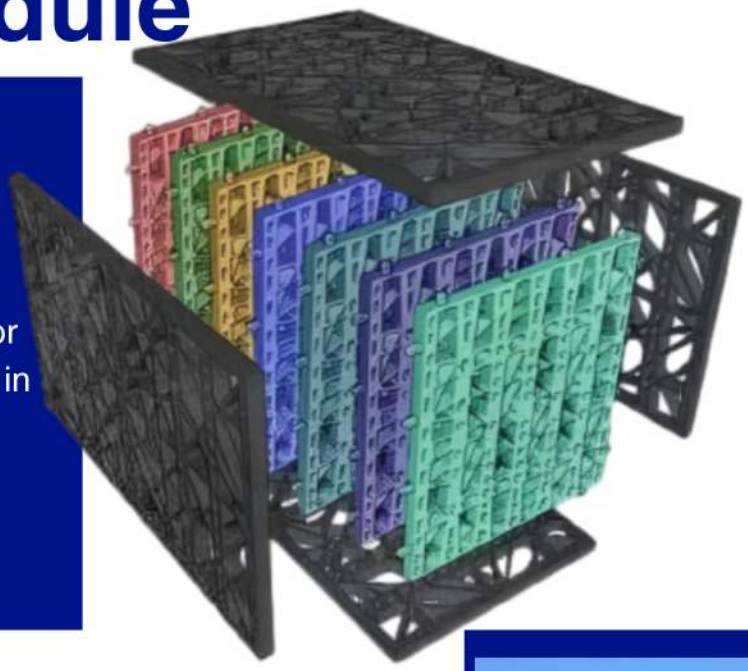
Geocellular Stormwater Module

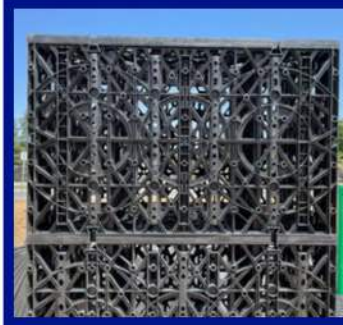
PRODUCT PROFILE

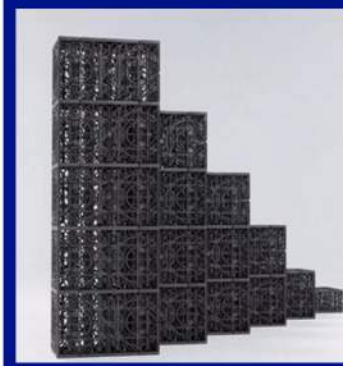
Geocellular modules are lightweight, high-void polypropylene blocks that assemble into underground tanks placed beneath pavements or landscaping. They provide large storage volume in a compact footprint, support traffic loads when designed correctly, and can be configured for detention, infiltration, or reuse with simple inspection and maintenance access.



BENEFITS & FEATURES

- High storage efficiency — typical internal void ratio around 95–97%, maximizing storage per cubic yard of excavation.
- Traffic-rated assemblies — systems can be engineered to meet AASHTO H-25/LRFD design criteria for vehicular areas.
- Modular and scalable — stack to the height you need; combine into any plan shape to fit site constraints.
- Fast, low-impact installation — hand-installed modules reduce crane time and site disruption; supply can be shipped unassembled to cut freight.
- Material durability — made from PP with resistance to soils, molds, bacteria, and bitumen; wide service temperature tolerance.
- Flexible hydraulics — use for detention, infiltration, or rainwater harvesting with inspection and clean-out provisions as required.
- Logistics & cost efficiency — high storage per excavation, flat-pack shipping, and hand installation reduce trucking, crane time, and total cost.
- Design-ready flexibility — choose infiltration or fully lined detention; integrate pretreatment, throttled outlets, and reuse filtration as required.





