

# Peter Morgan's Arborloo

- \* DIY Project
- \* Composition
  - \* Bag of cement
  - \* “Good river sand”
  - \* Thick wire
- \* Mounted on a “ring beam” of bricks or concrete
- \* Molded from bricks
- \* Addition of soil, wood ash & leaves creates compost

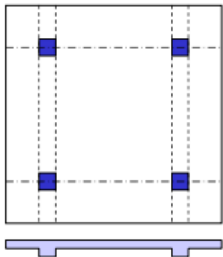


# Other Arborloos?

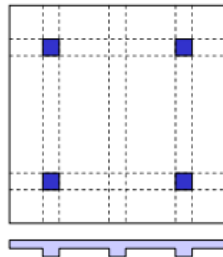
- \* Current concrete Arborloos have typical cement, sand, and gravel composition
  - \* Wire or rebar for reinforcement
- \* Flat or slightly domed circle and square shaped
- \* Catholic Relief Services reports \$5-8 for Arborloo in Ethiopia
- \* 2-3 slabs made from one bag of cement



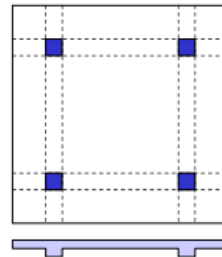
# Benchmarking



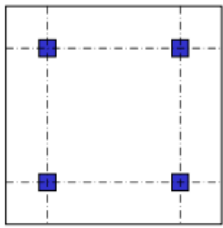
One-way slab



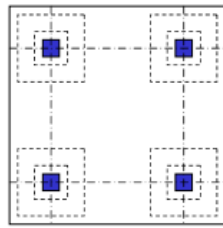
One-way slab



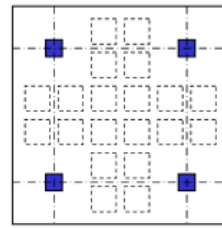
Two-way slab



Flat plate slab



Flat slab



Grid slab

- Effective fiber volume is at a 0.75% fraction
- Variety of Different aggregates and reinforcements
- Reinforcement patterns
- Material Properties of different fibers
- Haitian Perspective

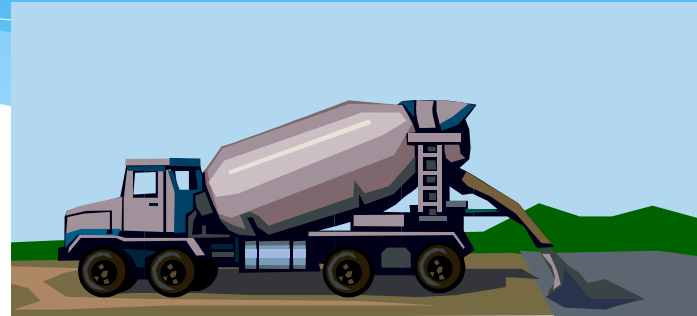
# Concrete Background

- Holly Holevinski
- Cement + water = paste
- Aggregates: Coarse ( $>1/4''$ ) Fine ( $<1/4''$ )
- Reinforcement (rebar)
  - Fiberglass, plastic, steel
- Add mixtures: reduce weight
  - Air-entrainment
  - Foaming materials
  - Accelerators and retarders



# Concrete Background

- \* 5 types of Portland cement
- \* Types I – V
- \* Type I & II General use
- \* Type IV- “High Early”
  - \* Reaches its maximum strength within 24 hours
- \* Window when paste is moldable 0-90 minutes
- \* Final set at 120 minutes
- \* 3000 psi goal for slab



# Concrete Background

## \* Concrete Tips:

- \* Concrete cannot go below 80% RH during cure process
- \* Rebar should not touch any open areas
- \* Use plastic to keep moisture in, spray concrete regularly if possible
- \* Mix parts of Portland cement with cheap substitutes (fly ash, silica fume)
- \* Concrete must be at least 30% Portland cement

