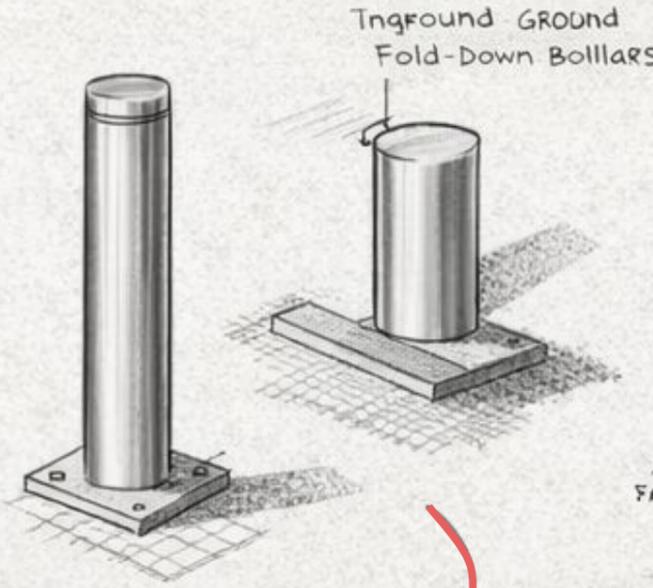
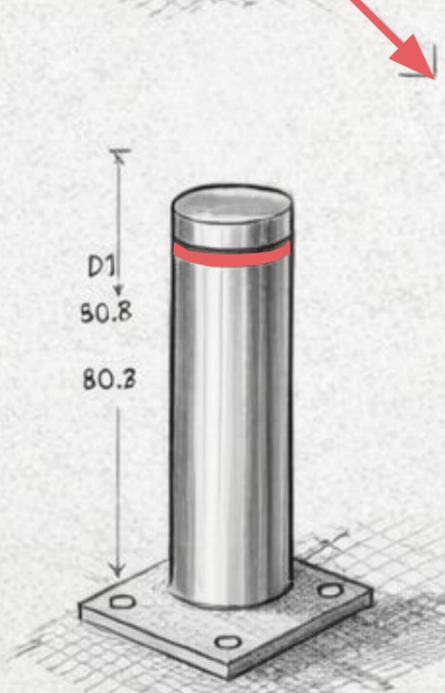
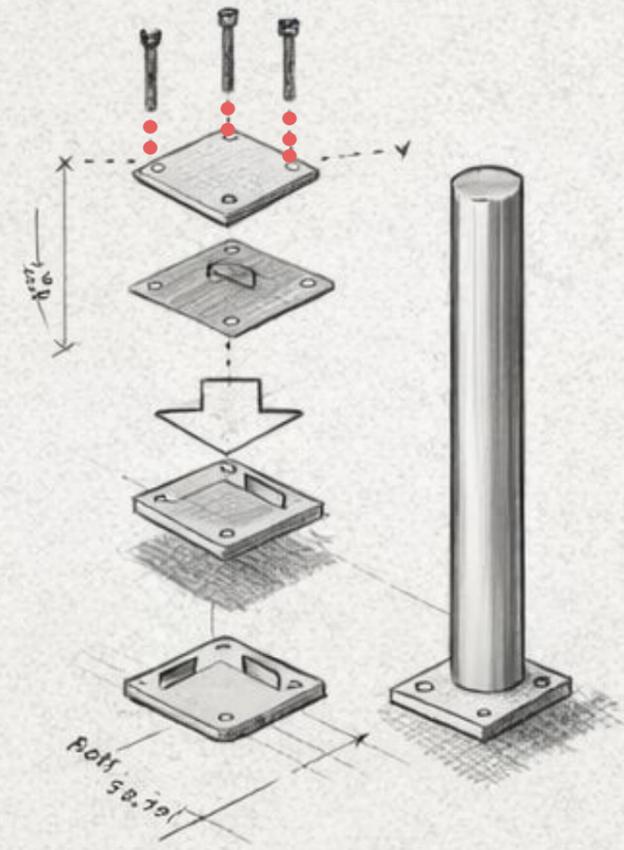
