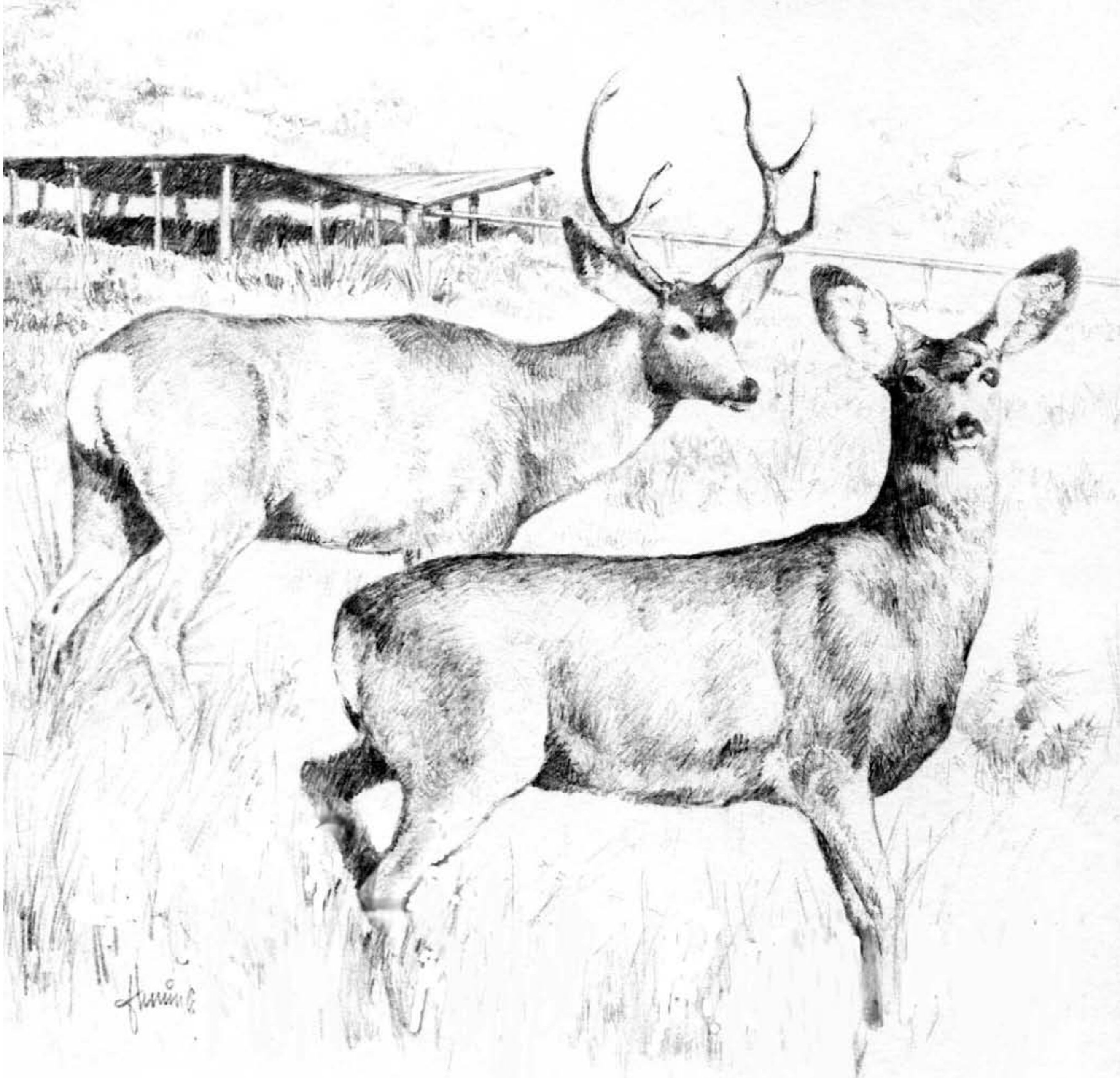
Water for West Texas Wildlife



Water for West Texas Wildlife

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Introduction

Within the Chihuahuan Desert of the Trans-Pecos area of Texas, or any equally arid area, the lack of permanent water is a major problem in the management of wildlife species (Figure 1). Without permanent water, many wildlife populations are usually low or nonexistent even where all other habitat requirements are met. Therefore, the game manager, landowner or sportsman must evaluate the location and quantity of the permanent water supply when establishing a wildlife management program.

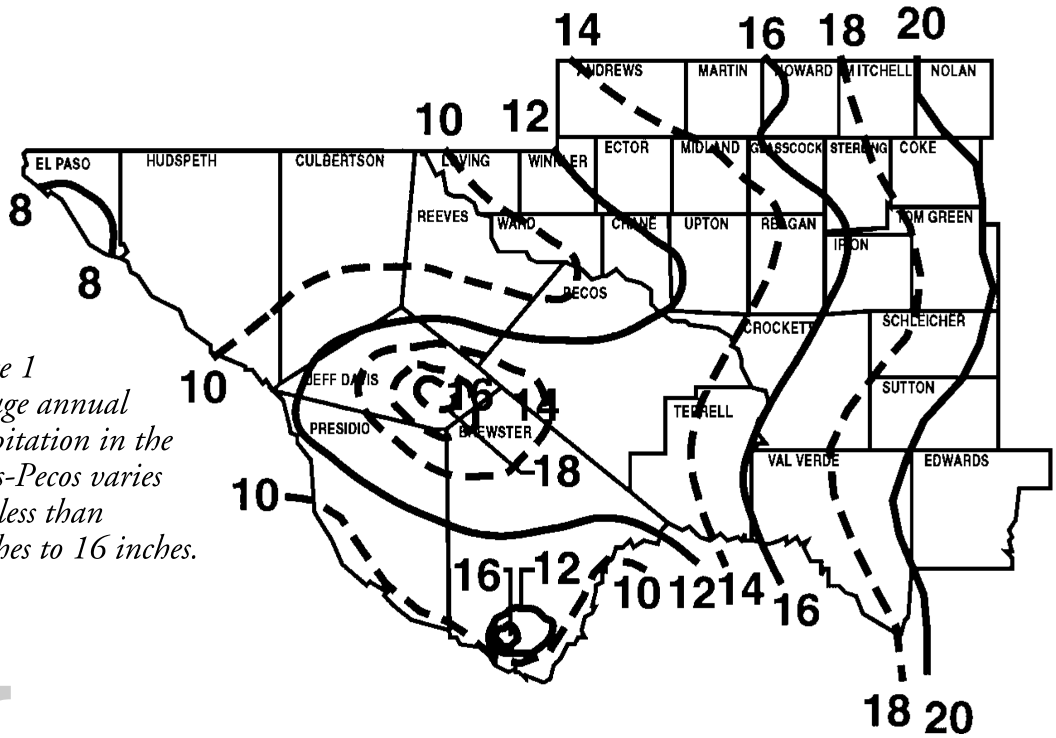


Figure 1
Average annual precipitation in the Trans-Pecos varies from less than 8 inches to 16 inches.

