



## Dead poultry composting project David Boyd Composter

Charles Fulhage, Agricultural Engineer, University Extension

A grant of EPA funds was made available by the Missouri Department of Natural Resources in October 1990 to selected southwest Missouri poultry producers representing each of the five major poultry processing companies. The purpose of the grant is to demonstrate the feasibility of composting dead birds in an environmentally sound manner. The grant is administered by Southwest Missouri Resource Conservation and Development, Inc., with technical assistance provided by the Soil Conservation Service and educational activities provided by University of Missouri Cooperative Extension.

David Boyd, of Purdy, MO, representing George's, Inc., agreed to participate in the demonstration project. Boyd's concerns about environmental considerations and future regulations pertaining to dead bird disposal were factors in his decision to participate in the project. This guidesheet describes the composting project relating to Boyd's poultry operation.

### Production facilities

The Boyd broiler operation consists of five buildings in which 6 flocks per year are grown to a market weight of 4 pounds. Table 1 outlines the characteristics of the five buildings.

**Table 1.**  
**Building Type and Bird Capacity in the Boyd Operation**

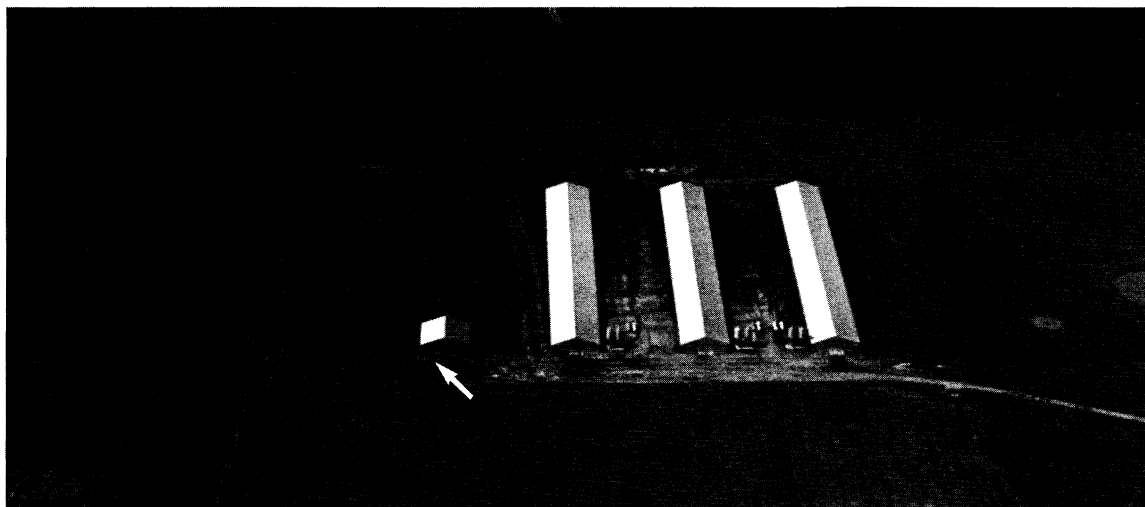
Building type	Number of birds	Weight in (lbs.)	Weight out (lbs.)	Time in bldgs (wks.)
growout	20,000	0	4	6.5

