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GFRC Cladding Panels

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PART 1 — GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes:
1. Glass fiber reinforced concrete (GFRC) exterior cladding panels
2. Steel stud backup frame systems integral to GFRC panels
3. Concealed clip-and-rod anchorage systems
4. Custom profile, reveal, and shadow-box configurations
B. Related Sections:
1. Section 05 40 00 — Cold-Formed Metal Framing
2. Section 07 21 00 — Thermal Insulation
3. Section 07 92 00 — Joint Sealants
4. Section 09 29 00 — Gypsum Board (interior finish at backup framing)

1.3 REFERENCES
A. ASTM C947 — Flexural Properties of Thin-Section Glass-Fiber Reinforced Concrete
B. ASTM C1116 — Standard Specification for Fiber-Reinforced Concrete
C. ASTM E119 — Standard Test Methods for Fire Tests of Building Construction
D. ASTM C666 — Standard Test Method for Resistance to Rapid Freezing and Thawing
E. PCI MNL-128 — Recommended Practice for Glass Fiber Reinforced Concrete Panels
F. CSI MasterFormat 03 49 00 — Glass Fiber Reinforced Concrete

1.4 SUBMITTALS
A. Product Data: Technical literature, material data sheets, and standard panel profiles.
B. Shop Drawings: Panel layout drawings, joint locations, anchorage details, section profiles, and panel identification system.
C. Samples: Minimum 12" x 12" sample of each finish color and texture specified.
D. Test Reports: ASTM C947 flexural strength (MOR minimum 1,200 psi) and freeze-thaw performance (ASTM C666, 300 cycles minimum).
E. Mix Design: GFRC mix design, fiber content by weight, and water-cement ratio.

1.5 QUALITY ASSURANCE
A. Fabricator: Minimum 10 years' experience in commercial GFRC panel production. Spray-up and/or premix GFRC manufacturing capability.
B. Testing: Independent lab testing per ASTM C947. Min. MOR 1,200 psi. Min. LOP 600 psi.
C. Mock-ups: Provide full-size mock-up panel(s) per the mock-up schedule on drawings.
D. Pre-installation Conference: Schedule with fabricator, installer, GC, and architect.

1.6 DELIVERY, STORAGE & HANDLING
A. Delivery: On padded transport racks or bundled frames. Label each with shop drawing mark.
B. Storage: Vertically on padded A-frames or horizontal on padded supports.
C. Handling: Use spreader bars for multi-point lifts.

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 with test data, project references, and sample panel.

2.2 MATERIALS
A. GFRC Mix: Portland cement, silica sand (max 3/8" aggregate), water, alkali-resistant (AR) glass fibers, and acrylic polymer per PCI MNL-128 recommendations.
1. Glass Fiber: Alkali-resistant (AR) type, minimum 16 mm length, 3–5% by weight. AR glass to maintain minimum 95% fiber retention after 28-day accelerated aging.
2. Water-Cement Ratio: Maximum 0.45 for spray-up; maximum 0.35 for premix.
B. Compressive Strength: Minimum 4,000 psi at 28 days.
C. Flexural Strength (ASTM C947): Minimum MOR 1,200 psi. Minimum LOP 600 psi.
D. Freeze-Thaw (ASTM C666): 300 cycles, no visible deterioration.

2.3 BACKUP FRAME
A. Steel Stud Frame: Integral galvanized steel stud backup attached to GFRC skin.
B. Frame-to-Skin Bond: Flex anchors connect frame to skin for differential movement.
C. Galvanization: All ferrous components per ASTM A123.

2.4 ANCHORAGE SYSTEM
A. Type: Concealed clip-and-threaded-rod or cast-in anchor with relief slot.
B. Materials: Hot-dip galvanized or stainless steel (Type 304 minimum).
C. Movement: ±3/4" in-plane and ±1/4" out-of-plane without restraint.

2.5 PANEL CONFIGURATIONS & TOLERANCES
A. Face Thickness: 3/4" minimum at all face locations.
B. Profiles: Flat, reveal, shadow-box, and custom 3D profiles per drawings.
C. Tolerances (PCI MNL-128): Overall ±1/8"; Flatness L/500 or 1/4" max; Thickness ±1/16"; Squareness 3/16" max; Anchor location ±1/4".

2.6 FINISHES
A. Standard: Portland (warm gray), Bucks County (buff/tan), Old World (antique cream), Carbon (charcoal gray).
B. Texture: Smooth, light sandblast, medium sandblast, acid-etch exposed aggregate.
C. Custom Colors: Minimum 6-week lead. Submit color batch samples before production.

PART 3 — EXECUTION

3.1 EXAMINATION
A. Inspect primary wall framing and anchorage substrate for dimensional compliance.
B. Verify anchor locations match shop drawings within allowable tolerances.
C. Do not begin installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION
A. Sequence: Install per approved erection sequence. Do not overload structure.
B. Anchorage: Connect each panel at all designated anchor points. Torque fasteners per engineer's specification.
C. Shimming: Use stainless steel or plastic shims at bearing points only.
D. Panel Joints: Maintain 3/4" nominal joint width. Do not force panels into position.

3.3 SEALANT JOINTS
A. Install backer rod and single-stage polyurethane or silicone sealant at all panel joints, perimeter conditions, and transitions.
B. Sealant color to match panel finish.
C. Joint width-to-depth ratio: 2:1 for sealant. Minimum joint width 3/4".

3.4 TOLERANCES (INSTALLED)
A. Panel plumb: ±1/4" per 10 ft.
B. Panel alignment (coplanar): ±1/4" between adjacent panels.
C. Joint width: ±3/16" from specified.

3.5 CLEANING & PROTECTION
A. Protection: Building paper or polyethylene on completed panels during construction.
B. Cleaning: Plain water or pH-neutral detergent. No acid cleaners; max 600 psi wash. No wire brushes on GFRC surfaces.
C. Sealant: Do not apply penetrating sealers without architect review of compatibility.

END OF SECTION 03 49 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.	±1/4"	±1/8" / ±1/4" in 10'	PCI MNL-128
Key ASTM Standards	C150, C33, C642	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: ±1/8" dimensional. ±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

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archstoneglobal.polsia.app · Mesa, AZ — also serving TX and PA