

TUCSON-AREA RESOURCE REFERENCES**Rain & Grey Water Harvesting Systems:**

- Watershed Management Group, install w/ Co-op workshops, co-op@watershedmg.org, 520-396-3266x3
- Dryland Design, Jeff Rhody, jeff@drylanddesign.com, 520-909-4946
- EcoSense Landscaping, Eli Nielsen, eli@ecosenseAZ.com, 520-575-7005
- Green Cloud Landscapes, Logan Byers, lmbyers@gmail.com, 520-808-1672
- Desert Living, lylea Olson, desertlivingtucson@gmail.com, 520-834-6932
- Grow With The Flow Permaculture, Sylvia Lindowitz, growwiththeflow2020@gmail.com, 520-204-7947
- Water Harvesting International, Mark Ragel, underground tanks & pumps, markaragel@gmail.com, 520-631-4676

Excavators:

- Big Truck LLC, Brian Aagaard, excavation and materials hauling services, bigtruckllc@hotmail.com, 520-304-0606
- Lil' John's Excavating, John Litzel, expert backhoe excavation services, 520-730-9350

Plumbers/Irrigators:

- Clay Brown Plumbing, skilled affordable greywater connections, 520-331-5656 (not licensed)

Gutters:

- Gutter Systems of Southern Arizona, Eric Perry, tucsonseamless@yahoo.com, 520-622-5255

Curb-side Cuts & Retro-fits:

- Custom Saw Cuts, Jack, curb cuts & cores, 520-624-2191
- Tucson Concrete Cutting-Coring, cores only, 520-349-309

Tank/Parts Suppliers:

- Ace Hardware, 22nd/Kolb, Bushman tanks, 520-747-1996
- Ewing Irrigation, Snyder tanks, bulkheads, 520-690-9530
- Loomis Tanks, plastic tanks, bulkheads, manways, bulk orders only, 520-889-1338
- Oasis Water Harvesting, Rick Weisberg, plastic tanks, rain chains, 520-234-7681 (NOT A LICENSED CONTRACTOR)

Online Informational Materials:

watershedmg.org/learn/resource-library – Green infrastructure, soil stewardship, rain garden care guides, composting toilets, and more....

www.harvestingrainwater.com – rain, greywater, energy nexus, and more...

www.oasisdesign.net – greywater and ecological systems

Materials:

- Arizona Trucking and Materials, rock etc., 520-299-1007
- Churchman Sand and Gravel, rock etc., 520-325-1611
- Cutting Edge Ceramics, various styles of ollas for water-efficient irrigation, 520-790-8773
- Desert Survivors, native plants and heritage fruit trees, www.desertsurvivors.org, 520-791-9309
- Spadefoot Nursey, native plant nursery, <https://www.spadefootnursery.com>, 520 909-3619
- Fairfax Companies/Tank's Green Stuff, recycled landscape materials – compost, mulch and more, 520-290-2796
- Nighthawk Natives, Bernadette Jilka, high quality native plants, nighthawknatives@gmail.com, 520-981-7136
- Sprinkler World, plumbing/irrigation parts/landscape tools, 520-888-9414

Certified Arborists:

- Made in the Shade, Dan Crosby, full tree-service plus free mulch on request, WHC Certified, 520-331-2092
- The Pedaling Arborist, Aleck MacKinnon, 520-338-1231

Hardscapes/Walls/Welders:

- Alfredo Montoya, custom masonry, patios, tile, flagstone, walls and stucco, alfmon79@gmail.com, 520-406-3343
- Beyond Brick, patios, 520-722-3400
- Kevin Blackwell, welder, 520-349-6009

Plant Guides/Planning Resources:

- AMWUA Landscape Plants for the AZ Desert: www.amwua.org/plants/
- LEAF Network Edible Tree Guide: <https://leafnetworkaz.org/Guide>
- Online Materials Coverage Calculator: <https://www.landscapecalculator.com/calculators/mulch>
- Rainwater Harvesting for Drylands (Brad Lancaster), www.harvestingrainwater.com/plant-lists-resources/
- Quivira Coalition <https://quiviracoalition.org/publications/>

PROJECT PLAN DEVELOPMENT PROCESS

Active Rainwater Harvesting Systems:

Collection Area – Roof only

Conveyance – direct water from catchment area via gutters and downspouts to storage tank

Storage – above or underground tank

Filter – downspout leaf diverter, first flush, etc

Passive Rainwater Harvesting Systems:

Collection Area –Roof, patio, pathways, etc...

Conveyance – direct water from catchment area via gutters, downspouts, channels, or swales to infiltration areas (basins, trenches, etc)

Filter & Storage – soil!

Step #1. Site Analysis:

- Assess site conditions to determine rainwater harvesting goals.
- Draw site to scale and include dimensions.
- Show direction of water flow with arrows starting at the high points like roof tops.
- Indicate ridges or divisions of roof areas
- Where are the low points or outlets that surface water moves to?
- Draw boundaries around catchment areas.
- Identify areas where irrigation will be needed.
- Label:
 - Surface areas of hardscapes and landscapes
 - Identified rainwater practice(s) and associated potential storage capacity (volume)
 - Site address
 - North arrow
 - Site applicant name

Step #2. Calculations:

- Rainfall Event: Calculate storage capacity to retain rainfall for A) passive earthworks, 1"-2" (ensures you will retain effective rainfall on your site for majority of rain events) or B) active rain tanks, 3"-6" (help store successive events or seasonal rainfall).
 - **Formula: Project catchment area (sq.ft) * 0.6 = storage volume per 1" rain (gallons)**
 - **Then multiply volume obtained by # of inches of rainfall you wish to retain/store.**
- Annual Water Budget: Helps determine overall site water budget
 - Calculate the total amount of rainwater which could be collected from roof & hardscapes each year
 - **Supply Formula: Project catchment area (sq.ft) * 0.6 * 11 (inches - annual Tucson rainfall) = annual rainfall supply (gallons)**
 - Calculate total amount of water needed to meet landscaping needs each year. (refer to handbook for worksheet)
- Monthly Water Budget: Helps to plan more accurately and with utilizing both greywater and rainwater resources.
 - Calculate monthly supply (rainfall harvest potential)
 - Calculate monthly demand (plant water requirement)
 - Calculate monthly storage/supplemental water

Step #3. Final Design:

- Use event calculations to determine capacity of earthworks retention capacity
- Use supply and demand calculations to size rainwater tanks
- Determine how to best convey water to desired infiltration areas or rainwater tank storage
 - Rainwater tanks: Locate storage close to plants needing water (e.g. vegetable garden) and higher than the planted area to take advantage of gravity flow. For optimal tank storage a rule of thumb is to retain the volume of 3-4" of rainfall from collection roof.
 - Earthworks: Locate infiltration areas to be most beneficial to perennial plant root zones while avoiding underground utilities, protecting structural foundations, and maintaining desired use of site. For optimal basin capacity a rule of thumb is to retain the volume of 1-2" of rainfall from collection area.

- **Always plan for overflow from all water harvesting features (earthworks and tanks)**