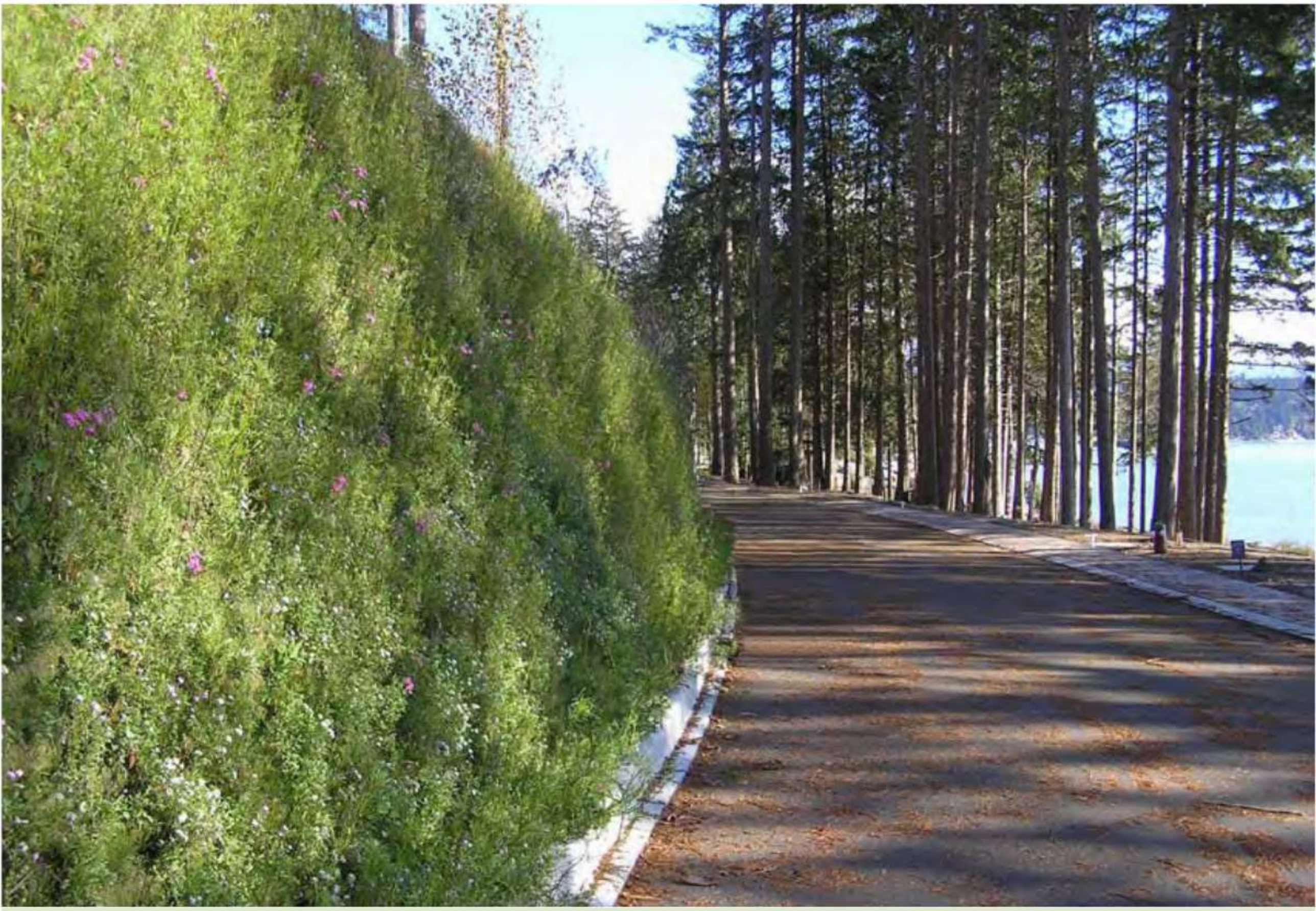
Deltalok®

Reduce Your Carbon Footprint



ENVIRONMENTAL SOLUTIONS FOR WALLS | SLOPES | WATER APPLICATIONS

Vantek Materials Limited 榮建行材料有限公司

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Est. 2000

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ABOUT DELTALOK

Deltalok is a versatile civil engineering system designed for erosion control and earth structures.

Deltalok is also a patented system consisting of modular ecology bags and interlocking plates that create a structure to support the earth forces.

In addition, Deltalok is capable of accepting various forms of planting to create an aesthetically pleasing and eco-friendly vegetated system.

Deltalok Interlocking Plate

Deltalok is a permanent, ecological solution.

Structural strength exists even without vegetation.

The modular ecology bag system is constructed with small vertical heights making it easy to build a fairly uniform face.

Deltalok provides mini 'eco-pockets' between each row and each bag where rain water can accumulate and seeds can germinate and thrive on a horizontal surface.

Deltalok allows the root system to penetrate through both the front and back layer of the ecology bag.

Deltalok Near Vertical Retaining Wall

BENEFITS

Environmental

- Friendly to Fish & Wildlife
- Low Environmental Impact (low carbon footprint)
- Anti-Graffiti
- Heat Island Effect Reduction
- Noise Reduction
- Sedimentation & Filtration Capabilities

Functional

- Versatility to use for Walls and Slopes
- Economical Transportation
- Efficient Installation
- No Leveling, Cutting or Waste
- Flexibility Allows to Install Where Others cannot
- Accepts Many Types of Vegetation
- Low Impact Construction

Vegetated Reinforced Soil Slopes

Stream Bank Protection

Infrastructure Solutions

APPLICATIONS

Deltalok is an engineered system designed specifically to provide an environmentally friendly solution for earth structures.

