

Water-harvesting Materials and Suppliers

The following listings are meant to inform, they are not meant as recommendations.

And don't forget to look in the yellow pages of the phone book for more local suppliers.

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A. ROOF CATCHMENT AND CISTERN SYSTEM MATERIALS AND SUPPLIERS

When designing or implementing your system be sure to follow the principles for cistern systems described in *Rainwater Harvesting for Drylands, Volume 1*

B. ROOFING MATERIALS AND SUPPLIERS

METAL ROOFING

Be sure roofing is at least 26 gauge, since lighter gauges can dent. Baked on enamel, galvanized, and galvalume steel roofs all work with water harvesting systems.

- www.metalroofing.com

Lists contractors, distributors, and manufacturers across the country

- Mueller, Inc.

Lap style corrugated, U Panel, R Panel, and AP panel metal roofing
www.MuellerInc.com

- ASC Building Products

www.ascbp.com

In Tucson, AZ

- MasterCraft Metals, Inc.

Standing Seam Roofing

1-800-607-7468

Tucson, Arizona (520) 792-2418

Silver City, New Mexico (505) 388-8800

www.mastercraftmetals.com

- Roof Ops Roof Options

Corrugated, Galvanized, Rusted, R Panel, Metal Tile, Metal Shingle

2734 E. Grant Road

318-4364

- Allied Building Products

3502 E. 34th St.

795-7663

ELASTOMERIC PAINT APPROVED FOR POTABLE RAINWATER CATCHMENT SYSTEMS

The following have been tested and certified by the National Sanitation Foundation International (NSF) as an approved potable water catchment coating that complies with the requirements of NSF Protocol 151 “Health Effects from Rainwater Catchment System Components”

(www.nsfconsumer.org/environment/rainwater.asp):

- ***Weather Barrier Rain Coat 2000*** is an acrylic roof coating that can be applied over an existing roof of less-desirable materials such as asphalt shingles. Due to its light color it is also effective in passively cooling buildings (*see Sidebar 18.6*). Weather Barrier 2000 Rain Coat is manufactured by Finnaren & Haley Inc., 901 Washington St., Conshohocken, PA 19428. 1-800-843-9800.
(www.weatherbarrier.com/wb2000.html)
- ***Topcoat W. O. B. White (without biocide)*** is a water-based liquid that can be applied with a brush, roll or spray mechanism. It cures to form a seamless rubber membrane that covers the entire roof. Topcoat W. O. B. White (without biocide) is manufactured by Topcoat, Inc. a subsidiary of GAF Materials, Inc., 24 Industrial Road, Walpole, MA 02081. 1-800-669-4128..
- ***Vulkem 450/451 PWC and Vulkem 450/451 PWC Red*** are elastomeric paints rolled or brushed onto a roof surface. According to a representative of the manufacturer the products are currently used in Bermuda and the Virgin Islands, but may be difficult to acquire within the continental U.S. Vulkem 450/451 PWC is manufactured by Tremco Incorporated, Mameco Manufacturing Division, 4475 East 175th Street, Cleveland, OH 44128. 216-752-4400.
- ***2001 Super-Flex 100% Acrylic Elastomer Roof Coating, 3000 Acrylic Barrier Coating, and TK2001 Elastomeric Finish*** are all manufactured by the Scott Paint Company, 7839 Fruitville Road, Sarasota, FL 34231. 941-371-0015

C. RAINHEAD DOWNSPOUT SCREENS AND GUTTER SCREENS

- Environmental Conservation Planning Pty Ltd:
US website: www.rainharvesting.com, Australian website:
www.rainharvesting.com.au

Manufacturer of a simple, relatively self-cleaning *leaf eater* and *leaf beater* rainhead filter meant to filter large debris *before* water gets to the cistern. Can be used for above and below ground tanks. Other filters and gutter screens are also available.

- Resource Conservation Technology Inc, www.conservationtechnology.com. Supplier of a number of well-made, relatively self-cleaning German filters meant to filter large debris *before* water gets to the cistern. These are primarily meant for underground installation.

- Local sheet metal shop

If you bring them a good design – they can likely fabricate it for you.

In Tucson, AZ

- AiRCO Products

748 E. 16th St.

326-1441

Ask for Chapo

D. FIRST FLUSH DIVERTERS

- FloTrue International Corp

www.flotrue.com

- Tank Town

www.rainwatercollection.com

- Environmental Conservation Planning Pty Ltd:

US website: www.rainharvesting.com, Australian website:

www.rainharvesting.com.au

- For how to make a simple home-made first flush diverter see *Texas Guide to Rainwater Harvesting* at

www.twdb.state.tx.us/publications/reports/RainHarv.pdf.

