

# VOLCLAY PANELS

## BENTONITE WATERPROOFING SYSTEM

### DESCRIPTION

Volclay Panels are a highly effective waterproofing system composed of a biodegradable kraft board filled with high-swelling, sodium bentonite. Volclay Panels contain a controlled rate of 1 pound per square foot (4.8 kg/m<sup>2</sup>) of Volclay sodium bentonite inside the flutes of the 4' x 4' x 3/16" thick (1.2m x 1.2m x 4.7 mm) corrugated kraft board. A special version, Volclay Type 1-C Panel, features a clear, water-resistant coating on the print side of the Panel to inhibit premature hydration of the bentonite from inclement weather prior to backfilling. Once backfilled, Volclay Panels hydrate and form a monolithic waterproofing membrane. Volclay Panels contain zero VOC, can be installed in almost any weather condition to green concrete, and most importantly, have proven effective for more than 35 years.

Volclay Panels work by forming a low permeability membrane upon contact with water. When wetted, unconfined bentonite can swell up to 15 times its dry volume. When confined under pressure the swell is controlled, forming a dense, impervious waterproofing membrane. The swelling action of Volclay can self-heal small concrete cracks caused by ground settlement, concrete shrinkage, or seismic action; problems over which there is normally no control.

### APPLICATIONS

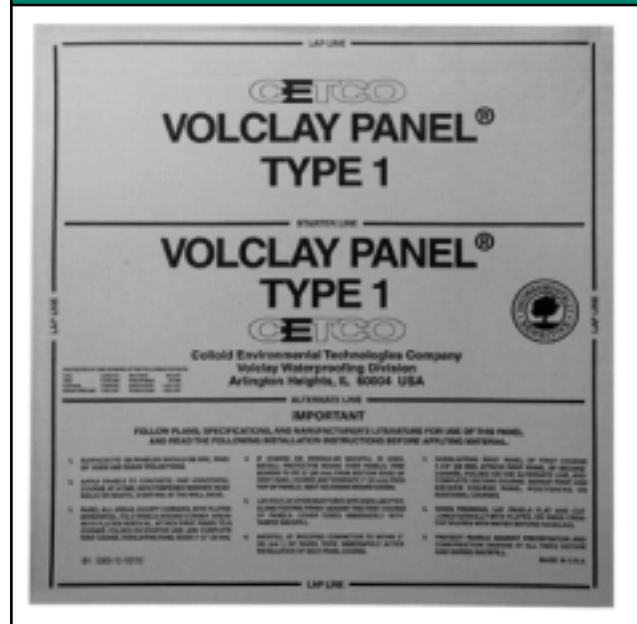
Volclay Panels are designed for below-grade structural concrete foundation walls. Typical applications include backfilled concrete foundation and retaining walls. Applications may include structures under continuous or intermittent hydrostatic pressure. Volclay Panels are not designed for below-grade masonry block walls.

Where contaminated ground-water or saltwater conditions exist, consult CETCO regarding recommended Volclay waterproofing products and installation guidelines.

### INSTALLATION

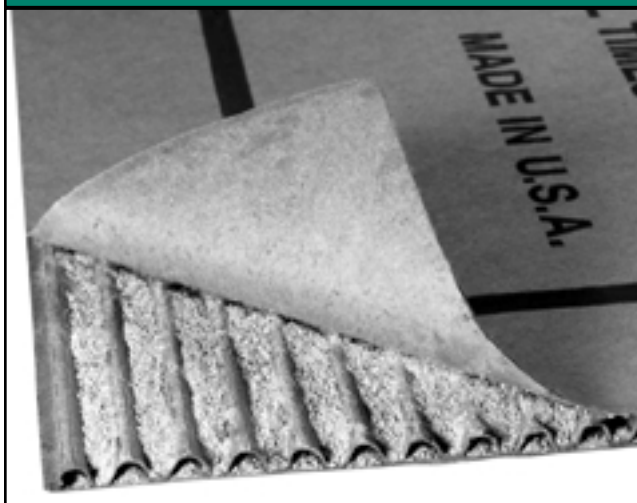
**General:** Install Volclay Panels in strict accordance with the manufacturer's installation guidelines. Use accessory products as recommended. Install both Type 1 and Type 1-C Panels with the print side facing the installer. Install Waterstop-RX in all applicable horizontal and vertical concrete construction joints. Schedule waterproofing material installation to permit prompt placement of compactible backfill material. For applications not covered herein, contact CETCO for specific installation guidelines.

