

Chapter 5: Cost Estimating

Now that you have chosen a workable landscape design option, you can estimate the cost of your landscape installation project. The cost-estimating procedure presented in this manual is based on the categories of common roof-reliant landscape features that were outlined in the previous chapter, and it will enable you to calculate a reasonably accurate financial picture of your project.

Worksheet 3 is provided at the end of this chapter for you to enter your cost estimates for the many aspects of your project. This worksheet was designed to be as inclusive as possible, so you may not need to fill in every box on Worksheet 3. Worksheet 4 is also provided to give you a less-detailed overview of your anticipated project costs. The additional information about some key categories provided in this chapter should assist you in filling out the worksheets.

sense to get some professional advice and feedback concerning design and implementation.

Surveying and other forms of land measurement are often necessary in order to be certain of the locations of property boundaries, easements, utility lines, etc. More precise measurements of existing vegetation, pathways, play structures and any other items that typically do not appear on professional surveys will need to be taken in the field. A detailed and comprehensive scaled drawing or blueprint of your landscape design can often save significant time and money in the long run and help prevent costly mistakes.

Since the permitting process can often consume significant time and require qualified, professional expertise, the cost of getting all of the permits for your project must be figured into the estimate.

Landscape Planning Costs



Landscape Planning Costs

It is possible to design your own landscape and cistern system, particularly if they are relatively simple. However, most large-scale or complex systems and landscapes are best designed by professionals who know the details of project planning and design.

On-site consultations for landscape evaluation are sometimes provided free of charge. Even if you plan the entire project by yourself, it often makes

Cistern System Expenditures



Cistern System Expenditures

Although it is helpful to be familiar with every feature of your cistern system during the cost-estimating process, this knowledge is not required to arrive at an accurate estimate. Obvious costs include the tank(s), delivery system, pump, pipe connections, excavation and backfilling. Less obvious cistern system expenditures include a pumphouse, a sediment trap, a vent, overflow piping (and associated erosion control structure[s]), a pressure tank, a level reader, at

least two 110-volt (minimum) electrical circuits, a float switch and the cost of removing (or using) excess dirt from the excavation process.

Cistern tank delivery can be a sizable installation cost. Most tanks are not put together on-site. Consequently, the cost of shipping a tank that ranges in size from a small car to an 18-wheeler truck is given a separate line item on Worksheet 3. Delivery may also include renting a crane large enough to lift a steel tank over your house.

Especially for underground and partially buried cisterns, excavation can be costly. Aboveground tanks typically do not require a line item for excavating around the tank, but some excavation is often necessary for at least some piping and the pumphouse. When excavation costs are low, you should expect to spend a little more money on landscape features that lessen the tank's visual impact, and additional costs could involve securing aboveground tanks (when empty) from high winds or pouring a concrete slab under an aboveground pumphouse. In addition, don't forget the costs of backfilling (and proper tamping) dirt back on top of all of the subsurface work.

Pipe connections include roof gutters, downspouts, drains, conveyance piping, first-flush devices, vent piping, electrical conduit, pump-related piping and pipes that connect cisterns together. These are described in greater detail in Chapter 8, but it is important here to recognize the materials and labor costs involved in this complicated matrix.

Sediment traps and first-flush devices are relatively inexpensive items that act as filtration mechanisms for all of your roof water. For ease of maintenance, these are usually conveniently located in your system's conveyance piping (which directs water from your roof to your tanks). This is a highly recommended item because it prevents significant future expense when too much solid matter collects at the bottom of your cistern. The water pump and associated parts and labor certainly need a line item on your spreadsheet. Submersible pumps, which are installed at or near

the bottom of the cistern, propel water out of the cistern, while in-line pumps, which are typically installed in a separate pumphouse, draw water out of the cistern via a pipe through the pump and run toward the distribution system. Note that an in-line pumphouse system, although it has some advantages, usually requires a greater initial investment.

Every cistern needs a vent so that air can enter the tank when water is pumped out. (Underground tanks typically have a vent pipe that protrudes from the ground.) Vents are also important during flood events because they provide space for air to escape, and this allows your overflow pipe to work more effectively. The cost of venting a cistern is often very low, but this does not mean venting is less important than other items. Remember also to consider the cost of creating a view screen for your vent if needed.

Overflow piping is essential for times when the cistern is full and precipitation is occurring. On relatively flat, level sites, this can become a significant cost because overflow pipes need to reach a daylight point in order to be effective. A daylight point is the place at which overflow water can become surface runoff. The cost of this piping is usually very little, but the cost of controlling erosion from the large flows of water that periodically pass through such pipes should not be underestimated.

