

SECTION 324100 METAL BOLLARDS

SECTION 265620 – LIGHTED METAL BOLLARDS

**** NOTE TO SPECIFIER **** *The following are based on Tournesol Siteworks' Standard Products. Contact the manufacturer for non-standard and custom products. Delete items below not required for project.*

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Decorative steel bollards.
- B. LED lighted steel bollards.
- C. LED lighted extruded aluminum bollards.
- D.

1.2 RELATED WORK

**** NOTE TO SPECIFIER **** *Delete any sections below not relevant to this project; add others as required.*

- A. Section 033000 - Cast-In-Place Concrete: Anchor placement in concrete.
- B. Division 16 - Electrical: Electrical power service and wiring connections.

1.3 REFERENCES

**** NOTE TO SPECIFIER **** *Delete references from the list below that are not actually required by the text of the edited section.*

- A. ASTM A 36 - Standard Specification for Carbon Structural Steel.
- B. ASTM A 53 - Standard Specification for Pipe, Steel, Black, and Hot-Dipped, Zinc Coated, Welded and Seamless.
- C. ASTM A 123 - Specification for Zinc (hot-dip galvanized) Coatings on Iron and Steel Products.
- D. ASTM A 536 - Specification for Ductile Iron Castings.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's detail sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: For custom applications, showing critical sizes and dimensions for installation and integration with other work.
- D. Samples: As required for color selection or material thickness only

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: minimum of 15 years experience manufacturing metal bollards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspect bollards after delivery for signs of damage during transit, note any damage on bill of lading
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.7 WARRANTY

- A. Structural integrity of all metal bollards shall be warranted for a period of 3 years from date of delivery against defects in materials and workmanship except for finishes of any kind.

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS/MANUFACTURERS

- A. Decorative Steel Bollards, manufactured by Tournesol Siteworks LLC, 2930 Faber St., Union City, CA 94587 Tel: (800)542-2282 FAX (510)471-6269 tournesol.com
- B. LED Lighted Steel Bollards, , manufactured by Tournesol Siteworks LLC, 2930 Faber St., Union City, CA 94587 Tel: (800)542-2282 FAX (510)471-6269 tournesol.com

2.2 MATERIALS

**** NOTE TO SPECIFIER ** Select bollards required from the following paragraphs; delete paragraphs that are not required. Visit the manufacturer's web site at Tournesol.com for photos of the various bollard designs**

- A. Steel Bollards:
 - 1. Model number B-1: 4 inch (102 mm) diameter bollard with collars.
 - A. Vertical element: 3-1/2 inch (89 mm) schedule 40 pipe, 4 inch (102 mm) OD.
 - B. Cap: Schedule 40 weld cap.
 - C. Collars: Two 2 inch (51 mm) and one 3 inch (76 mm) wide decorative collars welded to pipe.

**** NOTE TO SPECIFIER ** Select the following option if decorative rivets are required. . Delete if not used.**

- D. Decorative Rivets: 1/2 inch (13 mm) steel rivets welded with rounded head.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available – contact salesperson for details*

- E. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- F. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Further options available – see website for details.*

- G. Lock well covers.
- H. Receiver covers.
- I. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete options not used. Hinged mounting option available upon request.*

- J. Surface Mount: Base plate: 5/8 by 7-1/2 inch (16 by 260 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Mounting: Removable in a 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- L. Mounting: Embed in concrete.
- M. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

2. Model number B-1: 6 inch (154 mm) diameter bollard with collars.

**** NOTE TO SPECIFIER **** *Select one of the following pipe options. Delete options not used.*

- A. Vertical element: 5 inch (127 mm), schedule 10 pipe 5.56 inch (141 mm) OD
- B. Vertical element: 5 inch (127 mm), Schedule 40 pipe, 5.56 inch (141 mm) OD.
- C. Vertical element: 5 inch (127 mm), Schedule 80 pipe, 5.56 inch (141 mm) OD.
- D. Cap: Schedule 40.

