



GROUNDWORK
ENGINEERED SYSTEMS

Corriform Permanent Formwork Solutions For Building

UK & European Marketing



Groundwork Engineered Systems will continue to offer new and innovative building solutions across the international construction market. We bring both new and tried and tested, practical construction concepts to the attention of worldwide construction professionals.

Our UK based technical sales team can offer permanent formwork building solutions for your specific project needs. Continual product development underpins the success of the Corriform system, adding powerful support to Groundwork Engineered Systems growth strategy.

Innovative Formwork Systems

- The Corriform Permanent Formwork System
- Formtech prefabricated and shuttered reinforcement
- Element permanent formwork
- Isolohr insulated slab form system
- Fast Void pre cast under beam void system
- Corriflex





Groundwork Engineered Systems Ltd will deliver a Formwork Solution to your site on time, for a quick and safe installation.



Time Saving Formwork Systems

The Formtech System



The Corriform System



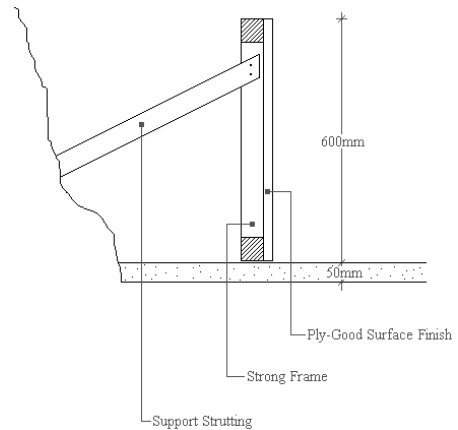
Formwork Installation Comparisons

Traditional formwork methods

Timber formwork

Using timber to form concrete foundations requires planning due to differing shapes and sizes. If the timber panels are to be utilised several times, they need to be robust, treated with release agents, erected carefully, dismantled carefully, repaired, transported and stored properly. The trench dig width has to be much wider than the foundation width and concrete blinding must be used. All these factors add to the basic cost of the timber formwork method.

Typical timber formwork can be used 4 times, this cost when added to the cost of blinding concrete can result in a total cost of **£28 per linear metre for a typical 600mm x 600mm ground beam.**

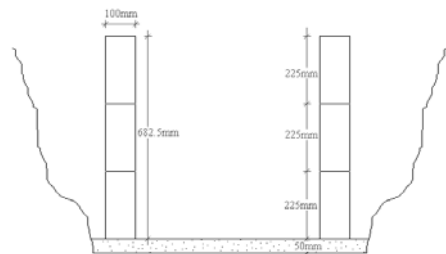


Typical ground beam section for timber formwork

Block formwork

Sometimes sacrificial blocks are used to form in-situ concrete ground beams, these blocks are generally 450mm x 225mm. The blocks are erected on blinding concrete and cement bonded together.

Typical blockwork formwork cost can be as much as £27/m², this when added to the cost of blinding concrete can result in a total cost of **£42 per linear metre for a typical 600mm x 600mm ground beam.**



Typical ground beam section for blockwork formwork

NOTE: Both of the above methods may require additional gas, water, mineral contamination proofing detailing. This cost is not shown above.



The Labour and Material Saving Solution

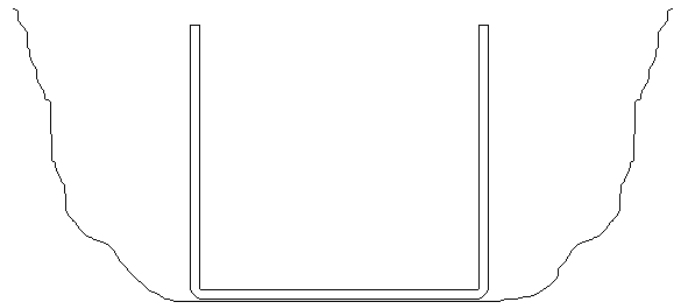
Corriform Permanent Formwork

The Corriform permanent formwork system provides a quick and efficient solution for forming sub ground concrete elements such as ground beams and pile caps. The Corriform formwork arrives on-site ready for immediate installation.