AQUA RainWater (China) — Stormwater Management

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ARW-8053 SPECIFICATION & TECHNICAL DATA SHEET

Tank Units	Size in Feet (h × w × l)	Size in Inches (h × w × l)	Size in Millimeters (h × w × l)
ARW-8053 Half	0.82’ h × 1.61’ × 2.63’	9.84” × 19.29” × 31.50”	250mm × 490mm × 800mm
ARW-8053 Single	1.74’ h × 1.61’ × 2.63’	20.87” × 19.29” × 31.50”	530mm × 490mm × 800mm
ARW-8053 Double	3.48’ h × 1.61’ × 2.63’	41.73” × 19.29” × 31.50”	1060mm × 490mm × 800mm
ARW-8053 Triple	5.22’ h × 1.61’ × 2.63’	62.60” × 19.29” × 31.50”	1590mm × 490mm × 800mm
ARW-8053 Quad	6.96’ h × 1.61’ × 2.63’	83.47” × 19.29” × 31.50”	2120mm × 490mm × 800mm
ARW-8053 Pent	8.69’ h × 1.61’ × 2.63’	104.33” × 19.29” × 31.50”	2650mm × 490mm × 800mm

Tank Units	Tank Volume (ft^3)	Tank Volume (US gal)	97% Water Storage (ft^3)	97% Water Storage (US gal)
ARW-8053 Half	3.46	25.9	3.35	25.1
ARW-8053 Single	7.34	54.9	7.12	53.2
ARW-8053 Double	14.67	109.7	14.23	106.4
ARW-8053 Triple	22.01	164.6	21.35	159.7
ARW-8053 Quad	29.36	219.6	28.48	213
ARW-8053 Pent	36.69	274.5	35.59	266.2

Notes:

*Dimensions are **nominal** (tolerance ±0.2 in / ±5 mm). Storage volumes **97% void**. Installation per project details; for H-25 traffic provide ≥24 in graded aggregate above the modules (surface not included).*

***Legacy model cross-reference: ARW-8025 = ARW-8053 Half** (same footprint). **ARW-6841** is available as a legacy size —please request the **ARW-6841 datasheet;** where ARW-6841 is specified, we will supply the ARW-6841 series **or an ARW-8053 configuration** providing **equal or greater** storage and strength.*

NON-WOVEN GEOTEXTILE MATERIAL SPECIFICATIONS

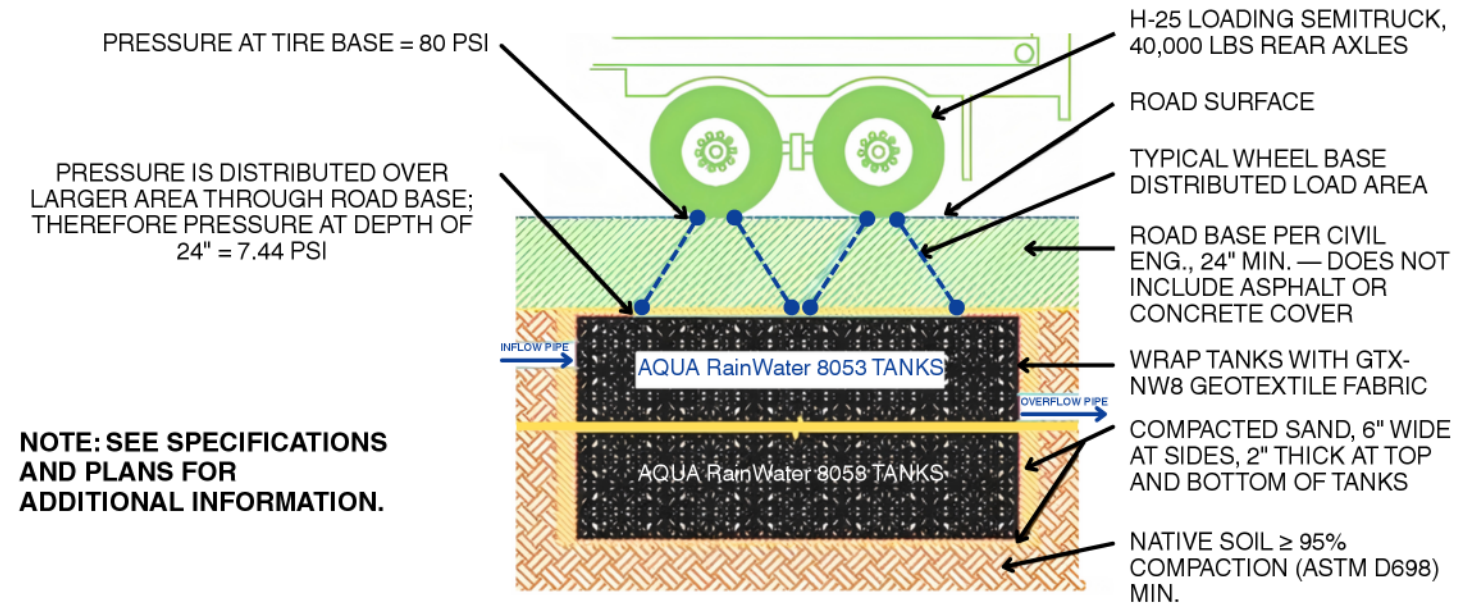
Wrap the AQUA RainWater 8053 Tanks with a polypropylene, staple-fiber, needle-punched nonwoven geotextile. Fibers shall resist UV and biological/chemical environments typically found in soils. Material shall meet or exceed the following minimum average roll values:

