Products to conserve the eco-system

ACO WILDLIFE

Amphibian Guidance System

Tunnel and fencing system for amphibians and other small animals

The ACO Group

Founded in 1946, the ACO Group is the world leader and pioneer of modular trench drain systems. ACO drainage systems are used in a variety of applications from domestic environments to airports. ACO products have been used at many prestigious locations.

ACO USA was founded in 1978 and is America's foremost manufacturer of trench drainage products.

ACO Wildlife

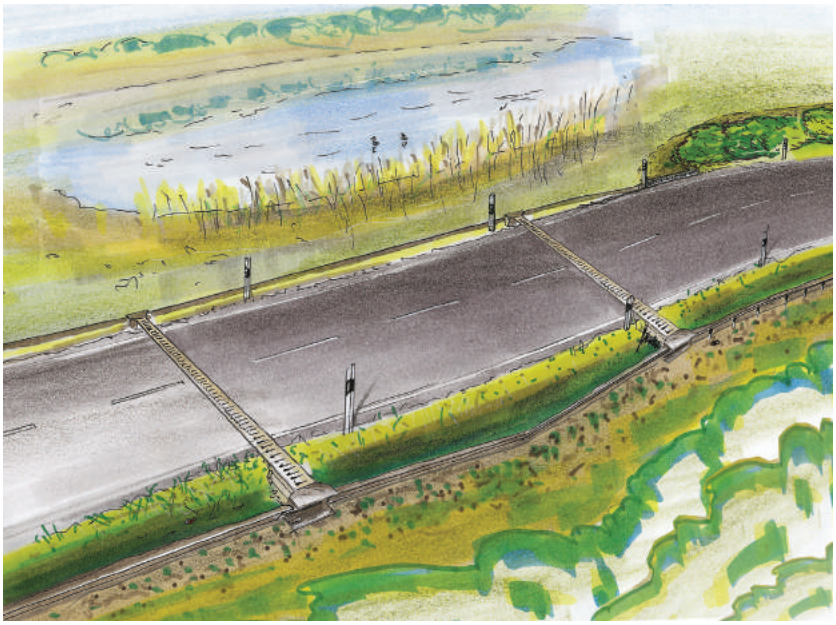
Working in conjunction with environmental specialists, ACO has utilized its extensive knowledge of surface drainage to develop a proven amphibian tunnel and drift fencing system.

The first tunnel systems were installed in Europe and North America in 1987. Since this date, numerous sites have utilized the ACO tunnel and fencing system.

In comparison to the provision of replacement spawning grounds, wildlife guidance systems are readily accepted by amphibians. The animals are led safely to their habitats: amphibians, reptiles and small mammals can safely cross under roads with a tunnel system and are prevented from reaching the road surface by surrounding fencing - a measure to protect both animals and humans.

Amphibians and Roads

The problem arises from a conflict between the natural migration instincts of animals and increased vehicle traffic and demands for more highways. The best solution is one that works for both motorists and wildlife without compromising the needs of either.