E. WATER TANKS/CISTERNS

RAIN BARRELS (PREMANUFACTURED)

These are typically too undersized to be considered a true cistern, but they can get you started.

- RainBarrel USA

www.rainbarrelusa.com

- Portland Rainbarrel Co.

www.portlandrainbarrels.com

- Rain Water Solutions, Inc.

www.rainwatersolutions.com

- Resource Conservation Technology Inc.
www.conservationtechnology.com.

RAINBARRELS (HOME-MADE)

Do a web search on: “How to make your own rain barrel” for instructions.

For a source of used food-grade barrels try:

- Feed stores
- Soda and juice bottling companies
- Bakeries and tortilla factories

PLASTIC TANKS

If placed above ground be sure tank is UV-resistant for durability, and light-proof so algae will not grow in tank. Select tanks for potable water storage.

- American Tank Company
www.watertanks.com

- Tank Town
www.rainwatercollection.com

- Resource Conservation Technology Inc.
www.rainwatertechnology.com

- Fralo Plastech
Plastic tanks for below-ground application
www.fralo.net

- Norwesco
www.norwesco.com
Beware of Norwesco rotation-molded tanks for below-ground installation that require you to keep 20% of the tank filled with water at all times to prevent collapse of tank.

FIBERGLASS TANKS

If the tank is to be placed above-ground be sure it has a UV-resistant coating for durability, and it is light-proof so algae will not grow in tank. Select tanks for potable water storage.

- Tank Town
www.rainwatercollection.com

- XERXES Fiberglass Underground Tanks
www.proformcorp.com

In Tucson, AZ

- Glas-Tec Inc.
3417 E. Michigan
746-9155

PRE-MANUFACTURED METAL TANKS

- American Tank Company
www.watertanks.com

- CorGal Water Storage Tanks
www.specallproducts.com

- Texas Metal Cisterns
www.texasmetalcisterns.com

STEEL CULVERTS TO MAKE YOUR OWN CULVERT CISTERNS

Instructions to build your own culvert cistern available in *Rainwater Harvesting for Drylands, Volume 3*

Look up “culverts” in your phone book yellow pages.

SOLID LIDS FOR CULVERT CISTERNS

A good design can be fabricated by local sheet metal shops.

In Tucson, AZ

- AiRCO Products
748 E. 16th St.
326-1441
Ask for Chapo

- APCON Construction Co, Inc.
3731 S Chrysler Ave.
747-4934
Ask for Horacio

PRECAST FERROCEMENT SEPTIC TANKS MADE FOR CISTERN USE

Instructions on customizing new ferrocement septic tanks to act as cisterns for non-potable water are provided in *Rainwater Harvesting for Drylands, Volume 3*

Look up “septic tank manufacturers” in your phone book yellow pages.

In Tucson, AZ

- Mitt’s Precast
3862 W. Valencia Road
883-5298

F. SEALERS APPROVED FOR CONTACT WITH POTABLE WATER

SEALERS FOR CONCRETE AND MASONRY

- **Thoroseal** is a cement-based waterproof coating for concrete and masonry. It is NSF approved for sealing concrete or masonry tanks storing potable water. It is also used to seal the concrete base of culvert tanks. To waterproof such a tank it is typically used in conjunction with another product ACRYL 60, which improves the adhesion of the sealer to the tank. I have used this product to seal precast concrete septic tank cisterns.

Thoroseal is manufactured by Chemrex. www.chemrex.com.

In Tucson, Arizona it is available from Border Products, 623-4100

- **Cement Slip** (aka *cement slurry* or *Nil*) is NSF 61-certified Portland cement mixed with water to form a thin paste (no sand or gravel added).

It is used to seal cement, masonry, and ferrocement tanks. Apply the slip to a 1/4-inch thickness with a trowel on the same day the concrete tank is poured or plastered. Cover the tank with a tarp after the slip has been applied to keep humidity in the tank high and to prevent the slip from drying too fast and cracking. When the slip is firm, but still green spray it with water or set a bucket of water in the tank to enhance humidity, and cover the tank again with plastic or a tarp. Keep the slip moist and covered (shaded from the sun) for three weeks for thorough curing.

- **Antihydro** and *Antihydro R* are add mixtures of organic and inorganic chemicals used to waterproof concrete and increase its workability, strength, hardness, and durability. According to the manufacturer mixing Anti-hydro within a concrete mixture produces impermeable concrete that is hard, non-dusting & safe for potable water. Though I was not able to obtain information from the manufacturer on what entity approved the products’ use with potable water.

