

Category: **3 – Meeting the Challenge of a Difficult Job – General Contractor**

Contractor: **GTC**

Project: **Intersand America**

The Intersand project in Windsor, Colorado met the challenge of a difficult job based on the construction of a manufacturing facility with a highly-complex process tower, plus juggling on-time deliveries and hoisting custom, owner equipment from around North America to set out in sequence on a difficult rigging and structural project. Add to that: the project site had collapsible soil, the owner was 1,800 miles away in another country, and processes of this plant and equipment are proprietary to Intersand, so the entire team had to maintain secrecy.

Intersand is a Quebec-based company that manufactures cat litter, sold in 47 countries around the world. This would be the company's second manufacturing facility, and their first outside Canada. The building is 58,000 sf on 6.5 acres. This includes 42,000 sf manufacturing/warehouse, 3,200 sf office, and another 13,000 sf of floor space in a six-story, 140-foot-high process tower, with 240-foot elevator overrun, and six 50-foot-tall silos. The project used 2,500 cubic yards of concrete and 489 tons of steel. Custom equipment was designed and installed as the project was being built. The project also included a deep rail pit adjacent to the process tower, and construction of a rail spur with two lines.

"This project is really large. It was a challenge coordinating all of the different elements with the shell that holds it all together," Amanda dos Santos, the project manager for Intersand America Corp, said.

The project's scope encompassed several significant moving parts, beginning with a complex design, which then had to be implemented by the GTC team.

"The manufacturing building could have been designed utilizing third-party, pre-engineered metal building (PEMB) design," Al Hauser of Hauser Architects said. "However, the design of the 140-foot-high material process tower required specialized structural design, including a six-level stair configuration that accommodated irregular floor-to-floor heights."

The irregular floor-heights were due to the equipment for the process tower that was being custom-built across Canada and the U.S. and shipped to the site. When the first floor was

finished, and the equipment was installed, the team then began work on the second floor. The Owner then also began installing the second floor's equipment.

"Intersand was designing custom equipment as we were building the tower," Joe Vasbinder, GTC Executive Vice President and principal-in-charge, said. "It was a challenge to coordinate the installation and delivery sequence, in addition to the permitting."

The building's elevations were also determined by the adjacent railway, which would deliver raw material to the process tower. The rail spur and pit created another layer of intricate coordination.

"Aside from the impressive size and quantities of concrete and steel, along with MEP systems put into place, work was continually coordinated around the hoisting, installation, and connection of Intersand's process equipment," Keith Butler, GTC project manager, said. "This complex system incorporates elements within a below-grade concrete rail pit fed by truck and rail, the six-floor process tower, and large warehouse/production space. Very detailed coordination between Intersand, their rail installer, and GTC's team was needed to get the rail pit placed as-needed to accommodate the owner's systems."

"Because it was design-build, we completed it in phases," Vasbinder said. "We broke everything down into packages: site development, grading, vertical component, etc., which allowed us to get an early start for our owner. We were able to start sitework and other early phases during the CD phase. We worked with prefabricators to get more done in less time."

Because of the owner's proprietary manufacturing process, the team also had to be careful not to leak certain information. GTC ensured owner-confidentiality by running all photos and press releases through Intersand before going public.

"From Intersand's side, it's a state-of-the-art facility," Vasbinder said. "We did an incredible amount of infrastructure for their manufacturing robotics."

Coordination of the facility was challenge enough on its own, but the project had additional levels of difficulty.

"The integration of two rail lines that feed into the building made this project that much more complicated, due to strict railroad policies and protocol," Robitaille said.

GTC also had to maintain not one, but three stormwater permits: one for the developer's offsite project, one for the Intersand project, and one for the rail spur project.

“We had to treat each part of the job as its own entity, running three separate weekly stormwater reports, delineating site boundaries for each job, reporting issues specific to each job, and then communicating and documenting overlapping features between each of the sites,” Dylan Hollingsworth, GTC’s stormwater superintendent, said. The sites were inspected monthly by state, local, and third-party auditors. “We not only overcame juggling the individual sites, but we were applauded for our efforts by all three inspection agencies.”