Deltalok creates a reinforced facing option for slopes and walls. The system protects the surface from erosion and provides a natural bed for vegetation which beautifies the structure.

In areas of limited space or access the Deltalok system can accommodate reinforcement using a 'Tie-Back' method of design which does not require geogrid reinforcement. This solution also minimizes excavation requirements.

Applications for Deltalok have included:

- Vegetated Slopes & Walls
- Stream / Waterway Improvements
- Solutions to Infrastructure Projects

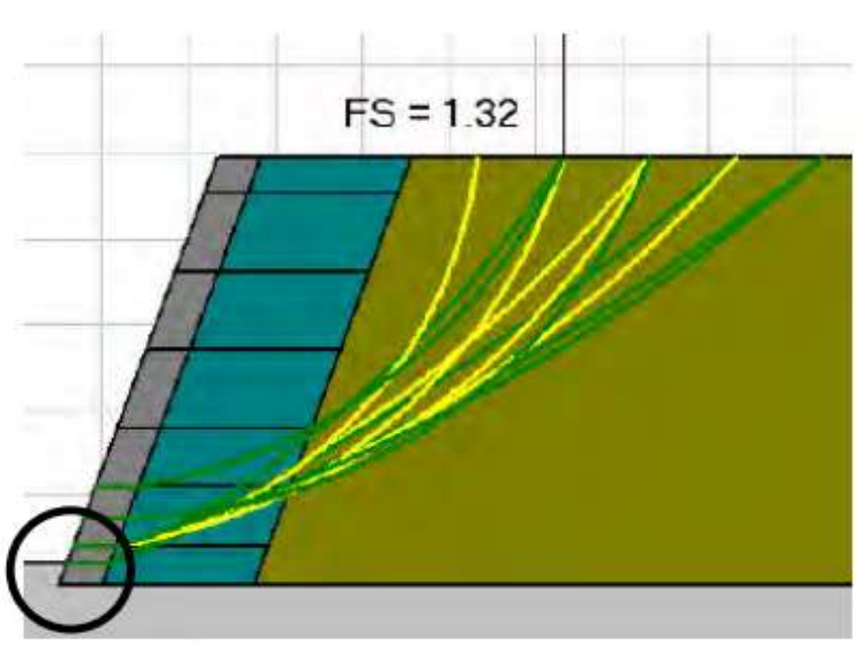
VEGETATED SLOPES

Vegetated reinforced soil slopes provide a significant benefit to highway and commercial construction where there is not enough room for a natural slope.

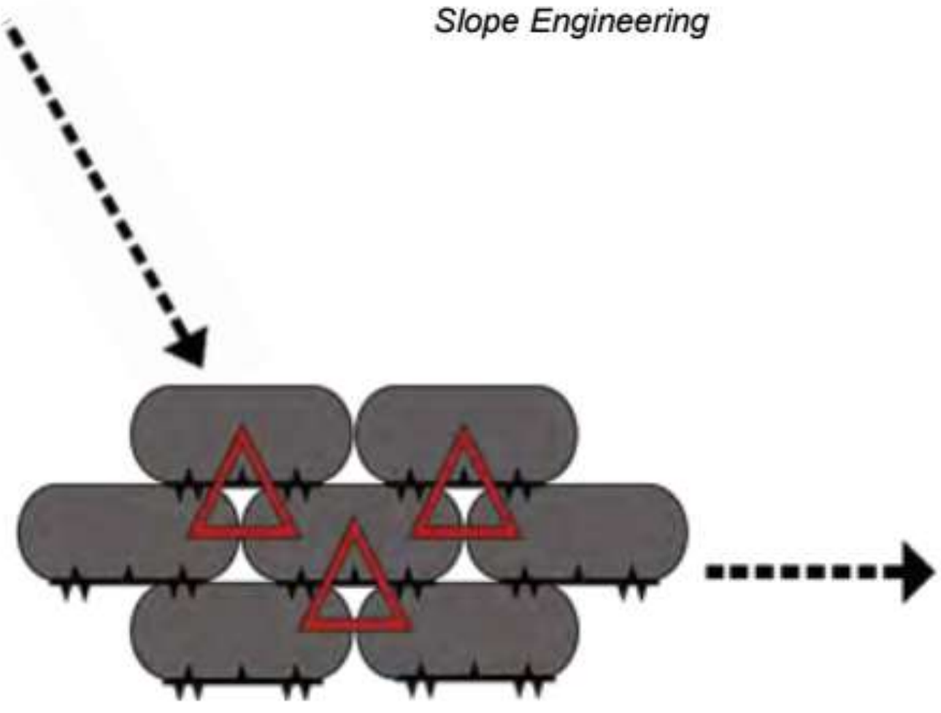
Deltalok provides speed and efficiency of installation comparable to other modular systems.

Deltalok provides a consistent and high quality growing medium that allows for healthy, uniform vegetated face.

Vegetated Reinforced Soil Slopes



Slope Engineering



Deltalok Interlocking plate locks units together and units to Geogrid connections.

The superior vegetated outcome is due to eco-pockets located between each row and each bag where rainwater accumulates and vegetation germinates on a horizontal surface.

Deltalok during construction

Deltalok Reinforced Soil Slope (RSS) Benefits:

- Structural Interlocking of the Deltalok Modular Ecology Bags
- A Mechanical Connection with Reinforcing Geogrid
- Instant Protection Against Surface Erosion
- A Vegetated Facing for a Natural, Bioengineered Solution

Deltalok provides instant erosion protection prior to vegetation. The flexible system mimics the pre-existing ground layout.