Desert Mule Deer

In much of the Trans-Pecos, the lack of available drinking water is the major limiting factor affecting big game populations. Studies concerning the use of water by desert mule deer indicated that water requirements were greater than expected and that their home range revolves around permanent water sources (Figure 2).

Research studies in New Mexico and Texas indicated that desert mule deer densities increased on ranges where permanent water was made available. The greatest increase occurred in areas which were formerly the most devoid of water. The data also indicated that where water sources were allowed to deteriorate, deer densities decreased.

During summer and fall months, water is usually adequate throughout much of the Trans-Pecos. With this availability, some scattering of the deer population is evident. However, during dry winter and spring months the reverse is true. As water sources begin to dry, desert mule deer begin to congregate in the vicinity of permanent water (Figure 3).

The tendency of desert mule deer to congregate around permanent water sources tends to cause over utilization of a portion of a total range while other portions are under utilized. To overcome this limitation, permanent water sources must be provided throughout the range on a year around basis. Studies indicate that the average home range of desert mule deer is fairly small (approximately 1.5 mile radius). Sources of permanent water should be no greater than 2.5 to 3 miles apart, throughout any range unit, in order to utilize deer habitat to its capacity.

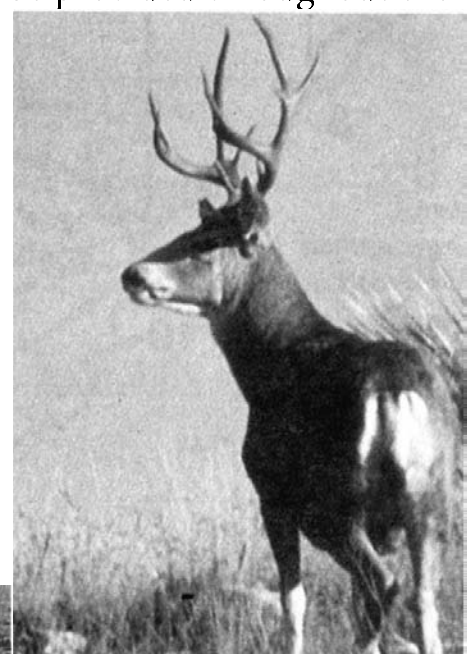


Figure 2
Desert mule deer are residents of the arid Trans-Pecos.

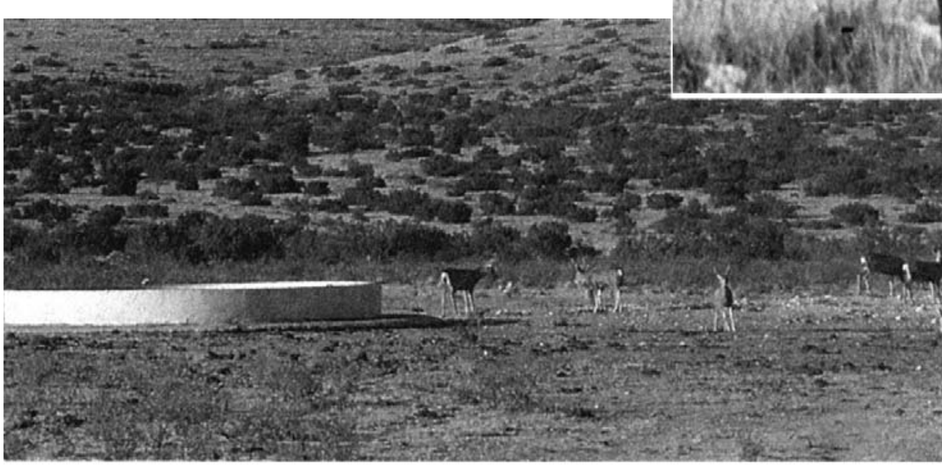


Figure 3
Mule deer concentrate at water sources during dry periods.

Desert Bighorn Sheep

As stated earlier, water availability is often the single most limiting factor affecting big game populations in West Texas. Because of specific terrain preferences, this statement is even more applicable for desert bighorn sheep than for desert mule deer (Figure 4). The lack of available surface water is a major limiting factor affecting desert bighorn sheep.

Research in the Southwest has shown that bighorn sheep will move away from an area with a dried up water source and attempt to reestablish themselves around a different water hole, only if other specialized habitat requirements are also present around the new source of water. If the sheep are unable to relocate, inadequate water supplies could contribute to low lamb survival and eventually to population declines. Little is known about their home ranges or how they may fluctuate seasonally, but it is generally concluded that the availability of free water may be a key factor in determining desert bighorn sheep home ranges and distribution.

As with desert mule deer, water for desert bighorn sheep should be spaced about 2.5 to 3 miles apart. Water sources should be within 0.5 mile of escape terrain with no dense vegetation around the watering site which might provide ambush locations for predators. Studies indicate that bighorn sheep will avoid watering areas which do not provide them ample visibility.

Figure 4
The lack of available surface water is a major limiting factor affecting desert bighorn sheep.

Pronghorn Antelope

Because of the development of watering systems for livestock on most West Texas ranches, water supplies for pronghorn antelope are taken for granted (Figure 5). On most range suitable for cattle production, water for antelope is usually available and may only be a limiting factor on parts of large pastures. Pronghorns may refrain from using remote areas void of available drinking water. It is important to remember that when a pasture is deferred from grazing, as part of a rotational grazing system, watering facilities should be continually maintained for the benefit of the wildlife resource (Figure 6).

Figure 5
Livestock watering systems are well developed in most areas used by pronghorn antelope.

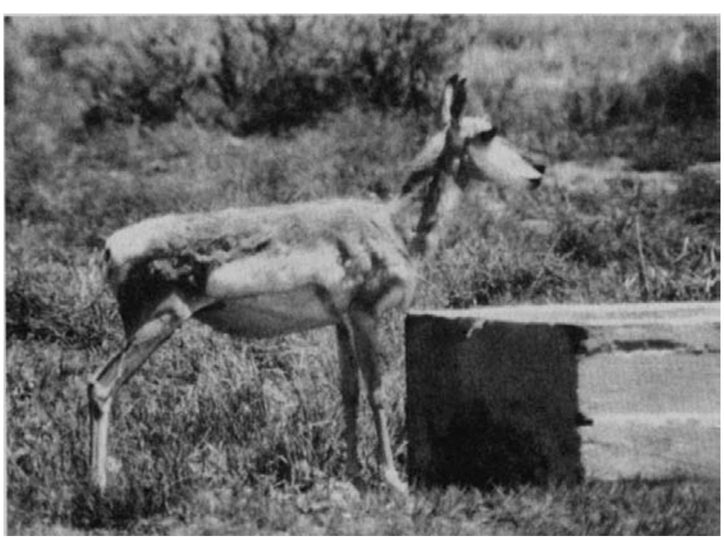


Figure 6
When a pasture is deferred from livestock grazing, water sources should be maintained for wildlife.