Once the trench is prepared the pre-fabricated formwork can be installed to form a complete foundation arrangement, the reinforcement can be lowered into the formwork and final fixed. The final installation can be backfilled and the concrete poured

This method is quick and easy, typically up to 76 linear metres of 600mm x 600mm ground beam Corriform formwork can be installed by two workmen per 4 hours.

No blinding concrete is required for the Corriform permanent formwork system meaning that typical total costs of **£20 per linear metre for a 600mm x 600mm ground beam** can be achieved. Corriform is impervious to gas, water and mineral contamination connections require the correct detailing.



Typical ground beam section for Corriform permanent formwork

Cost Comparisons

	Concrete	Corriform with blinding	Timber	Blockwork
Blinding Concrete	-	5.00	5.00	5.00
Labour and Materials	20.00	20.00	23.20	37.80
Total Cost	20.00	25.00	28.20	42.80

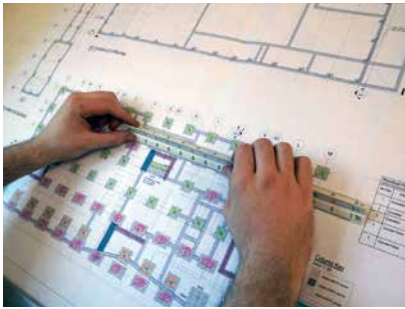
ESTIMATED COSTS BASED ON:

- £/linear metre
- 600mm x 600mm ground beam
- Timber formwork used 4 times
- Blockwork sacrificial.



Groundworks Engineered Systems Offer The Corriform System

Pile caps and ground beams come in a wide variety of shapes and sizes, each of these require consideration on both design and installation of the formwork. Groundworks will engineer a solution to meet your project needs.



1 Quantify your on-site requirements as per your construction drawings.



2 Design and fabricate each foundation shape.

3 Supply all spacers and fixing accessories.



4 Supply installation guidance.

5 Deliver the system to your project.

6 Offer continual advice and support.

The Corriform System comes complete in every way.

All cut and creased shapes arrive on site ready to install.