Anti-hydro is for the application of the product in temperatures below 85°F. Anti-hydro R is for the application of the product in temperatures exceeding 85°F.

Anti-hydro products are manufactured by Anti Hydro International, Inc.

www.anti-hydro.com

- **XYPEX HD-150** is a concrete waterproofing coating approved by NSF for use in potable water tanks and cisterns. It must be applied to bare concrete only. According to a representative of the manufacturer, XYPEX HD-150 is marketed for homeowners, though it is the same product as XYPEX Concentrate marketed for concrete contractors.

XYPEX HD-150 is manufactured by XYPEX Chemical Corporation. 1-888-443-7922.

<http://www.hi-dry.com/index.html>

SEALERS FOR GUTTERS AND BETWEEN DIFFERENT MATERIALS SUCH AS CONCRETE AND METAL OR PLASTIC AND METAL

- **Sikaflex-1A** is a moisture-cured, 1-component, polyurethane-based, non-sag elastomeric sealant. Can be used as an elastic adhesive between materials with dissimilar coefficients of expansion such as concrete and metal or plastic and metal.

I've used it to seal seams in gutters and seams around downspout pipes entering tanks. It is also used in culvert tanks to seal the seam between the metal culvert and concrete base (after the concrete has been sealed with Thoroseal), and the spiraling seam of the culvert itself. It is USDA-approved and NSF-approved for potable water contact.

Sikaflex-1a is manufactured by Sika Corporation
<http://www.sikaconstruction.com/con/con-prod-name.htm#con.prod-sikaflex1a>

In Tucson, AZ it is available from Border Products, 623-4100

SEALER USED TO COAT A VARIETY OF MATERIALS

- **#432 Urethane** is a liquid applied, single-component, moisture-cured polyurethane coating, designed to form a tough rubber membrane impervious to moisture. Once cured it allows expansion and contraction over a variety of surfaces, so it could be used to coat concrete and metal. It conforms to B.S. 6920 for use in contact with water intended for human consumption. #432 Urethane is NSF certified.

#432 Urethane is manufactured by GlobalShield, Inc. www.roofs-online.com and www.global-shield.com

G. PUMPS AND FILTERS

- Tank Town

www.rainwatercollection.com

- The Sta-rite Dominator pump is a high pressure, low flow pump. It is recommended by Richard Jennings of Earthwrights Designs for drip irrigation

systems. Richard says, “It has the motor on the top and can draw water down to 3 inches from the bottom of the tank, thus making the entire cistern usable. There are several models. People need to look at the pump curves to determine the correct model or call the local dealer. At least in this area the dealer has been extremely helpful. It is also very reasonably priced.” www.pumps.com

- The Wayne Water Systems PSD 1000 pump is a low pressure, high flow pump. It is recommended by Richard Jennings of Earthwrights Designs for use with a sump that collects water then pumps it up to a cistern. It is a 1 horsepower (HP) pump with a pressure switch included that turns it on and off. The pump can do 92 gallons/minute (gpm) at 5 feet of lift and 53 gpm at 20 feet. Wayne pumps have a 3-year warranty that they honor. www.waynepumps.com

H. IRRIGATION SUPPLIES

Rainwater Harvesting for Drylands, Volume 2 describes a simple gravity-fed drip irrigation system hooked up to an above-ground cistern. The suppliers for some of the parts are listed below:

DRIP IRRIGATION EMITTERS FOR LOW-PRESSURE GRAVITY-FED SYSTEMS

Rain Bird 2 gallon/hour *Xeribug* emitters and 4 gallon/hour flag-type emitters work well with gravity-fed drip irrigation systems.

In Tucson, AZ

- Irrigation & Sprinkler Supply, Inc. (ISS)
2130 E. 12
792-4652

LOW TECH/LOW COST IRRIGATION TIMER THAT WORKS WITH LOW-PRESSURE GRAVITY-FED SYSTEMS:

- *Toro® Battery Operated Hose-End Timer (Model 53746)*

This timer can be set to a watering frequency ranging from every hour to once a week. Watering durations can be set from 1 to 120 minutes. It requires two AA alkaline batteries, although models are available that can be connected directly to an electrical line. It is placed between the tank’s faucet and the hose or drip irrigation line. Available at larger hardware stores. Cost \$30.

UNGLAZED CLAY POTS FOR CLAY POT IRRIGATION

Look up Pottery in your yellow pages, and ask for the discounted chipped pottery since you will be burying it.

