CONTINUED IMPLEMENTATION – PRE-TRIP PLAN

Executive Summary	
Community:	Ait Bayoud
Country:	Morocco
Chapter:	Columbia University Student Chapter
Submittal Date:	05/19/2018
Authors:	Katherine Burt, Jacob Davis, Hong-Ann Do, Erik Melicio
REIC and other mentors:	Ryan Woodward (REIC, structural engineer), Matthew Riegel (mentor, geotechnical engineer), Tamar Caplan, Margaret Cowie
Scope of Work for the project (50 words) [1]	The bridge project has built a suspension footbridge crossing the Tagawowt river in Ait Bayoud, Morocco. The bridge gives residents of the northern bank of the river access to the road out of town to schools and hospitals. The team continues to inspect and repair the bridge as the chapter works on a water project in a neighboring community.
Scope of Work for the trip (100 words) [2]	Having already partially installed its replacement rope, the team will remove a damaged hand rope in order to finish the installation of the replacement. All hand ropes will be temporarily detensioned to replace damaged UHMW rope saddles from the top of each tower. In addition, as with every trip, the team will conduct a comprehensive inspection of the bridge and document its condition.
Proposed Next Step (100 words) [3]	After this trip, the team will have completed all major repairs on the bridge Thus our next steps for the bridge project are simply to monitor the bridge each time the team goes to Morocco to work on our other project.

Describe Recent Contact with Community, NGO, and in country partners. (100 words) [4]	Our primary contact has been with our affiliated Peace Corps volunteers, our NGO partners. We have had biweekly phone calls with them in recent months to plan the upcoming trip. They have most recently visited the community in January 2018, when they completed a spot inspection of the bridge and took measurements and photos of the towers of the bridge to help us plan our summer trip.
Describe the Chapters current fundraising goals and milestones. (100 words) [5]	The chapter is currently reaching out to companies and alumni for donations and applying to grants. Our goals are to fund enough money to continue necessary repair implementations on the bridge and continue implementation on the water distribution project.
☒ [6]	**IS THE PROGRAM STILL ON TRACK TO MEET THE EWB PROJECT EXPECTATIONS?**

Privacy: EWB-USA may release this report in its entirety to other EWB-USA chapters or interested parties. Once the report is approved any member in Volunteer Village will be able to find and view the plan. Please do not include personal or sensitive information.

Project Summary Instructions (Update the example answers above, and remove the following instructions before submitting this report). It is recommended that teams use the Project Management Tools and Logical Framework for project planning and execution:

1. Describe the overall scope of the work for the current project.
2. Describe the overall scope of work for this trip.
3. What are you proposing to do after the scope of this plan is completed?
4. Describe the current methods the chapter is using to communicate with the community. Is information easily shared? What was the date of the last contact?
5. DO NOT INCLUDE AMOUNTS. Describe your upcoming plans for fundraising and whether your fundraising is ahead of schedule, behind schedule, or holding up progress on other items(critical path)
6. Click the box if the statement is true and the program still meets the goals of EWB projects that the chapter is communicating with the community and on track to meet the minimum 5 year partnership requirement.

Project Timeline [1]			
Major Milestone	**Previous Date [3]**	**Current Date [3]**	**Description**
Program Adoption Date	2/26/11		
Previous Project in Program Date Constructed [2]	N/A		
Project Approval Date	3/31/11		
Completed Assessment Trip	7/17/11		Trip conducted to survey potential bridge sites along the river and collected general assessment data about the community and project
Completed Assessment Trip	1/3/11		Trip completed to finish surveying project sites, observe the river during the rainy season, collect data, form contacts with local contractors and suppliers, and strengthen community relations.
Completed Implementation Trip	5/7/12		Trip completed to construct footbridge. The towers were constructed and the main ropes were installed.
Completed Assessment Trip	1/9/13		Inspection of existing bridge construction, assessment of potential second bridge sites,
Completed Implementation Trip	5/22/13		Final tensioning of bridge cables, complete construction of deck and netting
Completed Implementation Trip	1/6/14		Routine inspection. Maintenance including adding a perimeter rope to the netting of the bridge and

