Installation Guide

ActiTex

Contents

THIS MANUAL CONTAINS INSTALLATION GUIDELINES FOR THE ACTITEX AND ACTITEX LAM WATERPROOFING SYSTEM FOR INSITU CONCRETE APPLICATIONS, INCLUDING FOUNDATION, UNDERSLAB, PROPERTY LINE AND BACKFILLED WALLS.
FOR APPLICATIONS NOT COVERED IN THIS MANUAL, CONTACT GDA-UK FOR SPECIFIC INSTALLATION GUIDELINES.
BEFORE APPLICATION, READ THIS MANUAL TO GAIN AN UNDERSTANDING OF GENERAL APPLICATIONS & TYPICAL DETAILS.

What is Sodium Bentonite Clay?

Sodium bentonite clay expands when in contact with water, it is of volcanic origin and is sourced from locations around the world. Sodium Bentonite is a natural product, being of non-toxic material with excellent colloidal properties.
GDA uses it vast experience as pioneers in manufacturing of Bentonite to achieve the highest possible performance for all of our waterproofing products & systems.
Sodium Bentonite clay resists water & vapour by forming a monolithic barrier upon contact with water.
The processed bentonite will expand under confinement, forming an impervious membrane that when left undisturbed will be maintained for the life of the structure. Once installed Sodium Bentonite clay will draw moisture from surrounding soils the majority of which it retains even in extreme dry environments.
Tests have shown even if Sodium Bentonite clay is repeatedly oven dried and wetted it will still have the ability to re-hydrate and retain its original swelling capacity.

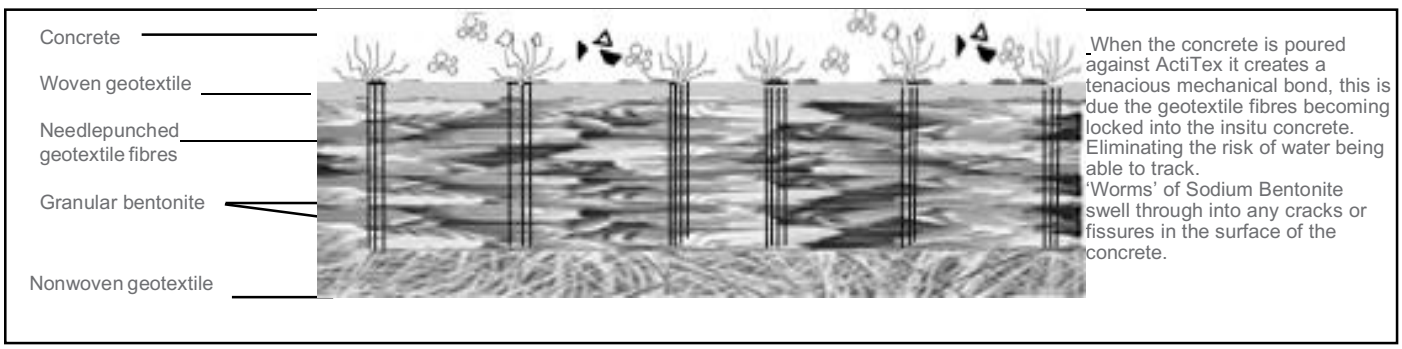

Figure 1 – Cross section illustration of ActiTex waterproofing membrane mechanically bonded to concrete

Installation Guide

ActiTex

Product Description

ActiTex is a highly effective waterproofing composite comprised of two polypropylene geotextiles, a woven & non-woven sandwiching a measured layer of bentonite clay.
ActiTex is referred to as a type A system in BS8102:2009 and achieves classes 1, 2 & 3.
Following a tried & tested needle-punching process using a bed of barbed needles to pull fibres of the non-woven geotextile through the woven layer, the two geotextiles are interlocked which both encapsulates and confines the bentonite.
ActiTex LAM integrates a HDPE liner bonded to the outside surface of the nonwoven geotextile.

APPLICATION

ActiTex allows for rapid installation. Simply locate the product into position and fasten. ActiTex can be installed in any UK weather, with no primers or adhesives needed. ActiTex has no memory and is designed to follow the contours of the substrate to which it is applied, it will cut easily fitting corners or around penetrations. Bentonite when wetted swells up to 15 times its dry volume and when confined forms a dense impervious membrane. Once ActiTex is applied below ground in a confined environment and activated by moisture it will retain that moisture and will perform for the lifetime of the building if left undisturbed.

DURABILITY

Under a controlled factory process the sodium bentonite clay is consistently measured between the layers of woven and non-woven geotextile, GDA's needle-punching process forms an interlocked membrane which confines the sodium bentonite clay. The robust nature of the geotextiles and its ability to mould to a given substrate aid in the membrane being highly resistant to damage during installation. ActiTex installation is un-affected by inclement weather.

SUPERIOR ADHESION

The mechanical bond (peel adhesion) between the poured concrete and ActiTex locks the membrane into the concrete. The mechanical bond will retain the ActiTex in place should any ground settlement or heave occur. This intimate bond eliminating the risk of water tracking between the waterproofing and the concrete.

COST EFFECTIVE AND TIME EFFICIENT

ActiTex is designed to be installed on a properly prepared sub-base, without the need to pour a concrete blinding. The product's lack of memory & inherent flexibility allows for easy installation on irregular surfaces. ActiTex can be installed as soon as the formworks is removed; there is no waiting for the concrete to cure.

ASSOCIATED SYSTEM PRODUCTS

ActiStop – an active expanding concrete joint waterstop used around penetrations and applicable concrete joints. Swells and injects upon hydration

ACCESSORIES

ActiSeal – trowel applied mastic used as a bedding detail around penetrations, corner transitions and terminations.
ActiFill– active granular material used at detail areas that require additional protection.
Acti200 – cementitous, ready-mixed waterproofing impregnator, used to maintain waterproofing continuity within bearing plane locations.
Acti300 – highly elastic cementitous waterproof coating, used as part of an overall waterproofing system.
Butyl Tape – premium tape used to seal overlapped membrane edges of ActiTex.
ActiDrain – foundation drainage composite consisting of a cupsulated core and a filter fabric. Used to reduce hydro-static pressure in combination with a maintainable land drain system.
Termination Bar – Min. 25 mm wide aluminum or stainless steel bar with pre-punched holes on 300 mm centres for fastening.

