

Technical Design & Installation Guide

 **PGH** BRICKS & PAVERS™

InBrick™ 

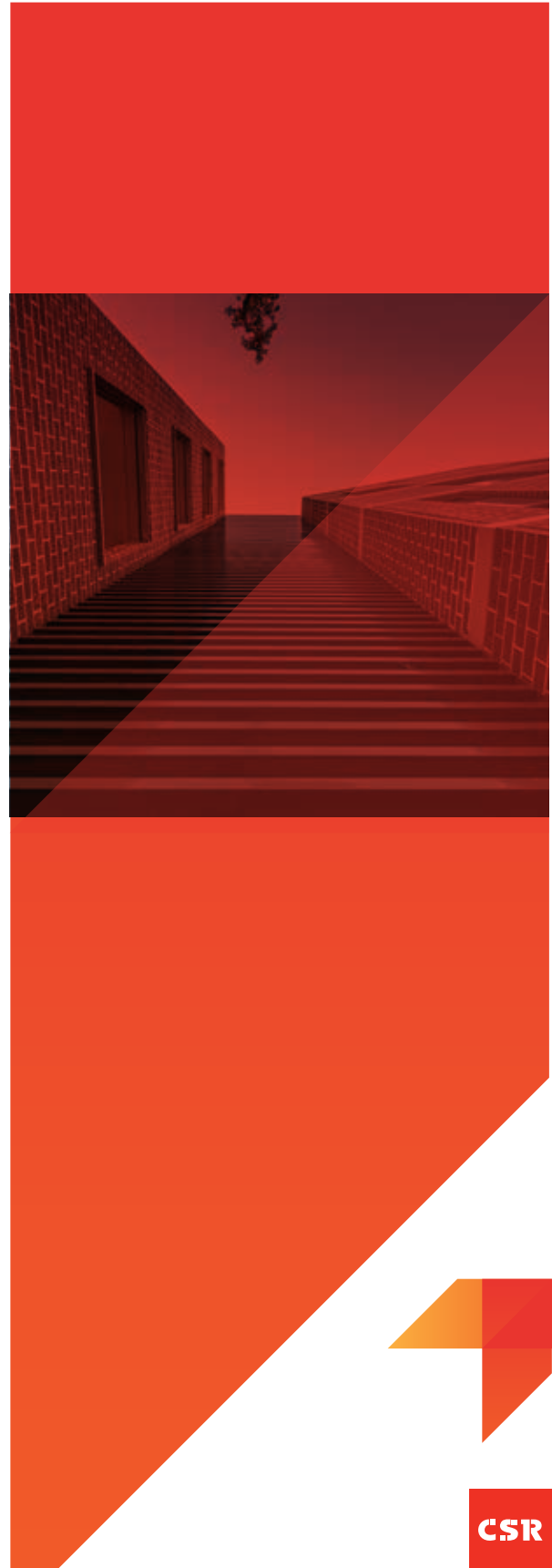
**Inlay
Brick
System**

Bringing the natural
beauty of real brick
to precast concrete

CSR

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01 VersaLiner® – Product Description and Specifications

VersaLiner® is a patented single use liner that enables precast and sitecast contractors to create the closest look to masonry available on a concrete panel. Its unique, seamless joint design provides a realistic covered joint and fully embeds the brick tile for superior bonding and weatherproofing. Each liner is designed with a unique indexing feature that makes setting up the panel easy.



VersaLiner®'s single use design enhances bed utilisation and lowers costs.



VersaLiner® brick tile cross section

A. Material Specifications

VersaLiner® sheets are made of high impact polystyrene – a rigid, yet flexible material optimally suited for easy setup and teardown.

Thermo Form High Impact Polystyrene recyclable material number 6 PS

U.S. Patent No. D479614

Thickness 0.6mm

Weight 0.006 kg per square metre

Tensile 4080 psi at yield

Izod Impact 3.3 @ 23°C

Vicat Softening 104°C

Colour White-primary; can vary

B. Brick Sizes and Bonds

VersaLiner® can be ordered to accommodate a variety of brick sizes. All common bonds are available, including stacked, stretcher, soldier and Flemish. Special bonds are available on a custom order basis.

C. Sheet Indexing – for easy installation

Each sheet of stacked bond VersaLiner® has embossed markings [plus (+) and minus (-) signs] around its perimeter. These refer to the slight size distinction between the molded mortar joints that form the perimeter of each sheet. The joints near the minus signs are slightly smaller in order to fit properly underneath the larger joints. The difference is 0.2mm and is hardly visible to the eye. The difference, however, provides proper overlapping of each adjoining liner for enhanced stability and performance.



