

# Easi-Span™ Precast Concrete Buildings

## Field Assembled

### Section 13120

#### PART 1 – GENERAL

##### 1.01 SUMMARY

Contractor to furnish a precast concrete building. Building to be field assembled by manufacturer on contractor's poured-in-place foundation, or precast floor panels as indicated on contract drawings. Precast building to be Easi-Span™ brand as manufactured by Easi-Set Industries (ESI), Midland, Virginia, or licensed manufacturer of Easi-Set Buildings. Building to be provided by manufacturer with all necessary openings as specified by contractor in conformance with manufacturer's structural requirements.

##### 1.02 QUALITY ASSURANCE

- A. ACI-318-02, "Building Code Requirements for Reinforced Concrete". Concrete Reinforcing Institute, "Manual of Standard Practice".
- B. ANSI/ASCE-7-02 "Building Code Requirement for Minimum Design Loads in Buildings and Other Structures".
- C. IBC 2006, 1996 BOCA
- D. Concrete Reinforcing Institute, "Manual of Standard Practice".
- E. UL-752 test method level 4 for bullet resistance certified by an independent structural engineer.
- F. Fabricator must be a certified producer/member of The Precast/Prestressed Concrete Institute (PCI), National Precast Concrete Association (NPCA) or equal.
- G. Building fabricator must have a minimum of 5 years experience manufacturing and setting transportable precast concrete buildings.
- H. No alternate building designs to the pre-engineered Easi-Span™ building will be allowed unless pre-approved by the owner 10 days prior to the bid date.

##### 1.03 DESIGN REQUIREMENTS

- A. Dimensions: If the size building you require differs from the specifications below, please see "Instructions for Modification to Easi-Span™ Building Specifications" to properly adjust the building's specifications to fit your needs.

Exterior: 20' x 20' x 10'-5"

Interior: 19'-4" x 19'-4" x 9' 0"

B. Design Loads:

1. Seismic load performance category 'C', Exposure Group III
2. Standard Live Roof Load – 60 PSF
3. Standard Floor Load – 250 PSF (if precast floor provided by building manufacturer)
4. Standard Wind Loading – 130 MPH

C. Roof: Roof panel shall have a minimum of 8" slope from peak to edge. The roof shall extend 4" beyond the wall panel and have a turndown design which extends ½" below the top edge of the wall panels to prevent water migration into the building along top of wall panels. Roof shall also have an integral architectural ribbed edge.

1. Option: If indicated on contract drawings, building can be made expandable with a removable ribbed fascia panel. 20'-0" wall and roof must have lugs to allow post-tensioning of additional modules onto existing structure without removing roof. Roof slabs must be designed to span 20'-0" of free area without internal support for intermediate modules without end walls.

D. Keyway Roof Joints: Grout in keyways shall be polymer concrete placed after coating keyways with a methyl methacrylate resin and isocyanate resin. Top of keyway must be coated with primer followed by one coat of a polymeric joint sealant followed by a fiberglass resin fabric followed by a second coat of polymeric joint sealant.

E. Floor panel or contractor supplied P.I.P slab must have a ½" step-down around the entire perimeter to prevent water migration into the building along the bottom of wall panels.

1.04 SUBMITTALS

- A. Engineering calculations that are designed and sealed by a professional engineer, licensed to practice in the state where the project is located, shall be submitted for approval.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Concrete: Steel-reinforced, 5000 PSI minimum 28-day compressive strength, air-entrained (ASTM C260).
- B. Reinforcing Steel: ASTM A615, grade 60 unless otherwise specified.
- C. Post-tensioning Strand: Roof and floor (if required) shall be post-tensioned in field after grout keyway is filled and has cured to required PSI strength. Post-tensioning cable shall be 41K polys-trand CP50, .50", 270 KSI, 7-wire strand, enclosed within a greased plastic sheath (ASTM A416). There will be a minimum of three post-tensioning cables connecting roofs and floors together to provide a watertight joint.

- 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 to be 3/8" x 3/8" square so that sides of joint are parallel for correct caulk adhesion. Back of joint to be taped with bond breaking tape to ensure adhesion of caulk to parallel sides of joint and not the back.
- E. Panel Connections: All panels shall be securely fastened together with 3/8" thick steel brackets. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A283, Grade C and hot dipped galvanized after fabrication. All fasteners to be 1/2" diameter bolts complying with ASTM A307 for low-carbon steel bolts. Cast-in anchors used for panel connections to be Dayton-Superior #F-63 or equal. All inserts for corner connections must be bolted directly to form before casting panels. No floating-in of connection inserts shall be allowed. Wall panels shall be connected to floor slab with 4" expansion anchors by manufacturer.

