

Section 04 72 00 — Architectural Cast Stone, Precast Concrete & GFRC

Keystones & Arches

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PART 1 — GENERAL

1.1 SUMMARY

A. This Section includes:

1. Precast architectural cast stone keystone units
2. Voussoir arch units, springing stones, and impost blocks
3. Complete arch sets for door, window, and facade openings
4. GFRC arch units where scheduled

B. Related Sections:

1. Section 04 20 00 — Unit Masonry
2. Section 07 92 00 — Joint Sealants
3. Section 05 50 00 — Metal Fabrications (arch centering, lintels)

1.2 REFERENCES

- A. ASTM C1364 — Standard Specification for Architectural Cast Stone
- B. ASTM C666 — Standard Test Method for Resistance to Rapid Freezing and Thawing
- C. ASTM C947 — Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete
- D. ASTM C1194 — Standard Test Method for Compressive Strength of Architectural Cast Stone
- E. PCI MNL-128 — Recommended Practice for GFRC

1.3 SUBMITTALS

- A. Product Data: Data sheets, mix designs, test reports.
- B. Samples: Two keystone units minimum per profile and finish color.
- C. Shop Drawings: Elevation with arch geometry, voussoir numbering schedule, joint widths, anchor details, bearing support design.
- D. Test Reports: ASTM C666 freeze-thaw; ASTM C1194 compressive strength.
- E. Mock-Up: One full arch set per major arch type for institutional/commercial projects.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Minimum 10 years' experience per ASTM C1364.
- B. Compressive Strength: Minimum 6,500 psi at 28 days.
- C. Absorption: Maximum 6% per ASTM C642.
- D. Freeze-Thaw: 300+ cycles per ASTM C666, less than 0.10% mass loss.

1.5 DELIVERY, STORAGE & HANDLING

- A. Ship in padded crates. All units in each arch set shipped together.
- B. Store off ground. Protect from damage and moisture.
- C. Handle keystone units carefully — do not chip projecting faces.

PART 2 — PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Mesa Precast, Mesa, AZ
Contact: Jess Mason, 480-600-6776
 1. Additional manufacturing locations: Texas, Pennsylvania
 2. Representative: contact via archstoneglobal.polsia.app
- B. Substitutions: Equal products by other certified manufacturers may be submitted 10 days prior to bid.

2.2 CAST STONE KEYSTONES AND ARCH UNITS

- A. Material: Architectural cast stone per ASTM C1364.
- B. Mix Design: Portland cement Type I/II, limestone/marble aggregate, integral pigments.
All units in each arch set fabricated from the same batch for color consistency.
- C. Units: Voussoirs, keystone, springing stones, impost blocks per approved shop drawings.
- D. Keystone Projection: As shown. Projecting keystones require stainless steel anchor pins.
- E. Arch Geometry: Semi-circular / Segmental / Tudor / Elliptical / Jack / Moorish per drawings.
- F. Color: Portland Grey / Bucks County Buff / Old World Cream / Carbon Blend.
- G. Finish: Smooth / Light Sandblast / Medium Sandblast as specified.

2.3 PHYSICAL PROPERTIES (ASTM C1364)

- A. Compressive Strength: 6,500 psi minimum at 28 days.
- B. Absorption: 6% maximum by weight.
- C. Freeze-Thaw (ASTM C666): 300 cycles minimum.
- D. Tolerances: $\pm 1/8"$ on cross-section. $\pm 1/4"$ on arch radius.

2.4 GFRC ARCH UNITS (Where Scheduled)

- A. Material: Glass fiber reinforced concrete per ASTM C947 and PCI MNL-128.
- B. Glass Fiber Content: Minimum 5% by weight, alkali-resistant.
- C. Use for arch spans over 10 feet or where dead load requires weight reduction.

2.5 ANCHORAGE

- A. Keystone Anchors: Stainless steel or hot-dip galvanized pins for projecting keystones.
- B. Arch Unit Bearing: Stainless steel or galvanized setting plates at springing line.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Install per manufacturer's written instructions and shop drawings.
- B. Set arch units using centering support. Do not remove centering until mortar achieves design strength.
- C. Set each unit in full-coverage mortar bed, Type N or S.
- D. Keystones: Set last; verify bearing on both adjacent voussoirs before final seating. Anchor projecting keystones per shop drawings.
- E. Joints: 3/8" minimum; fill solidly with mortar; tool to match adjacent masonry.
- F. Sealant at crown joint: Backer rod and paintable polyurethane sealant per Section 07 92 00.

3.2 TOLERANCES

- A. Variation in cross-section: $\pm 1/8"$.
- B. Variation in arch radius: $\pm 1/4"$.
- C. Variation in keystone projection: $\pm 1/8"$.

3.3 CLEANING & PROTECTION

- A. Protection: Cover completed arch work during construction operations.
- B. Cleaning: Plain water or mild detergent. No acidic cleaners on limestone-colored units.
- C. Sealant: At crown and perimeter joints per Section 07 92 00.

END OF SECTION 04 72 00

Material Selection Guide

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Property	Precast Concrete	Cast Stone	GFRC
Compressive Strength	3,500–4,500 psi	6,500 psi min	4,000 psi min
Water Absorption	<6% (ASTM C642)	<6% (ASTM C1364)	N/A (non-porous face)
Freeze-Thaw Cycles	300 (ASTM C666)	300 (ASTM C666)	300 (ASTM C666)
Weight (approx.)	~140 pcf	~135 pcf	~25–30 psf (panel)
Dimensional Tol.	$\pm 1/4"$	$\pm 1/8" / \pm 1/4"$ in 10'	PCI MNL-128
Key ASTM Standards	C150, C33, C642, C1194	C1364, C1185, C947, C1194	C947, C1116, PCI MNL-128
CSI Reference	03 45 00	04 72 00	03 49 00
Anchors / Sealant	Stainless steel	Stainless steel	Galvanized / Stainless
Sealant Ref.	Section 07 92 00	Section 07 92 00	Section 07 92 00

Part 3 Execution Notes — Key Requirements

1. Mortar: Type N or S (ASTM C270). Full-coverage bearing on all units.
2. Joints: 3/8" nominal. Backer rod + sealant at all horizontal and perimeter joints (Section 07 92 00).
3. Anchors: Stainless steel or hot-dip galvanized steel. No uncoated ferrous metal in contact with stone.
4. Tolerances: $\pm 1/8"$ dimensional. $\pm 1/4"$ in 10 feet from level or plumb.
5. Cleaning: Plain water or mild pH-neutral detergent. No acid cleaners on limestone-colored finishes.
6. Cutting: Wet saw only. No hammer-and-chisel for structural cuts.
7. Submittals: Product data, shop drawings, samples, test reports required before fabrication starts.

Mesa Precast — Technical Sales Contact

Jess Mason · 480-600-6776 · jmason@mesaprecast.com
archstoneglobal.polsia.app · Mesa, AZ — also serving TX and PA