



# La Conga Suspension Bridge

## La Conga, Panama

Submitted to: Canadian Consulting Engineering Awards  
Category I: Community Outreach & In-House Initiatives

**Confirmation Receipt**

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## **Entry Consent Form**

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## **Full Project Description**



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# CH2M and Bridges to Prosperity

An estimated 900 million rural people in developing countries do not have reliable year-round access to road networks. For nearly half of the world's population living in rural isolation, this lack of transportation access reinforces the cycle of poverty.

Bridges to Prosperity envisions a world where poverty caused by rural isolation no longer exists. They provide isolated communities with access to essential health care, education and economic opportunities by building footbridges over impassable rivers.

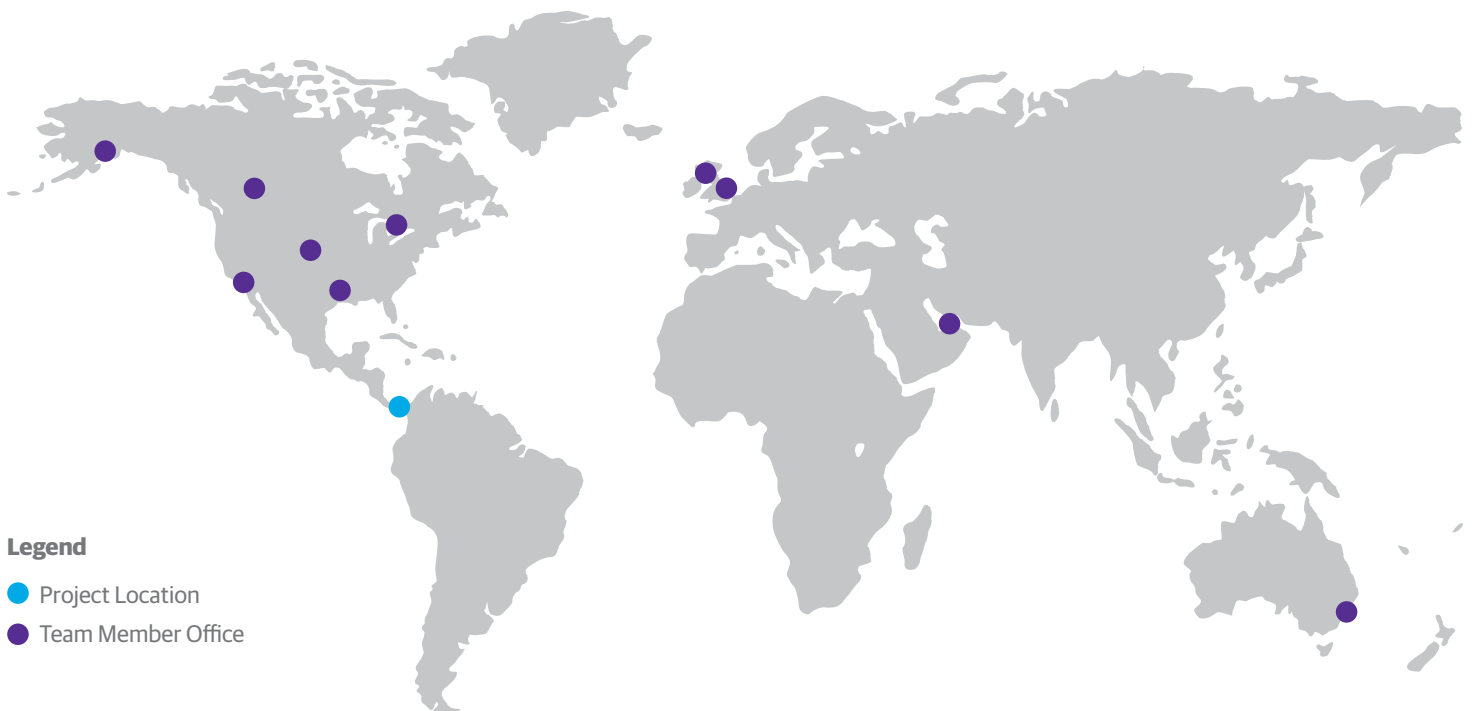


In partnership with



## CH2M HILL Foundation chose to partner with B2P because:

- Their mission aligns with our commitment to build sustainable communities.
- Their needs align with our transportation expertise.
- Their projects provide meaningful opportunities for our employees to use their technical skills to make a difference.
- Our respective organizational models encourage strong community empowerment, engagement, and technology transfer.