Deltalok creates an environment for vegetation to thrive. The bag depth offers a thick layer of non-erodable surface for vegetation to mature.

This solution also minimizes excavation requirements.

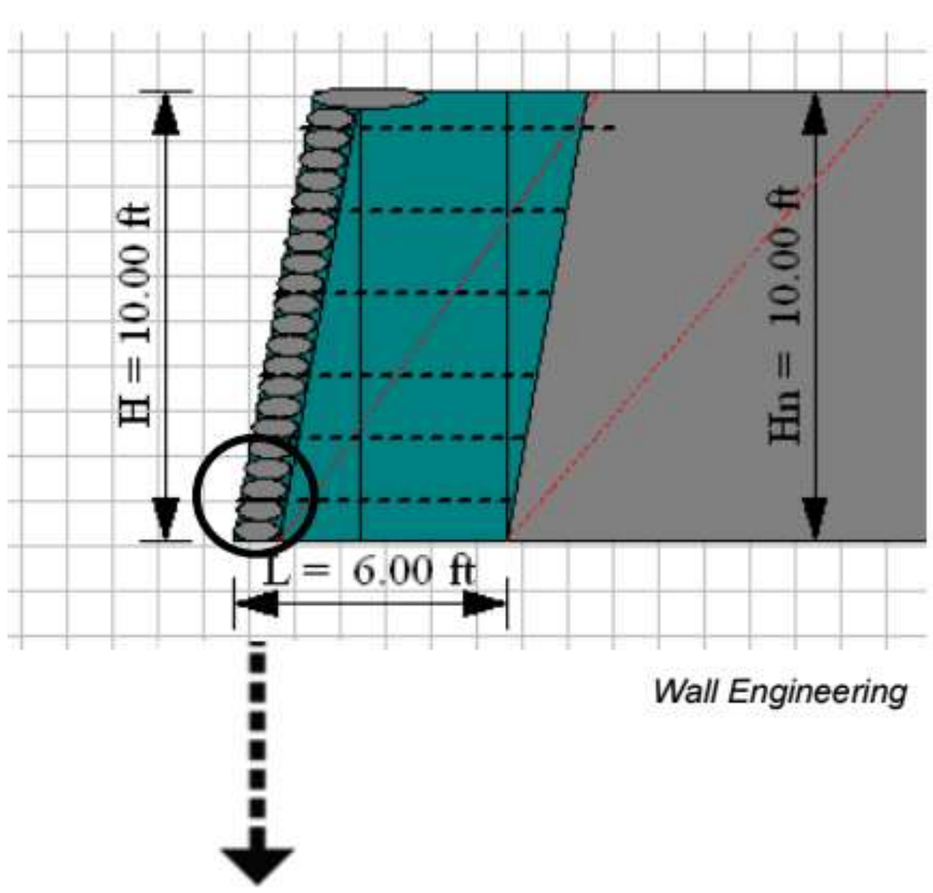
VEGETATED SLOPES

VEGETATED WALLS

Deltalok provides optimal efficiency when designing and constructing vegetated walls.

The modular ecology bags and interlocking plates provide the engineered structural strength for highway and commercial surcharge loadings.

Interlocking Plate



Wall Engineering

The patented Deltalok System locks the modular ecology bags and provides a mechanical connection between the facing and the soil reinforcing materials.

Deltalok allows near vertical walls to be constructed from a few feet tall to structures over 20 feet in height.

Deltalok's design and construction follows guidelines set for other mechanically stabilized earth systems.

Deltalok provided an aesthetically pleasing and environmentally friendly solution for this beach front development.

Deltalok Mechanically Stabilized Earth (MSE) Wall Benefits:

- Conforms to Highway (AASHTO) & Commercial (NCMA) Guidelines.
- Sound Absorption
- LEED Points up to 13 credits
- Reduced Green House Gas Emissions (GHGE)
- Graffiti Resistant
- More Efficient than Modular Block Walls
- No Leveling Footing, No Drainage Zone
- Enhanced Beauty

WATER APPLICATIONS

Millions of feet of shoreline are lost to water erosion. Deltalok is used to form permanent erosion resistant shorelines.

Deltalok Stream Banks and Shorelines Benefits:

- Easy to Build Over Soft Ground or Wet Environments
- Mimics Existing Contour
- Permanent Erosion Protection
- Provides Vegetation for Enhanced Fish and Wildlife Habitat
- Accepted by Environmental Consultants

WATER APPLICATIONS

Rain gardens, ponds, drainage channels, rivers and waterfronts require flat slopes to remain stable with the moving water.

Deltalok allows for steeper slope angles to be built by providing protection from erosion and sedimentation.

This permanent solution minimizes future loss of private and public land.

Infrastructure Projects

Deltalok's infrastructure projects include culvert head walls, trails, road repair, ditch lining, dikes, sound walls & garden walls.

The system's ability to mimic existing contour, adapt to seismic activity and differential settlement as well as perform on soft or low bearing soil positions Deltalok in it's own category.

This soft flexible system can adapt to a wide range of applications.

Undermining of highways by erosion leads to traffic delays and expensive repairs.

Drainage ditches along roads and property lines are susceptible to erosion.

Deltalok provides protection and prevents loss of property without the use of hard materials.

Culverts require head walls and erosion protection between the soils and the pipe.

The modular bags conform easily to the pipe geometry, not requiring special cutting, forming or fitting.

Culverts are located in environmentally sensitive areas which prefer an eco-friendly solution.

Deltalok's green, vegetated outcome is ideal for these types of applications.

Deltalok provides for steeper slopes which reduces the length of the pipes and minimizes land use.

