

RESIDENTIAL RAINWATER HARVESTING TEAM

TEAM ADVISOR: DR. JEFFREY HEIDERSCHEIDT

DATE: 02/15/16

SUBJECT: Background Research and Technical Considerations

1. **Project Constraints:** budget and time will be the top two most limiting constraints of the project
2. Stormwater/Graywater reuse limitations
3. **Project Site:**
 - Address, site photos
 - Roof slope/ area (Google Earth)
4. **Rainfall Data:** tank size based on seasonal flow
5. **Aesthetics:** verify with the client as to whether he prefers the cistern above or below ground
6. **Water Supply:** there is potential to re-do the exiting plumbing within the household
 - Graywater: toilets, laundry, irrigation
 - Potable: shower, kitchen, bathroom sinks
7. **Sanitation:** refer to City of Flagstaff and Coconino County standards for water sanitation, and consider pre-sanitation implementation and methods
8. **Run-Off:** Limit on how much water can be collected per day (code research)
9. **Water Demand:** Duration, water depth, volume → A sprinkler test to determine how much water is used during irrigation would provide a water demand base for calculations
10. **HOA Standards:** watering limits, water privatization, water laws
11. **TANK MATERIAL:** Design for peak/regulatory limit, fiber glass is the most common cistern material

RESIDENTIAL RAINWATER HARVESTING TEAM

TEAM ADVISOR: DR. JEFFREY HEIDERSCHIEDT

DATE: 03/31/16

SUBJECT: Bathroom Distribution Configuration

1. **Meter:** determine where the supply closet is located
2. **House Floor Plan:** this will help determine where exactly the bathrooms are located
3. **Plans:** do not really show where the pipes run so we need to plan where the toilets are to account for the valve and water storage locations
4. **Water Heater:** take into consideration the water heater closet for a potential location for the water tank for a storage location to prevent freezing
5. **Bathroom Distribution Tank:**
 - Include an overflow system in the event that the tank reaches max storage capacity
 - Ensure filtration as a pre-sanitation method to keep grit and debris out of tank
 - Minimum 40°F water temperature is cold enough to keep microbial and algae out
 - Do not get rid of existing systems in the event of a dry year
 - First flush sanitation method for bathroom storage
 - Chlorine tablets are a suitable means of sanitation, which can be purchased at Home Depot
6. **Septic VS. WWTP:** Determine the final location of the water being flushed in the bathrooms
7. **Deliverables:**
 - 30% → constraints, criteria, codes
 - 50% → design halfway done (cistern design)
 - 90% → Design is finished
 - Last 10% → Last final touches

RESIDENTIAL RAINWATER HARVESTING TEAM**TEAM ADVISOR: DR. JEFFREY HEIDERSCHIEDT****DATE: 04/14/16****SUBJECT: Staffing Hours and Cost and Presentation**

1. *Project Staffing/Hours*

The team inquired Dr. Heiderscheidt regarding the team's projected hours, and it was recommended that the staffing hours should be converted from days into hours.

2. *Project Cost*

The project cost was substantially higher than the advisor expected, due to overestimated Senior Engineer (SE) staff hours. It was advised that the team places the SE in charge of mainly project oversight, document drafting as well as presentations and meetings, rather than including the SE on design work.

3. *Staffing/Cost Submittal*

It was advised by Dr. Heiderscheidt that the team should include a written description of the staffing hours and cost of engineering services tables. This will aid the client's understanding of why staff members are assigned to the duties included in the proposal, and how their billing rates were determined.

4. *CENE476 Presentations*

Dr. Heiderscheidt was informed about the team's presentation dates and times, hoping for his presence to observe the team's progress in the practice and formal presentations.