D. Re-use

VersaLiner® liners are a balanced combination of durability and economy. They are designed to be applicable to a variety of creative panel designs and to assure they will hold up, even under the most extreme conditions for a single cast. However, considering the designed-in safety factor, some contractors may find the sheets to be useable more than once. PGH Bricks & Pavers warrants only a single use of each VersaLiner® sheet.

E. VersaLiner® Storage

VersaLiner® is relatively impervious to hot and cold weather conditions. However, prolonged exposure to direct sunlight will damage the liners. It is recommended to store them in the packaging provided until they are ready for use. Avoid top-loading, or crushing them in their packages. While they may remain useable, the resulting distortion may make them more time consuming to install.

F. Brick Coursing – Liner properties and coursing

VersaLiner® is a flexible plastic that reacts to hot and cold conditions by slightly expanding or contracting. These slight variations may be compensated for by simply compressing, or stretching, the elastic joints as the bricks are being installed. Once the bricks are nested, their weight will hold the liner in the position.

Thus, one of the most important procedures is to check the coursing frequently as the brick tile is being installed. Brick tiles may be on course at the top and bottom, but still vary in the center. This can be easily avoided by marking and referring to story lines on the edges of each form as the bricks are installed. Story poles are useful as well.



G. Easy Liner Removal

VersaLiner® is made from plastic with an oily microfilm on the surface. This film resists sticking to concrete so that the liner can be removed extremely easily. Removal is generally done by hand with the aid of a small screwdriver or chisel for areas where concrete may have leaked underneath the liners. The labour to strip the VersaLiner® is a negligible component of the job.

H. Corner Methodology

Corner, or return, brickwork can be easily installed with VersaLiner®. Return liners are available as foldable corner liners; separate, factory cropped sheets; or can be prepared on site from the standard liners. It is not necessary to adhere or fasten the vertical liner to the form's bulkhead. One or more of the mechanical methods of holding brick against the form will sandwich the liner at the top.



A common method for holding brick in place is a temporary bond utilising an adhesive such as PSA adhesive. This method is simple and fast, requiring no hammering or clip materials. PSA works best in moderate temperatures (between 7 and 30 degrees C.) and washes off easily within the normal pressure wash process.





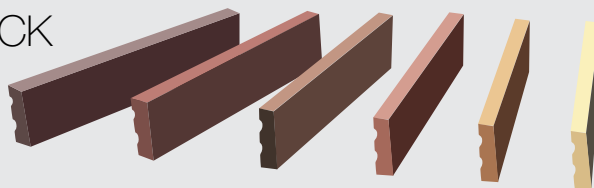
For backer rod, use 40mm aluminum nails, and avoid pinning the backer rod directly against the liner's joints.



Another commonly used method is to use a 'horseshoe clip'. This is a simple 'u' type bend in a heavy (approx. 3mm) wire that slips over the form edge and clamps the brick to the side. These can be fashioned to any width of form an edge or bulkhead, and multiple lengths in order to clamp the corner brick and intermittent half brick. Once the concrete has been placed and vibrated, and begins its initial set, the clips can be easily removed.

02 Brick Tiles

THIN BRICK



Brick tiles are real, clay fired brick that have all of the durable and timeless characteristics of genuine face brick.

A. Brick Tile Colour

PGH Bricks & Pavers (PGH) warrants that the bricks manufactured and supplied to the Builder/Installer, or to the Consumer, on or after 1 May 2015 for use in a wall cladding application (Intended Purpose), which are of the appropriate grade for their intended purpose and are laid in accordance with the relevant building codes, regulations and Australian standards, will remain fit for purpose and colourfast (will not

fade or change colour / shade), for a period of 25 years from the date of this warranty, or if not specified, 25 years from the date of purchase. This warranty is subject to the terms, conditions and exclusions set out below. All of the conditions and requirements stated in this warranty must be met in order to make a claim under this warranty.

B. Storage of Brick Tile

Brick tile is generally packed in cartons, put on pallets and wrapped in protective plastic for transportation. The brick itself is relatively impervious to the elements. However the protective coatings that are often applied to the face of the brick may weather or age. In the case of wax coatings, which are recommended for the VersaLiner® system, they will begin to melt and wick into the brick at temperatures around 55 degrees C. If this happens, its effectiveness as a bond-breaker and release agent is diminished.

It is advisable to protect the brick from extreme heat until it is installed and cast. In addition, excessive dust and dirt may

affect the brick's ability to bond to the concrete properly. Care should be taken to keep the brick covered and protected from the sun prior to its installation.

Keep brick relatively dry prior to installation. Although quality brick tile has low absorption qualities it will become saturated if left exposed to water for a prolonged period. Part of the concrete to brick bond depends on concrete being absorbed into the brick surface. If the brick is saturated with water, the concrete absorption is hindered. It is best to have relatively dry brick when casting.

