Prefilled Lined Above Water Hand-Placed Bagwork

Above Water Bagwork Product Datasheet

UK Patent No. GB2464669
UK Patent Application No.1905855.1

Identification

Introduction

Prefilled Above Water Bagwork is designed for the hand placement of concrete, above the waterline or away from watercourses, where external water is not present to hydrate the concrete contained inside the bag. Uses typically include the formation of headwalls to culverts and bridges or the creation and protection of riverbanks, but in controlled situations can also be used for the creation of scour protection, the filling of voids and for underpinning. Containment of the cement fines is provided by the addition of a water soluble liner inside an outer hessian bag.

The concrete contained within the bagwork, remains inside the bagwork product during its use, with the outer hessian bag acting as the external formwork. The concrete mix within the bags typically hydrates within several hours (refer to instructions below), hardens fully within 12 hours, and achieves full design strength within 28 days.

Each prefilled Above Water Bag is supplied filled with 20kg of dry mix concrete, 50no. prefilled bags per pallet, with each pallet shrink wrapped for storage and protection. Prefilled Above Water Bagwork can be pre-soaked prior to placement or soaked insitu, in order to hydrate the concrete sufficiently and begin the hardening process. Steelwork can also be used as a means of linking blockwork together into a singular massive block of concrete blockwork.

Authority

The individual components of the concrete comply with the requirements of BS/IS EN 206-1:2002 and is manufactured under a BSI registered ISO 9001:2015 Quality System.

Materials used comply with the following standards:

Cement	BS EN 197-1:2011 (UK)	Aggregate BS EN 12620:2002
	IS EN 197-1: 2011 (Ireland)	

General Advantages

Prefilled Above Water Bagwork allows the hand placement of concrete, in situations where water is not generally available to harden the concrete. Typically this will be on riverbanks or away from a watercourse and it is intended to be used in conjunction with SoluForm Underwater Bagwork for the below water parts. The use of any bagwork near watercourses may be subject to suitable Method Statements and Approvals to avoid any risk to nearby bodies of water, and is often subject to a formal Regulatory Consent. Provided prefilled, primarily the advantage is that it removes the need for the Contractor to fill bagwork themselves. As a means of concrete placement, it is highly adaptable during construction, and requires very little in the way of design.

Description Manufacture

Concrete raw materials and end products are subject to regular quality control procedures and testing. Materials are factory blended, weighed and bagwork filled to ensure consistency and quality of the end bagwork product.

Compressive Strength

Prefilled Above Water Bagwork is supplied to achieve an in-situ strength of at least 25N/mm^2 in the case of the high strength formulation or at least 9N/mm² for the general civil formulation, complying with BS EN 206-1.

Characteristic Strength N/mm² (typical)

High Strength Concrete Blend		
Strength Test- Cube	7 Days	28 Days
Laboratory Tested	**25**	**32**
Representative (in situ)	18	25

General Civil Concrete Blend		
Strength Test- Cube	7 Days	28 Days
Laboratory Tested	**9**	**12**
Representative (in situ)	7	9

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Performance

Prefilled Above Water Bagwork contains a premixed, dry mix cementitious concrete product, formulated for pre-soaking and non-flow applications. It consists of an outer hessian bag and a separate water soluble liner to contain and shape the dry mix concrete contained within. It is designed to be pre-soaked prior to or whilst being placed, with the associated biodegradable bagwork simply providing a means of carrying, shaping and forming the concrete blockwork. The concrete has been specifically blended to provide a durable, long term concrete formation, with structural grade strength in excess of 25N/mm^2 if necessary, and offer good adhesive properties for any associated steelwork. As such, it is ideal for a range of long term hand placed concrete bagwork uses, including headwalls, training and retaining walls, formally defining channels and ditches, and out of water underpinning.

Instructions for Use

All prefilled bagwork should remain palletised and wrapped until ready to use. Palletised bagwork should be stored in the dry, or suitably covered and protected if stored outside.

Care should be taken in removing protective wrapping, so as not to cut or damage the bagwork. When ready to use, bagwork should be removed individually from the pallet wrapping, and individual bags gently shaken, rolled or squeezed to loosen any compacted dry mix concrete contained within each bag. Should there be any small amounts of cement powder on the outside of the bag, resulting from the filling process, this can be gently brushed off with a soft brush. Where bags are more heavily dusty, it is likely that the bagwork has been damaged during transit and the bags should not be used. Where damage has occurred during transit, these damaged bags should not generally be used, although often the dry mix can be reused to refill empty bagwork or reutilised for other purposes.

For Placement Away from Watercourses

Prefilled bagwork placed away from any watercourse needs to be hydrated prior to or during placement. This can either be achieved by pre-soaking the lined bagwork in a bath of water for approximately 15 minutes prior to placement, or by thoroughly wetting the bagwork during placement (typically for a minimum of 3 minutes). To ensure full strength we recommend pre-soaking the bags. The water soluble liner will begin to dissolve in 5 seconds and is typically fully dissolved within approximately 15 seconds, sufficient enough to allow water to readily soak into the dry mix to harden the concrete. Typically a 20kg bag will absorb around 4L of water during this process so it is important to have a ready supply of water available and to top up at regular intervals.

When ready to use, each of the bags should be removed from the pallet and if pre-soaked, fully submerged in a suitable bath of water. Once hydrated (approximately 15 minutes), the bagwork can be carefully lifted from the bath and excess water allowed to drain. The pre-soaked bagwork should be carried, individually by hand or using a wheel barrow, to the site of placement.

