



Concrete Weavers LLC

it's a concrete miracle

USER GUIDE:

GENERAL / CLIENT DIRECT BOARD /
CLIENT MANAGE GENERAL/CLIENT CONTROL GENERAL
JOINTING & FIXING / JOINT / CONNECTING /
FIXING PROCESS / ASSEMBLING

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.

Cutting Unset Concrete Weavers:

- Concrete Weavers can be cut with basic hand tools or utility knife prior to hydration. When cutting unset Concrete Weavers a 15mm-20mm gap should be left from the cut edge due to potential loss of fill. For major projects where numerous cuts are required it is recommended to use Angle Grinder or handheld powered disc cutters. Cutting with a disc cutter, it is recommended to wet the cut in advance to minimize dust generation.

Cutting Set Concrete Weavers:

- Set Concrete Weavers can be cut using the same tools used for cutting conventional concrete such as disc cutters & angle grinder. Concrete Weavers also can be water cut for applications where a high resolution is required such as for signage or sculptural works.



Fixing Specification:

For Soil

Anchor Trench:

- ▶ Covering the perimeter edges of Concrete Weavers in a stay channel or anchor trench is basic for most of installations. This will help keep undermining from surface water and give a perfect edge end. Utilized related to hook/bolt/pegs or when refilled with concrete an anchor trench gives effective methods for securing Concrete Weavers to the substrate. Normally anchor trench are used at the peak and toe of slope & along the shoulders of a channel & leading & trailing edges to prevent wind & water entrance.
- ▶ Wherever possible we would hence recommend anchor trenching the whole perimeter edge of Concrete Weavers.

Pegs / Hook / Pin / Bolt:

- ▶ Concrete Weavers have galvanized steel J-Hooks or pegs in lengths of 250mm & 380mm. Hook/ Pegs might be sourced from alternate suppliers but must have an adequately sharp point to enter the Concrete Weavers & a head structure that will capture the surface of Concrete Weavers. Peg/ Hook length and separating should be chosen dependent on soil conditions and application. Pegs should be connected at joints where possible to secure adjoining layers together.

Soil Nails / Ground Anchors / Ground Plate:

- ▶ For high load applications or where ground conditions are poor, for example, with erosion or slope protection, slope stabilization or for high stream applications, it is recommended to utilize Concrete Weavers related to soil nails, ground anchors or earth percussion anchors. The anchor plate design should be circular where possible or have radiused corners to avoid concentrations. The soil nail & anchors plate specification should be approved by a certified geotechnical engineers.

Concrete

Mortar:

- ▶ A reasonable mortar can be utilized to join & seal Concrete Weavers to existing concrete foundation, for example, head walls & slaps. Most off-the-shelf mortars will bond well to the fibrous surface of Concrete Weavers. We recommend applying the mortar to the Concrete Weavers immediately after hydration or wetting the Concrete Weavers surface if applying post-set.

Masonry fixings (bolt/nails/hook):

- ▶ A range of traditional masonry fixings, for example, self-tapping masonry bolts, wedge anchors, can be utilized to fix Concrete Weavers to other concrete surfaces. We suggest a minimum shank measurement of 3mm & a minimum washer/head diameter of 16mm or clamping plate to prevent pull-through.

Rock

Rock Bolts:

- ▶ To be used on hard or rocky substrates, the quantity & type of rock bolt should be selected based at the pull-out pressure requirement. An appropriate head layout should be selected to prevent stress concentrations. A minimum head diameter of 16mm is commonly encouraged & plates up to 150mm are regularly used.

Steel

Hog Rings / Hoard Rings

- ▶ Ideal for fixing Concrete Weavers to wire work, gabion basket or fencing, hoard rings are available in a scope of sizes & can be applied with a manual or powered hog ringer. The hog rings should be applied to Concrete Weavers before hydration.

Tech Screws:

- ▶ Self-drilling screws, for example, tech-screws are reasonable for fixing Concrete Weavers to sheet steel. A washer might be required to avoid pull-through.

Wood

Staples/Nails/Screws/Adhesive:

- ▶ A range of traditional fixings can be utilized to fix Concrete Weavers to substrates such as wood. In its pre-hydrated form Concrete Weavers like a thick geotextile & can be fastened with suitable screws, staples, nails or glues.

Others

- ▶ The flexible nature of Concrete Weavers means that it can be jointed, fixed & sealed utilizing a large choice of products available on the market. The three following listed joints (3.0) are reasonable for most of applications & summarized in the table toward the finish of this report (5.0). Some other fixings which might be used are also shown in the below images.



Jointing Specifications / Joint Requirement / Conjoint Specification / Joint Description / Overlapped Joint / Joint Overlapping / Joint Overlap

- ▶ Joint is appropriate for most of Concrete Weavers applications & includes overlapping adjacent sheets of Concrete Weavers by at least 100mm, (see picture 1). For slope control applications, care should be taken to position the overlap toward direction of water flow (like shingled roof tiles). While jointing cut edges of Concrete Weavers, the material can be folded back on itself to form a knuckle joint, (see picture 2) which covers the cut edge and improves the seal between layers. We would suggest securing the overlap with one of the following methods - it is important to hydrate the material under the overlap before fixing.

