gcp
applied technologies

Application Manual

PREPRUFE® Plus

PRE-APPLIED MEMBRANES

DO'S AND DON'TS
OF APPLYING
PREPRUFE® Plus
PRE-APPLIED MEMBRANES

Please turn over

DON'TS

1. Do not use a protection screed over the PREPRUFE® Plus membrane. The membrane is designed to bond to structural concrete.
2. Do not use as pond or tank liner.
3. Do not use PREPRUFE® Plus membrane for installation in concrete infilled hollow block wall construction. The membrane is designed for use with reinforced concrete designed for a maximum crack width of 0.4mm.
4. Avoid curved shapes for permanent formwork and blinding otherwise extensive cutting and folding of the PREPRUFE® Plus membrane will be necessary. Angular formwork will generally be easier for use with PREPRUFE® Plus membrane.
5. Do not use staples to fix the membrane to temporary formwork.
6. Do not allow water to pond beneath the PREPRUFE® Plus membrane prior to concreting - can lift to the membrane and damage the joints.
7. Do not 'mix & match' GCP waterproofing membranes with membranes from other manufacturers except with prior agreement with both companies.
8. Do not allow the vibrator to come into contact with PREPRUFE® Plus membrane - can damage the membrane.
9. Do not apply Shotcrete to PREPRUFE® Plus membrane.

DO'S

1. Use flush fixings to fix PREPRUFE® Plus membrane to permanent formwork.
2. Place flush fixings through the selvedge to enable them to be covered by the next overlapping sheet.
3. Where fixings are made to secure vertical PREPRUFE® Plus membrane to temporary formwork, 40 mm clout nails should be used, 20 mm being left exposed to provide an anchor for the nail during striking of the formwork.
4. Seal fixings with 2 layers of PREPRUFE® Tape where fixings have been placed through the membrane into blinding but not overlapped.
5. Firm fold the PREPRUFE® Plus membrane at 90° changes in direction to allow maximum contact with the substrate.
6. Extend the PREPRUFE® Plus membrane beyond the starter bars rather than the edge of the stop-end formwork to ensure easy overlapping of the adjacent bay PREPRUFE® Plus membrane.
7. Stop the PREPRUFE® Plus membrane minimum 50 mm below top of concrete surface on temporary (removable) formwork.
8. Use PREPRUFE® Tape LT at all overlaps including the adhesive selvedge when the ambient application temperature is expected to fall below 0°C.
9. Seal 'Fish Mouth' openings i.e. where the overlapping PREPRUFE® Plus membrane has not stuck to the layer beneath should be sealed, with PREPRUFE® Tape.
10. Air lance debris away immediately prior to concreting unless there has been a heavy build up of mud on the PREPRUFE® Plus membrane in which case use a high pressure water hose and air lance.
11. Repair damage to the PREPRUFE® Plus membrane before concreting.
12. Remove surplus water from the excavation to be concreted.
13. Check all the release liner have been removed before concreting.
14. Remove grout spillage on the PREPRUFE® Plus membrane as it can locally inhibit the bond of fresh concrete placed on it.
15. Ensure that correct concreting and vibrating practices are observed during concreting.
16. Concrete with pfa, additives and admixtures can be used with the PREPRUFE® Plus membrane.
17. Wait until the concrete strength is 10 N/mm^2 before striking the formwork.

Contents

	Pages
Introduction	
Applications	4
Independent Assessments	5
Advantages	5
Limitations	6
System Components	6
Material Properties	8
Health, Safety & Environmental Issues	
First Aid Measures	10
Fire-fighting Measures	10
Handling and Storage	10
Environmental Effects	10
Personal Protection Equipment (PPE)	11
Installation - General	
Delivery to site	12
Material Storage	12
Substrate Preparation	13
Removing PREPRUFE® Plus membrane from the box	15
Tools/Materials required	17
Installation for Slabs	
Method 1 - Vertical PREPRUFE® membrane < 900 mm	18
Installation - Internal & External	20
Method 2 - Vertical PREPRUFE® membrane > 900 mm	22
Installation – Horizontal	
Application Sequence	24
End Laps and Cut Edges	26
Penetrations	27
Membrane Repair	28
Installation – Vertical	
Application Sequence	29
Placement on Vertical Pile Walls	30
Installation – Double Sided Formwork	
Wooden formwork	32
Metal formwork	34
PREPRUFE® Plus membrane preparation when PREPRUFE® 800PA membrane / BITUTHENE® membranes are used on Walls	35
Inspection Procedures	36
Placement of Reinforcing Steel	36
Placing of Concrete	37
Removal of Formwork	37
Trouble Shooting	
Examples	38
Details	42
Installation Checklist	58

PREPRUFE® Plus pre-applied waterproofing membranes are composite sheets comprising a robust HDPE backing, a pressure sensitive adhesive and a trafficable weather resistant coating. Uniquely, the membrane develops a continuous adhesive bond to concrete poured against it. This prevents water migration between the structure and the membrane, substantially reducing the risk of leaks and minimising the risk of aggressive salts in solution reaching the structural concrete.

GCP Applied Technologies can provide a list of applicators, trained by GCP in the installation of PREPRUFE® Plus membranes.

Applications

- Water and vapour proofing all basement grades to BS 8102:2009
- Waterproofing civil engineering substructures.
- Methane, carbon dioxide and radon gas protection compliant of the standard membrane requirements in BRE Reports 211 (Radon) and 212 (Methane and Carbon Dioxide) and in BS 8485:2015.
- Protection of reinforced concrete structures in aggressive ground conditions.

Independent Assessments

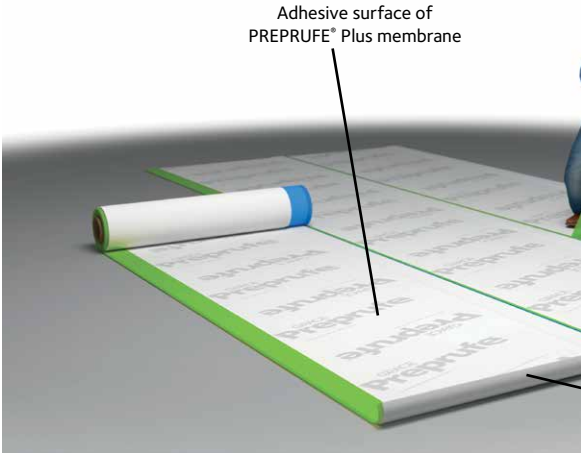
- BBA Certificate No. 97/3325
- CE Certificate No. 09/F017
- Mott MacDonald Special Services Report May 2001
- National Certifications available
- Technical University of Nuremberg Technical Report February 2017

Advantages

- Can be used beneath foundation slabs and with single or double-sided formwork systems.
- Seals adhesively to concrete cast against it.
- Easy to handle and install without special corner pieces.
- All joints have double side bonded 'selvedge' or PREPRUFE® Tape overlaps for leak protection.
- Unaffected by groundwater contaminants, ponded water or wet/dry cycling.
- Smooth surface membrane – site contaminants easily removed.
- Excellent chemical resistance – protects structure from salts, sulphate attack and most contaminants likely to be found in the ground.
- Requires no priming, surface conditioning or protection screeds.
- Simply installed without any mechanical lifting device or special equipment.
- No release liner. Kick out roll.

Limitations

- PREPRUFE® Plus membranes should not be permanently exposed to sunlight.
- PREPRUFE® Plus membranes are not intended for roof underlayments or through wall flashing applications.
- PREPRUFE® Plus membranes should not be used as a pond or tank liner.
- PREPRUFE® Plus membranes should not be used between concrete infilled hollow block walls.
- PREPRUFE® Plus membranes are not intended to provide the main waterproofing for expansion joints.
- PREPRUFE® Plus membranes are not intended for negative side waterproofing applications.
- Pour concrete within 56 days (42 days in hot climates) of installation of the membrane.



System Components

PREPRUFE® Plus ZipLap™ have been tested for hydrostatic head resistance to in excess of 70 m (0.7 MPa).

