Pipe-rail Fence Construction Specifications

The pipe-rail fence construction would occur with the following specifications:

- Wildlife-friendly pipe-rail fences would be used (Photo 1 and 2);
- Braces and corner posts would be cemented in the ground; and
- Each post would be approximately 78 inches in length, with 34 inches below ground surface.

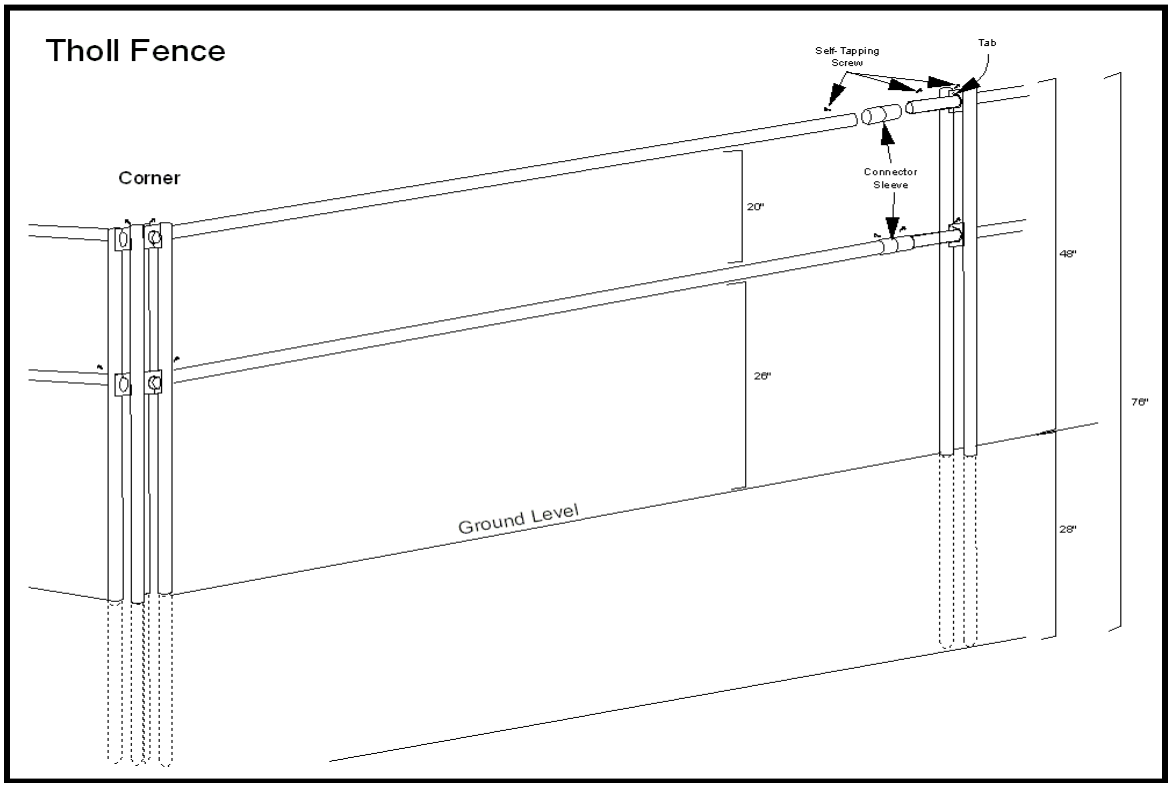

Photo 1 Typical Pipe Rail Fence Diagram

Photo 2 Example of a Typical Pipe Rail Fence

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HOW TO MAKE AND INSTALL FENCE MARKERS FOR SAGE-GROUSE

GETTING STARTED

MATERIALS

- **Vinyl undersill trim strips**
  - *Manufactured for house siding*
  - *12 ft. strip yields 48 markers*
- **Reflective Tape *(optional)***
  - *All-weather foil tape (1.5-2 in. width)*

TOOLS

- **Miter saw**
- **Tin snips**
- **Scissors**
- **Safety glasses**
- **Dust mask**
- **Gloves**

PLANNING

Fence marking using vinyl undersill trim is an effective and practical approach to increasing wire fence visibility and reducing potential sage-grouse collisions. Not all fences present the same level of risk for sage-grouse. Work with a biologist to determine the most appropriate fences to mark. Preliminary research indicates that the risk of collision may be highest on fences near sage-grouse strutting grounds, or leks, located on sites with gentle terrain.

