Southern Highway (Mile 14) - Belize/Guatemala Border Road Project
THE PROJECT

In the first quarter of 2011, Cisco Construction Limited commenced work on the approximately twenty-one mile (33.7 kilometres) stretch of highway between the area known as “the Dump” and the village of Jalacte in the Toledo District. The road works are scheduled to be completed no later than March 2014. Financial support for the project was received from the Kuwait Funds for Arab Economic Development, OPEC Funds for International Development, Central American Bank for Economic Integration and the Government of Belize.

The scope of the project involves the expansion of the pre-existing carriage way to an 8.5 meter wide double carriageway with one (1) meter wide shoulders. Additionally, ten major culverts will be installed; six wooden bridges will be replaced with concrete structures; three (3) existing bridges will be rehabilitated; eighty culverts will be installed; ninety catch pits will be included in the new drainage system; fourteen (14) bus shelters will be built; more than six thousand linear meters of guard rails will be installed and road paint stripes will be applied to more than one hundred and ten thousand linear meters of highway.
THE TEAM

According to Project Manager Vernon Samuels, the work has been divided into three phases. As of April 2012, phase one, which refers to the area between Mafredi and San Antonio Village, a distance of approximately seven (7) miles, was near completion.

Project Manager Vernon Samuels

Civil Engineer Gina Longsworth (right) inspects the installation of speed bumps
It is the policy of Cisco Construction Limited to hire as many locals as possible from the nearby communities. To date, the company has retained the services of two hundred and three (203) full time employees. While forty-five (45) employees are from other areas of the country, one hundred and fifty-eight employees are from the Toledo District. Additionally, fifty villagers have also been hired as subcontractors to construct culvert headwalls, guardrails, bus shelters and install water lines.

Above: Independent contractors dig holes for guard rail posts.

Above: Cisco Construction employees level posts
(Above) Head of Survey Unit Kevin Young and Project Manager Vernon Samuels liaise on site

(Above) Cisco Construction employees work on drainage system
It is estimated that at the project’s end, more than six hundred thousand cubic meters of material will be used. Approximately 160,000 m$^3$ as “borrow to fill” and 490,000 m$^3$ – as cut to fill or waste.
During the course of the project, Cisco Construction will establish three quarries. The Mafredi quarry is currently producing fill, sub-base and base course material. 46,500 m³ of “all-in” (Base Course) and 80,000 m³ of sub-base will be crushed by Cisco Construction’s crushers.
Above: The Mafredi Quarry.

Above: One of the three on-site crushers; San Antonio Quarry
To support its team of dedicated workers, Cisco Construction is relying on an arsenal of heavy duty equipment. Those resources include some eight (8) backhoes; a dozen (12) excavators; five (5) graders; five (5) bulldozers; five (5) rollers; two (2) asphalt distributors; three crushers as well as a fleet of trucks, vehicles and miscellaneous equipment.

The largest excavator on site, the 345B fills a dump truck to capacity in just three bucketfuls.

To ensure efficiency, Operations Manager Joe Swift and a team of mechanics have taken an aggressive approach by establishing a preventative maintenance team to service the vehicles when they are not in use as well as a mobile team and service truck to deal incidents in the field. Swift says, “If the machines aren’t working, the job isn’t getting done. We work hard to keep everything in good condition. We have three containers with everything from truck parts to Caterpillar parts to back up blades, buckets and teeth for the excavators.”
Operations Manager Joe Swift and mechanics at Cisco South 6 Base camp

The Mechanic Shop at South 6 Base camp
While the heavy duty equipment attracts the most attention, behind the scenes, a small team of analysts conduct the crucial tests necessary to ensure that the material used in every aspect of the project meets both the contract’s specifications and international standards.