Product	Recommended Applications	Material Properties			
		Thickness	Roll Size	Roll Area	Weight per unit
PREPRUFE® 300R Plus membrane	• Horizontal and vertical applications where risk of membrane damage from reinforcement placement, backfilling or other site operations is considered high. • Available in two versions, PREPRUFE® 300R Plus membrane for application above +5 °C and Preprufe® 300R Plus LT membrane for application between -5 °C and +30 °C.	1.2 mm	1.18 m x 31 m	36 m^2	50 kg
PREPRUFE® 160R Plus membrane	• Beneath sub-structure slabs <500 mm thick. • Vertically, against sub-structure walls with single or double sided formwork systems. • Available in two versions: see PREPRUFE® 300R Plus membrane.	0.8 mm	1.18 m x 36.5 m	42 m^2	42 kg
PREPRUFE® Tape LT/HC	• Taping roll end laps, cut edge laps and detailing. • Available in two versions, PREPRUFE® Tape LT for applications at −5 °C to +30 °C and PREPRUFE® Tape HC for applications at +10 °C to +50 °C.	0.7 mm	100 mm x 15 m		2 kg

Product	Recommended Applications	Material Properties			
		Thickness	Roll Size	Roll Area	Weight per unit
PREPRUFE® CJ Tape HC	• Applications at +10 °C minimum. • Pre-applied for all construction joints – available in the Middle East.	0.7 mm	100 mm x 15 m		4 kg
BITUTHENE® LM (E)	• Liquid membrane for detailing terminations, pile caps and pipe penetrations. Application temperature 5 °C and rising.				6.1 kg
Protection 03	• Optional protection of PREPRUFE® 160R/300R membrane applied in double sided formwork, prior to backfilling.	3 mm	0.9 m x 2 m		5 kg per board
ADCOR® 550 MI/ T-MI waterstops	• Hydro expansive injectable waterstop for added security of concrete construction joints		5 m rolls 6 rolls/carton		13 kg
ADCOR® 500S/500T waterstops	• Hydro expansive waterstop for use in concrete construction joints and at pipe entries.		5 m rolls 6 rolls/carton		23 kg
AT System	• Hydro-expansive PVC co-extruded waterstop for movement and expansion joints.	**Available in shapes and configurations to suit site requirements. Refer to AT system Data sheet.**			

Safety data sheets for PREPRUFE® Plus membranes & PREPRUFE® Tapes are not required, since they are finished goods. Nevertheless, customers are provided with the information below to assist with the safe use of the product. Safety data sheets for other GCP products are available on our website: www.gcpat.com

First Aid Measures

- Eye Contact: Direct contact with adhesive layer may cause irritation. Rinse opened eye for several minutes under running water. Seek immediate medical advice.

Fire-fighting Measures

- Suitable extinguishing media: Water, foam, and carbon dioxide.
- Special exposure hazards: Do not breathe smoke.
- Special equipment for fire-fighters: Self contained breathing apparatus.

Handling and storage

Gloves should be worn to reduce hand contamination. Any transfer of adhesive to skin should be removed with soap and water - not solvent.

- Store in cool, dry building to prevent physical damage.

Environmental effects

Not expected to be dangerous for the environment.

- Safety Instructions are on the side of the PREPRUFE® membrane cardboard container boxes and on the main can of BITUTHENE® LM (E) liquid detailing membrane.

Personal Protection Equipment (PPE)

Minimum recommended PPE for installers of PREPRUFE® Plus membrane/ PREPRUFE® Tape/ ADCOR® 500 S/T/ ADCOR® 550 MI/ T-MI waterstops:

- Safety helmet
- Safety shoes
- Safety glasses
- Where the PREPRUFE® Plus waterproofing membranes are applied in bright sunlight conditions, it is advisable that tinted safety glasses be used by installers
- Cut resistant gloves

Minimum recommended PPE for application of BITUTHENE® LM (E) liquid membrane in non-confined areas:

- Long sleeved overalls
- Safety helmet
- Safety footwear
- Safety glasses/spectacles
- Gloves - long gauntlet type
- Refer to Safety Data Sheet

Full boxes of PREPRUFE® 160R Plus and 300R Plus membranes require two men to lift. Alternatively mechanical lifting equipment can be used.

Delivery to site

Normally the PREPRUFE® Plus membrane is delivered to site shrink wrapped on pallets and will require mechanical equipment for offloading at site. However, small orders may be delivered as individual rolls.

Material Storage

Store PREPRUFE® Plus membrane rolls vertically. Sequence deliveries to avoid delays, but minimise on-site storage. Select a safe, covered secure location for material storage for each day's use in a location that won't require movement a second time. Do not stack pallets of waterproofing on the job site. Provide cover on top and all sides.

Substrate Preparation

Concrete Blinding

Suitable substrates include:

- concrete blinding
- well compacted sand on rolled crushed stone
- rigid insulation
- clay heave boards
- permanent formwork
- removable formwork
- 19 mm plywood
- Plastic fluted protection board
- HYDRODUCT® drainage sheets
- Adjacent sub-structures

Compacted Sand Blinding

It is essential that the substrate is sound and solid to ensure no membrane movement during the concrete pour.

Substrates should be uniform with no gaps or voids greater than 12 mm. Where these exist fill with a material of sufficient strength to support the membrane. All substrates must be free of loose aggregate and sharp protrusions.

Where possible, avoid sloping or rounded concrete blinding, any required change in blinding level must be angular.

In crushed stone applications, it is important to create a sound and solid substrate around "through slab" penetrations to eliminate movement during the concrete pour. Excessive movement may jeopardise the waterproofing integrity around the penetration. Therefore grout around the penetration prior to installing the membrane.

The surface does not need to be dry, but standing water must be removed. Substrates must have sufficient rigidity not to move during the concrete pour. Boarded substrates must be close butted to provide support and not more than 12 mm out of alignment.

Removing PREPRUFE® Plus membranes from the box

The following sequence indicates the recommended method for removing the PREPRUFE® Plus waterproofing membrane from its box.


3


4

Tools/Materials Required

- Heavy duty lap roller
- Utility knife with retractable blade (blade must be sharp).
- Tape measure
- Cotton cleaning cloths
- Plywood or similar cutting board
- Thin metal straight edge
- Chalk line
- Broom
- 2 metre long pipe or heavy broom handle
- Paddle MR2 for mixing BITUTHENE® LM (E) liquid membrane
- Heavy-duty low speed (500 rpm) drill
- Round nose trowel or spatula
- Required protection and/or drainage boards and other ancillary products

PREPRUFE® Plus membranes are supplied in rolls 1.18m wide with dual adhesive PREPRUFE® system ZipLaps™ on both edges to enable fully bonded laps between adjacent rolls. All other laps must be taped with PREPRUFE® Tape.

Application Sequence for Slabs - Method 1 - vertically applied PREPRUFE® Plus <900 mm

1. Form internal/ external corner sections

Forming corners - refer to page 20

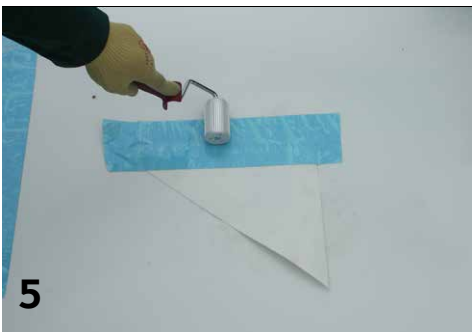
2. Install horizontal/vertical interface

3. Place horizontal lengths

Refer to page 24

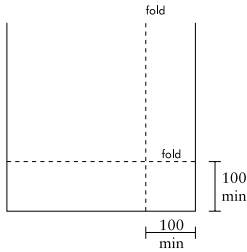
4. Remove release film

5. Inspect & repair any damage

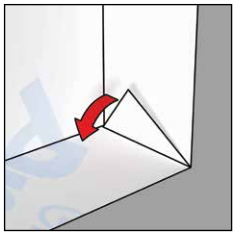


Installation - Internal & External Corners

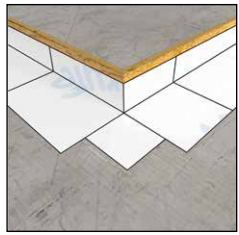
Internal and external corners should be formed as shown in the diagrams returning the membrane a minimum of 100 mm and sealing with PREPRUFE® Tape. Ensure that the apex of the corner is covered and sealed with Tape and roll firmly. Crease and fold the membrane to ensure a close fit to the substrate profile and avoid hollows.