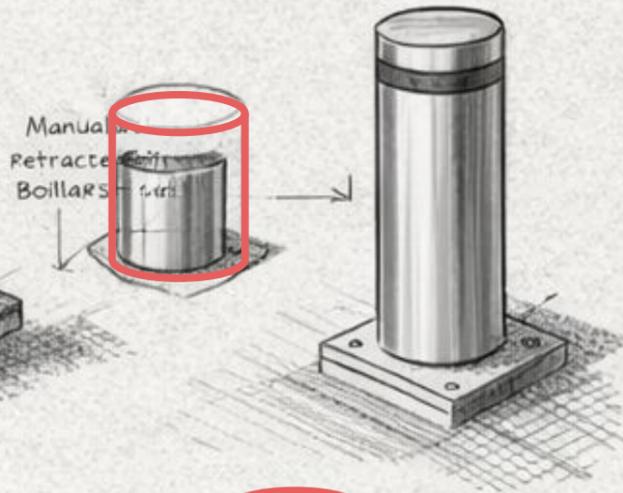
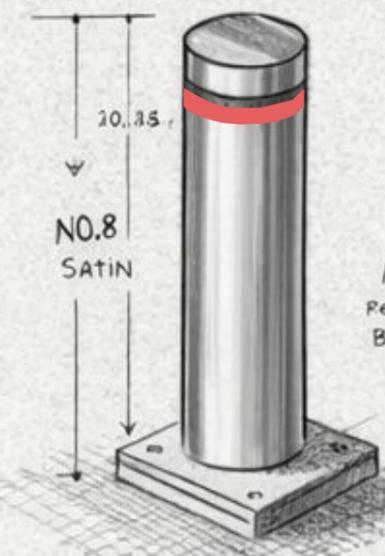
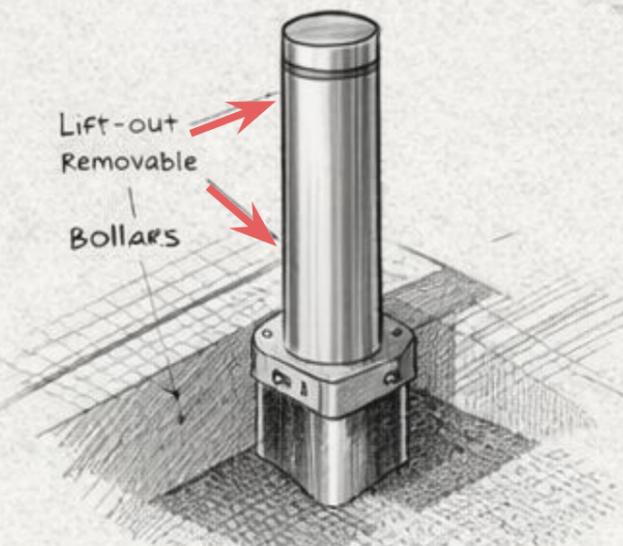