(NOTE: Make sure that the ends of all vent pipes and overflow pipes have a screen covering of small enough mesh to keep mosquitoes from entering.)

Many systems have a number of accessories including pressure tanks, level readers, float switches, heating mechanisms and others that will be discussed in greater detail in Chapter 9, Water Storage. Keep in mind that the cost of getting professionals—such as licensed electricians, plumbers, irrigators and cistern systems installers—involved early in your design project is almost always worth the effort. For example, your pump will need electrical power, and many of the accessories often require dedicated low-volt, 110-

volt or 220-volt circuits. Be sure to outline the work order for each professional up front in order to prevent costly change orders.

One potentially significant cost is that of dirt removal. For now, suffice it to say that not only are there often expenses associated with a pile of dirt the size of a school bus, serious fines can be levied on those who dump dirt illegally. In a best-case scenario, your extra dirt will become a resource (for use in terraced beds, for example). But in other cases, you might have to pay a surprisingly high price for the removal of the dirt leftover from an underground cistern installation.

In the simplest cistern system, water distribution components may consist of only a valve, a garden hose and a spray nozzle. However, many distribution systems include an automated drip irrigation system connected to a pump and a pressure tank. The associated parts for water distribution range from expensive computerized valve controllers to plastic emitters and couplings that cost pennies apiece.

Erosion Control Expenses



Erosion Control Expenses

The costs of controlling erosion and properly handling any drainage issues on your property are extremely variable. In most cases, all that is needed is a large French drain and a small swale located below a cistern's overflow pipe. With a shovel and some extra rocks or gravel, this work can take less than an hour and cost virtually nothing. In extreme cases where, for example, a cistern must be sited near the unstable bank of an arroyo, it might cost

thousands of dollars for proper erosion control. Be sure to manage water appropriately, as neighbors will not appreciate your overflow, and in most cases it is required by law.

Plant Material



Plant Material

In general, the larger the plant material, the greater the price tag. It is usually most cost effective to invest in larger sizes of slower-growing plants and smaller sizes of plants that will grow quickly, even with modest watering. To accurately predict the costs of plants, contact a local plant nursery or landscape professional. From a water budgeting perspective, also keep in mind that larger plants require more water to get established than smaller plants of the same species.

Hardscape



Hardscape

For the purposes of this manual, hardscape refers to any surface on which people walk. Typically,

hardscapes also provide space for other activities such as dining and relaxing. Hardscapes enable people to enjoy being in the midst of the landscape.

Concrete and gravel provide cost-effective hardscape surfaces. Wooden decks, brick, pavers and widely spaced flagstones set in sand can fit within many mid-range budgets. Flagstone (especially that which is set in concrete with tight joints and broad, finely chiseled stones) is one of the most expensive hardscape surfaces commonly available in New Mexico.

Fences and Walls



Fences and Walls

A fence can be a cost-effective alternative to plants when privacy, wind and water consumption are issues. Free-standing walls can also provide privacy and wind protection, but walls are usually more expensive than fences. Keep in mind that a permeable windbreak, such as a fence with space between the slats, is better at reducing the negative effects of wind than an impervious windbreak, such as a solid wall.

Retaining walls can quickly increase the cost of the project. If money is an issue, good alternatives include on-contour swales and/or decorative boulders associated with appropriate grading. If a wall is designed to retain the earth surrounding a cistern, include the cost of having a licensed engineer approve the design.

Other Costs

Birdbaths, shade houses and tool sheds are examples of items that do not fit into a predetermined category. These other costs should still be accounted for in the cost estimating worksheets.

Now, let's assume that you are ready to begin filling out your cost estimating worksheet. From the time you begin meeting with professionals on your property and continuing through the creation of the conceptual design, you have done the majority of the research necessary to create an itemized estimate for a particular category. At this point it makes sense to add up all of the features for each category to determine the subtotals.

Whenever you have a subtotal completed in Worksheet 3, move this figure to the corresponding category in Worksheet 4. While the more detailed version of Worksheet 3 is essential, it is also helpful to get a quick overview at the major expense categories provided in Worksheet 4.



Figure 5-1: Retaining walls can reduce soil erosion and create additional spaces for plants and recreation areas.

