

## Appendix – Cattle Guards

### A. Product Description

The cattle guard, sometimes referred to as a cattle grid or stock grid, is a great way to provide gateless entry and exit to a ranch or farm field. The cattle guard is an alternative to the erection of gates that would need to be opened and closed every time a vehicle passes, and are common where roads cross open rangeland, maintained by grazing, but where segregation of fields is impractical. They come in a variety of lengths to accommodate most farm equipment from pickups to tractor trailers.



The open rail cattle guard is placed in fence gaps where a gate would normally be installed to allow for easy vehicle or pedestrian access while keeping the livestock in the field. The guards are wide enough to discourage cattle from attempting to jump the guard. These cattle guards are very low maintenance, durable, will not rot or rust and are easy to install. (Note: These guards are not recommended for use around horses.) While these cattle guards perform the same function as guards made from other materials, like steel, it should be noted that installation requirements are different for the precast concrete product. The concrete guards require that the main cast beams be installed on solid fill and are not meant to perform as a free span across a culvert.

### **Customer Identification:**

Typical customers for cattle guards include the oil industry, farmers, ranchers, feed lot operators and other agricultural operations. Getting your message out to these customers can be more challenging than other more centralized industries but many of the same tools can be utilized.

The key to marketing agricultural products is maintaining a high level of visibility in the agricultural community. You are marketing to local small businessmen and need to get your product in front of them at every opportunity. Since you have a limited delivery area for precast products, the marketing efforts need to be focused on local tools.

Advertising in targeted farm and cattle related publications published for your market is critical. The American Farm Bureau has local offices with publications throughout most markets and may be a good resource. Agricultural and Farming Publications like the *High Plains Journal*, *Farm Journal* and *American Small Farm Magazine* are listed on [www.moocow.com](http://www.moocow.com) along with many other regional publications. Local publications can also be identified through conversations with farmers and ranchers in your area or simply a visit to a farm supply or feed store in your market.

This same type of information can be obtained by participating in area “Farm Shows”. There are a number of local farm shows throughout the country. There are a number of resources that list shows in your region. Two websites that list a large number of shows are:

[www.farmequip.org/farm\\_shows](http://www.farmequip.org/farm_shows)  
[www.farmshows.com](http://www.farmshows.com)

There are many associations representing different segments of the farm and ranch community which can be a source of information about local issues and activities that may be beneficial. Some of the associations are:

Your State - Farmers and Ranchers Associations  
Breeders Associations - [www.naab-css.org/guidelines/beefbrd.html](http://www.naab-css.org/guidelines/beefbrd.html)  
Cattlemen’s Associations – [www.beefusa.org](http://www.beefusa.org)  
Rancher Associations – [www.Ranchers.net](http://www.Ranchers.net)  
State Livestock Association – [www.nlpa.org](http://www.nlpa.org)

Your State Department of Agriculture will also have resources to help develop leads concerning the farmer and rancher community. Most sites include an agriculture and a rural resource directory, links to outside resource, a list of industry associations and fairs and festival calendars. In addition, if your state has an agricultural college with extension services for farmers and ranchers they can be very beneficial resources and possess a great deal of local knowledge in their extension offices around the state.

## B. Manufacturing Requirements

The following bill of materials tables utilizes 5000 psi air entrained concrete at a cost of \$100/yd<sup>3</sup>. The Direct Labor, cost of manufacturing manpower, is estimated at a \$20/hr wage including an increase to account for benefits.

### Bill of Materials:

#### 12 Foot Cattle Guard

Description	Units	Quantity	Unit Cost (\$)	Extended Costs (\$)
Concrete (5000 psi)	Ft 3	40.5	3.70	\$149.85
Rod / Rebar 1/2 inch Dia.	Lbs.	225.51	0.40	\$90.20
Form Oil	Gal.	0.4	7.00	\$2.80
½ inch coil insert	Each	4	1.62	\$6.48
Direct Labor	MHrs	4.25	20.00	\$85.00
Total Unit Cost				\$334.33

#### 14 Foot Cattle Guard

Description	Units	Quantity	Unit Cost (\$)	Extended Costs (\$)
Concrete (5000 psi)	Ft 3	47.25	3.70	\$174.83
Rod / Rebar 1/2 inch Dia.	Lbs.	287.57	0.40	\$115.03
Form Oil	Gal.	0.4	7.00	\$2.80
½ inch coil insert	Each	4	1.62	\$6.48
Direct Labor	MHrs	4.25	20.00	\$85.00
Total Unit Cost				\$384.13

#### 16 Foot Cattle Guard

Description	Units	Quantity	Unit Cost (\$)	Extended Costs (\$)
Concrete (5000 psi)	Ft 3	47.25	3.70	\$174.83
Rod / Rebar 1/2 inch Dia.	Lbs.	319.64	0.40	\$127.86
Form Oil	Gal.	0.4	7.00	\$2.80
½ inch coil insert	Each	4	1.62	\$6.48
Direct Labor	MHrs	4.25	20.00	\$85.00
Total Unit Cost				\$396.96

### **Plant Requirements:**

The plant requirements for the addition of a new product line, like cattle guards, is a moderate amount of mixer capacity, forms, adequate production floor space and adequate finished product storage area.

The mixer capacity required to support the production will depend on the number and size of cattle guards you choose to add to your product line. While the opportunity to sell these products is year round, our experience is that generally the strongest sales occur in the fall after part of the herd has been sold off and the rancher is investing in improvement to his property. We have assumed that you will be pouring a minimal number of cattle guards throughout the year which makes your spare mixer capacity requirement approximately 1.75 yd<sup>3</sup> on days you will be pouring.

Forms for cattle guards are available from a number of sources and several are noted in a later section.

