Designation: C825 – 19

Standard Specification for Precast Concrete Barriers[1]

This standard is issued under the fixed designation C825; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers precast concrete barriers, intended to be used adjacent to a roadway or as a median, to redirect vehicles unintentionally leaving the roadway.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A416/A416M Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete

A421/A421M Specification for Stress-Relieved Steel Wire for Prestressed Concrete

A615/A615M Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

A996/A996M Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement

A1064/A1064M Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

C31/C31M Practice for Making and Curing Concrete Test Specimens in the Field

C33/C33M Specification for Concrete Aggregates

C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens

C42/C42M Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

C150/C150M Specification for Portland Cement

C173/C173M Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

C231/C231M Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C260/C260M Specification for Air-Entraining Admixtures for Concrete

C330/C330M Specification for Lightweight Aggregates for Structural Concrete

C494/C494M Specification for Chemical Admixtures for Concrete

C595/C595M Specification for Blended Hydraulic Cements

C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

3. Classification

3.1 Precast concrete barriers manufactured in accordance with this specification shall be as shown in either Fig. 1or Fig. 2.

4. Basis of Acceptance

4.1 Precast barrier shall comply with all of the provisions of this specification and shall be tested as prescribed in 8.3 and 8.4.

4.1.1 *Acceptance as to Strength Properties*—Concrete barrier shall be acceptable under the strength tests when the sections have met the requirements of Section 8.

4.1.2 *Acceptance as to Dimensional Properties*—Concrete barrier shall meet the dimensional tolerances of Section 9.

4.1.3 *Acceptance as to End Result*—The concrete barrier sections shall be finally acceptable to the purchaser at the designated point of delivery with no significant cracking. Significant cracking is defined as fractures or cracks passing through the section or any continuous structural crack extending for a length of 12 in. (305 mm) or more, regardless of position in the section.

5. Materials

5.1 *Cement*—Portland cement shall conform to the requirements of Specification C150/C150M or shall be portland blast-furnace slag cement or portland-pozzolan cement conforming to the requirements of Specification C595/C595M.

[1] This specification is under the jurisdiction of ASTM Committee C27 on Precast Concrete Products and is the direct responsibility of Subcommittee C27.20 on Architectural and Structural Products.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

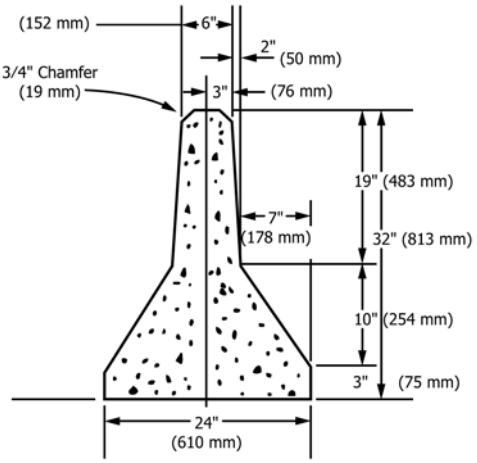

FIG. 1 New Jersey Barrier

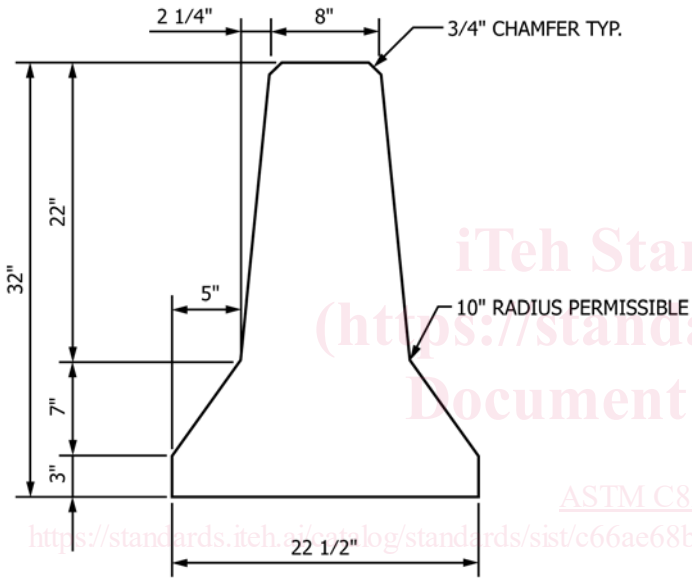

FIG. 2 Type-F Barrier

5.2 *Aggregates*—Aggregates shall conform to Specification C33/C33M or C330/C330M.