The Soils Laboratory at Cisco Construction’s South 6 Base Camp
Manager of the Soils Laboratory Henry Bennett has been conducting soil tests in Belize for almost three decades. A career employee of Cisco Construction, Bennett maintains, “If we don’t do a good job, that nice road will just fall to pieces. The company is depending on us but we have our own standards. We stand by our results. If we say it passes, then any other lab in the world will get that same result.”

According to Bennett, mudstone (an extremely fine-grained, sedimentary rock) ranging from poorly to well-weathered, is the most dominant type of rock in the project area.

Mudstone is the most common type of rock found in this part of the Toledo District
Bennett and his team conduct various types on the material intended for use in the project. Those tests include the California Bearing Ratio or CBR, a penetration test to evaluate the mechanical strength of sub-base and base-course material. In relation to road construction, the test simulates the load bearing capacity of the material to ensure ability to withstand constant pressure such as road traffic.

Other tests such as the Linear Shrinkage test detect the clay content in the soil while the Sieve Test assesses the particle size distribution of the material. Experts agree size distribution is often of critical importance to the way the material performs in use.

Bennett reiterates, “Before anything is used in this project, it is tested. Everything is tested. Those test results are forwarded to all the managers and engineers as well as third party engineers. The series of tests and our other quality control measures ensures that the material is usable for the intended purpose.”
Soil Lab Assistants Maria Ical (Above) and Marcial Sanchez (Below) conduct analysis on soil and rock samples.
Safety First

The new highway will have immediate impact on five villages: Mafredi, San Antonio, Santa Cruz, Santa Elena and Pueblo Viejo. In addition to promoting safety considerations and mandating the use of safety equipment by its employees and visitors, Cisco Construction Limited also conducts regular visits to the communities to give presentations on road safety to villagers, especially young students. Additionally, safety officers and “flag men” are posted at each site where heavy duty equipment is in use to ensure safety to both pedestrians and motorists.

One of the many “flag men” posted to areas where heavy duty equipment is in use.
Workers use reflective gear while on work site

The new highway will be used by pedestrians, livestock and vehicular traffic
The dry-season strategy

In Belize, most of the year’s rainfall occurs during the period June to November (in tandem with the Hurricane Season). However, onset of the rainy season can be as early as May in the Toledo District, which receives the highest rainfall nationally.

According to Civil Engineer Gina Longsworth, once the rains come, the work grinds to a halt. If the material is too wet, it cannot be used. As such, since the road works began in 2011, the company adopted a dry-season work schedule working fifteen (15) hour shifts to as Longsworth puts it “make hay while the sun shines.” She goes on to assert, “The weather conditions are a key factor to this project. For instance, our soils laboratory has to ensure that the material can withstand the periodic flooding in this area and our bridges, which traverse small streams in the dry season, must withstand roaring rivers in the rainy season; same goes for our culverts. Road building in Belize has a lot to with drainage. At Cisco Construction, we take pride in ensuring we have proper drainage systems.”

A comprehensive drainage system has been designed to ensure durability of highway in flood zones.
Young students traverse one of the newly constructed bridges along highway project

While the highway project is scheduled to be completed in March 2014, it is clear that the locals who have sought employment with Cisco Construction Limited are earning valuable skill sets in masonry, carpentry, mechanics as well as lab analysts and assistant surveyors.

The new highway is more than just an upgrade to the road—it is no doubt a precursor to an increase in basic services such as access to running water, electricity and telecommunications and thereby, improved quality of life.
The traditional home of the indigenous Maya. This home is immediately adjacent to highway project.

According to the management team of Cisco Construction, the second phase of the Southern Highway (Mile 14) Belize/Guatemala Road Project which will cover kilometre ten (10) to kilometre twenty-two (22) is scheduled to be completed by March 2013. The third and final phase of the project: kilometre twenty-two (22) to thirty-three (33) has an estimated completion date of March 2014.

For more information, visit the company’s website at [www.cisco.com.bz](http://www.cisco.com.bz)
Cisco Construction Limited’s South 6 Camp