- E. Collars: Two 2 inch (51 mm) and one 3 inch (76 mm) wide decorative collars, 6.62 inch (168 mm) OD, welded to pipe.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available upon request.*

- F. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Further options available, see website for details.*

- H. Lock well covers.
- I. Receiver covers.
- J. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select the following option if decorative rivets are required. Delete if not used*

- K. Decorative Rivets: 1/2 inch (13 mm) steel rivets welded with rounded head.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete options not used. Hinged mounting available upon request.*

- L. Surface Mount: Base plate: 5/8 by 10-1/4 inch (16 by 260 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- M. Mounting: Removable in 6-1/4 inch (159 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- N. Mounting: Embed in concrete.
- O. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 3. Model number B-1: 8 inch (203 mm) diameter bollard with collars.

**** NOTE TO SPECIFIER **** *Select from the following pipe options. Delete options not used.*

- A. Vertical element: 8 inch (203 mm) 0.188 inch (4.8 mm) wall pipe 8.625 inches (219 mm) OD.

- B. Vertical element: 8 inch (203 mm) Schedule 40 pipe, 8.625 inches (219 mm) OD.
- C. Vertical element: 8 inch (203 mm) Schedule 80 pipe, 8.625 inches (219 mm) OD.
- D. Cap: Schedule 40 weld cap welded to pipe.
- E. Collars: Two 3 inch (76 mm) and one 4 inch (100 mm) wide decorative collars welded to pipe.

**** NOTE TO SPECIFIER **** *Select the following option if decorative rivets are required. . Delete if not used.*

- F. Decorative Rivets: 1/2 inch (13 mm) steel rivets welded with rounded head.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available upon request.*

- G. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- H. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Further options available – see website for details.*

- I. Lock well covers.
- J. Receiver covers.
- K. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete options not used. Hinged option available upon request*

- L. Surface Mount: Base plate: 5/8 by 13-1/2 inch (16 by 343 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- M. Mounting: Removable in 9-1/8 inch (232 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- N. Mounting: Embed in concrete.
- O. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

4. Model number B-2: 4 inch (102 mm) diameter bollard no collars.
 - A. Vertical element: 4 inch schedule 40 pipe, 4-1/2 inch (114 mm) OD, either mild steel or 304 stainless steel
 - B. Cap: Schedule 40 weld cap welded and ground smooth., in either flat or dome configuration.

**** NOTE TO SPECIFIER ** Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available upon request.**

- C. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER ** Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.**

- D. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER ** Select from the following options if removable mounting is required. Delete options not used. Further options available – see website for details.**

- E. Lock well covers.
- F. Receiver covers.
- G. Brass padlocks.

**** NOTE TO SPECIFIER ** Select from the following mounting options. Delete option not used. Hinged option available upon request.**

- H. Mounting: Removable in a 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- I. Mounting: Embed in concrete.
- J. Surface Mount: Base plate: 5/8 by 7-1/2 inch (16 by 191 mm) steel flange welded to bottom. Anchored with four 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Coating: For mild steel powder coated as selected from manufacturer's standard powder coated colors. Stainless steel bollard to have #4 brushed finish.

5. Model number B-2: 6 inch (154 mm) diameter bollard with no collars.

**** NOTE TO SPECIFIER ** Select from the following pipe options. Delete options not used**

- A. Vertical element: 5 inch (127 mm) schedule 10 pipe, 5.56 inch (141 mm) OD.

- B. Vertical element: 5 inch (127 mm) schedule 40 pipe, 5.56 inch (141mm) OD. Choose either mild steel or 304 stainless steel material.
- C. Vertical element: 5 inch (127 mm) schedule 80 pipe, 5.56 inch (141 mm) OD.
- D. Cap: Schedule 40 weld cap welded and ground smooth. Flat or dome configuration available.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- E. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- F. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- G. Lock well covers.
- H. Receiver covers.
- I. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinged mounting option available upon request.*

- J. Surface Mount: Base plate: 5/8 by 9-1/2 inch (16 by 241 mm) steel flange welded to bottom. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Mounting: Removable in 6-1/4 inch (159 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- L. Mounting: Embed in concrete.
- M. Coating: For mild steel powder coated as selected from manufacturer's standard powder coated colors. Stainless steel to be #4 brushed finish.

- 6. Model number B-2: 8 inch (203 mm) diameter bollard with no collars.