PROPERTY	TEST METHOD	Minimum Average ROLL VALUE	
Mechanical		**Metric**	**English**
Grab Tensile Strength	Grab Tensile Strength	4 oz: 0.445 kN; 6 oz: 0.711 kN; 8 oz: 0.911 kN	4 oz: 100 lb; 6 oz: 160 lb; 8 oz: 205 lb
(Elongation @ Break)	ASTM D4632	**50%**	
Trapezoidal Tear	ASTM D4533	4 oz: 0.222 kN; 6 oz: 0.289 kN; 8 oz: 0.378 kN	4 oz: 50 lb; 6 oz: 65 lb; 8 oz: 85 lb
Mullen Burst	ASTM D3786	4 oz: 1481 kPa; 6 oz: 2170 kPa; 8 oz: 2756 kPa	4 oz: 215 psi; 6 oz: 315 psi; 8 oz: 400 psi
Puncture Strength	ASTM D4833	4 oz: 0.285 kN; 6 oz: 0.400 kN; 8 oz: 0.578 kN	4 oz: 65 lb; 6 oz: 90 lb; 8 oz: 130 lb
Hydraulic			
Pore Size (O95)	ASTM D4751 (Dry)	4 oz: 0.212 mm; 6 oz: — ; 8 oz: 0.18 mm	4 oz: 70 US Sieve; 6 oz: 75 US Sieve; 8 oz: 80 US Sieve
Permittivity	ASTM D4491	**4 & 6 oz: 1.6 s^{-1}; 8 oz: 1.4 s^{-1}**	
Water Flow Rate	ASTM D4491	4 oz: 5689 L/min/m^2; 6 oz: 4480 L/min/m^2; 8 oz: 3657 L/min/m^2	4 oz: 140 gpm/ft^2; 6 oz: 110 gpm/ft^2; 8 oz: 90 gpm/ft^2
Endurance			
UV Resistance (% retained @ 500 h)	ASTM D4355	70% @ 500 hours	70% @ 500 hours

Note:

For roadway/parking H-25 applications, select 8 oz/yd^2 or heavier and reference AASHTO M288 requirements for load-bearing road applications. For light-duty/infiltration conditions, 6 oz/yd^2 may be used per soil gradation and hydraulic design.