In Tucson, Arizona

- Mexican Garden Pottery
2901 N. Oracle Road
624-4772

I. WATER-HARVESTING EARTHWORKS MATERIALS AND SUPPLIES

The bulk, if not all, the materials for creating most water-harvesting earthworks are all ready on-site and free. The soil is the main one. *Rainwater Harvesting for Drylands, Volume 2* covers the rest. And for some of the strategies that may require you to import or buy material – potential sources are listed below:

J. VEGETATION

Plants native to your site and extending to a 25-mile wide radius and 500 foot elevation range above or below your site's elevation are typically the best adapted to thrive on local rainfall alone. Check with local native plant societies for reputable nurseries and seed suppliers. For native or exotic plant, locally-owned plant nurseries and seed suppliers are typically the best since they know the area, the local plants, and more of the money you invest in them is more likely to recycle through the local economy.

In Tucson, Arizona:

Native plants

- Desert Survivors
1020 W. Starr Pass
791-9309
- Tohono Chul Park Nursery
7366 Paseo Del Norte
742-6455
- Tucson Cactus and Succulent Society
www.tucsoncactus.org

Exotic and some native plants

- Catalina Heights Nursery
6074 E. Pima
298-2822
- Mesquite Valley Growers

8005 E. Speedway Blvd
721-8600

- Civano Nursery
5301 S. Houghton Road
546-9200

Native plant seed, wildflower seed

- Wildlands Restoration
882-0969

Garden vegetable seed

- Native Seeds/SEARCH
526 N. 4th Ave.
622-5561

K. MULCH

Mulch can often be purchased from landscape material suppliers. Make sure it contains organic matter only – no mixed in soil. Also, if you can purchase what they call “overs,” a mulch containing wood chips and such as large as 3 inches (7.5cm), it will last much longer than smaller particle-sized mulches that more rapidly decompose. Additional mulch sources include:

- ***Finished compost*** can be made at home, purchased at garden supply stores, or found at composting facilities (look up “compost” in the yellow pages). To learn how to make your own, contact your local organic gardening club or read a composting book.
- ***Aged manure*** is often free from livestock stables. Make sure it is sufficiently aged and composted so it won't burn your plants or smell like the fresh stuff. If you want your manure poison-free, avoid suppliers who spray insecticides at their sites to discourage flies. To avoid propagating Bermuda grass (*Cynodon dactylon*) or field bindweed (*Convolvulus arvensis*), avoid manure originating from animals that eat feed containing these two plants. Politely ask livestock owners and commercial suppliers about their product and they'll tell you what you need to know.
- ***Tree bark and wood chips*** can often be obtained free from local firewood distributors who consider them waste products. Sometimes they are also available from the local dump. Another source are tree-trimming companies, particularly those that cut trees from conflicting power lines for the local power company. Flag down the driver of the tree-trimming truck, and give him or her a map to your site and where you want their chipped trimmings dumped (saving

them a trip to the more distant dump). Make your own mulch by renting a heavy-duty chipper for a day when you can mulch all the accumulated prunings from your site and your neighbors'. Since the bark and chips are generally bigger and heavier than manure and compost particles, they work well as an anchoring top layer. Two inches (5cm) of aged manure or homemade compost topped with 2 inches (5cm) of dry tree bark is my favorite combination of mulch. I don't go far to get it, it works great, and it costs nothing but time and transportation.

- **Straw** can frequently be obtained free at the conclusion of straw-bale wall raisings. Water-damaged or broken bales are available from feed stores for close to nothing. After spreading straw over the soil, spray it with water to compress and lock it into itself, reducing the chance of it blowing away.

- **Discarded paper products** such as cardboard, newspaper, junk mail, and office paper can all be mulch, and will eventually decompose into soil. Remove staples to reduce hazards. Cover these materials with straw, manure, compost, fallen leaves, or bark so your landscape looks fertile rather than trashy. By covering paper products, you'll also keep them from blowing away.

- **Discarded natural fibers** such as old cotton clothing, wool rugs, and damaged basketry can also be used as mulch since they will eventually break down into the soil. Again, cover them with straw, compost, or bark for a cleaner appearance.

- **Grass clippings** can be recycled right back into your lawn. Called *grasscycling*, this is a faster, cheaper and easier way to maintain a healthy lawn than conventional management that tosses grass clippings into the garbage.

For more info: "A Landscaper's Guide to Grasscycling" by the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board, 777 Davis Street, Suite 100, San Leandro, CA 94577. Email: acwma@stopwaste.org. Web: www.stopwaste.org.

However, be careful using Bermuda grass or crab grass clipping elsewhere than the lawn or the seeds within may grow the grass where you don't want it.