			stalling firehose to protect the rope. Vibration testing was conducted and a test place was added to the bridge deck.
Completed Implementation Trip	8/1/14		Routine inspection. Maintenance including over planks added to the bridge deck for stabilization, approach deck anchored and eyelet replaced at west end and
Completed Implementation Trip	12/30/14		Routine inspection. Lashing between netting and main roes was reinforced with 550 cord and firehose was wrapped around linkages
Completed Implementation Trip	8/16/15		Routine inspection.
Completed Implementation Trip	1/2/16		Routine inspection. Traveler constructed and tested to possibly be used for future repairs.
Completed Implementation Trip	8/14/16		Routine inspection. Conducted meeting with Bridge Committee and walked through community inspection. Removed some damaged UHMW and added temporary protections to the ropes at the tops of the towers.
Completed Implementation Trip	12/30/16		Routine inspection. Bridge Committee meeting. Slip-resistant coating was applied to the bridge deck and loose boards were replaced.
Completed Implementation Trip	8/1/17		Routine inspection and inspection with community member. Meeting with Bridge Committee. Additional

			handrope was installed and tensioned on the south side of the bridge.
Planned Implementation Trip	Not Previously Planned	7/16/18	Implementation trip planned to complete rope addition by threading additional rope added summer 2017 through blue hangers and to complete repairs of damaged UHMW on towers started in summer 2016.
Planned M&E Trip	1/1/18	1/1/19	Trip to monitor the system performance and conduct minor repairs.

Water supply project that is also a part of the CU-EWB Morocco program was left out of the project timeline because complete in water project report.

Table of Contents

This section should provide a brief high level summary of the project

1. Project Description

1.1. Project Background and History

The program started in 2011 with Columbia EWB's firsts assessment trip to Ait Bayoud, Morocco. The team met with community members from the various villages (dwars) in the area, who were all interested in the construction of a bridge across the Tagawowt river that divides the community. The road that connects the dwars to the region at large was inaccessible to the residents of the north bank of the Tagawowt during the rainy season, shutting them off from access to schools and hospitals during that time. EWB chose a site and began construction on the bridge in summer 2012, and completed it in summer 2013. Since then, the program has continued to monitor the bridge while simultaneously working on the program's water project in a nearby community. In recent years, the team has worked on various maintenance projects to correct minor issues while still working in the community.

1.2. Project Context

Located 60 km east-southeast of the regional capital of Essaouira, the greater Ait Bayoud is comprised of 19 small dwars, or villages, along the banks of the Tagawowt River. The population is estimated to be about 4,800, with most residents of Berber origin. The primary language spoken in Ait Bayoud is Tashleheit, mixed with Darija (likely due to the strong Arab presence in the area). The main source of income for most people in the community is agriculture and livestock farming. Each extended family owns land plot(s) on the outskirts of their home dwars (land is not only a means to a livelihood in Ait Bayoud but also a status symbol) and every member of the family plays some role in its cultivation; however, because of this mono-focus, there is no diversity in production. People are forced to leave town to find other services, vocational or artisan, and consequently the local economy is virtually nonexistent.

Of these villages, only 2 have running water; the other 17 dwars only have access to untreated river or well water. The river water especially is used for multiple purposes, including washing laundry and dishes, swimming, and watering livestock. There is strong evidence of contamination, as gastrointestinal infection is a very common diagnosis in the local health center. Water tests that we performed were positive for fecal coliform, and negative for Arsenic and Manganese. Sanitation is also a problem in Ait Bayoud and as of now, not all of the homes and schools have working latrines.

Ait Bayoud's location both hinders and facilitates contact with outside communities. Physically accessing the village is extremely difficult, though not for lack of infrastructure. There is a well-paved road off the main road from Henchane to Ait Zeltan that travels parallel to the river for 11km before dead ending at the Rabbi Nessim Mausoleum. There is no public transit service that runs on regular schedule in and out of the community, with the exception of the taxis that take people to and from Meskala (the market town) on Thursday (souq day). The majority of the dwars is located on the north bank of the river and has no direct access to the paved road.