CONCEPT H-25 LOAD CAPACITY DIAGRAM



NOTE: SEE SPECIFICATIONS AND PLANS FOR ADDITIONAL INFORMATION.

NOTE:

Under H-25 loading, the design pressure at 24 in cover is taken as 7.44 psi and, per code, increased by 20% to account for moving tire load and road-base weight, giving 9.25 psi. For AQUA RainWater 8053 Tanks, the required Factor of Safety (FOS) in load-bearing installations is ≥2 (use 4 where overlapping wheel/axle pressures may occur). Laboratory compression testing yielded ≈43 psi with 5 small plates (≈30 t/m^2, 294 kPa) and 55 psi with 7 small plates; therefore, for the scenario above, FOS ≈ 4.65 and ≈ 5.95, respectively. AQUA RainWater recommends a layer of biaxial geogrid for parking-lot and roadway applications. In-ground testing with a 51,000-lb live load (H-25) at 24 in cover showed no damage to the tanks. Test documentation and the full ASTM C857 FOS calculation are available upon request.

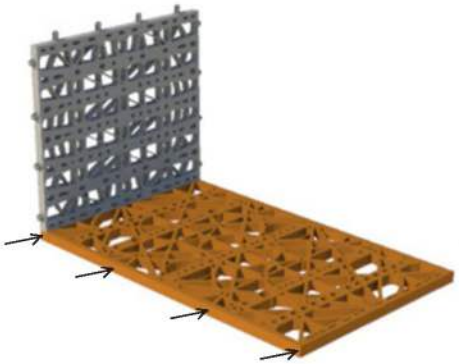
H-25 Quick Spec

- System: AQUA RainWater 8053 modules (cells vertical).
- Cover (traffic): ≥ 24 in graded aggregate above modules (surface not included).
- Wrap: GTX-NW8 nonwoven PP, 12 in overlaps.
- Lined systems: LLDPE 60 mil (GRI GM17) with GTX-NW16 protection above/below.
- Compaction: All fills ≥ 95% (ASTM D698).
- Design check: p(24 in) = 9.25 psi (+20% moving load).
- FOS reference: Ultimate ÷ 9.25 psi (ASTM C857).

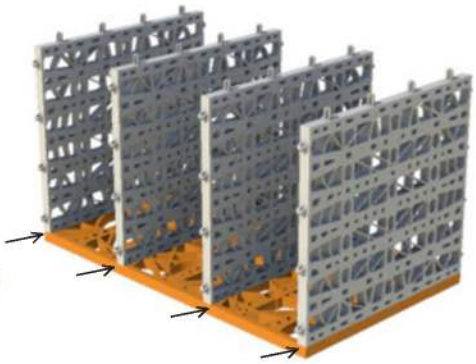
ASSEMBLY OF SINGLE AND MULTIPLE

Single Tank Assembly — Large plate & small plate

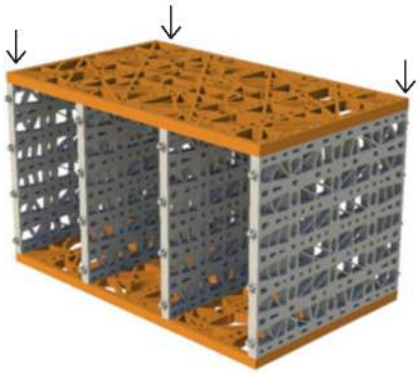
Step 1
Install large pegs of one small plate into holes of one Large plate.



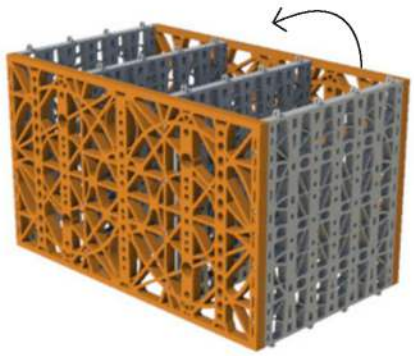
Step 2
Install large pegs of the second, third, and end small plates into the Large plate.