03 Engineering and Designing the Brick Panel

A. Shop Drawings

Properly detailed shop drawings are vital for successful brick projects. Most jobs require a complete set, taking into account each panel. Brick should be considered as a primary modeling criteria when sizing panels and openings. This can speed installation immensely.

Too often the focus turns to brick after panel sizes have been established. Last minute adjustments and changes can cause disruptions on the job and certainly contribute to tension between the design team and installers. Shop drawings are traditionally the responsibility of the installing contractor, or general contractor. In some cases they are prepared by the engineer, or draftsman, responsible for panel and reinforcement design. Sometimes the material supplier will produce them. In these cases it is the responsibility of both general contractor and the architect to review them thoroughly for accuracy and ensure they reflect intent.

It is not uncommon when preparing these drawings to offer recommendations as to dimensional changes of panels and openings. These changes are usually minor – less than 50mm. These recommendations should be considered carefully as to their impact on other elements. They must

also be acted upon quickly whenever they affect the structural element of a project.

There are a number of important elements that need to be included on each shop drawing:

1. Actual brick should be drawn to scale. Avoid inaccurate hatches that may misrepresent the exact intent with regard to brick placement and size.
2. Coursing and alignment need to be taken into account.
3. Brick should continue in pattern across construction joints consistently. Full brick should abut full brick, half to half etc. A notation is helpful in directing the installers to use either a full or half brick at one corner of the panel.
4. Where cutting or trimming brick is necessary it should be clearly dimensioned to avoid ambiguity.
5. Coursing heights are one of the more critical elements of the drawings. Dimensions such as bottom of brick (B.O. BRICK), top of brick (T.O. BRICK), or header, sill and panel heights, can be established from datums set at the finished floor or bottom of panels. These are easy for the installer to interpret and help avoid cumulative errors in

establishing coursing heights. It is also useful to include partitioned dimensions whenever possible. Although this redundancy may clutter the drawing somewhat, the advantage of being able to establish framing sizes for openings, bands, etc. much more easily, makes them worthwhile.

6. On panels with more than a few courses it is important to give intermediate coursing height check points. These are helpful to the installer. Without they are left to establish their own control lines. When course heights are critical they should be gauged at least every 80mm vertically. Horizontally, a check every 200mm will suffice.

B. Engineering Considerations

1. Pullout tests

Ongoing testing has shown that the embedded brick tile's performance is far superior to hand laid or post-adhered applications. Pullout tests typically generate tensile strengths in excess of the concrete alone.

The various grooved and dovetail configurations of some brick add to their adhesion, as would be expected, but are not necessary in order to achieve satisfactory results. In independent NATA approved testing, resistance has been beyond 1Mpa of embedment strength.

2. Pre-stress or post-tensioning, (deflection criteria)

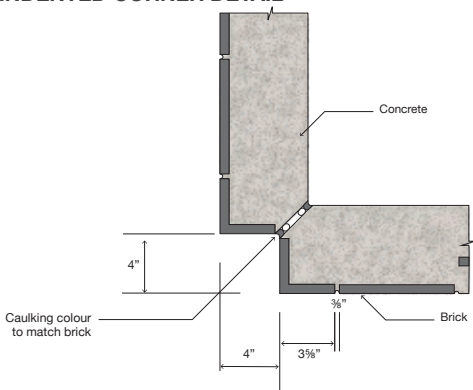
VersaLiner® panels as long as 18m have been pre-stressed with no effect to the brick. Nominal deflection will not cause brick to 'pop' out, or crack.

The brick will not crack without the concrete structure behind it failing. We do not recommend taking any extraordinary precautions in handling large panels other than those that would normally be employed.

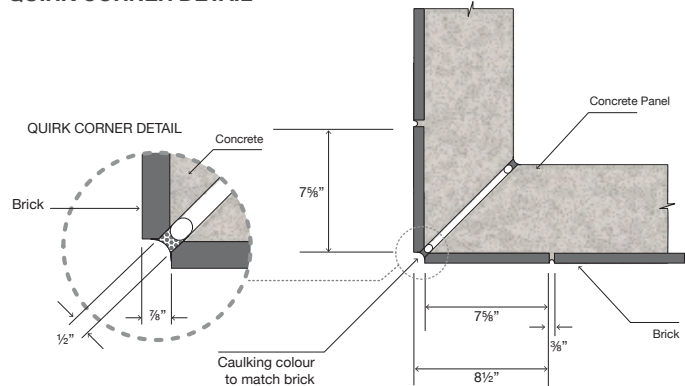
3. Module openings, corners & quirk joints.