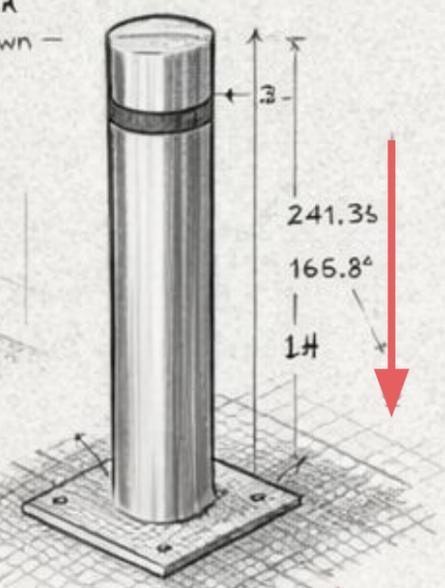
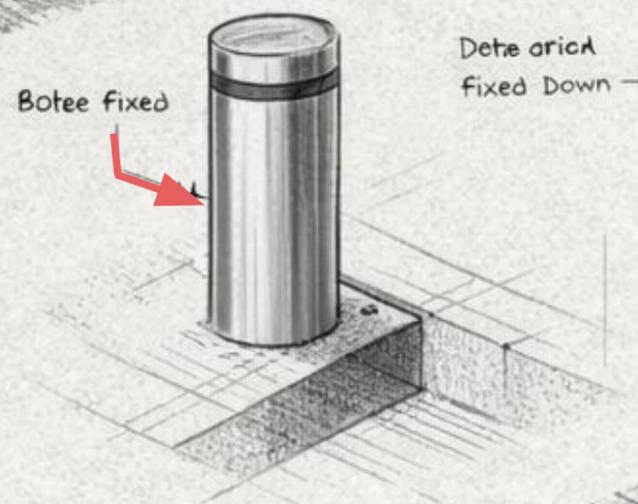
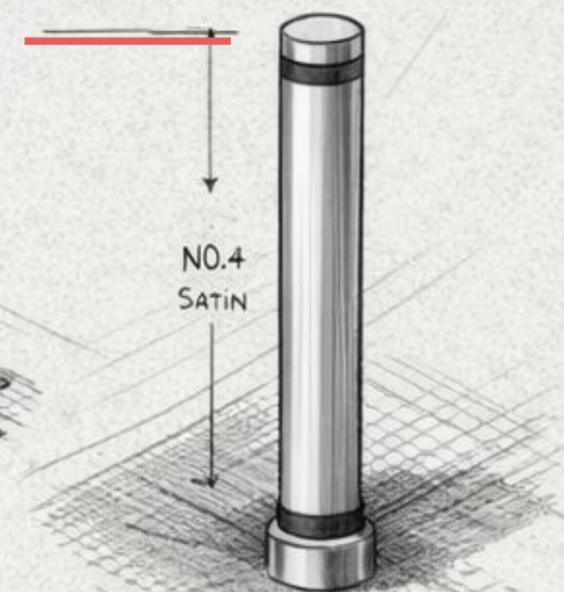