**** NOTE TO SPECIFIER **** *Select from the following pipe options. Delete options not used.*

- A. Vertical element: 8 inch (203 mm) 0.188 inch (4.8 mm) wall pipe, 8.625 inch (219 mm) OD.
- B. Vertical element: 8 inch (203 mm) schedule 40 pipe, 8.625 inch (219 mm) OD.
- C. Vertical element: 8 inch (203 mm) schedule 80 pipe, 8.625 inch (219 mm) OD.
- D. Cap: Schedule 40 weld cap welded and ground smooth.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- E. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- F. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- G. Lock well covers.
- H. Receiver covers.
- I. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinged mount available upon request.*

- J. Surface Mount: Base plate: 5/8 by 13-1/2 inch (16 by 343 mm) steel flange welded to bottom. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Mounting: Removable in 9-1/8 inch (232 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- L. Mounting: Embed in concrete.
- M. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 7. Model number B-3: 6 inch (154 mm) diameter bollard with collars.

**** NOTE TO SPECIFIER **** *Select from the following pipe options. Delete options not used.*

- A. Vertical element: 5 inch (127 mm) schedule 10 pipe, 5.56 inch (141 mm) OD.
- B. Vertical element: 5 inch (127 mm) schedule 40 pipe 5.56 inch (141 mm) OD.
- C. Vertical element: 5 inch (127 mm) schedule 80 pipe 5.56 inch (141 mm) OD.
- D. Cap: 2.78 inch (71 mm) radius dome with two 1/2 inch (13 mm) collars.
- E. Base: Two 1/2 inch (13 mm) collars with 1/2 inch (13 mm) space between and 4 inch (102 mm) base collar.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- F. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Other options available, see website for details.*

- H. Lock well covers.
- I. Receiver covers.
- J. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinge mount available upon request.*

- K. Surface Mount: Base plate: 5/8 by 10-1/4 inch (16 by 260 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- L. Mounting: Removable in 6-1/4 inch (159 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- M. Mounting: Embed in concrete.
- N. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 8. Model number B-4: 5 inch (127 mm) diameter bollard with top and reveals.

**** NOTE TO SPECIFIER **** *Select from the following pipe options. Delete options if not used.*

- A. Vertical element: 5 inch (127 mm) schedule 10 pipe, 5.56 inch (141 mm) OD.
- B. Vertical element: 5 inch (127 mm) Schedule 40 pipe 5.56 inch (141 mm) OD
- C. Vertical element: 5 inch (127 mm) Schedule 80 pipe 5.56 inch (141 mm) OD.

**** NOTE TO SPECIFIER **** *Select one of the following top options. Delete options not used.*

- D. Cap: Flat top: Model No B-4-5A2.
- E. Cap: Dome top: Model No. B-4-5B2.
- F. Cap: Sphere: Model No. B-4-5C2.
- G. Reveals: Two, one near top and one near bottom.

****NOTE TO SPECIFIER**** Select the following option for an additional reveal. Delete if option is not used.

- H. Option: extra reveal, specify location if this option is required

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- I. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- J. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Other options available, see website for details.*

- K. Lock well covers.
- L. Receiver covers.
- M. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- N. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinge mount available upon request.*

- O. Surface Mount: Base plate: 5/8 by 9-1/2 inch (16 by 241 mm) steel flange welded to bottom. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- P. Mounting: Removable in a 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- Q. Mounting: Embed in concrete.
- R. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

9. Model number B-4: 8 inch (203 mm) diameter bollard with top and reveals.

**** NOTE TO SPECIFIER **** *Select from the following pipe options. Delete options if not used.*

- A. Vertical element: 8 inch (203 mm) 0.188 inch (5 mm) wall pipe, 8.625 inch (219 mm) OD.
- B. Vertical element: 8 inch (203 mm) schedule 40 pipe, 8.625 inch (219 mm) OD.
- C. Vertical element: 8 inch (203 mm) schedule 80 pipe, 8.625 inch (219 mm) OD.

**** NOTE TO SPECIFIER **** *Select one of the following top options. Delete options not used.*

- D. Cap: Flat top, Model B-4-8A2.
- E. Cap: Dome top, Model B-4-8B2.
- F. Cap: Sphere, Model B-4-8C2.
- G. Reveals: Two, one near top and one near bottom.