The following drawings show various common details used in the VersaLiner® system. They are helpful as guidelines when working with the brick module.

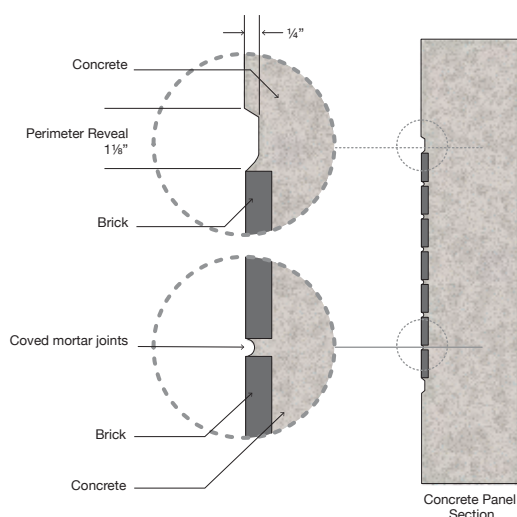
INDENTED CORNER DETAIL



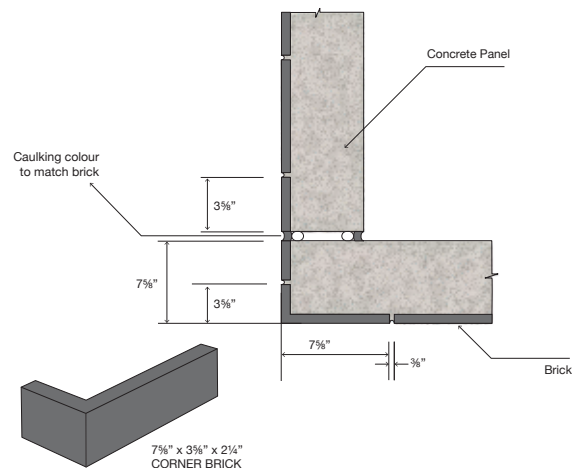
QUIRK CORNER DETAIL



MORTAR JOINT AND REVEAL DETAILS



WRAPPED CORNER DETAIL



C. Designing with Brick

Avoiding “sliver brick” cuts

Occasionally an area to brick is fixed by other factors and cannot be modified to fit a brick module. The joints may be compressed or expanded in order to attain small adjustments in the brick width. This can be attained by using the Adjust-A-Liner. Adjust-A-Liner is a liner with only the horizontal bed joints in it. The head joints are installed separately with the brick. This allows for a great deal of flexibility in adjusting for areas that require irregular spacing.

While this method takes more time to install, it is an excellent solution for areas where the brick joints must be compressed in order to fit an area and avoid an unsightly ‘sliver-brick cut’. It is recommended that the adjustment area be kept to a minimum and that the coursing return to the standard module as soon as possible. Joints are commonly compressed to 7mm without being aesthetically objectionable. They can be expanded as far as 20mm if necessary.



D. Recesses

Recessed areas can add an element of depth and interest to the appearance of a wall. They can be combined with colour changes, or patterns for an even more dramatic set-off.



E. Brick Arches

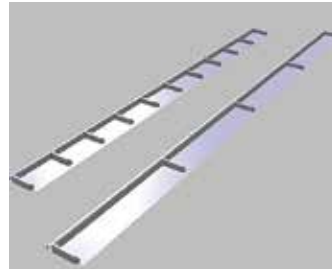
Arches are a common feature on brick structures. Special VersaLiner® liners are available that are customised for a particular arch design. The liners are similar in material to the standard VersaLiner®. They are used in much the same way. However, arched liners are more flexible and can be manipulated and customised.

F. Bounding Rustications

Transitions between brick and smooth concrete should be considered carefully. There are many advantages to having a rustication or embossment in the concrete between the brick and any smooth surfaces. They frame the brick area much like window jambs and sills do with windows. Brick ending directly into concrete looks awkward and untrimmed. A rustication leaves a sharp crisp line that looks more professional. The bounding rustication also helps contain the brick prior to casting. Installing a rustication takes less time than securing the liner to the form and dealing with mortar joints and uneven brick. It is advisable to completely remove the end joint from the VersaLiner® liner, abutting the brick directly to the rustication.

Most of these rustications are small, 10mm to 26mm wide. They need to be at least 3mm deep, but are usually 10mm to 13mm. Typically they will have a 90 degree edge against the brick and a small amount of taper on the outside. Often a 13mm radius timber dowel is used. This is one of the simplest types and is readily available at most lumber yards.

PGH Bricks & Pavers offers easy-to-use VersaLiner® edge accessories. These simulate a smooth mortar joint and may be attached to the form.