LIMITATIONS

ActiTex should only be installed after substrate preparation has been properly completed and is suitable to receive the waterproofing system.
ActiTex is designed for below-ground waterproofing applications where the product is properly confined. ActiTex products should not be installed in standing water or over ice. If ground water contains strong acids, alkalies, or is of a conductivity of 2,500µmhos/cm or greater, water samples should be submitted to the manufacturer for compatibility testing.
Both standing & flowing water should be correctly managed before application of any waterproofing system. Though standing water will not alter the performance of ActiTex it can make the surface a little slippery, so should be trafficked with care.
ActiTex is designed for use under reinforced concrete slabs 100 mm thick or greater on a compacted earth/gravel substrate. ActiTex requires a minimum 150 mm thick reinforced concrete slab if installed over concrete blinding.

ActiTex is not designed to waterproof movement joints. Do not use ActiTex on masonry foundation walls. Consult GDA-UK for special installation guidelines that apply to construction methods not shown in this manual.

In this manual, the product name ActiTex is used generically in the installation and application guidelines for the applicable products: ActiTex & ActiTex LAM. Refer to the Product Technical Data Sheets for product descriptions and roll sizes. Illustrations are not shown to scale.

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ActiTex

INSTALLATION GUIDE

To gain an understanding of the ActiTex system application read this guide and relevant product technical data sheets before installing ActiTex.
Ensure you have the current information required.
For project specific applications contact GDA_UK for specifications & details.

SECTION 1 – UNDERSLAB INSTALLATION

ActiTex is designed for use under reinforced concrete slabs 150 mm thick or greater and can be laid on void formers, compacted earth/gravel/sand substrate, or concrete blinding. ActiTex requires a two layers of ActiStop for reinforced concrete slabs greater than 500mm. ActiTex can be used in certain contaminated conditions as determined by tests on water or soil samples taken from the site.

You should always assume a structure will suffer hydrostatic pressure at some point in its lifespan, ActiTex should be installed under footings and ground beams as shown in Figures 1.16, 1.17.

Prior to installing ActiTex the substrate must be properly prepared. Complete all detailing to lower sections eg. lift pit, sump pit, ground beams and piling work prior to installing ActiTex under main slab area. All areas must be correctly completed to form a continuous monolithic barrier.

1.1 SUBSTRATE PREPARTION

Substrate can be any of concrete, void formers, earth, sand, or crushed stone. Earth and sand substrates should be compacted to a minimum 85% Modified Proctor density. Crushed stone should be no larger than 20 mm in size. Substrate should be smooth and without sharp deflections or pockets.

1.2 INSTALLATION

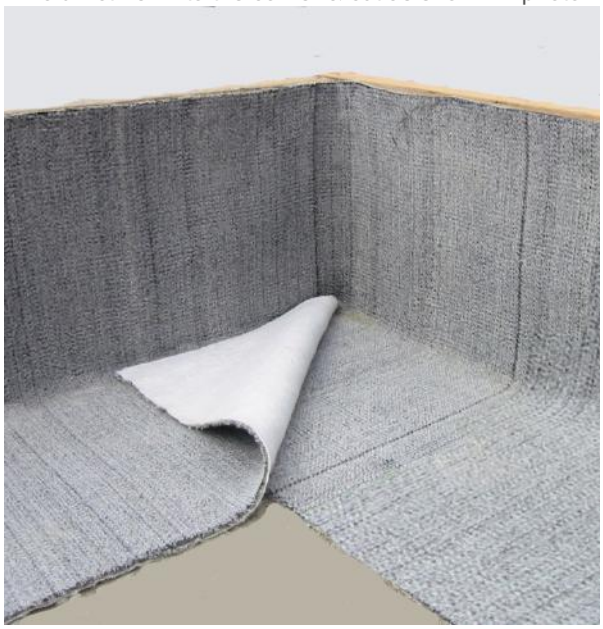
Install ActiTex or ActiTex LAM onto the properly prepared substrate with the dark grey (woven) geotextile side up. First work on the perimeter (slab edge) completing each corner. Then the main slab area by lapping all adjoining edges a minimum of 100 mm and stagger membrane end lap a minimum of 300 mm.

Nail & washer (300mm c/c) or staple (150mm) edges together as required to prevent any displacement before and during concrete placement (Figure 1.12). Avoid ActiTex being lapped more than 3 times.

When the slab is poured in sections, ActiTex should extend a minimum 300 mm beyond the slab edge. This enables ActiTex to be properly overlapped for subsequent slab section pours. ActiStop should be installed in all applicable slab construction joints.

FORMING INTERNAL CORNERS

1.Fold ActiTex into the corner & cut as shown in photo.



2. Forming lap detail below.

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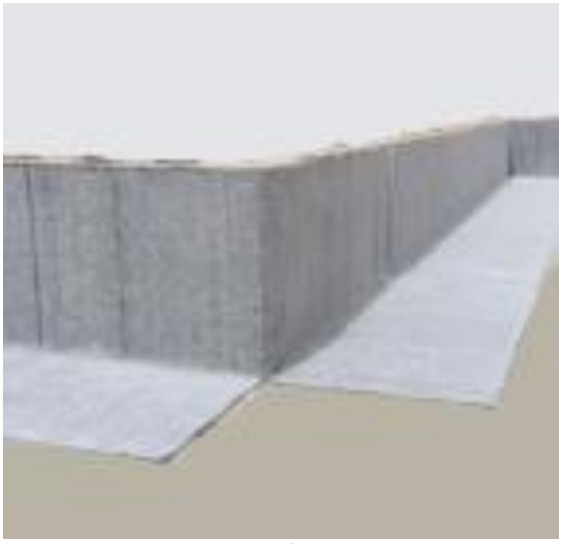
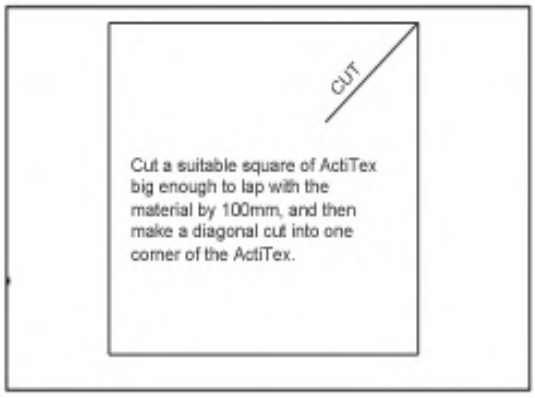
ActiTex

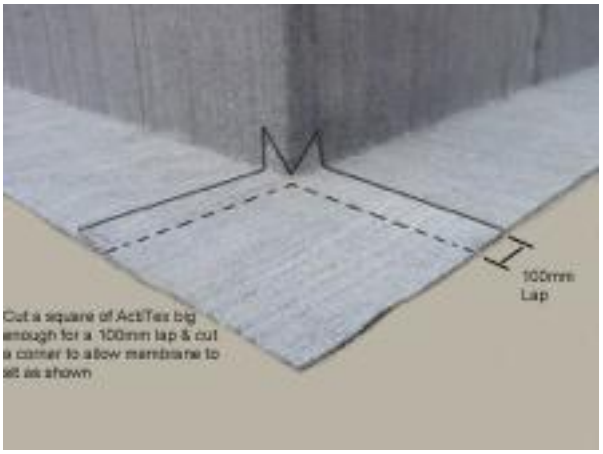
FORMING EXTERNAL CORNERS



1.Fold ActiTex into corner & cut as shown in photo



2.Cut a suitable square of ActiTex



3.Install square of ActiTex as shown below.