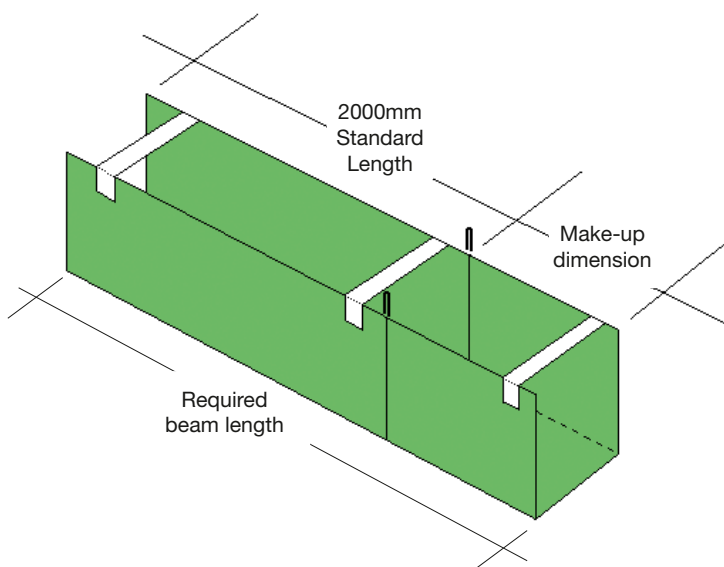
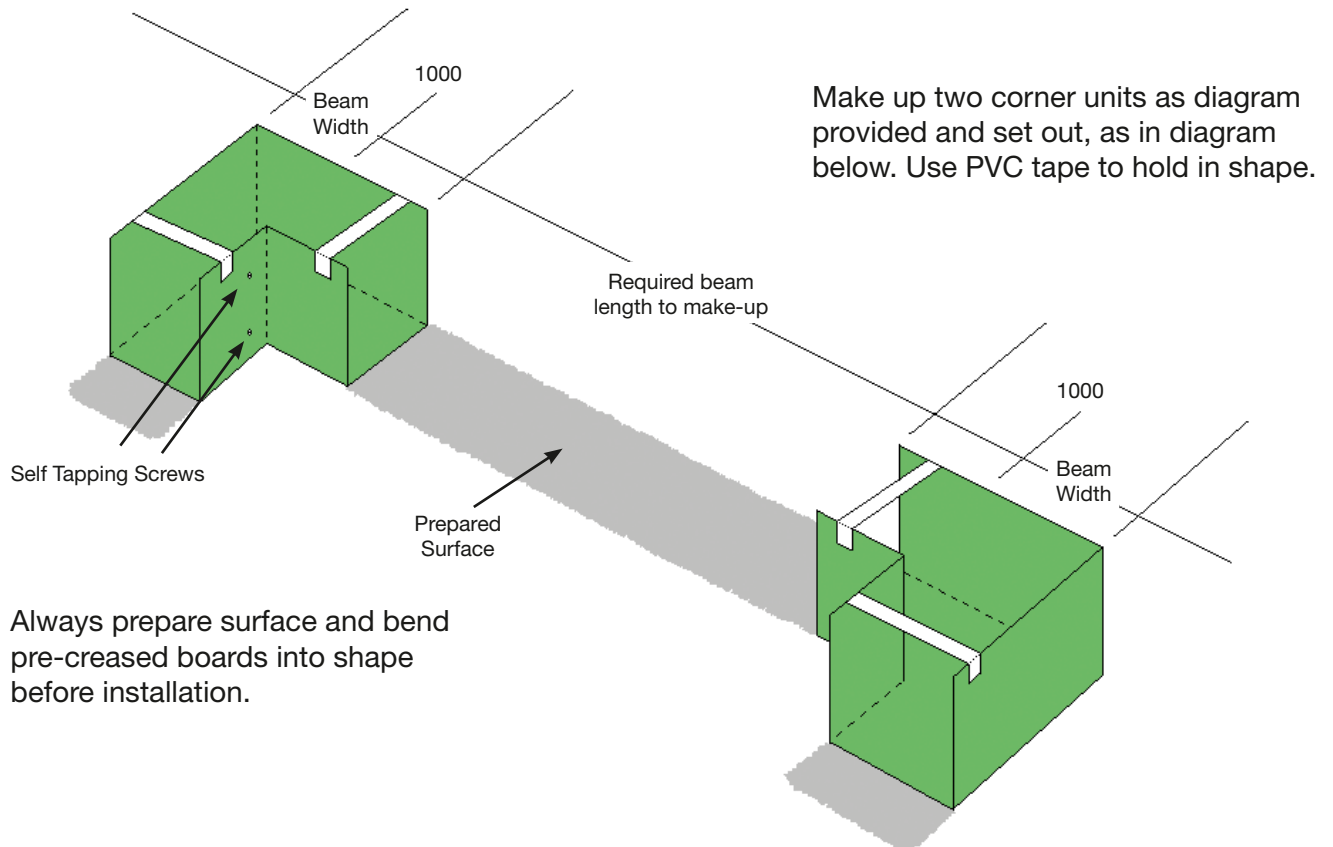
- Delivered to site on time
- All Shutter types
- Referenced and ready for use





Typical Installation Advice

Corriform Ground Beam Setting Out Procedure



The Corriform Permanent Formwork System Installation Accessories Advice

When installing the Corriform permanent formwork system a little pre-planning helps avoid potential pitfalls. Corriform is a thermo plastic and not the usual traditional wood or steel. The following information will assist a competent and professional installation team.

The Package

The Corriform delivered to site, includes a full accessory pack to allow correct on-site installation of ground beam, pile cap or other types of concrete foundation formwork. Each pallet will be delivered with assembly instructions for each particular type of formwork. The instructions will be either attached to the pallet or in an enclosed envelope addressed to the relevant site person. The following criteria must always be considered when installing Corriform: **Site conditions, type of backfill, spacer placement and method of support.**

The Corripin

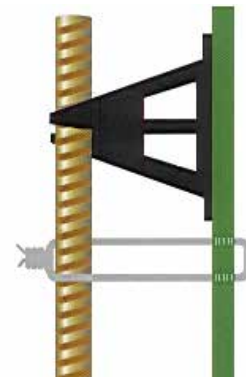
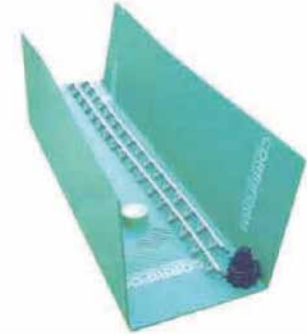
This is used to mechanically connect the Corriform sheets. The Corripin is pushed firmly down the flutes. Make sure the pin is slightly sprung to create tension.