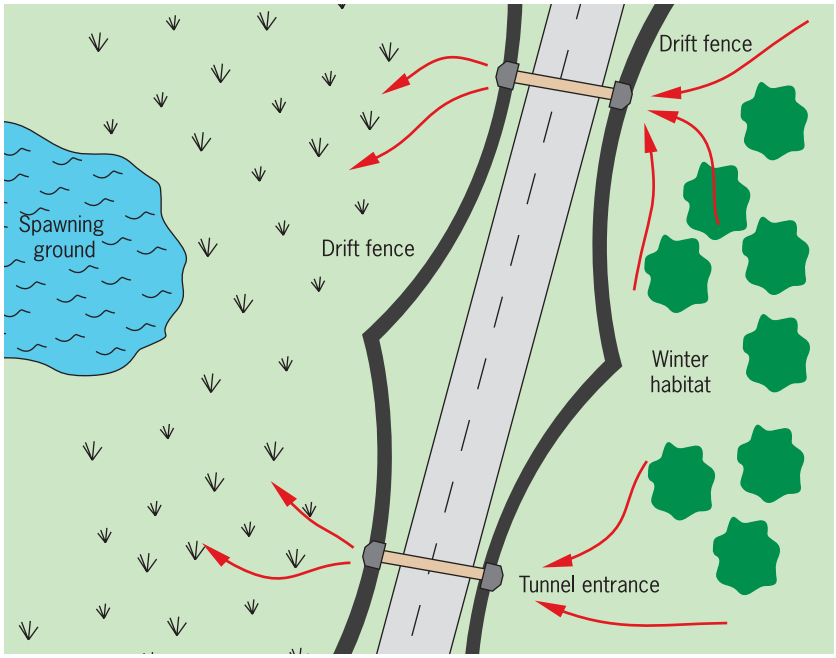
During the Spring mating season amphibians, such as toads and salamanders, seek water to spawn (lay their eggs). Once ground temperatures have risen above freezing, the migration begins. Being nocturnal, amphibians begin to appear at dusk to make their way to a pond to mate. The journey from land to water may be as much as a few miles, taking several days, and crossing one or more roads. In Autumn, the migration is reversed as they seek sheltered ground in preparation for Winter.

The migratory journeys pose risks from vehicles and roads that intersect the migration routes. It takes several minutes to cross a road, and thousands of creatures can be killed in a single evening. This risk affects motorists too - as slippery roads can result and drivers may swerve to avoid amphibians and animals on the road, both leading to possible traffic accidents.

Relocating breeding ponds is not always effective as some amphibians use the new pond and others instinctively returning to their original breeding pond.

Project Design

Tunnels are installed at intervals along the road, between the pond and the Winter habitat. The fence system should be installed to direct the animals towards the tunnel entrance - the best design is to arch or angle the fence so that the toads follow the curve rather than meet a dead end and stop.To ensure the correct layout, the installer should take specialist advice from a qualified herpetologist, biologist or conservation officer.



Tunnel and Fence Guidance System

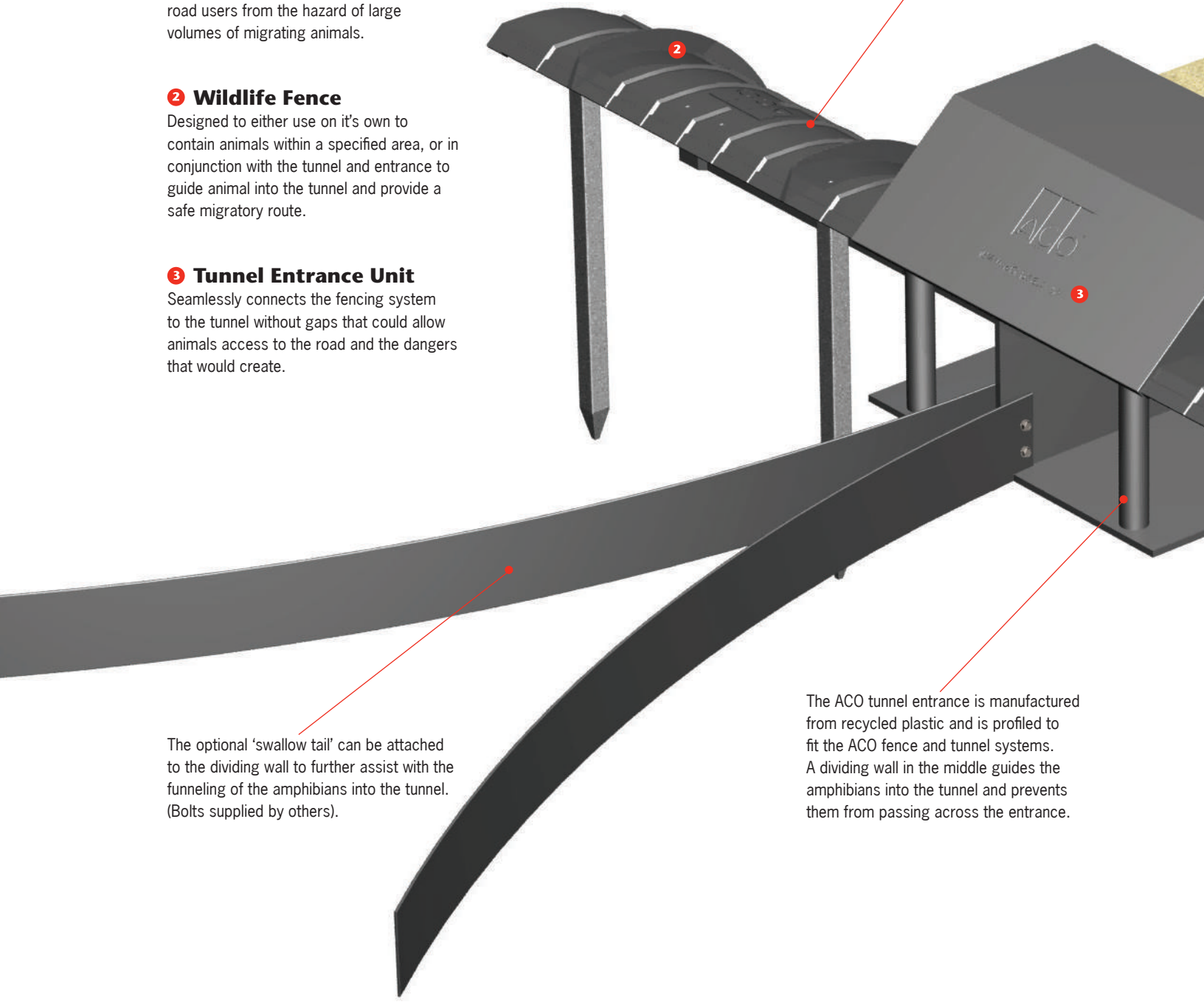
The ACO Wildlife Guidance System comprises of three key components:

