



January 1, 2011

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Clovermist Vault Toilet Specifications

BOOM Concrete, Inc.

Specifications for Clovermist Precast Concrete Vault Toilet

1.0 SCOPE

1.1 This specification covers the prefabrication, on-site delivery, off loading and placement of the Clovermist precast concrete vault restrooms as produced by BOOM Concrete, Inc.

2.0 SPECIFICATIONS

- 2.1 ASTM C33 - Concrete Aggregates
- 2.2 ASTM C39 - Method of Test for Compressive Strength of Cylindrical Concrete Specimens
- 2.3 ASTM C143 - Method of Test for Slump of Concrete
- 2.4 ASTM C150 - Standard Specification for Portland Cement
- 2.5 ASTM C192 - Method of Making and Curing Test Specimens in the Laboratory
- 2.6 ACI 1211.1 - Recommended Practices for Selecting Proportions for Normal and Heavyweight Concrete
- 2.7 ASTM A615 - Reinforcing Steel
- 2.8 ASTM A185 - Welded Wire Mesh
- 2.9 PCIMNL 116 - Quality control for Plants and Production of Precast Pre-stressed Concrete Products

3.0 DESIGN CRITERIA

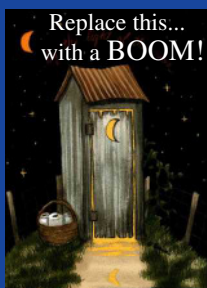
- 3.1 Vault restrooms have been designed to meet the following criteria. Calculations and Engineer's stamped drawings are available upon request by the customer and are for their sole and specific use only. The design criteria are to ensure that vault restrooms not only will withstand the forces of nature listed below but to provide protection from vandalism and other unforeseen hazards.
- 3.2 Snow Load: The vault restroom will withstand a snow load of 250 pounds per square foot.
- 3.3 Wind Load: The vault restroom will withstand the effects of 130 mile per hour wind load (3 second-gust), Exposure C.
- 3.4 Earth Quake: The vault restroom will withstand the effects of a zone 4 earthquake.
- 3.5 Floor Load: The vault restroom floor will withstand loads of 50 pounds per square foot.
- 3.6 The vault restroom is designed to meet the requirements of the Americans with Disabilities Act Requirements and Uniform Federal Accessibility Standard including as of the date of these specifications.
- 3.7 The vault restroom shall have full 60-inch turning diameter in each interior and entry area.
- 3.8 The vault restroom incorporates all design aspects of Sweet Smelling Technology as outlined by Brian Cook for the U. S. Forest Service. ("In Depth Design and Maintenance Manual for Vault Toilets" – July 1991 – Publication No. 9123 1601).
- 3.9 Tolerances: Tolerances will be within the limits as dictated by the PCI Quality Control and Assurance Manual.

4.0 MATERIALS

- 4.1 Concrete mix design, mixing and delivery, placement finishing, curing and quality assurance.
 - 4.1.1 Concrete will contain proper proportion of cement, aggregate, and water to obtain concrete with good workability. Minimum strength concrete: 5,000 PSI at 28 days.
 - 4.1.2 Cement will be ASTM C-150 Type II SR (Sulfur resistant) or Type V, 6.5 sacks per cubic yard.
 - 4.1.3 ASTM C33 with designated size of coarse aggregate No. 67 (3/4 inch to No. 4).
 - 4.1.4 Potable water with minimum water/cement ratio 5.0 gallons per sack.
 - 4.1.5 Slump will be 3 to 5 inches by ASTM C231.
 - 4.1.6 Air content shall be 4 to 7 percent as per ASTM C231. Air-entrained admixtures will conform to ASTM C260. Water reducing admixtures will conform to ASTM C494, Type A. Use of other admixtures is subject to approval.

Products

Benches
Bird Baths
Boat Ramps
Cattle Guard Block
Cisterns
Feed Bunks
Flower Pots
Gravel
Parking Curbs
Patio Blocks
Picnic Tables
Plinth Blocks
Redi Mix
Retaining Walls
Rock
Sand
Septic Tanks
Splash Blocks
Stock Tanks
Tile
Well Pits
Vault Toilets





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4.1.7 Curing compound will be colorless complying with ASTM C309, Type I or I-D

4.2 Colored Concrete – Color requirements for pre-cast toilets.

4.2.1 The toilet building roof panels, wall panels to floor line and screen panels will be precast with integrally colored concrete.