Side Panel Fixing Tie

This is to tie the Corriform side panels to the steel reinforcement keeping the Corriform formwork in shape until backfill is placed. Punch 2 holes 20mm apart through the Corriform side panel using a bradawl. The tie is more effective near to the clip on spacer (see diagram b). Nip the tie around the steel reinforcement firmly.

Spacer Placement Advice

To maintain the correct concrete cover dimension to steel, we apply a simple rule of 200/250mm max spacer centres, thus giving equal and uniform support from the weight of backfill, prior to concrete pour and avoiding deflexion of formwork. See Diagram.

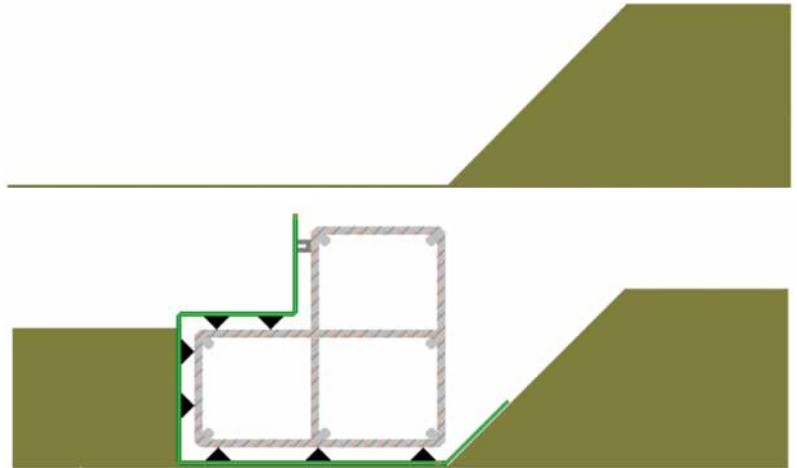




Installation advice for slab edge 'toe beam' former

1. Dig out trench to the required level forming the batter as required. Level base using coarse sand or stone.
2. Place Corriform formwork to building line, installing steel reinforcement and securing the Corriform to the reinforcement with fixing accessories supplied.

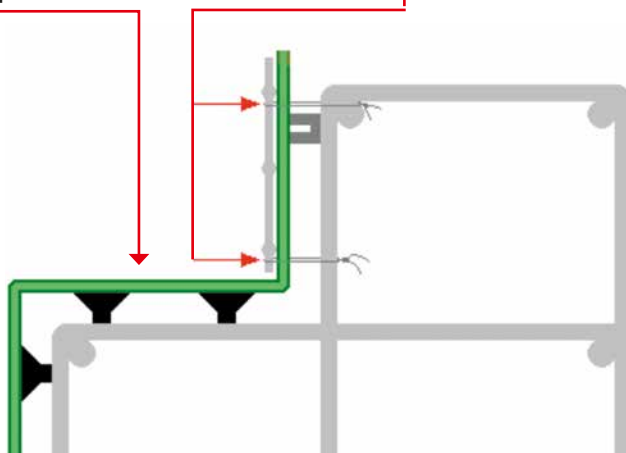
Note: Spacers must be fixed prior, giving concrete cover to reinforcement.



3. Backfill up to level of top spacer, as diagram.
4. Using strips of steel mesh, tie through the Corriform and secure to the reinforcement. This allows a straight flat front to the toe beam front as the concrete cures.

Using mesh to support externally, supports Corriform against reinforcement.

