

<http://sowers4pastors.blogspot.com/2011/03/el-mongual-bridge-project-now-were.html>



The picture above shows the location of the new bridge, in El Mongual, not far from the city of Gracias. You can see, on the ground, the foundations for the walls which will hold up the ends of the bridge on each side of the river. It is currently the dry season, so the river is low and easily forded. When the rainy season starts, however, this is frequently a swollen and raging river, and without a bridge a large number of people are unable to ford the river to get out of their communities during that time.



Here's the empty form, into which the concrete will be poured. The form is 43' long.



Here you can see down the form from the top. There is a framework of rebar inside, and much more rebar will be added as the process continues.



More long pieces of rebar are added to the form.



Here comes some more heavy rebar.



Rebar is threaded into place from the open end.



While the rebar is being pushed into place, four teams of men are mixing concrete. The concrete is poured into the form, starting at the closed end.



The level of concrete is rising at the one end.



Russell is working with the trowel, smoothing the top of the concrete as the work progresses.



A look from above, which might give some idea of how much rebar is packed inside this concrete beam!



Here's how all the wet concrete gets into the beam.



And more, and more, and more buckets of concrete.



The guys keep smoothing the top, as the form fills with concrete.



When the entire beam is poured and smoothed, the empty paper sacks which previously held concrete are put on top, to protect the beam from drying out too quickly.



Men in the community continue to pour water on the paper sacks for several days, as the beam dries slowly from the inside.

With the big beams finished, the workers turned to pouring the concrete walls which will hold up the beams at each end. You can look forward to those pictures sometime in the near future.



As you probably recall, two huge beams were fabricated for the bridge in El Mongual. The beams had to be moved into place on the riverbed at the foot of the supporting walls, and then lifted up to sit on top of the walls. Just to keep things confusing, some of the pictures I'll post will be from

the moving of the first beam, and some will be from the second. I didn't have a photographer there every day of this long project, so that's the way it is. The picture at the top shows the first beam already in place across the river, and the front end loader dragging the second beam toward the river, using logs as rollers under the beam. Easy, right? No, I know you know that nothing comes easy here. This post will show some of the work of getting ready for the moving of the first beam:



Some dirt was dug out from under the beam.



Logs were collected from downed trees.



Cable had to be connected from the front end loader to the beam.



After several tries, it was determined that the best way to connect the cable to the machine was to weld a metal post to the bucket, and put the cable around the post.



Here's the very first lift, just barely lifting the beam up off the ground.



Impressive, huh? Yes, it's just the teensiest bit off the ground.



With the weight of one end of the beam lifted a bit, more work is done to clean out under the beam.



More dirt is dug out from under the beam, the wall panels which were under the beam are pulled out, and stacks of lumber are used to prop up the beam, so that the machine can lift it up a bit more. Henri, in this picture, is signaling to Russell, who is at the controls of the front end loader.



Progress is being made.

The following pictures will show the journey of the second beam (you can see the first beam sitting atop the support walls):



Russell, driving the front end loader, pulls the beam down the hill toward the river.



Frequent adjustments had to be made to the rollers and to the path. At times, the progress in an hour would be less than a yard.



As the beam heads into the riverbed, it must be turned to manipulate it into the space between the walls. More log adjusting is required, of course. Adjusting logs while a 20 ton beam sits on top of them isn't a quick or simple process!



The soft, damp soil at the edge of the river made it necessary for the men to create a "roadbed" for the rollers, so they wouldn't bog down.



Manipulating the beam into place by the wall was another challenge. With the first beam in place, Russell was working in tight quarters, as he maneuvered the second beam around while the first beam was in his way.

With the beam basically in place, it was time to lift it up onto the top of the 9 foot high walls. Those pictures will come soon.



Here we are, looking at the far end of the beam we're working to lift. [You'll recall from the previous bridge post](#) that we've already started building a tower under the other end of the beam. The front end loader has been moved, and is being connected to this end of the beam.



Of course, the logs which were used for rollers have to be taken out from under the beam.



The base for the second tower is carefully created, once again making certain that it is level and secure. Having the beam fall is the biggest concern of this job, and building an unstable tower would make this much more likely.



This tower is built up until it is taller than the previous tower.

You might notice, in these pictures, that Russell is able to lift the beam several feet at a time, while the workers are building beneath it, and you might wonder why he could only lift the beam a few inches at a time when it was still up on the hill where it was poured. The answer is a fun fact of physics, which Allen wanted me to be sure you knew. Think of an old-fashioned see saw, which might be a heavy wooden plank balanced across a log. If you tried to pick up the plank when it was lying flat on the ground (before it became part of the see saw), you'd probably have to use both hands to lift one end, and you might just barely be able to lift it. However, when the plank is balanced on the log in the middle, then you can lift one end of the plank quite easily, perhaps even with just one hand. That's because you're only trying to lift part of the weight of the plank, and because the other end of the plank is being pulled downward by gravity, which also helps make it easier for you to lift. At our bridge construction site, the towers are acting as the center log of the see saw, making it possible for the front end loader to lift an end of the

beam much higher than it could previously do. It sure is handy to know about physics!



Now the guys have moved back to the first tower, and will make that one a few feet taller than the one they just worked on.



These huge, squared off logs, by the way, are from those trees which were mentioned in a previous post, which we cut down to use for this project. Some of the wood was left round, to use for rollers, and some was squared off for use in the towers.



I think you've probably got the back-and-forth process figured out now.



We're getting close.



way up!

The front end loader yanks one end all the



With the front end loader moved to the other side of the river one last time, pieces from the tower which is no longer in use are put into place to raise the remaining tower higher.



Now we're really close!



Success! Now both beams are in place, and we can all say a prayer of gratitude and breathe a sigh of relief!

Meanwhile, Allen and Russell have been working steadily on the bridge in El Mongual. Here are some pictures from about 2 weeks ago, of the crew preparing to pour the deck of the bridge. The deck, for those of you (like me) without a lot of knowledge of construction terms, is the part of the bridge you actually drive on.





In the past two weeks, the concrete deck has been poured, as well as the safety walls on each side of the bridge, to keep people and cars from going over the sides and falling into the river. I'd better make sure and send the camera out for some more recent pictures. This morning Allen told me that they only have about 6 more days of work on the bridge! Of course, once this project is done, there's another bridge project waiting to start!