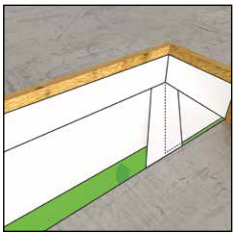


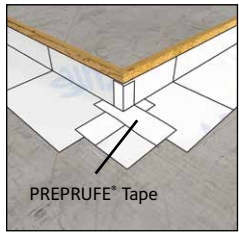
Internal



External







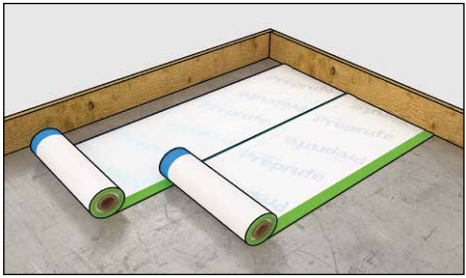
Measure, crease & fold membrane

Fold internal corner & tape

Form external corner & tape

Application Sequence for Slabs - Method 2 - vertically applied PREPRUFE® Plus >900 mm

1. **Place horizontal lengths first**

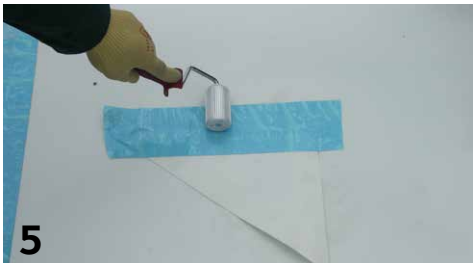


2. **Form internal/external corners**
   Refer to page 23

3. **Install horizontal/vertical interface - wall paper fashion**

4. **Remove release film**

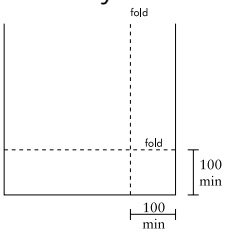
5. **Inspect & repair any damage**



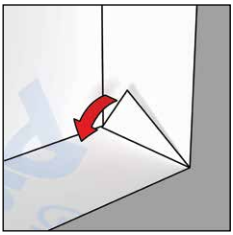
Corners

Internal and external corners should be formed as shown in the diagrams returning the membrane a minimum of 100 mm on the horizontal and sealing with PREPRUFE® Tape. Ensure that the apex of the corner is covered and sealed with Tape and roll firmly.

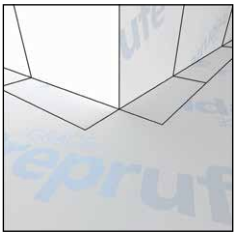
Crease and fold the membrane to ensure a close fit to the substrate profile and avoid hollows.

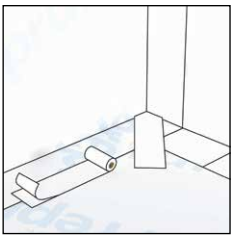


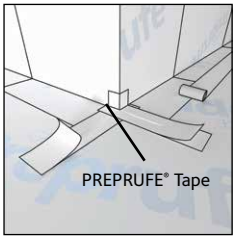
Internal



External







Installation – Horizontal

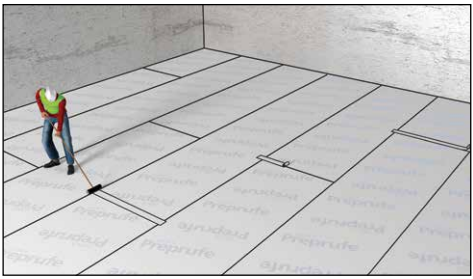
Place the membrane with the green zip strip facing towards the concrete pour. This side has the pressure sensitive adhesive which would enable an intimate bond with the concrete. End laps should be staggered to avoid a build up of layers. Leave green and blue zip strips on the membrane until overlap procedure is completed. Accurately position succeeding sheets to overlap the previous sheet 75 mm along the marked selvedge. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond at the overlap. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. On completion of the installation, ensure complete removal of the plastic zip strips from all overlaps and tape.

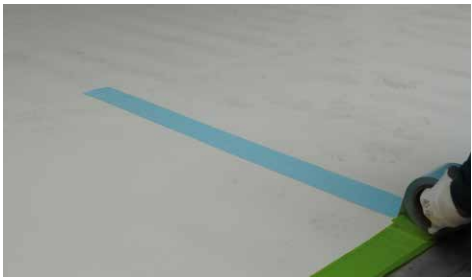
When installing the PREPRUFE® Plus membrane in cold or marginal weather conditions (<0 °C) the use of PREPRUFE® Tape LT is recommended at all laps and detailing. PREPRUFE® Tape LT should be applied to clean dry surfaces and the release liner must be removed immediately after application.

End Laps and Cut Edges

Overlap all roll ends and cut edges by a minimum 75 mm and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary.

Allow to dry and apply PREPRUFE® Tape centred over the lap and roll firmly. Remove tape release liner. Refer also to PREPRUFE® Plus system Standard Details.





Penetrations

To seal around penetrations such as service pipes, pile heads, reinforcing bars, lightening conductors etc. mark and cut the membrane tight to the penetration. If the membrane is not aligned within 12 mm of the penetration, apply PREPRUFE® Tape lapped onto the membrane and butted tight to the penetration. For PVC pipe penetrations wrap the pipe with PREPRUFE® Tape. Mix and apply BITUTHENE® LM (E) liquid membrane around the penetration using a fillet to provide a watertight seal between the PREPRUFE® Plus membrane and Tape. Refer also to the GCP PREPRUFE® Plus system standard detail drawings, available on request.

Membrane Outside Pour Area

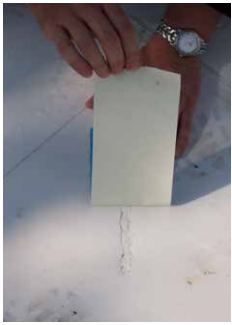
Lay the PREPRUFE® Plus membrane just beyond any reinforcement starter bars to ensure easy access for further overlaps. Where this is not achievable the direction of membrane application may be changed to simplify overlap procedure.

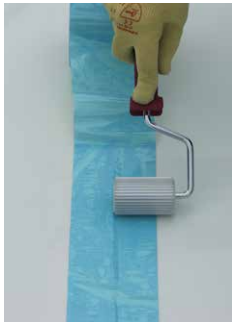
Membrane Repair

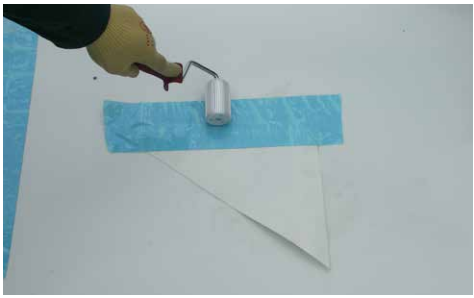
Inspect the membrane for damage before installation of reinforcement steel, formwork and final placement of concrete. Clean by compressed air or jet washing if required.

Wipe the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. For repairs with no punctures, apply PREPRUFE® Tape centrally over the damaged area and roll firmly. For larger repairs use a patch of PREPRUFE® Plus membrane and tape all edges with PREPRUFE® Tape, ensuring a minimum cover of 150 mm. Remove plastic release liner from the PREPRUFE® Tape.

Where exposed selvedge has lost adhesion or laps have not been sealed, ensure the area is clean and dry and overband with PREPRUFE® Tape and roll firmly.