LAYING ACTITEX UNDERSLAB

1.Slab edge junction 100mm minimum lap

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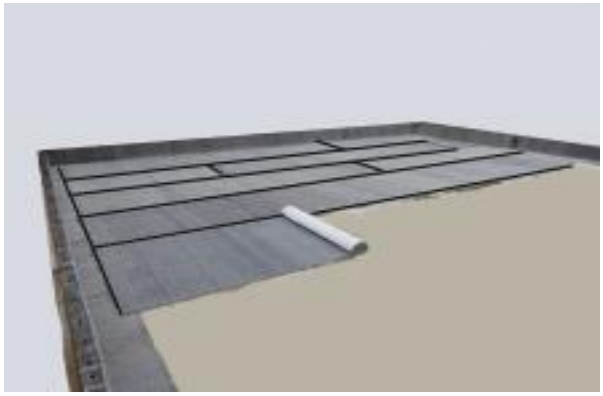

2.Roll Actitex forming 100mm laps & 300mm Staggered End Laps

3.Secure laps with mechanical fixing staple or nail

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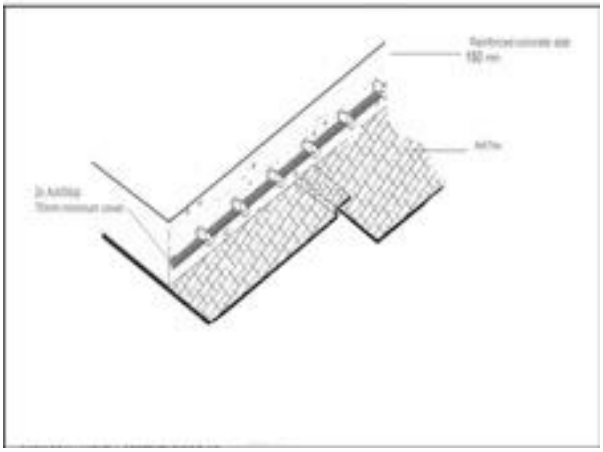

Figure1.16–Construction joint in reinforced slab 150-500mm

ActiStop secured with ActiMesh

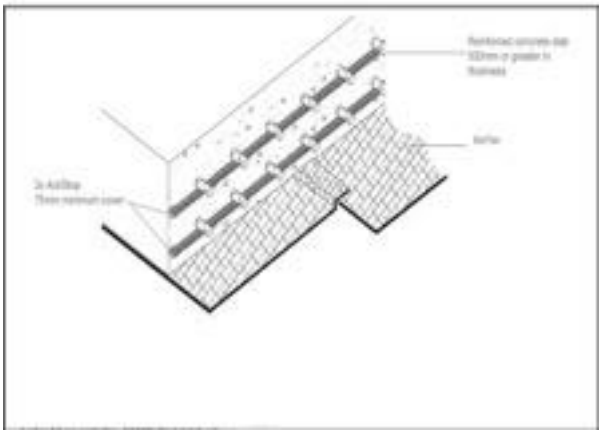

Figure1.17-Construction joint in reinforced slab 500mm+

TYPICAL DETAILS

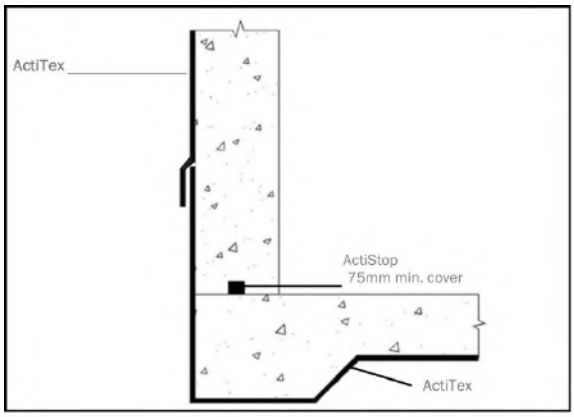

Figure 1.18 – Slab/wall without kicker

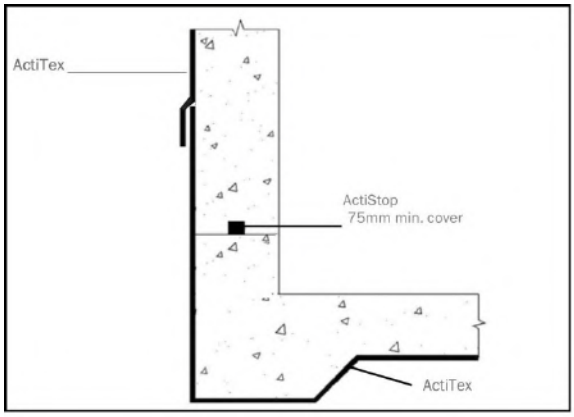

Figure 1.19 – Slab/wall with kicker

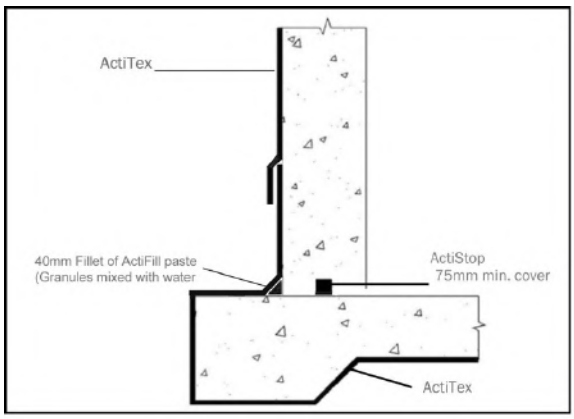

Figure 1.20 – Slab/wall with toe

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1.2 PILE HEADS AND GROUNDBEAMS

ActiTex is typically not installed over pile heads but cut to fit tightly around pile heads. First apply Acti200 across pile head and down sides by 200mm, then lay ActiTex, cutting tight to sides of pile, apply a 40mm fillet of ActiFill paste (granules mixed with water) around pile. Acti200 should extend beneath ActiTex and be in contact with both ActiTex & ActiFill (Figure 1.31).

For ground beams, ActiTex should be either installed under the entire ground beam (Figure 1.33), this is typical on sites suffering radon or using Acti200 as (Figure 1.32) and by taking ActiTex & Acti200 down side of ground beam forming 100mm lap with ActiTex & Acti200.