The accessibility issue is one that we addressed with our footbridge project. Although the majority of residents do not have direct access to a road, during the dry season the river is shallow and they regularly cross it in order to travel to Meskala for food and supplies. However, during the winter months, the Tagawowt River floods extensively, making it impossible for people living on the north bank of the river to access fresh food, schools, and the health clinic - all of which are located on the south bank of the river. Considering that the literacy rate in Ait Bayoud is significantly lower than in the rest of the country, this poses a major concern for the community.

1.3. Project Goals and Objectives

During this trip, the rope that was impacted at the south west tower during the Summer 2016 implementation trip will be removed. The replacement rope that was installed adjacent to the bridge during the Summer 2017 trip will be installed to replace the damaged rope. It will then be tensioned using a block-and-tackle system, which involves a come-a-long and a dynamometer, to permanently install it in the bridge.

Using the block-and-tackle setup, we will check the in-service tension of the remaining ropes, and adjust sag if needed. The UHMW tubes from the top of each tower will then be replaced by UHMW c-channels, and firehose will be wrapped around the channels to protect the UHMW from debris and UV radiation.

As a contingency plan, the team has developed an alternative procedure if time constraints prevent the team from implementing the full detensioning/retensioning plan. The handropes may be lifted with engineered screw jacks, to provide access for replacing the UHMW channels without needing to detension the ropes.

1.4. Scope of Work

The bridge project has built a suspension footbridge crossing the Tagawowt river in Ait Bayoud, Morocco. The bridge gives residents of the northern bank of the river access to the road out of town to schools and hospitals. The team continues to inspect and repair the bridge as the chapter works on a water project in a neighboring community. The project meets the goals of the community, who in our first assessment trip demonstrated a need for year-round access to essential infrastructure such as clinics. The bridge, by circumventing the main obstacle in the community, has accomplished this goal.

1.5. Summary of Alternatives Analysis

Our current plan for the repair is to do a systematic, full detensioning of the hand ropes of the bridge to allow work to be done at the towers. To remove the damaged rope, we have to interface with the detensioning system anyway, so we have decided to continue using that system of a comealong and pulleys to temporarily release tension in the handropes and gain access to the protective UHMW pipes underneath. Furthermore, by detensioning and then retensioning the ropes, we will be able to correct the minor discrepancy in tension that has resulted in the slight unevenness of the deck. The reason detensioning has not been our first choice in the past is simply due to the time requirement of this process. We estimate it will take several days to detension the ropes, due to the level of care the process requires. However, given that we must use this process in the rope replacement, it makes sense to continue to do the same process for the rest of the ropes and carry out the repair of the UHMW. In light of the time constraint

and the possibility that it will take longer than anticipated, we have also extensively developed an alternative plan, which consists of the fabrication of a custom screw jack that will allow us to lift the ropes on either side of each tower to perform maintenance underneath in the same way detensioning would.

1.6. Project Team

REIC - Ryan Woodward (ryan@ewbny.org)
Mentors/Internal Reviewers - Matthew Riegel (mdriegel@hntb.com), Tamar Caplan (tamarjcaplan@gmail.com), Margaret Cowie (m.m.cowie@gmail.com)
Faculty Advisor - Mohamed Haroun (mah2122@columbia.edu)
Project Leads - Ally Israel (aai2121@columbia.edu), Kevin Le (kl2921@columbia.edu)

1.7. Community Partners

For our project, the Peace Corps are our NGO contact. Our direct source of contact with the Ait Bayoud community was initially Nina Morency-Brassard, a Peace Corp Volunteer (PCV). Since Nina finished her time with the Peace Corps, we have maintained relations with PCVs in the area, who function as our in-country contacts and translators with the community to ensure our projects are maintained and in good use and for any other updates regarding our projects.