4.2.2 The same type and brand of cement, color, aggregates, and other additives shall be used throughout. In addition, as far as is reasonably practicable, all ingredients shall be from the same lot or manufacturing process. Aggregates shall be from the same source.

4.2.3 All volumes of concrete shall be uniform in all respects to ensure uniformity of the color of the finished concrete. All ingredients shall be weighed. All color by weight as recommended by the manufacturer of the concrete color. The mixing operations shall be adequate to uniformly disperse the color throughout each batch. A 12"x12"x1" color sample will be available for customer approval.

4.2.4 Wash and thoroughly clean the mixer and transporting equipment before mixing colored concrete.

4.2.5 Color additive shall be the color specified on the delivery order. Standard schedule of colors will be by Solomon Colors (800-624-0261) with recommended colors being ColorFlo Liquid - #306 -Cinnamon, #238 - Marigold, #338 - Earthen, #242 - Sandstone.

4.3 Cold/Hot Weather Concrete

4.3.1 Cold weather concrete placement shall be in accordance with ACI 306.

4.3.2 Concrete will not be placed if ambient temperature is expected to be below 30° Fahrenheit during the curing period unless heat is readily available to maintain the surface temperature of the concrete at least 45° Fahrenheit.

4.3.3 Materials containing frost or lumps of frozen materials will not be used.

4.3.4 Hot Weather Concrete: The temperature of the concrete will not exceed 80° Fahrenheit. At the time of placement and when the ambient temperature reaches 90° Fahrenheit. The concrete will be protected with moist covering.

4.4 Concrete Reinforcement

4.4.1 All reinforcing steel will conform to ASTM A615. All welded wire fabric will conform to ASTM A185.

4.4.2 All reinforcement will be new, free of dirt, oil, paint, grease, mill scale, loose or rust when placed. Reinforcement will be stored on blocks or saw horse off the ground in a manner to prevent bending, rusting and accumulation of dirt or soil.

4.4.3 Reinforcement will be installed as shown on the drawings and if details of reinforcement not shown will be in accordance with ACI 318.

4.4.4 Steel reinforcement will be centered in the cross-sectional area of the concrete member unless otherwise specified on the drawings.

4.4.5 Welded wire mesh in flat sheet form may be substituted in place of reinforcing steel in the roof slab and the exterior slab. The steel area of the wire mesh must be equal to or greater than the steel bar area. No more than two layers of welded mesh will be allowed in any concrete section to provide the required steel area. Mesh openings for two layers of mesh shall be shifted ½ mesh grid size both ways.

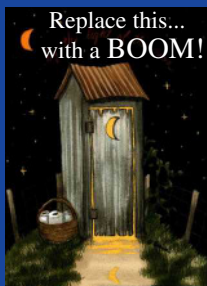
4.4.6 Adequate placement and support of reinforcing steel and wire mesh in final position will occur before starting placement of concrete.

4.4.7 Reinforcing steel will be continuous around corners between adjacent walls. Full lengths of reinforcing steel will be used whenever possible and the number of splices will be kept to a minimum. On long runs, splices will be alternated from opposite sides of the component for adjacent steel bars.

4.5 Concrete Sealers

4.5.1 Clear, colorless polysiloxane resin penetrating sealer for weatherproofing concrete which meets performance requirements of Federal Specification SS-W-110b

4.5.2 Weatherproofing sealer for exterior of building will be transparent, non-yellowing methylmethacrylate acrylic resin sealer, minimum 20% solids, for weatherproofing concrete exteriors. Low luster finish.





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4.6 Caulking, Grout, Adhesive and Sealer

4.6.1 In accordance with Federal Specifications TTS-01543A, Class A or B (silicone rubber based) caulk will be used with standard colors of white for inside surfaces and brown to match on the exterior.

