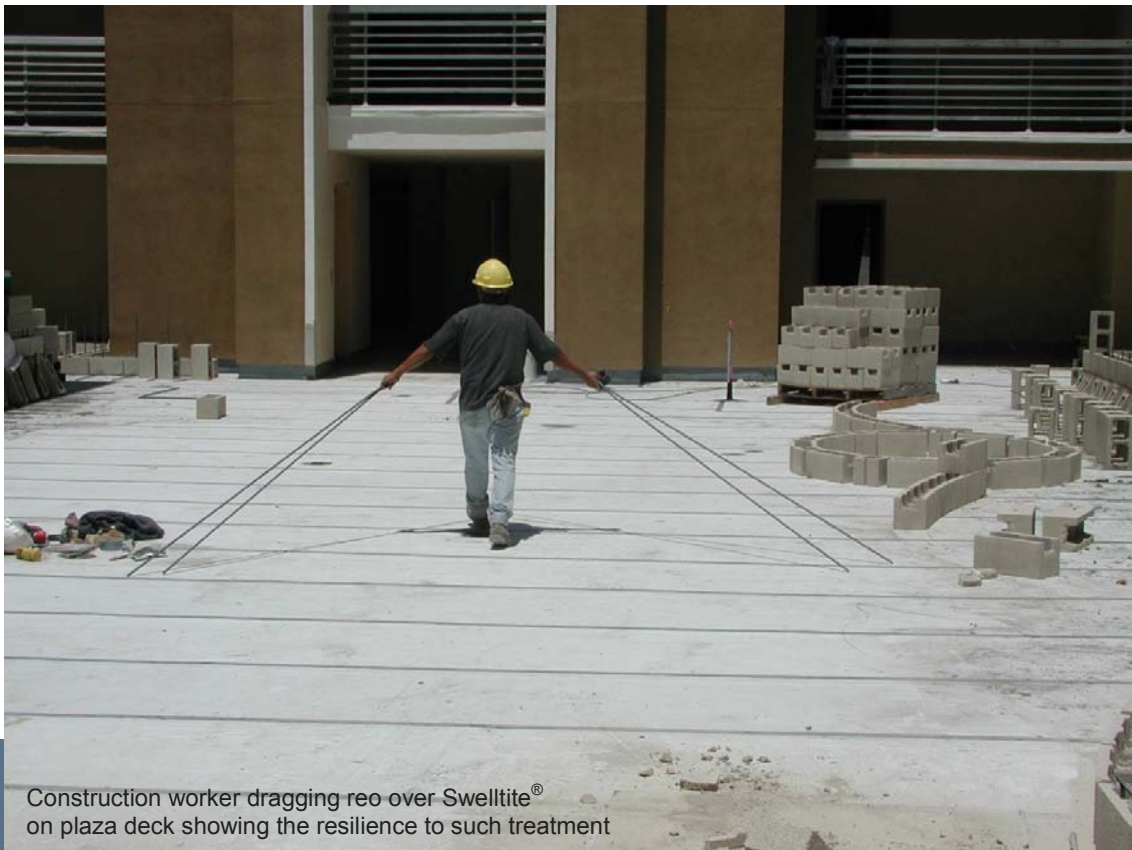


WATERTITE ADVICE - PLAZA DECKS

- Plaza decks a ticking time bomb?
- Tired of leaking plaza decks and water tracking headaches?
- Do you need a waterproofing membrane that is self healing, can be applied in inclement weather and can be easily joined and detailed at difficult joints?

**When a whole lot depends on a reliable seal
. . . Specify VOLCLAY SWELLTITE®!**

This months feature: Plaza Decks



Construction worker dragging reo over Swelltite® on plaza deck showing the resilience to such treatment

Volclay® Bentonite

The material and its applications

Sodium bentonite is a non-toxic mineral found primarily in British Columbia, Alberta, Saskatchewan, Manitoba and the Black Hills region of the United States. It consists largely of a plastic-type clay known for its absorption, expansion, cohesion and sealing characteristics. When hydrated in an unconfined condition, sodium bentonite swells 10 to 15 times its dry volume. However, when constrained against the below-grade foundation's exterior, the material's swell capacity is restricted, and it transforms into a thick, water-impermeable gel. Most manufacturers also add polymers and other chemicals to processed bentonite, enhancing its resistance to salts and other contaminants. These additives can enhance the mineral's impermeability a hundredfold.

Over the last 20 years, bentonite has been combined with geomembranes and geotextiles, forming composite products with greater performance, durability and economy. Today, it is increasingly being used on backfilled foundation walls, plaza decks and tunnels. Although material cost is typically more than asphaltic sheets and fluid-applied elastomeric products, the total installed expense can be less as Volclay® requires neither substrate priming nor protection courses.