Reflective vs. Non-Reflective Markers

Reflective or non-reflective markers may be used. Since markers make fences more conspicuous to people as well, it is important to consider social acceptability of the technique used. The addition of reflective tape to markers in particular can make fences highly visible from a distance. Reflective tape is thought to be needed to increase marker contrast with snow covered backgrounds and research has established the effectiveness of this technique. Markers without reflective tape are much less noticeable from a distance but may be just as effective; however, this has not been rigorously studied. One alternative to reflective tape is to use both white and dark-colored markers to increase visibility in a variety of conditions. The project planner will need to find a balance between demonstrated effectiveness and social acceptability in determining whether to use reflective or non-reflective markers.

Select type(s) of markers to be used for this project:

- ❑ **Reflective Markers**
  Materials: White-colored undersill strips; reflective tape
- ❑ **Non-Reflective Markers**
  Materials: Split evenly: white-colored undersill strips; dark-colored undersill strips

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photos by Bryan Stevens

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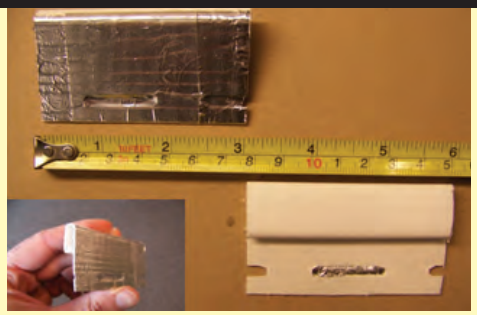
CONSTRUCTION

Reflective Markers:
Layout undersill strips with "lip" facing down. Apply reflective tape to flat side of strip.

Non-Reflective Markers:
Skip to step 2

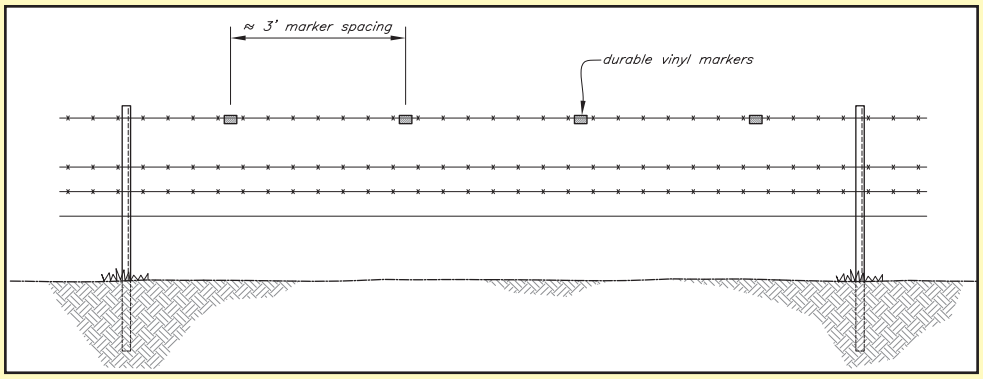


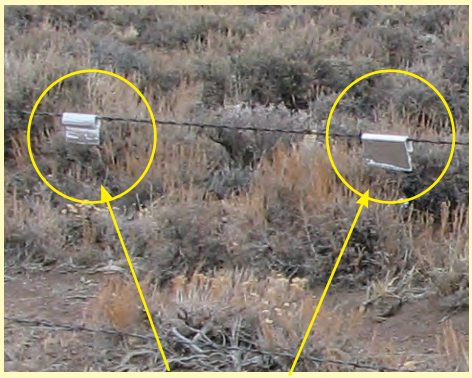
Cut strips into 3-inch pieces using miter saw (tin snips work for small projects). To reduce splintering, use a fine-toothed plywood blade (200 teeth), vinyl siding blade, or tile saw blade (***Caution:*** ***Always follow manufacture's guidelines for safety when operating power tools***). Multiple undersill strips can be stacked and cut at once to expedite production. Cut slowly.

Note: *Markers will need to fit between barbs on wire fences, so it is recommended that barb spacing on the planned fence be taken into consideration before cutting. Three-inch markers should fit all but the very old barbed wire fence, in which case, smaller markers may be needed.*

INSTALLATION

On a typical wire fence, it will only be necessary to mark the top wire. Snap markers on top wire between barbs at approximately 3 foot intervals; posts can serve as markers.





Reflective Markers
Alternate every other marker so that reflective side shows on each side of the fence every 3 feet.

Non-Reflective Markers
Alternate dark and white-colored markers every 3 feet.

References

Christiansen, Tom. 2009. Fence Marking to Reduce Greater Sage-grouse (Centrocercus urophasianus) Collisions and Mortality near Farson, Wyoming – Summary of Interim Results. Unpublished Report. Wyoming Game and Fish Department.

Stevens, B. S., K. P. Reese, and J. W. Connelly. 2010. Impacts of Fences on Greater Sage-grouse in Idaho: Collision, Mitigation, and Spatial Ecology. Thesis Research Progress Report. Unpublished.

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