Screws:

- ▶ Appropriate for most of utilizations this joint is quick and easy to apply, it provide good mechanical strength yet has restricted impermeability. The screws should be applied at 200mm spacing (50mm for bund lining) & 30-50mm from the edge of the Concrete Weavers. The screws should be applied prior to setting but however after hydration (Concrete Weavers has 1-2 hours working time in a middle east atmosphere), so the concrete inside Concrete Weavers will at that point set around the thread of the screws. Consequently it is important that the screws have a completely threaded shank & a minimum length equivalent to the full thickness of the joint. Collated screws allow for the utilization of an auto-fed screwdriver which provides quick means of creating a screwed joint. Appropriate collated stainless steel screws are available from Concrete Weavers LLC.

Screws & Sealant

- ▶ For applications wherein improved impermeability is required, Concrete Weavers can be jointed with a Concrete Weavers approved adhesive sealant using a caulking gun. This is applied as a single 8mm bead with the screws inserted via the sealant bead where possible to minimise leakage. An 8mm bead is equivalent to a coverage of 50g/m that is equivalent to 5.8m of joint for 290ml cartridge or 12m of joint from a 600ml cartridge. Suitable Concrete Weavers approved adhesive sealants are available from Concrete Weavers LLC, 200mm screw spacing is suitable for maximum applications, 50mm is suggested for bund lining. it is essential to hydrate below the overlap prior to applying use of the adhesive sealant in order to remove excess dust, making sure touch with the fibrous top surface of the lowest Concrete Weavers layer & to provide moisture for curing.

Hydration of the Overlap / Overlap Hydration / Overlapping Hydration

- ▶ In a few conditions for the above joints, it may not be conceivable to hydrate underneath the overlap prior to fixing. This isn't commonly advised, as the underlap material will only be partially hydrated, however it may be acceptable if certain conditions exist. For example, if the joint is going to be continually exposed to water due to the nature of the application, the underlap material will gradually hydrate through infiltration.
- ▶ Please be aware, that in these examples, the joint strength may be compromised. For instance a screwed joint depends on the Concrete Weavers setting around the thread of the screw to achieve the strength values overleaf in this short term strength will be significantly lower until full hydration is achieved.
- ▶ Adhesive sealants also benefit from pre-hydration as this cleans the jointing surface of dry cement dust before the use of application of adhesive & helps to cure the adhesive during setting. Joints will therefore typically achieve a long term strength which is 30-40% lower than the published values if the underlap Concrete Weavers isn't hydrated before jointing.

Installation Principles / Establishment Standards

The unique material properties of Concrete Weavers mean that it can be used for a variety of applications. Following the 4 Installation Principles below will help ensure a successful installation.

Avoid Voids / Maintain a strategic distance from Voids / Stay away from Voids

- ▶ Set up the substrate so it is well compacted, geotechnically steady and has a smooth and uniform surface.
- ▶ For soil substrates, remove any vegetation, sharp or protruding rocks and fill any large void spaces. Ensure the Concrete Weavers makes direct contact with the substrate to minimize soil bridging or potential soil relocation under the layer.
- ▶ For concrete substrates, remove any loose or friable material, remove any protruding uncovered re-bar and fill any large cracks or breaks or voids.

Secure Canvas / Secure Weavers

- ▶ Ensure that the Concrete Weavers is jointed at each overlap between layers and that those layers are fixed to the substrate.
- ▶ **Jointing:** Overlapped Concrete Weavers layers should be safely jointed together; ordinarily this is achieved using stainless steel screws connected with an auto-fed screw gun at regular intervals. Right screw position will help ensure intimate contact between Concrete Weavers layers, prevent washout of the substrate, and limit potential weed development. A glue sealant can be connected between the layers to improve the joint impermeability.
- ▶ A non-penetrative method of jointing is to thermally bond the Concrete Weavers layers together. This also improves joint impermeability. For additionally jointing alternatives see above.
- ▶ **Fixing:** When fixing to a soil substrate, ground pegs (eg J-Hook) are normally utilized. On concrete substrates or rock, Concrete Weavers layers can be jointed together and fixed to the substrate utilizing masonry bolts, percussion anchors or shot fired masonry nails. Stainless steel fixings with washers are recommended.

Prevent Ingress / Anticipate Entrance / Counteract Entrance

- ▶ It is essential to prevent water or wind ingress 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 entire perimeter edge of the Concrete Weavers within an anchor trench.
- ▶ On concrete or rock substrates, the perimeter edge should be sealed with a concrete file or a adhesive sealant.
- ▶ All overlapped Concrete Weavers layers should be lapped toward water flow.

Hydrate Fully / Hydrate Completely

- ▶ It is critical to appropriately hydrate Concrete Weavers, considering the amount of material used and surrounding temperature conditions.
- ▶ Always ensure hydration through the fibrous top surface.
- ▶ Ensure to hydrate any overlapped areas & anchor trenched material used 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.





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