**SECTION 13 34 00**
**FABRICATED PRE-ENGINEERED PRECAST CONCRETE STRUCTURES**

**BLUE RIDGE FLUSH TOILET W/CHASE**
**OUTBACK STYLE ROOF**

## SECTION 1 – GENERAL

### 1.1 SUMMARY

Contractor shall furnish a precast concrete transportable restroom. Building to be delivered and placed on owner-prepared crushed stone foundation in accordance with manufacturer's recommendations. Precast building to be EASI-SET® brand Restroom Model Blue Ridge Flush Toilet w/Chase Outback Style Roof (herein stated as Blue Ridge) as manufactured by a *licensed producer of Easi-Set Buildings*. Manufacturer to provide building with all necessary openings as specified by contractor in conformance with manufacturer's structural requirements.

### 1.2 REFERENCES

A. ACI-318 – Current Edition: Building Code Requirements for Structural Concrete and Commentary

B. ASCE/SEI – Current Edition: Minimum Design Loads for Buildings and Other Structures

C. IBC – Current Edition: International Building Code

D. PCI Design Handbook – Current Edition

E. Concrete Reinforcing Institute, Manual of Standard Practice

F. UL-752 (Test Method level 5) for bullet resistance certified by a military approved laboratory.

G. 2010 ADA Standards for Accessible Design

H. International Plumbing Code (IPC) and National Electrical Code (NEC)

### 1.3 SYSTEM DESCRIPTION

DESIGN REQUIREMENTS

A. Building Dimensions:

Exterior: 10'-8" x 11'-1" x 9'-8" (tallest point)

Interior: 7'-2" x 10'-7" x height (varies)

***Design case to be selected to correspond to the design criteria indicated in the aforementioned codes for the geographical location of the project or as specified.***

**CASE 1: Typical**

B. Design Loads:

1. Seismic Design Category 'C', Risk Design Category II

2. Roof Live Load (Snow) – 30 PSF

3. Floor Live Load – 100 PSF

4. Wind Loading* – 115 MPH

*Design loads relate to precast components only, not accessories (i.e. doors, windows, vents, etc.)

**CASE 2: Heavy**

C. Design Loads:

1. Seismic Design Category 'D', Risk Design Category III

2. Roof Live Load (Snow) – 150 PSF

3. Floor Live Load – 150 PSF

4. Standard Wind Loading* – 165 MPH

*Design loads relate to precast components only, not accessories (i.e. doors, windows, vents, etc.)

D. Roof: Proprietary two-piece Outback style roof. Roof panels shall overhang on all sides to prevent water intrusion. The pitch of the roof shall be 3/12. The roof standard finish is a simulated cedar shake. Other finishes are available.

E. Roof panels, floor, and wall panels must each be produced as single component monolithic panels. No floor or vertical wall joints will be allowed, except at perimeter interfaces, corners and partitions. Wall panels shall be set on top of floor panel.

F. Wall-to-Floor interior surface joints along the perimeter of each restroom and partitions (if precast) must contain the locked-in, easy clean-out radius coving. The 3/8" (recessed) x 2" cove must be continuous around the interior of the restroom and along the sides of any precast partitions. Apply 5,000 PSI (minimum) non-shrink, non-metallic grout to the cove, finishing the grout to form a flush 1" minimum radius.

## 1.4 SUBMITTALS

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

B. Manufacturers' product literature shall be provided for all plumbing, electrical and miscellaneous installed fixtures demonstrating compliance with these specifications

## 1.5 QUALITY ASSURANCE

A. The precast concrete building producer shall be a plant-certified member of either the National Precast Concrete Association (NPCA), The Precast/Prestressed Concrete Institute (PCI), or equal.

B. The precast concrete building producer shall demonstrate product knowledge and must have a minimum of 5 years experience manufacturing and setting precast concrete.

C. The manufacturer must be a licensed producer of Easi-Set Buildings.

D. No alternate building designs to the pre-engineered EASI-SET® building will be allowed unless pre-approved by the owner 10 days prior to the bid date.