Installation – Vertical

Apply the membrane with the green zip strip facing towards the concrete pour.
Mechanically fasten the membrane vertically using flat headed fixings appropriate to the substrate. The membrane may be installed in any convenient length. Secure the top of the membrane using a batten or fixings 50 mm below the top edge. Use fixings at typically 600 mm centres to secure the membrane flat against the substrate. Fixings can be made through the selvedge, this allows firmly rolled overlaps, which are covered by the subsequent strips of PREPRUFE® Plus membrane. Any exposed fixings should be patched with PREPRUFE® Tape. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond at the overlap.
Ensure a continuous bond is achieved without creases and roll firmly. On completion of the installation, **completely remove the plastic zip strips from all overlaps and tape**.

Placement on Vertical Pile Walls

The PREPRUFE® Plus membrane is fixed through the selvedge into the regularised diaphragm/secant wall and does not require any separation board unless used to face up the walling where it is rough and full of voids and depressions. Board can be 19 mm plywood capable of taking the weight of PREPRUFE® Plus membrane fixings and the weight of concrete during the pour.

Similarly, sheet piling will require the prior installation of 19 mm plywood or concrete infill before installing the PREPRUFE® Plus membrane vertically against the piling.

Placement on Diaphragm Walls

Inspect the condition of the diaphragm wall surface. Fill all gaps/ voids greater than 12 mm with a suitable repair mortar, and remove all sharp protrusions. Apply PREPRUFE® Plus membrane as per the adjacent instructions.

If a board has been used to face up the diaphragm wall, ensure boards are mechanically fixed, butt jointed, and with no gaps greater than 12 mm. The boarded substrate must be capable of withstanding all loads applied during both the PREPRUFE® Plus membrane installation, and the concrete pour.

Placement on Secant & Contiguous Piled Walls

GCP recommend all concrete piled walls are faced off to create a flat, solid substrate for the vertical PREPRUFE® Plus membrane application.

If a concrete facing has been constructed (e.g. shotcrete wood float finish), inspect the condition of the concrete surface.
Fill all gaps/ voids greater than 12 mm with a suitable repair mortar, and remove all sharp protrusions. Apply PREPRUFE® Plus membrane as per the adjacent instructions.

If the piled wall has been faced off using a boarded system, ensure boards are butt jointed with no gaps greater than 12 mm. The boarded formwork must be capable of withstanding all loads applied both during the PREPRUFE® Plus membrane installation, and the concrete pour.

Placement on Sheet Piled Walls

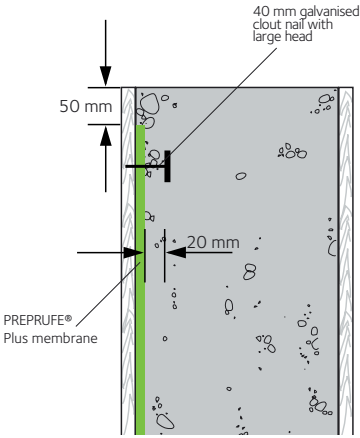
GCP recommend sheet piled walls are faced off to create a flat, solid substrate for the vertical PREPRUFE® Plus membrane application. This will require infilling the sheet pile troughs with an appropriate material capable of withstanding all loads applied both during the PREPRUFE® Plus membrane installation, and the concrete pour. The selected formwork must have no gaps/ voids greater than 12 mm, and all sharp protrusions removed. Apply PREPRUFE® Plus membrane to the flat solid substrate as per the adjacent instructions.

Installation – Double Sided Formwork

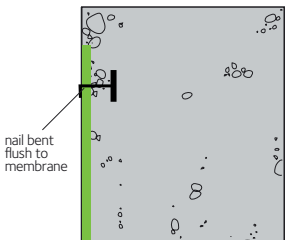
Wooden formwork:

1. Apply the membrane with the green zip strip facing towards the concrete pour
2. Cut lengths of membrane to height of formwork less 50 mm.
3. Align the first piece of membrane against the formwork edge and 50 mm below the top of the formwork.
4. Nail the membrane in place at the top of the formwork using 40 mm galvanised clout nails at 300 mm centres. The nail heads should be left protruding a minimum 20 mm. (This will enable encapsulation of the nail head when the concrete is poured).
5. At the middle and bottom of the formwork cut and apply 150 mm x 150 mm square patches of BITUSTIK™ double sided bituminous tape to both edges of the membrane.
6. The BITUSTIK™ patches will partially adhere the membrane to the formwork and keep it flat during the concrete pour.
7. All edge laps should be formed using the ZipLap™ on the membrane.
8. Any cut edge laps and end laps should be sealed with PREPRUFE® Tape.
9. On completion of the installation, completely remove the plastic zip strips from all overlaps and tape.
10. Place formwork, pour and vibrate concrete.
11. Remove formwork when concrete has a minimum in-situ strength of 10 N/mm².

12. After removal of formwork:
    a. Use a hammer to bend all protruding nail points flush to membrane surface.
    b. Fill tie bar holes with BETEC® 350 waterproof compound or GCP approved equivalent. Allow 48 hours to dry then prime with PREPRUFE® SC1 primer and cover with cut patches of PREPRUFE® 800PA or BITUTHENE® self-adhesive membrane, 150 mm x 150 mm.
    c. Lap PREPRUFE® Plus membrane at bottom of wall to slab edge membrane using PREPRUFE® Tape.
    d. Form agreed termination detail at ground level using BITUTHENE® LM (E) liquid membrane.



PREPRUFE® Plus membrane - Double Sided Formwork (wooden) Termination Detail Before Formwork Removal

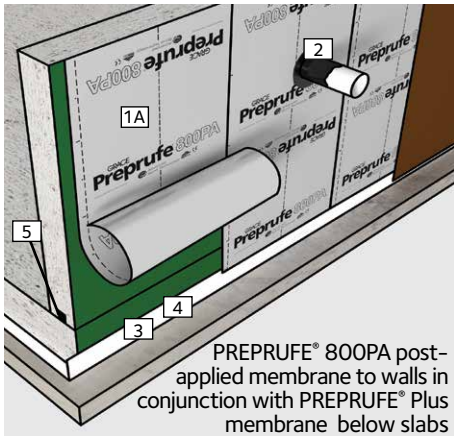


PREPRUFE® Plus membrane - Double Sided Formwork (wooden) Termination Detail After Formwork Removal

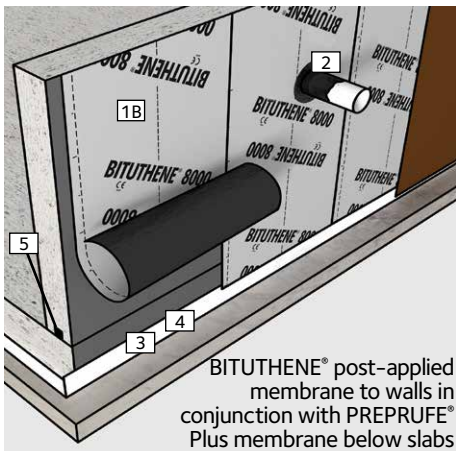
Installation – Double Sided Formwork

Metal formwork:

1. Install PREPRUFE® Plus membrane as for wooden formwork except:
2. At top of metal formwork fix PREPRUFE® Plus membrane to flange of formwork system using bolts or tie wire.
3. On removal of formwork cut the excess unbonded membrane at the top of the wall flush, using a straight edge to avoid damaging the bonded membrane.



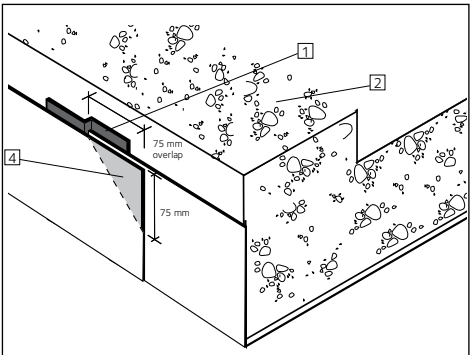
PREPRUFE® 800PA post-applied membrane to walls in conjunction with PREPRUFE® Plus membrane below slabs



BITUTHENE® post-applied membrane to walls in conjunction with PREPRUFE® Plus membrane below slabs

PREPRUFE® Plus System Preparation when PREPRUFE® 800PA or BITUTHENE® systems are used on Walls

Inspect the PREPRUFE® Plus membrane around the perimeter edge of the concrete slab. Identify any exposed non-selvedge overlaps in PREPRUFE® Plus membrane. To ensure continuity of the fully bonded system, carefully cut and remove a 75 mm triangular piece of the top flap of the PREPRUFE® Plus membrane only, as shown shaded in the below detail, 'Slab Perimeter Detail for Non-Selvedge Lap.'