❶ Wildlife Tunnel
Provides a safe route across the road, away from the hazards of vehicles. Also protects road users from the hazard of large volumes of migrating animals.

❷ Wildlife Fence
Designed to either use on it's own to contain animals within a specified area, or in conjunction with the tunnel and entrance to guide animal into the tunnel and provide a safe migratory route.

❸ Tunnel Entrance Unit
Seamlessly connects the fencing system to the tunnel without gaps that could allow animals access to the road and the dangers that would create.

The fence panels are manufactured from recycled plastic for lightweight shipping and easy installation. Profiled ribs ensure maximum strength to weight ratios.



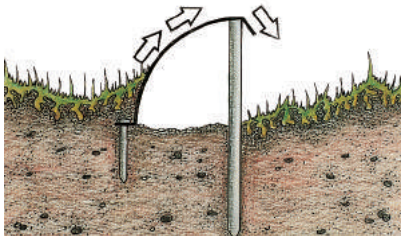
The optional 'swallow tail' can be attached to the dividing wall to further assist with the funneling of the amphibians into the tunnel. (Bolts supplied by others).

The ACO tunnel entrance is manufactured from recycled plastic and is profiled to fit the ACO fence and tunnel systems. A dividing wall in the middle guides the amphibians into the tunnel and prevents them from passing across the entrance.

Slotted upper surface, which enables airflow in and out of the tunnel to ensure climatic conditions remain constant.

Tunnel sections are manufactured from polymer concrete and are resistant to the freeze-thaw cycles due to low water absorption rate. The smooth surface of polymer concrete also ensures that the amphibians can pass safely through the tunnel with no risk of injury.

Road closures and disruptions during installation are minimal as units fit flush to the road surface and low profile (20.47") depth minimizes excavation requirements. Problems with high water tables around pond and marsh areas are also eliminated by this compact depth.