Planning and Construction

If an evaluation of a range indicates that lack of permanent water is limiting game populations, the feasibility of developing additional water sources should be explored. In many instances, the cost of developing permanent water facilities at properly spaced intervals would be prohibitive if conventional methods were used to provide livestock water, such as deep wells and pipeline systems. However, other efficient methods of furnishing adequate water to desert mule deer herds and other forms of wildlife are available at a relatively low cost per unit (Figure 7).

Figure 7
Water sources designed specifically for wildlife use may be constructed in areas that lack livestock watering facilities.

This booklet details alternative methods for providing permanent water for wildlife; i.e., construction of above-ground and concrete rainwater catchments and modification of existing permanent water supplies. However, these structures are not designed for domestic livestock use and should be fenced to exclude livestock. The cost of construction and maintenance of these systems is relatively low.

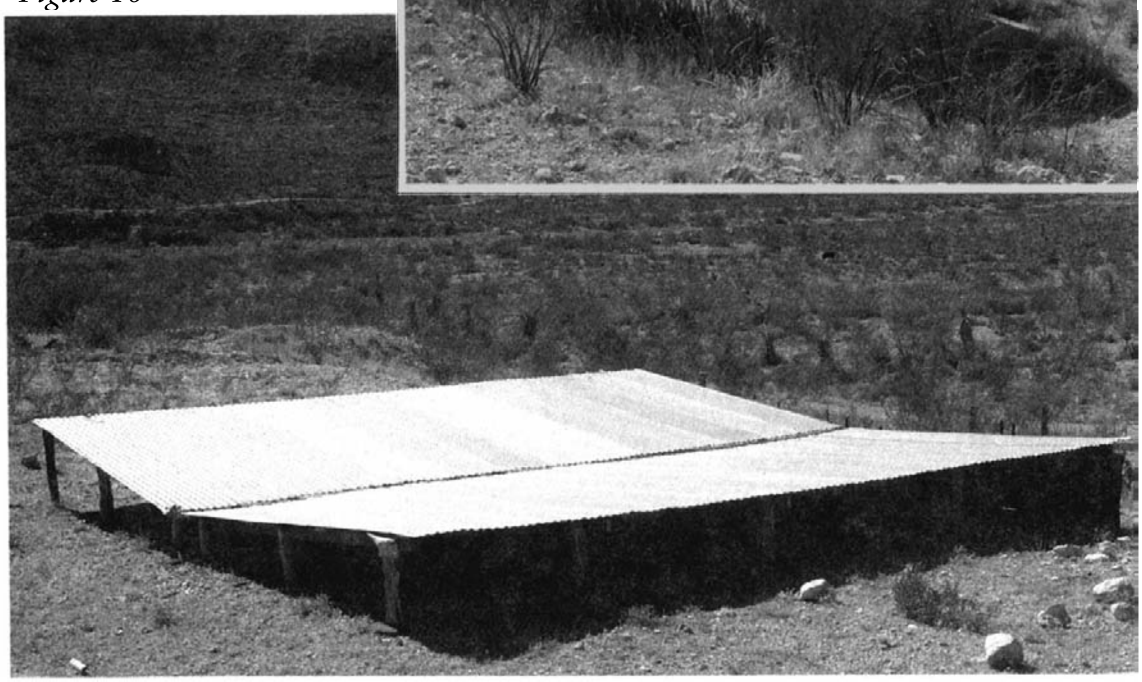
The above-ground water catchment or "guzzler" is an adaptation of cisterns utilized in many areas to catch and store rainwater. In the guzzler, galvanized sheet iron collecting aprons are used to catch rainwater for storage. The storage tank is placed on a lower level than the collecting apron. Proper placement of the storage tank is essential to maximize storage capacity of the system. Ideally, the pipe from the collecting apron should enter the storage tank at the top. To prevent loss of stored water through evaporation, the storage tank must be covered. Water is dispensed by a float-operated trough (Figure 8-10).

Figure 8

"Guzzler" components include (8) drinking troughs, (9) water storage tank(s), and (10) rainwater catchment apron.

Figure 9

Figure 10



The Black Gap Guzzler

Construction details of the guzzler designed by Wildlife Technician Don Martin on the Black Gap WMA are shown in Appendix 1 and 2. This design provides a strong, well anchored catchment with a minimum amount of material. Materials needed for construction are listed in Table 1. This guzzler is designed to maintain itself in an eight-inch rainfall region (Figure 11). If annual rainfall is less, it may become necessary to haul water to the storage tank or increase the size of the collecting apron. Although maintenance of the system is minimal, the system should be inspected often. The most frequent problems encountered are improper operation of the float valve and loosening of the sheet-iron.

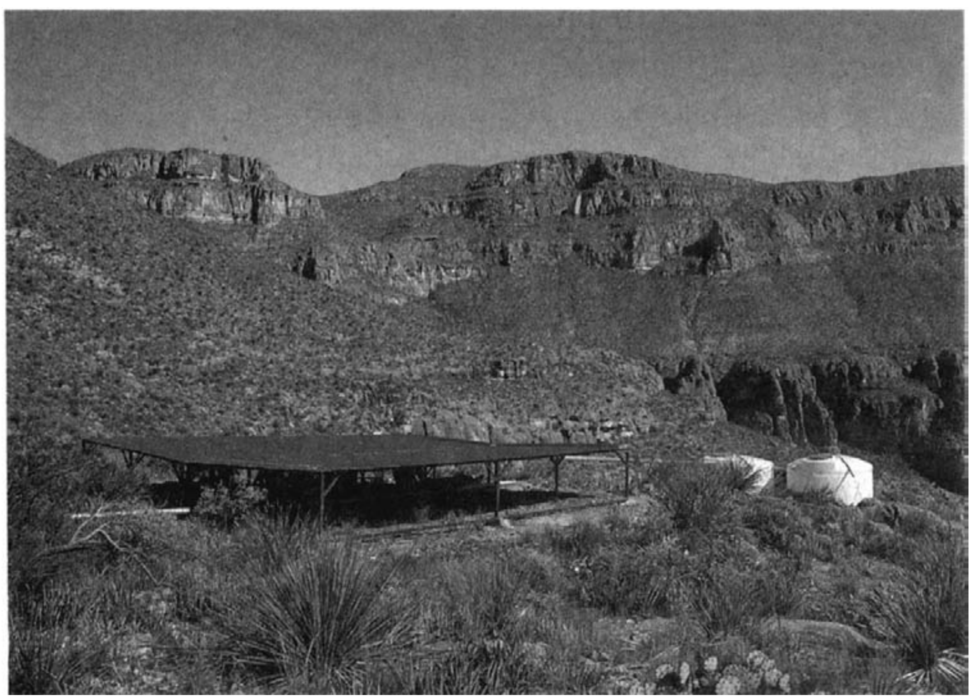


Figure 11
Guzzlers are an efficient means of providing wildlife water in remote, arid locations.