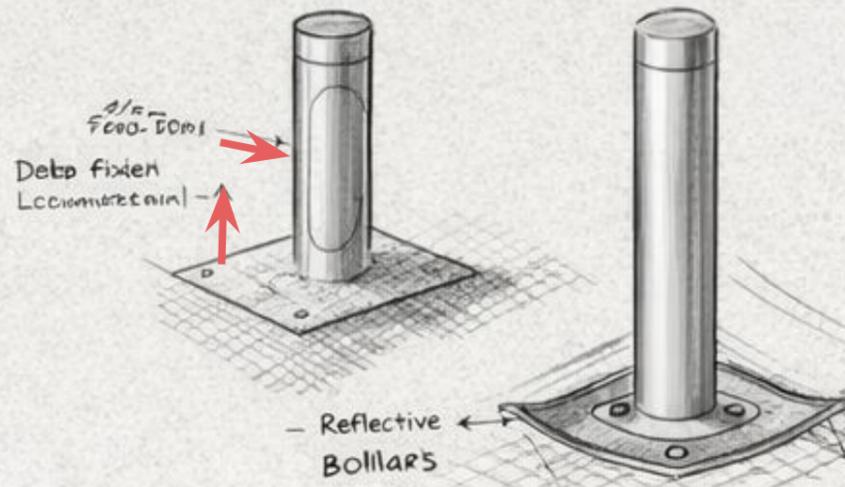
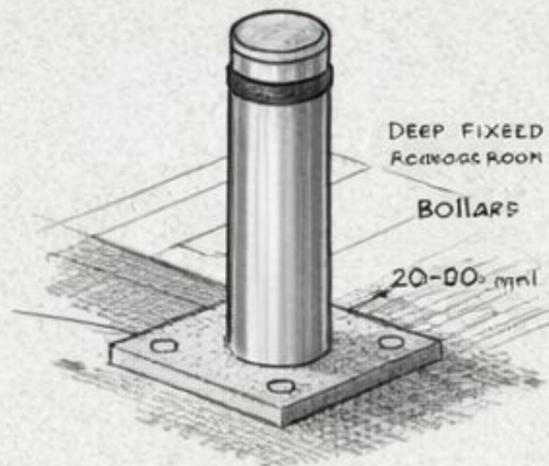
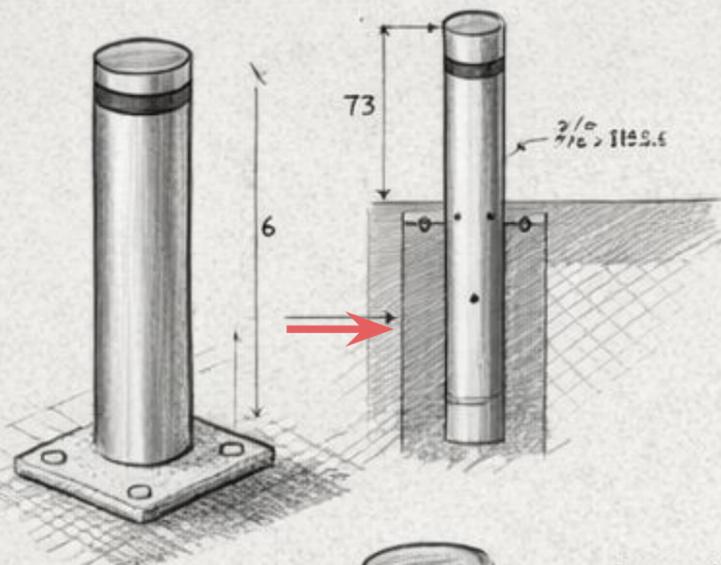