The material is a positive-side waterproofing treatment (in direct contact with hydrostatic pressure). It can be installed under reinforced slabs, on backfilled walls' exteriors, as part of a split-slab deck construction, earth-covered tunnel roofs or zero-lot line shoring walls before concrete placement. Volclay® products range from waterstops and geotextile mats to geomembrane sheets, polymer alloy composites and remedial injection grout. The material requires no on-site blending, and is free of volatile organic compounds (VOCs). It can be applied to poured concrete as soon as the forms are removed and/or in freezing temperatures. Volclay® membranes are usually secured temporarily in place with washer-head fasteners until backfill placement or concrete casting against shoring walls. Volclay® can also be installed in formwork at a precast yard and panels then transported to site already waterproofed.

Photo courtesy CETCO



When hydrated, bentonite expands and conforms to penetrations and irregular surfaces, sealing small concrete cracks.

Plaza Decks

Generally, Swelltite® bentonite waterproofing is used with a split-slab plaza deck construction with a minimum 75mm thick concrete wearing slab placed over a bentonite membrane system. Brick and stone pavers – at least 50mm thick, and placed within a setting bed of sand or cementitious grout – offer an alternative wearing surface. Bentonite systems should not be used under pavers perched on pedestals, as this does not provide the required uniform confining ballast - use EnviroSheet® membrane. Bentonite should also not be used under thin set tile flooring or other similar thin wearing surface material.

The wearing surface design should provide positive slope to a sufficient number of drains. Inadequate slope is the most common deficiency in plazas with leakage and wear surface deterioration – industry practice dictates a deck slope of 3 to 6mm per 300mm. In cold climate regions it is extremely important to provide drainage at the membrane level below the wearing surface to avoid deterioration and freeze-thaw heaving. It is also important the subsurface drain assembly has many large weep holes to permit sufficient water flow and reduce clogging.

Membranes on decks should be installed with the bentonite component side down, directly against the structural slab surface. The membrane should be installed from the lowest to the high point across the fall line so the laps shed water like roof shingles.

The overlapped membrane edges should be sealed with the manufacturer's specific seam tape, which protects the installed membrane from pre-hydration prior to the topping slab placement and completes an outer membrane barrier during service. Penetrations, transitions, drains and slab edges should be treated with proper accessory products before membrane installation. Around the deck perimeter, the deck-to-wall transition corner should be detailed with an elastomeric mastic cant, extending the mastic out onto the deck a minimum 150mm, and the vertical wall surface to just below the

SWELLTITE WATERPROOFING

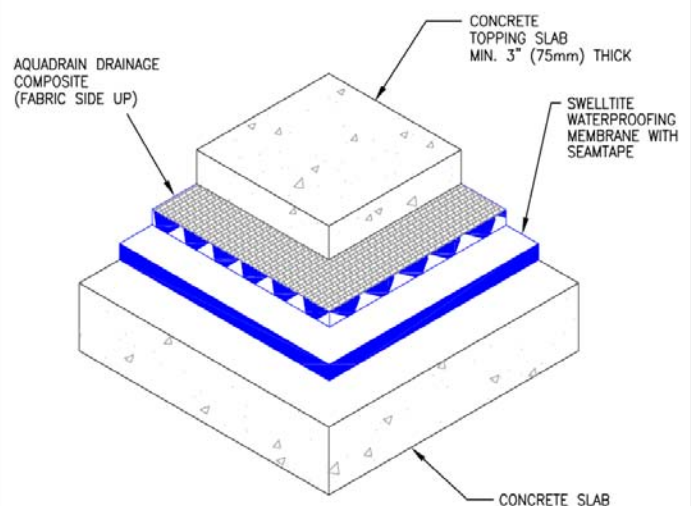
PLAZA DECK

Concrete Topping Slab

DETAIL

ST-400

NO SCALE - 04/05



INSTALL SWELLTITE WITH BENTONITE COMPOUND SIDE DOWN

wearing surface's finished height. The bentonite membrane should not extend up the perimeter wall if joint fibreboard is installed, as it deteriorates over time and does not provide proper containment.

Additionally, bentonite membranes should not be installed all the way to the subsurface drains, rather, they should be detailed around the drain at least 300mm with a trowel-grade elastomeric waterproofing mastic to ensure the bentonite edge does not extrude and clog drain weep holes.

Since open concrete block cells do not provide proper confinement, a fluid-applied elastomeric waterproofing should be specified to run uniformly under any block walls constructed on the deck. To overlap with the bentonite system, the elastomeric membrane – at least 2mm thick – needs to extend outward a minimum 300mm from both sides.