4.6.2 Epoxy concrete adhesive will be two components rigid, non sag gel adhesive for bonding to dry or damp surfaces, moisture insensitive. Gray or other approved color.

4.6.3 Portland cement mortar will consist of one part Portland cement, three parts sand and enough water to make a workable mixture.

4.7 Paint

4.7.1 All paints and materials will conform to all Federal specifications or be similar "top-of-the-line components". Paints will be lead free. Standard paint materials and finish will be as follows:

4.7.2 Metalwork, steel doors

4.7.2.1 Metalwork and steel doors will be primed with a one coat zinc dust metal primer, Federal Specification TT-P-1046A. Primer not required on items delivered shop primed.

4.7.2.2 A minimum of one coat semi-gloss alkyd exterior enamel as per Federal Specification TT-509 Class A will be applied to all metalwork. The color of enamel will be dark brown, Federal Standard NO 595A

4.7.3 The interior walls will be painted using a one or two part, high gloss polyamide epoxy enamel, white in color with a minimum of one primer coat and one color coat.

4.7.4 Interior floors will be a one or two part, high gloss polyamide epoxy enamel, tan or grey in color. There will be a minimum of one primer coat and one color coat. Anti-skid sand or grit will be added to the final coat to provide a non-skid surface.

4.8 Toilet Riser

4.8.1 Toilet Riser for the vault toilet will be 18" high, white cross linked polyethylene, with heavy duty seat and lid, as manufactured by Romtec, Roseburg, OR. The color will be white with safety bars consisting of two 3/8" stainless steel bars, 5 1/2 "centered.

4.9 Grab bars

4.9.1 Stainless steel, 18 ga. material, satin non-slip finish, 1 1/2" outside diameter tubing, mounted with 1 1/2" wall clearance for handicapped, with concealed screw mounting flanges as manufactured by Tubular Specialties Manufacturing, 1-800-225-5876.

4.10 Toilet Paper Dispenser

4.10.1 Bar-type toilet paper dispenser shall be constructed of stainless steel with satin finish, designed to hold three standard rolls of toilet paper. All corners will be rounded and holder will consist of two mounting brackets (predrilled and slotted) and one lockable bar.

4.11 Signs

4.11.1 With each order, Boom Concrete, Inc. shall be notified as to the number of toilet signs - MEN'S, WOMEN'S OR UNISEX.

4.11.2 Appropriate signage will be installed to meet ADA-ABAAG standards. The required signs shall be mounted on the exterior wall of the toilet building adjacent to the latch side of the door. Signs will be attached using concrete epoxy.

4.11.3 Signs will be 6"x 9" made of clear Lexan polycarbonate plastic with standard white recreation symbols or text on a brown background.

4.11.4 Message "RESTROOM" will be in raised Grade 2 Braille across the bottom of the sign.

4.11.5 As an option an interior sign reading "PLEASE DO NOT PUT TRASH IN TOILETS. IT IS EXTREMELY DIFFICULT TO REMOVE - Thank you" may be installed above each toilet riser.

4.12 Windows

4.12.1 Glazing





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4.12.1.1 The standard toilet will be furnished with a 20"x36" window with 1/4" Lexan polycarbonate pebble finished glazing clear or bronze/opaque in color. Other optional sizes will be available.

4.12.2 Steel Frame

4.12.2.1 The window frame will 16 ga. metal frame suitable for casting or installation in concrete wall. The frame will be wall thickness plus or minus 1/4".

4.13 Steel Doors

4.13.1 Steel Door - A 3'-0"x 6'-8" steel flush door will be installed in each toilet. It will be 1 3/4" thick, 18 gauge steel panels, 16 gauge internal bracing channels and 14 gauge hinge & lock rail of one piece construction. One coat of baked on primer coating will be factory applied. Doors will be Lockseam LS-series by Shanahan's Manufacturing Ltd. 1-800-661-8420.

4.13.2 Steel Door Frame will be welded type, single rabbet, that is a minimum 16 gauge steel, suitable for installation in precast concrete. Three rubber door silencers will be installed on the latch side of the door frame. Door frame will be factory primed with one coat of baked on coating. Frames will be FW-series by Shanahan's Manufacturing Ltd. 1-800-661-8420.