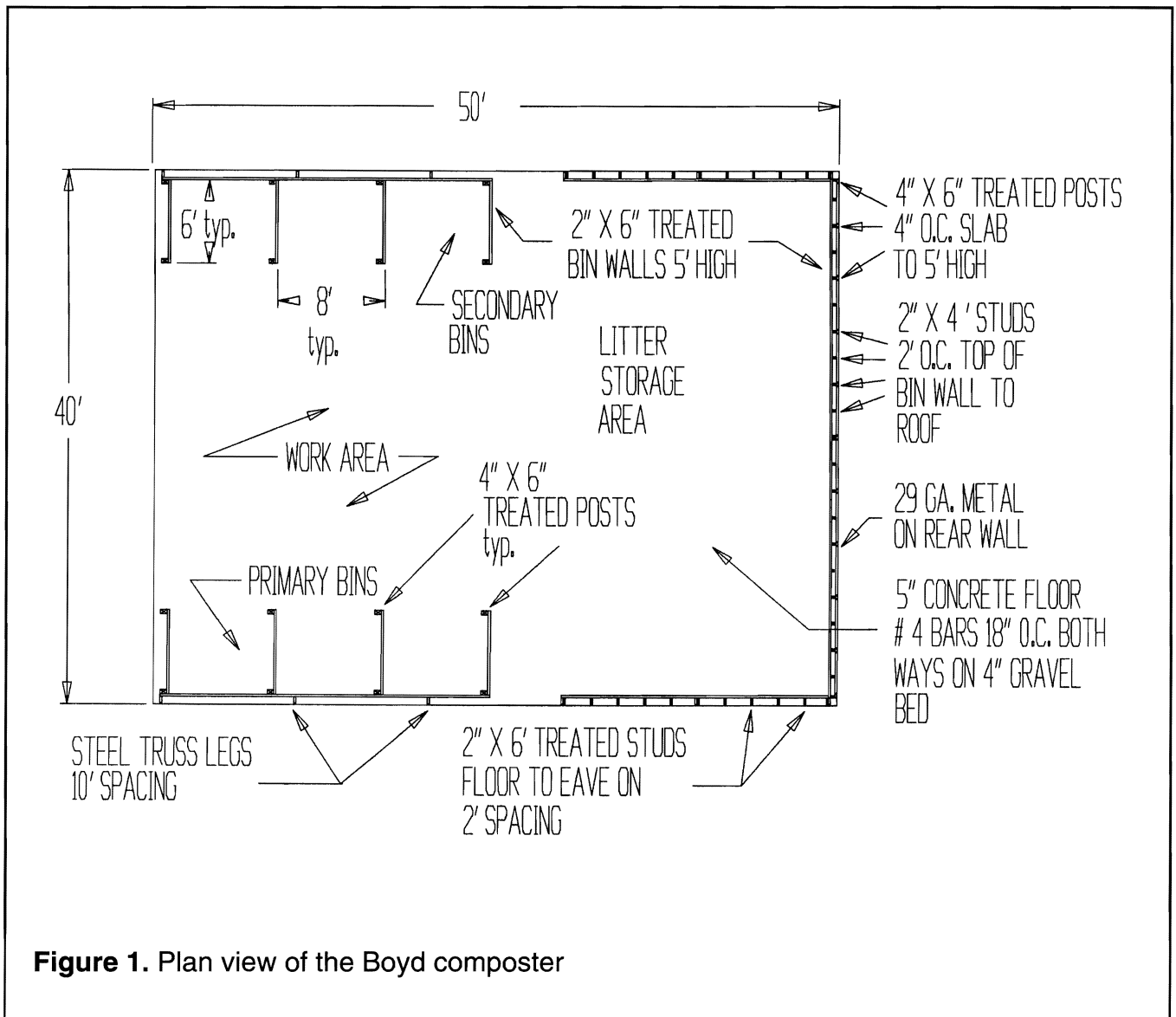
An aerial view of the building layout with composter for the Boyd production facilities is shown. Average mortality rate in these facilities is about 3 percent.

### Composter

The composter serving this operation has several

The Boyd composter serves five broiler buildings with a capacity of 20,000 birds each.





**Figure 1.** Plan view of the Boyd composter

unique construction features:

- Straight-leg steel frame trusses on 10 foot spacing, which provides a clear span of 40 foot with maximum headroom.

- Primary and secondary bin walls of treated lumber supported by 4 x 6 treated posts set inside the centerline of the steel truss legs. Posts and walls are 5 feet high.

- A dedicated litter storage area at the rear of the composter. Walls in this area are made of 2 inch treated lumber and are 5 feet high. The walls are supported laterally by 2 x 6 treated studs, 2 foot centers, which extend from the concrete floor to the eave line. Along the rear wall, the walls are supported by 4 x 6 treated posts on 4 foot centers. These posts extend to a height of 5 feet above the concrete floor. A portion of the end wall above the posts is framed with 2 x 4 studs on 2 foot centers. Corrugated sheet metal covers this portion of the

