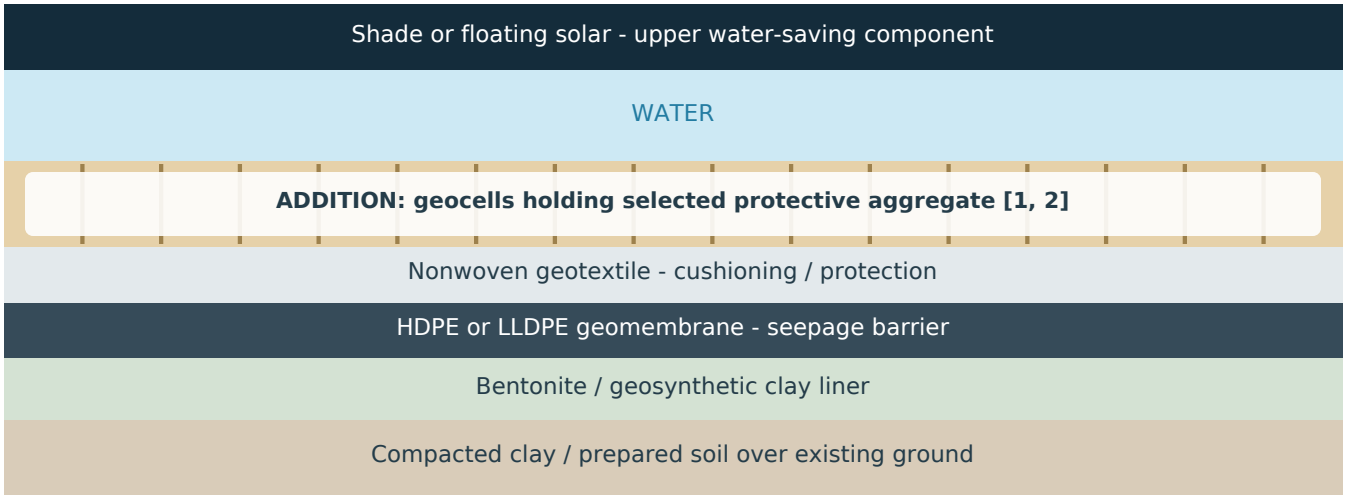
GEOCELL ADDENDUM

Water Sandwich

Keep the protective cover in place above the liner.

Original purpose: shade or floating solar above open water helps address evaporation; a liner below addresses unwanted seepage. This addition strengthens the protective cover over that liner.

CONCEPT SECTION - ONE COMPOSITE LINER OPTION



Layer order only; thicknesses and interfaces require project design. The pilot may also compare simpler liner options.

WHAT THE GEOCELLS ADD [1, 2]

They confine the protective fill, especially on sloping banks, helping limit cover movement and liner exposure. The intended benefit is a more stable protective layer; local performance still needs testing.

DESIGN DETAILS THAT MATTER

Select fill and cushioning to avoid punctures. Design slope stability, liner uplift and anchorage together. Use a support system that preserves liner integrity; ordinary stakes through the membrane create leaks. [2]

CONTROLLED PILOT

Compare: the same liner and cover, with and without geocells, under comparable flow, slope and shading. Record: fill displacement, exposed liner, leakage, cleaning needs and installed cost per square metre.

Begin with engineered canals or reservoirs in a controlled Juarez pilot. Any intervention associated with the Rio Grande / Rio Bravo needs its own evidence and assessment.

EVIDENCE AND SCOPE

[1] Presto Geosystems | GEOWEB Basin Containment (manufacturer guidance)

[2] Presto Geosystems | Protecting Environmental Geomembrane Covers (2022)

The Water Sandwich layout comes from the prior TGU project discussion. Applying geocells to it is an implementation option, not a demonstrated saving or a construction specification.

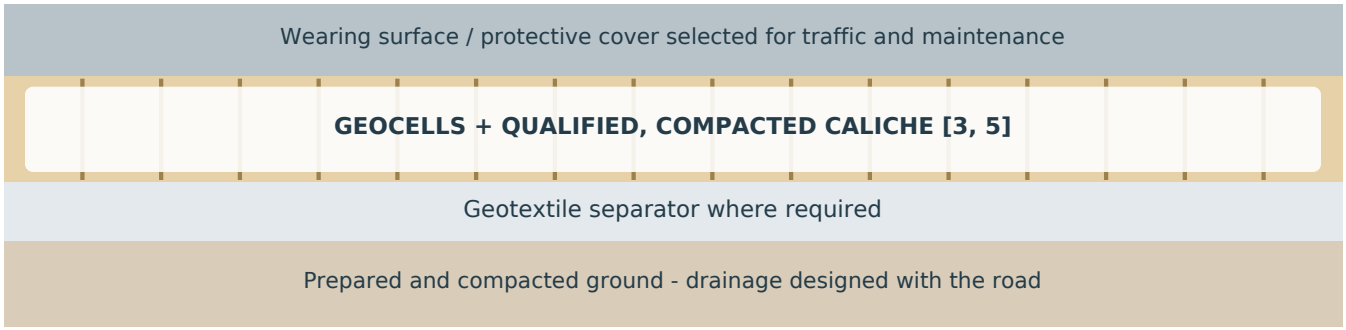
GEOCELL ADDENDUM

Evolucracia + caliche

Stage 2: evaluate confinement where roads repeatedly rut.

Add to Stage 2: compare ordinary compacted caliche with geocells filled with the same tested caliche. The aim is better resistance to wheel ruts and lower maintenance where the extra reinforcement is worthwhile.

CONCEPT ROAD SECTION



Concept only. Cell depth, base thickness, fill quantity and surface treatment follow site and traffic testing.

QUALIFY THE CALICHE [4, 5]

Caliche quality varies by source. Check the particle-size mix, clay/plasticity, moisture and compaction, and strength when wet before selecting it as fill. A local test must confirm its suitability for the chosen geocell system.

PLACE IT WHERE IT EARNS ITS COST

Prioritize sections with recurring ruts or weak supporting ground. Keep compacted caliche as the comparison on firm, lightly trafficked ground. Drainage, surface wear and utility access remain part of the road design. [3]

PILOT AND DECISION RULE

Control: plain compacted caliche. Trial: comparable caliche reinforced with geocells. Use comparable ground, traffic, drainage and construction quality; document all differences.

Measure: wheel-rut depth, material loss, performance after rain, maintenance visits and total cost. Expand use where the measured service improvement or maintenance saving justifies the added cost.

FIT WITH EVOLUCRACIA

Plan testing, supply and technical supervision before the neighborhood work week. Use trained equipment operators for earthworks and compaction. Track donated materials and operating costs. Coordinate road drainage with Stage 3 water-capture areas; test permeability instead of assuming compacted caliche will pass water.

TECHNICAL BASIS

[3] ASCE Geo-Institute | Geocell Confinement in Pavement Systems Fact Sheet

[4] Texas A&M / TxDOT | Use of Local Materials, caliche discussion (slide 6)

[5] HUITEX | Geocell Installation Reference Manual, ground stabilization

Pilot layout and selection rules are proposed applications. No local price, load rating, lifespan or percentage saving is asserted.