

SECTION 03460 – PRECAST CONCRETE BUILDINGS

PART 1 – GENERAL

1.1 REFERENCE STANDARDS

- .1 ACI-318-02, "Building Code Requirements for Reinforced Concrete". Concrete Reinforcing Institute, "Manual of Standard Practice".
- .2 ANSI/ASCE-7-02 "Building Code Requirement for Minimum Design Loads in Buildings and Other Structures".
- .3 IBC 2006, 1996 BOCA
- .4 Concrete Reinforcing Institute, "Manual of Standard Practice"
- .5 Steel Door Institute, "Recommended Specification for Steel Doors and Frames" (SD-100)
- .6 UL-752 test method level 4 for bullet resistance certified by an independent structural engineer.

1.2 QUALITY OF MANUFACTURER

- .1 Manufacturer shall be fully experienced in and equipped for this type of work and shall be able to document minimum ten consecutive years of activity in the field and have successfully completed projects of similar size and complexity.
- .2 Manufacturer shall be a member of the National Precast Concrete Association (NPCA).
- .3 Approved manufacturer: **Hy-Grade Precast Concrete** (905.684.8568).

1.3 DESIGN CRITERIA

- .1 Building shall be pre-fabricated '**Easi-Set**' Building with the following dimensions:
 - a. Exterior Dimensions: _____ **SPECIFIER CHOICE**
- .2 Design precast concrete elements to carry handling and expected service loads, without detrimental effects. Assumed Standard Loads as follows:

Standard Live Roof Load:	60 psf
Standard Wind Load:	27 psf
Standard Floor Load:	100 psf
- .3 Retain a structural engineer, licensed to practice in the state where the project is located, experienced in the field of precast concrete to ensure adequacy of the structural aspects of the design, shop drawings, manufacturing, transportation and installation of all precast concrete components, attachments, hardware and assemblies.
- .4 "Flat" Roof: The roof slab shall be fabricated with varying thickness to achieve a minimum 2" slope from front-to-back or side-to-side. The roof shall extend a minimum of 3" beyond the wall panel on each side.
- .5 Pitched Roof (**Option**): Wall panels shall be fabricated with a gable design to create a pitched roof application with a 4/12 pitch. Roof slabs are to be fabricated with a consistent thickness and a simulated metal seam finish. The roof slabs shall extend a minimum of 6" beyond the wall panels on all sides. **SPECIFIER CHOICE – Only include this item if required for specific project**
- .6 Floor slab must have a minimum 1/2" step-down around the entire perimeter to prevent water migration into the building along the bottom of wall panels.
- .7 Sandwich Panel (**Option**): Building shall incorporate an R10 sandwich panel design system. The roof slab and wall panels to be fabricated with an internal layer of 2" thick, R10 rigid insulation. Floor slab to be solid concrete only. **SPECIFIER CHOICE – Only include this item if required for specific project**

1.4 SUBMITTALS

- .1 Prepare and submit detailed drawings, containing all pertinent information in regard to the erection of the precast concrete building including:
 - a. Location of each panel / slab in the completed structure and identifying marks for each unit
 - b. Size and dimensions of each panel / slab complete with connection details
 - c. Grade of reinforcement, concrete strength and admixtures
 - d. Locations and details for lifting hooks and handling points
 - e. Sequence of erection and any special instructions that may be required in handling and setting.
- .2 Shop drawings to be sealed by professional engineer licensed to practice in jurisdiction of this project.

