



SPECIFICATION FOR STEPS

PART 1: GENERAL

1.1 Scope

Work includes furnishing and installing precast concrete modular steps to the lines and grades designated on the construction drawings and as specified herein.

1.2 Reference Standards

- ACI 301 Structural Concrete
- ACI 318 Building Code Requirements for Reinforced Concrete
- ASTM C33 Concrete Aggregates
- ASTM C39 Compressive Strength of Concrete
- ASTM C94 Ready-Mixed Concrete
- ASTM C231 Air Content of Concrete
- ASTM C1776 Wet-Cast Precast Modular Retaining Wall Units
- ASTM D698 Laboratory Compaction Characteristics of Soil Using Standard Effort
- ASTM D1557 Laboratory Compaction Characteristics using Modified Effort

1.3 Delivery, Storage, and Handling

- A. Contractor shall check the materials upon delivery to assure proper material has been received.
- B. Contractor shall prevent excessive mud, wet concrete and like materials from coming in contact with the precast modular steps.
- C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the project.

PART 2: MATERIALS

2.1 Step Units

- A. Step units shall be irregular or dimensional precast concrete modular units as produced by a manufacturer licensed and authorized by the precast modular block licensor to produce the units.
- B. Steps shall meet Rosetta specifications and be made from wet-cast concrete in accordance with ASTM C1776, per the following chart, and as modified herein.

Freeze-Thaw Exposure Class*	Air Content %	28-Day Compressive Strength <i>psi (MPa)</i>	Maximum Water Cement Ratio	Min. Concrete Temp. at Placement °F (°C)
Negligible	1½ to 4½	4000 (27.6)	0.45	50 (10)
Moderate	3½ to 6½	4000 (27.6)	0.45	50 (10)
Severe	4½ to 7½	4000 (27.6)	0.45	50 (10)
Very Severe	4½ to 7½	4500 (30.0)	0.40**	50 (10)

All Rosetta products shall use frost-free aggregate.

*Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to order placement.

**For Very Severe exposure, fly ash, other pozzolan, and slag shall be limited as described in ACI 318 4.2.3.

Notwithstanding anything stated above, all material used in the units must meet applicable ASTM and ACI requirements for exterior concrete.

- C. Exterior step dimensions, as measured in accordance with ASTM C1776, shall be uniform and consistent. Maximum dimensional deviations shall be 1/8 inch (3 mm) or 2%, whichever is less, excluding the architectural surface. Maximum width (face to back) deviation including the architectural surface shall be 1/2 inch (13 mm).
- D. Exposed faces shall have a textured finish. Other surfaces to be smooth form or troweled surface type.
- E. Chips, holes, and cracks in the unit smaller than the dimensions described in ASTM C1776 may be permitted.

SPECIFICATION FOR ROSETTA® STEPS

2.2 Base, Subbase, and Fill Material

- A. Base for steps shall be free-draining granular material, such as sand or pea stone, with less than 5% passing the No. 200 (0.075 mm) sieve and meeting the requirements of the local transportation agency.
- B. If specified, subbase material shall be a free-draining, natural sand and gravel mixture free of particles greater than 3 inches (75 mm) and no more than 8% passing the No. 200 (0.075 mm) sieve.
- C. Backfill material (if needed) shall be suitable soils approved by the geotechnical engineer. Site excavated soils may be used if suitable and approved by the geotechnical engineer. Suitable soils generally include predominately granular soils with non-plastic fines. Unsuitable soils, those with a PI>6, organic soils, saturated soils, and frost susceptible soils, shall not be placed within a 1 to 1 influence area from the base of the steps.
- D. Where additional fill is needed, the Contractor shall submit sample and specifications to the Engineer for approval.

PART 3: CONSTRUCTION OF STEP SYSTEM

3.1 Excavation & Grading

- A. Contractor shall excavate and/or grade to the lines and grades shown on the construction drawings.

3.2 Subgrade Preparation

- A. Verify that the subgrade meets the required alignment and grade.
- B. Verify subgrade meets or exceeds assumed design strength and compaction. Unsuitable soils, such as excessively soft or loose soil, soils that yield excessively under load, soils with high organic content, undocumented fill, or frozen soils shall be removed and replaced with acceptable, compacted material, or otherwise improved, to the satisfaction of the engineer. Unless otherwise required by the engineer, compact subgrade to at least 95% of standard proctor maximum dry density (ASTM D698) or 90% of modified proctor maximum dry density (ASTM D1557).
- C. Protect prepared subgrade from weather and traffic. Remove subgrade that has been degraded and replace with acceptable, compacted material.

3.3 Subbase and Base Placement

- A. Place subbase, if required, to the required thickness and compact to at least 95% of

standard proctor maximum dry density (ASTM D698).

- B. Place base to a thickness of at least 3 inches (or as otherwise required by the Engineer) and compact to at least 95% of standard proctor maximum dry density (ASTM D698).
- C. Ensure surface of base is smooth and uniform, without irregular low or high locations.

3.4 Step Installation

- A. To ensure proper color distribution, mix layers from several pallets.
- B. Starting from bottom of run, place step with either forks or straps using a small excavator or skid-steer to lift the piece into place. Practice safe handling procedures during this process.
- C. Slope each step 1% to 2% forward to allow for drainage.
- D. Fill behind each step with free-draining soil and compact to 95% of its maximum dry density, as determined by ASTM D698 (standard Proctor). Grade and slope fill to allow for proper alignment and drainage when the next step is placed.
- E. Continue placing steps in this manner until required grade is reached. Overlap lower step as required for desired tread width.
- F. Replace steps that become cracked or chipped.

PART 4: AVAILABILITY

Rosetta products are available from a licensed manufacturer, authorized to produce the units, or an authorized dealer. For a list of approved manufacturers contact:

Rosetta Hardscapes® LLC
05481 South US-31,
Charlevoix, MI 49720
1-844-367-9763
www.rosettahardscapes.com
info@rosettahardscapes.com