Florida Specifier

TECCO Cell Installation is Applicable in Florida

By NORWIN VOEGELI

Coastal erosion presents a significant challenge to shorelines worldwide, impacting local communities, governments, researchers, and environmental planners. Rising sea levels and increasingly extreme weather events, such as hurricanes, exacerbate the need for effective coastal management and protective structures.

Traditional methods, such as rock armor and concrete revetments, have long been utilized, but innovative solutions, such as the TECCO Cell, offer enhanced protection against coastal erosion. TECCO Cell, a specially engineered system, consists of a steel mesh array filled with locally sourced materials including stones, blocks, and pebbles. This new technology provides a cost-effective and sustainable alternative for protecting shorelines.

Current Shore-Protection Systems
Traditional systems for coastal protection include:

- **Rock Armor/Rip Rap**: Large boulders are strategically placed along shorelines with gentle slopes to dissipate wave energy and minimize erosion.
- **Precast Concrete Elements**: Like rock armor, these elements are installed on shallow slopes to guard against wave action.

- **Gabions**: Rectangular wire-mesh containers filled with rocks and stones, commonly used to absorb wave energy.
- **Concrete or Sheet Pile Seawalls**: Vertical barriers installed on shorelines to act as a direct defense against wave erosion, often with anchors to prevent collapse.

- Each solution has proven effective, but the choice of system depends on site-specific conditions, including:
- Material and transport costs
- Installation and maintenance expenses
- Service life and resistance to scour
- Dismantling or recycling requirements

The TECCO Cell Solution

Gabions have been a familiar sight in coastal defenses for decades. The TECCO Cell takes this concept further, utilizing high-tensile stainless steel (AISI 318 LN) wire mesh to create an array of cells. These cells are filled with locally sourced materials, offering a robust and flexible solution for coastal protection.

Key Installation Steps:

1. Prepare the slope using an excavator.
2. Install geosynthetics for separation and filtration as needed.
3. Deploy the empty TECCO Cell array on the slope.
4. Fill the cells with stones, blocks, and pebbles from the site.
5. Secure the cells with clips and ropes.
6. Add rock armor along the edges to prevent scour.

In 2016, TECCO Cell was installed at Beesands Beach in Devon, UK, following the failure of existing coastal defenses due to severe storms in 2014. The rock armor previously in place had been damaged, prompting local authorities to seek innovative solutions through public procurement. Working in collaboration with a local contractor, TECCO Cell was introduced as a custom-engineered solution for the shoreline.

An initial 20-meter stretch was completed, receiving approval from the UK Environment Agency. The installation proved successful, and in 2021, an additional 70 meters of coastline was secured with TECCO Cell. After Storm Darcy in 2021, the installation demonstrated resilience, with no visible damage or corrosion.

Beyond traditional coastal erosion protection, TECCO Cell offers unique applications in Florida, where protecting delicate ecosystems is a priority. The modular nature of TECCO Cell allows for diverse uses, such as:

Artificial Reefs: TECCO Cell Mobile can be submerged underwater to act as an artificial reef, breaking waves before they reach the shoreline. When filled with limestone or similar rocks, TECCO Cell also serves as an ideal habitat for oysters, promoting marine biodiversity in areas like Florida's Big Bend.

Natural-Looking Dunes: TECCO Cell installations can be covered with sand to mimic natural dunes, providing a surface suitable for pedestrian traffic and even turtle nesting. In the event of a storm, sand can be easily replaced, significantly reducing the cost compared to traditional beach renourishment. The underlying TECCO Cell structure remains intact for decades, ensuring long-term protection against erosion.

Traditional TECCO Cell installation provides durable protection for roads, streets, railways, jetties, and much more. It can be applied in any location where rip rap is typically used, offering the significant advantage of requiring little to no maintenance for many years. TECCO Cell remains secure even after severe weather events like hurricanes, eliminating the need for post-storm rearrangement.

TECCO Cell presents an innovative and versatile solution to coastal erosion, combining the durability of traditional methods with enhanced adaptability. Its success in Beesands and potential applications in Florida highlights its value as a long-term, cost-effective approach to shoreline protection, ensuring sustainability in an era of rising sea levels and increasingly volatile weather patterns.

Norwin Voegeli is CEO of Global Ingress

This article was originally published in November 2024, Florida Specifier