## SECTION 2 – PRODUCTS

### 2.1 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.
Welded wire fabric: ASTM 185, Grade 65

**C.** Post-tensioning Strand: 41K Polystrand CP50, ½" 270 KSI Seven-Wire strand, enclosed within a greased plastic sheath (ASTM A416). Each Roof and floor shall be post-tensioned by a proprietary, second generation design using a single, continuous tendon. Said tendon is placed in the concrete slab to form a perimeter loop starting from one corner of the slab to a point where the cable entered the slab. The tendon then turns 90 degrees and follows the cable member(s) in the periphery to a point midway along the "X" axis of the concrete building panel and then turns 90 degrees along the "Y" axis of the concrete building panel. This bisects the concrete building panel and crosses the opposite parallel portion of the cable member and exits from an adjacent side of the concrete building panel. This creates a cable pattern with no less than 2.5 parallel cables in any direction. To ensure a watertight design, no alternate methods shall be substituted for the post-tensioning.

**D.** Sealant: All joints between panels shall be caulked along the exterior and interior surface of the joints. Exterior sealant shall be DOW CORNING 790 silicone sealant or equal. Interior sealant shall be SIKAFLEX-1A elastic sealant (paintable) or equal. Exterior caulk reveals to be 3/8"x 3/4" deep so that sides of the joint are parallel for proper caulk adhesion. Back of the 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 utilizing cast-in stainless steel embeds and welding. All welding shall be done in conformance with AWS, Structural Welding Code latest revision. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A304. No floating-in of connection plates shall be allowed.

**F. Stain and Paint:**

***a.*** Interior concrete surfaces (toilet room)
- ***i.*** Interior floors will be a two component, water based polyamide epoxy floor coating (gray, unless otherwise specified). Approved manufacturers: Sherwin Williams (Floor-Plex 7100), Armorpoxy or equal.
- ***ii.*** Interior walls and ceilings will be a pre-catalyzed water based epoxy. Approved manufacturers: Sherwin Williams or equal.

***b.*** Exterior concrete surfaces
- ***i.*** Exterior slab top surface (if selected) will be a two component, polyamide epoxy floor coating (gray, unless otherwise specified). Approved manufacturers: Sherwin Williams, Armorpoxy or equal.
- ***ii.*** Exterior walls and roof will be a water-based acrylic, water-repellent penetrating stain. Approved manufacturers: United Coatings (Canyon Tone Stain), Sherwin Williams (H&C Concrete stain) or equal
- ***iii.*** Clear Acrylic anti-graffiti sealer (if selected)

## 2.2 ACCESSORIES AND FIXTURES

**A. Doors and Frames**: Shall comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100) and as herein specified. All door and frame galvanizing shall be in accordance with ASTM A924 and A653, minimum coating thickness shall be A60.

1. The buildings shall be equipped with 3'-0" x 6'-8" x 1-3/4" (restroom entry door) & 2'-8" x 6'-8" x 1-3/4" (chase door) thick insulated, 18 gauge, metal doors with 16-gauge frames (to meet wall thickness). Doors shall have a flush top cap. Doors and frames shall be factory bonderized and painted with one coat of rust-inhibitive primer and one finish-coat of enamel paint; color to be BOLT BROWN unless otherwise specified.
2. Doors and frames shall meet SDI standard Level 2, 1¾" heavy duty.
   *Approved manufacturers: Republic, Steelcraft, Ceco, Black Mountain, Pioneer, Curries, Mesker, MPI, Door components or equal*
   *Approved distributor: Integrated Entry Systems*

**B. Door Hardware**:

**1. Cylindrical Lock**: Commercial grade, shall meet requirements of ANSI A156.2, series 4000, UL listed and ADA approved. Zinc dichromate chassis with cast solid zinc levers to resist corrosion. Furnish locks with 6-pin solid brass keyway. Exterior locks and unlocks by key, interior push button lock, released when lever is turned. Manufacturer shall provide a limited lifetime warranty on this product.
*Approved manufacturers: Design Hardware, or equal*

**2. Hinges**: Self-Closing (spring) Hinges. Shall comply with ANSI A156.17 Grade 1 self closing hinges (3 per door). Hinges shall be Stainless Steel Grade 304 (ANSI K81071F) US32D brushed satin finish. Manufacturer shall provide a lifetime limited warranty.
*Approved manufacturers: Design Hardware, or equal*

**3. Door Sweep**: Nylon brush door sweep, ANSI/BHMA certified. Sweeps shall have an integral drip edge to repel water from base of door. Sweeps shall be approved for UL 10C positive pressure and suitable for use with fire doors up to three hours.
*Approved manufacturers: National Guard Products or equal*

