SECTION 03 40 01 - PRECAST CONCRETE CONTROL BUILDING

PART 1 GENERAL

1.1 SUMMARY

A. Furnish precast concrete, fully assembled, transportable building. The building shall be assembled in one module at manufacturer's plant and shipped to the job site for final installation. Modules shall be delivered and placed on cast in place slab foundation in accordance with manufacturer’s recommendations.

B. Design Basis for precast building: “EASI-SET” as manufactured by SMITH-CAROLINA Corporation, Reidsville, North Carolina. Building shall be provided by manufacturer with all necessary openings as specified by Contractor in conformance with manufacturer’s structural requirements.

1.2 REFERENCES

A. ACI 318-05, “Building Code Requirements for Reinforced Concrete”, American Concrete Institute.

B. ASCE 7-02, “Minimum Design Loads for Buildings and other Structures”, American Society of Civil Engineers

C. “Manual of Standard Practice”, Concrete Reinforcing Steel Institute.

D. NC Building Code

E. PCI MNL-116S - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products; latest Edition.

F. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; latest Edition.

G. PCI MNL-127 - Recommended Practice for Erection of Precast Concrete; latest Edition.

H. UL-752 Level 4 Bullet Resistance, certified by an independent structural engineer. (Precast elements Only)

I. Fabricator shall be a producer member of the National Precast Concrete Association (NPCA).

J. Building fabricator shall have a minimum of five (5) years experience manufacturing and setting transportable precast concrete buildings.

K. Building designs to the pre-engineered “EASI-SET” or equal pre-approved by the owner ten days prior to the bid date.

1.3 DESIGN REQUIREMENTS

A. Minimum Dimensions. Refer to drawings for project specific dimensions:
   1. Exterior: 10’-0” x 12’-0” x 8’-8”
   2. Interior: 9’-6” x 11’-6” x 8’-0”
B. Standard Design Loads:
   1. Seismic load performance category “C”, Exposure Group I, III.
   2. Standard Roof Live Load - 60 psf.
   3. Standard Floor Load – 250 psf.
   4. Standard Wind Load - 130 mph.

C. Floor: Floor shall include a ½” turn down edge on all four sides to prevent migration of water into building along bottom of wall panels. Floor keyway joint shall be filled with non-shrink grout.

D. Sloped Roof: Roof shall slope ½" from front to back in 10' direction. The roof shall extend a minimum of 2 ½" beyond wall panels on all sides and include a ½” turn down edge with built in drip feature that caps all four walls to prevent migration of water into the building along top of wall panels. Roof shall have an integral architectural ribbed edge.

E. Roof, walls, and floor panels shall be produced as single component monolithic panels. No roof or vertical joints are acceptable, except at corners. Wall panels shall be set on top of floor panel or keyed into poured slab foundation. Wall panels shall be 4” thick minimum.

1.4 SUBMITTALS

A. Shop Drawings shall be provided for approval prior to production.

B. Building engineering calculations that are designed and sealed by a licensed engineer in the State of North Carolina shall be submitted.

C. Color chart for door and frame paint.

D. Exterior finish images.

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete: Steel reinforced, 5000 psi minimum 28-day compressive strength, air-entrained (ASTM C260), water reduced normal weight.

B. Reinforcing Steel: ASTM A615, grade 60, deformed bar unless otherwise indicated.

C. Post-tensioning Strand: 41K Polystrand CP50, .50, 270 KSI, 7-wire strand, greased plastic sheath, (ASTM A416), Roof and floor shall be post-tensioned by a single, continuous tendon. Said tendon shall form a substantially rectangular configuration

having gently curving corners, and a corner where the tendon members are anchored. Tendons shall be greased and enclosed within sheathing. Building modules shall be post-tensioned together through floor and roof conduits.