## 2.02 ACCESSORIES

- A. Doors and Frames: Shall comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100) and as herein specified. The buildings shall be equipped with double 3'-0" x 6'-8" x 1-3/4", 18-gauge galvanized/insulated Dominion Imperial right hand reverse metal doors with 16-gauge galvanized frames. Doors and frames shall be bonderized and painted one coat of rust inhibitive primer and one finish coat of enamel paint; color shall be Yorktown Brown unless otherwise specified.
- B. Door Hardware:
  1. Handle: Lindstrom stainless steel, 8-1/2" x 2" or equal.
  2. Hinges: PB-31/NRP/26D 4 1/2" x 4 1/2" (chrome-plated with non-removable hinge pins), 3 per door or equal.
  3. Lock Set: PDQ Industries KR116 – 32D (stainless steel finish) or equal.
  4. Surface Bolt, Upper: Cal-Royal 045901426D (satin chrome finish) or equal.
  5. Surface Bolt, Lower: Cal-Royal 045901426D (satin chrome finish) or equal.
  6. Astragal: A4441/68R or equal.
  7. Threshold: National Guard 897V60 raised interior, extruded aluminum threshold with neoprene seal or equal.
  8. Door Holder: Glynn-Johnson 904H US32D (stainless steel finish), overhead slide type surface mounted door holder or equal.
  9. Drip Cap: National Guard 15D72 or equal.
  10. Door Stop: Ives 445B26D (Inactive leaf only) or equal.

## 2.03 FINISHES

- A. Interior of Building: Smooth steel form finish on all interior panel surfaces.
- B. Exterior of Building: Architectural precast concrete brick finish - Finish must be imprinted in top face of panel while in form using an open grid impression tool similar to EASI-BRICK™. Finished brick size shall be 2 3/8" x 7 5/8" with vertical steel float or light broom finish. Joints between each brick must be 3/8" wide x 3/8" deep. Back of joint shall be concave to simulate a hand-tooled joint. Each brick face shall be coated with the following acrylic concrete stain: 1) Cementrate by FOSROC; or, 2) Canyon Tone stain by United Coatings. Stain color shall be Brick Red unless specified otherwise. Stain shall be applied per manufacturer's recommendation. Joints shall be kept substantially free of stain to maintain a gray concrete color.
- C. Exterior of Building (Option): Additional finishes are available and will vary by local producer.

## PART 3 – EXECUTION

### 3.01 SITE PREPARATION REQUIREMENTS (Field assembled on cast-in-place floor)

- A. Slab on grade to be minimum 6" thick and 4,000 psi steel reinforced concrete. Slab to be level within 1/8" in both directions and capable of supporting loads imposed by the structure, with a 1/2" step-down along the perimeter edge.

### 3.02 SITE PREPARATION (Field assembled on precast floor system)

- A. Easi-Span™ building shall bear fully on a crushed stone base that is at least two feet larger than the length and width of building.
- B. Stone shall be a minimum of 4" thick or down to firm sub grade. The vertical soil capacity under stone shall be compacted to have minimum bearing of 1,500 pounds per square foot. Stone shall be 3/8" or smaller and must be screeded level within 1/4" in both directions. Stone shall be placed within a perimeter form with flat and level top edge for screeding. Forming material shall remain around stone until after the building is set.
- C. The crushed stone base shall be kept within the confines of the soil or perimeter form. Do not allow the base to become unconfined so that it may wash, erode, or otherwise be undermined.

OR

If building is placed on pavement or concrete slab, substrate below pavement or slab must have a vertical soil capacity of 1,500 pounds per square foot. Place stone or sand to 1" above highest point of area where building will be placed and at least 1'-0" wide all around the building footprint. Retain stone or sand with a perimeter form to prevent the material from washing out.

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

### 3.02 ACCESS

- A. Contractor must provide a level unobstructed area large enough for a crane and a tractor-trailer to park adjacent to the pad. Crane must be able to place outriggers within 5'-0" of edge of pad, and truck and crane must be able to get side by side under their own power. No overhead lines may be within 75' radius of center of pad. Firm roadbed with turns that allow 65' lowbed tractor-trailer must be provided directly to site. No building shall be placed closer than 2'-0" to an existing structure.