**4. Drip Cap**: Aluminum drip cap with minimum projection of 2 ½" shall be furnished.
*Approved Manufacturers: Design Hardware, National Guard Products, or equal*

**5. Door Stop**: ANSI 156.16 approved wall mounted door stop with keeper constructed of a corrosion resistant cast brass material. Finish US26D (626) brushed chrome finish.
*Approved manufacturers: Don-Jo, Rockwood, or equal*

**C. Wall Vent:** Wall vents will be extruded aluminum, minimum thickness of .125", 6063-T5 alloy. Vents to be supplied with aluminum mesh insect screen and 204-R1 clear anodized finish. Approved manufactures: Sunvent Industries or equal.

**D. Signs:** Signs to have braille, characters, and pictograms to meet ADA requirements.

**E. Windows:** Frames shall be constructed from stainless steel. Window glazing will be ¼" translucent Lexan.

**F. Grab Bars:** Stainless steel tubing, 18 gauge, type 304 stainless steel, mounted 1-1/2 inches from wall. Approved manufacturers: Bobrick or equal.

**G. Toilet Paper Dispenser:** Dispenser will be constructed of 3/16" to 1/4" thick 304 stainless steel. Dispenser will be capable of holding three (3) standard rolls of toilet paper. Approved manufacturers: Aslin Industries, Bobrick or equal.

**H. Plumbing:** All fixtures will meet ASME A112.19.3

1. Waste and vent piping: ABS or PVC plastic
2. Water piping: Copper tubing Type L, hard drawn. A gate or ball valve will be provided at the inlet end of the water line. Size water lines to provide proper flushing action based on a nominal water pressure of 40 psi.
3. A main shut-off valve and drain will be provided with plumbing
4. Toilet and urinal (if provided): ADA compliant, type 304 stainless steel, wall hung, with siphon or blowout jet action. Provide back spud for concealed flush valve connection, unless otherwise specified.
5. Flush valve: Concealed toilet flush valve with integral vacuum breaker and a non-hold-open pushbutton or handle. Constructed of bronze or brass with water saver flow of 1.6 gallons per flush.
6. Lavatory: ADA compliant, type 304 stainless steel with backsplash.
7. Lavatory valve will be pneumatically operated pushbutton valve. Valve to be non-hold open type with a vandal resistant pushbutton requiring less than 5 lbs. pressure to activate.
8. Hose bib to be provided in chase area.
9. Floor drain: (Optional)-Floor drains to be provided in each room of the restroom building if selected.
10. Hammer arrester to be installed on water line
11. Trap primer distribution unit to be installed

**I. Electrical:** All components UL shall be listed

1. A 100-amp breaker panel will be provided
2. All electrical wiring will be encased in conduit. All wire to be copper.
3. Light Fixtures:
   a. Chase(service area): 4-foot (48") fluorescent fixture, switch controlled
   b. Toilet room: 4-foot (48") fluorescent fixture, motion detector activated
   c. Exterior: 35-watt minimum high pressure sodium light, polycarbonate vandal resistant.
4. Hand dryer: Surface-mounted ADA compliant, universal type motor, with adjustable sensor operation.
5. One GFCI outlet located next to the lavatory
6. One restroom area exhaust fan with 270 CFM speed controllable, occupancy/motion sensor controlled.

## 2.3 Finishes

A. **Interior of Building**: Smooth form finish on all interior panel surfaces unless exterior finish is produced using a form liner, then smooth hand-troweled finish.

B. **Exterior of Building (standard)**: Barn board finish on all exterior wall surfaces with a simulated cedar shake roof finish.

C. **Exterior of Building (Option #1)**: 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.

D. **Exterior of Building (Option #2):** Additional finishes for walls and roof are available and will vary by local producer.

## SECTION 3 – EXECUTION

### 3.1 SITE PREPARATION (MANUFACTURER'S RECOMMENDATION)

Work under this section relates to placement of the restroom building by the Easi-Set licensed producer on the customer-prepared foundation and site.

Water, electrical, and waste site connections to be located corresponding to the drawings. Connections must allow for easy installation and hookup to building.

**A.** EASI-SET® Restroom 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 and 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 ¼" in both directions. Stone shall be placed within a perimeter form having a 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.

**D.** Provide positive drainage around the building.

### 3.2 SITE ACCESS

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; 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 unless specifically permitted.