4.13.3 Spring Door Hinges will be 1-1/2 pair wrought steel, 4 1/2 x 4 1/2, adjustable tension, anti-friction bearing, non removable pin, automatic closing, in a satin brass finish. Hinges will be #1250 by Hager Companies, 1-800-255-3590.

4.13.4 Lockset

4.13.4.1 Commercial grade, heavy-duty cylindrical lockset for exterior door. UL listed complies with ASNI A156.2, series 4000, grade 1, function F76-1 and meets ADA-ABAAG standards for a toilet lock. Lockset will be satin brass finish. Lockset will be 3400 Series Lever by Hager Companies 1-800-255-3590.

4.13.4.2 Lever handles inside and outside with the end of handles return to within 1/2' to 3/4" of door surface.

4.13.4.3 Either handle operates latch unless outside handle is locked by inside push button.

4.13.4.4 Push-button will automatically release when inside lever handle is turned or door is closed.

4.13.4.5 Lockset will have an emergency slot on exterior so door can be unlocked from the outside with a screwdriver. Inside lever will always be active.

4.13.5 Deadbolt - Mortised type, operated by key from outside only, keyed to existing or provided key. Deadbolt will be 3100 series by Hager Companies, 1-800-255-3590.

4.13.6 Wall Bumpers will have a cast metal base, satin brass finish, convex gray rubber bumper with a 2 3/8" diameter and 1" projection, suitable for installation on exterior of steel door. Wall bumpers will be #236W by Hager Companies, 1-800-255-2590

4.13.7 Door and Wall Louvers

4.13.7.1 Door and Wall Louvers will consist of non-vision, two-piece, exterior door louver for mounting on each side of door. Fiberglass or nylon insect screen with a 18-14 mesh installed in an aluminum frame between louvers. Door and wall louvers will be Model 700A by Air Louvers Inc. 1-323-726-8814.

4.13.7.2 Blades of 18 ga. steel will be welded or set into the frames.

4.13.7.3 Frames will have one coat of factory applied baked on primer.

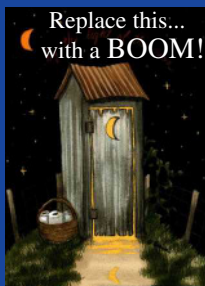
4.13.8 Door Sill Seal will be provided at the bottom of door and will be extruded aluminum channel with one-inch legs on each face of door with vinyl insert on bottom. Door Sill Seal will be #782S by Hager Companies, 1-800-255-3590.

4.13.9 Double Coat Hook - As an option a double coat hook of stainless construction with a satin finish and nail in anchor may be installed. Upper hook shall extend at least 2 1/2 inches from wall and lower hook extend 1 1/4 inches from wall. Mounting height will be a maximum of 48 inches from floor to center of coat hook. Double coat hook will be #895 by Tubular Specialties, Inc. 1-800-472-2227.

4.14 Vault Cleanout - The vault cleanout will be located on the back of the toilet and be an 8" Type PSM SDR35 PVC pipe that extends 4 inches above the ground surface at a 60 degree angle manufactured by J-M Manufacturing, 973-535-1633. Cover will be a 8' Schedule 40 Cap. Cover may be padlocked (owner supplied) using the included latching rod.

Products

- Benches
- Bird Baths
- Boat Ramps
- Cattle Guard Block
- Cisterns
- Feed Bunks
- Flower Pots
- Gravel
- Parking Curbs
- Patio Blocks
- Picnic Tables
- Plinth Blocks
- Redi Mix
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4.15 Vault Vent Pipe shall be polyethylene plastic pipe, 12" nominal size DR21, PE 3608 high density, black color, UV stabilized HDPE pipe manufactured by WL Plastics, 307-682-5554.

4.16 Vault/Liner

4.16.1 Standard Vault configuration will include a precast concrete vault with a minimum wall thickness of 3 inches. The inside of the vault will be allowed to cure for seven days and then be coated with two coats of Conseal CS-55 applied with a paint roller. The vault/liner will have a 5-year warranty against leakage.