D. Caulking: All joints between panels shall be caulked on the exterior and interior surface of the joints. Caulking shall be SIKAFLEX-1A elastic sealant or equal. Exterior caulk joint shall be 3/8” x 3/8” square so that sides of joints are parallel for correct caulk adhesion.

E. Panel Connections: All panels shall be securely fastened together with 3/8” thick steel brackets. Steel shall be of structural quality, hot-rolled carbon complying with ASTM A36 HR, prime coated after fabrication. All fasteners shall be anchored with ½” diameter bolts complying with ASTM A307 for low-carbon steel bolts. Cast-in anchors used for panel connections shall be Dayton-Superior #F-63, or equal.

2.2 FINISHES

A. Interior of Building: Smooth form finish concrete walls. Paint interior with one coat primer and two finish coats of white paint after installation on site.

B. Exterior of Building: As selected by Owner.

C. Door(s) and Frame(s): Doors and frames shall be top coated with Induron, Tnemec, or Sherwin Williams Industrial & Marine Coatings paint. Color chart shall be provided for color selection.

2.3 ACCESSORIES

A. Doors and Frames: Shall comply with the Steel Door Institute “Recommended Specifications for Standard Steel Doors and Frames” (SDI-100) and as herein specified. Building shall be equipped with single or double, insulated, 3’-0” x 6’-8” x 1 ¾”, hot dip galvanized, 14 gauge A40, full flush door and “Inter-lok” hot dip galvanized, 12 gauge A40 frame. Doors and frames shall be factory bonderized and primed. Refer to drawings for project specific door sizes.

B. Door Hardware:
1. Handle: Lindstrom stainless steel, 8-½" x 2" or equal.
2. Hinges: PB-31/NRP/32D 4 ½" x 4 ½" (stainless steel with non-removable hinge pins), 3 per door or equal.
3. Lock Set: PDQ Industries KR116-32D (stainless steel finish) or equal.
4. Threshold: National Guard 897V60 raised interior, extruded aluminum threshold with neoprene seal or equal.
5. Door Holder: Glynn-Johnson 904H US32D (stainless steel finish), overhead slide type surface mounted door holder or equal.
6. Drip Cap: National Guard 15D72 or equal.

PART 3 EXECUTION

3.1 SITE PREPARATION

A. The vertical soil capacity under stone base shall be, or compacted to be, a minimum of 1,500 pounds per square foot.

B. A poured in place foundation shall be installed. To be designed by the Engineer of Record.

C. Provide positive drainage for the fill, pad, or slab as required.

3.2 ACCESS

A. Contractor shall provide level unobstructed area large enough for crane and tractor-trailer to park adjacent to pad. Crane must be able to place outriggers within 5’-0” of edge of pad and the truck and crane must be able to get side-by-side under their own power. No overhead lines may be within a 75’ radius of center of pad.

3.3 DELIVERY, STORAGE, AND HANDLING

A. Lift and support units during manufacturing, yard handling, and installation only at lifting or supporting points or both, as shown on shop drawings, and using appropriate lifting devices.

B. Store units in a manner to prevent cracking, distortion, warping, staining, or other physical damage.

C. Transport units with proper equipment and methods and with qualified personnel.

D. Use all means necessary to protect materials before, during and after installation and also protect work of others.

3.4 INSTALLATION

A. Erect in accordance with Precast/Prestressed Concrete Institute Field Certification Program.

B. Install units using suitable lifting devices at points provided by manufacturer.

C. Align and level units as shown on shop drawings; minimize variations between adjacent units by jacking, loading or any other feasible method as recommended by manufacturer.

D. Erection Tolerances: Comply with PCI MNL-127.

E. Submit project record documents prior to Substantial Completion, showing all revisions and modifications made during fabrication and erection.

3.5 CLEANING AND PROTECTION

A. On a daily basis and at completion of work, remove surplus materials, rubbish and apparatus from project site.

B. Protect installed products until completion of project.

C. Touch-up, repair or replace damaged products and finishes before Substantial Completion.

END OF SECTION