SECTION 03460 – PRECAST CONCRETE BUILDINGS

1.5 DELIVERY, HANDLING AND STORAGE

- .1 Proper lifting devices for the completed unit shall be incorporated to ensure that it will be safely and efficiently handled and not produce distortion, cracking or deflection nor strain or adversely affect the unit.
- .2 Precast panels shall be handled and adequately protected during fabrication, curing, storage and transport by methods that will prevent damage, warping, cracking, breakage, chipping, staining or other disfigurement. Units shall not be permitted to contact the earth or other staining influences.
- .3 Repair chipped, checked, cracked, blemished or defective units.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Concrete: Steel-reinforced, 5000 PSI minimum 28-day compressive strength, air-entrained (ASTM C260).
- .2 Formwork materials: All forms shall be accurately constructed, well braced and stiffened to avoid deformations under pressure of wet concrete and vibrators.
- .3 Use same brands and source of cement and aggregate for entire project to ensure uniformity of colouration and other mix characteristics.
- .4 Reinforcing Steel: ASTM A615, grade 60 unless otherwise specified.
- .5 Panel Connections: All panels shall be securely fastened together with minimum 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-42, or equal.

2.2 CONCRETE MIXES

- .1 Use a concrete mix designed to produce minimum 5000 PSI compressive strength at 28 Days.

2.3 FINISHES

- .1 All exterior wall faces to have a _____ finish. **SPECIFIER'S CHOICE**
- .2 All interior wall faces to have a Smooth steel form finish.
- .3 Curing and Sealing:
 - a. All exterior floor and roof edges to be treated with Externit #50 'Special Grey' coating.
 - b. Any simulated exterior surfaces will be finished with concrete stain – colour selection by owner (if required).
 - c. Any exposed aggregate exterior precast surfaces will be treated with a Masonry Sealer (if required).

2.4 DOORS

- .1 Doors and Frames:
 - a. The building shall be equipped with one 36"x84"x1 3/4" 18 gauge metal door with lockseam construction and honeycomb interior.
 - b. The doors shall be installed in a 16 gauge galvanized steel door frame.
 - c. The door and frame paint colour to be selected by the owner from manufacturer's standard colours.
- .2 Hardware:
 - a. Hinges: Taymor 4100 series, 4-1/2" x 4" grey primed with non-removable pins.
 - b. Lockset: Dorex TLA5132D – Standard Schlage
 - c. Threshold: KN Crowder – Extruded Aluminum CT-804
 - d. Sweep: KN Crowder – Extruded Aluminum W-13S-2 with Neoprene Inserts
 - e. Pull: Commercial grade 4" x 16" Plate with 7" pull handle (each door)
 - f. Door Closer: LCN Model 4111 CUSH X AL
 - g. Drip Cap: KN Crowder – Extruded Aluminum W-3
 - h. Astragal: Weld on flat plat; finished same as door

SECTION 03460 – PRECAST CONCRETE BUILDINGS

2.5 LOUVERS *SPECIFIERS CHOICE - Only include this item if required for specific project*

- .1 The building shall be equipped with two 16" x 8" louvers
 - a. Model: Ventex 2225 – 2" deep stormproof louvre with perimeter flange.
 - b. Louvres come with stationary blades and a 19 gauge bird screen.

PART 3 – EXECUTION

3.1 SITE PREPARATION (*Recommendation only; actual design as directed by consultant*)

- .1 Contractor to provide clear and level area at a minimum of 24" wider and longer than the building with the building situated at the center of the prepared base.
- .2 Stone shall be a minimum of 4" thick or down to firm subgrade. 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.
- .3 Ensure that the granular subbase and the area surrounding the building are well drained by positive slope of subgrade or by underfloor drainage pipes. Ensure all finished surfaces adjacent to the building slope away from the building perimeter.
- .4 If soil is disturbed, excavation must be lower than the disturbed level as per geotechnical review.

3.2 INSTALLATION

- .1 All work shall be executed using workers skilled in the trade of precast erection.

3.3 ACCESS

- .1 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. A minimum of 24" clearance is required between this building and adjacent buildings.

3.4 CLEANING

- .2 Clean soiled precast concrete surfaces by approved means to satisfaction of consultant.
- .3 Repair units that have minor visual defects to the satisfaction of consultant.

3.5 INSPECTION AND TESTING

- .1 All inspection and testing as directed by consultant. Costs incurred for all inspection and testing shall be the responsibility of the contractor.

END