Concrete Weavers LLC

it's a concrete miracle

INSTALLATION USER GUIDE:
CHANNEL LINING

PRESENTATION

Concrete Weavers is a new and revolutionary construction material called concrete rolls or concrete cloth. Essentially it is concrete on a roll.

The finished product is a combination of two geotextiles with a dry concrete mix in between. The product initially is flexible and can be put in any shape desired. Once water is applied to it, it starts to set and becomes hard. No need for plant or mixing equipment on site, just add water.

The bottom layer is a woven geotextile and the top layer is a non-woven geotextile.

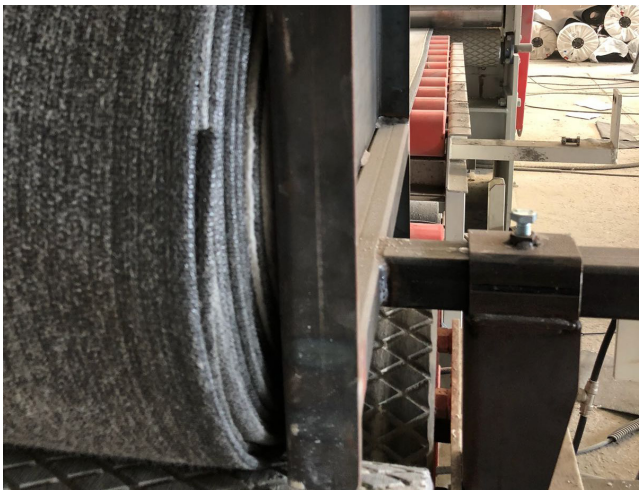
Between the top and the bottom layer, there is a special Concrete Weavers dry mix, developed by a Dutch company with many references such as; Nakheel Mall UAE , Abu Dhabi Plaza Skyscraper, Kazakhstan, Coen Underwater Tunnel Netherlands, Port house Belgium, Cairo's Grand Egyptian Museum Egypt, etc.

Top and bottom layers are connected by needle punching technology.

Concrete Weavers are available in 2 different thicknesses and strengths; the civil model used for erosion control, irrigation, ditch lining, dust suppression etc. and the military model used for runway construction over all kind of terrains, temporary parking for planes and vehicles, temporary military roads etc.

SCOPE / EXTENSION

- This record or document gives guidance procedure for the installation of Concrete Weavers as channel lining in a way that maximizes safety, proficiency, & the physical integrity of the material & channel.
- This report or document gives helpful data to installers, clients and specifiers of Concrete Weavers & provides an outline of overview of installation methods or techniques for the lining of channels.
- The adaptable idea of Concrete Weavers means that this document or record isn't exhaustive & is planned for direction purposes only. Exceptions to this rule might be required to address site-specific or product specific conditions.
- The performance of the Concrete Weavers is entirely dependent on the quality of its installation. It is the installer's duty to adhere to these rules or guidlines where applicable & to the project specification, detail and drawings.



PARTICULAR & DETERMINATION & INSTALLATION ESSENTIALS

Determining & Specifying the right Concrete Weavers Thickness

Concrete Weavers is available in two thicknesses, CW Civil 8 (8mm) and CW Military 18 (18mm).

Concrete Weavers Civil can be used for ditch lining, line channel & irrigation. It is significantly faster, easier and less expensive to install than traditional concrete channel and ditch lining and requires no special equipment on site. The rolls can be laid and installed at a rate of up to 250m2 per hour by a small team. Concrete Weavers Civil can be used for slope protection as an easy and less expensive alternative for classic concrete structures. Becomes hard after hydration but still has some flexibility to prevent the concrete from cracking. Mostly used for protection against mud slides and rocks falling down the slope. Concrete Weavers Civil can be used to rapidly reline and refurbish existing concrete structures suffering from degradation and cracking.

Concrete Weavers Military, the military version of the concrete weavers can be used for aircraft runways and temporary parking spots for vehicles and aircrafts. By covering compacted sand runways with concrete weavers it prevents dust entering the engines.

The biggest benefit for this application is the fast and easy installment. The mixture of sand and resin layered on top of the concrete weavers makes the runway slip resistance. Concrete Weavers Military covering storages and bunker sand bags with concrete weavers makes it more armored and prevent the sandbags from falling apart.

Product	Nominal Thickness (mm)	Batch Roll Size (m2)	Bulk Roll Size (m2)	Roll Width (m)
CW CIVIL	8	10	100	1
CW MILITARY	18	N/A	100	1

Determining & Specifying The Right Concrete Weavers Roll Format

Concrete Weavers is available in Bulk or Mass Rolls or as littler Batched Rolls.