VersaLiner® rustication strips



04 Preparing Thin Brick for Installation

A. Blending brick

Clay bricks are made from natural materials. Variation in both the clay and firing process means textures, composition, size and colour can vary from batch to batch. Poorly blended bricks may show unwanted patches, streaks and bands of colour in the finished masonry. To avoid this: all brick tiles required for the project, or as many packs as will fit, should be delivered at one time and stored on site; and, brick tiles should be drawn from different pallets or boxes during the process of laying.

B. Cutting brick

Almost every project requires brick that is cut in some fashion. Bricks are easily cut with common masonry saws that are readily available. The depth of brick facings to be cut is between 13mm-25mm. For optimum efficiency the saw should be fairly powerful. At least 160cc or 5.5HP. This will cut multiple brick fairly rapidly. A water system is highly recommended. While most diamond blades these days are the 'wet-dry' type the dust problem can be severe without water. A closed system is fine (re-circulating water via the pump), however a constant clean water supply will keep the brick cleaner and reduce wear on the pump parts.

The brick usually chips slightly on the edge where the blade exits. If this presents a problem position the brick so that the blade cuts down into its face. This limits most of the chipping to the back edge.

Blades with solid cutting edges of diamond impregnated steel work fine, but segmented blades have the added advantage of dispersing heat more rapidly and generally make more aggressive cuts.

Occasionally it is necessary to shorten a brick tile in order to fit properly into the liner. VersaLiner® does accommodate oversize and irregular shaped brick tiles to a degree. When brick tiles must be trimmed it is often less than 3mm. In these cases the saw blade will tend to slip off to one side during the cut. One solution is to cut multiple brick tiles at once, positioning them alternately on both sides of the blade. This puts pressure on the blade from both sides and reduces the deflection. Six or eight brick tiles can be cut at once in this manner. It may also be helpful to double-up or triple the blades, side by side on the arbor. This widens the cut and helps resist deflection. Check to be sure this is not a safety concern on your particular saw.

C. Brick protective coating

Applying a concrete bond-breaker or retardant to the brick tile's face prior to installation is an important step in creating a successful brick panel job. The retardant will act as a bond-breaker against concrete residue that leaks around the joints of the liner and settles underneath the face of the brick tiles. Without this coating cleaning the brick panel of the concrete residue may be difficult, if not impossible. Wax is the most common bond-breaker application.

A thin layer of wax can be factory applied to the face of the brick to act as a bond-breaker for concrete residue and leakage. This wax can be removed with hot water. Concrete residue varies in thickness from 3mm to a thin cloudy stain. The wax in conjunction with high pressure hot water will in almost all cases remove the latent concrete.

Wax that has melted prior to concrete placement usually wicks into the brick. This reduces its effectiveness, but will still aid greatly in the cleaning. As with any protective coating, the brick should be cleaned as soon as possible.

D. Adhesive Coatings (For adhering thin brick units to vertical return form rails)

Pressure sensitive adhesive (PSA) is a water base adhesive that softens with water and can be removed with high pressure hot water. It is designed to aid in placing brick in the vertical areas of forms and will adhere to the VersaLiner® liner and brick. It is an air dry material that acts like a contact adhesive.

PSA can be applied in one of the following two ways:

- 1 Apply PSA to brick and liner pocket use a brush (cardboard edge will work as well). Once applied to the brick, allow adhesive to dry until tacky (approximately 5 – 30 minutes, depending on temperature; the cooler, the longer) and then place into the VersaLiner® liner pocket. Concrete can be placed within one hour after applying the adhered corner bricks.
- 2 Apply adhesive to brick and liner pocket and immediately bond the two. Let dry for 18 – 20 hours. Care should be taken during this time to ensure that the brick is undisturbed until the adhesive is cured enough to hold it adequately. This method will provide a more complete bond.

PSA is ideal for vertical wall casting applications where there is adequate cycle time for the forms to be prepared. In vertical form applications form is first laid horizontally. Next the VersaLiner® liner is attached to the form face with staples, adhesive spray, or tape, and the coated brick is then placed into it.

Once cured, the form is raised into vertical position and the concrete is cast. Removal of the adhesive is relatively simple if it is attempted soon after the concrete is cured and immediately after the VersaLiner® liners are removed. The Adhesive continues to strengthen as it dries, making it more difficult to remove over time.

Cleaning rates of about 4.6 square metres per hour can be expected if the panel is being cleaned within 30 hours of casting. Yields decrease the more time elapses. A worse case of 2.3 square metres per hour may occur if the adhesive is left for a prolonged time to cure.