****NOTE TO SPECIFIER**** *Select the following option for an additional reveal. Delete if option is not used.*

- H. Option: extra reveal, specify location if this option is required

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- I. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- J. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- K. Lock well covers.
- L. Receiver covers.
- M. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinge mount available upon request.*

- N. Surface Mount: Base plate: 5/8 by 13-1/2 inch (16 by 343 mm) steel flange welded to bottom . Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- O. Mounting: Removable in a 6-1/4 inch OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- P. Mounting: Embed in concrete.
- Q. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 10. Model number B-5: 6 inch (154 mm) diameter bollard with asymmetrical top and collars.

**** NOTE TO SPECIFIER **** *Select the following pipe options. Delete options if not used.*

- A. Vertical element: 5 inch (127 mm) schedule 10 pipe, 5.56 inch (141 mm) OD.
- B. Vertical element: 5 inch (127 mm) schedule 40 pipe, 5.56 inch (141 mm) OD.
- C. Vertical element: 5 inch (127 mm) schedule 80 pipe, 5.56 inch (141 mm) OD.
- D. Cap: 6 inch (154 mm) angled steel top with collar.
- E. Collars: Asymmetrical collar and base, 6.625 inch (168 mm) OD.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- F. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- H. Lock well covers.
- I. Receiver covers.
- J. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinge mount available upon request.*

- K. Surface Mount: Base plate: 5/8 by 10-1/4 inch (16 by 260 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- L. Mounting: Removable in 6-1/4 inch (159 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- M. Mounting: Embed in concrete.
- N. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 11. Model number B-5: 8 inch (203 mm) diameter bollard with asymmetrical top and collars.

**** NOTE TO SPECIFIER **** *Select from the following pipe options. Delete options if not used*

- A. Vertical element: 8 inch (203 mm) 0.188 inch (5 mm) wall thickness pipe, 8.625 inch (219 mm) OD.
- B. Vertical element: 8 inch (203 mm) Schedule 40 pipe, 8.625 inch (219 mm) OD.
- C. Vertical element: 8 inch (203 mm) Schedule 80 pipe, 8.625 inch (219 mm) OD.
- D. Cap: 8 inch (203 mm) angled steel top with collar.
- E. Collars: 9.625 inch (244 mm) collar and base.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- F. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following mounting options if removeable mounting is required. Delete options not used. Additional options available, see website for details.*

- H. Lock well covers.
- I. Receiver covers.
- J. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete options not used. Hinge mount available upon request.*

- K. Surface Mount: Base plate: 5/8 by 13-1/2 inch (16 by 343 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- L. Mounting: Removable in a 9-1/8 inch (232 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- M. Mounting: Embed in concrete.
- N. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 12. Model number B-6: square bollard with flat top and decorative panels.

**** NOTE TO SPECIFIER **** *Select the following tube options. Delete options if not used.*

- A. Vertical element: 5 by 5 inch (127 by 127 mm), 0.120 inch (3.2 mm) wall steel tube.
- B. Vertical element: 5 by 5 inch (127 by 127 mm), 0.180 inch (4.6 mm) wall steel tube.
- C. Vertical element: 5 by 5 inch (127 by 127 mm), 0.250 inch (6.4 mm) wall steel tube.
- D. Cap: 6 by 6 by 1/2 inch (152 by 152 by 13 mm) steel plate.

**** NOTE TO SPECIFIER **** *Select the following decorative panel option for permanent embed or surface mount bollards. Delete option if not used.*

- E. Decorative panels: Four 1/2 inch by 3-1/2 inch by 19-1/2 inch (13 mm by 88 mm by 495 mm) separate steel panels attached with 1/2 inch (13 mm) vandal resistant stainless steel pinned buttonhead bolts.

**** NOTE TO SPECIFIER **** *Select the following decorative panel option for removable bollards. Delete option if not used.*

- F. Decorative panels: Four 1/2 inch by 3-1/2 inch by 19-1/2 inch (13 mm by 88 mm by 495 mm) separate aluminum panels attached with 1/2

inch (13 mm) vandal resistant stainless steel pinned buttonhead bolts.