### Legend

- Project Location
- Team Member Office

# Our Team and Mission

*"For many of us, a bridge is something that we take for granted. For other communities across the world, a bridge can create the opportunity for growth, independence and prosperity, forging a link to a stronger future for those who will use it every day."*

Reece, project manager (Calgary, Alberta)

## Team Mission

Build a 45-meter suspension bridge to connect the communities of La Conga and La Florida in Panama

Focus on tower erection, hanging suspension cables, installation of decking and fencing

Collaborate as a team, and most important, involve local community for ownership and technology transfer

Complete the work in only 8 days

## Rio Trinidad

- Located in the Panama Canal Watershed
- Divides the communities of La Conga and La Florida
- Rises several feet during rainy season, requiring a 2-hour walk to bypass the river
- Current increases steadily following rain
- Primary school is within ¼ mile (402 meter) of the bridge site



## Our Team



Reece, Calgary



Kimberly, Toronto



Eric, Anchorage



Lilly, Los Angeles



Blake, Denver



Tessa, Denver



Robert, Houston



Haluk, Sharjah



Emily, Sydney



Karen, Warrington



Tomas, London



Luisa, London



Andrew, London



# Timeline – June 28 to July 1, 2014

*"Enjoy every minute. All the hard work, bug bites, blisters, sleepless nights will all be worth it when you stand back and see the bridge you have built for the people who need it."*

Emily – project controls (Sydney, Australia)

## June 28, 2014



### Day 4

- Filled a 5 to 6 feet deep U-shaped pit with rocks and soil
- Completed quality control (QC) on all suspenders
- Set the tower saddles



## June 28, 2014

### Day 1

- Arrived in La Conga
- Set up camp and met community



### Day 2

- Assembled two steel towers
- Erected one tower right at sunset
- Bent all of the rebar for the suspenders
- Hauled in several truckloads of lumber for bridge decking



### Day 3

- Unraveled the massive cable spool (4 metric tons)
- Anchored first tower
- Erected second tower
- Filled hole on La Conga side of the river





# Timeline – July 2 to July 5, 2014

*"It was great to work on team building and communications, as both are a must on site. It is not like being at your desk running simulations or numbers for a day on your own. If you spend one day without communicating on site, there is something really wrong and you are missing the opportunity to learn."*

Luisa, engineer (London, England)

## Day 5

- Raised and set the cables
- Anchored crossbeams to suspenders



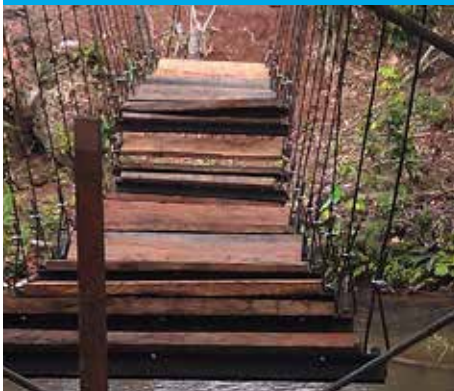
## July 5, 2014



July 5, 2014

## Day 6

- Hoisted the crossbeams and suspenders onto the main cable
- Staged and completed QC of lumber for decking



## Day 7

- Began decking
- Completed final QC



## Day 8

- Completed decking
- Installed fencing and hand rail
- Celebrated the inaugural crossing of the bridge with the people of Lo Conga and La Florida



# Nuts and Bolts

*"Just like any jigsaw you have to pull the corner pieces out first, then the rest of the puzzle starts coming into focus. Completing the towers was our corner piece."*

Robert, construction professional (Houston, Texas)