Figure 12
Due to remoteness and rugged terrain, guzzler materials many times have to be airlifted in.

The Elephant Mountain Guzzler

Wildlife managers sometimes recognize the need for guzzler placement in locations that are not accessible by vehicles. Texas Parks and Wildlife Department personnel at Elephant Mountain WMA developed a catchment design which utilizes prefabricated support panels. The components of this design can be delivered by helicopter and are bolted together at the isolated site (Figure 12). Guzzlers of this type have been erected for desert bighorn sheep on mountains where the materials could not be trucked in. Construction details of the "air-mobile" catchment system are shown in Appendix 3 and 4. Materials are listed in Table 2.

The Concrete Rainwater Catchment

The concrete rainwater catchment is more expensive to build due to more construction time and cost of associated materials. However, this system is permanent and maintenance costs are small. Proper maintenance consists of keeping brush cleared from the collecting apron and drinking trough to prevent debris from entering the storage tank. Additionally, the collecting apron and storage tank have to be periodically sealed with roofing compound materials to prevent loss of water. The concrete rainwater catchment is also designed to maintain itself in an eight-inch rainfall region. As is the case of the guzzler, water must be hauled if the minimum rainfall is not received. Construction details of the concrete rainwater catchment system are shown in Appendix 5 and 6. Materials needed for construction are listed in Table 3.

Other Watering Devices

The Soil Conservation Service has conducted field demonstrations utilizing other guzzler designs. Rainwater catchments have been constructed at ground level using galvanized corrugated steel and from asphalt impregnated polyester fabric. Anchoring of catchment materials not supported by posts and framework is done by trenching, utilizing large rocks or other fill material (Figure 13).

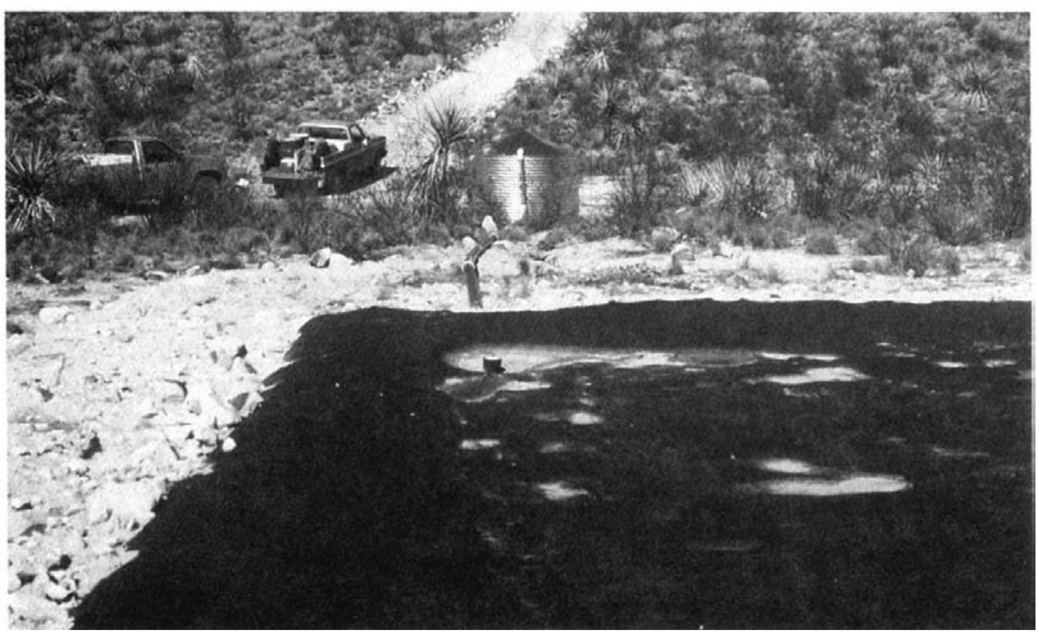


Figure 13
Rainwater catchments can be made out of asphalt impregnated polyester fabric.

Figure 14
The inverted umbrella catchment design reduces the space required for the guzzler.

Inverted umbrella catchments, which are commercially available, have been used in West Texas and New Mexico with a degree of success. Their design allows the collecting apron to be a part of the storage tank, reducing the space required for construction and placement (Figure 14).

Modifications for Birds and Small Mammals

Water sources are of importance to other wildlife species in the arid regions of the southwestern United States. Studies have shown that quail, dove, white-tailed deer, and many other kinds of wildlife will utilize such water sources. Modifications can be made to water sources designed for big game that will encourage use by song birds and small mammals. Water for birds and small mammals should be available at ground level and on a gentle slope of less than 20 degrees. Troughs should be located close to screening cover. Guzzlers intended for small animals can be similar to those designed

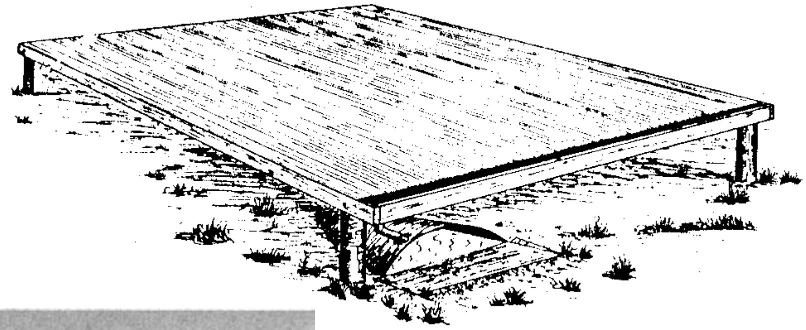


Figure 15
Small guzzler designed to provide economical resting cover and water to quail and other wildlife. (Drawing by Warren D. Snyder.)