E. Undersized Brick

Brick tile may be undersized. This does not present a problem in terms of the liner's ability to hold the brick for casting. Brick tiles will not move or 'float' out of place if concrete is properly placed and vibrated.

As always, a mock-up panel should be produced before casting begins in order to assess the appropriateness of the brick to be installed. The coved joint is the most natural looking type available. One of its benefits is in the way it blends smoothly into the face edge of brick. This blending can visually absorb the thin concrete band or 'eyebrow' that is usually present around the perimeter of embedded brick.



05 Installation

VersaLiner® liner is designed to be easy to install and tear down. Its single use design enables a producer to utilise multiple beds concurrently for even the most complex brick jobs. The following are important installation procedures and tips that will help ensure a smooth and successful panel cast.

A. Trimming liners

VersaLiner® liners are made of a thin, rigid, non-brittle plastic that can easily be trimmed on the jobsite using scissors or a utility knife. For cutting multiple liners at once a band saw is advantageous. A sharp 4-8 tpi blade works well. Care should be taken not to compress the liners before gang-cutting them as this may spread some joints and produce unexpected results.

B. Preparing the form

The form surface should be swept or blown clean. Debris or unevenness will transfer into the brick surface.

It is a good idea to use a base coat of bond breaker or release agent under the area where the VersaLiner® liners are placed. There is usually very little leakage of concrete through the VersaLiner® joints. However, some leakage is likely to occur at the edges.



Reference marks, which are sometimes called 'story lines', are a necessity for most jobs. These help keep the courses lined up to match adjacent panels and properly space brick in their designated areas. VersaLiner®, as with any brick template system, is prone to expand, contract, and in general display elastic tendencies when installed. Reference marks along the side rails and bottom of form give the installer a visual checkpoint to lay to. Brick tiles rarely move

or shift, as long as they are properly placed, bounded with a fixed element such as rustication or form-edge, and care is taken during the concrete placement.



Adhering liners to the form or bed is generally unnecessary. The bounding rustication and edges of the form will hold the liner from moving laterally, and proper concrete placement and vibration will keep the brick and liner from rising. If the brick area is not bounded by some rustication or form element then it may need to be secured to the form face.



A two sided tape or adhesive will work well for this. Staples or nails may be used with care. They may have a tendency to cause the brick to fit irregularly into the pockets. Once the brick is properly assembled into the liner it is extremely unlikely to move. Care must be taken during this assembly to check coursing as the installation proceeds. Liners may have to be compressed or expanded slightly in order to stay

on course, but when the brick is fully installed its weight will hold them in place.

All panel features such as openings, steps, and rustications should be in place prior to applying VersaLiner® liner. It is strongly recommended that a rustication be attached along the perimeter of thin brick areas whenever possible. Rustications at the edges of brick aid in properly spacing it, and give a sharp clean transitional boundary. These rustications, or 'feature strips', are generally not less than 10mm wide and at least 3mm deep, and are firmly secured to the form face. Various methods of attachment can be used: nailing, tape, hot-glue, and magnetism, to name a few. It is good to also calk both the inside and outside of the rustication prior to installing liner and brick.

C. Applying VersaLiner® liner

Take care to note whether the first course of brick requires a full or half unit. It is desirable to match brick edges to those of the adjacent panels, both in alignment and spacing consistency. A spacer or 'full' brick should abut another like unit. The exception to this is at inside corner junctions, or overlaps, where it is irrelevant. Properly prepared shop drawings which are drawn transparently from the back of the panel, should display which brick to start with (e.g., half or full).



Full mortar joints are usually removed from the perimeters of the brick areas. This is easily accommodated by cutting or sawing the VersaLiner® liners prior to installation. A utility knife will easily cut through the liner. Trimming in this way is the most common and simplest. However, if time and planning allow, it is often more efficient to saw multiple liners at one time. A band saw is ideal for this operation. For any repetitive cutting this is a great time saver.



Each piece of running bond VersaLiner® liner has embossed plus (+) and minus (-) signs around its perimeter. The joints near the minus signs are slightly smaller in order to fit properly underneath the larger, plus joints. The difference, so minor it is hardly noticeable, enables the liners to adjoin without buckling.

Avoid walking on the liners before the brick is placed in them. Once brick is installed it can be walked on, however caution and care is advised in doing so.

D. Installing brick tiles



Measure and lay-out coursing lines. This is an important step. Where panels are adjacent with one another it is imperative that brick tiles align across their construction joints. Layout lines, often referred to as 'story lines', should be drawn or snapped periodically along the edges of the brick tile perimeter. The liners may be stretched or compressed manually to accommodate the varying conditions encountered at times. This flexibility must be considered when installing the brick tiles. When installing, it is wise to mark vertical story lines at 600mm increments

(9 complete courses). Horizontally, 2400mm would be sufficient as there is less flexibility between liners in that direction.

