SECTION 321613.23 - PRECAST CONCRETE AND GRANITE CURBING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Precast concrete curbs.

Granite curbs.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 310000 “Earthwork” for earth moving and compaction.

Section 310001 “Earthwork Materials” for base and subbase materials.

Section 321313 "Concrete Paving" [**for concrete base under unit pavers**] [**and**] [**for cast-in-place concrete curbs and gutters serving as edge restraints for unit pavers**].

* + - 1. REFERENCES
				1. American Concrete Institute

ACI 212.3R – Report on Chemical Admixtures for Concrete

* + - * 1. American National Standards Institute

A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar

* + - * 1. ASCE

ASCE 6 / TMS 602 - Specification for Masonry Structures

* + - * 1. ASTM International

ASTM C33 - Standard Specification for Concrete Aggregates

ASTM C144 - Standard Specification for Aggregate for Masonry Mortar

ASTM C150 - Standard Specification for Portland Cement

ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes

ASTM C270 - Standard Specification for Mortar for Unit Masonry

ASTM C615 - Standard Specification for Granite Dimension Stone

ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data:

Revise list to coordinate with products retained in Part 2.

For the following:

Precast concrete curbs.

Granite curbs.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for precast curb within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

* + - * 1. Product Test Reports: For precast concrete curbs, include test data for freezing and thawing according to ASTM C67.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Store curbs on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.
				2. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
			2. FIELD CONDITIONS
				1. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace curbing work damaged by frost or freezing.
				2. Weather Limitations for Mortar:

Cold-Weather Requirements: Comply with cold-weather construction requirements contained in TMS 602/ASCE 6.

Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ASCE 6. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

When ambient temperature exceeds 100 deg F, or when wind velocity exceeds 8 mph and ambient temperature exceeds 90 deg F, set pavers within 1 minute of spreading setting-bed mortar.

1. PRODUCTS
	* + 1. MANUFACTURERS
				1. Source Limitations: Obtain each type of curb, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.
			2. CURBS
				1. Precast Concrete Curbs: Made from normal-weight concrete with a compressive strength not less than 5000 psi and water absorption not more than 5 percent, in shapes and sizes indicated.

Color and Texture: As selected by Director’s Representative from manufacturer's full range.

* + - * 1. Granite Curbs: Granite curbing, with face battered [**1 inch per foot (1:12)**], produced in random lengths not less than 36 inches from granite complying with ASTM C615.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=5251) Subject to compliance with requirements, provide products by one of the following:

[Cold Spring Granite Inc](http://www.specagent.com/Lookup?uid=123457155902)., (320) 685-3621, 17482 Granite West Rd, Cold Spring, MN 56320

[Fletcher Granite Company](http://www.specagent.com/Lookup?uid=123457155903)., (978) 692-1312, 534 Groton Rd, Westford, MA 01886.

[Granicor, Inc](http://www.specagent.com/Lookup?uid=123457155904)., (418) 878-3530, 300 Rotterdam Street, St. Augustin QC G3A 1T4

[New England Stone, LLC](http://www.specagent.com/Lookup?uid=123457155905)., (206) 372-4236, 282 Knox Marsh Road, Madbury, NH 03823

[North Carolina Granite Corporation](http://www.specagent.com/Lookup?uid=123457155906), (336) 786-5141, 151 Granite Quarry Trl, Mount Airy, NC 27030

[Polycor Inc](http://www.specagent.com/Lookup?uid=123457155907)., (418) 692-4695, 76 rue Saint-Paul, Suite 100, Quebec City (Quebec), Canada G1K 3V9

[Swenson Granite Works](http://www.specagent.com/Lookup?uid=123457155908), (203) 270-6644, 292 South Main Street, Newtown, CT, 06470.

Approved equivalent.

Granite Color and Grain: [**Match existing color**][**Light gray**] [**Dark gray**] [**Buff**] [**White**] [**Black**] [**Pink**] <**Insert color**> and [**fine**] [**medium**] [**coarse**] grain.

Indicated dimensions for curb segments shall not vary more than 2 inches for depth and 1 inch for width.

Furnish curbs with sawed top, split face and ends. Straight pieces shall be a minimum of 3 feet long. Curb segments on curves with radius of 100 feet or less shall be shaped to the required curvature, with the ends split on radial lines.

Top and front surfaces shall be true planes at right angles to each other, as seen with a straight edge. No projection greater than 3/4 inch or depression greater than 1/2 inch on the split surfaces will be acceptable. Top surface shall not vary more than 1/8 inch.

Drill holes will not be permitted in exposed curb surfaces.

Top Finish: Sawed.

Face Finish: Split.

* + - 1. MORTAR SETTING-BED MATERIALS
				1. Portland Cement: ASTM C150, Type I.
				2. Hydrated Lime: ASTM C207, Type S.
				3. Sand: ASTM C144.

Retain "Latex Additive" Paragraph below for thickset applications if latex additive is required to improve flexibility and other properties of mortar setting bed or if latex additive is used for mortar-bed bond coat.

* + - * 1. Latex Additive: [**Manufacturer's standard**] [**acrylic resin**] [**or**] [**styrene-butadiene-rubber**] water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed Portland cement and aggregate mortar bed, and not containing a retarder.
				2. Water: Potable.
			1. MORTAR MIXES
				1. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed materials of uniform quality and with optimal performance characteristics. Discard mortars if they have reached their initial set before being used.
				2. Portland Cement-Lime Setting-Bed Mortar: Type M complying with ASTM C270, Proportion Specification.
1. EXECUTION
	* + 1. EXAMINATION

Coordinate conditions required by work of this Section with requirements in Section where substrate is specified. Delete this article if aggregate setting-bed method is used.

* + - * 1. Examine surfaces indicated to receive curbing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION
				1. Remove mortar and concrete from existing curbs to be reused.
			2. INSTALLATION, GENERAL
				1. Do not use curbs with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.
				2. Mix curb units from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.
				3. Cut curb units with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
			3. MORTAR SETTING-BED APPLICATIONS
				1. Apply mortar bed over prepared substrate; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of curbs to finished grades indicated. Apply one cubic feet of mortar for each linear foot of curb installed.
				2. Mix and place only that amount of mortar bed that can be covered with curbing before initial set. Before placing curb, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.
				3. Place curbs before initial set of cement occurs.
				4. Tamp or beat curbs with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each curb in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.
				5. Butt joint curb sections together.
				6. Install joint sealer as specified in Section 321373 where curb abuts existing walls, posts, buildings, and fixed structures or appurtenances.
			4. REPAIRING, POINTING, AND CLEANING
				1. Remove and replace curbs that are loose, chipped, broken, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
				2. Pointing: During tooling of joints, enlarge voids or holes and completely fill with grout. Point joints at sealant joints to provide a neat, uniform appearance, properly prepared for sealant application.

END OF SECTION 321613.23