### THE IDEAL GREEN ARCHITECTURE WATERPROOFING MEMBRANE



Consisting only of a natural mineral and biodegradable kraft board, Volclay Panels are one of the most environmentally friendly waterproofing products making them an ideal choice for green architecture projects.

### SIMPLE PRODUCT DESIGN HAS PROVIDED RELIABLE WATERPROOFING SINCE 1963



Volclay Panel corner cut away shows the corrugation flutes of the biodegradable kraft board are filled with 1-lb/sf of granular sodium bentonite.

**Preparatory Work:** Concrete surfaces should be free of voids and sharp projections. Surface irregularities should be removed before installation. Apply Bentoseal® to form-tie pockets, construction joints and honeycombs in concrete. Tapered form-tie holes extending through the wall should be completely filled with non-shrink grout.

**Panel Installation:** Starting at a bottom outside corner of the wall, bend Panel around the corner along the "Starter Line" (printed on Panel) with the kraft board corrugations vertically oriented. Cut the Panel at the bottom along the "Starter Line" so that the Panel can be extended onto the footing a minimum of 6" (150 mm). Secure Panels with washerhead concrete fasteners along each edge and one or two fasteners in the center. Cut and apply a Panel section at the footing corner base where the Panel does not cover. Then apply Bentoseal over the Panel section at the corner. After securing the corner Panel, install adjacent Panels with corrugations (and print) horizontally oriented. Overlap all adjoining Panel edges a minimum of 1-1/2" (38 mm) and extend onto footing a minimum of 6" (150 mm). Continue horizontal placement until the next corner. At the next corner install the Panel with print vertical. At the inside corners, apply a continuous 3/4" (18 mm) fillet of Bentoseal directly in the corner prior to installing the Panels.

Place Hydrobar Tubes tight against the Panel along the wall/footing intersection at the bottom of the wall. "Butt" Hydrobar Tube ends together and tamp a shovel of backfill over them immediately to prevent displacement. Replace any damaged or prehydrated materials prior to backfilling.

Begin the next course at the original outside corner by positioning the Panel at the corner along the "Alternate Line" (printed on Panel) overlapping the previous course a minimum 1-1/2" (38 mm). After securing the corner Panel, install adjacent Panels with kraft board corrugations and print horizontally oriented. Overlap all adjoining Panel edges a minimum of 1-1/2" (38 mm). Repeat Panel installation procedure to finished grade level.

To closely fit around penetrations, cut Panels parallel with the corrugations. Immediately seal open Panel corrugation edge by applying a small amount of water with a wet cloth or sponge prior to Panel installation. Trowel a minimum 1/2" (12 mm) thick layer of Bentoseal around penetrations. Extend Bentoseal onto penetration and completely fill area between Panel edge and penetration.

Terminate Panels at finished grade with a rigid termination bar fastened 12" (300 mm) on center. Embed top edge of Panels in 2" (50 mm) wide, by 1/2" (12 mm) thick layer of Bentoseal. A 12" (300 mm) wide strip of UV resistant flashing material is also recommended to be installed over the top edge of the Panels at grade.

Backfill material should be compacted to 85% of Modified Proctor density immediately following the application of each Panel course. Backfill to within 3" (75 mm) of the top edge of the Panel. If backfill cannot be applied immediately, protect Type 1 Panels (non-coated) from precipitation with polyethylene sheeting. Remove sheeting prior to backfilling. If backfill contains sharp or irregular material, cover Panels

with Protection Mat 10V or Aquadrain® drainage composite to avoid damage during backfilling and compaction.

Tie into underslab waterproofing as required by overlapping the underslab waterproofing a minimum of 6" (150 mm). When a drain tile is required, install it below the top of the footing — not in direct contact with the waterproofing.