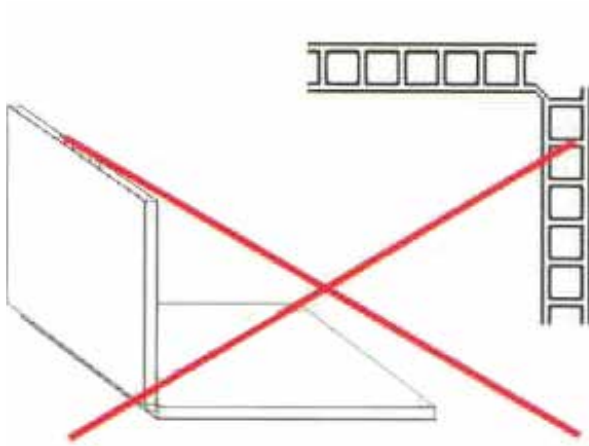
Holes (flaps) can be cut through this horizontal area to allow vibration poker entry during concrete pour.



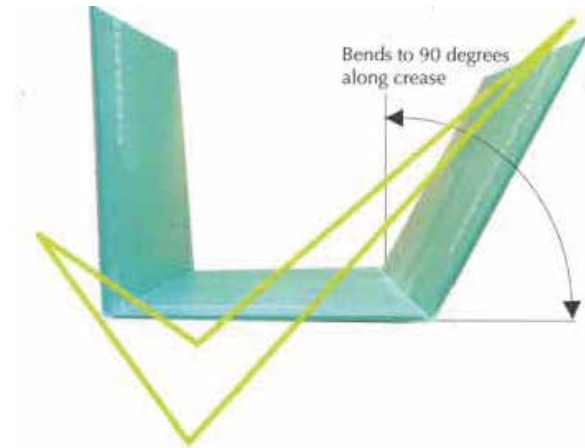
Why the corriform methods are correct way

Many Civil Engineers & Groundworkers now use polypropylene board material to form concrete building foundations unaware that this method of permanent formwork was originated and developed as the corriform permanent shuttering system in 1997 by the current owner of Groundwork Engineered Systems.

Our journey has been long and arduous. Competing in a tough and fluctuating market place. Throughout we have worked hard to maintain quality standards both in quality of materials and customer service. All this experience allows us to pass on this quality advice to the market place.



One skin cut to accommodate bend



Pre-creased Corriform is 3 times stronger

Creasing across the board profile gives added strength

This creasing method is unique to Groundwork Engineered Systems.

This method of creasing the board gives the fold line 3x the strength of a cut line and is virtually impossible to burst!



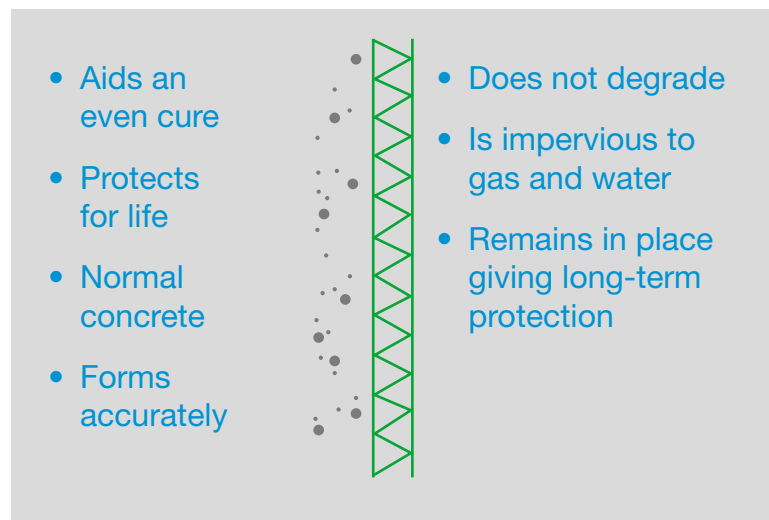
The Contamination Solution

Corriform Polypropylene Permanent Formwork

The formwork system offers solid benefits and cost savings when installing reinforced concrete foundations in situ. The fully protected concrete foundation, formed and encapsulated by Polypropylene, the most effective thermo plastics for proofing concrete foundations from the ingress of subsoil, gas, mineral and waterborne contamination.