4-100m sections of 1 1/8" cable weighing 350kg each were installed

**384 small cable clamps**

**44 large cable clamps**

**40 bolts**

**690 lag bolts to secure the decking**

**270 lag bolts for the crossbeams**

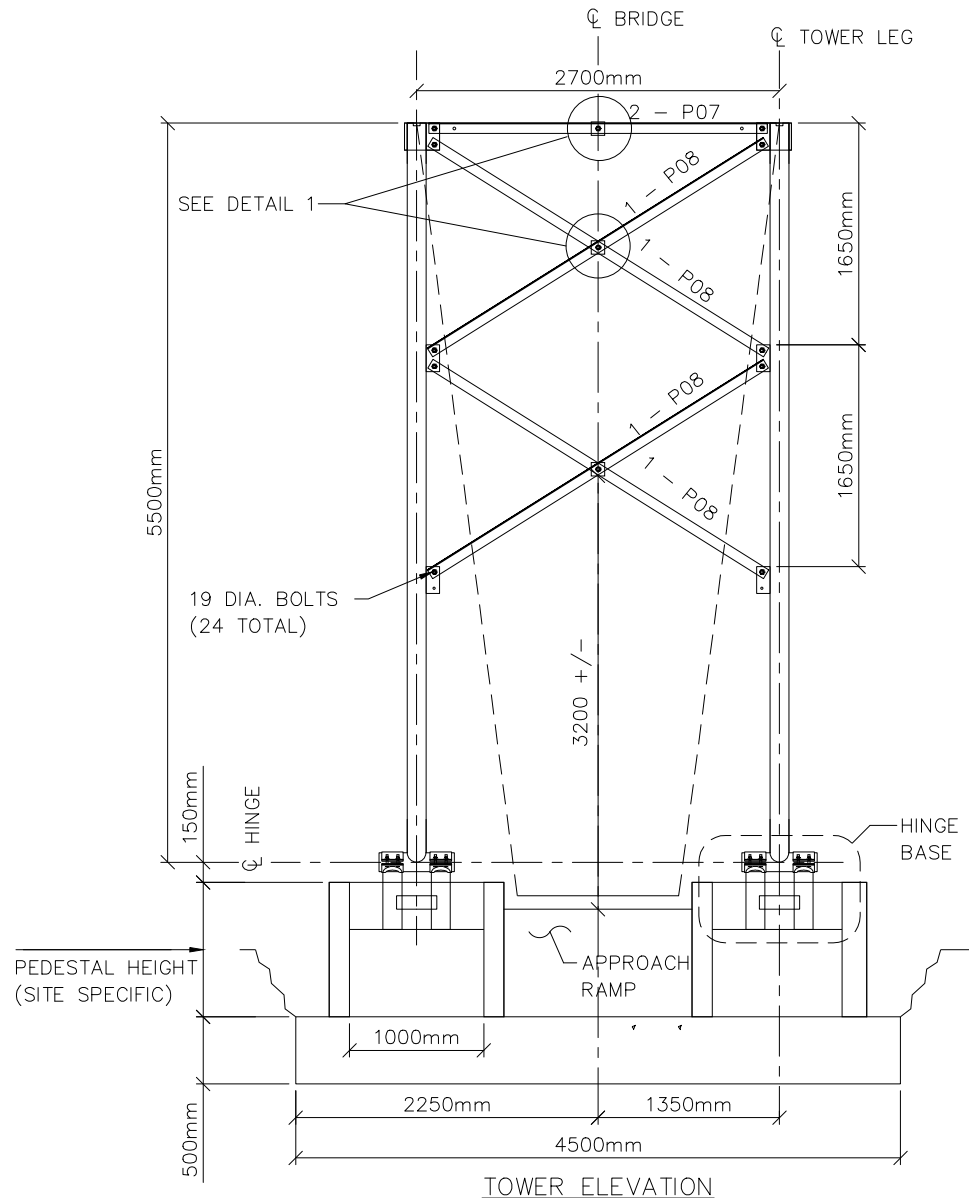
**115 boards**

**45 crossbeams**

**90 suspenders**

**360 meters of 1/4" cable installed**

**135 m<sup>2</sup> of fencing with a few hundred wire ties and couple hundred U nails**



# Project Challenges

*"Today was an exercise in dexterity. I spent 12 hours up on 25-foot high scaffolding handing suspenders. Tomas and I had to hold each suspender in place with one hand, pull the pull wire to the correct marking with the other hand and then with that same hand clamp the rebar closed with two screws. Clamps were dropped. Markings were missed. Only the cool condensation of my iced beverage soothed the ache in my hand."*

Eric, transportation engineer-in-training (Anchorage, Alaska)



## Erecting the Towers

The biggest challenge was finding a place to securely anchor the pull rope to raise the 5.5-meter towers. On remote sites, construction methods are limited by available technologies and site conditions, such as the proximity of anchors (i.e. trees). On the first attempt, the team used a tree as a pivot, but the tower had to be lowered when the tree started to crack. Although not the most ideal option, the team switched to using scaffolding and were able to raise the first tower.

## Engineering on the Fly

Quick turn-around projects require rapid problem-solving and practical solutions. In what is every bridge-builder's nightmare, the last space to be decked was larger than any of the decking available, which prevented the team from connecting the two sides of the bridge. As this was the night before inauguration, the team had to act quickly. Using a spare crossbeam, the team bent new suspenders for the gap. Installing an extra crossbeam allowed them to cut the decking to fit.