Bulk or Mass Rolls offer the fastest installation yet should be deployed using heavy lifting equipment & a spreader beam or pillar. Bulk or Mass Rolls are commonly more effective to use than Batched Rolls, in terms of material use & transportation. For sites where this isn't appropriate, man portable Batched Rolls can be installed without the requirement for plant & are well suitable to littler scale works in limited access areas. Concrete Weavers is presently additionally available in Wide Rolls of upto multiple times the standard roll width. For further details please contact Concrete Weavers.

Determining / Specifying the right fixing

Concrete Weavers can be laid along the length of the channel (longitudinal) or across or over the width (transverse).

Laying longitudinally is ordinarily quicker than laying transversely. Anyway a transverse layup may be ideal if.

The channel side slope is more than 0.8m as this makes verifying the Concrete Weavers difficult when using a longitudinal layup.

The channel geometry means that longitudinal layup is materially wasteful or inefficient.

The channel profile varies significantly along the channel length.

The channel has significant as well as continuous or frequent sharp bends.

Concrete Weavers four key Installation Principles / Establishment Standards

The unique material properties of Concrete Weavers mean that it can be used for a variety of applications. Following the Four Installation Principles below will help ensure a successful installation.

Avoid Voids

Prepare or Set up the substrate so it is all around well compacted, geotechnically steady or stable & has a smooth & uniform surface.

- For soil substrates, expel/remove any vegetation, sharp or protruding rocks & fill any large void spaces. Ensure the Concrete Weavers reaches the substrate to limit soil bridging or potential soil relocation or migration under the layer.
- For Concrete substrates, remove or expel any loose, free or friable material, remove any protruding uncovered re-bar and fill any large cracks or breaks or voids.

Secure Weavers

Ensure that the Concrete Weavers is Jointed at each overlap between layers & that those layers are Fixed to the substrate.

- **Jointing:** Overlapped Concrete Weavers layers should be safely jointed together, ordinarily this is achieved utilizing stainless steel screws applied or connected with an auto-fed screw gun at regular intervals. Right screw position will help guarantee private contact between Concrete Weavers layers, prevent washout of the substrate, & limit potential weed development or growth. A adhesive or glue sealant can be applied or connected between the layers to improve the joint impermeability.

  A non-penetrative method for jointing is to 'thermally bond' the Concrete Weavers layers together. This also improves joint impermeability. For additionally jointing options see the Concrete Weavers User Guide: Jointing & Fixing.
- **Fixing:** When fixing to a soil substrate, ground pegs (eg J-Hook) are normally used. On rock or concrete substrates, Concrete Weavers layers can be jointed together & fixed to the substrate utilizing masonry bolts, percussion anchors or shot fired masonry nails. Stainless steel fixings with washers are recommended.

Prevent Ingress / Avert or Block Entrance

It is essential to avert or block water or wind entrance between the Concrete Weavers & the substrate, both around the perimeter of the installation & along the joints.

- For soil substrates, this is ordinarily achieved by capturing the whole edge of the Concrete Weavers within an anchor trench.
- On solid or rock or concrete substrates, the perimeter edge should be fixed with a concrete fillet or an adhesive sealant.
- All overlapped Concrete Weavers layers should be lapped toward water flow.

Hydrate Fully / Hydrate Completely

It is basic to appropriately hydrate Concrete Weavers, considering the amount of material utilized and surrounding temperature conditions.

- Always guarantee or ensure hydration through the fibrous top surface.
- Ensure to hydrate any overlapped areas & anchor trenched material before backfilling.
- Spray the fiber surface with water until it feels wet to contact for a several minutes after hydration.
- Follow the Concrete Weavers User Guide: Hydration.

Installation Technique or Methodology

Equipment Required

Adequate or sufficient Concrete Weavers to finish project.

Security cover, Safety Mask & Gloves

Cutting equipment, snap off knife or disc cutter.

Metal or plastic fixing pins.

Hammer Lump.

Screwdriver & stainless screws or elective technique to join the Concrete Weavers layers.

Water supply.

Follow Concrete Weavers Equipment List for full details. Dust hazard or risk. Wear proper PPE.

Site Preparation

Occupy or Divert water (if covering a current waterway)

Remove or Expel vegetation & grade channel to a uniform profile. Concrete Weavers will conform closely to the underlying channel profile

Remove or Expel sharp or protruding rocks more than 25mm & fill large voids

Excavate or Unearth anchor trench into the shoulders of the channel (min. 150mm)

Excavate or Unearth Leading and Trailing Edge end channels or termination trenches (min. 150mm) along invert & side slopes (if Concrete Weavers isn't to be fixed into existing foundation).