We also work with the Ait Bayoud Development Association (ABDA), the local organization of community leaders that has assembled a bridge committee composed of representatives from each dwar, to oversee the construction of the project and ensure community ownership of the footbridge project. When speaking with the community, we have emphasized that they will be responsible for maintaining the bridge and raising funds to pay for future maintenance costs. Thus far, we have met with at least one ABDA member during each travel trip to ensure consistent communication and a mutual understanding of the project needs and goals.

1.8. Provide three similar projects conducted by EWB-USA

Other pedestrian bridge projects have be conducted by EWB chapters at Cornell University, Marquette University. These teams have chosen to implement steel suspended footbridges with wood decks, similar to the Bridges to Prosperity model. The original CU-EWB Morocco team decided against using steel cables in the bridge's design and opted to use synthetic (polyester) cables because they were more affordable and lightweight, allowing relatively quick and easy construction, given the geographical constraints of the project. The bridge is also redundant and the cables are easy to replace. The University of Wisconsin--Madison constructed a vehicular bridge in haiti, an option that was not viable for our project given interest and constraints. We have not been in contact with these teams.

2. Project Description

2.1. Existing Infrastructure

CU-EWB's bridge project is in its maintenance phase. The 210 foot simple suspension footbridge was completed in June 2013. Ten cables anchored to a concrete grade beam foundations support wooden decking that spans the Tagawowt River. In August 2017 a replacement rope was temporarily anchored and pre-tensioned adjacent to the bridge. For the past year, the replacement rope has released its inelastic stretch in preparation for final installation on the bridge in Summer 2018.

During this trip, the rope that was impacted at the south west tower during the Summer 2016 implementation trip will be removed. The replacement rope that was installed adjacent to the bridge during the Summer 2017 trip will be installed to replace the damaged rope. It will then be tensioned using block-and-tackle system to permanently install it in the bridge.

Using the block-and-tackle setup, we will check the in-service tension of the remaining ropes, and adjust sag if needed. The UHMW tubes from the top of each tower will then be replaced by UHMW c-channels, and firehose will be wrapped around the channels to protect the UHMW from debris and UV radiation.

As a contingency plan, the team has developed an alternative procedure if time constraints prevent the team from implementing the full detensioning/retensioning plan. The handropes may be lifted with engineered screw jacks, to provide access for replacing the UHMW channels without needing to detension the ropes.

2.2. Description of Proposed Facilities

The detensioning of the ropes won't require the addition of new facilities as it is a procedure that just requires working with the ropes currently at the site. If we were to pursue the screw jack plan, we would have to build concrete forms at the base of each tower. This would allow for the jacks to be properly supported on a hard and level surface.

2.3. Calculations

The continued implementation is following original design documents and calculations; no changes have been made. Original design calculations have been looked at again, however, and adjusted based on the current sag of the bridge to understand the loads acting on the top of the towers, which is relevant to the design of the screw jack, our alternate plan. These edited calculations are included in Appendix E.

2.4. Material Specifications

No new materials have been incorporated into the design

3. Schedule

3.1. Schedule overview

During this trip, the bridge team will be removing and replacing the damaged handrope. This will require detensioning and re-tensioning of all of the handropes. During the detensioning process, the team will also be removing the damaged UHMW from the ropes and replacing it with new UHMW.

3.2. Work Breakdown Structure

Work Breakdown Structure			
Task	**Start Date**	**End Date**	**Individuals/Group completing the task**
General Health and Safety	7/16/18	8/05/18	EWB Team
Community Meeting	7/16/18	7/16/18	EWB Team, Community Members
Bridge Inspection	7/16/18	7/16/18	EWB Team
Rope Removal	7/17/18	7/17/18	EWB Team
Replacement with New Rope	7/18/18	7/19/18	EWB Team
UHMW Replacement	7/20/18	7/26/18	EWB Team

3.3. Detailed Task Description

Pre-trip training performed on April 13-14, 2018, with full travel team and mentors, including original team members from 2012 implementation. Hands-on lab training was performed for the block-and-tackle tensioning and detensioning system, including set-up and operation. Team members were also trained in relevant knot tying and splicing skills. Professional mentors present at training will also be travelling with the team, and have previous experience with the project performing planned task on prior trips.

