

Bull Barn

A centralized cattle handling facility and feeding facility

Steve Higgins and Lee Moser

Location and access are two very important attributes to consider when designing a beef operation. The Bull Barn is a pre-existing building placed on a summit position in close proximity to the farm manager's house and a county highway. This provides an excellent location and access for the producer. More importantly, the location also provides access to handling facilities, multiple pastures, and infrastructure for cattle.

Proper design of facilities can reduce the drudgery of farming for beef producers and their cattle. The goal of proper design is to create optimization and efficiencies that reduce inputs needed to produce cattle while at the same time increase cattle productivity. The end result is higher profits for beef operations. The objective of the Bull Barn Project was to create a facility, which acts as a centralized hub with multiple attributes designed to increase profits.

There are numerous systems implemented around the facility to increase productivity and profit. Many of the concepts demonstrated are low impact design principles that were adopted to capture runoff, increase infiltration, and reduce imperviousness, while at the same reducing erosion. Although the overall project looks expensive and complicated, all of the practices are simple, applied, practical, and scalable to any operation.

Access and Location **A**

- Facility access and location are critical for reducing time, labor, fuel, etc. This facility is accessible for the planned activities.
- The proximity to highways, residences, farm roads, and multiple cattle pastures indicates good access and location.

Orientation **B**

- Orientation of the barn was probably based on location and access rather than on solar direction and prevailing wind (It was placed along the ridge). The siting is not ideal and therefore creates spatial and temporal challenges.

Ventilation **C**

- Orientation based on prevailing wind was not considered. In addition, ventilation specifications have changed since this barn was constructed.
- The barn does include a ridge vent, but the dimensions are not ideal. Modifications have been made to the sidewalls to improve air movement, but there are limitations to what can be accomplished.

Security **D**

- Gates are placed to facilitate cattle handling and contain any escapes. The location of gates also provides visibility and added security for the farm.

Bedding **E**

- Bedding is usually not considered necessary by beef producers. However, it is used by dairy, chickens, and in some cases hogs.
- Bedding is used in this facility to increase cattle comfort, average daily gains, and marbling. The cost is offset by increased efficiency in cattle production.

Water Harvesting **F**

- Precipitation is collected from the roof area to provide cattle with their water requirements ([Water Harvesting](#)).
- The roof collection area is ~4,900 square feet.
- A one-inch rainfall event provides 3,000 gallons of water.
- Three cisterns are used to hold 6,000 gallons.
- A solar panel and pump are used to transfer the water from the cisterns to a 5,000 gallon water tower, which is used to gravity feed two tire waterers.
- The water harvesting system also performs multiple functions:
- The practice of diverting water from discharging onto the concrete feeding floor is [stormwater diversion](#). Collecting the water in tanks is [retention](#). The overflow from the tanks is conveyed by drainage pipe to the bottom of the hill ([flow and erosion control](#)).
- This system makes an immediate impact to reduce production inputs while improving herd health and well being.

Watering Facilities **M**

- Watering stations are located and designed to provide water access to cattle, as well as room to drink, and to meet water intake requirements.
- They are designed to serve multiple pastures, to facilitate rotational grazing, and reduce erosion.

All-Weather Surfaces **L**

- Multiple all weather surfaces are demonstrated that include concrete, geotextile fabric and rock, and plastic grid. These surfaces are used to limit the creation of mud, facilitate cleaning, and increase cattle welfare.

Shade and Shelter **K**

- Cattle require shade and shelter.
- Shade structures are used to provide relief from the sun.
- Shelter is used to provide protection from the elements.

Dry Lot **J**

- A holding area with an all weather surface (geotextile fabric and rock) is used for working cattle, weaning calves, and feeding cattle.
- It's main function is to control the traffic of cattle and equipment to protect pastures.

Manure Storage **G**

- Manure is a resource. It has value as a fertilizer source and soil amendment.
- Manure is stored under roof to dry the manure and retain nutrients.
- It is used on the farm to reduce inputs and build soil organic matter and soil health.

Filter Strip-Vegetative Terrace **H**

- The field adjacent to the concrete feeding floor was ripped with a subsoiler to disturb the restrictive root layer and heave the soil along the contours of the hillside. The area was fenced and gates were installed to allow creep feeding by calves or flash grazing by cows.
- The heaving of the soil creates terracing, which slows the flow of water over a large area ([flow control](#)). The berm created by the subsoiler creates [detention](#). A thick stand of forages are used to filter the flow and capture sediment ([filtration](#)) and reduce erosion. The vertical movement of water through the subsoiler trench increases [infiltration](#), root growth, forage production, organic matter and soil formation. Nutrients in the runoff create higher forage production ([utilization](#)). Pathogen are destroyed by beneficial bacteria ([treatment](#)).

Handling Facility **I**

- One of the main functions of the complex is cattle handling. The handling system was pre-existing and only minor modifications have been changed to facilitate better flow of livestock through the system.