Check to establish whether a particular course, (top for instance) should begin with a full or half brick. While this is not critical, it adds to the professional appearance of the finished product if bricks are properly matched, as the pattern crosses construction joints, e.g., a full brick adjacent to another full brick – and halves adjacent to halves. Well prepared shop drawings will have taken this into consideration.

Be sure to install brick tiles face down in the form. While incorrectly installed brick is an uncommon mistake it certainly is an embarrassing one.



Brick Blending: Brick tiles should be drawn from the various stock piles on the job. If a blend is required, the precise ratio should be assembled near the pour bed. The various colours should be numerically staged by boxes. Next, they should be blended together as sets in order to maintain the ratio. At this point the brick tiles should be randomly mixed into the sets. Do not line up the colours or group them. Deliver to the installers randomly blended brick. The installer should then fill the VersaLiner® liner pockets randomly. They should avoid laying brick tiles in some sequential order, such as in a row from left to right etc. This is an important practice, whether installing a blended or monochrome brick, due to the natural variation between the pallets and boxes of factory brick.

Walking on brick. Prior to concrete placement foot traffic over the installed brick tiles is often necessary. This can be done without incurring a great deal of damage to the brick tiles. Brick tiles are prone to breaking, or become dislodged if overstressed. If some care is taken to walk



VersaLiner®
– patented single
use liner

Thin brick facing
nominal thickness
12mm–25mm

Standard 10mm
rolled mortar joint

230mm

10mm

110mm

20mm



'softly', 'set' reinforcing bars, (not drop them), and not 'whip' strands while pulling them, then breakage may be kept to an acceptable minimum. An acceptable number would be somewhere in the vicinity of 1 per 1,000 brick tiles. These brick tiles should be immediately removed and replaced. It's not always obvious to everyone on the job how critical this is, so a general pre-job briefing should stress this important point to everyone who might need to work in the form. This should include the concrete placement team. While there is a very low likelihood of breaking brick tiles once the concrete has been placed, there is the possibility that the suction of someone removing their foot from the sticky concrete will lift brick out of their pockets. Placers and vibrator operators should only step in the concrete when absolutely necessary and then only on top of the reinforcing.

Pre-wetting brick. Pre-wetting thin brick prior to casting is unnecessary and not recommended.

E. Placing Concrete

1. Concrete Placement. When placing concrete, care should be taken not to create currents with the concrete that could disturb the brick tiles. Placement should be done in such a way that there is little or no forceful impact of concrete onto the brick tiles. Ideally the discharge hose or trough should be approx. 150mm above the brick. It is also preferable to pour the concrete onto itself into a small 'buffer' pile and follow it across the brick to fill the bricked areas. This minimises the chance of brick lifting, or tilting. Never use vibration to move the concrete over embedded brick, and be careful when screeding not to drag heavy piles of concrete. The weight of the concrete produces a sticky current over the back of the bricks that can easily dislodge them.



2. Self consolidating concrete. Self consolidating, sometimes called 'self compacting' or 'self leveling' concrete, is by far the easiest to place. It requires little or no vibration, and rarely disturbs the brick tiles. One thing however that must be considered is that some of the same properties that give these cements their elastic properties also tend to inhibit them from attaining the 'feather edges' that otherwise surround each brick. To compensate for this, some mild vibration may be necessary. Producing a mock-up panel would be advisable as a way to find the method that will give you the best results.

3. Vibration. Consolidating the concrete through vibration rarely causes brick tiles to become dislodged from the liner. Brick tiles will not 'float' into the concrete under normal conditions. However, excessive vibrating that causes segregation may affect both the brick tiles and joints.

If interior vibration is used it is best to insert the vibrator into the concrete perpendicularly to the panel. Do not lay the vibrator horizontal and drag it into, or along the surface of, the concrete. When the vibrator is properly inserted the energy affects a broader area and does not induce strong concentrated currents that may tilt brick. Care should of course be taken not to touch the brick tiles with the head of the vibrator. A tennis ball or tape on the head is handy for marking the maximum depth of insertion.

When exterior vibration is used it should be done sparingly. Never use the vibration to level the concrete, instead utilise hoes or screeds. High frequency vibration is preferred to high impact shock tables. Whatever method is used it is advisable to try it on the mock-up test panel first.

4. Slump of concrete. It is not necessary to adjust the slump from the normal setting in order to accommodate the brick tiles. The same batch design that gives satisfactory results to the smooth casting surfaces will work for the brick tiles in VersaLiner® liner.