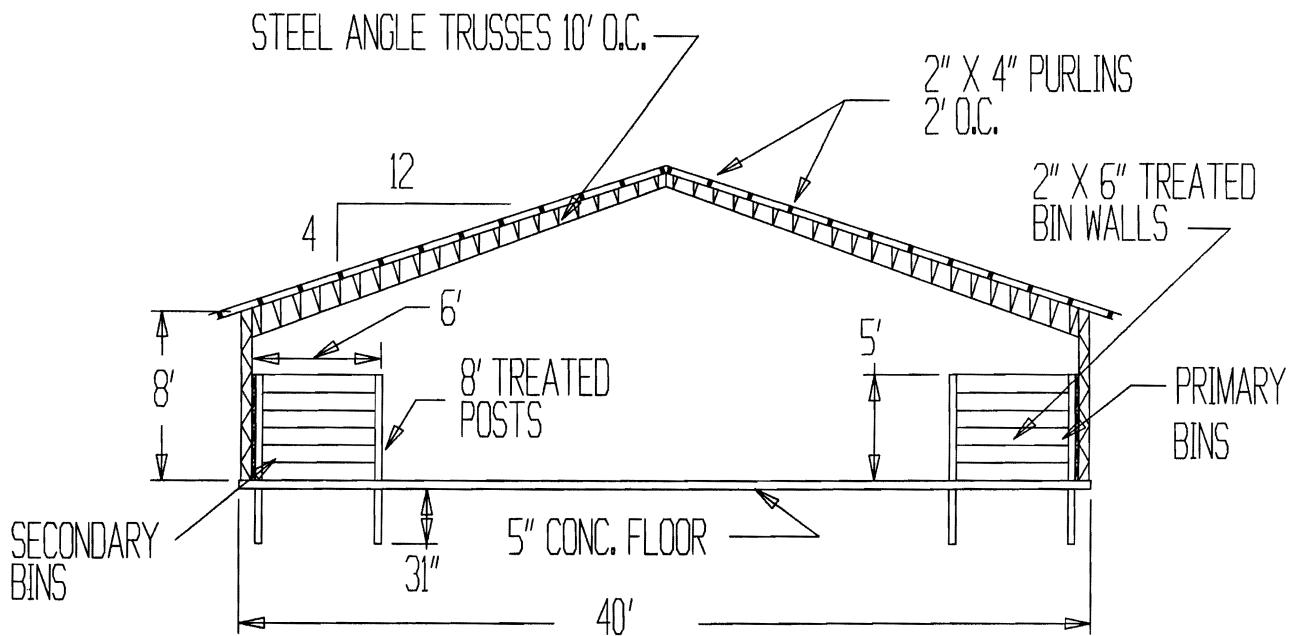
building end wall to the litter storage area from rain.

Figure 1 shows the steel frame truss used to support the roof. These trusses are bolted to the perimeter footing of the building.

Primary and secondary compost bins are located along the outside front walls (See Figure 1). There are three primary and secondary bins in the facility. All bins are the same size (8 feet wide, 6 feet long and 5 feet high) with a capacity of 240 cubic feet each. Total capacity is 720 cubic feet in the primary bins and 720 cubic feet in the secondary bin.

This layout provides a large covered work area (24 feet by 27 feet; see Figure 1.) Corrugated sheet metal partially encloses the top of bin walls and the eave for rain protection. Primary and secondary bins are made with two inch treated lumber allowing one inch spacing between boards for air movement. See Figure 3.

The rear portion of the composter is used as a litter storage area. This area is 39 feet wide, 20 feet long