Deltalok Benefits to Infrastructure Projects:

- Allows Simple Construction Around Pipes & Culverts
- Ideal for Wet & Soft Areas
- Environmental Solution that Blends with the Natural Landscape
- Effective Solution for Retention & Detention Areas

DELTALOK Vegetation

Engineered vegetated walls and slopes have been desired for ages. The challenge has always been the stability of soils placed steeper than the natural angle of repose.

Deltalok root penetration exposed in a cut ecology bag

Brush Layering

Placed as modular bags, vegetation grows through the geosynthetic fabric to reinforce the soil within and beyond the face.

Deltalok prevents the erosion of surface soils, and avoids the cost and inconsistency of wrap slopes.

Deltalok creates and maintains a successful vegetated near vertical surface.

Live Planting

The system allows the root system to penetrate through both front and back layer of geotextile as well as grow into the backfill.

In addition, vegetation options such as pre-seeding for near or in water applications, hydro seeding, live planting, live stacking as well as brush layering can be utilized with Deltalok.

Native vegetation and woody plants can penetrate several feet of embedment and backfill.

Hydro-seeded

The modular ecology bags are constructed with small vertical heights making it easy to build without any bulging or sagging of the face.

Mini 'eco-pockets' exist between each row and each bag where rain water can accumulate and seeds can germinate.

Deltalok's patented system addresses these challenges and more.

Live Staking

Deltalok Installation Guide

Deltalok®

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1 FILLING & CLOSING DELTALOK BAGS

Fill the Deltalok bags with a clean granular soil and material mix. Properties should include approximately 70% - 80% course sand and 20% - 30% organic soils. Clay and silt are not recommended for filling the bag. Fill the bags consistently, close bag with a UV resistant zip tie. Sewing, stapling, hog-rings, etc. are also acceptable.

2 PREPARATION

Dig a shallow trench 15 inches wide for the length of your desired Deltalok structure and 3 inches deep. The purpose of the trench is to embed the base of the structure to protect from it being undermined by erosion. Tall structures or water applications will require deeper embedment. Ten percent of the design height is a good rule of thumb. With water applications, a minimum of one foot deep or below the scour line is a good rule of thumb.

3 PLACE DELTALOK BAGS & INTERLOCKING PLATE AT BASE

Place the Deltalok interlocking plate on the ground below the first row of bags. Place the interlocking plate face up, so that you are reading the "This Side Up" label. Space the interlocking plate so that it will lie directly below the middle of each bag, approximately 30 inches to 33 inches apart. Place the first row of bags spacing them with 1 inch to 2 inches between the ends of the bags. Compaction will fill the bag into the open space. Do not overlap the bags.

Place the bag with the seam towards the backfill.

PLACING ADDITIONAL ROWS

Place a Deltalok interlocking plate over the space between the two base Deltalok bags. Place another row of bags in a running bond layout over the previous row so that the interlocking plates lie below the middle of each Deltalok bag. After placement, walk on top of the bags to lock them onto the interlocking plate. The bag may flatten forward with compaction, so a backward setback should be considered. We recommend using a simple right angle triangle jig with a small level attached to check that the slopes angle consistent with design drawings or specification.

4

5 FILLING & COMPACTING THE STRUCTURE

Fill and compact the backfill soils every two layers of bags. Compaction should be done on no more than 8 to 10 inch thick lifts of fill. Vibratory compaction equipment is preferred. [A clean gravel fill zone behind the bags is not recommended to help keep alignment or for filtration as required by concrete units]. Vegetation will penetrate the Deltalok bag and grow into the backfill zone, further stabilizing the structure.

Where required

6 GEOGRID PLACEMENT

For structure heights where soil reinforcement is needed, place the geogrid reinforcement from the front of the face of the bags toward the back of the fill area. Place the interlocking plate over the geogrid at the joints between the lower Deltalok bags. Pull the geogrid snug, removing folds and wrinkles. Place the next layer of bags into place over the interlocking plate and geogrid. Then walk on top of the row. Place the fill soil from the front of the structure toward the back, this technique keeps the geogrid flat and tightly connected to the face.

7 TOP ROW

Place the top row of Deltalok bags at a 90-degree angle to the structure alignment. The deeper embedment will anchor the top of the structure and provide for a more stable structure. Embed the rear portion of the bag so that 50% of the bag will be covered with backfill soil. This may require less fill in the top row of bags.

8 PLANTING

Once wall construction is complete it is time to vegetate the wall. You may choose seed mixes of grasses or wild flowers suitable for the local climate and exposure. If live planting the wall, make a small cut in the bag, remove soil as needed to place the live planting material. If combining seeding and live planting, apply seed first, and then add live plant materials.

Vegetation choices are the owner's preference and should be discussed with local experts.