WORKSHEET 3				
Estimating Roof-Reliant Landscape Installation Costs (Detailed Version)				
CATEGORY	FEATURE	MATERIALS	LABOR	COST
Landscape Planning				
	Design			
	Cost estimating			
	Installation scheduling			
	Water budgeting			
	Permit fees			
	Project management			
	Other			
	Landscape Planning Subtotal			
Cistern System				
	Tank(s)			
	Cistern fittings, serviceway, lid, lock, etc.			
	Delivery			
	Excavation, tank setting, extra dirt removal			
	Access issues			
	Pipe connections (conveyance and delivery)			
	Sediment trap or first-flush device			
	Backfill and tamping			
	Vent			
	Overflow piping			
	Pump			
	Pressure tank			
	Pumphouse and associated accessories			
	Level reader			
	Float switch(es)			
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WORKSHEET 3				
Estimating Roof-Reliant Landscape Installation Costs (Detailed Version)				
CATEGORY	FEATURE	MATERIALS	LABOR	COST
Cistern System				
	Electrical work (contractor)			
	Connection to supplemental water			
	Pressurized pipe			
	Winterization shutoff valves			
	Frost-free hydrant(s)			
	Landscape hose and spray nozzles			
	Backflow prevention			
	Zone valves and boxes			
	Polypropylene tubing			
	Drip emitters, couplings, etc.			
	Deep pipe irrigation			
	Electrical connections and supplies			
	Other/Miscellaneous			
	Cistern System Subtotal			
Erosion Control				
	Grading			
	French drains			
	Swales			
	Check dams, gabions, etc.			
	Other			
	Erosion Control Subtotal			
(continued next page)				

WORKSHEET 3				
Estimating Roof-Reliant Landscape Installation Costs (Detailed Version)				
CATEGORY	FEATURE	MATERIALS	LABOR	COST
Plant Material and				
Decorative Materials				
	Soil building and amendments			
	Large trees			
	Small trees / large shrubs			
	5-gallon vines			
	5-gallon shrubs			
	1-gallon shrubs and perennials			
	4" perennials			
	2" perennials			
	Annuals			
	Seeding			
	Boulders			
	Decorative accents			
	Other			
	Plants Material and Decorative Materials			
	Subtotal			
Mulch and				
Weed Barrier				
	Gravel			
	Crusher fines			
	Shredded bark			
	Bark chips			
	Straw			
	Hay			
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<p align="center">WORKSHEET 3 Estimating Roof-Reliant Landscape Installation Costs (Detailed Version)</p>				
CATEGORY	FEATURE	MATERIALS	LABOR	COST
Mulch and				
Weed Barrier				
	Pecan shells			
	Compost			
	Landscape Fabric (permeable)			
	Other			
	Mulch and Weed Barrier Subtotal			
Hardscape				
	Pathways and stepping stones			
	Patio areas			
	Stairs			
	Wooden deck			
	Other			
	Hardscape Subtotal			
Fences and Walls				
	Wood fence (coyote, split rail, etc.)			
	Metal fence			
	Concrete wall with stucco (free standing)			
	Rock wall (free standing)			
	Concrete wall with stucco (retaining)			
	Rock wall (retaining)			
	Railroad tie/treated wood wall (retaining)			
	Edging (metal, plastic, wood, rock, concrete)			
	Other			
	Fences and Walls Subtotal			
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WORKSHEET 3				
Estimating Roof-Reliant Landscape Installation Costs (Detailed Version)				
CATEGORY	FEATURE	MATERIALS	LABOR	COST
Recreation				
	Sandbox			
	Swing set, trampoline			
	Basketball hoop			
	Other			
	Recreation Subtotal			
Lighting				
	Pathway			
	Security			
	Accent			
	Other			
	Lighting Subtotal			
Additional				
	Birdbath /small fountain			
	Garden ornaments			
	Trellis /arbor			
	Shade house /ramada /pergola			
	Additional Subtotal			
	Pre-Contingency and Pre-Tax Subtotal			
Miscellaneous				
	Add your contingency factor here.			
	(20% is recommended.)			
Tax (NM Gross				
Receipts Tax)				
	TOTAL ESTIMATE			

WORKSHEET 4	
Estimating Roof-Reliant Landscape Installation Costs (Condensed Version)	
CATEGORY	COST
Landscape planning subtotal	\$
Cistern system subtotal	\$
Erosion control subtotal	\$
Plant material and decorative materials subtotal	\$
Mulch and weed barrier subtotal	\$
Hardscape subtotal	\$
Fences and walls subtotal	\$
Recreation areas subtotal	\$
Lighting subtotal	\$
Additional subtotal	\$
Miscellaneous	\$
Subtotal	\$
Contingency Factor (20%)	\$
NM Gross Receipts Tax	\$
TOTAL ESTIMATE	\$