**Figure 2.** Cross section of the Boyd composter through the composting bins

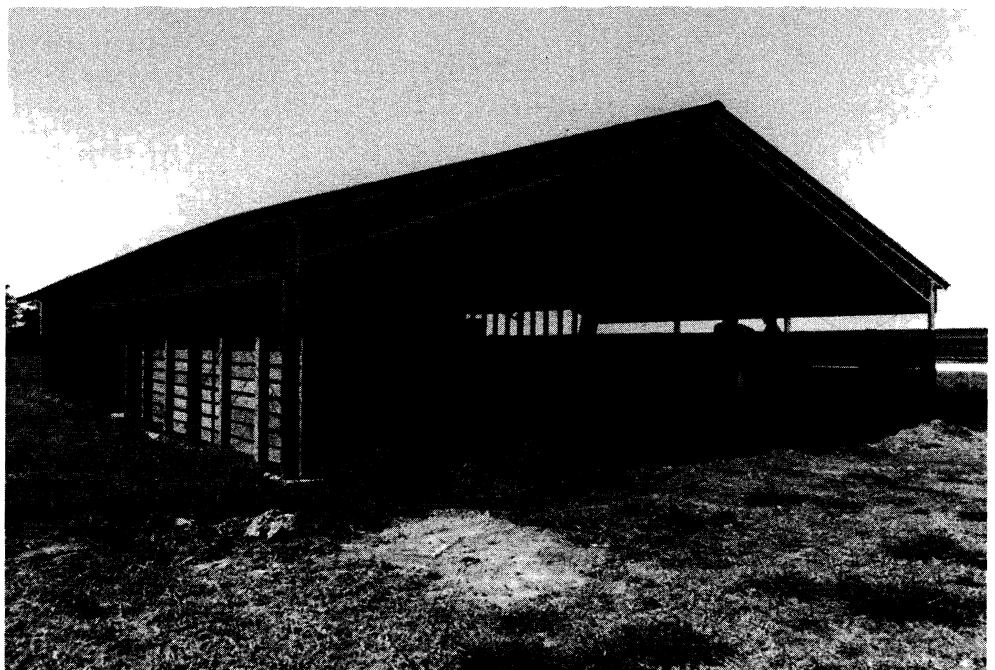
and 5 feet high. Volume for the litter storage area is 3,900 cubic feet – 60 tons of litter storage space. This volume is greater than the volume of litter used annually in the composter, hence in excess of one year's storage of litter is available in the composter building. Additionally, the large litter storage area adds flexibility to the production building cleanout and land spreading schedule. The litter storage area has 5 feet high walls supported by 2 x 6 treated wood studs on the sides and 4 x 6 treated wood posts along the back. The gable area of the back wall is enclosed with 29 gage corrugated sheet metal attached to 2 x 4 studs which rest on a plate at the top of rear wall posts.

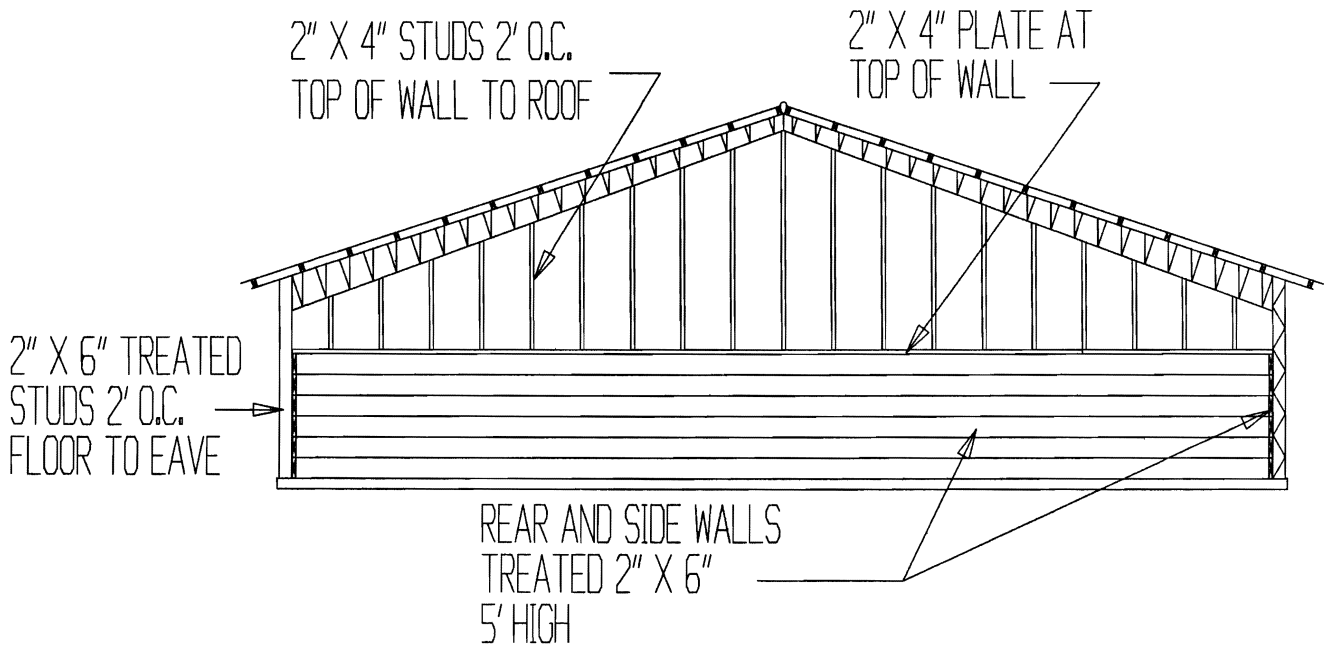
Figures 1 through 5 show construction details of the Boyd composter.