Arrangement / Deployment

Confirm if longitudinal or transverse layup deployment of Concrete Weavers is specified.

Start at downstream end of channel & work up slope.

Remove or Expel packaging & unroll Concrete Weavers in channel profile to suit specified layup, ensuring the fibrous top surface faces upwards, with the PVC layer in contact with the ground.

Inspect Concrete Weavers to ensure close contact with substrate and adjust to remove any void space behind.

For transverse layup installations, tuck the Edge of the Concrete Weavers into the anchor trench before cutting to length.

In the event that cutting with a disc cutter, it is recommended to wet the cut beforehand to limit dust generation.

Ensure the Edge of the primary layer of Concrete Weavers is either

Appropriately terminated into existing infrastructure or foundation & fixed to prevent water entrance, for example a screwed and sealed knuckle joint– see the Concrete Weavers User Guide:

Jointing and Fixing for strategy or; Tucked into an termination trench which is refilled to prevent scour below Concrete Weavers.

Installation Technique or Methodology

Overlapping Layers

When situating consequent layers ensure there is somewhere around a 100mm ovelap toward water flow (shingled like roof tiles) and that the material is in close contact with the ground.

Jointing and Fixing

Fix the material along the shoulder of the channel by inserting fixing pins through each overlap or at 2m intervals for longitudinal installations.

Hydrate the material under the overlapped segments or sections of the Concrete Weavers. When hydrated, the material remain workable for 1 to 2 hours.

Insert stainless screws at 200mm centers, at around 30– 50mm from the edge of the Concrete Weavers. Ensure there is no rucking at the joint & the two layers are in contact with one another.

Care will be taken during installation to avoid damage occurring to the Concrete Weavers. Concrete Weavers should be damaged during installation & before hydration, the layer should be expelled or removed and replaced.

It is fundamental that all uncovered (for example unjointed) Edges of the Concrete Weavers should be verified during the installation to prevent water entrance below the Concrete Weavers which may cause wash-out of the substrate & resulting undermining.

Just installed what can be completely or fully installed & hydrated before the finish of construction day to limit any adverse impact on the installation & additionally performance capabilities of the product.

In the event that installation proceeds with the following working day, secure the Edge of the last layer of Concrete Weavers overnight with waterproof sheeting to enable jointing on come back to work.

Ensure the Edge of the last layer of Concrete Weavers is either: Appropriately ended into existing foundation or infrastructure & fixed to prevent or counteract water entrance, for example a screwed & sealed knuckle joint– see the Concrete Weavers User Guide:

Jointing & Fixing for technique or methodology; Tucked into an end trench which is refilled to prevent scour below Concrete Weavers.

Installation Technique or Methodology

Hydration

Spray or shower the Concrete Weavers with water to hydrate, after fixing & jointing.

Splash or spray the fiber surface on multiple occasions until the Concrete Weavers is completely soaked. The wet Concrete Weavers will initially darken and afterward turned out to be lighter as it absorbs the water.

Don't use high pressure water spray directly on the Concrete Weavers as this may wash a channel in the material.

Concrete Weavers can be hydrated using salt water or fresh water & will hydrate & set underwater.

Concrete Weavers is not possible to over hydrate.

Minimum 50% of the material weight water is required. For example Concrete Weavers Civil required 6 liters of water per square meter.

To know proper hydration, the Concrete Weavers should feel wet to the touch several minutes after hydration

Please not rely on rainfall to provide hydration.

To know whether the Concrete Weavers has been properly hydrates simply press your finger into the Concrete Weavers & release. If water is present in the depression in the Concrete Weavers, it has been properly hydrated. If no water is feel, then more water must be applied.

Please refer Concrete Weavers User Guide: Hydration, for information on hydration & for temperature installations.

Configuration / Adjustment / Setting

There is a working time of 1-2 hours after hydration.

Refill anchor trench to create perfect termination & encourage surface water runoff to flow over the anchor trench & in to the Concrete Weavers channel.

Concrete Weavers harden to 75% strength in 24 hours and is then prepared for use.

Maintenance & Upkeep & Repair

Concrete Weavers lined channels require minimal maintenance; give long term scour assurance or protection, decreased silt generation & effective weed suppression.

In the event that damage is found during an occasional investigation, a fix can be put over the damaged area extending at least 150mm in all directions beyond the damaged area & attached with mortar approved sealant.

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