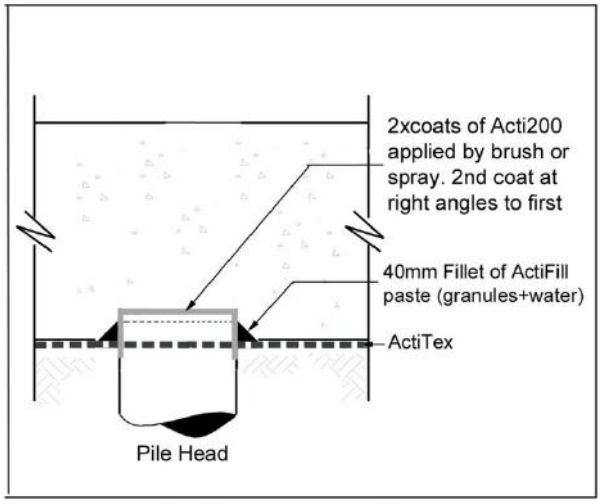

Figure 1.31 Typical Pile Head

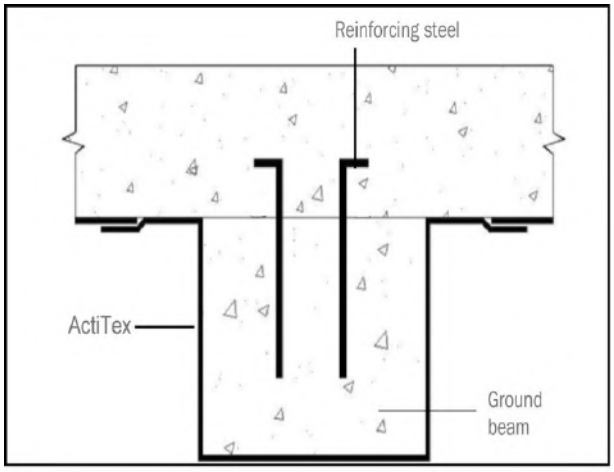

Figure 1.33 ActiTex around groundbeam

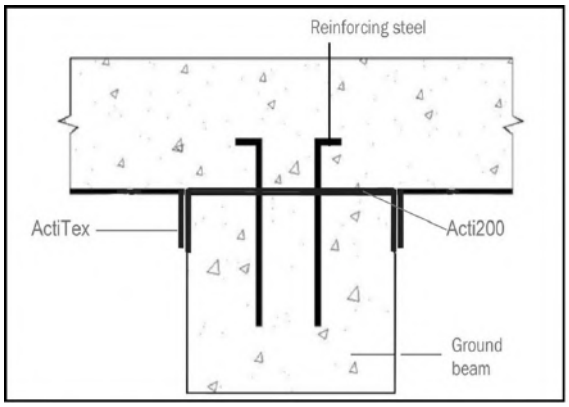

Figure 1.33 Groundbeam with Acti200/ActiTex

Application of 40mm Fillet of ActiFill paste to pile head

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1.4 SLAB PENETRATIONS

Cut ActiTex to closely fit around penetrations and form a minimum 40mm fillet of ActiFill paste (granules mixed with water) around the penetration to completely fill any void area between ActiTex and the penetration (Figure 1.17).

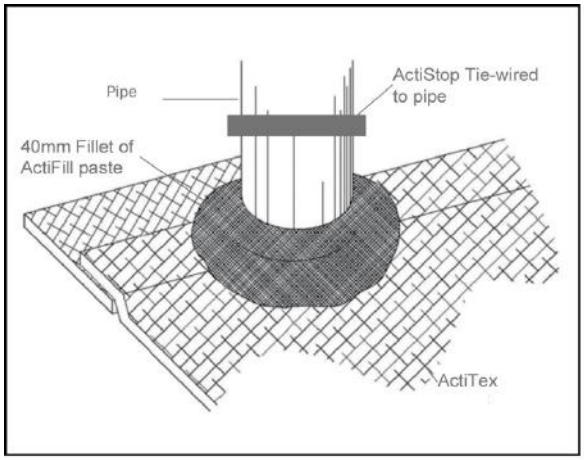

Figure 1.17 – Pipe penetration

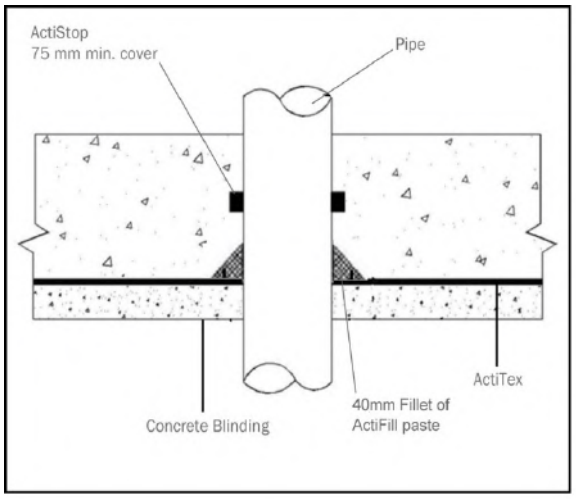

Figure 1.17 – Slab penetration cross section detail

Where concrete blinding is not used, detail an additional chase around the penetration filled with ActiFill granules beneath the ActiTex.

Note: When designing a structure it is good practice to avoid having penetrations in a basement, if possible these should be designed to enter at near to ground level. When penetrations cannot be avoided these should be designed to allow full access to ensure good levels of workmanship in installation. Avoid corners or locations were access can be limited or hindered.

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1.5 LIFT PITS

ActiTex should be placed on vertical surfaces and on the substrate below the slab to form a continuous barrier enveloping around the lift pit (Figure 1.20). If the vertical soil cut is smooth and stable, ActiTex may be installed directly against the soil. Contain unstable soils with concrete backblinding. Install ActiTex directly against the concrete backblinding. Consult GDA-UK for specific installation and detailing.