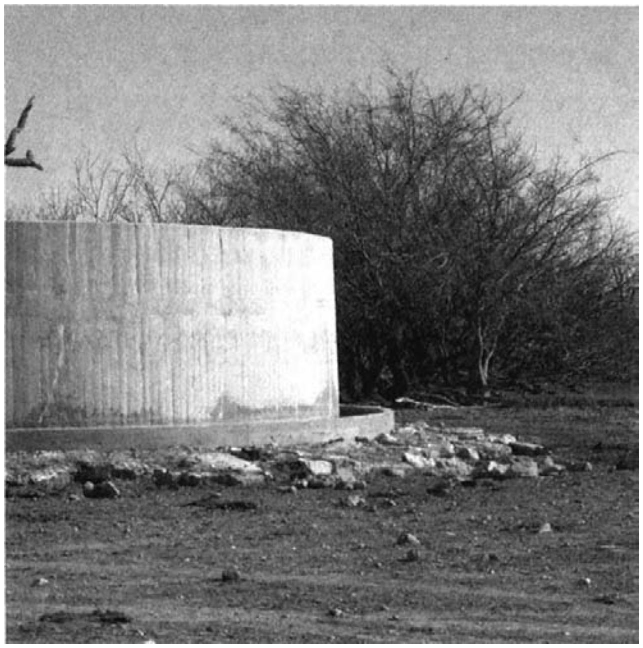


Figure 16
Overflow from windmill storage tanks can provide water for smaller wildlife species.

for big game (Figure 15). The size of the components is smaller to accommodate the reduced water requirement. Fifty-five gallon barrels may be substituted for the large storage tanks and the rainwater catchment is reduced in size. These modifications permit a significant cost reduction.

Other watering devices for small animals are limited only to a person's imagination. Earthen stock tanks make good watering sites for small animals if plants on the shoreline don't form an impassable barrier. Doves like to water on open bare ground. Quail prefer nearby escape cover. The overflow from windmill storage tanks can be directed to ground level dugouts or cement saucers (Figure 16).

A truck or tractor tire cut in half along the center of the tread can be placed under brush to catch both rainwater and dew. Tapping into an existing livestock water pipeline and utilizing a drip irrigation emitter is an easy way to provide water for smaller wildlife species.

Summary

Regardless of what system is used, supplementing water in dry areas can increase the potential of the land to support wildlife. Landowners interested in developing water systems for wildlife may qualify for cost sharing projects with the Soil Conservation Service.

Each tract of land has its own individual limitations and needs for wildlife watering sites. Wildlife biologists of the Texas Parks and Wildlife Department are available to assist landowners in determining the practices that could be applied on each individual tract of land to increase its value to wildlife populations.

Table 1

Materials needed for construction of the Black Gap WMA Guzzler

- Sump box 18" x 18" x 12" deep of 29 ga. with 4" collar
- 6' high 8' diameter storage tank. Tank to be constructed of 20 ga. corrugated galv. sheet iron with top and bottom of 24 ga. smooth galv. sheet iron. Pipe outlet to be 4" from bottom and threaded for 3/4" pipe.
- galvanized sheet iron – 24 sheets 12' x 36"
- 6 pieces – 2" square tubing, 44" long
- 6 pieces – 2" square tubing, 50" long
- 6 pieces – 2" square tubing, 56" long
- 6 pieces – 6" C purlin, 26' long
- 6 pieces – 1" square tubing, 4" long
- Ridge roll, 26' long
- Plastic or aluminum pipe, 4" diameter – length as needed from sump box to storage tank
- Galvanized pipe 3/4" diameter – length as needed from storage tank to trough.
- Float and valve
- Cement for posts
- #12 x 3/4 galv. self-drilling Tex screws – approx. 450
- Hail screen over sump box hole to prevent debris from entering storage tank.
- Steel casing 16" dia., 3' long for trough. With sheet metal welded on ends and hinges for float cover.

Table 2 Materials needed for construction of the Elephant Mountain WMA Guzzler

- Outside Support Panels: 6 pieces – 2" square tubing, 32" long
  8 pieces – 2" square tubing, 13' long
  8 pieces – 2" square tubing, 18" long
  12 pieces – 2" x 2" angle iron, 2" long
- Middle Support Panels: 6 pieces – 2" square tubing, 26" long
  8 pieces – 2" square tubing, 13' long
  8 pieces – 2" square tubing, 16" long
  24 pieces – 2" x 2" angle iron, 2" long
- Center Support Panels: 6 pieces – 2" square tubing, 20" long
  8 pieces – 2" square tubing, 13' long
  8 pieces – 2" square tubing, 10" long
  12 pieces – 2" x 2" angle iron, 2" long
- 12 pieces – 2" square tubing, 66" long.
- 12 pieces – 2" square tubing, 66$^{1}/_{4}$" long.
- 12 pieces – 1" x 1" angle iron, 71$^{11}/_{16}$" long.
- 8 pieces – 2" x 2" angle iron, 153" long.
- 6 pieces – 2" x 2" angle iron, 12" long.
- 16 pieces – 2" x 2" angle iron, 2" long.
- 18 pieces – 36" coverage galvanized "U" panel.
- #12 x $^{3}/_{4}$ self drilling galvanized Tex screws – approximately 600.
- Ridge roll – 26'.
- Sump box 18" x 18" x 12" deep of 29 ga. with 4" collar.
- Plastic or aluminum pipe, 4" diameter – length as needed from sump box to storage tank.
- Galvanized pipe $^{3}/_{4}$" diameter - length as needed from storage tank to trough.
- Float and valve.
- Bolts, $^{5}/_{16}$ x 2$^{1}/_{2}$ – 76 pieces.
- Hail screen over sump box outlet hole to prevent debris from entering storage tank.
- 36 pieces – 1" round rod, 36" long. Used to anchor catchment to ground.
- 6' high x 8' diameter storage tank. Tank to be constructed of 20 ga. corrugated galv. sheet iron with top and bottom of 24 ga. smooth galv. sheet iron. Pipe outlet to be 4" from bottom and threaded for $^{3}/_{4}$" pipe.
- Steel casing, 16" diameter – 3' long for trough. With sheet metal welded on ends and hinges for float cover.