Detailed Task Description

Task	Start Date	End Date	Description
Rope Removal	7/17/18	7/17/18	1. Block off bridge using bright flagging tape so people do not cross 2. Un-do firehose and remove top UHMW channel from both south towers, taking care to prevent damaged rope/any rope from sliding along cracked UHMW 3. Set-up block and tackle a. Place tarps under points of contact b. Thread tow line A (Tow line A, 4 CMI blocks) c. Connect Front CMI blocks and "pulley-fixed" end of tow line A together (1 carabiner, 3 D-rings) d. Connect back of pulley system to back anchor (3 D-rings) e. Connect "free" end of tow line A to comealong. i. If using dynamometer, connect comealong to dynamometer and connect dynamometer to back anchor adjacent to back of pulley system. ii. If not using dynamometer, connect comealong directly to back alchor adjacent to back of pulley system. f. Connect ratchet strap to back anchor on other side of pulley system (1 D-ring) g. Connect ratchet strap to end of Orange rope (1 D-ring) h. Connect tow line B to orange rope and front end of pulley system (tow line B, 1 D-ring)

			i. Attach safety lines (3 climbing ropes at back anchors, 1 climbing rope at grade beam anchor) 4. Detension rope a. Start with comealong fully extended, pull it in all the way b. Right as the blue linkages start to go slack, measure tension in damaged rope (and any other existing bridge rope that is being detensioned) by reading the dynamometer c. Release blue linkages and extend comealong completely d. Engage ratchet strap as much as possible e. Fully spool comealong. Pull block and tackle system with come-along until come-along wire rope is completely spooled f. Tighten tow line B as much as possible by hand g. Adjust (lengthen) safety line at grade beam. h. Disengage Ratchet strap. i. Release come-along incrementally until wire rope is almost fully extended, making sure not to stress the rope clamp. Make sure to monitor the rope at the top of the saddle to ensure UHMW is not cracking under it during the detensioning process. j. Engage Ratchet strap, as tight as possible. k. Untie tow line B. l. Repeat until rope is completely detensioned, then disconnect from block and tackle system. i. Repeat until rope reaches desired location. ii. At final repetition, release into climbing rope secured to anchor instead of ratchet strap

			5. Remove damaged rope by threading it out of the existing south handrope bundle while travel team members are harnessed to bridge to added security. This should be done slowly to avoid harming the remaining ropes.
Replacement with New Rope	7/18/18	7/19/18	1. Set up block and tackle system (details above) 2. Detension rope taking care to ensure that detensioned rope is released onto the bridge span and does not fall into the valley below (details above) 3. Tie a safety line the length of the distance from grade beam to tower, plus required bowline knot lengths at each end, to the end of the rope before detensioning that is anchored to the main grade beam anchors, this is so that it would catch the rope in case it slipped. Once we are sure we have the rope, we can disengage. 4. Carefully release tie off from west anchorage, remove UHMW tubes, end splice and thimble and walk across the bridge, figure-8-ing the rope until you reach the east tower 5. Walk along bridge from east to west, slowly threading the replacement rope through the blue eyelets of the hangers 6. Resplice end and insert thimble, then temporarily tie off the rope to the southernmost (outer) gradebeam anchor using climbing rope
UHMW Replacement	7/20/18	7/26/18	1. Detension remaining handropes (details above) beginning first with the south handrope which at this point would already have one rope detentioned (the replacement rope) a. At final repetition, release into climbing rope secured to anchor instead of ratchet strap (only do this if rope could be held in place by hand - climbing rope should not be used as structural anchor, only as “place-holder”) 2. Carefully break existing UHMW tube with hammer/pliers. Be careful to not allow jagged edges of tube or pliers to impact the ropes. If tube