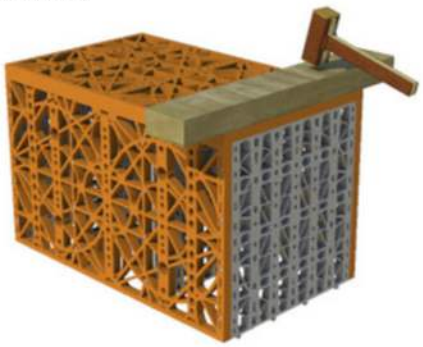
Step 3
Place and align the second side Large plate on top of the small plates.



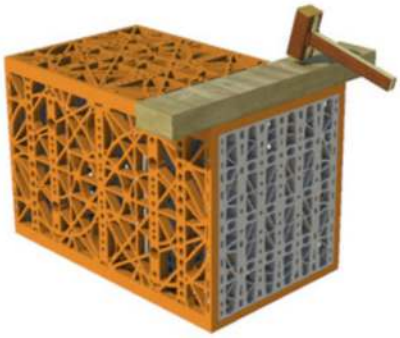
Step 4
Rotate the tank so the side Large plates are now on the sides; top and bottom open.



Step 5
Place and align a Large plate onto the pegs of the vertical small plates; tap into place with a 2×4 and dead-weight hammer.

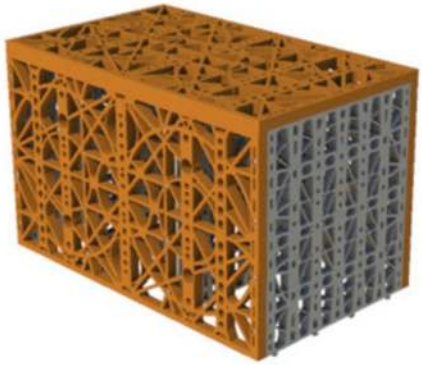


Step 6
Turn the tank upside down; place and align the second Large plate on the opposite pegs; tap into place with a 2×4 and dead-weight hammer.

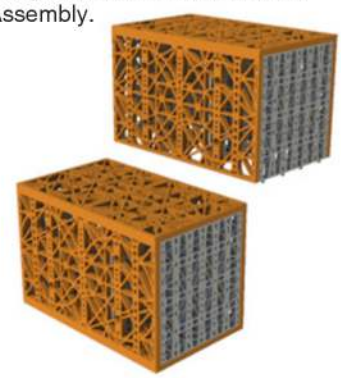


Multiple Tank Assembly

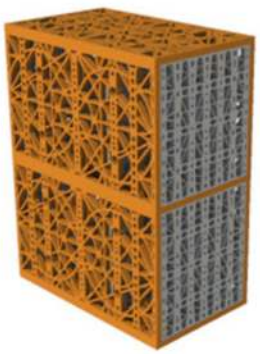
Step 1
Repeat Steps 1–5 for the first tank.



Step 2
Turn the tank upside down; align a second tank (one open end) over a complete tank for Double Tank Assembly.



Step 3
For Triple, Quad, and Pent assemblies, repeat Steps 1–2; check full pin insertion and re-tap if necessary.

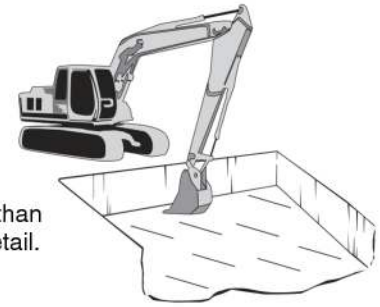


Note :

Assemble on a flat surface, cells vertical. Fully seat each small plate peg into the Large plate (no gaps) using a 2×4 and a dead-blow hammer—do not strike plates directly. Lift by Large plates only; do not drop; if tight, realign and re-seat rather than forcing.