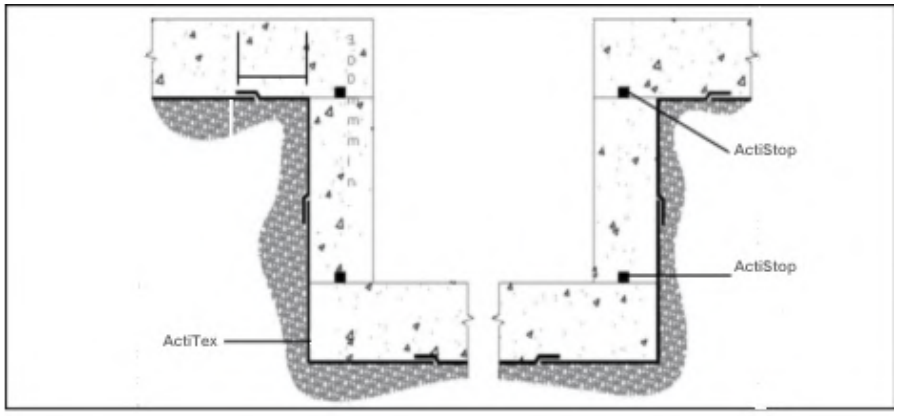


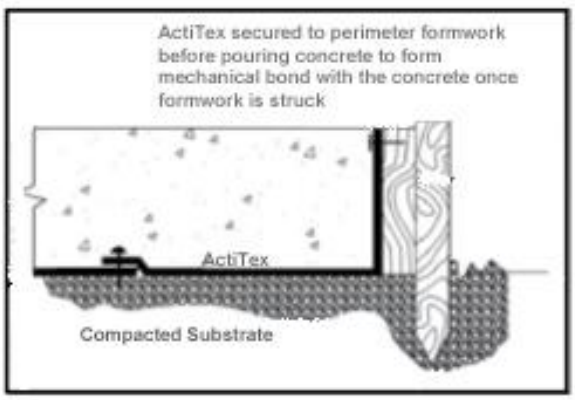
Figure 1.20 – ActiTex under lift pit slab and on excavation cut walls

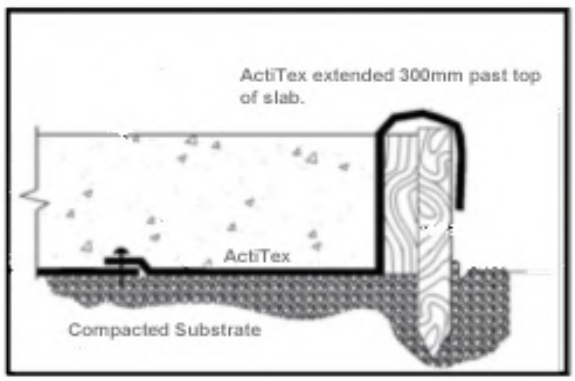
1.6 EDGE OF SLAB

When the installation reaches the outer edge of the slab, continue ActiTex up to the top edge of the formwork inside surface (Figure 1.21) or extend the ActiTex sheet out the top of the form a minimum of 300 mm (Figure 1.22). At the slab corner, ActiTex should remain in contact with the substrate and the inside surface of the concrete form. When the slab edge form is removed, any undamaged portion of ActiTex extended outside the form should be positioned and secured to the top of the concrete footing.

Damaged material outside the form should be cut off and disposed of. Overlap the secured ActiTex edge on top of the footing a minimum 150 mm with the succeeding wall waterproofing.

ActiStop should be installed in the perimeter wall/slab inter- section joint as illustrated in Figure 1.23.





1.7 EDGE OF SLAB, PROPERTY LINE CONSTRUCTION

Where property line retaining walls, are used as the outside form, continue the underslab ActiTex installation up the retaining wall a minimum 300 mm above the top edge of the slab or footing (Figure 1.23). The extra 300 mm sheet extension is very important since there is no access to the outer edge of the footing after it is poured.

Slab to Wall Corner Transition: Install ActiTex or ActiTex LAM sheet horizontally oriented (dark grey woven geotextile facing installer) with a minimum 300 mm of the sheet extending out onto the horizontal substrate. The top edge of the sheet should extend a minimum 300 mm above the finished slab surface. Secure ActiTex sheet to wall with washer-head fastener maximum 600mm centres. Overlap edges of adjacent ActiTex sheets a minimum 100 mm.

If the slab thickness is greater than 600 mm, install a second full sheet or cut strip of ActiTex, horizontally oriented, to meet the 300 mm requirement above the slab. Overlap top edge of previous sheet and edges of adjacent sheets a minimum 100 mm

Base Wall Course: Install first ActiTex sheet course on the property line wall horizontally oriented (dark grey woven geotextile facing installer) over the corner transition sheet, with the bottom edge extending down to the wall/slab transition corner as shown in Figure 1.23. Secure ActiTex sheet to wall with washer-head fasteners maximum 600 mm centres. Overlap edges of adjacent ActiTex sheets a minimum 100 mm

Install underslab ActiTex membrane extending to corner transition, overlapping the 300 mm sheet tail of the corner transition sheet installed at the wall base. Secure corner edge with fasteners 300 mm maximum centres.

For steel sheet piling walls, first install the ActiTex corner transition sheet horizontally oriented with the bottom edge extending minimum 300 mm out onto the substrate. Cut the bottom edge of the corner transition sheet at piling transition angles to allow the bottom edge to lay flat onto the substrate. Then install underslab ActiTex sheet cut to fit contours of steel sheet piling. Finally, install the base ActiTex sheet (horizontally oriented) overlap- ping the corner transition sheet Form a 40mm continuous fillet of ActiFill paste (Granules mixed with water) along base of the wall. (Fig1.24).

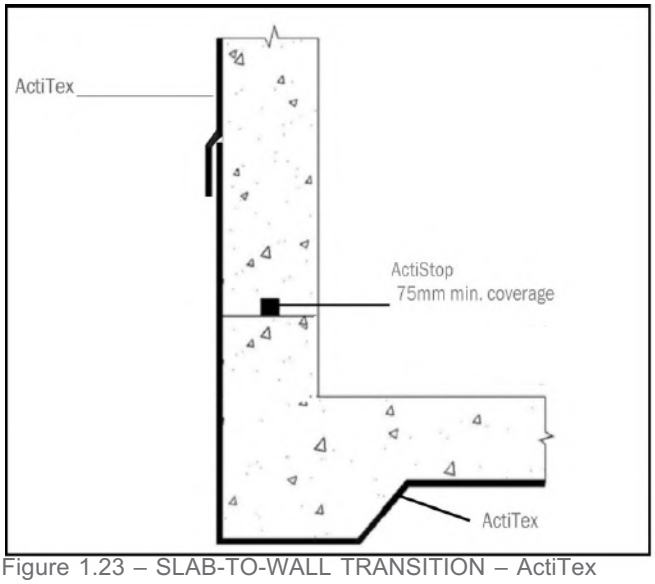


Figure 1.23 – SLAB-TO-WALL TRANSITION – ActiTex corner transition sheet should extend past the height of the top of the finished slab level a minimum 300 mm and extend under the slab 300 mm