**** NOTE TO SPECIFIER **** *Select the following decorative panel option for grooves. Delete option if not used.*

G. Option: Grooved panels.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

H. Height above surface.

- 1) 30 inch (762 mm).
- 2) 36 inch (914 mm).
- 3) 42 inch (1067 mm).
- 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

I. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used.*

- J. Lock well covers.
- K. Receiver covers.
- L. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinge mount available upon request.*

- M. Surface Mount: Base plate: 5/8 by 8-1/2 inch (16 by 216 mm) square steel flange welded to bottom. Anchored with four 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- N. Mounting: Removable in a 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- O. Mounting: Embed in concrete.
- P. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

**** NOTE TO SPECIFIER **** *Select from the following two models. Model B-8A bollard has straight clean lines while the B-8B softens the look with curves. Delete model not used.*

13. Model number B-8A: 5 inch (127 mm) diameter bollard with top and reveals.
14. Model number B-8B: 5 inch (127 mm) diameter bollard with top and reveals.

**** NOTE TO SPECIFIER **** *Select the following pipe options. Delete options if not used.*

- A. Vertical element: 5 inch (127 mm) schedule 10 pipe, 5.56 inch (141 mm) OD.
- B. Vertical element: 5 inch (127 mm) Schedule 40 pipe, 5.56 inch (141 mm) OD.
- C. Vertical element: 5 inch (127 mm) Schedule 80 pipe, 5.56 inch (141 mm) OD.
- D. Cap: Flat steel top.
- E. Reveals: Six, three near top and three near bottom.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- F. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- H. Lock well covers.
- I. Receiver covers.
- J. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete options not used. Hinge mount available upon request.*

- K. Surface Mount: Base plate: 5/8 by 9-1/2 inch (16 by 241 mm) steel flange welded to bottom . Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- L. Mounting: Removable in 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- M. Mounting: Embed in concrete.
- N. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

- 15. Model number B-10: Square bollard with collars and pyramid top.

**** NOTE TO SPECIFIER **** *Select from the following tube options. Delete options if not used.*

- A. Vertical element: 5 by 5 inch (127 by 127 mm), 0.120 inch (3.2 mm) wall steel tube.
- B. Vertical element: 5 by 5 inch (127 by 127 mm), 0.180 inch (4.6 mm) wall steel tube.
- C. Vertical element: 5 x 5 inch (127 by 127 mm), 0.250 inch (6.4 mm) wall steel tube.
- D. Cap and collar: Cast steel pyramid shape top with one each 1/2 by 3 inch (13 by 76 mm) decorative collar.
- E. Collars: One each 1/2 by 3 inch (13 by 76 mm) decorative steel base collars.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- F. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- H. Lock well covers.
- I. Receiver covers.
- J. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete option not used. Hinge mount available upon request.*

- K. Surface Mount: Base plate: 5/8 by 9-1/2 inch (16 by 241 mm) square steel flange welded to bottom collar. Anchored with four 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- L. Mounting: Removable in 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- M. Mounting: Embed in concrete.
- N. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

16. Model number B-11: Square bollard with pyramid top.

**** NOTE TO SPECIFIER **** *Select from the following tube options. Delete options if not used.*

- A. Vertical element: 5 inch by 5 inch (127 mm by 127 mm), 0.120 inch (3.2 mm) wall steel tube.
- B. Vertical element: 5 inch by 5 inch (127 mm by 127 mm), 0.180 inch (4.6 mm) wall steel tube.
- C. Vertical element: 5 inch by 5 inch (127 mm by 127 mm), 0.250 inch (6.4 mm) wall steel tube.
- D. Cap: Pyramid shape steel welded and ground smooth.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required. Custom lengths available, see website for details.*

- E. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).
 - 3) 42 inch (1067 mm).
 - 4) 48 inch (1219 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- F. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following options if removable mounting is required. Delete options not used. Additional options available, see website for details.*

- G. Lock well covers.
- H. Receiver covers.
- I. Brass padlocks.

**** NOTE TO SPECIFIER **** *Select from the following mounting options. Delete options not used. Hinge mount available upon request.*

- J. Surface Mount: Base plate: 5/8 by 8-1/2 inch (16 by 216 mm) square steel flange welded to bottom . Anchored with four 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Mounting: Removable in 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- L. Mounting: Embed in concrete.
- M. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

17. Model number B-12: Hexagonal bollard.

- A. Vertical element: 6 by 6 by 0.120 inch, (152 by 152 by 3.2 mm) wall steel formed to a hexagonal shape.
- B. Cap: Flat steel welded and ground smooth.

**** NOTE TO SPECIFIER ** Select one of the following size paragraphs and delete the paragraphs not required.**

- C. Height above surface.
 - 1) 30 inch (762 mm).
 - 2) 36 inch (914 mm).