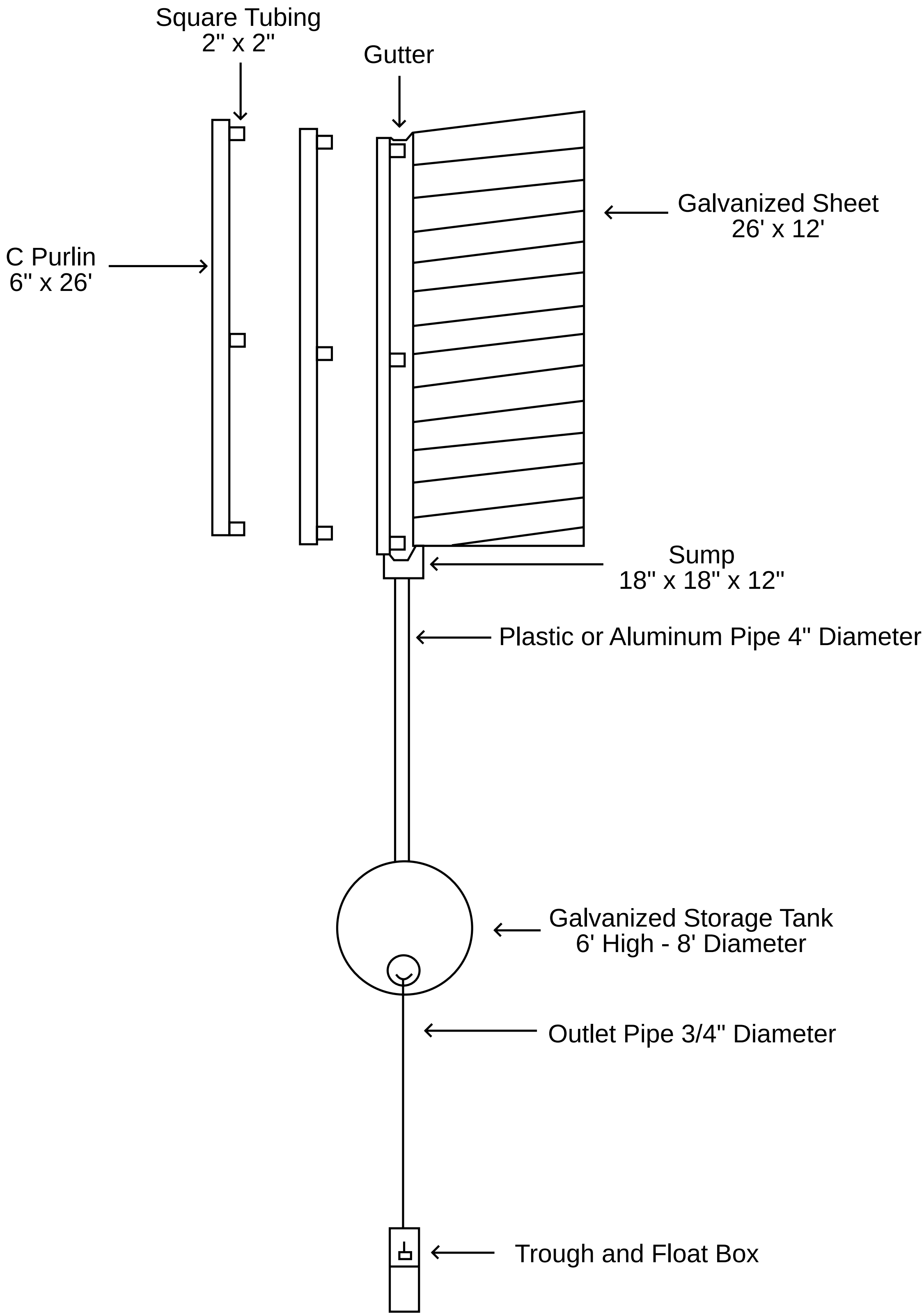
Table 3 Materials needed for construction of concrete guzzler

Approximately 14 yards concrete

- Cement 56 sacks (based on four sacks of cement per yard of concrete).
- Rock $^3/_4$ inch – 23,000 pounds.
- Sand – 21, 000 pounds.
- Water – 490 gallons.
- Reinforcing steel and mesh – to reinforce sides, bottom and collecting apron.
- Hail screen in sump to prevent debris from entering storage tank.
- Framing Materials: $^1/_2$" plywood for wall framing
2" x 4" lumber
1" x 1" lumber
Nails