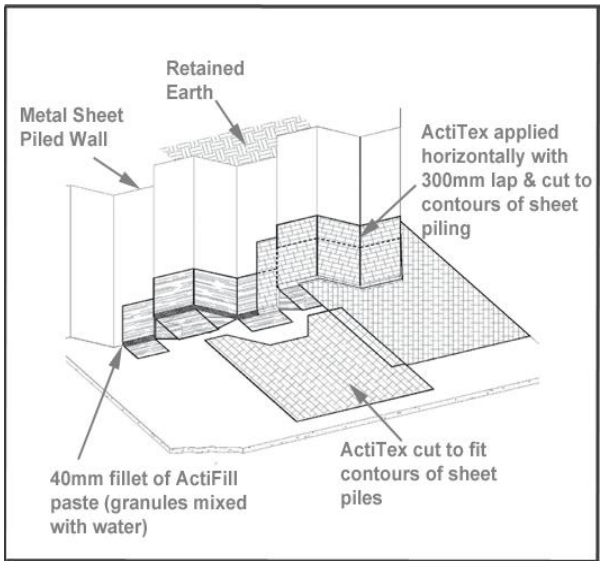


Figure 1.24 – Steel sheet piling to slab transition detail

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2.0 PROPERTY LINE CONSTRUCTION

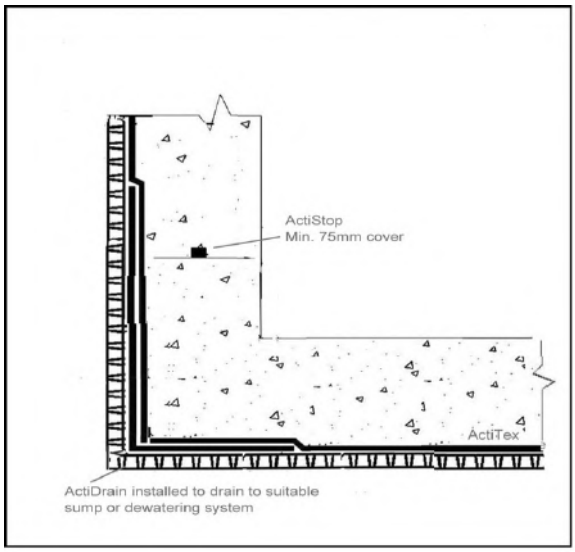
The use of construction techniques described in this section allow the exterior building dimensions to coincide with the property line, thereby maximizing use of available land for building. Bentonite GCL's such as ActiTex/ActiTex LAM has been proven to be one of the most effective and widely used means for waterproofing property line construction. Cast-insitu property line construction methods include steel sheet piling, secant / contiguous piled walls, kingpost construction, earth formed retention walls.

For all property line construction methods, ActiTex is installed to the formwork/shoring wall prior to concrete placement. Install ActiTex or ActiTex LAM with the dark grey (woven) geotextile inward, facing the installer, away from the formwork/shoring wall. Refer to each applicable construction for specific substrate preparation and detailing installation guidelines

If running water is present a method of de-watering is required before applying ActiTex, using ActiDrain composite system connected to a suitable water discharge system (sump pump or gravity discharge**).**

Protect bentonite waterproofing products from hydrating before material is contained with concrete or backfill. After any precipitation, standing water should be pumped off waterproofing as soon as possible.

Employ construction methods to stop water flowing through shoring wall prior to waterproofing installation. If only water seepage, install ActiDrain over the seepage area prior to installing ActiTex.
ActiDrain should extend from seepage elevation to suitable discharge to protect entire waterproofing installation.



Using ActiDrain to de-water

Surfaces should be free of large voids or projections. Voids, pits and cracks in excess of 20mm, shall be parged to flush condition using cement grout, ActiSeal or ActiFill Paste (Granules mixed with water). Projections greater than 20mm shall be removed or smoothed flush. Particular attention should be made to ensure surfaces behind laps are satisfactory. Generally gradual undulating surfaces are acceptable, sudden changes in level (ridges & hollows are not).
When working against property line, always start with the vertical installation, prior to installing ActiTex under slab. Apply the bottom run of the vertical face with ActiTex running horizontally against the property line allowing 300mm of ActiTex to extend under slab.
On Profiled property line (metal sheet piling, secant and contiguous piling, etc) the 300mm base 'flap' will need to be cut and splayed as necessary, to allow the material to sit flat

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2.1 PROPERTY LINE WALL INSTALLATION GUIDELINES

After the slab to wall transition sheet and bottom wall course have been installed, ActiTex sheets can be installed either vertically or horizontally oriented. Fasten ActiTex into position with washer-head fasteners maximum 600mm centres around the sheet edge. Install succeeding ActiTex sheet overlapping the previous sheet edge 100mm. Note: Shingle lap seams so that the bottom edge of the upper sheet is over (behind) the lower sheets top edge.

Continue installation up wall until ground level termination detail, or as specified, staggering all sheet ends of adjacent rolls a minimum 300 mm. Do not allow sheet overlap joints to occur at same elevation as concrete construction joints. Plan by chalk lining the location of construction joints.

Penetrations: Install ActiTex tightly around the penetration. Apply a 5x75mm bed of ActiSeal over ActiTex around penetration and bed ActiStop into the ActiSeal secured with tie-wire. Form a puddle flange with by applying a ring of ActiStop centrally to the pipe (ensuring minimum 75mm cover). With sleeved pipes, the concrete work should include filling the gap between the pipe and the sleeve with non-shrink cementitious grout, mechanical seal by others.

Ground Termination:Terminate ActiTex membrane below finished ground level. Install Solsheet SAM to primed substrate with bottom edge overlapping top edge of ActiTex membrane minimum 150 mm. With a 5x75mm bed of ActiSeal within the lap. Height and detail shall be per project specific details and specifications. Install a rigid termination bar to mechanically fix ActiTex/Solsheet SAM lap, fastened maximum 300mm centre's. When detail has Solsheet HP DPC or other EPDM follow same 150mm lap detail.