			end cannot be broken off completely, slip to span side of ropes 3. 2 people lift rope from either side of the tower, making sure rope are detangled/not twisted as much as possible. This may require some adjustment, especially with the replacement rope. 4. While rope is lifted, take out UHMW tube fragments and c-channel and sweep saddle 5. Place firehose with rubber side up on the saddle (firehose has zipper ensure the zipper can be accessed from the top/side of where the bundle is 6. Place bottom c-channel (notched, smaller one) on tower 7. Carefully lower rope bundle on top of c-channel 8. Place top c-channel (larger one) over ropes 9. Wrap channels together with 550 cord 10. Wrap bundle with firehose and 550 cord (or with zipper) 11. Tension handropes after UHMW has been replaced on both south towers. 12. Repeat 1-6 for north handrope 13. Tension north handropes
Task #5 - UHMW Replacement with use of a screw jack This is an alternative to Task #4, will only be completed if travel team is short on time	7/20/18	7/26/18	1. Build concrete forms at the base of each tower and place concrete (with 8" key the side of the wood posts) to cure for 7 days 2. Screw two 9x6cm wood posts together and cut to the desired lengths. 3. Place each screw jack (which has a cap-like base) onto their posts and secure with screws. 4. Using the concrete forms as a base, place one screw jack/wood post on either side of a tower directly below the handropes 5. Ratchet strap the the screw jacks to the towers to prevent lateral movement around the base of the jacks and around the wood posts. 6. Using a wrench, lift the jack saddle until the ropes are lifted about 4cm from the top of the concrete tower.

			7. Slide the UHMW half-pipes toward the span side and remove them 8. Replace UHMW with replacement firehose-UHMW solution. 9. Slowly lower ropes. 10. Repeat for each tower.

3.4. Schedule Analysis

3.4.1. Advanced Task Scheduling

Materials that are already on-site in Morocco are: new UHMW for replacement, the new handrope that we are using to replace the old one, 2 CMI blocks, shovels, tarps, wheelbarrow, hoe, concrete finishing tools, carabiners, harness
Materials we will need to purchase in Morocco are: wood, cement, gravel, sand
Materials we will be bringing over from the US on the flight over: dynamometer, 550 cord, some pulleys, power tools, batteries for power tools, 2 CMI blocks, exacto knife, jack

3.4.2. Critical Path Analysis

First, we will unwrap all of the firehose and detension the damaged rope. Once it is detensioned, we will remove it. Then we will detension the new rope and then thread it through with the handropes. Once the new rope is in place, we will detension all of the handropes and remove all of the damaged UHMW. We will then replace it with new UHMW, rewrap all of the ropes, and then re-tension the handropes. Bridge inspection can be done after or in between tasks.

3.4.3. Schedule Threats

After we have removed/replaced the new rope, there is a possibility that we will not have enough time to detension all of the ropes to replace the UHMW. This could either be due to weather disruptions or an underestimate of the task timeline.

3.4.4. Schedule Issue Mitigation

In the case that we will not have enough time to detension/re-tension all of the ropes to replace the UHMW, we have a backup plan using a jacking system (the jack will be brought over with us). The jacking system will be used if we have less than the estimated time (roughly ten days) for detensioning/re-tensioning. The jacking system requires concrete pads to be made at the based of each of the four towers. These will be made before detensioning starts. The jacking system will be used to jack up the rope enough so that the UHMW and be removed and replaced. This will be done on all four towers

4. Construction Budget

Disclaimer: we are not including budgets for the construction of the bridge, as we are not continuing to build it, but rather are including a budget for this specific maintenance.

Materials Schedule	
Item	**Price**
American Dewalt battery charger	$40
110 to 220V converter (heavy duty)	$40
Dewalt 20 Volt 5 Amperes DCB205 Lithium Ion battery	$150
2000 ft. 550 cord	$80
Dynamometer	$1000
Firehose	[donated]
Screw: Acme A193 Grade B	$71
Acme hex nut	$6.61/nut, $52.88 total
2" SCH 40 pipe (2.375 OD X .154 wall)	$40
3” pipe for saddle	$52
Steel Square Tube	$25
F436 washers	$13.51
Steel plating	$50
Neoprene padding	$16
Wood post	$200
Concrete	$100
Total	**$930.39**

5. Operation and Maintenance Plan

For our operation and maintenance plan, we are continuing our biannual bridge inspections as well as working with the community to inspect the bridge as part of an ongoing process to transfer ownership. Currently the community conducts minor maintenance like screw tightening and netting repair, but larger maintenance tasks such as rope replacement are performed by CU-EWB travel teams. As far as revisions are concerned, there have been no major changes in our operation and maintenance plan.