Slab Perimeter Detail

1. Taped non-selvedge lap
2. Poured Concrete
3. Remove formwork
4. Cut and remove shaded piece before applying PREPRUFE® 800PA/ BITUTHENE® post-applied membrane

Slab Perimeter Detail for Non-Selvedge Lap

1A	PREPRUFE® 800PA membrane on primed concrete surface
1B	BITUTHENE® membrane on primed concrete surface
2	BITUTHENE® LM (E) detailing membrane
3	Do not prime PREPRUFE® Plus membrane with Primer
4	PREPRUFE® Plus membrane
5	ADCOR® 500 S/T / ADCOR® 550MI/T-MI waterstops

Inspection Procedures

PREPRUFE® Plus membrane application's should be inspected on completion of a specific area before placing any reinforcing steel. Any damage to the membrane system should be made good using PREPRUFE® Tape or oversize patching with PREPRUFE® Plus membrane.

During placing of reinforcing steel any damage should be identified and made good while access to the membrane is relatively easy. On completion of reinforcing placement another inspection should occur and any damage made good.

It should be noted that use of an air lance to blow out debris prior to pouring concrete is a good identifier of poorly bonded PREPRUFE® Tape, and overlaps. A further application of PREPRUFE® Tape will be required after the affected areas have been cleaned and dried.

Placing of Reinforcing Steel

Before placing reinforcement ensure that the membrane application is continuous, has bonded laps, end laps taped, penetrations and pile heads sealed with BITUTHENE® LM (E) liquid detailing membrane and all the plastic release film removed from the membrane overlaps and tapes.

Placing of the reinforcement should be done with care to prevent damage to the membrane using spreader type spacer blocks or similar, to avoid point loadings and puncturing. Progressive removal of temporary membrane protection used for access and storage should occur as steel fixing proceeds. Localised displacement of the PREPRUFE® adhesive may occur around spacer blocks but is not detrimental to membrane performance.

Placing of Concrete

Ensure the plastic zip strips have been removed from all overlaps and Tape.

It is recommended that concrete be poured within 56 days of application of the membrane. Where the PREPRUFE® Plus membrane is used in hot climates, the membrane exposure should be reduced to 42 days.

Concrete must be placed and compacted carefully to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

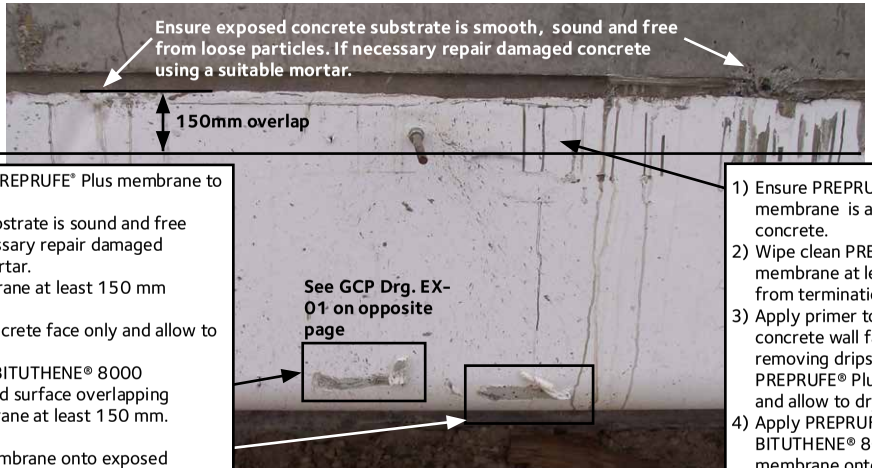
Where grout splashes occur on the PREPRUFE® Plus membrane, these should be immediately removed before curing begins and the surface cleaned with damp cloths.
Alternatively grout may be removed with a metal scraper together with the top adhesive layer to expose the white HDPE before joining or lapping adjacent sheet.

Removal of Formwork

PREPRUFE® Plus membranes can be applied to removable formwork and pile caps etc. Once concrete is poured, the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond with the PREPRUFE® Plus membrane.

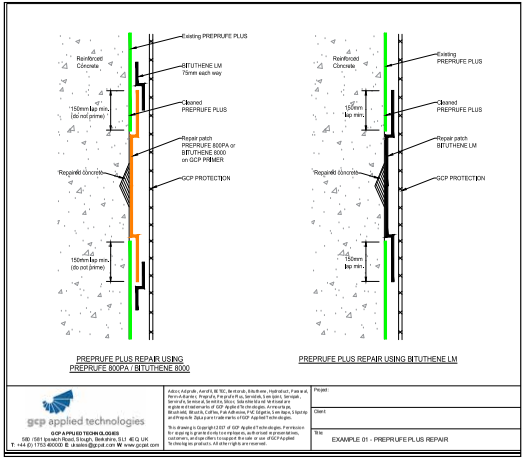
A minimum in-situ concrete compressive strength of 10 N/mm^2 is recommended prior to stripping formwork supporting PREPRUFE® Plus membranes. Premature stripping may result in loss of adhesion between the membrane and concrete.

Repairs to PREPRUFE® Plus system – damaged after concrete placement

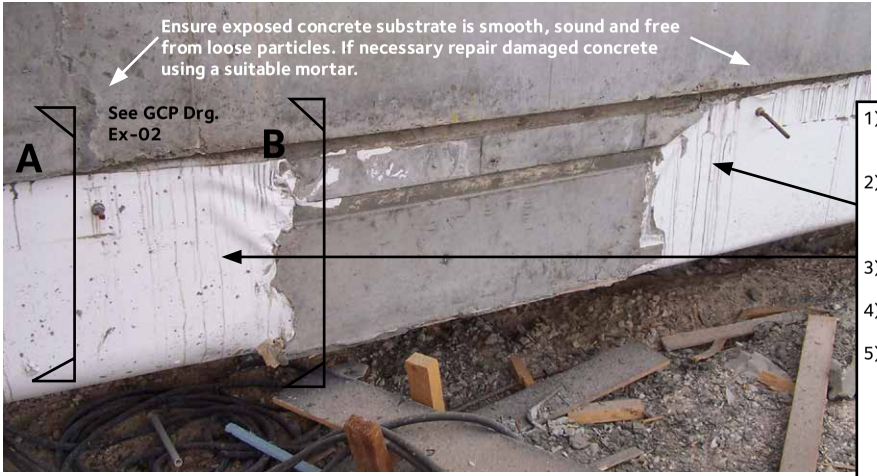


1) Remove loose and crinkled PREPRUFE® Plus membrane to expose concrete substrate.
2) Ensure exposed concrete substrate is sound and free from loose particles. If necessary repair damaged concrete using a suitable mortar.
3) Wipe clean remaining membrane at least 150 mm from cut edges.
4) Apply primer to exposed concrete face only and allow to dry.
5) Apply PREPRUFE® 800PA / BITUTHENE® 8000 membrane patch onto primed surface overlapping onto PREPRUFE® Plus membrane at least 150 mm.
   OR
   Apply BITUTHENE® liquid membrane onto exposed concrete (without primer) overlapping onto PREPRUFE® Plus membrane at least 150 mm.

1) Ensure PREPRUFE® Plus membrane is adhered to concrete.
2) Wipe clean PREPRUFE® Plus membrane at least 150 mm from termination edges.
3) Apply primer to exposed concrete wall face removing drips from PREPRUFE® Plus membrane and allow to dry.
4) Apply PREPRUFE® 800PA / BITUTHENE® 8000 membrane onto primed wall surface overlapping onto PREPRUFE® Plus membrane at least 150 mm.