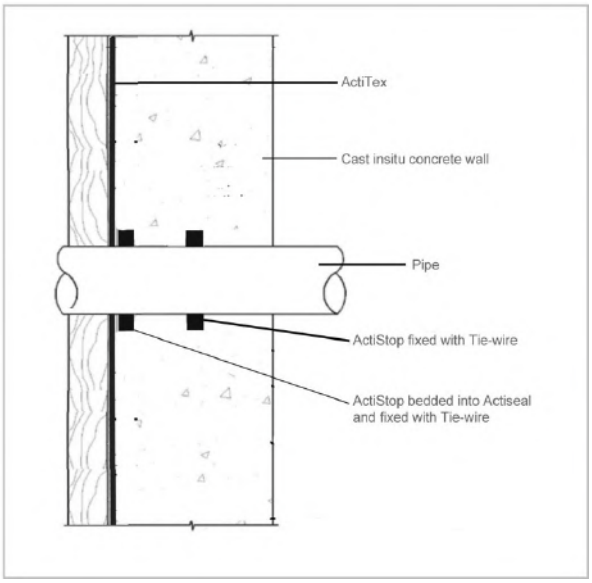


Fig 1.27 Typical Pipe Penetration through wall

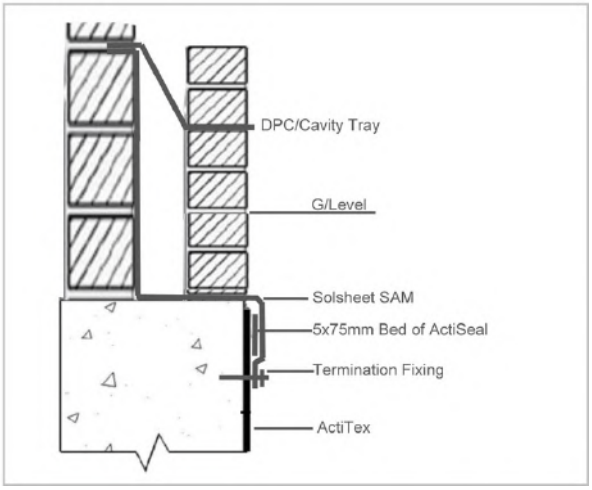


Fig 1.28 Ground level Termination

2.2 STEEL SHEET PILING RETAINING WALL

Verify the following substrate preparation work has been completed. Then install ActiTex following the property line installation guidelines. Special washer-head fasteners are recommended to secure ActiTex to the steel sheet piling.

Preparation: Check condition of steel sheet profiles for voids, damage or mis-alignment. Fill voids or cavities with ActiSea, ActiFill paste (Granules mixed with water) or parge with cementitous grout. Generally, gradual undulating surfaces are acceptable, sudden changes in level i.e ridges and hollows, are not.
If excessive water is penetrating the sheet piling knuckles, consult GDA_UK regarding correct de-watering before attempting to apply

Alternative Plywood Method

Alternatively, 12mm plywood may be fastened to the sheet piling to create a flat surface upon which ActiTex is fastened. All void spaces between the plywood and sheet piling must be filled before placing concrete. Apply ActiTex to plywood following 'Property line Construction' guidelines covered in this information

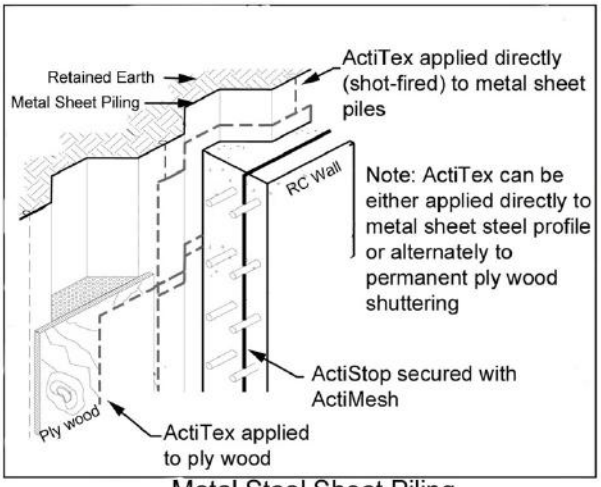
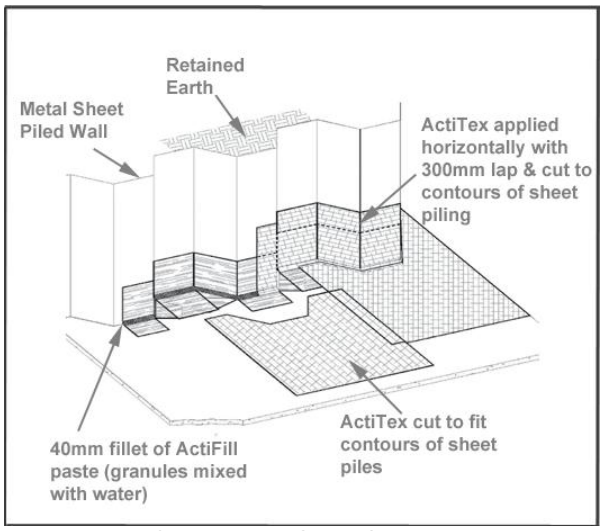


Figure 2.15 – Install ActiTex onto steel sheet piling retaining wall with washer-head fasteners



Installation of ActiTex to Steel Sheet Piling

ActiTex splayed at wall/slab junction following contours.

Fastened using washer head fixings

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Installation of ActiTex to steel sheet pile continued

Aerial view of ActiTex close fit to steel profile

Beneath slab ActiTex cut to fit steel profile

40mm Fillet of ActiTex paste (Granules & water)

Installed Slab/wall ActiTex

Installed ActiTex beneath reinforced concrete slab

ActiTex continued up steel sheet wall

Installation Guide

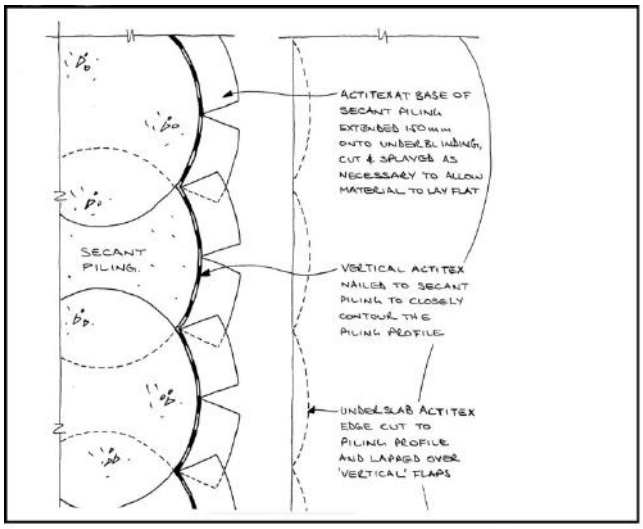
ActiTex

2.3 SECANT/CONTIGUOUS PILED WALLS

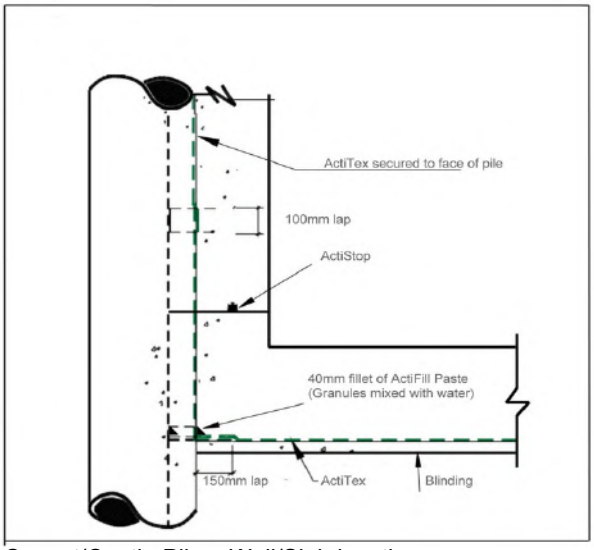
Verify the following substrate preparation work has been completed. Then install ActiTex following the property line installation guidelines in Section 2.1.