Previous maintenance activities include constructing rock walls to prevent people from stepping on the ropes near the anchors, and repainting the entire deck with an anti-skid grit and paint mixture to prevent slipping. To prevent friction against the cables, sacrificial UHMW (Ultra-High Molecular Weight Polyethylene) tubes were removed from each abutment and replaced with UHMW c-channel elements and wrapped in firehose as a further preventative measure against UV damage.

6. Community Based Organization (CBO)

CBO structure has not changed.

7. Baseline Monitoring Data Collection

7.1. Baseline Data

Every trip, we conduct a meeting with the Ait Bayoud Development Association bridge committee and other community members to ask them about how they utilize the bridge and view the project as a whole. These indicator questions include:

Functionality

Functionality Indicator 1 - Number of different types of vehicles types crossing per day (Answer: number of types/day)
Functionality Indicator 2 - Number of people surveyed who say that they have access to the other side of the crossing
Functionality Indicator 3 - Percentage of community members satisfied with the project

Periodic Maintenance

Maintenance Indicator 1 - Number of days per month that the bridge is not passable
Maintenance Indicator 2 - Number of days per month that maintenance issue prevent access to the building
Maintenance Indicator 3 - Observed evidence of routine maintenance on the bridge done accurately without EWB-USA

Community Capacity

Com. Cap. Indicator 1 - Community completed major repairs to the system accurately with EWB-USA
Com. Cap. Indicator 2 - Duplication of any element of the system without EWB-USA
Com. Cap. Indicator 3 - Chapter observed community members training others

7.2. Other Factors Contributing or Hindering Development

The procedure for determining if there are other NGOs, regional or local governments or organizations working in the community includes communicating with our community contacts to ask if there is anyone new acting in the community(?). We also ask our NGO partners, Peace Corps volunteers, who serve as our primary point of contact and translators, to see if there are any updates in the community and who is working there.

7.3. Beneficiary Analysis

The beneficiaries, or the population using this bridge, for this project are the 476 people of the Ait Bayoud community. This census was taken by the Peace Corps Volunteers in 2011. To update this number, Peace Corps Volunteers will take a census in Ait Bayoud and they will inquire about the community members' bridge utilization.

8. List of Attachments

Attachment A: Drawing Package
Original bridge drawing set.
https://drive.google.com/file/d/0ByEY-mGKu-hgNWFDenJMUzdnRDA/view?usp=sharing
Attachment B: Schedule
https://drive.google.com/open?id=1RYgEg2JF3kovXfZosAos2tesPqDKPCZev8bWs9GLKE0
Attachment C: Revised Construction Cost Estimate/ Material Takeoff
https://docs.google.com/spreadsheets/d/1v6Zj-y6ucvEtnqpGCudtT7cGjbcIpDIn70HOa9JvqZo/edit#gid=0
Attachment D: Revised or Additional Specifications
NA
Attachment E: Revised Design Calculations
Original design calculations have been looked at again, however, and adjusted based on the current sag of the bridge to understand the loads acting on the top of the towers, which is relevant to the design of the screw jack, our alternate plan.
https://drive.google.com/open?id=1zgcYFyap4g8x4hFnUy_LegycKDvziwoo
Attachment F: Revised Operations and Maintenance Plan
NA
Attachment G: Signed Implementation Agreement
Attachment H: Original Implementation Plan
https://drive.google.com/open?id=0BzzrPOlarFcATFBsQklQS211bU0
Attachment I: Revised Construction Safety Plan
https://docs.google.com/document/d/1gUrMZ-_OWixGaYib0dZ-SYka20EeabJUpl0dyUQxkUE/edit