## SIZE AND PACKAGING

Volclay Type 1 and Type 1-C Panels are 48" x 48" x 3/16" thick (1.2m x 1.2m x 4.7 mm). Each Panel weighs approximately 18 lbs. (8 kg). Volclay Panels are packaged 125 panels per pallet; 2000 sq. ft. (185 sq.m.) per pallet.

**Storage:** Keep all Volclay materials dry, with adequate polyethylene or canvas cover for sides and top. Block up or pallet materials to prevent contact with ground surface water.

## TECHNICAL DATA

Volclay sodium bentonite is composed of a minimum of 90% high-swelling montmorillonite.

**Permeability Rating:** Volclay Panels have been tested by independent testing laboratories in accordance with ASTM D 5084, and have a measured permeability of  $1 \times 10^{-9}$  cm/sec.

**Hydrostatic Resistance:** A single course of Volclay Panels is rated to withstand 33' (10 m) of hydrostatic head. For hydrostatic conditions greater than 33' (10 m), a double course of Volclay Panels is required.

**Crack Bridging Ability:** Laboratory testing has shown that Volclay Panels are capable of bridging cracks in concrete up to  $1/16$ " (1.5 mm).

**Free Swell Rating:** 2 grams of sodium bentonite sifted into deionized water swells a minimum volume of 16 cc.

**Bentonite Mass per Unit Area:** ASTM D 3776 (mod), 1.0 pound per square foot (4.8 kg/m<sup>2</sup>).

## ACCESSORY PRODUCTS

Volclay Panel System accessories include:

**BENTOSEAL®:** patented trowel grade sodium bentonite compound used as a detailing mastic around penetrations and corner transitions. Bentoseal is packaged in 3 gallon pails (36 lbs (16.34 Kg)).

**HYDROBAR TUBE®:** 2" (50 mm) diameter x 24" (610 mm) long, water soluble casing tube filled with Volclay Bentonite. It is used as a convenient method of adding extra bentonite at the footing/wall intersection. Hydrobar Tube is packaged 32' (9.7 m) per carton.

**WATERSTOPPAGE®:** pure granular Volclay Bentonite used to detail critical areas that may require extra Volclay protection. Waterstoppage is packaged in 50 lb. (22.70 Kg) bags.

**AQUADRAIN®:** prefabricated drainage composite consisting of a heavy filter fabric adhered to a high-strength polystyrene drainage core. Aquadrain is available in 4' x 52' rolls.

**PROTECTION MAT 10V:** heavy geotextile protection course materials that protect installed Volclay Panels from backfill damage.

**WATERSTOP-RX®:** expanding bentonite-based concrete joint strip waterstop designed to replace PVC dumbbell waterstops. Waterstop-RX is manufactured in flexible strips that are adhered into place with Volclay WB-Adhesive. Also place Waterstop-RX around applicable penetrations.

## LIMITATIONS

Do not install Volclay Panels in standing water or during precipitation. If ground water contains strong acids, alkalis, or is of a conductivity of 2,500  $\mu\text{mhos}$  or greater, submit water samples to the manufacturer for compatibility testing. If contaminated ground-water or saltwater conditions exist, consult CETCO regarding recommended Volclay waterproofing products and installation guidelines.

Volclay Panels are not designed for unconfined above-grade waterproofing applications or below-grade masonry block foundation walls. Do not install Volclay Panels in horizontal split-slab plaza deck applications that will receive a poured concrete wear surface or other solid topping.

Volclay panels are not designed for below-grade masonry block foundation walls, with or without a cementitious parge . Consult CETCO regarding recommended Volclay waterproofing products and installation guidelines.

Volclay Panels are not designed to waterproof expansion joints. Expansion joints require a properly engineered expansion joint sealant product manufactured by other companies.