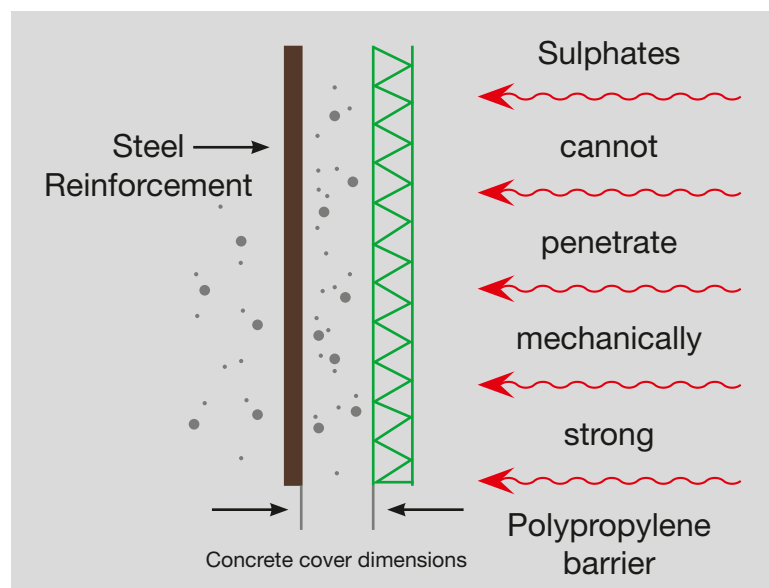
Main benefits are:

- A project specific former for fresh concrete
- Protects during and after cure
- Will not degrade
- Continues to protect the formed concrete against contamination.
- This solution can obviate the use of expensive sulphate resistant concrete.



Potential Inherent Benefit

- Due to the mechanical strength and longevity of Polypropylene there is potential to consider a reduction of the concrete cover dimension. This could offer tremendous potential savings on concrete volumes.



Gas, Water, Mineral Contamination Proofing Solutions



Fitting Proofex Total gas membrane starter strip, ready for connection to the under slab membrane



Sealing Pile Head with Supercast EPT epoxy



Installing Proofex Engage water proofing membrane



Proofex Hydromat installed inside Corriform formwork

The Groundwork Engineered Solutions - The Corriform System is totally compatible with the Fosroc range of proofing products.



Waterborne Contamination Solution

The Corriform Formwork System: Nottingham Hospital Extension, UK

Slab piled, pile caps cut out along slab edge.
All service pipes installed under slab edge



Corriform pile caps and slab edge formwork, installed and sealed, using Proofex 3000. Timber support along front edge, provides complete toe beam accuracy.



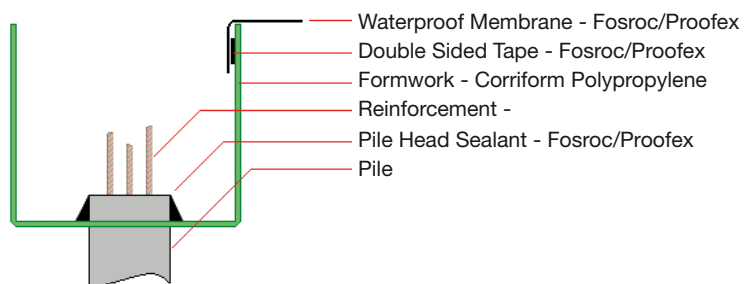
Fosroc Proofex 'Engage' installed and connected to Corriform Permanent Formwork completing the under slab waterproofing.



Steel reinforcement completely installed and connected.
Ready for concrete pour.



- Fully compatible with FOSROC
- Project specific
- Effective in gas, water and mineral contamination situations
- Non permeable
- No sulphate res/concrete required



Methane Gas Contamination Solution

Corriform Formwork System: Office Building, Scotland

Corriform Permanent Formwork installed.
Concrete driven pile heads sealed using Proofex LM.



Corriform Permanent Formwork installed. All pile heads sealed, connection joints sealed, ready for reinforcement.



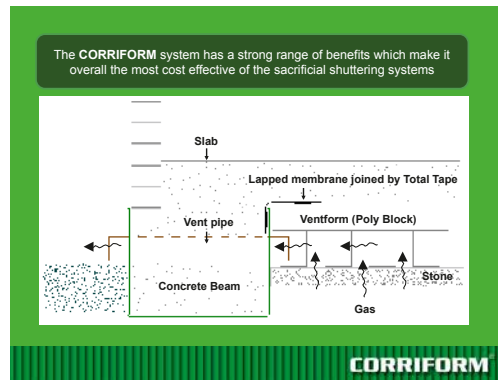
Proofex Total gas membrane starter strip connected to top edge of Corriform. Gas vent pipe cut through Corriform and sealed using top hats.



