



ITLGC Geocell Installation Guide | RETAINING WALLS

Purpose

GeoCells retaining walls are three-dimensional, honeycomb structured systems made from high density polyethylene (HDPE) strips ultrasonically welded into interconnected cells. They provide soil confinement for construction of gravity walls and reinforced retaining walls and can be used for both cut or fill applications.

By interlocking with the backfill and overlying courses, geocells create a flexible yet stable wall system capable of withstanding earth pressures, surcharges, and environmental loading.

Applications:

- Gravity walls
- Reinforced steep slopes
- Vegetated walls
- Non-vegetated walls
- Highway embankments
- Channel wall protection
- Gabion replacement
- Landscape walls and terracing
- Bridge abutments

Materials Equipment

- GeoCell panels- Cell depth typically 6 or 8 inches with intermediate cell aperture ITLGC30. Typical front to back embedment of the GeoCell panels is three cells (~2.85 ft) to ensure proper structural stability and load transfer. Fascia strips are often solid and available in black, green or tan.
- Reinforcement layers- Geocell panels for each course, uniaxial geogrids extending 60-110% of the overall height of the wall. Strength of uniaxial grid based on engineer's design. First uniaxial layer installed over the compacted base, with additional layers every 3 geocell courses. No mechanical connection between the uniaxial grid and the geocell is required. Stability is provided by weight and friction.
- Connection Device- Geocell cable ties or pneumatic stapler and staples for side panel to panel connection. Follow manufacturer's overlap recommendation for Uniaxial geogrid.

Materials Equipment, continued

- Infill material- Per engineer's design.
- Structural backfill- Well graded angular stone or engineered fill.
- Fascia infill- For vegetation, use topsoil (optionally pre-mix with native seed). Reminder cells engineered fill or angular rock. For non-vegetated fascia, use angular rock or engineered fill.
- Not recommended- Rounded rock (river rock, pea gravel).
- Drainage Material- Per engineer's design, typically a 12-inch minimum thickness of free draining gravel, perforated pipe, and geotextile fabric behind the wall. Drain pipes may also be placed perpendicular to the wall for weep holes.
- Geotextile (Filter Fabric)- Nonwoven, wrapping perforated pipe and separating drainage gravel from retained soil.
- Panel Expansion Tools- Rebar stretcher bars matching the front to back dimension of the panels with an additional 6 inches bent at a 90-degree angle on either side.
- Hand Tools- Utility knife (hook blades recommended), shovels, rakes, measuring tape/wheel, chalk line.
- Compaction Equipment- Plate compactor or small roller (no vibration) and not used on the fascia cell. Compact per lifts per engineer's specification.
- Infill material- per engineer's design (well graded angular rock, sand, local fill and others).
 - Not recommended: Rounded rock (river rock, pea gravel), organic soil or clay.
- Compaction equipment- Static smooth drum roller (vibration OFF)
- Hand tools- Utility knife (hook blades preferable), measuring tape/wheel, 3-5 lb. mallet, shovels, chalk line.

Site Preparation

- Excavate to wall line and remove all unsuitable materials.
- Excavate for the base/foundation per engineer's design.
- Grade and compact foundation soil to engineer's specifications.

Base Course Installation

- Place first course on the uniaxial grid on the prepared base, covering the full front to back dimensions of the wall.
- Expand the first layer of geocell panels using stretcher bars, aligning the front fascia to wall line.
- Expand the panels with the rebar stretcher bars.
- Place fascia infill first (if different from structural backfill), then fill remainder of the panel with back fill material.
- Install drainage zone per engineer's design (typically perforated pipe wrapped in nonwoven geotextile).

Successive Course Installation

- Place next GeoCell course directly above the filled lower course. Set back 3-5 inches from the lower course for vegetated fascia applications, or per design.
- Join panel edges with cable locks or pneumatic stapler and staples.
- Repeat compaction, drainage placement, uniaxial geogrid reinforcement (typically every 3 GeoCell courses) and structural backfill until full wall height is achieved.

Infill Guidelines

- Fascia Cell:
 - Vegetated: Organic rich soil. Optionally premixed with native seeds.
 - Rock: angular rock no larger than 1/3 the cell depth.
 - Concrete- For applications where the front of the wall needs to be reinforced or hydraulic flows might dislodge other infill. The front cell can be filled with concrete and the rest of the panel with onsite material.
- Avoid dropping infill from > 3 feet height to prevent damage.

Drainage Considerations

- Maintain continuous drainage layer behind all wall courses based on engineer's design.
- Keep outlet pipes clear and ensure safe discharge.
- Wrap perforated drainage pipes in nonwoven fabric to prevent clogging.

Quality Control

- Verify base leveling pad is per engineer's design.
- Ensure fascia alignment and batter match design at each course.
- Ensure that the GeoCell layers are on top of each other to avoid loss of infill material if miss aligned.
- Verify compaction meets engineer's design for each lift.

Maintenance

- Inspect fascia after heavy rainfall or seismic events.
- For vegetated walls, maintain healthy growth on fascia.
- Keep drainage outlets clear and functional.