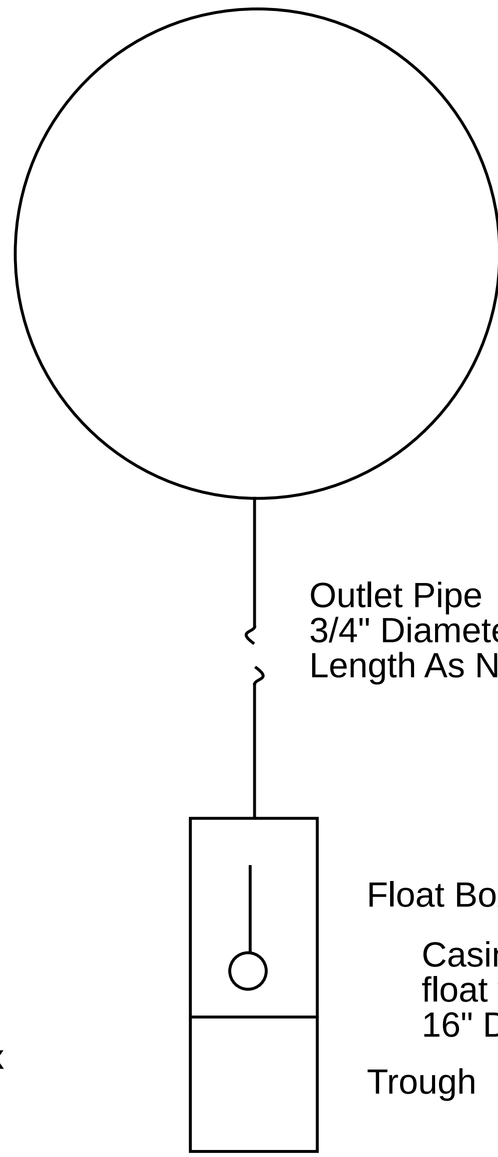
Appendix 1

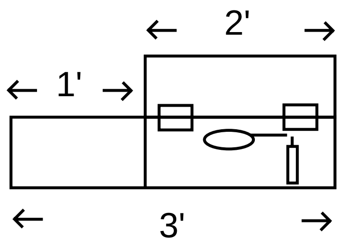
Rainwater Catchment



Appendix 2

Storage Tank & Trough Detail

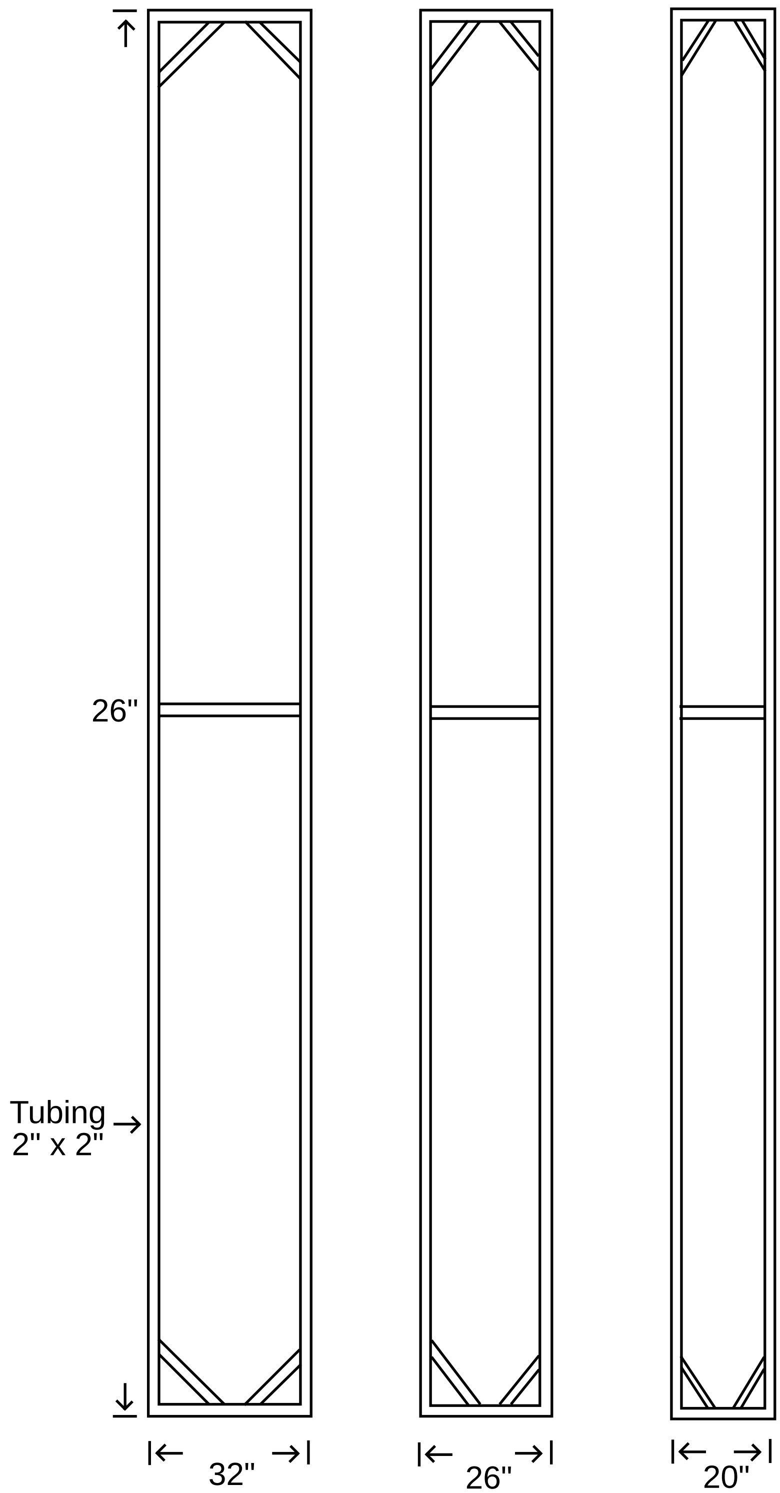




Trough and Float Box
Cross-Section

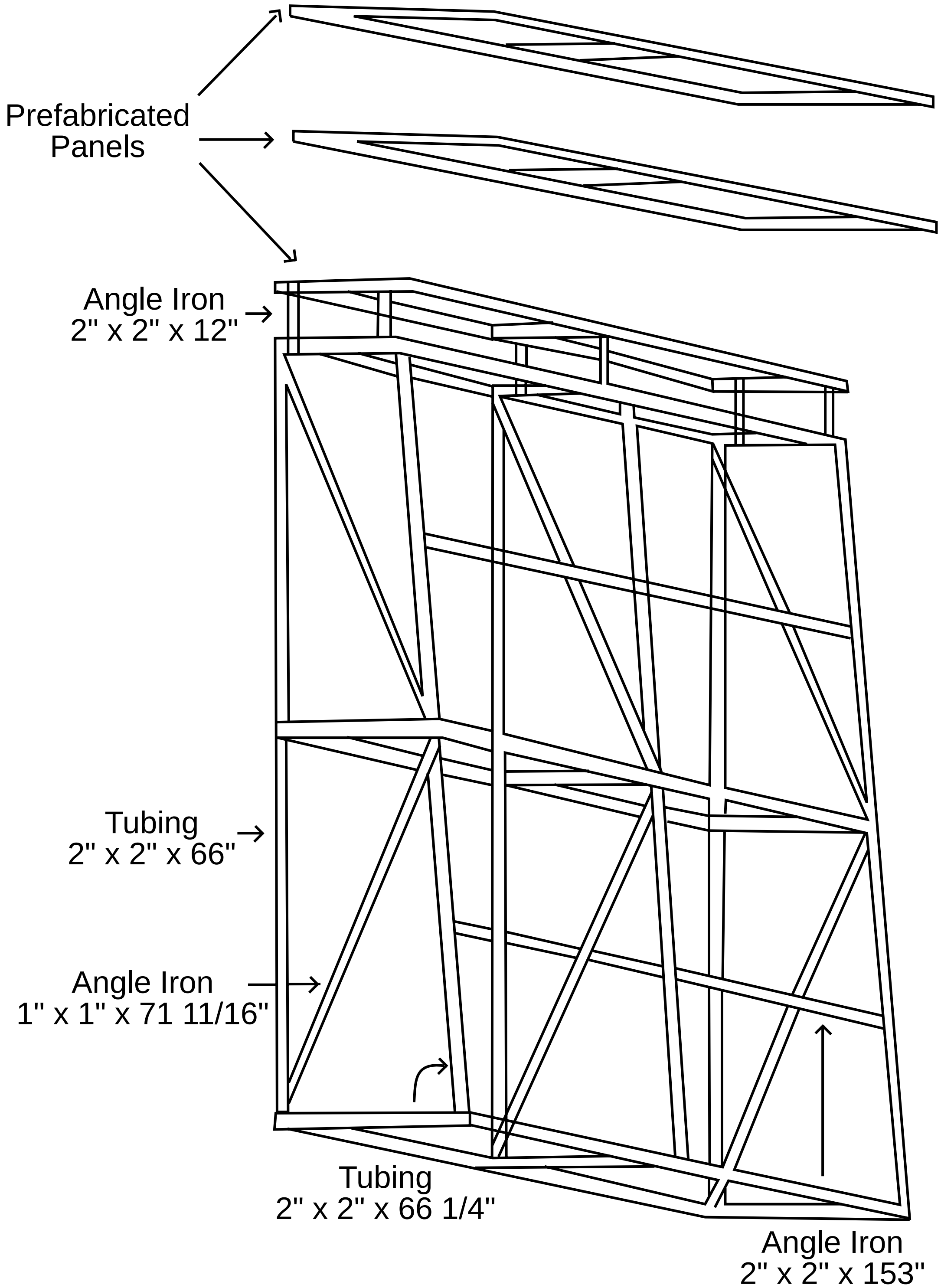
Appendix 3

Prefabricated Rainwater Catchment Support Panels