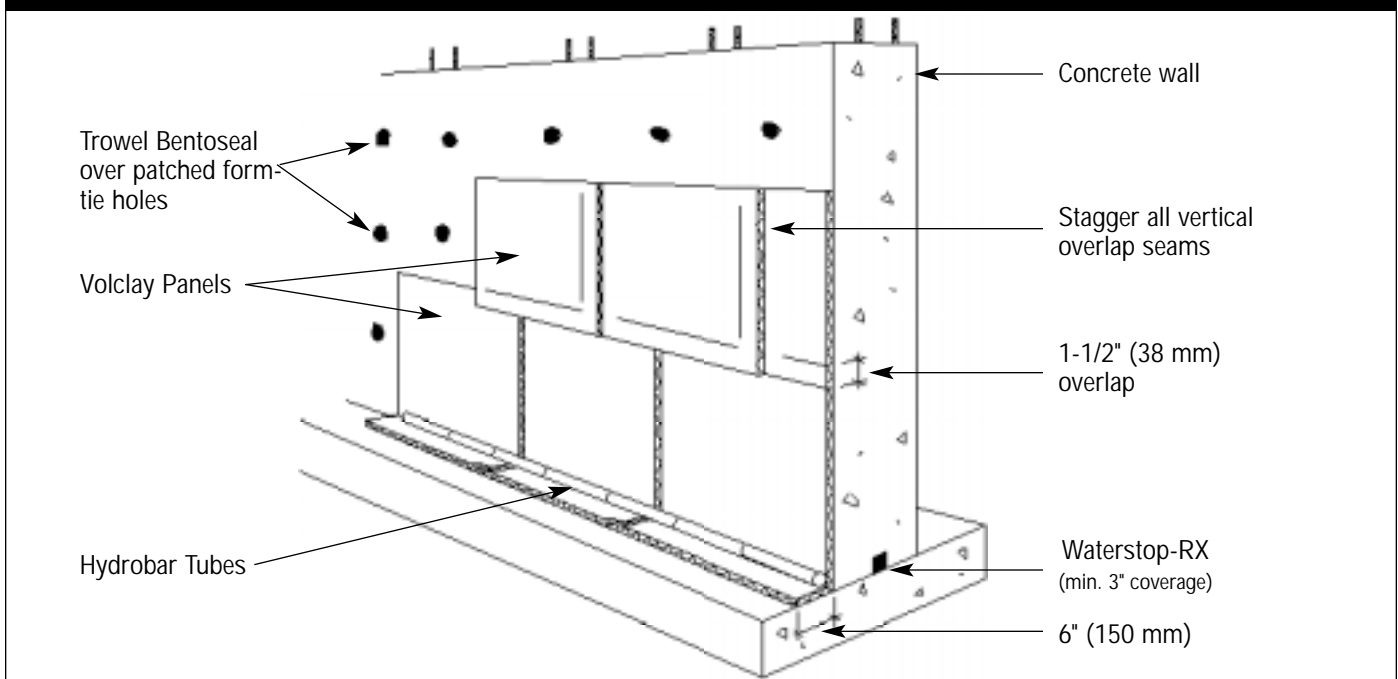
Backfill should consist of compactible soils, pea gravel, or crushed stone (3/4" or less). Compact soils to minimum 85% Modified Proctor density. Stone backfill larger than 3/4" (18 mm) may require the use of a protection course; consult CETCO for specific guidelines. Avoid backfill with aggregate larger than 1-1/2" (38 mm).

## USGBC - INDUSTRY PARTNER

CETCO is an Industry Partner of the US Green Building Council (USGBC). USGBC is a national, committee based, consensus organization representing a full cross section of the building industry whose mission is to accelerate the adoption of green building practices, technologies, policies, and standards through market based solutions. USGBC's primary vehicle for promoting sustainable design and construction is the LEED Rating System (LEED - Leadership in Energy and Environmental Design). The LEED Rating System has been developed in response to the U.S. market's demand for a definition of "green building".

Volclay Panels, consisting solely of natural sodium bentonite carried in a biodegradable kraft board, is one of the most environmentally friendly waterproofing materials in the world. Containing no volatile organic compounds (VOCs) Volclay Panels have been used successfully on thousands of projects worldwide.

