

Garden Water Access Project

Water Group

SEH Symposium – May 2, 2014

Presenters:

- Lindsey Adomat
- Marcus Upton
- David Wilson





Scope

- Client- SIM and Open Door Development
- Goal- To provide the Survival Garden project with improved technologies for obtaining water.





Deliverables

Well Drilling Equipment



Handpump





Completed Milestones

- Pump drawings and design





Pump Design Revisions

- Bearing redesign
- Locking mechanism
- FEA set-up





Original Bearing Design

- Goal: To make the bearings removable



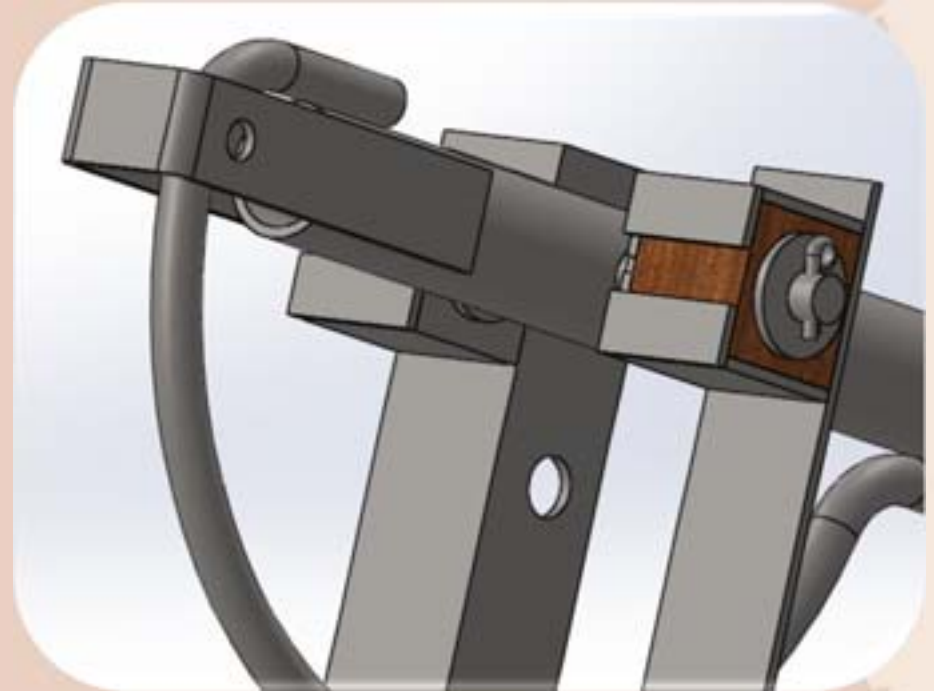


Improved Bearing Design

Before



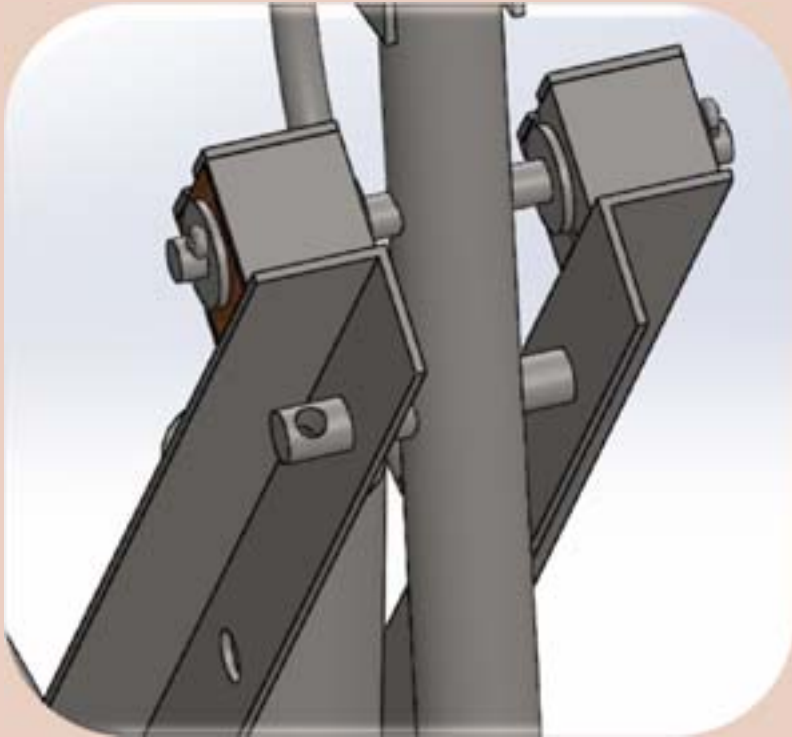
After





Locking Mechanism

- Goal: To be able to lock the pump
 - Prevent unwanted use
 - Prevent damage





Finite Element Analysis (FEA)

- Goal: Determine likely failing points of the Earl pump design





Completed Milestones

- Drilling equipment design and fabrication completed summer of 2013





Goals

- Gather quantitative data on drilling rates
- Test functionality and usability of our drilling systems
 - Normal use
 - Underwater
 - With casing
- Can a five man team use our systems, and are the systems better than what our client currently has?



Setup





Sites: Erikson's Farm





Sites: Messiah College Location





Challenges: diabase





Challenges: Rope and Pulley





Challenges: weight



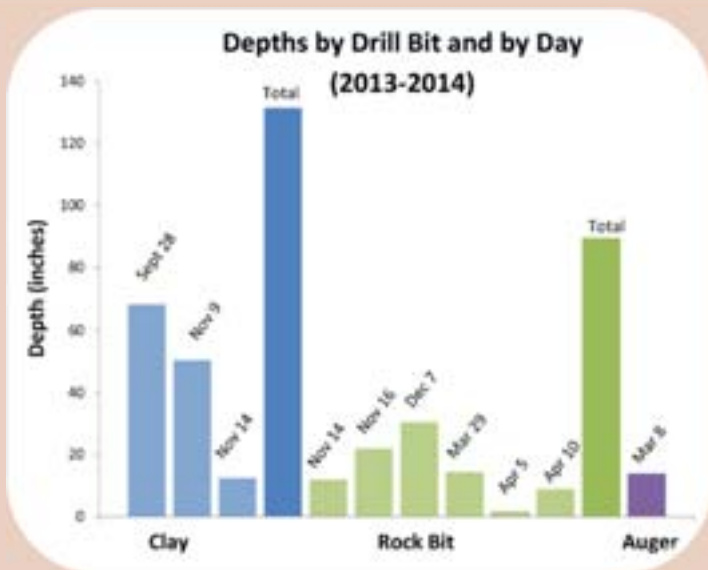


Challenges: Bailer





Results





The Verdict

- Can a five man team use our systems, and are the systems better than what our client has already?
- ***YES! Let's ship! ****





Shipping

- Deliver equipment to client
 - *Air freight*
 - *Shipping Container*
 - *Passenger Luggage*
- Time and Cost Constraints





Site Team Trip

- Burkina Faso May-June 2014
- Construction of percussion bits
- Apply new equipment and techniques
- Examine pump failures





Future of Project

- Will be completed upon delivery of drilling equipment and pump designs
 - *Finish work over summer*
 - *Final conclusions, documentation, and publication in Fall 2014*
- New project—same team





Mechanized Well Drilling

- Uses an engine to lift percussion drill bits
- Reduces work for drillers
- Faster progress





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Questions?



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