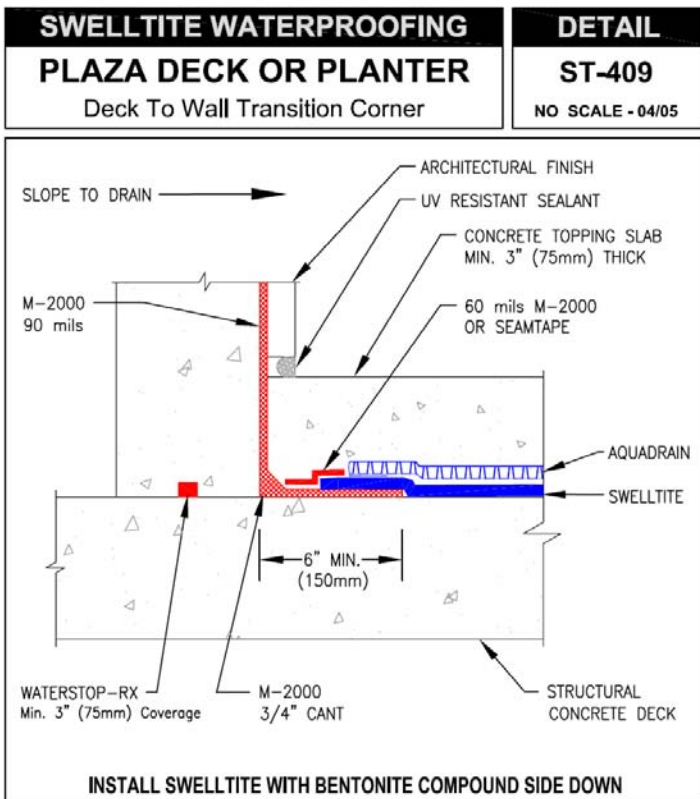
Examples of plaza deck detailing



▲ Circled area shows instance of LDC membrane detailing applied to metal up-stand along with M-2000 detailing to pipe penetrations in foreground.



▲ Plaza deck drain detailed with 2.3mm layer of Volclay M-2000



Precast concrete decks, common to parking structures, have many joints prone to movement, particularly at the ends of precast elements and beside side joints lacking positive connections. As a result, precast deck joints should be grouted and striped with a reinforced elastomeric coating prior to the bentonite system installation.

For pedestrian plywood decks and balcony walkway areas, a minimum 0.8mm thick fluid-applied elastomeric membrane should be installed prior to the bentonite membrane. A bentonite system should not be placed in direct contact with a plywood or milled lumber deck. Tongue-and-groove plywood should be screwed and not nailed, and the joints treated with a geotextile-reinforced, elastomeric mastic strip prior to the full elastomeric coat. As with concrete plaza deck design, drains need to be provided, along with a minimum 75mm thick concrete wearing surface for ballast.

For earth-covered decks or roof gardens, most bentonite systems require a minimum 450mm soil layer compacted to 85% modified Proctor density. Where required, the membrane can be protected from landscaping placement and future removal by installing a protection course over it.

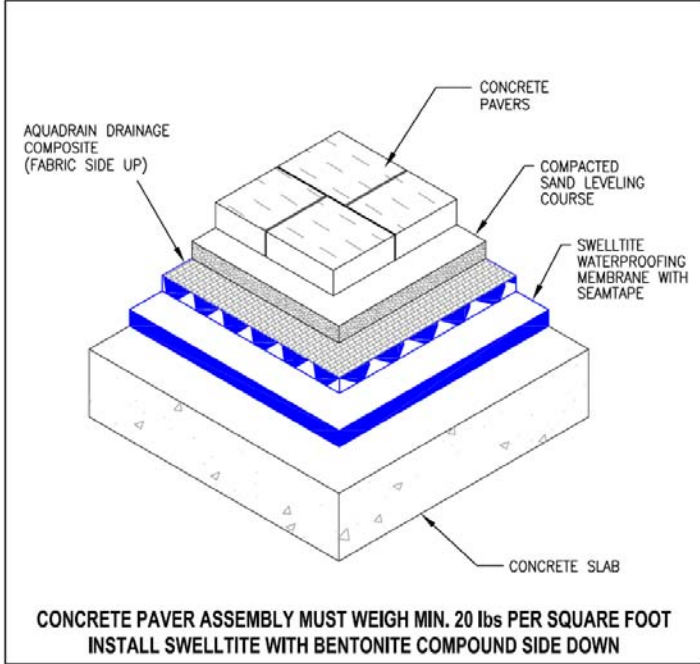


Information compiled by Peter Stevens,
Volclay Sales Engineer

To update your plaza deck specification, contact:
peter@allco.co.nz 0275-420-225

Expansion joints are a common leakage problem in plaza deck waterproofing, but they can be elevated above the membrane level through raised curbs to install the expansion joint material. Additionally, a properly sloped deck should drain water away from expansion joints, rather than over them. (Removable concrete pavers set into a sand bed can be placed above the elevated curb for easier access to the expansion joint should leakage occur).

SWELLTITE WATERPROOFING	DETAIL
PLAZA DECK	ST-402
Concrete Paver Assembly	NO SCALE - 04/05



Limitations

Bentonite's biggest limitation is its need for confinement. Although the material has great swelling properties, most manufacturer's limit its crack sealing to the industry standard established by self-adhering sheet membranes – no greater than 1.5mm – making it an inappropriate expansion joint sealer.



Example of Volclay® M-2000 elastomeric mastic



MasterSpec®
Reference 4131V



- Approved Applicators
- On Site Quality Assurance
- Independent Inspection Available
- See Our Website www.allco.co.nz