**** NOTE TO SPECIFIER ** Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.**

- D. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ____ eyebolt(s).

**** NOTE TO SPECIFIER ** Select from the following options if removable mounting is required. Delete options not used.**

- E. Lock well covers.
- F. Receiver covers.
- G. Brass padlocks.

**** NOTE TO SPECIFIER ** Select from the following mounting options. Delete option not used.**

- H. Surface Mount: Base plate: 5/8 by 10 inch (16 by 254 mm) hexagonal steel flange welded to bottom. Anchored with six 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- I. Mounting: Removable in a 4-1/2 inch (114 mm) OD, HDG steel receiver welded to a 3 by 5 inch (76 by 127 mm) lock well.
- J. Mounting: Embed in concrete.
- K. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

B. LED Lighted Steel Bollards:

1. Model number BL-1: 6 inch (152 mm) diameter LED lighted bollard with collars.
 - A. Vertical element: 5 inch (127 mm), schedule 40 pipe, 5.56 inch (141 mm) OD.
 - B. Cap: Schedule 40.
 - C. Collars: Two 2 inch (51 mm) and one 3 inch (76 mm) wide decorative collars, 6.62 inch (168 mm) OD welded to pipe.
 - D. Light source: 6 each, 4 inch (102 mm) iLight Plexineon bright white lights
 - E. Diffuser: Impact resistant acrylic.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required.*

- F. Height above surface.
 - 1) 36 inch (914 mm).
 - 2) 42 inch (1067 mm).

**** NOTE TO SPECIFIER **** *Select from the following two mounting options. Delete option not used.*

- G. Surface Mount: Base plate: 5/8 by 10-1/4 inch (16 by 260 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- H. Mounting: Embed in concrete.
- I. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Delete option if not used.*

- J. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID.

- 2. Model number BL-3 6 inch (152 mm) LED lighted bollard with collars.
 - A. Vertical element: 5 inch (127 mm) schedule 40 pipe, 5.56 inch (141 mm) OD.
 - B. Cap: 2.78 inch (71 mm) radius dome with two 1/2 inch (13 mm) collars
 - C. Base : Two 1/2 inch (51 mm) collars with 1/2 inch (13 mm) space between and one 4 inch (102 mm) base collar.
 - D. Light source: 6 each, 4 inch (102 mm) iLight Plexineon bright white lights
 - E. Diffuser: Impact resistant acrylic.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required.*

- F. Height above surface.
 - 1) 36 inch (914 mm).
 - 2) 42 inch (1067 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- G. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following two mounting options. Delete option not used.*

- H. Surface Mount: Base plate: 5/8 by 10-1/4 inch (16 by 260 mm) steel flange welded to bottom collar. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- I. Mounting: Embed in concrete.
- J. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

3. Model number BL-4: 6 inch (152 mm) LED lighted bollard with top and reveals.

- A. Vertical element: 5 inch (127 mm), schedule 40 pipe, 5.56 inch (141 mm) OD.

**** NOTE TO SPECIFIER **** *Select the following cap options. Delete options not used.*

- B. Cap: Flat top, Model B-4-5A2-L
- C. Cap: Dome top, Model B-4-5B2-L.
- D. Cap: Sphere, B-4-5C2-L.
- E. Reveals: Two 1 inch (25 mm) one at top and one at bottom.
- F. Light source: 6 each, 4 inch (102 mm) iLight Plexineon bright white lights
- G. Diffuser: Impact resistant acrylic.

**** NOTE TO SPECIFIER **** *Select one of the following size paragraphs and delete the paragraphs not required.*

- H. Height above surface.
 - 1) 36 inch (914 mm).
 - 2) 42 inch (1067 mm).

**** NOTE TO SPECIFIER **** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.*

- I. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ___ eyebolt(s).

**** NOTE TO SPECIFIER **** *Select from the following two mounting options. Delete option not used.*

- J. Surface Mount: Base plate: 5/8 by 9-1/2 inch (16 by 241 mm) steel flange welded to bottom. Anchored with five 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Mounting: Embed in concrete.
- L. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

4. Model number BL-6: LED lighted square bollard with flat top and decorative panels.

- A. Vertical element: 5 inch by 5 inch (127 mm by 127 mm) 0.120 (3.2 mm) wall steel tube.
- B. Cap: 6 inch by 6 inch by 1/2 inch (152 mm by 152 mm by 13 mm) steel plate.
- C. Light and/or Signage panels: up to four 1/2 by 3-1/2 by 19-1/2 inch (13 by 88 by 495 mm) separate steel panels attached with 1/2 inch (13 mm) vandal resistant stainless steel pinned buttonhead bolts. See drawings for signage graphic design. Panels not designated as lighted will be standard unlighted panels.