5.3 *Admixtures*—Admixtures may be used with the approval of the purchaser. Air-entraining admixtures shall conform to Specification C260/C260M. Chemical admixtures shall conform to Specification C494/C494M. Fly ash or other pozzolanic admixtures shall conform to Specification C618. Admixtures containing chlorides shall not be used in the manufacture of prestressed barrier sections.

5.4 *Steel Reinforcement*—Steel reinforcement shall consist of **wire fabric** conforming to Specification A1064/A1064M or of **wire** conforming to Specifications A421/A421M or A1064/A1064M, or of **strand** conforming to Specification A416/A416M, or of **bars** conforming to Specifications A615/A615M or A996/A996M.

6. Design

6.1 Precast concrete barrier shall be as defined in Section 3.

6.2 *Concrete Strength*—Concrete for barrier sections shall have a design compressive strength of 4000 psi (28 MPa) in 28 days.

6.3 *Air Entrainment*—Unless otherwise specified by the purchaser, all concrete shall have an air content of 5½ ± 1 % as measured by Test Methods C173/C173M or C231/C231M.

6.4 *Dimensions*—Cross-sectional dimensions of the barrier shall be as shown in Fig. 1. Unless otherwise specified by the purchaser, the length of each barrier section shall be a minimum of 10 ft (3 m).

6.5 *Steel Reinforcement*—Unless designated by the purchaser, steel reinforcement shall be designed by the producer and shall be sufficient to permit handling, delivery, and placement of the sections without damage. The producer shall provide steel reinforcement details to the purchaser. The design cover of concrete over reinforcing steel shall be a minimum of 2 in. (50 mm). Unless prestressing is used, reinforcement shall be assembled as a cage utilizing any combination of single or multiple layers and mats containing sufficient longitudinal bars or wire extending through the section to maintain the shape and position of reinforcement within the form during placement of the concrete. The exposure of the ends of longitudinal reinforcement in the barrier shall not be a cause for rejection.

NOTE 1—The purchaser or producer, or both, of the precast concrete barrier specified herein is cautioned that he should design reinforcing for the ends of barrier sections in accordance with the publication "Concrete Median Barrier Research," Vol, 2, Research Report, prepared by the Southwest Research Institute for the Federal Highway Administration, to prevent fracture at the joints.

6.6 *Reinforcement Laps, Welds, and Splicing*—All splices shall be acceptable to the purchaser and shall develop the full strength of the reinforcing.

6.7 *Concrete Finish*—Concrete finishing shall be at the option of the producer and shall produce a finish comparable to a steel form finish. The concrete finish and curing of all median barrier sections shall be uniform for all sections included in the contract lot.

6.8 *Lifting Devices*—Should the producer cast lifting devices into the barrier sections, they shall not be on the side surfaces.

6.9 *Anchorage*—Anchorage to prevent lateral movement of the barrier shall consist of dowels, keyway joints, or interlocking devices as may be specified by the purchaser.

7. Manufacture

7.1 *Mixture*—The constituent materials shall be proportioned and thoroughly mixed to produce a uniform concrete mixture of such quality so as to conform to the strength requirements of this specification.

7.2 *Curing*—The barrier section shall be subjected to any one of the following methods of curing, or combination thereof. The sections shall be cured for a length of time sufficient to develop the specified concrete compressive strength as determined in accordance with Section 8.

7.2.1 *Accelerated Curing*—The sections may be cured with either low-pressure steam or radiant heat in a moist atmosphere.