Each bag should be carefully placed horizontally, taking care not to drop, snag or tear the bags on sharp objects. Bagwork is to be placed flat and built up in rows, typically alternating or cross bonding bagwork. Cross bonding improves the strength and effectiveness of the finished concrete blockwork. Bagwork can be patted flat or shaped once placed, to improve the appearance of the bagwork and reduce the amount of voids within the finished blockwork.

After the second or third row of bags, steel rebar pins can be pushed down vertically through the bagwork to tie all the blockwork together, with additional steel used to tie subsequent rows. Pins can be inserted by hand, or if a hammer is used, this should be a rubber mallet. Steelwork is not always needed for above water bagwork although we do recommend that it is used wherever the bags are needed for medium to long term works, or where additional wall strength is needed. Typically standard 300mm long steelwork pins are inserted every two rows of bagwork, piercing 3 rows of bagwork with a single 300mm long pin.

Should the bagwork be placed dry with the intention of hosing the bagwork in situ, we recommend that each row is placed and wetted in situ individually, wetted for at least 3 minutes to ensure adequate take up of water to achieve full hydration. Full strength cannot be guaranteed if the bagwork is to be hosed down.

Upon completion of the works, if used, the temporary bath of water should be emptied and disposed of in a safe and environmentally acceptable manner. Bear in mind that the water will be of high pH, may be sediment laden and will contain dissolved liner material. This water should therefore not be discharged into any watercourse.

For Placement Above Water Level

The main difference between bagwork placed above a watercourse and bagwork placed away from a watercourse is that typically bagwork cannot be hosed down during placement and will need to be pre-soaked. This is to avoid the potential for water flushing off the bagwork and directly entering the watercourse. Where the watercourse has been dewatered for the construction works, hosing concrete bagwork can sometimes be undertaken although this is usually subject to regulatory consent and a suitable and approved method statement. In those instances, care and consideration should be made to the potential risk and consequences of any flushings then entering the watercourse.

For above water placement, similarly prefilled bagwork supplied as a dry mix needs to be hydrated prior to placement. This should typically be achieved by pre-soaking the lined bagwork in a bath of water for approximately 15 minutes prior to placement. The water soluble liner will begin to dissolve in 5 seconds and is typically fully dissolved within approximately 15 seconds, sufficient enough to allow water to readily soak into the dry mix to harden the concrete. Typically a 20kg bag will absorb around 4L of water during this process so it is important to have a ready supply of water available and to top up at regular intervals.

When ready to use, each of the bags should be removed from the pallet and fully submerged in a suitable bath of water. Once hydrated, the bagwork can be carefully lifted from the bath and excess water allowed to drain. The pre-soaked bagwork should be carried, individually by hand or using a wheel barrow, to the site of placement. The worksite should be approached from the dry side, such that pre-soaked bagwork is not carried over or through the watercourse unnecessarily, where slips, trips or falls could result in the bagwork being dropped into the water. The Contractor's method statement should include measures to ensure that pre-soaked bagwork is not carried through a watercourse, unavoidably.

Each bag should be carefully placed horizontally, taking care not to drop, snag or tear the bags on sharp objects. Bagwork is to be placed flat and built up in rows, typically alternating or cross bonding bagwork. Cross bonding improves the strength and effectiveness of the finished concrete blockwork. Bagwork can be patted flat or shaped once placed, to improve the appearance of the bagwork and reduce the amount of voids within the finished blockwork.

After the second or third row of bags, steel rebar pins can be pushed down vertically through the bagwork to tie all the blockwork together, with additional steel used to tie subsequent rows. Pins can be inserted by hand, or if a hammer is used, this should be a rubber mallet. Steelwork is not always needed for above water bagwork although we do recommend that it is used wherever the bags are needed for medium to long term works, or where they fulfil a role of providing protection against scour. It also protects against vandalism, or blocks becoming dislodged during flood conditions. Typically standard 300mm long steelwork pins are inserted every two rows of bagwork, piercing 3 rows of bagwork with a single 300mm long pin.

Due to the risk of uncontrolled flushings entering the watercourse, we do not generally recommend wetting insitu for over water works, however in controlled situations this may still be possible. The use of non pre-soaked water soluble bagwork in above water applications should only be considered following an assessment of environmental risk and regulatory approval. Should the bagwork be placed dry with the intention of hosing the bagwork in situ, we recommend that each row is placed and wetted in situ individually, wetted for at least 3 minutes to ensure adequate take up of water to achieve full hydration.

Upon completion of the works, the temporary bath of water should be emptied and disposed of in a safe and environmentally acceptable manner. Bear in mind that the water will be of high pH, may be sediment laden and will contain dissolved liner material. This water should therefore not be discharged into any watercourse.

For placement of prefilled bagwork below water level we recommend the use of our Prefilled SoluForm Underwater Bagwork product, to allow clean, dry mix placement, under water.

We recommend you pre-test the bags and proposed methodology beforehand, prior to using them on site, to ensure the product is suitable for the application, is environmentally safe to use and meets the requirements of any regulatory body or consent.

Biodegradation: The outer hessian bagwork intentionally does not contain any fungicides and will safely biodegrade, typically within 6-12 months. The outer hessian bag is purely temporary and needed to contain and shape the concrete within. It therefore deviates from the requirements of the Specification for Highways Works and specifically BS1214.