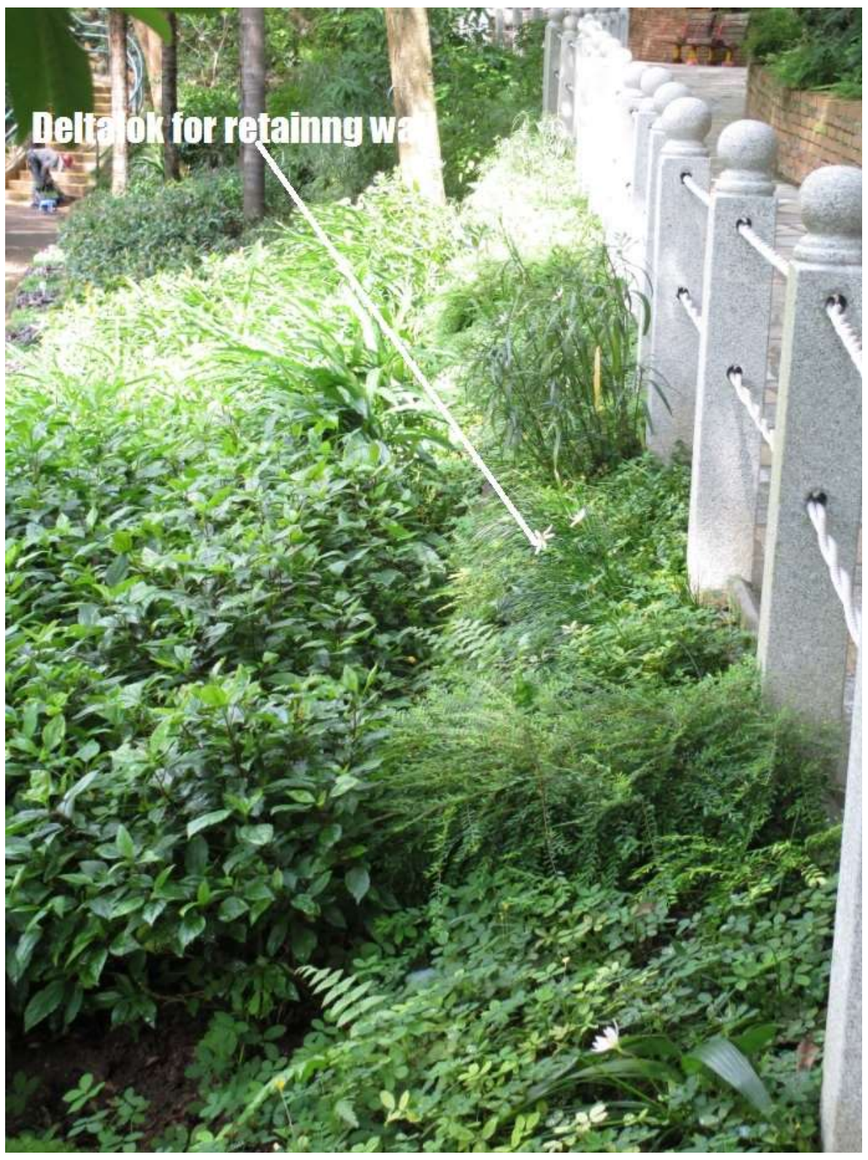
Hydro-seeding

Live Planting

Live Staking

Dimensions: 400mm x 880mm

Hong Kong Job Reference

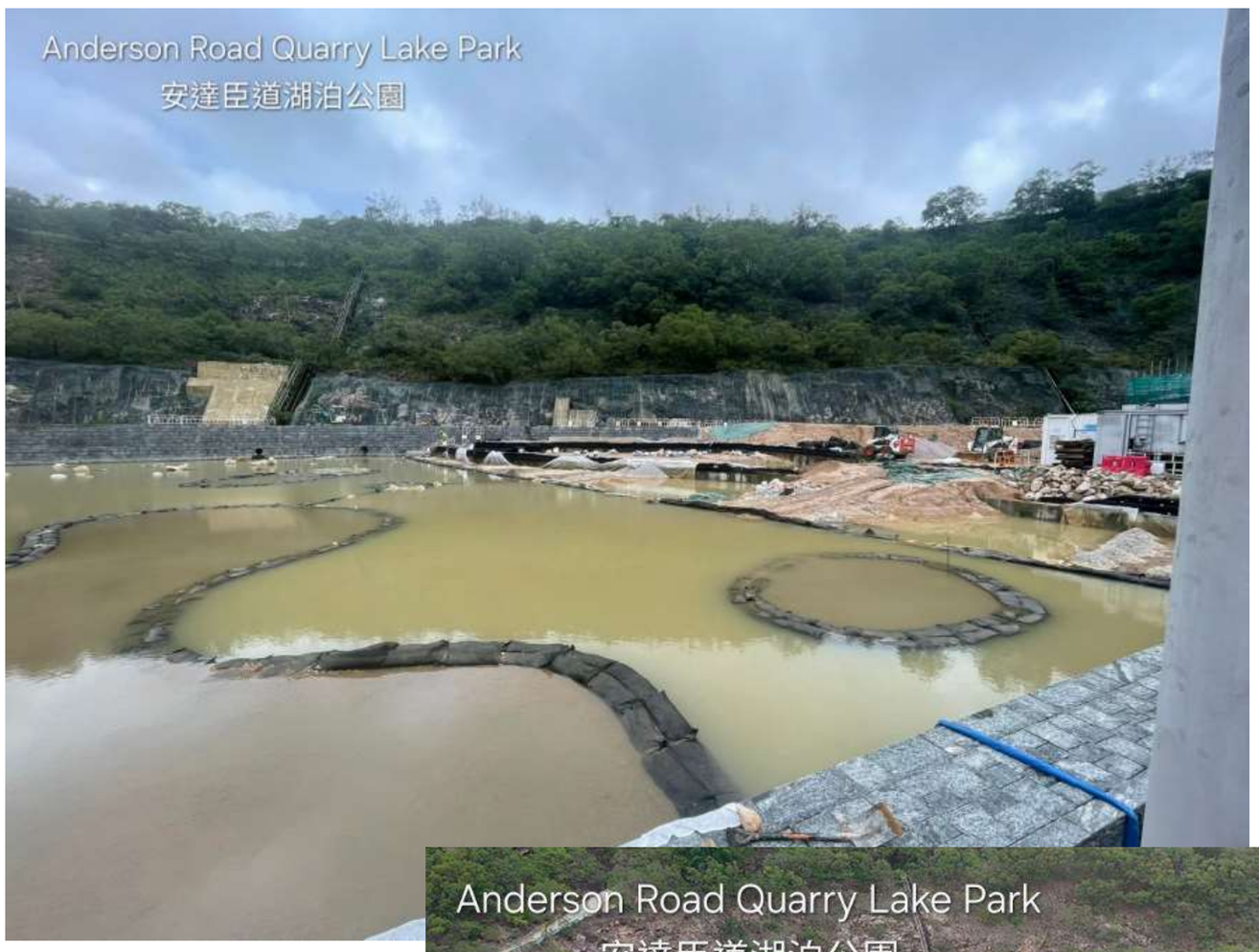

Deltalok for retainng wa


Geotextile Bag