## Ensuring safety in an unknown environment

Balancing North American industry safety practices with those typically practiced in remote areas was a constant challenge for the team, and particularly for the safety manager. The team was working in an unknown environment, many of them had never worked on a construction site before, and language barriers made communication difficult. In daily onsite safety meetings, the team discussed task-specific challenges and mitigation strategies for that day, and took advantage of every opportunity to benefit from safety lessons learned.



# Benefits to the Community

Bridges to Prosperity measures the impacts and benefits to the community for each of the bridges they build. They track and report real-time traffic information through remote monitoring traffic devices, and conduct socioeconomic surveys that include bridge use, variations in school attendance records and clinic vaccination rates, and qualitative anecdotes from household surveys. Their studies have demonstrated that bridge projects offer a significant benefits to the communities involved.



## Increased Access to Education

Because the primary and secondary schools are on opposite sides of the river, the bridge will benefit all the children who live in La Conga and La Florida, enabling them to travel safely to school year-round, giving them access to new opportunities.



## Increased Access to Healthcare

Any access to healthcare for La Conga residents is on the other side of the river, making access particularly challenging for months on end during the rainy season.



## Increased Employment of Women

One direct impact of the La Conga Bridge was employment for a local woman, Maria Luisa Navarro (left in photo above), who hosted the team at her home and arranged for all meals and other accommodation. Her organizational skills impressed the new municipal leader, who offered her a secretarial position with the local government. She was only able to accept the job because the new bridge would provide her with year-round access to her workplace.

**Children** can go to school

**Parents** can take their children to health clinics

**Mothers** can access local markets and shops

**Fathers** can use local transportation to get to jobs



*"Bridges stand for connectivity, figuratively and literally. A whole landscape can be transformed in such a subtle way that it's almost possible to forget the months of labour behind the beautiful bridge that will change the lives of the people in the local community."*

Jake, Bridges to Prosperity – Panama manager

# Benefits to CH2M

CH2M's collaboration with Bridges to Prosperity helped to strengthen the capacity and sustainability of the La Conga and La Florida communities by engaging and empowering team members throughout the process. For every CH2M team member onsite, there were at least 2 to 3 local community members, and more in the evening and on weekends. Team members became mentors to the local workers, passing along skills in construction and project management, along with the knowledge they will need to maintain the structure for the community.



*"Working with Bridges to Prosperity was truly a humbling experience. Being able to apply some of my technical skills to help bridge two communities is something that I will forever take pride in."*

Eric, transportation engineer-in-training  
(Anchorage, Alaska)

*"The most valuable skill I learned through my participation in B2P is to leverage my critical thinking with effective communication and teamwork to become an asset to the team. I learned that is not only is important to have a thirst for learning and desire to create value with your actions, but also to know how to engage others and build a stronger, more efficient team. "*

Blake, finance professional (Denver, Colorado)

*"It was great to work on team-building and communications, as both are a must on site. It is not like being at your desk running simulations or numbers for a day on your own. If you spend one day without communicating on site, there is something really wrong, and you are missing the opportunity to learn."*

Luisa, engineer (London, UK)

**All hands on deck**

**Collaborate**

**On-the-ground engineering**

**Think outside the box**

**Mentorship**

**Leadership**

**Have fun**

**Encourage one another**

*"I have been designing bridges for more than 20 years, but this is the first project where I actually understand what a bridge really is – and what it means."*

Tomas, senior bridge engineer (London, England)



*"The 45-meter suspension bridge our team built will never grace the front pages of history books, but its impact is life-saving and incredibly important to the 200 community members who will now have a safe, efficient way to reach school, health clinics, and commercial markets. The community of La Conga will benefit daily from this bridge, and every team member who played a small role in making this a reality has been changed as well by this experience—it stretched us outside our comfort zones, bridged new relationships, and will likely remain one of the most meaningful projects throughout our careers."*

Tessa – CH2M HILL Foundation officer (Denver, Colorado)

*"Thanks to God the bridge is finally being built and I am going to be able to see it. This makes me feel really happy. This is going to make a difference for my son because this is not a good life for him. He will not have to cross the river back and for the in the rain time and again. Completing this project, I will not have to worry anymore knowing that he will be safe, that he will get back home safe."*

Felicita Navarro, 90-year-old "grandmother" of La Conga, who lost one of her 15 children to the river