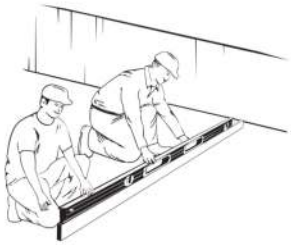
INSTALLATION GUIDE

Step 1
Excavate trench larger than tank, per engineered detail.

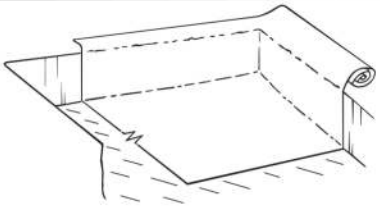


Step 2
Compact base to 35 psi (or as specified).

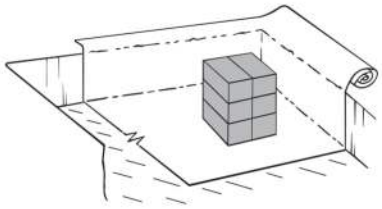
Step 3
Place 4–6 in sand/free-draining bedding; compact and level.



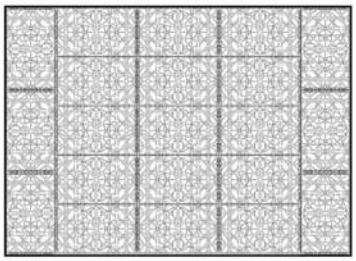
Step 4
Pre-line bottom/sides to fully wrap; 12 in overlaps.



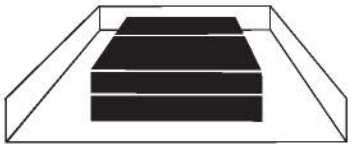
Step 5
Install ARW-8053 modules upright (cells vertical).
Half Tank - 0.82'High
Single Tank - 1.74'High



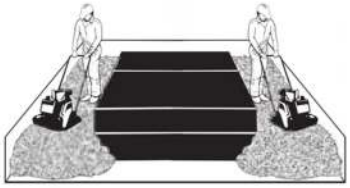
Step 6
Orient modules lengthwise along the perimeter.



Step 7
Wrap field with GTX- NW8; tight fit, trim folds, overlap/seal joints.

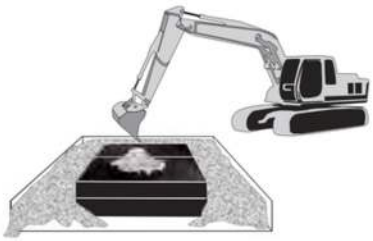


Step 8
Side b ackfill with sandy fill in ≤12 in lifts; compact ≥95%.



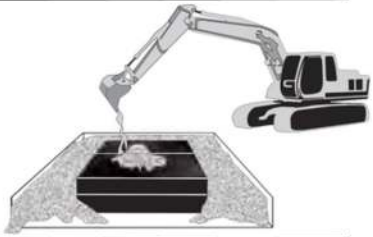
Step 9
Top backfill 12 in sandy layer; no rocks; compact with light equipment.

Correct



Do Not Drop Fill from High Up

Incorrect



Step 10
Finish backfill per plans: 12 in (pedestrian) / 24 in (vehicular) cover; biaxial geogrid 12 in above , extend 3 ft past edges (if specified).

Note:
Install by trained crews. Wrap 8053 modules with GTX-NW8 (12 in overlaps). For lined systems, use LLDPE 60 mil (GRI GM17) with GTX -NW16 protection above/below; perform 100% NDT per ASTM D4437 and peel/shear tests per ASTM D6392. For H-25 traffic, provide ≥24 in graded aggregate cover (surface not included). Lab compression: 5 plates ≈43 psi (30 t/m^2), 7 plates 55 psi; design FOS = ultimate / 9.25 ≥ 2.0 (≥4.0 where wheel loads overlap). Compact all fills ≥95% ASTM D698.