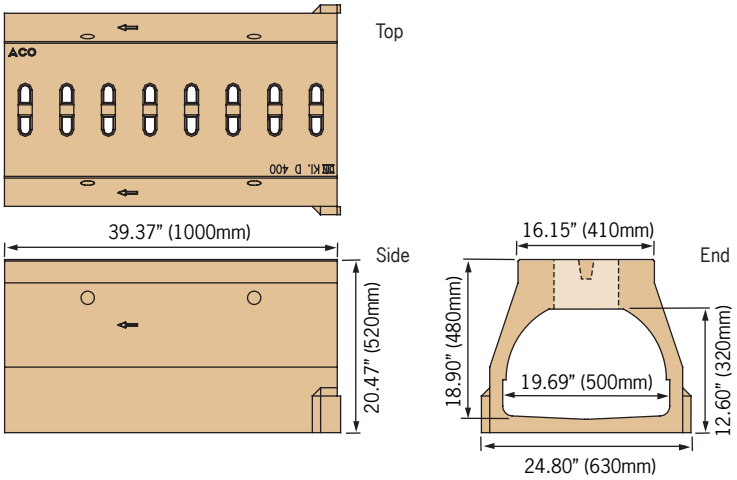
The curved shape of the fence helps prevent animals climbing over from the protected side - but allows animals to climb from the road and drop to safety. The curved shape also offers protection from natural predators and strong sunlight.

Nails hold base securely in the ground. Backfilling with dirt prevents animals digging under the fence.

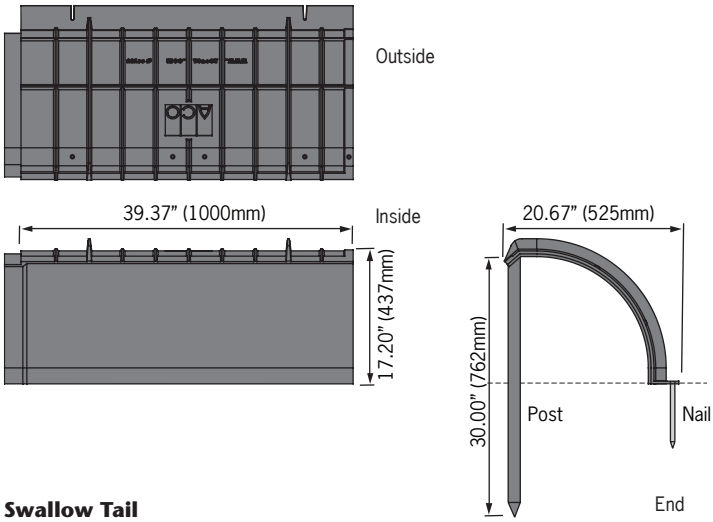
Posts support the open side of the fence to ensure integrity of shape and prevent collapse of system.

Description	Part No.	Length in. (*mm*)	Width in. (*mm*)	Height in. (*mm*)	Wgt lbs
Tunnel					
KT500 Tunnel	**11120**	39.37 *(1000)*	24.80 *(630)*	20.47 *(520)*	566.5
Fence System					
Fence	**99705**	39.37 *(1000)*	20.67 *(525)*	17.20 *(437)*	17.6
Post	**99708**	30.00 *(762)*	1.57 *(70)*	-	2.5
Nail (bag of 20)	**99710**	7.00 *(178)*	0.25 *(6)* dia	-	1.5
Tunnel Entrance					
AT500 tunnel entrance	**99712**	29.53 *(750)*	21.47 *(545)*	20.47 *(520)*	46.0
Swallow tail (optional)	**99707**	78.74 *(2000)*	0.25 *(6)*	5.91 *(150)*	8.4