4.16.2 An optional double walled vault will be available at extra cost. The optional vault will consist of the standard concrete vault with a one peice molded plastic liner placed inside the concrete tank. The Vault Liner shall consist of a one-piece molded .20" thick LDPE plastic liner by RMI Manufacturing. The LDPE plastic liner will be warranted against leaks for a period of 7 years.

5.0 MANUFACTURE

5.1 Concrete Forms

5.1.1 Steel forms shall be sufficiently rigid to prevent distortion due to pressure of the concrete during placement, vibrating and curing of concrete.

5.1.2 Form ties will not be used in any concrete

5.1.3 Forms will be constructed to allow the interior surface of walls, ceiling and vault to have a steel form finish. Upper surface of the roof slab will have a steel-trowel finish standard with other optional textures by means of form liner.

5.1.4 Form liner patterns shall be continuous pattern match.

5.2 Reinforcement

5.2.1 All reinforcing steel and wire mesh will be put in place and supported in final position prior to placement of concrete.

5.3 Concrete

5.3.1 Placement - Concrete will be poured in layers not more than 24 inches deep. Vibrators or tampers will not be used to move concrete.

5.3.2 Vibrating -

5.3.2.1 The concrete will be consolidated with suitable mechanical vibrators operating within the concrete or attached to the steel forms.

5.3.2.2 Vibration will be done at all points to sufficiently accomplish compaction and not prolonged to a point where segregation would occur.

5.4 Construction and Execution

5.4.1 The walls and floors will be a minimum of four inches thick unless otherwise specified on the drawings.

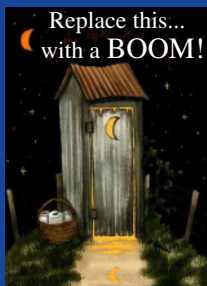
5.4.2 Standard exterior surfaces of all colored concrete components shall have exposed aggregate finish. The exposed aggregate finish will be accomplished by sandblasting, brushing, or other approved methods that will remove 1/8 to 1/4 inch of cement mortar from surface of concrete. The Manufacturer will have available a 12 x 12 colored sample with the exposed aggregate finish for approval. Other optional exterior finishes will be available.

5.4.3 Any exterior exposed aggregate finish will be cleaned, allowed to dry and a concrete sealer will be applied as recommended by the manufacturer.

5.4.4 The four sections of the concrete building will be joined at the seam with epoxy concrete adhesive and four weld plates, two on top and two on bottom. Excess epoxy will be removed flush with concrete surfaces.

5.4.5 The floor slab will be fabricated with a one inch to two inch high raised concrete cove around the perimeter except in the door opening.

5.4.6 Interior vertical wall surfaces will have all depressions and small rock pockets filled with cement mortar while concrete is still green and within one day of form removal.





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- 5.4.7 Patching of holes, chips, exposed reinforcement, and other defects on the exterior of the building will be done with a Portland cement-based patching material with the color, finish and texture of the patched surface matching the surrounding concrete.
- 5.4.8 Signs will be installed on building as shown on drawings per ADA-ABA guidelines.
- 5.4.9 All hardware will be installed in accordance with manufacturer's instructions after finish paint work is completed.
- 5.4.10 Spring hinges will be adjusted after the building is installed to meet the following criteria:
 - 5.4.10.1 Maximum force for pushing or pulling open the door shall be five pounds.
 - 5.4.10.2 The door shall take at least three seconds to move from an open position of 70 degrees to a point three inches from the latch, measured to the leading edge of the door.
- 5.4.11 Wall bumpers will be installed on outside of steel door as shown on drawings to contact concrete wall near edge of the building.
- 5.4.12 Glazing will be installed as shown on drawings with glazing strips on the exterior side of the glazing, secured a maximum of ten inches on center with corrosion resistant Phillips metal screws.
- 5.4.13 Tan or grey concrete enamel on the floor shall extend around the cove at the junction of the wall and floor. Line between the tan or grey floor enamel and white wall enamel shall be straight and parallel to the floor.
- 5.4.14 Concrete surfaces will be allowed to adequately cure and surfaces will be prepared for application of epoxy paints as recommended by the paint manufacturer.
- 5.4.15 Interior and exterior joints between concrete and steel frames of doors will be caulked and joints will be smoothed with a concave surface tool.