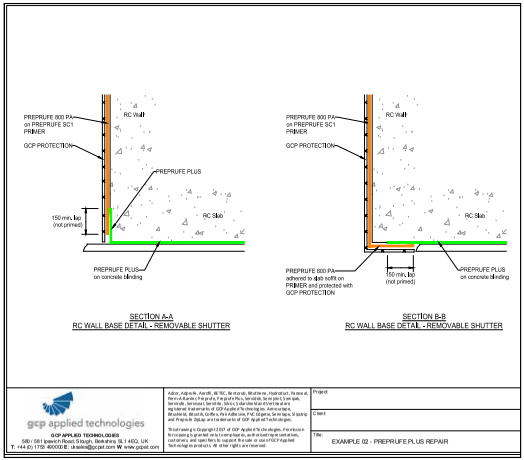

Existing PREPRUFE PLUS
Reinforced Concrete
BITUTHENE LM 75mm each way
150mm lap min. (do not prime)
Cleaned PREPRUFE PLUS
Repair patch PREPRUFE 800PA or BITUTHENE 8000 on GCP PRIMER
Repaired concrete
GCP PROTECTION
150mm lap min. (do not prime)
PREPRUFE PLUS REPAIR USING PREPRUFE 800PA / BITUTHENE 8000
Existing PREPRUFE PLUS
Reinforced Concrete
150mm lap min.
Cleaned PREPRUFE PLUS
Repair patch BITUTHENE LM
Repaired concrete
GCP PROTECTION
150mm lap min.
PREPRUFE PLUS REPAIR USING BITUTHENE LM
gcp applied technologies
GCP APPLIED TECHNOLOGIES
680 / 1081 Ipswich Road, Slough, Berkshire, SL1 4EQ, UK
T: +44 (0) 1753 490000 E: ukadmin@gcpat.com W: www.gcpat.com
Project
Client
Title
EXAMPLE 01 - PREPRUFE PLUS REPAIR

GCP Drawing

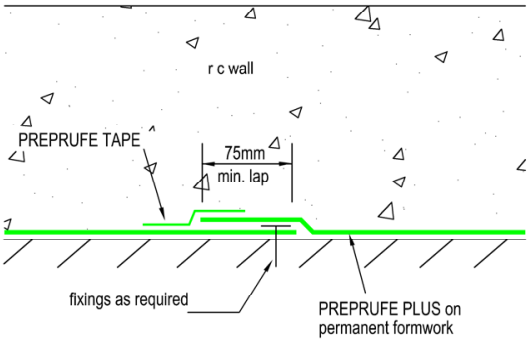


Repairs to PREPRUFE® Plus system - damaged after concrete placement

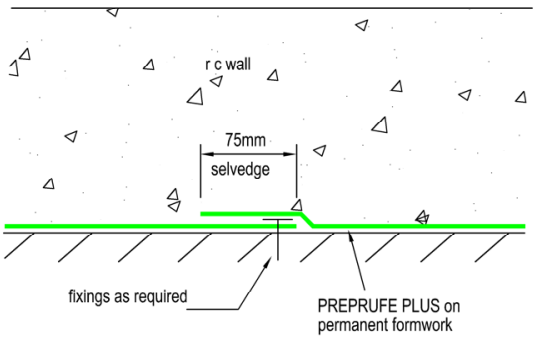
1) Remove loose and crinkled PREPRUFE® Plus membrane to expose concrete substrate.
2) Ensure exposed concrete substrate is sound and free from loose particles. If necessary repair damaged concrete using a suitable mortar.
3) Wipe clean remaining membrane at least 150 mm from cut edges.
4) Apply primer to exposed concrete face only and allow to dry.
5) Apply PREPRUFE® 800PA / BITUTHENE® 8000 patch onto primed surface overlapping onto PREPRUFE® Plus membrane at least 150 mm.
   OR
   Apply BITUTHENE® liquid membrane onto exposed concrete (without primer) overlapping onto membrane at least 150mm.


PREPRUFE 800 PA on PREPRUFE SC1 PRIMER
GCP PROTECTION
RC Wall
PREPRUFE PLUS
150 min. lap (not primed)
RC Slab
PREPRUFE PLUS on concrete blinding
SECTION A-A
RC WALL BASE DETAIL - REMOVABLE SHUTTER
PREPRUFE 800 PA adhered to slab soffit on PRIMER and protected with GCP PROTECTION
SECTION B-B
RC WALL BASE DETAIL - REMOVABLE SHUTTER
gcp applied technologies
GCP APPLIED TECHNOLOGIES
Project
Client
Title
EXAMPLE 02 - PREPRUFE PLUS REPAIR

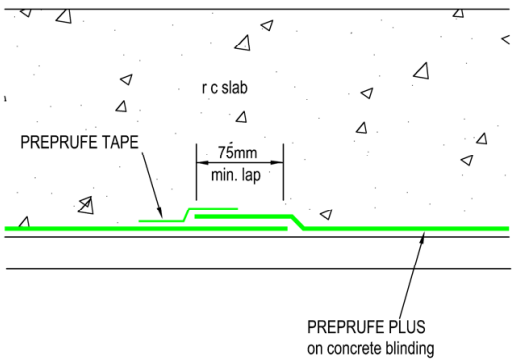
GCP Drawing



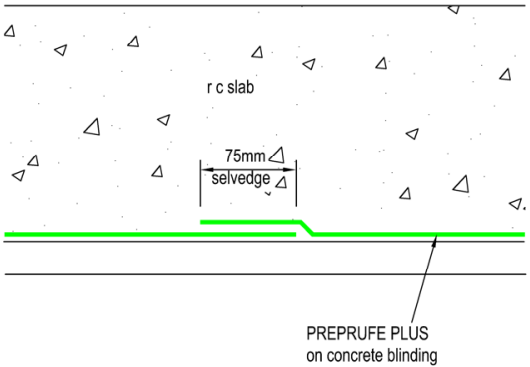
Non-Selvedge Overlap Detail
RC Wall Plan



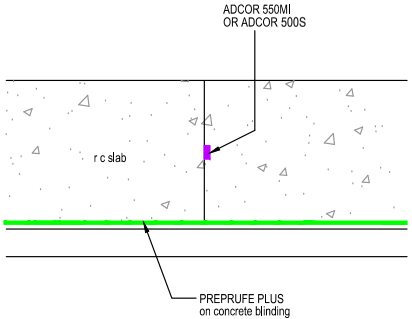
Selvedge Overlap Detail
RC Wall Plan



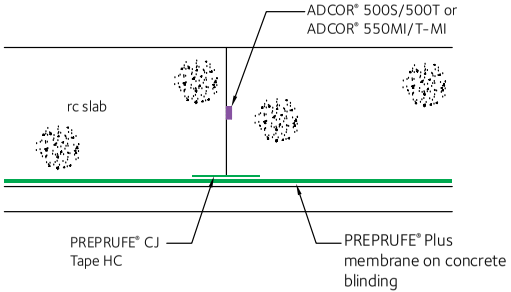
Non-Selvedge Overlap Detail
RC Slab



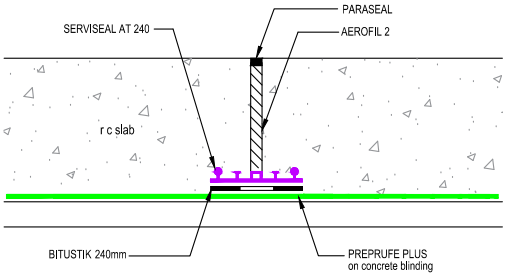
Selvedge Overlap Detail
RC Slab



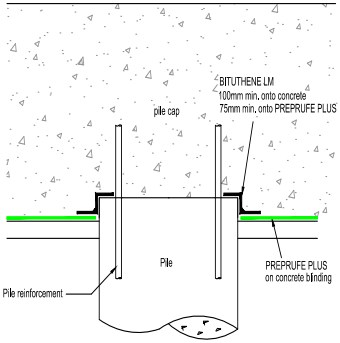
RC Slab Construction Joint



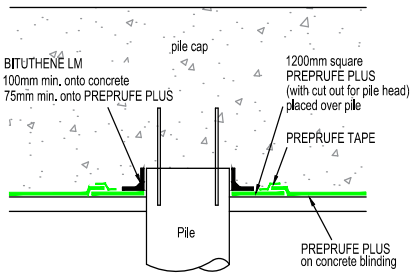
RC Slab Construction Joint
(For Middle East use only)



