

SECTION 13120
PRECAST CONCRETE BUILDING
PREFABRICATED

PART I - GENERAL

1.01 SUMMARY

Contractor to furnish precast concrete building. Building to be field erected on customer prepared crushed stone foundation in accordance with manufacturer's recommendations or on customer's poured-in-place slab as indicated on contract drawings. Precast building to be EASI-SPAN Brand Model 2020 as manufactured by Lonestar Prestress Mfg., Inc., Houston, Texas. 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

ACI-318-95, "Building Code Requirements for Reinforced Concrete".

ASCE 7-95, "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures".

1994 UBC

Walls to be UL-752 Test Method Level 4 for bullet resistance, certified by an independent structural engineer.

Concrete Reinforcing Institute, "Manual of Standard Practice"

Building fabricator must have a minimum of 5 years experience manufacturing precast concrete buildings.

No alternate building designs to the pre-engineered EASI-SPAN building will be allowed unless pre-approved by the owner TEN (10) days prior to the bid date.

1.03 DESIGN REQUIREMENTS

Dimensions:

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

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

Design Loads:

Seismic load performance category 'C', Exposure Group III

Standard Live Roof Load - 60 PSF

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1.03 DESIGN REQUIREMENTS (cont.):

Standard Floor Load - 250 PSF

Standard Wind Loading - 130 MPH (ASCE 7-95)

Roof: Roof panel shall slope 6" in 10'-0" direction from peak to edge. The roof shall extend a minimum of 4" beyond the wall panel on each side and have a turndown design which extends 3/4" 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.

Option: If indicated on contract drawings, building can be made expandable with 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 walls.

Keyway Roof Joints: Grout in keyway shall be polymer concrete placed after coating keyway with a methyl methacrylate resin and isocyanate resin.

Floor: There shall be a 1/2" turn down, the width of the wall panels, cast into the floor. The 1/2" turn down makes the interior floor surface 1/2" higher than the joint between the wall panel and floor slab preventing intrusion of water.

Wall panels shall set on top of floor slab.

1.04 SUBMITTALS

Building engineering calculations that are designed and sealed by a professional engineer shall be submitted for approval.

PART 2 - PRODUCTS

2.01 MATERIALS

Concrete: Steel-reinforced, 6000 PSI minimum 28-day compressive strength,

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

Post-tensioning Strand: Roof and floor shall be post-tensioned in field after keyway is filled and has cured to required PSI strength. Post-tensioned cable shall be 41K Polystrand CP50, .50, 270 KSI, 7-wire ungreased strand, (ASTM A416). There will be a minimum of three post-tensioning cables connecting roofs and floors together to provide watertight joint.

If post-tensioning is not used in the roof panel, the following guidelines must be followed to ensure a watertight roof design.

The entire precast concrete roof panel surface must be cleaned and primed with a material that prepares the concrete surface for proper adherence to the coating material.

The entire precast concrete roof panel surface shall be sealed with a .045 EPDM continuous membrane cemented to the concrete with a compound designed for this purpose.

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2.01 MATERIALS (cont.)

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

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 A36 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 must be bolted directly to form before casting panels. Floating of connection inserts will not be allowed.

2.02 ACCESSORIES

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 steel doors, with insulated core and galvanized. Doors shall open as noted on drawings. Frames shall be 16-gauge galvanized steel. Doors and frames shall be painted one coat of rust inhibitor primer and one finish coat of epoxy paint, MEDIUM GRAY, if no other color is specified.

Door Hardware:

Handle: Lindstrum stainless steel, 8-1/2" x 2", or equal.

Lockset: Cal-Royal lever lock, or Easi-Set, or equal.

Deadbolt: Yale or Easi-Set stainless steel keyed outside only, or equal.

Hinges: Hagar stainless steel five knuckle ball bearing with non-removable pins, or equal.

Threshold: Hagar or National Guard Products extruded aluminum with neoprene seal, or equal.

Overhead Door Holder: Yale surface mounted overhead slide type with safety release, or equal

Drip Cap: Hager or National Guard Products aluminum with stainless steel screws, or equal.

Door Closer: Norton CE1604H or Yale 4410 with hold open, or equal.

Surface Bolts (Upper and Lower): Magnokrom Inc. 400-401 cadmium plated finish, or equal.

Astragal: Galvanized steel, same finish and brand as door.

Door Stop: Ives 445B26D brushed chrome (inactive leaf only), or equal.

2.03 FINISHES

Interior of Building: Smooth steel form finish on all interior panel surfaces.

Exterior of Building: Washed San Jacinto river-stone aggregate finish on all exterior wall surfaces.

Aggregate must be seeded into top of panel while in form, chemically retarded, and high-pressure water-washed to expose the aggregate to a depth of 1/8". As noted on drawings.

Exterior of Building: (option) 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 5/7" with vertical steel float or light broom finish. Joint 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) Cementate 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. As noted on drawings.

PART 3 - EXECUTION

3.01 SITE PREPARATION REQUIREMENTS (MANUFACTURER'S RECOMMENDATION)

Contractor to prepare a stone base at least one foot larger in length and width of building. EASI-SPAN building shall bear fully on firm undisturbed soils with an approved fill or pad. The turf shall be removed and a minimum 8" pad of approved fill material shall be placed. Where unacceptable material occurs, excavate and replace with an approved compacted fill material. The minimum recommended, allowable bearing shall be 1,500 pounds per square foot.

No building shall bear directly on rock. Where rock is closer than 2 feet from the bottom of the building floor slab or foundation slab, it shall be undercut to a minimum of 2 feet below the building and replaced with an approved fill material,

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

Approved fill or pad material shall be stone which conforms to ASTM C33. Allowable sizes are #56, #67, #6, #7, and #8.

All fills, pads, or slabs shall be level to within a 0.042 foot (1/2 inch) differential over the entire building area.

The entire granular fill or pad shall be kept within the confines of the soil or other surrounding objects. Do not allow the fill or pad material to be undermined so that it may wash, erode or otherwise be undermined.

The finished floor slab elevation shall be above the exterior grade. The grade shall have positive slope and drainage away from the building at all points.

Stone base or pad shall be a minimum of 2 feet larger in length and width of building.

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3.02 SITE PREPARATION REQUIREMENTS (Poured-in-place slab)

A. EASI-SPAN building shall bear fully on an engineered concrete or asphalt slab. The slab shall be

designed to support the anticipated load of the building and its contents. The building shall be leveled, shimmed as required, and set in a grout bed sufficient to fill all cavities between the foundation slab and the building floor slab.

3.03 SITE PREPARATION REQUIREMENTS (Cast-in-place floor)

Contractor to pour concrete floor slab with turndown footing the same length and width of building. The floor slab shall be designed to support the anticipated load of the building walls and its contents.

The finished floor slab elevation shall be above the exterior grade. The grade shall have a positive slope and drainage away from the building at all points.

Concrete slab to be steel reinforced and level within 1/8" in both directions.

Footer depth and reinforcement to be in accordance with design drawings.

3.04 ACCESS

Contractor must 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 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.

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