All reinforcement installed and first concrete pour complete.

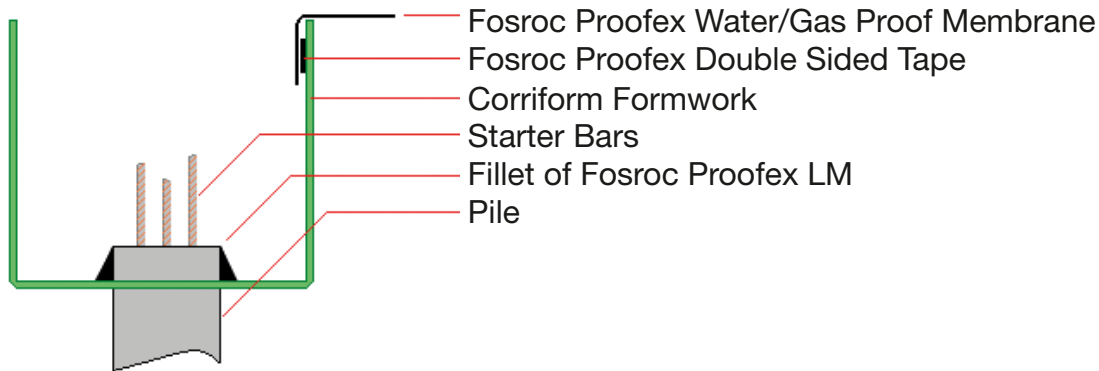


Sectional diagram showing construction and venting.





Typical pile cap protection



Benefits

- The Corriform permanent formwork system is fabricated project specific.
- The Corriform formwork material (polypropylene) is the most effective thermo plastic in resisting attack by contaminating chemicals, minerals, gas and water.
- The Corriform (PP) material is non permeable and jointing can be effectively sealed, using proprietary sealants.
- Concrete additives are not required to resist sub-soil contaminates.
- The polypropylene material is fluted (having cavities which lock air), therefore it has an insulation value.
- The Corriform formwork system is delivered to site with installation instructions.
- The Corriform formwork material is light and easy to transport.
- Due to flat pack benefit, the Corriform formwork material is palletised and requires less storage space.
- The Corriform permanent formwork system is fully compatible with the Fosroc Proofex range of products



Attaching Fosroc Proofex Total gas membrane to ground beam.

Corriform Formwork Data Sheet

High performance, waterproof, gasproof permanent formwork system.



Permanent formwork system designed for concrete foundations, both forming the concrete and protecting it against water, gas and other solid contaminants.

- Foundation ground beams
- Pile caps

As polypropylene permanent formwork, Corriform remains in-situ when concrete is cast, encapsulating the ground beam within a permanent gas impervious layer. Corriform can be bonded to other FOSROC Proofex gasproof membranes at ground level, creating a complete gasproof layer beneath your structure.

Advantages

- Provides radon and methane protection
- Compatible with FOSROC Proofex gas resistant membranes
- Compatible with FOSROC Proofex waterproofing membranes
- Water, mineral, chemical and gas resistant
- Can be installed in-situ or pre-fabricated prior to placing
- No binding needed
- Quick and easy to install
- Permanent system requires no cleaning

Description

Corriform is a range of extruded plastic boards based on polypropylene/ethylene copolymer. It comprises of flat polypropylene fluted boards which are pre-creased to specific project requirements. Supplied as bespoke panels, it comes in two weights and two colour types (green and natural). White is used in extreme hot climates. Each board is chemically inert regardless of colour. For applications in hot climates, a white coloured board can be supplied upon request.

Standard Compliances

Manufacturers certified performance.

Typical Properties

Board Thickness	7.8mm	7mm
Board Length	3050mm	3050mm
Board Width	2000mm	2000mm
Weight per M2	1500GSM	1200GSM
Tensile Strength (ASTMD638)	25	25
Nominal Wall Thickness	0.51mm	0.35mm
Melting Point	200/250°	200/250°

Standard Tolerances

Length	3050mm	-0/+15mm
Width	2000mm	-0/+3mm
Flute Pitch	5.8mm	5.8mm

Application Instructions

Preparation

The trench is excavated to accommodate the desired size of formwork. The bottom of the excavation should be level, even and properly compacted.