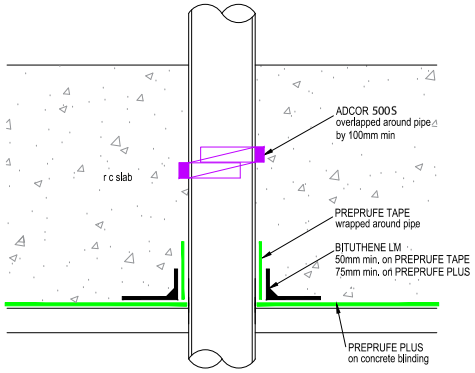
RC Slab Expansion Joint



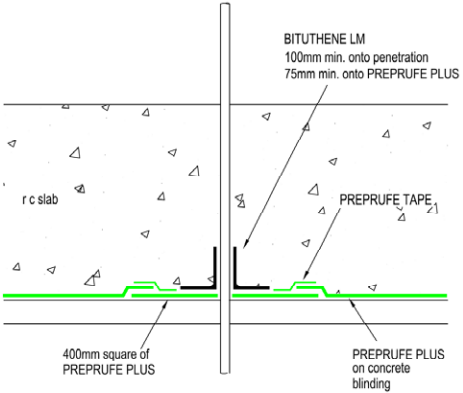
Pile Detail
(large diameter)



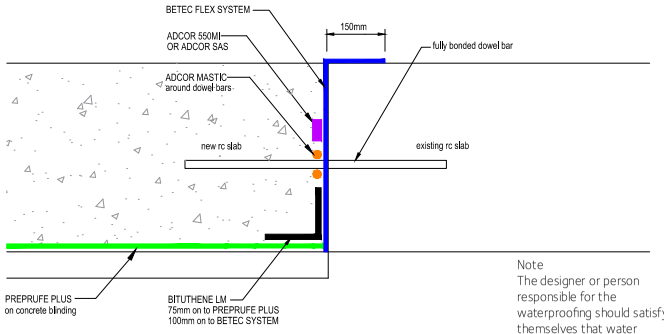
Pile Detail
(small diameter)



Pipe Through RC Slab

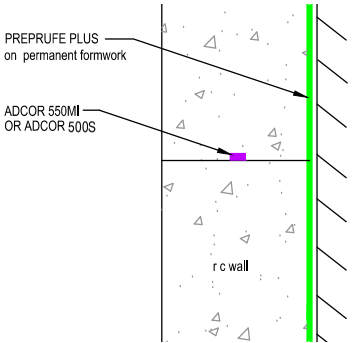


RC Slab - Rod Penetration

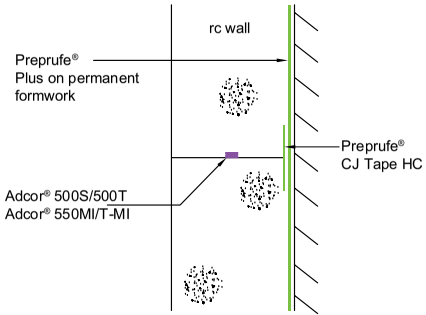


New To Existing Slab Detail
PREPRUFE® Plus membrane

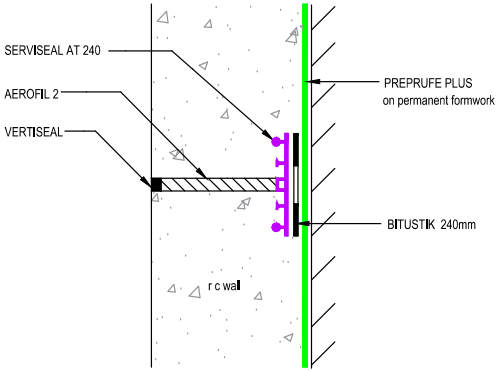
Note
The designer or person responsible for the waterproofing should satisfy themselves that water cannot enter the protected structure by bypassing the detailed GCP system.



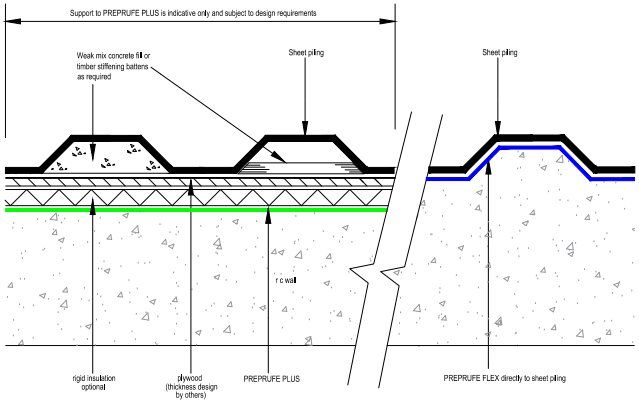
RC Wall Construction Joint



RC Wall Construction Joint
(For Middle East use only)

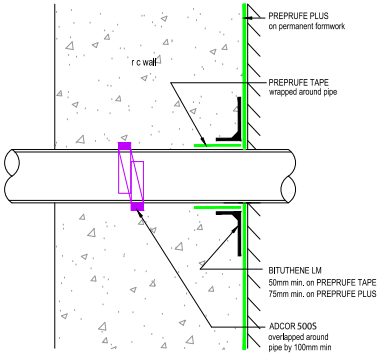


RC Wall Expansion Joint

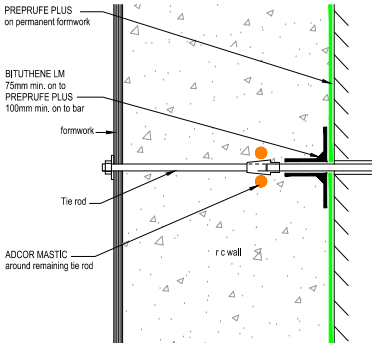


PREPRUFE® Plus system On Faced Sheet Piling

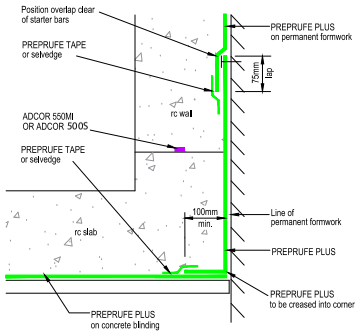
PREPRUFE® Flex membrane to Sheet Piling



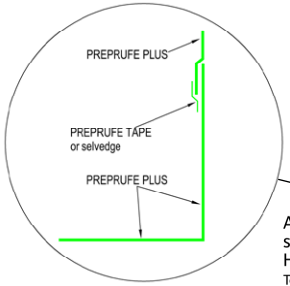
Pipe Through RC Wall



Pre-Fixed Formwork Tie detail

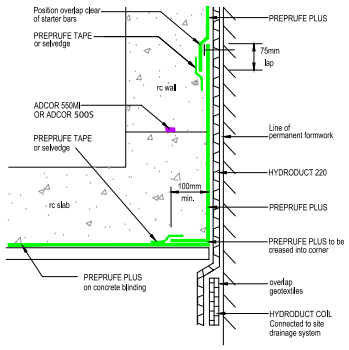


RC Wall Base Detail Against Permanent Shutter

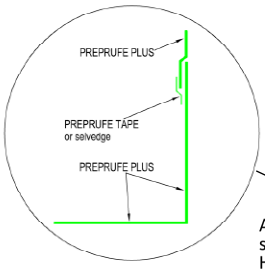


Alternative PREPRUFE® system Configuration Horizontal To Vertical

To be read in conjunction with adjacent detail.