Sleeve Options



| | RSH1 | RSH2 |
|---|---|--|
| Diameter Core Bollard | 219.1 mm 8 Inch | 273mm 10 Inch |
| Material Core Bollard | Steel (EN 10219) | |
| Bollard Length Core Bollard | Above Ground 1000 mm Below Ground 200 mm | Above Ground 1000 mm Below Ground 200 mm |
| Wall Thickness Core Bollard | 30 mm | |
| Finish Core Bollard | Hot Dip Galvanizing (Optional SS-Sleeve) | |
| Weight (kg) Core Bollard | 209 | 245 |
| Impact Resistance (kj) | 700 | 1800 |
| Equivalent to International Standard | K4 PAS 68 7500 kg @ 48 kph IWA 14 7200 kg @ 48 kph ASTM F2656 M30 15000 lb @ 30 mph | K12 PAS 68 7500 kg @ 80 kph IWA 14 7200 kg @ 80 kph ASTM F2656 M50 15000 lb @ 50 mph |

Must be installed within an approved, reinforced concrete foundation



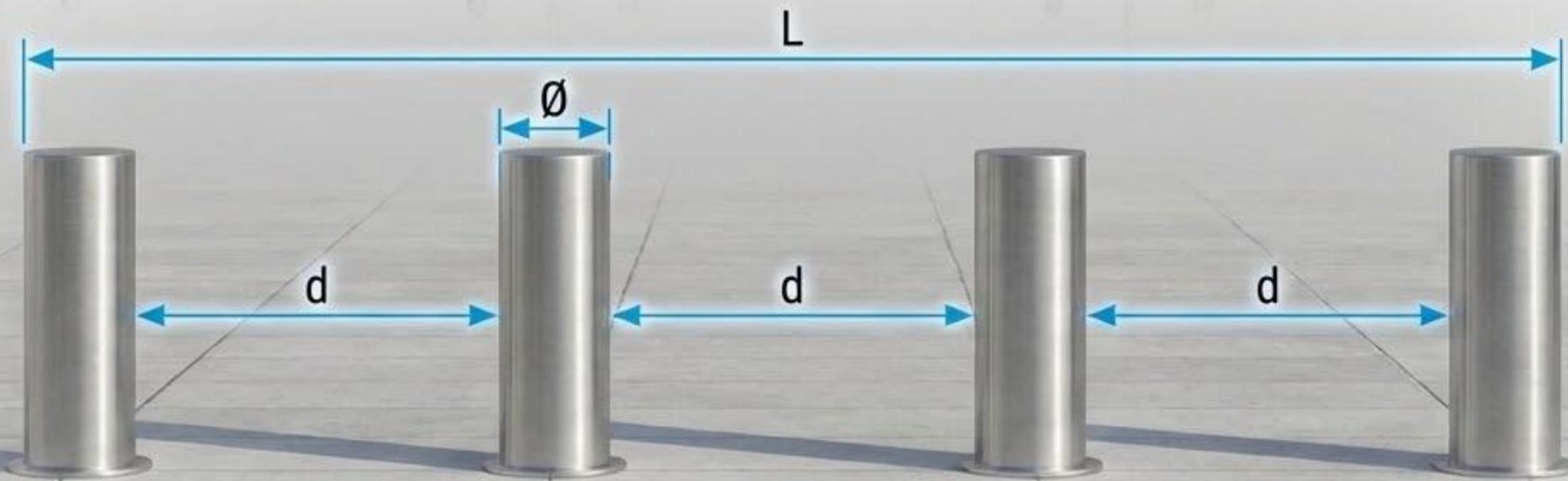
STAINLESS STEEL BOLLARD FINISH OPTIONS



STEEL BOLLARD SURFACE FINISH OPTIONS



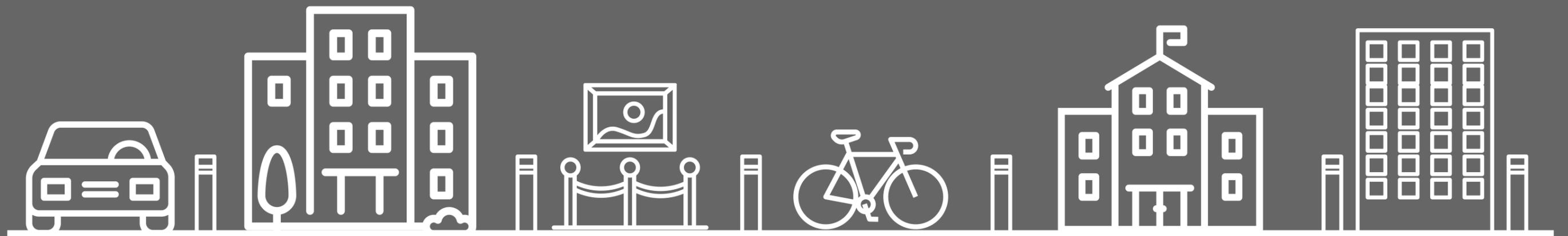
DISTANCE BETWEEN BOLLARDS



$$N = \frac{L - d}{\text{Ø} + d}$$

$$d = \frac{L - (\text{Ø} * N)}{N + 1}$$

- L (mm) = Passage width for vehicle access
- N = Number of bollards required
- Ø (mm) = Bollard diameter
- d (mm) = Distance between bollards



A brand of QUA LLC

Dubai, UAE, P.O. Box 20394
info@ebollard.ae

UAE, Dubai
+971 50 348 3932

KSA, Riyadh
+966 54 419 8592

KSA, Jeddah
+966 54 118 2816