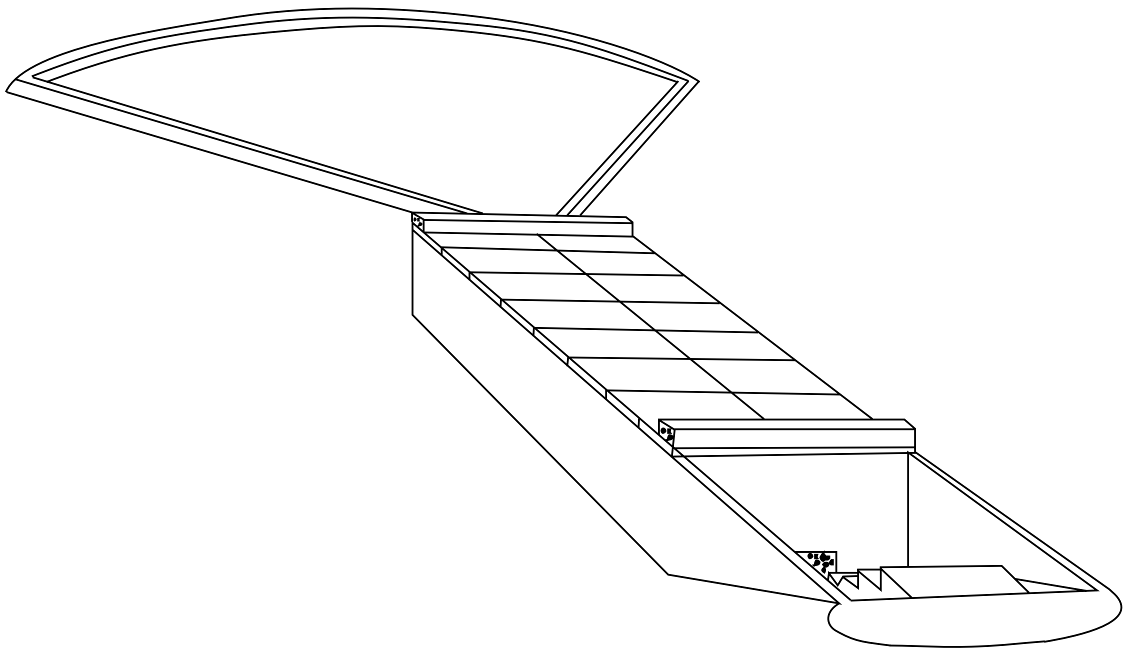
Appendix 4

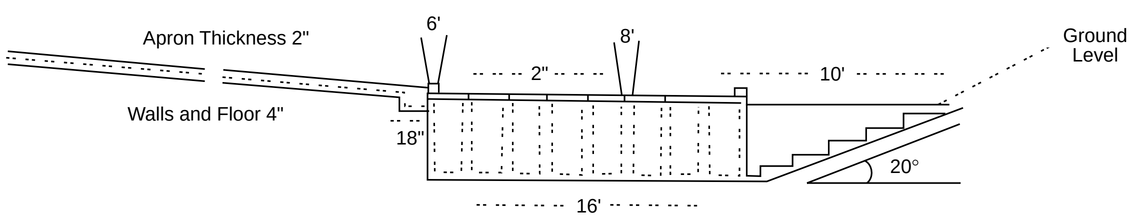
Prefabricated Panels and Completed Support Section



Appendix 5

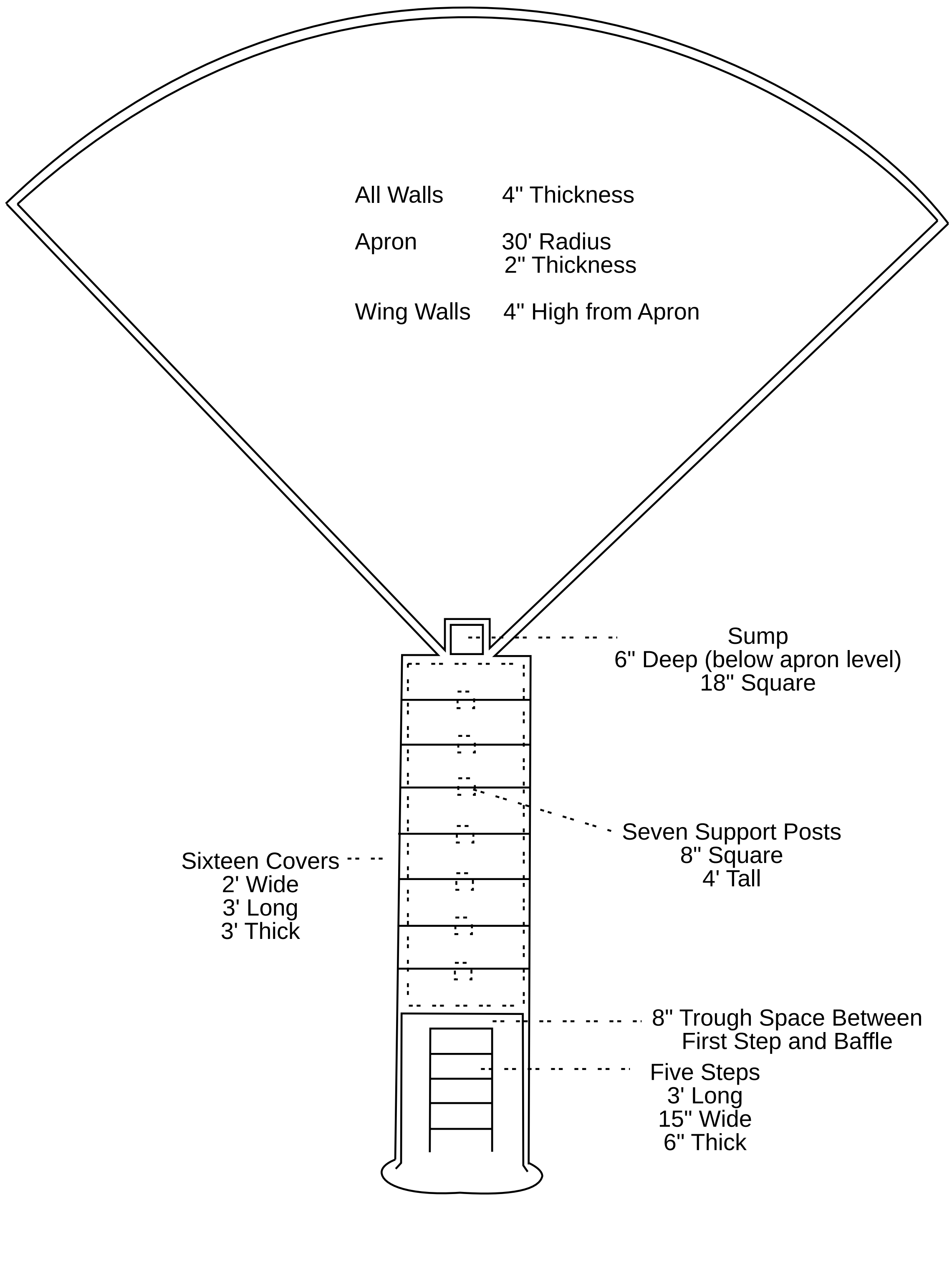
Rainwater Catchment





Appendix 6

Rainwater Catchment



Other Suggested Readings

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