Deltalok Interlocking Plate


Shing Mun Valley Park
城門谷公園


Deltalok for soil erosion in
Shing Mun Valley - LCSD


Deltalok for Seed Plant


Anderson Road Quarry Lake Park
安達臣道湖泊公園


Anderson Road Quarry Lake Park
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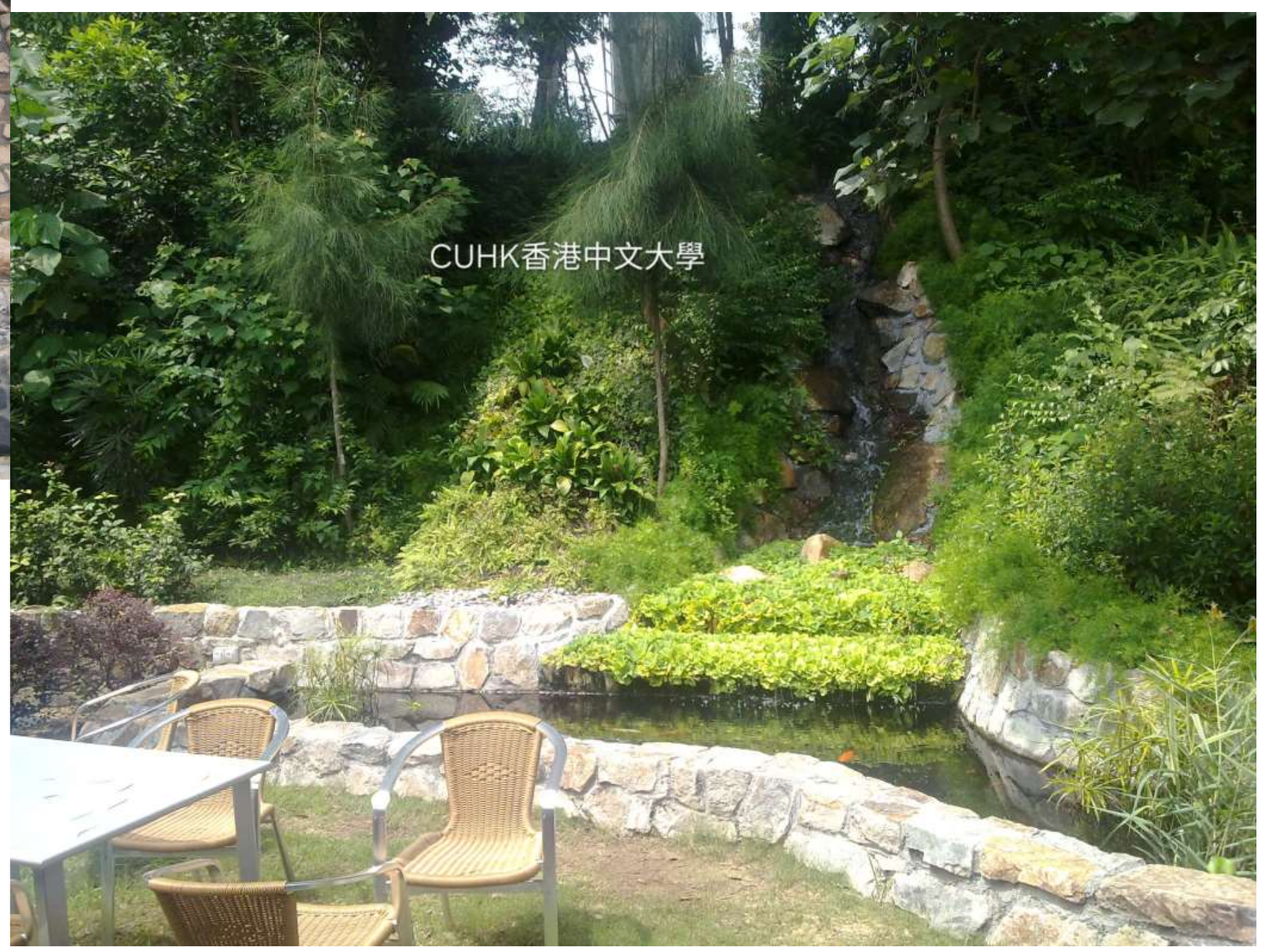
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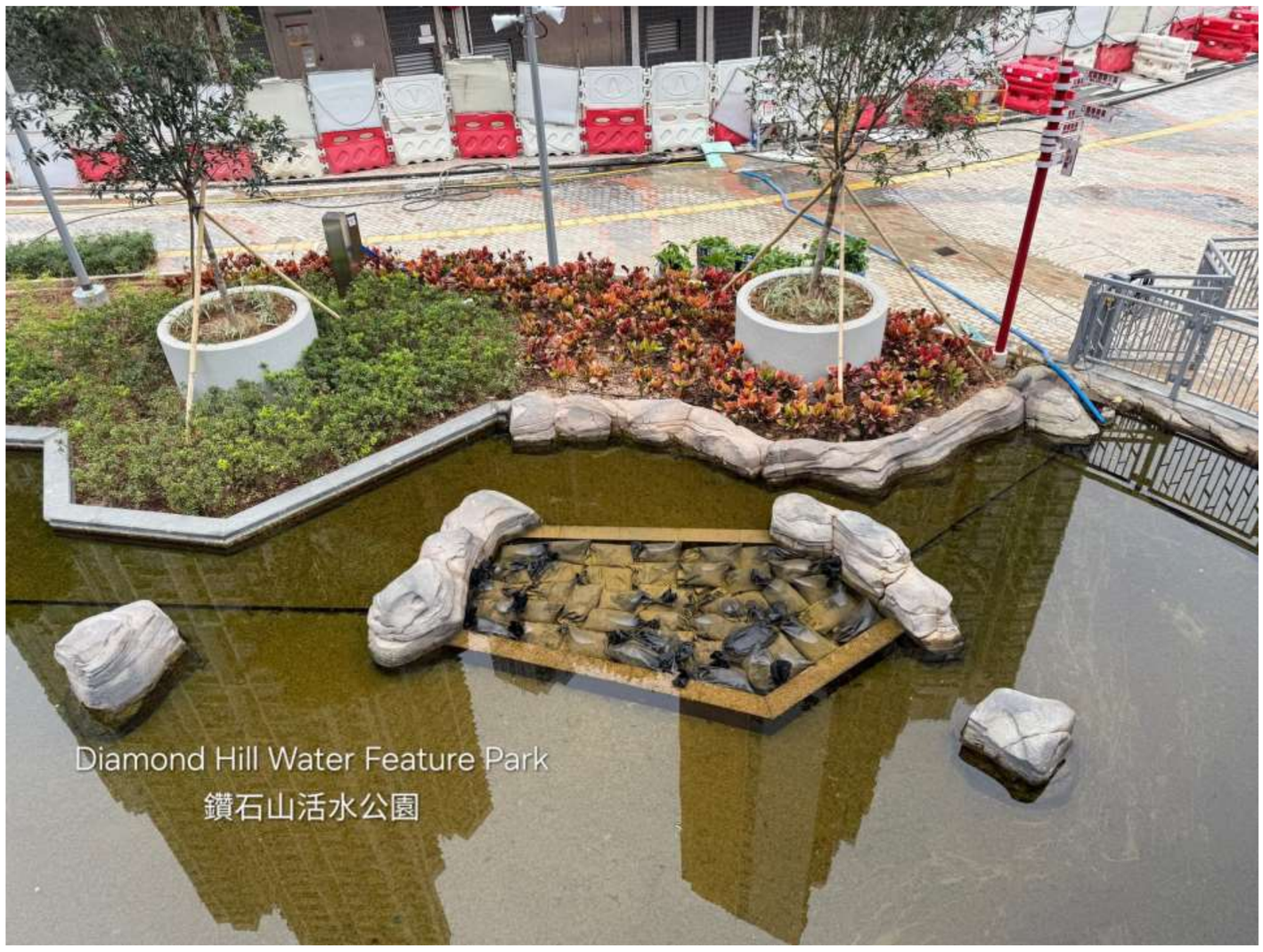
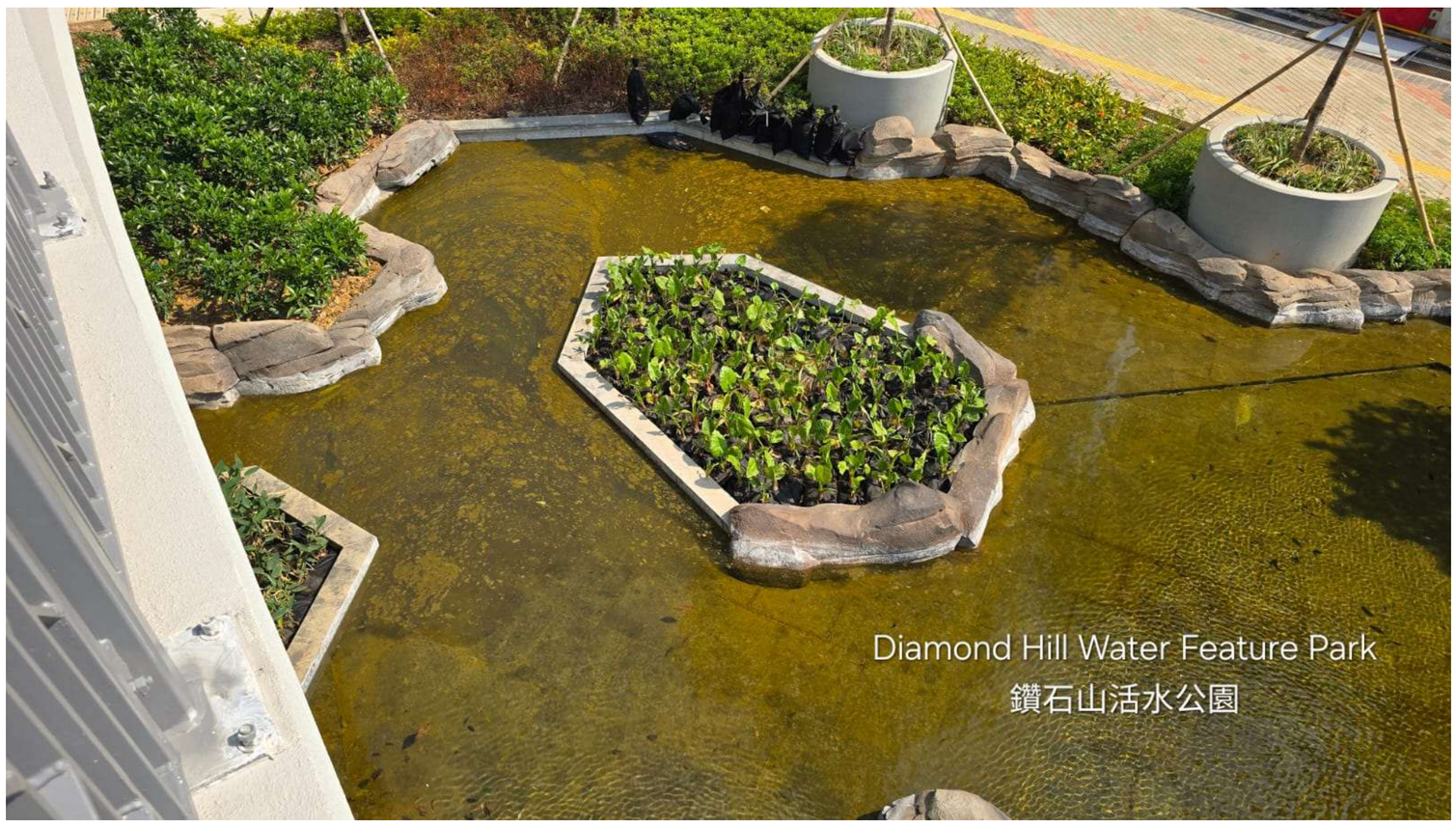