Installation

The 'U' sections should be butted up to the corner / end pieces and mechanically secured with two Corripins pushed down the flute of the boards.

Continue the installation inwardly until the final length is to be put in place. The required length should be measured and a 'U' section cut to the correct length to fill the gap.

Joints should be sealed with FOSROC Proofex TOTAL Tape to prevent grout loss. The reinforcement cage is placed in the formwork with spacers attached to the cage. (When fabricating out of the trench, the sides should be tied temporarily to the reinforcement). Holes for pile caps should be cut out of the base.

The pre-creased boards may be made up in-situ or outside the excavation and lifted into place together with the reinforcement. The trench is then backfilled up to the level of the top spacers or within 100mm of the top of the formwork, whichever is the highest.

Checks should be made to ensure that the correct cover to the reinforcement is maintained. The concrete is poured and vibrated according to normal practice.



Additional procedures for gasproof applications

Joins between adjacent boards should be made by butting together and securing with two Corripins. An internal saddle 100mm wide is then positioned centrally over the join and sealed with FOSROC Proofex TOTAL Tape.

Where pile caps penetrate the base an additional piece of Corrifom should be stuck with FOSROC Proofex TOTAL Tape, giving a minimum overlap of 150mm all around. All corners, ends and exposed flutes should be sealed with FOSROC Proofex TOTAL Tape. Pile caps should be sealed with either FOSROC Proofex LM or FOSROC Proofex WG as required.

Estimating

Corriform

Board Length	3050mm
Board Width	2000mm

Proofex TOTAL Tape

Board Length	30M
Board Width	50mm

Storage

Store in original unopened packaging, in cool dry conditions, away from direct sunlight.

Precautions

Health and Safety

There are no known health hazards associated with Proofex Corrifom in normal use. For further information on ancillary products refer to appropriate Product Safety Data Sheet.

Additional Information

Ancillary products

FOSROC Proofex TOTAL Tape

Double-sided butyl tape for sealing of side and end laps and for use in detailing work.

FOSROC Proofex LM

Two-part bituminous liquid membrane for sealing complex details in conjunction with FOSROC Proofex waterproofing and gas resistant systems.

Corripin

U-shaped metal pin inserted into the flutes to mechanically connect the Corrifom boards.

Spacers

Grippa type spacers are attached to the reinforcement to provide the correct dimensional concrete cover to the reinforcement.

Important note

Groundwork Engineered Systems are guaranteed against defective materials and manufacture and are sold subject to its standard conditions for the supply of goods and services, copies of which may be obtained on request. Whilst Groundwork Engineered Systems endeavours to ensure that any advice, recommendation, specification or information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation of information given by it.

Technical Data Sheet

Groundworks panels made of Polypropylene

Properties

- Good chemical resistance
- Easy to processing by cutting and welding, and easy to clean
- Impact resistant and tear-proof
- Sound absorbing and thermally insulating
- Environmentally friendly because the base polypropylene is recyclable

Technical data

▪ Temperature range	-20° to +80° C	
▪ HDT B (0,45 MPA)	+95° C	
▪ Vicat softening point A (10N)	+150° C	
▪ Density	0,9 g/cm ³	
▪ Flexural modulus	1400 MPa	
▪ Elongation at break	70 %	
▪ Impact strength (notched)	+23° C	45 KJ/m ²
	0° C	10 KJ/m ²
	-20° C	6 KJ/m ²

Chemical resistance

Polypropylene is generally resistant against most chemicals at temperatures ≤ 50° C proof. Some solvents can cause swelling. Also some substances can cause discoloration irreversible. In case of doubt, tests must be done by user.

Tolerances

Length (from current production)	± 0,3 %
Width (from current production)	± 1 mm/m
Sheet thickness tolerance	± 5 %
Thickness over the surface	± 0.1 mm
Thermal expansion	1-2 mm/m / 10° C
Weight tolerance	> -3 %
Angle	± 0.3 %



Notes



Contamination Proof Systems



Contact our technical department on
Telephone: 01457 863 444
Email: admin@groundworkeng.co.uk