**A steel-frame truss supports the roof of the Boyd composter, with primary and secondary bins located on either side of a central work area.**

## Operational characteristics

Boyd estimates an average of 30 minutes per day is spent layering dead birds and ingredients in the composter. Boyd says he prefers the composter method of dead bird disposal over his former method of pit burial.



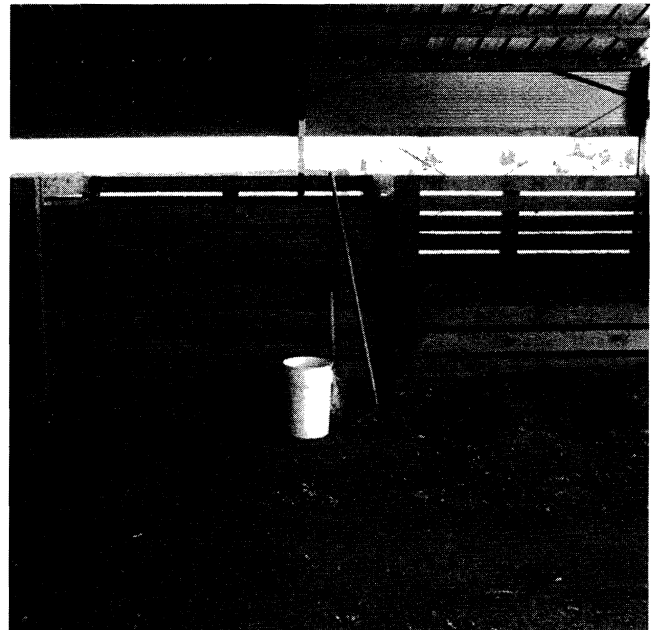


**Figure 3.** Cross section of the Boyd composter through the litter storage area

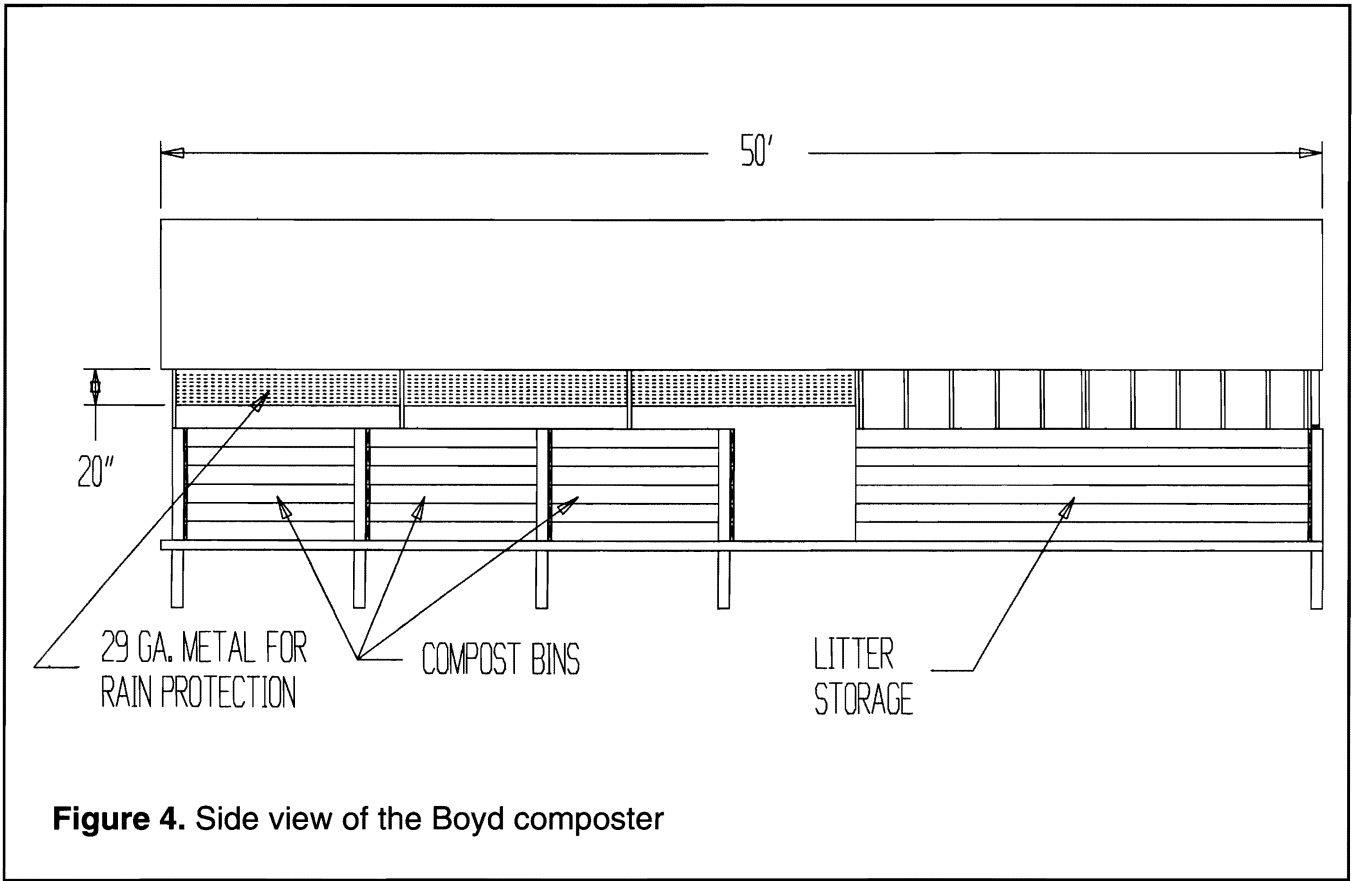
He uses a 60 hp tractor with a six foot bucket on a front end loader to move and load compost. Finished compost is spread by a hired contractor. He noticed that compost containing excessive straw is difficult to handle with his loader. Table 2 shows a laboratory analysis of the finished compost fertilizer value from the Boyd composter.

**Table 2.**  
**Analyses of litter and finished compost in the Boyd operation**

Fertilizer nutrient	Litter	Finished compost
Dry matter, %	73.5	77.3
Nitrogen, lb/ton	22.8	21.2
Crude protein, %	73.0	68.0
P <sub>2</sub> O <sub>5</sub>	80.0	84.0
K <sub>2</sub> O	28.0	41.0



Compost bins are built with 1 inch spacing between boards, and sheet metal is used on the walls to keep out rain.