Diamond Hill Water Feature Park
鑽石山活水公園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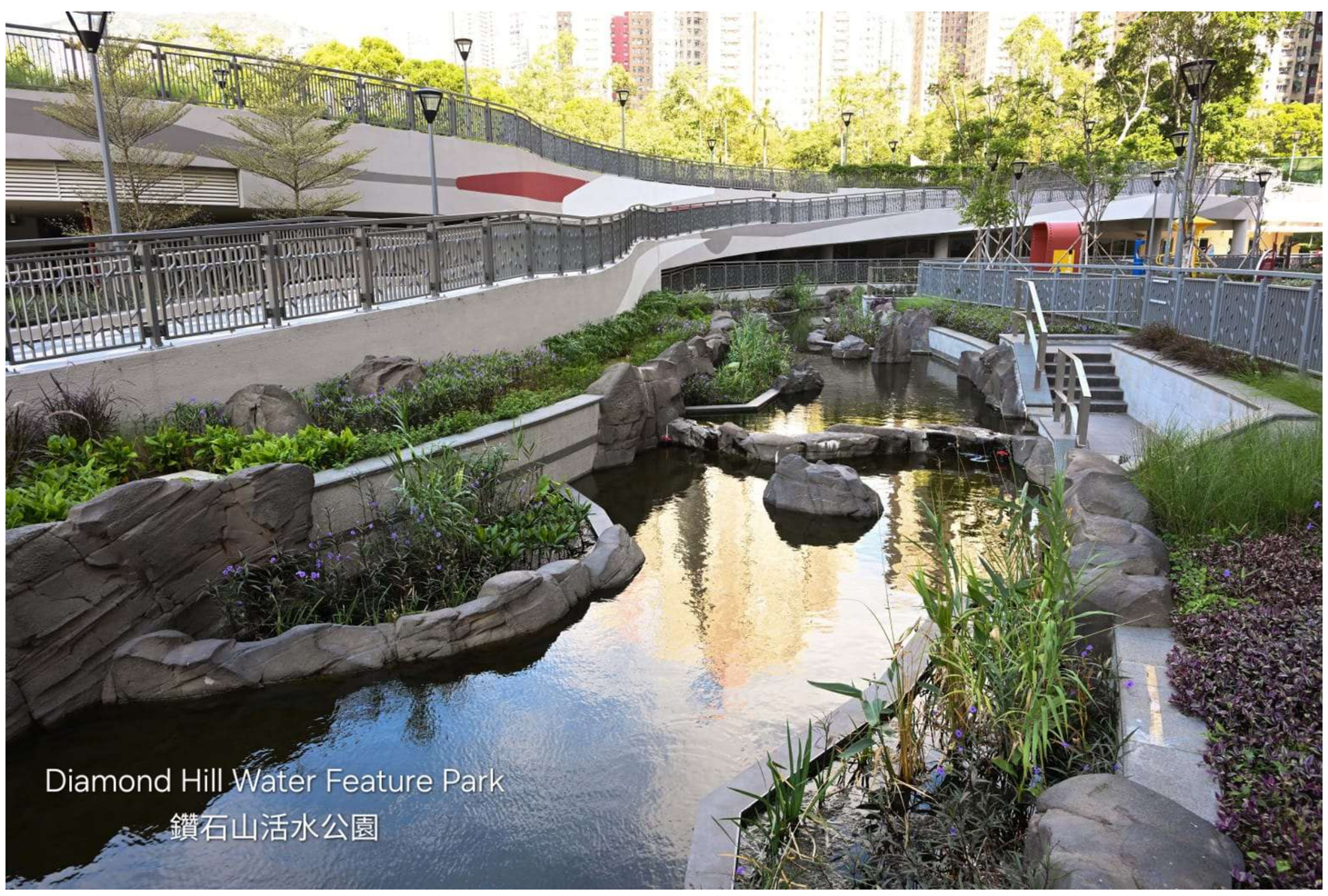
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A versatile civil engineering system designed
for erosion control and earth wall applications.

Deltalok utilizes modular geosynthetic bags
and interlocking plates to create a 3D structure
strong enough to hold back the earth
pressures.

GREEN ENGINEERED SOLUTION FOR SLOPES | WALLS | WATER APPLICATIONS

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