6.0 INSTALLATION

6.1 Scope of Work:

- 6.1.1 Work specified under this Section includes, unless otherwise noted, site location, excavation, backfill and placement of precast concrete vault toilet.

6.2 Materials

- 6.2.1 Bedding material to be sand or 3/8" minus crushed or screened aggregate.

6.3 Location and Access to the Site:

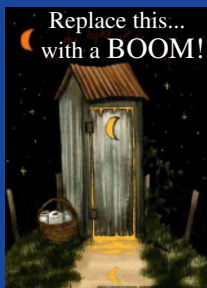
- 6.3.1 It is the responsibility of the customer to locate the vault toilet in area that provides safe and reasonable access for trucks and equipment.
- 6.3.2 The area must be free of overhead or underground obstructions.
- 6.3.3 Care must be taken to not place excavated material in the area where the crane or truck may be positioned.
- 6.3.4 Verify that bridges/culverts en-route to the site are rated for HS-20 loading.
- 6.3.5 Deliveries may be delayed if road conditions are hazardous or unsuitable for normal trucks and trailers.
- 6.3.6 Trucks must be able to reach the site under their own power.

6.4 Excavation and Elevation

- 6.4.1 Comply with all applicable OSHA Standards for excavation.
- 6.4.2 The standard vault toilet requires a hole that is 8ft wide and 8ft long as measured at the bottom. Depth should be 4ft. below desired finished floor elevation.
- 6.4.3 Finish floor elevation will be 4 inches above natural grade measured at the front (entrance) of the exterior slab unless otherwise approved by the customer. The customer may specify a finish floor elevation for buildings at some sites. The contractor will install buildings at these sites with the floor elevation within ± 0.05 feet of the specified floor elevation. It is very important that the installation provides drainage away from the structure.

6.5 Bedding and Compaction

- 6.5.1 Compact the natural ground at the bottom of the vault excavation with a whacker-type mechanical compactor or equivalent approved by the customer.



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6.5.2 Install sand or aggregate bedding material for leveling course. Compact leveling course so there will be no high spots in the middle of the vault bottom.

6.5.3 Set vault in place. Backfill around the structure. Use excavation material for backfill except that rocks larger than six inches in maximum dimensions shall not be placed within six inches of the exterior vault walls.

6.5.4 Fill, adjacent to the building entry, will have excavated material placed in eight inch loose lifts and compacted with a whacker-type mechanical compactor or equivalent.

6.6 Finish Grading

6.6.1 Spread excess excavated material from the vault around structure. Intended final grade is flush with the top of the front slab. Allow for placement of topsoil to reach that grade. Grade backfill away from structure at maximum slope of five (5) percent unless otherwise approved by the customer.

6.6.2 Spread stockpiled topsoil as final layer after rough grading is completed. Areas disturbed by excavation, backfilling and stockpiling of excavated materials will be hand raked to remove exposed rocks over one inch in maximum dimension.

7.0 WARRANTY

7.1 Boom Concrete, Inc. precast vault toilets when installed in accordance with the manufacturer's instructions are warranted against defective materials and/or workmanship for a period of 5 years from date of delivery. All components such as windows, vents, vault toilet risers, grab bars, toilet paper dispensers, doors, locksets, dead bolts, door sweep, door stops, coat hooks, signs and vault vent pipes are covered for 3 years from date of delivery. As an option the double walled vault will include a water tightness warranty for a period of 7 years from date of purchase.

7.1.1 Should a defect appear within the warranty period, Boom Concrete, Inc. will, at its discretion, repair or replace the precast concrete parts that have deteriorated due to such defects in material and/or workmanship provided that Boom Concrete, Inc. is first given the opportunity to inspect such defects.

7.1.2 Boom Concrete, Inc. liability is limited to the value of the precast vault toilet itself and specifically excludes the cost of installation and/or removal and consequential damages.

7.1.3 Failure to comply with Boom Concrete, Inc. installation procedures and general notes will void warranty. Boom Concrete, Inc. assumes no liability in cases of improper installation or misuse.