And then: coronavirus.

“When COVID-19 hit, it made the collective efforts of each task that much more difficult to achieve. Maintaining the end date with all the restrictions was a critical path nightmare,” Robitaille said.

GTC had to juggle communication with permitting authorities, the Town of Windsor, the local land developer, the architect, the steel fabricator from Massachusetts, the structural engineer from Oregon, all the subcontractor firms, and the ownership team in Montreal.

“It was hard because of the different time zones and distance,” dos Santos said. “GTC dealt with it fabulously, taking early morning phone calls. We got weekly photos from the super and did our meeting scheduling on the phone. We had limited travel, but it wasn’t really a concern for us to be this far away, because we had a lot of confidence in the GTC team.”

The Intersand site had collapsible soils. Projects on untreated collapsible soils in Colorado have sunk up to four feet, ruining orchards, reversing irrigation/drainage canals, and destroying foundations. The team incorporated a process that is lesser-known in the U.S. called High Energy Impact Compaction (HEIC).

“This was a Geotechnical option the owner accepted in lieu of the deep overexcavation and recompaction that would have been required, given the highly collapsible onsite soils, which ultimately saved considerable time and cost,” PM Butler said.

Long used overseas in arid climates with collapsible soils, such as the Middle East and Australia, HEIC utilizes a heavy, pentagonal-shaped drum, which bounces behind a tractor, compacting ten feet of soil at once.

“The HEIC provided thousands of ground readings per rotation of the impact drum,” Robitaille said. “That device was able to show weak soil conditions in a simplified location, thus

allowing us to repair said conditions without wasting energy and efforts in overexcavating. It dialed in the locations and mapped it out for us.”

“We covered acres, instead of square feet, at a time,” Butler said. “The whole site was completed in a week and a half.”

“We were very concerned at the beginning because of the number of subcontractors that were going to be on this project,” dos Santos said. “We knew our GC, whoever it was, was going to be the gatekeeper of all of the safety.”

“From the deep utility line installation, with massive de-watering efforts, to the dangerous and complicated rail pit construction, this project saw excavations as deep as 25 feet, and steel erection of the building topping out at 140 feet,” Robitaille said. “Our safety protocol saw challenges from the basic enforcement of proper PPE to the coordination of the crane flight path. Safety measures were a constant and continuously-evolving matter.”

The breezy jobsite had regular wind gusts exceeding 50 mph. Three times during the project gusts exceeded 100 mph. The normal danger-level increased as the height of the tower grew.

“Safety risks on this project included falls, trips, and hazards,” Vasbinder said. “The falls could’ve been a greater hazard because of the height of the tower and the depth of the rail pit, so we just kept making sure everyone was tied off.”

The build finished with zero safety events.

“There were no lost-time incidents, which is a testament to the focus and diligence GTC’s field team, subcontractors, and owner’s contractors continually put into their efforts,” Butler said.

“The sheer amount of different entities working together was incredible,” Vasbinder said. “But everyone pulled from the same end of the rope.”

In the end, the owner was very happy with their new facility, both functionally and aesthetically.

“Our main purpose is manufacturing,” dos Santos said. “Our branding is important. This is a metal building, so we used panels with different colors to incorporate our brand colors without getting tacky.”

“The exterior wall cladding utilized Insulated Metal Panels for their structural span capabilities and insulation value,” architect Hauser said. “This contributed to a clean and easily-maintained interior environment. The exterior color of the IMPs reflected the corporate identity and integrated the Intersand logo as a design element. They also served to visually reduce the scale and height of the main building structure.”

“On behalf of Intersand, I would like to personally thank the entire GTC team and its partners for all the efforts you put in place to deliver our new plant.” - Stéphane Chevigny, Président Directeur Général/CEO, Intersand.