Preparation: The surface of secant / contiguous piled must be sufficiently planar to provide an adequately smooth surface to apply ActiTex. ActiTex can be applied over large, relatively shallow indentations where ActiTex can conform tight against the surface. The surface should not contain voids or sharp protrusions in excess of 20 mm. Fill all large recesses between piles prior to installing ActiTex. For application to contiguous piles fix ActiTex to two thirds of the pile. If soil between contiguous piles falls away leaving consistent void areas then application of plywood to the face of the piles may be best option (again any voids behind plywood must be filled).

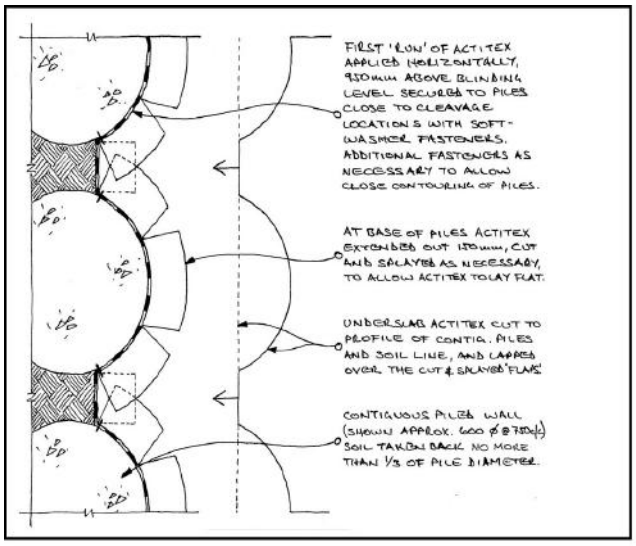
If running water appears through piled wall, then this will need to be managed correctly (injection or other method of de-watering). Consult GDA-UK for guidance.



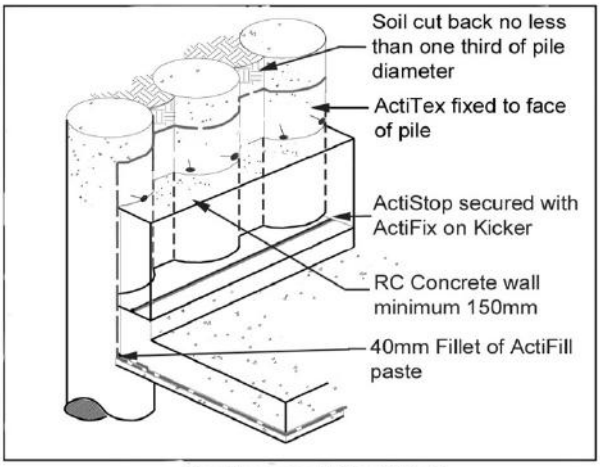
Secant Pile - Plan view Wall/Slab junction



Secant/Contig Pile – Wall/Slab junction



Contiguous Pile – Plan View Wall/Slab junction



Contiguous Piled Wall

Securing ActiTex to contiguous pile (one third of pile face)

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3. BACKFILLED WALLS

Post apply ActiTex & ActiTex LAM with the dark grey (woven) geotextile side against the concrete wall on cast-insitu concrete foundation walls prior to backfilling. ActiTex may be applied as soon as the formwork is struck. It is not necessary to wait for the concrete to completely cure. Use ActiTex with concrete cast with conventional forms that produce smooth surface.

3.1 SURFACE PREPARATION

Foundations should be swept clean of silt, rocks and debris to provide ActiTex with direct contact to the concrete in the application area. The wall surface must be properly prepared before ActiTex is installed. Areas of surface honeycombing or voids should be filled with ActiSeal or a cementitious grout. Protrusions of over 6 mm should be knocked off smooth with the concrete surface. Concrete work should include completely filling holes with non-shrink grout or plugging as advised by GDA-UK.

3.2 INSTALLATION

For projects without concrete blinding before installing the first course of ActiTex, place a continuous 40mm chase of ActiFill at the wall/footing junction.

Beginning at the bottom corner of the wall, install ActiTex horizontally oriented with 1m on one wall and the remainder around the corner on the other wall surface. Cut the bottom edge of ActiTex at the corner a minimum of 150 mm so that ActiTex can be extended onto the footing. Fasten ActiTex into position with washer head fasteners maximum 300 mm centres. Then cut and install a ActiTex section over the uncovered footing corner area. Apply ActiSeal at the ActiTex section to ActiTex overlaps.

Install adjacent ActiTex rolls of the bottom course horizontally oriented. Each roll should overlap the preceding roll a minimum 100 mm and should extend onto the footing a minimum 150 mm. At vertical inside corners apply a continuous 20mm fillet of ActiSeal directly in the corner prior to installing ActiTex. Stagger all vertical overlap joints a minimum of 300 mm. When radon conditions exist, the vertical wall ActiTex should cover the entire footing and overlap the underslab waterproofing a minimum 150 mm. Tape all ActiTex LAM membrane overlap seams with Butyl Tape.

Backfill: The excavated area should be backfilled and compacted promptly after ActiTex is installed. Use placed backfill as a platform in applying succeeding ActiTex courses. The backfill must be compacted to a minimum 85% Modified Proctor density. Backfill should consist of compactible soils or angular aggregate (20 mm or less) free of debris, sharp objects, and stone larger than 20 mm. When backfill cannot be placed immediately protect membrane from precipitation and debris by sealing edges to concrete substrate with Butyl Tape. This temporary termination can be left in place covered by subsequent membrane overlap.

3.3 POST APPLIED ACTITEX – PENETRATIONS

Cut ActiTex to closely fit around penetration, trowel a minimum 40mm thick fillet of ActiSeal around penetration. Note the penetration should already have a puddle flange formed using ActiStop tie-wired to the penetration.

For a specific detail or areas of multiple penetrations consult with GDA-UK for a suitable project soution.

3.4 TERMINATIONS

Post applied ActiTex would typically be finished using a termination band with fixings to suit substrate and depending on building construction the link between ActiTex and damp proofing can vary, we would suggest you consult GDA-UK for a specific project detail.

For applications and details not covered in this guide contact GDA-UK.

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