

Project Profile - Citrus County Landfill Expansion



First panels of Biaxial Geogrid, GCL, and Geomembrane deployed at the East Side of the Citrus County Central Landfill Cell 3 Expansion Project.

The Citrus County Landfill in Lecanto, FL needed to create more airspace by constructing an expansion to the North end of the landfill. The project included an Expansion (Cell 3) to the Citrus County Central Landfill, which already had 2 cells filled and closing. This work would consist of Earthwork (Removing unsuitable soil and replacing with suitable), installation of eight different types of geosynthetics, installation of a Leachate Collection and Leachate Detection System, installation of a protective cover soil layer, and installation of a new access road with sod around the cell.

The W. Construction General Permit was granted by National Pollutant

Discharge Elimination System (NPDES) and project documentation was submitted and reviewed by the Florida Department of Environmental Protection (FDEP). The project was funded through Citrus County Board of County Commissioners and required concrete and electrical permits from Citrus County as well as an NPDES Construction General Permit from the EPA. The Citrus County Board of County Commissioners (Owner) and SCS Engineers (Engineer) placed this project under competitive bid in Spring of 2010. COMANCO Environmental Corporation was awarded the project in June 2010 and began work in July and was complete in February 2011.

Uniqueness

The Citrus County Central Landfill Phase 3 Expansion project was unique due in part to severe sloping (2:1 slopes); sandy soil conditions; and site management coordination. Obstacles were overcome through precision management and practical construction methods. The initial planning involved preparations to manage stormwater in the event of inclement weather. The new cell was constructed adjacent to the existing active cell, but concerns of stormwater entering the new cell through run off would be significant if not planned and protected with diversion berms and temporary sediment ponds that could be maintained with pumps.

Team Effort

The COMANCO team utilized the ongoing efforts of 10 estimators, managers, and safety personnel in the office; 10 fleet dispatchers, technicians, and coordinators; 2 field superintendents; 4 earth-work laborers and operators; and 10 geosynthetics installers, QC techs, and welders. There were also numerous Subcontractors and suppliers out on site. The team used 2 bulldozers, 1 compaction roller, 1 excavator, 1 water truck, 2 loaders, 1 ATV, 1 skid steer, and 1 mini-excavator to complete the work. The geomembrane was welded together using Extrusion and Fusion Welders. The geosynthetics were installed beginning late September and were completed in early November 2011.

Challenges

The sandy soil conditions created several concerns that impacted construction means and methods. First, water was needed to stabilize subgrades and surface conditions to allow equipment to pass through the sandy soils. If the subgrade was too dry, it created blowing/drifted erosion, and if it was too wet it created sloughing/run-off erosion. Sand is most concise when optimum moisture is maintained, thus allowing truck and equipment passage with minimal runoff erosion issues. Water was also used to obtain compaction of newly placed subgrade materials, and allowed us to monitor density required by the engineer and FDEP.

Finally, severe slopes were constructed and maintained from the top of the cell down to bottom, while six layers of geosynthetics were placed over a month long period. This method was used as sand did not promote ease of travel for heavy



Leachate Collection System pipes sitting on top of panels of Uniaxial Geogrid at the West Side of the Cell.



It took 3 months of stripping, excavating, and grading on the Cell before geosynthetics were ready for deployment.

equipment on these slopes. The equipment would slide on so an attempt was made to grade horizontally while on the slopes. To provide better slope working conditions, the vegetation was stripped off the slopes as the grading efforts were completed. The vegetation helped maintain subgrade erosion issues during rain events, and also maintained consistent moisture in the subgrade. The moisture prevented subgrade from over-drying and creating windblown erosion issues.

Geosynthetics

The biggest problem came from stormwater runoff and erosion. Another issue encountered was the strategic placement of geosynthetic panels in order to eliminate an overrun of materials waste (intersecting diagonal panels, overlapped edges, etc). This was eliminated by careful planning upfront and the ordering of custom-length geosynthetic panels based on panel layout drawings. Finally, much coordination was needed in the field to deploy the eight layers of geosynthetics. The liner superintendent utilized a very efficient communications system with the crew and the geosynthetics were installed one month ahead of schedule.

Materials Used

- Bentomat ST Geosynthetic Clay Liner manufactured by CETCO
- Dura-Skrim 12BV Geosynthetic Rain Tarp manufactured by Raven Industries
- NW16 Non-Woven Geotextile manufactured by GSE Lining Technologies
- Tendrain 770-2 Tri-Axial Geomembrane by Syntec

- FabriNet HS Biaxial Geocomposite by GSE Lining Technologies
- Miragrid® 5XT-BD Biaxial and Miragrid® 22XT Uniaxial Geogrids manufactured by TenCate and supplied by R.H. Moore
- 60 mil Micro Spike Liner Geomembrane manufactured by AGRU America
- HDPE Pipe manufactured by HDPE, Inc.
- Pumps and Control Panels manufactured by Sligo Systems

Ahead of Schedule & Under Budget

The construction experience was a huge success due to outstanding communication between the contractor, the engineer, and the owner. The project was completed well ahead of schedule and under budget. The Citrus County BOCC and SCS Engineers were all very pleased with the work done. The cell was completely transformed within half a year, and everyone involved with the project noted that things probably could not have gone any better than they did.

The construction site was inspected by SCS Engineers, Citrus County, and the local fire marshall. This project will be continuously monitored by Citrus County Landfill employees, and FDEP as they begin to fill this area with incoming waste stream materials. **L&W**

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