**** NOTE TO SPECIFIER ** *Select the lighted panel style(s) and quantities required. Delete options not used.***

- D. Standard lighted panel with 2 each 8 inch (203 mm) and 1 each 12 inch (305 mm) iLight Plexineon bright white lights, _____ panels required
- E. "STOP" Signage Panel with iLight Plexineon Red lights, _____ panels required
- F. "SLOW" Signage Panel with iLight Plexineon Amber lights, _____ panels required

NOTE TO SPECIFIER ** *Select the following decorative panel option for grooves for panels without lights. Delete option if not used.*

- G. Option: Grooved panels

**** NOTE TO SPECIFIER ** *Select one of the following size paragraphs and delete the paragraphs not required.***

- H. Height above surface.
 - 1) 36 inch (914 mm).
 - 2) 42 inch (1067 mm).

**** NOTE TO SPECIFIER ** *Select the following option if eyebolts are required. Available with 1 or 2 eyebolts – insert quantity required. Delete option if not used.***

- I. Eyebolts: 2 inch (51 mm) OD by 1-1/4 inch (32 mm) ID. Provide each bollard with ____ eyebolt(s).

**** NOTE TO SPECIFIER ** *Select from the following two mounting options. Delete option not used.***

- J. Surface Mount: Base plate: 5/8 by 8-1/2 inch (16 by 216 mm) square steel flange welded to bottom. Anchored with four 1/2 inch (13 mm) diameter anchor bolts. Anchor bolts supplied by others.
- K. Mounting: Embed in concrete.
- L. Coating: Powder coated as selected from manufacturer's standard powder coated colors.

**** NOTE TO SPECIFIER ** Include the following paragraph for all lighted bollards.**

5. Electrical requirements.

- A. Voltage: Standard 120-volt line (input range 100Vac/240Vac/0.3A. Low voltage 24 volt/20watt transformer.
- B. Bulb life: 57,000 to 180,000 hours (6.5 to 20 years based on 24 hours a day for 365 days a year).
- C. Bulbs: six LED Plexineon bright white bulbs unless otherwise noted.

C. Miami LED Lighted Extruded Aluminum Bollards.

**** NOTE TO SPECIFIER ** Select from the following bollard designs. Delete options not used.**

1. Model number BL-1400R.

- A. Vertical element: circular aluminum extrusion.
- B. Cap: flat aluminum circular top.
- C. Light source: 4 each iLight Plexineon bright white lights
- D. Diffuser: Impact resistant acrylic.

**** NOTE TO SPECIFIER ** Select one of the following size paragraphs and delete the paragraphs not required.**

- E. Height above surface.
 - 1) 24 inch (610 mm) with 18 inch (457 mm) lights.
 - 2) 36 inch (914 mm) with 30 inch (762 mm) lights.
- F. Base plate: flat aluminum circular base.

**** NOTE TO SPECIFIER ** Select from the following installation options. Delete option not required.**

- G. Mounting: Surface.
- H. Mounting: Permanent embedded

**** NOTE TO SPECIFIER ** Select from the following finish options. Delete options not required.**

- I. Powder coated as selected from manufacturer's standard powder coated colors.
 - J. Clear anodized finish.
 - K. Bronze anodized finish.
2. Model number BL-1400T.
- A. Vertical element: triangular aluminum extrusion.
 - B. Cap: flat aluminum triangular top.
 - C. Light source: 3 each iLight Plexineon bright white lights
 - D. Diffuser: Impact resistant acrylic.

**** NOTE TO SPECIFIER ** Select one of the following size paragraphs and delete the paragraphs not required.**

- E. Height above surface.
 - 1) 24 inch (610 mm) with 18 inch (457 mm) lights.
 - 2) 36 inch (914 mm) with 30 inch (762 mm) lights.
- F. Base plate: flat aluminum triangular base.