**Figure 4.** Side view of the Boyd composter

**Cost**

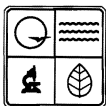
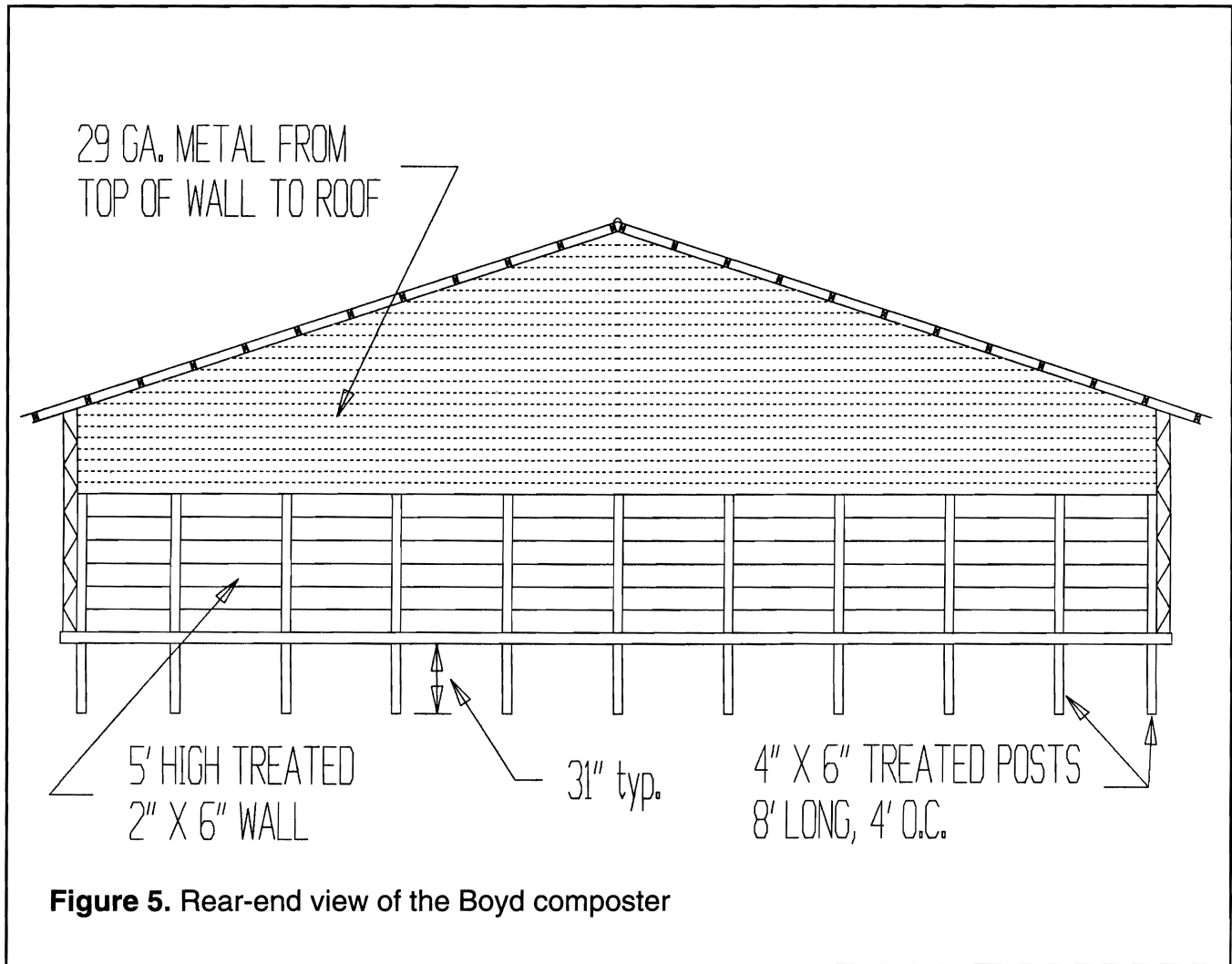
Composter costs depend upon many factors such as site characteristics, composter design, size, etc. Table 3 shows costs incurred for the Boyd composter as constructed in November 1990.

**Table 3.**  
**Cost associated with the Boyd composter**  
**(November 1990)**

Item	Cost (\$)
materials	7,150
labor	3,600
total	10,750



The back of the litter storage area in the Boyd composter is enclosed with sheet metal.



Published with funds provided to the Missouri Department of Natural Resources from the Environmental Protection Agency, Region VII. To learn more about water quality and other natural resource issues, contact the Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102. Toll free 1-800-334-6946.



■ Issued in furtherance of Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Ronald J. Turner, Director, Cooperative Extension, University of Missouri and Lincoln University, Columbia, MO 65211. ■ University Extension does not discriminate on the basis of race, color, national origin, sex, religion, age, disability or status as a Vietnam era veteran in employment or programs. ■ If you have special needs as addressed by the Americans with Disabilities Act and need this publication in an alternative format, write ADA Officer, Extension and Agricultural Information, 1-98 Agriculture Building, Columbia, MO 65211, or call (314) 882-8237. Reasonable efforts will be made to accommodate your special needs.