The floor space required for cattle guards is fairly significant and may require some creative form arrangement, since many of the Wilbert plants have very limited production floor space. An area roughly 10 ft. x 20 ft. is adequate for the largest cattle guard. An overhead crane is used to strip the cattle guard from the form and to remove from the production floor. The cattle guards weigh from 5400 to 7200 pounds each so a 5 ton overhead crane is more than adequate to handle the product in the plant.

The cattle guard business also requires the plant to have a truck suitable for delivering and setting the cattle guard. It also requires an employee trained in setting the cattle guard and the operation of the lifting device on the truck to ensure the cattle guard is set properly. This truck is typically a straight frame truck with a gross vehicle weight of roughly 26,000 lbs, which has been equipped with an A-frame or knuckle boom.

### **Manufacturing Process:**

The manufacturing process for cattle guards is relatively straight forward precast production. The form is thoroughly cleaned and form release is applied to all surfaces that will come in contact with concrete.



Rebar is placed and tied, in accordance with the structural design. The concrete is then placed in the form and consolidated by external vibration to ensure it has properly molded to the form. The form may need to be topped off after consolidation to ensure that the form is completely filled. Strike off the form to ensure that it is not overfilled.



After the product has cured the cattle guard form is then lifted up and the turning latch is disengaged to allow a gravity turn of the form. The cattle guard is then removed from form and the overhead crane takes it to storage.

**Employee Requirements:**

There is no special employee training or knowledge associated with the production of this product.

**Regulatory Requirements:**

There are no national standards established for this product nor are there any known national regulatory requirements. There are regional authorities, including states, counties, municipalities and cities, which have established specifications to ensure consistency of the product they receive.

**Sourcing of Consumables:**

The consumables for this product are consistent with your current vault production and will not require new or unique raw material inventory to be established. The consumables for this product include form oil, and reinforcing steel.

**Sourcing of Forms:**

Steel forms for cattle guards are available from a number of sources. New forms can be obtained from:

**Steel Forms:**

Norwalk Precast Molds, Norwalk Ohio  
Website: [www.norwalkprecastmolds.com](http://www.norwalkprecastmolds.com)  
Phone: 419-668-1639 or 1-800-251-8409  
By email: [sales@norwalkprecastmolds.com](mailto:sales@norwalkprecastmolds.com)

Molds of Bethlehem, Inc., Hickory, North Carolina  
Website: [www.moldsofbethlehem.com](http://www.moldsofbethlehem.com)  
Phone: 828-495-7731 or 1-800-659-7815  
By email: thru link on website

Wieser Concrete, Maiden Rock, WI 54750  
Website: [www.wieserconcrete.com](http://www.wieserconcrete.com)  
Phone: 715-647-2311 or 1-800-325-8456  
By email: [wieser\\_eng@dishup.us](mailto:wieser_eng@dishup.us)

## C. Total Capital Investment

### Capital Costs

Description - Forms	Units	Quantity	Unit Cost (\$)	Extended Costs (\$)
12 foot cattle guards	Each	1	15,000	15,000
14 foot cattle guards	Each	1	16,500	16,500
16 foot cattle guards	Each	1	18,000	18,000
Total Cost				\$ 49,500

### Advertising Cost

Description	Units	Quantity	Unit Cost (\$)	Extended Costs (\$)
Postcard Mailers	Each	100	0.35	\$35.00
Product Flyers	Each	100	0.04	\$4.00
Milled Alum. Brand Mold	Each	1	400.00	\$400.00
Reinforced Rubber	Each	4	1.00	\$4.00
Yellow Page Advertisement	Each	12	100.00	\$1,200.00
Journal Advertisement	Each	12	100.00	\$1,200.00
Website Update	Each	1	80.00	\$80.00
Total Cost				\$2,923.00

## Inventory Cost

To enter the cattle guard market one has to establish an inventory and form investment strategy. A total 20 piece inventory of cattle guards should be initially adequate. Since the pricing frequently is very tight from 12 ft. to 16 ft. the larger guards sell well and 10 units of the 16 ft. guard is advisable. You can maintain an inventory of just 5 each of the 12 ft. and 14 ft. sizes. Utilizing the unit cost based on an earlier section your inventory cost for cattle guards is approximately \$ 7,562.

## Breakeven Analysis

The following sample breakeven analysis allows you to look at the point at which you will be breaking even on this new product line. In order to perform this simple analysis we hold the profit at zero dollars (breakeven) and solve for the number of cattle guards sold.

Assigned Values:

Average Selling Price = \$ 950.00

Average Cost to manufacture one cattle guard = \$ 378.10

Profit = 0

Calculated Values:

Revenue = Selling Price x Cattle Guards Sold

Revenue = \$ 950.00 x Cattle Guards Sold

Fixed Cost = Capital Cost + Advertising Cost + Inventory Cost

Fixed Cost = \$ 49,500 + \$ 2,923 + \$ 7,562

Fixed Cost = \$ 59,985

Variable Cost = Cost to manufacturer one Cattle Guard x Cattle Guards Sold

Variable Cost = \$378.10 x Cattle Guards Sold

Profit = Revenue – Fixed Cost – Variable Cost

0 = (\$ 950.00 x Cattle Guards Sold) – \$ 59,985 – (\$378.10 x Cattle Guards Sold)

\$ 59,985 = (\$950.00 – 378.10) x Cattle Guards Sold

\$ 59,985 / \$571.90 = Cattle Guards Sold

104.9 = Cattle Guards Sold

This means you will have to manufacture and sell 105 Cattle Guards to break even on this new product. Since this plan is for manufacturing 1 Cattle Guard each day, it will take you 105 working days to make the cattle guards needed to break even. **The cost of delivery has not been incorporated into this analysis, since it is frequently billed as a separate item, but can be estimated at roughly \$3.25 per loaded mile.**