

**Supplemental Specification
2017 Standard Specification Book**

SECTION 02825

CATTLE GUARD

Delete Section 02825 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cattle Guard fabrication and installation.
- B. Removal of existing cattle guard.
- C. Cast-in-place concrete aprons.

1.2 RELATED SECTIONS

- A. Section 02056: Embankment, Borrow, and Backfill
- B. Section 02075: Geotextiles
- C. Section 02221: Remove Structure and Obstruction
- D. Section 02317: Structural Excavation and Backfill
- E. Section 03055: Portland Cement Concrete
- F. Section 03056: Self-Consolidating Concrete (SCC)
- G. Section 03211: Reinforcing Steel and Welded Wire
- H. Section 03390: Concrete Curing
- I. Section 03575: Flowable Fill
- J. Section 05120: Structural Steel

1.3 REFERENCES

- A. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- B. AASHTO M 251: Plain and Laminated Elastomeric Bridge Bearings
- C. AASHTO M 252: Corrugated Polyethylene Drainage Pipe
- D. AWS D1.1 Structural Welding Code – Steel
- E. Precast Concrete Institute (PCI) Design Handbook
- F. Precast Concrete Institute (PCI) Tolerance Manual for Precast and Prestressed Concrete Construction, MNL-135.
- G. UDOT Steel Construction Manual

1.4 DEFINITIONS **Not Used**

1.5 SUBMITTALS **Not Used**

PART 2 PRODUCTS

2.1 GENERAL

- A. Refer to SW Series Standard Drawings.

2.2 MATERIALS

- A. Concrete
 - 1. Class AA(AE). Refer to Section 03055.
 - 2. Self-Consolidating Concrete – SCC. Refer to Section 03056.
- B. Reinforcing Steel
 - 1. Use coated reinforcing steel. Refer to Section 03211.
- C. Structural Steel
 - 1. Refer to Section 05120.
 - 2. Fabricator must have AISC Bridge Component Certification (CPT).

- D. Lifting Devices
 - 1. Use lifting devices that can support the required vertical and horizontal forces with the applicable safety factors according to the Component Handling and Erection Bracing requirements in the PCI Design Handbook.
 - 2. Galvanize steel elements. Refer to AASHTO M111.
- E. Flowable Fill
 - 1. Refer to Section 03575.
- F. Drainage Geotextile
 - 1. Refer to Section 02075
- G. Free Draining Granular Backfill
 - 1. Refer to Section 02056.
- H. Corrugated Polyethylene Pipe
 - 1. Refer to AASHTO M 252.
- I. Bearing Pad Strips
 - 1. Use 50 durometer hardness (Shore A), Grade 3 elastomer.
 - 2. Refer to AASHTO M 251.

2.3 TRAFFIC GRILL UNIT AND WELDED END GUARD UNIT FABRICATION

- A. Fabricate according to the UDOT Steel Construction Manual and AWS D1.1
- B. Hot-dip galvanize after fabrication. Refer to AASHTO M 111.

2.4 PRECAST CONCRETE CATTLE GUARD UNIT FABRICATION

- A. Use a Department Certified Concrete Precaster.
- B. Limit fabrication tolerance for length to: $+1/8$ inch to $-3/8$ inch or as indicated in the Certified Precaster's plant quality control manual, whichever is more stringent.
 - 1. Use the tolerances specified for Ribbed Wall Panel in the PCI Tolerance Manual, MNL-135, where no cattle guard specific tolerances are specified in the Certified Precaster's plant quality control manual.
- C. Permanently mark each precast unit with date of casting, supplier identification, and identifiers to facilitate field placement.
 - 1. Stamp markings in fresh concrete.

- D. Curing
 - 1. Refer to Section 03390.
- E. Predrill holes for apron doweled bars when aprons are shown.
 - 1. Use template to mark drilling locations to prevent drill from damaging stud anchors.

PART 3 EXECUTION

3.1 GENERAL

- A. Structural excavation and backfill. Refer to Section 02317.
- B. Reinstall removed fence as required.

3.2 SUBGRADE PREPARATION

- A. Place flowable fill as shown.
 - 1. Allow flowable fill to become firm and unyielding before placing free draining granular backfill.
- B. Place free draining granular backfill as shown
 - 1. Contour to distribute roadway grade break among adjacent joints between precast cattle guard units.
 - 2. Do not allow gap between precast cattle guard units at roadway surface to exceed $\frac{3}{4}$ inch.

3.3 CAST-IN-PLACE APRON PLACEMENT

- A. Dowel and epoxy reinforcing steel as shown. Refer to Section 03211.
- B. Place and finish concrete
 - 1. Dampen subgrade just before concrete placement
 - 2. Hand methods of strike-off and consolidation are permitted.
 - 3. Finish the surface smooth with a concrete finishing float.
 - a. Do not add water to the surface of the concrete
 - b. Remove form marks and irregularities.
 - 4. Round edges to a $\frac{1}{2}$ inch radius.
 - 5. Brush exposed surfaces to a transverse broom finish.
- C. Cure concrete. Refer to Section 03390.

END OF SECTION