F. Cleaning the Bricked Panel (see also: Protective coatings, Section IV. C.)

Clean concrete residue from the face of the brick once concrete is properly cured. Protective elements on the face

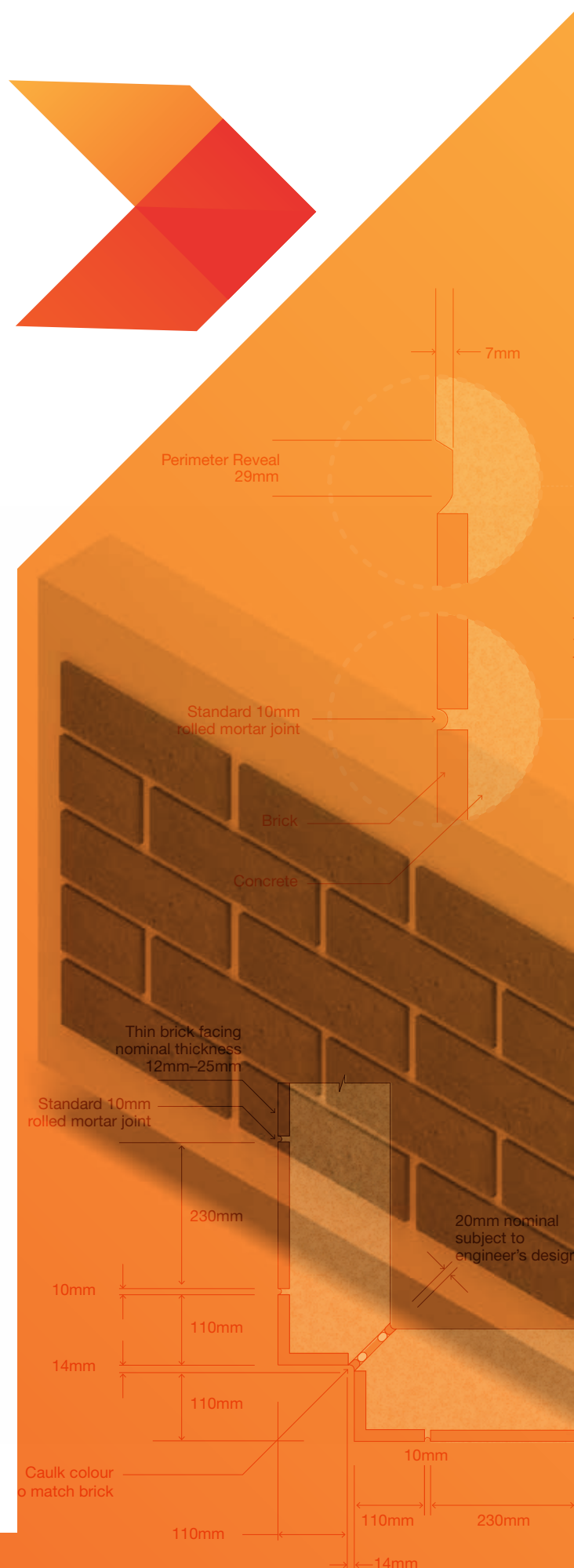
of the brick make cleaning much easier. Wax, brick release, or retarders are some of the materials used to diminish the bond between the brick's face and leakage. In most cases a powerful hot water pressure washer is recommended. The minimum recommended output is 82 degrees C temperature w/ 4000psi pressure.

It is important to consider the cleaning method most suited for each project. The cleaning operation is often the most overlooked component of the embedded brick system, and can be the most frustrating. Inadequate cleaning machinery or protective coatings on the brick may drastically increase cleaning time. It is important to realise that there will be a substantial amount of water involved as well.



A properly chosen pressure washer is extremely important. The optimum capacity machine is about 4000psi. and around 6gpm. at 80 degrees C. Smaller units will work, but they may slow down cleaning speeds. Among most hot water pressure washer manufacturers there is a substantial difference between a 3500psi machine and a 4000psi machine. Hoses, pumps, nozzles, and many other components are considerably more robust in the 4000psi units. It is also good to consider that the tip pressure diminishes over time so that a unit that originally put out 3500psi may after a few months be as low as 3000psi or less. There is a noticeable threshold of increased performance with the 4000psi machines.

Pressure tips are important to consider as well. A 15 degree tip is excellent for concentrating cleaning and breaking action on the concrete residue, but is still a wide enough angle to cover a reasonable area. 'Bell' or 'articulating' nozzles spread the cleaning action over a greater area and are useful when there is light residue on the face. These nozzles make it difficult to focus pressure on specific areas. Both types have their uses and it doesn't hurt to have both on hand.





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For more information contact

pghbricks.com.au/inbrick

inbrick@pghbricks.com.au

1300 119 579

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