**** NOTE TO SPECIFIER ** Select from the following installation options. Delete option not required.**

- G. Mounting: Surface.
- H. Mounting: Permanent embedded

**** NOTE TO SPECIFIER ** Select from the following finish options. Delete options not required.**

- I. Powder coated as selected from manufacturer's standard powder coated colors.
- J. Clear anodized finish.
- K. Bronze anodized finish.

3. Model number BL-1400S.

- A. Vertical element: square aluminum extrusion.
- B. Cap: flat aluminum square top.
- C. Light source: 4 each iLight Plexineon bright white lights
- D. Diffuser: Impact resistant acrylic.

**** NOTE TO SPECIFIER ** Select one of the following size paragraphs and delete the paragraphs not required.**

- E. Height above surface.
 - 1) 24 inch (610 mm) with 18 inch (457 mm) lights.
 - 2) 36 inch (914 mm) with 30 inch (762 mm) lights.
- F. Base plate: flat aluminum triangular base.

**** NOTE TO SPECIFIER ** Select from the following installation options. Delete option not required.**

- G. Mounting: Surface.
- H. Mounting: Permanent embedded.

**** NOTE TO SPECIFIER ** Select from the following finish options. Delete options not required.**

- I. Powder coated as selected from manufacturer's standard powder coated colors.
- J. Clear anodized finish.
- K. Bronze anodized finish.

**** NOTE TO SPECIFIER ** Include the following paragraph for all lighted bollards.**

4. Electrical requirements.

- A. Voltage: Standard 120-volt line (input range 100Vac/240Vac/0.3A. Low voltage 24 volt/20watt transformer.
- B. Bulb life: 57,000 to 180,000 hours (6.5 to 20 years based on 24 hours a day for 365 days a year).
- C. Bulbs: six LED Plexineon bright white bulbs unless otherwise noted.

2.3 FABRICATION.

- A. Material Requirements
 - 1. Carbon steel pipe shall conform to ASTM A53
 - 2. 304 & 316 Stainless steel pipe shall conform to A312
 - 3. Carbon steel caps shall conform to ASTM A253
 - 4. 304 & 316 Stainless steel caps shall conform to A403
 - 5. Carbon steel plate shall conform to ASTM A36
 - 6. 304 & 316 Stainless steel plate shall conform to ASTM A240
- B. Construction Technique Requirements
 - 1. All welds shall be ground smooth
 - 2. Remove all weld splatter
 - 3. Butt seam welds to be fully filled before being ground smooth

2.4 FINISHES.

**** NOTE TO SPECIFIER ** Select from the following metal finish options. Select either powder coat finish or hot dip galvanized finish for metals, not both. Do not use powder coating over hot dip galvanized finish.**

- A. Exposed Metal Finish: Polyester or polyester TGIC powder finish applied by the dry electrostatic process on a 2-mil zinc-rich primer surface to a minimum of four mils thick on all surfaces and baked until properly cured. Colors to be selected from manufacturer's standard powder coated colors.
- B. Ground Receiver Finish: following fabrication the receiver, covers and lock well covers shall be hot dip galvanized to ASTM A 123, 3 to 4 mils thick.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work. Do not proceed until unsatisfactory conditions are corrected in manner acceptable.
- B. Verify that foundation, applied finishes and adjacent construction are ready to receive bollards and are level, plumb and square within tolerances acceptable to manufacturer.

- C. Verify that required utilities are in correct location and are of correct capacities for specified products.
- D. If preparation and condition is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

**** NOTE TO SPECIFIER **** *Select the required mounting type(s) from the following paragraphs and delete those not used. Indicate installation hole and mounting locations on the Drawings.*

- B. Removable mounting. Provide depth and diameter of installation hole as indicated on the Drawings. Receiver is to be extended a minimum of 24 inches (610 mm) below finish surface and cast in concrete. The receiver must be installed over a layer of gravel for drainage.
- C. Embedded mounting. Provide depth and diameter of installation hole as indicated on the Drawings. Bollard pipe is to be extended a minimum of 18 inches (457 mm) below finish surface and cast in concrete.
- D. Surface mounting. Provide location and drilling of holes for inserts as indicated on the Drawings. Anchor bolts and inserts provided by others.
- E. Electrical Connections for LED lighted bollards - Coordinate connection to utilities as specified in Sections of Division 16.

3.3

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION