Making a Difference
One Bridge at a Time

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Finding a Hero...

http://www.youtube.com/watch?v=FcUpmzcoW2U
How I Got Involved...

- Connection with Harmon Parker
- Appointment to Board of Directors
- Planned Surveying and Inspection Trip to Kenya
- Construction Trip - 2012
REFERENCE MANUALS

- Helvetas
- Bridges to Prosperity
- AASHTO Pedestrian Bridge Guidelines
- Other Local Manuals
**Bridge Facts**

**Our Mission**

Bridging the Gap Africa is dedicated to saving lives and improving the quality of life for rural African families and communities by constructing pedestrian footbridges. Our footbridges are providing safe passage and increasing access by marginalized communities to education, healthcare and commerce.

*Kenya’s population is estimated to be 42 million; 78% of Kenyans live in this rural and remote walking world.*

*In the past 10 years it is estimated that 6,000 children, women and men lost their lives while crossing rivers*
Bridging the Gap Africa has actively planned and completed numerous bridges to date - contributing to several million safe crossings and saving countless lives!

- To date BtGA has built 48 pedestrian footbridges in Kenya

- Our bridges are saving an estimated 600 lives every year by eliminating drowning, hippo and crocodile attacks

- BtGA bridges are improving the access of thousands of people to schools, health clinics and market centers, bringing enormous quality of life benefits as education, health and household incomes are improved in rural Kenya

- BtGA constructed the longest suspension footbridge in East Africa – 112-meters 368 feet and it is the first of it’s type on the continent of Africa
**Survey**

- Abney Level
- Yard Stick
- Measuring Tape

<table>
<thead>
<tr>
<th>Survey Station</th>
<th>Topo Point</th>
<th>distance (m)</th>
<th>Angle Theta (radians)</th>
<th>remarks</th>
<th>Horizontal Distance</th>
<th>Vertical Distance</th>
<th>Elevation</th>
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<tbody>
<tr>
<td>Starting point a</td>
<td>L</td>
<td>5</td>
<td>0.061086524</td>
<td></td>
<td>4.990673992</td>
<td>0.3052427</td>
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<td>h</td>
<td>7</td>
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<td>0.04072</td>
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<td>-1.58305</td>
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<tr>
<td>c</td>
<td>5.2</td>
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<td>average water level</td>
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<td>4.584206753</td>
<td>2.45459</td>
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<td>d</td>
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<td></td>
<td>30.85728215</td>
<td>2.97121</td>
<td>97.03</td>
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</table>

**Survey Station**

- Changed Survey Point
  - d a 31 0.081448698 30.89723153 2.52211 99.55
  - e 3.35 0.34906585 3.14797028 1.14576 98.18

**Graph**

- Elevations (M) - NOT to Benchmark
- Horizontal Distance (m)
- High water mark
- Average water level
The Bridges...

- “Suspended” Hanging Bridge
- Typically 40-60 meter spans
- Typically 20 - 32mm Cable (donated)
- .5m – 1.0m walkway
- Steel Cylinder Towers – concrete filled
- Concrete = M10 or M20 Grade
  - 1450psi to 2900 psi
  - Low strength mix with no quality control – mixed with aggregates found onsite
- Eucalyptus Wood Deck – 2 meter lengths
- 12mm rebar used as hangers
- Fencing for safety
Analysis

AASHTO Pedestrian Load = 90 lb/ft$^2$

Steel Tower – AISC Manual

Anchor Analysis – Pull out, Overturn, Sliding
Anchors
Anchors
TOWERS AND FOUNDATIONS
“FABRICATION SHOP”
DECK AND HANGERS
PROBLEMS

- No Soil Testing!
- Cable is Used (breaking strength is re-tested)
- Concrete strength is low
- Aggregates are often substandard
- Steel strength is questionable
- Welds and Fabrication is questionable (on site shop)

- TIA! This Is Africa!
MY TRIP

- September 2011 – Survey and Planning

- August 2012 – Construction of Two Bridge
  - Maasi Mara – Game Reserve Area
  - West Pokot – Kitale farmland
HOW YOU CAN help - SPONSORSHIPS

- East Coast Fundraiser
  - Golf Tournament – Leesburg, VA
  - Raspberry Falls Golf and Hunt Club
  - September 10, 2012
  - Register to Play! – [http://bridgingthegapafrica.golfreg.com](http://bridgingthegapafrica.golfreg.com)
  - Sponsorships Still Available
    - Overall Sponsor of Event - $10,000
    - Hole Sponsorships - $500

- West Coast Fundraiser
  - Dinner / Music / Silent Auction
  - San Jose, CA – The Tech Museum
  - October 19, 2012
  - Invitations to be sent within the next two weeks
  - Sponsorship Opportunities available
  - Guest speaker – Barton Newton, Caltrans State Bridge Engineer!
HOW YOU CAN HELP

 Corporate Sponsorships

 Bridge Sponsorships
  • Organizations sponsor a specific bridge
  • Raise funds for materials
  • Can choose to raise funds to bring a construction group to Kenya and BtGA will organize travel for the group
TECHNICAL ADVISORY COMMITTEE

- Currently Being Formed
- Chair – Kelley Rehm, PE

- Work on standardizing designs
- Compiling our own construction and design manuals
- Developing standard detail drawings
- New more efficient designs using rural materials for longer spans

- Please contact me if you are interested!
MORE INFORMATION

○ www.bridgingthegapafireica.org

○ My Blog: Kelley in Kenya
  • http://krehm.posterous.com

○ Facebook

○ www.Causes.com

○ Contact Me:
  • Kelley Rehm
  • krehm@aashto.org
QUESTIONS?