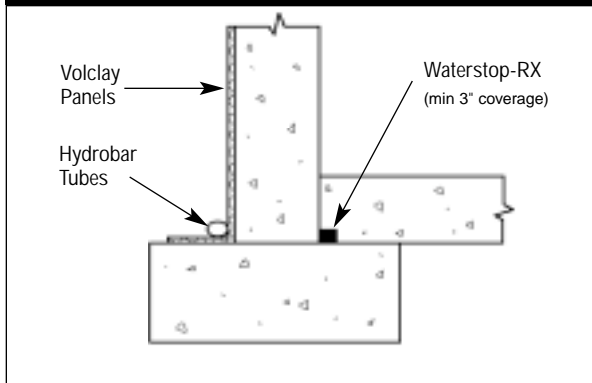
## BACKFILLED CONCRETE WALL DETAIL



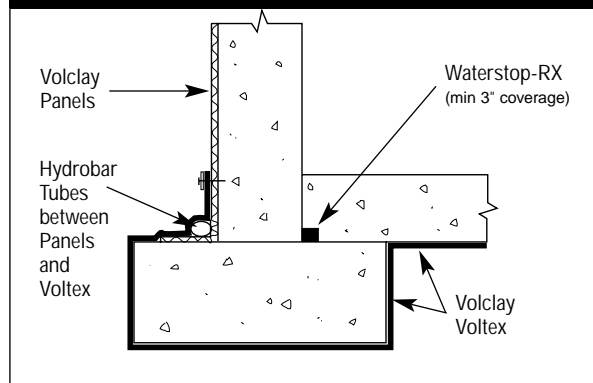
# VOLCLAY™ PANEL WATERPROOFING

## GENERAL APPLICATION DETAILS

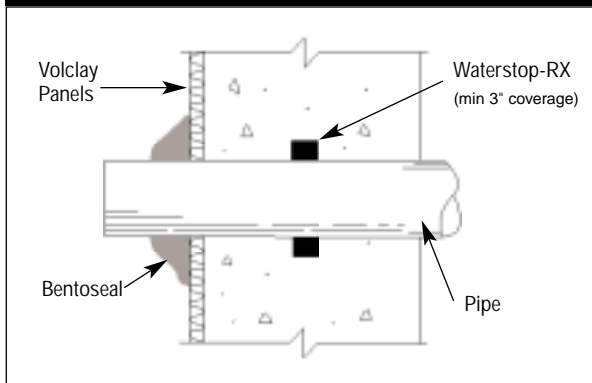
### NON-HYDROSTATIC CONDITION



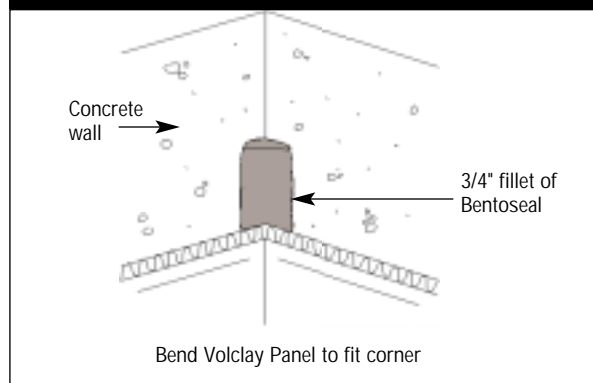
### HYDROSTATIC CONDITION



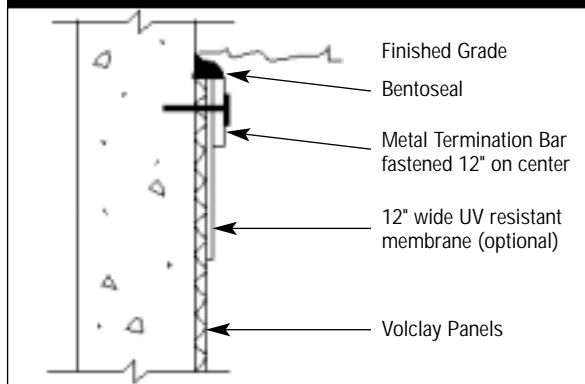
### WALL PENETRATION DETAIL



### INSIDE CORNER DETAIL



### TYPICAL GRADE TERMINATION



SEPTEMBER 2002  
(Supersedes All Previous Versions)

The information contained herein supersedes all previous versions printed prior to September 2002, and is believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information. CETCO reserves the right to update information without notice.

# CETCO

Building Materials Group  
1500 West Shure Drive Arlington Heights, IL 60004-1440 USA  
tel (847) 392.5800 fax (847) 506.6195 <http://www.cetco.com>  
(800) 527.9948