- **Fallen leaves** decompose into fertile soil that produces more plants that produce more leaves that decompose, contributing to the next mulch layer. Assist this natural cycle by raking or sweeping fallen leaves toward your plants. Consider bagged leaves sitting on street curbs as gift-wrapped mulch to take home and use. However, avoid or compost the leaves of such plants as eucalyptus (*Eucalyptus spp.*) and oleander (*Nerium oleander*) that are known to inhibit the growth of other vegetation-- restrict these to no more than 50% of your compost pile.

- **Prunings** from your plants smaller than 3/4 inch (1.8cm) in diameter should be cut up to 4-inch (10cm) or shorter pieces and laid beneath the plants from which they came. All plant parts work as mulch so help your plants mulch themselves.
- **Vegetation** is the “living mulch” that shelters soil, moderates temperature, and creates beneficial microclimates for more vegetation. Desert trees tend to grow with their branches draped down to the ground, where they shade the soil, protect the bark from sunburn, and create habitat for wildlife. Avoid the temptation to prune desert trees to create single tall trunks, and instead allow them to take on their natural multi-trunked, self-mulching draped shape.
- **Rock and gravel** make long-lasting surface mulches that don’t break down with time. Light-colored gravel reflects sunlight and can cool the soil surface in hot climates, although the air above the rock will still be hot. Dark-colored gravel absorbs, stores, and re-radiates heat - often an advantage in colder climates. Rock and gravel can be used for vertical mulch, but while they encourage rapid infiltration of water into the soil, they lack the water-holding capacity of organic matter. If you use decomposed granite as your gravel be sure the fine materials/clays have been screened out since they can clog soil pores and impede the infiltration of rainwater into your earthworks.
- **Sand** is a mulch traditionally used on lands farmed by Native Americans such as the Hopi and Navajo, where it naturally overlays clay soils. Dry farmed gardens are planted by temporarily moving a section of sand aside to expose a small area of moist clayey soil below. The clay is punctured using a digging stick, a few seeds are dropped in, the hole is covered with moist clay, then sand is put back over the clay soil.

L. POROUS PAVING

Low cost porous paving materials and installation such as porous aggregate and recycled concrete sidewalk chunks or bricks are covered in *Porous Paving* by Bruce K. Ferguson and *Rainwater Harvesting for Drylands, Volume 2*, but for higher-traffic areas, or those where local codes require more durable or tested materials a few of the product options are listed below:

Plastic geocells

- Invisible Structures, Inc. (manufacturers of Gravelpave²)
www.invisiblestructures.com
- Presto Products (manufacturers of Geoblock) www.prestogeo.com.

Open-jointed paving blocks

- SF-RIMA permeable pavements of SF Concrete Technology, Inc.
www.sfconcrete.com
- Uni Eco-Stone permeable pavers of UNI-Group U.S.A. www.uni-groupusa.org

M. IMPRINTING SERVICES

www.imprinting.org

N. FRENCH DRAIN PIPE

Water-harvesting French drains often don't need pipes, but when they do the pipe and drain boxes are available from those listed below:

- NDS, Inc.
www.ndspro.com

In Tucson, Arizona

- Irrigation & Sprinkler Supply, Inc. (ISS)
2130 E. 12
792-4652

O. GABION BASKETS

- Maccaferri
www.maccaferri-usa.com

P. GREYWATER MATERIALS AND SUPPLIES

OASIS BIOCOMPATIBLE LAUNDRY AND DISHWASHING DETERGENT

- www.bio-pac.com/biopac/oasis.htm

In Tucson, AZ

- Food Conspiracy Co-op
412 N. 4th Ave.
624-4821

- Tucson Cooperative Warehouse
350 S. Toole Ave.
884-9951

GREYWATER 3-WAY DIVERTER VALVES

- Any pool and spa supplier selling 3-way Jandy valves

In Tucson, AZ

- Catalina Spas and Pools
4001 N. Runway Dr.
888-4181

GREYWATER FLOW SPLITTERS

- www.oasisdesign.net
- Any well-stocked plumbing supplier that sells double ells from which you can make your own greywater flow splitters.

In Tucson, AZ

- Plumbing Suppliers Inc.
2555 E. Grant Road

GREYWATER LEACHING CHAMBERS (otherwise know as INFILTRATION CHAMBERS or SUBSURFACE OUTLET CHAMBERS)

- Infiltrator Systems, Inc.
www.infiltratorsystems.com
- Hancor
www.hancor.com
- For plastic 30 or 55 gallon barrels to make your own chambers check:
 - Feed stores
 - Soda and juice bottling companies

Q. COMPOSTING TOILETS

- Biolet
www.biolet.com

- Clivus Multrum, Inc.
www.clivusmultrum.com
- Phoenix composting toilets
www.compostingtoilet.com