



PROCEDURES FOR INSTALLING CORRUGATED TUBING CONSERVATION BARRIER (FENCE)

Pre-Install Planning

- Contact the organization legally responsible for the berm (and/or other areas, including bridge abutments) of the highway along which installation of a fence is planned. Usually this will be the County or Municipal Engineers Office. Obtain preliminary approval to proceed, subject to any initial restrictions.
- Mark out the desired path of the barrier using red marker flags, balancing the needs discussed earlier in this article.
- Arrange an on-site meeting with the legally responsible person(s) and mark out the mutually agreed on path for the fence using colored spray paint.
- As early as possible, provide a project schedule to participating individuals and organizations, including: Municipal or County Engineers Office; persons responsible for purchases; Community College Shop Personnel who might, for instance, be asked to put points on the posts; Boy Scout troops and other groups that will help with the installation; preferred suppliers of corrugated tubing, posts and zip ties. Be aware that untested materials

substitutions can lead to major problems immediately or in the future. Because of its use in general construction worldwide, corrugated tubing delivery times might become extended.

Fencing Materials Specifications and Preferred Suppliers

- Black corrugated single wall tubing in 100 ft lengths is manufactured by ADS. The distributor in South New Jersey is Caterina Supply Inc, 1271 Glassboro Road, Williamstown, NJ, 08094, phone 856-728-0171 and email: info@caterinasupply.com. We purchased the following items from Caterina:
 - 6 inch single wall ADS corrugated tubing in 100 ft lengths at \$0.98/ft
 - 6 inch internal couplers, \$3/each
 - 6 inch end caps, ~ \$3/each
 - 6 inch split couplers for the gates, ~ \$3/eachNote: corrugated tubing is specified by referencing its internal diameter
- Posts were fabricated from Home Depot's product 1x2 -8 PT SKU 315412 costing \$2 each. The material comes in 8ft lengths, each yielding four 24inch long posts, at \$0.50 each. It is pressure treated to minimize rot and should be handled appropriately.
- Black zip ties are available from Nelco Products. The distributor has a Website at www.cabletiesplus.com and phone number 800-926-5981. We used their product CP 36-50-B which refers to 36 inch long Standard Black ties with 50lb strength, 0.19 inches wide. A package of 100 ties cost \$22.
- Total fencing materials cost is ~ \$1.17/linear foot of fence.
- Alternative suppliers of corrugated tubing and zip ties are available, but might have slightly different dimensions to the ones

recommended above. If changes are made check that the zip ties will fit at the bottom of the tube corrugations.

Tools for Fence Installation

One or more of *each* of the following tools will be needed:

- Dewalt 14.4V electric drill kit with ½ inch chuck, 2 HD batteries and charger. A kit costs ~ \$200. An additional kit of 2 HD batteries at \$119 is recommended.
- Ship Auger (Drill bit) 18 inches long, 1 inch diameter at \$32
- Rakes
- Shovels
- Several pieces of rebar about 3 ft long to make holes in berms that are unusually hard-packed or rocky.
- Short handle sledge hammers
- 8.5 inch measuring tube(s)
- 6 ft measuring stick(s)

Safety Requirements

Heavy summer traffic using the nearby road is the principal concern. During the site preparation and installation phases, full and stringent safety precautions must be in effect for all participants. This includes, but is not limited to: provision of bright orange vests and safety helmets, which should be worn at all times; placement of orange traffic cones to appropriately mark off work areas; traffic wardens to set appropriate traffic patterns, enforce speed limits and monitor the safety of the participants.

Site Preparation

- Mark out the agreed upon path for the tubing barrier using spray marker paint, as a continuous smooth line wherever possible.
- Rake debris, large weeds, and stones from along the path. Short range hills or valleys with a length along the path less than about 18 inches should be smoothed out. It is unnecessary to alter longer range undulations as the corrugated tubing will conform to them.
- Every six feet, use spray paint to mark the intended location of posts along the path.
- Unroll the 100 ft lengths of corrugated tubing and place them along the painted path but several feet away, towards the marsh.

Installation of the Tubing Barrier

- Use the battery operated electric drill and auger to drill a hole 16" deep at each of the previously marked locations.
- Place the pointed end of each post into the hole and, using a sledge hammer, (carefully) drive it 15.5 inches into the ground. Use a measuring tube to verify the correct post height of 8.5 inches above the ground. Smooth the earth around the posts.
- Install 18 posts, covering a distance of a little over 100ft.
- Move a 100 ft section of tubing along the line of posts, with the tubing on the marsh side of the stakes. Move the tubing along the posts so that it extends about 12" beyond the first post. The tubing should not be stretched during this operation. Close this end of the tubing with a cap.

- At the first post, thread a zip tie through the lower hole in the post and then under the tubing. Pass it over the tubing and thru' the upper hole in the post. The smooth side of the zip tie must face outwards. Thread the end of the zip tie through the zip tie head and gently tighten.
- As the zip tie is tightened, gently pull or push the corrugated tubing no more than +/- ¼ inch, so the tie falls into the closest tube corrugation-valley.
- Tighten until it is snug.
- Move on and repeat at the next post
- When this is complete, insert a coupler into the end of the tubing, ready for the next 100 ft section.