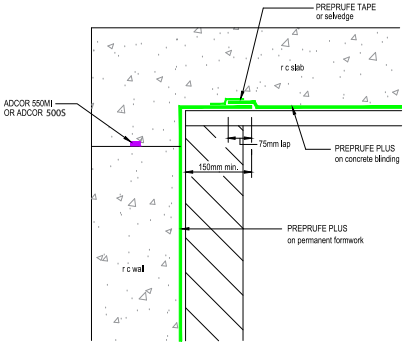


RC Wall Base Detail With Drain Sheet

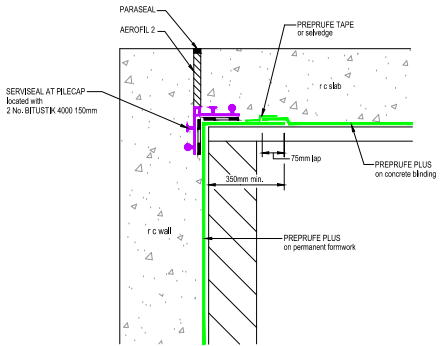


Alternative PREPRUFE® system Configuration Horizontal To Vertical

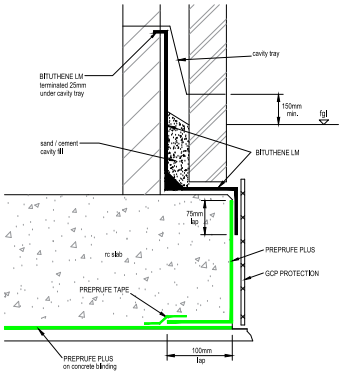
To be read in conjunction with adjacent detail.



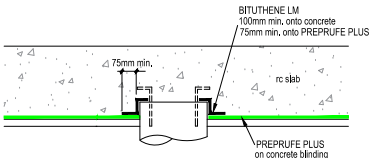
RC Wall To Upper Level RC Slab Detail
PREPRUFE® Plus membrane to PREPRUFE®
Plus membrane



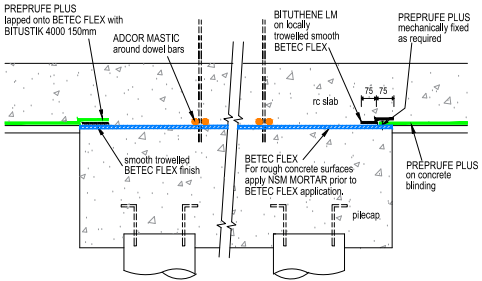
RC Wall To Upper Level RC Slab Detail
PREPRUFE® Plus membrane to PREPRUFE® Plus membrane

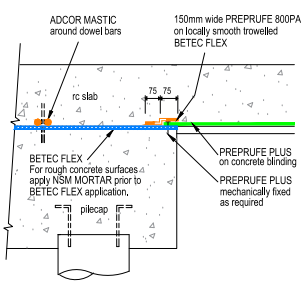


Slab Edge Termination
PREPRUFE® Plus membrane

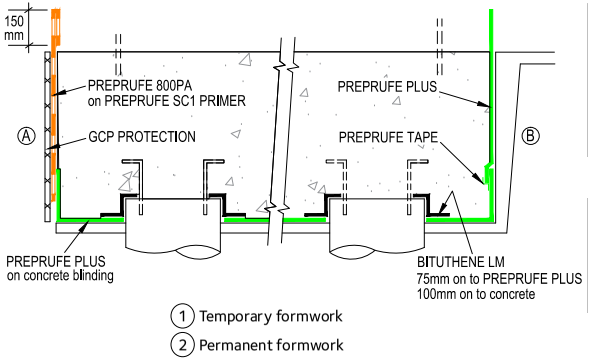


Pile Direct To Slab

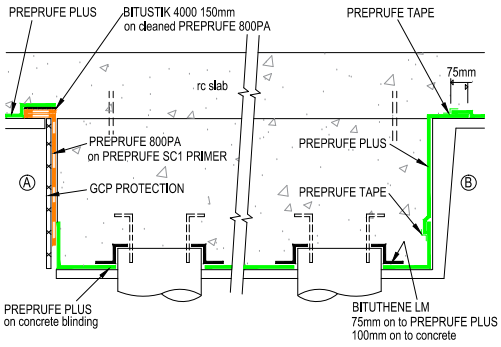




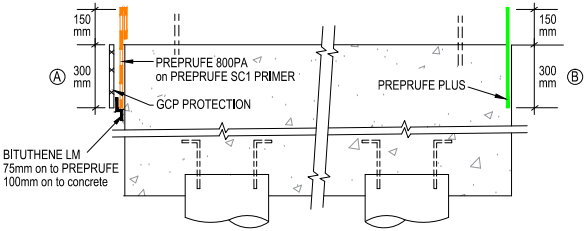
PREPRUFE® Plus membrane Terminations On Monolithically Cast Pile Cap



Pile Cap - Fully Tanked 1

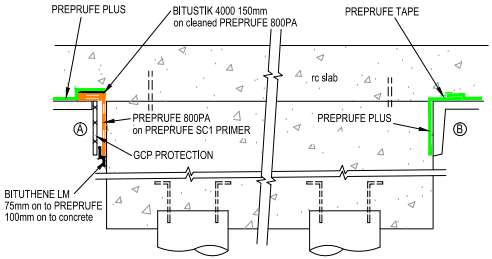


Pile Cap - Fully Tanked 2



① Temporary formwork
② Permanent formwork

Monolithic Pile Cap - Discontinuous Waterproofing 1
Applicable Only To Pilecaps Over 600 mm Deep



Monolithic Pile Cap - Discontinuous Waterproofing 2
Applicable Only To Pilecaps Over 600 mm Deep

Note:
Successful partial external waterproofing of the pilecap is dependent on the waterproofing integrity of the structure below the level of external waterproofing.
The designer or person responsible for the waterproofing should satisfy themselves that water cannot enter the protected structure by bypassing the detailed GCP system.

Installation Checklist

Before PREPRUFE® Plus Membrane Installation Check

- Substrate is firm & regular.
- Gaps or voids greater than 12 mm filled.
- No protrusions likely to damage membrane.
- Substrate swept clean.
- No ponded water.
- Tools & equipment in place.
- Installers are trained for PREPRUFE® Plus membrane installation.
- Concreting to be within 56 days (42 days in hot climates) of installation.

PREPRUFE® Plus membrane Installation – refer pages 12 to 37

After PREPRUFE® Plus membrane Installation Check

- Area of installed PREPRUFE® Plus membrane.
- PREPRUFE® Plus membrane side & end laps are sealed. Reinforce with PREPRUFE® Tape if necessary.
- Internal & external corners are sound & properly taped. Reinforce with PREPRUFE® Tape if necessary.
- Damage to membrane is repaired. Refer to page 29.
- Penetrations and pile (head) treatment has been correctly carried out.
- Temporary fixings to formwork.
- Ensure plastic zip strips have been removed from all overlaps and Tape.

Placement of Reinforcing Steel Check

- Temporary membrane protection where grinding/welding etc. being carried out.
- Temporary protection removed as installation progresses.
- Spacer blocks used beneath reinforcement.
- Any damage to the PREPRUFE® Plus membrane repaired as installation of reinforcement progresses.
- Again all plastic zip strips removed from all overlaps and tape.

Immediately before Concreting Check

- Damage to PREPRUFE® Plus membrane & Laps. Repair as necessary.
- All plastic zip strips removed. External waterstop is secured and correctly positioned/sealed against the PREPRUFE® Plus membrane.
- PREPRUFE® Plus membrane self-adhesive laps area intact behind external waterstop.
- Membrane surface clear of dust & debris.
- Concreting will be within 56 days (42 days in hot climates) of membrane installation.

During Concreting Check

- Concrete placement procedure will not damage membrane.
- Vibrating pokers do not touch the membrane surface.

Formwork Removal Check

- Concrete has a minimum compressive strength of 10 N/mm^2.
- Good membrane to concrete adhesion. Repair if necessary.

GCP Technical Experts Are Available to Assist Project Teams from the Planning Stage through Project Completion

GCP's global team of technical experts are committed to ensuring your project runs smoothly from start to finish. GCP brings global relationships, manufacturing infrastructure, knowledge of best practices and extensive experience with the complexities of construction to large and small projects.

Visit us at **gcpat.com**

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

GCP Applied Technologies (UK) Ltd 580/1 Ipswich Road, Slough, Berkshire SL1 4EQ.

BE0174 Printed in the UK - 04/19

gcp applied technologies