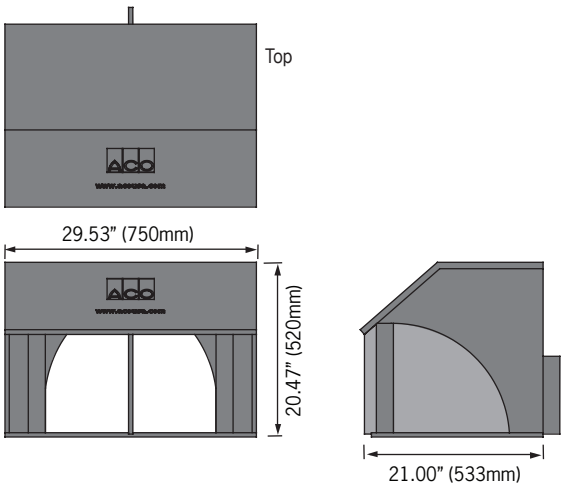
Tunnel



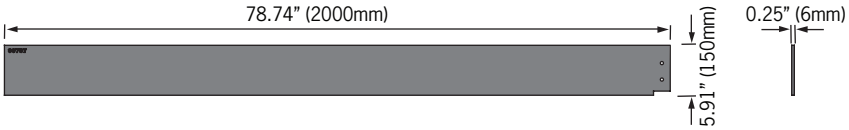
Fence System



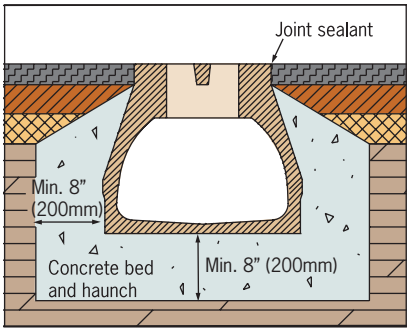
Tunnel Entrance



Swallow Tail



Tunnel Installation



1. Excavation
Excavate to allow a minimum of 8" (200mm) all around tunnel unit. Tunnel units should be flush with surrounding pavement surface. **Ground conditions may require additional dimensions and engineering advice should be taken.**

2. Tunnel layout
Position units in trench and support at correct height using either; stiff/dry mix concrete 'patties' at intervals (two patties per unit), or concrete bricks.

3. Concrete pour
Pour minimum grade 4,000 psi compressive strength cement concrete equally on both sides to avoid disturbing tunnel alignment. Use weight (re-bar or bags of sand) placed inside or on top of tunnels to prevent floating during concrete pour.

Protect top surface with plastic during pour to prevent splashes and ingress into tunnel.

In asphalt installations, avoid contact between compaction equipment and tunnel surface.

ACO recommend the finished pavement be 1/8" above or level with top edge of the tunnel. This protects tunnel edges and prevents ponding as water will drain easily into the tunnel.

4. Finishing
Remove protective plastic from top of tunnel, connect to tunnel entrance and fencing system - checking that there are no gaps. Flush tunnel thoroughly with water to remove debris.

Fencing Installation

1. Ground Preparation
Clear and level ground in a 10 ft. wide strip along proposed line of fence. Slopes should be prepared to give constant gradient. Changes in gradient should be spread over as long a section as possible. Changes in direction should be designed as gentle curves rather than tight shifts in direction. Peg out and check line of the fence in advance of fence construction.

2. Support Posts
Posts must be set at an above ground height of 15.75". In hard ground, it may be necessary to use an auger or similar prior to setting of posts. Where ground conditions prevent posts being driven in to correct height, shorten posts and set in concrete footings (12" x 12" x 12"). Check posts are vertical.

3. Fixing Panels
Position base plates flat on the ground, eliminate any gaps by adding or removing soil along base. Adjacent panels should overlap and be screwed to support posts. Secure base of each fence panel with nails.

4. Backfilling
To discourage amphibians from digging under the fence, the base on the outside of each panel should be covered in compacted soil. Backfill should extend to a height of 10"-12" above base plate, and slope gradually away from fence to ground level. Soil should also be placed and compacted along inside bottom edge of each panel (i.e. side nearest posts) to a depth of 2".

5. Checking
Continually check quality of installation. Check fence is at correct height and there are no gaps. Joins between panels should be watertight to prevent water eroding away compacted soil and creating gaps. Overgrown vegetation should be cut back, or removed, to prevent animals using it to climb over fence.

Swallow tail - bolts to center divider of tunnel entrance. Area between pieces should be filled with earth to ensure animals drop into either side of the entrance.

Maintenance
Regular maintenance of system is important. If surrounding undergrowth is not cut away prior to migration, it could provide bridges which allow creatures to climb over the fence. During inspection check for damage and replace as necessary.

Other ACO products

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