

Journal of the
National
Academy OF
Forensic
Engineers[®]



<http://www.nafe.org>

ISSN: 2379-3252

Forensic Engineering Analysis of Hazards Associated with Operating an ATV by a Paraplegic

By Gary E. Kilpatrick, P.E. (NAFE 794M)

Abstract

A paraplegic plaintiff filed a lawsuit against the defendant and alleged the defendant failed to make reasonable accommodations required by the Fair Housing Amendments Act (FHAA) to meet the needs of a resident with a disability. The paraplegic plaintiff requested that he be allowed to use an All Terrain Vehicle (ATV) on the streets of a subdivision. An ATV is a rider active vehicle and is physically demanding to operate. An ATV should never be ridden by a person physically limited by paraplegia. The lawsuit was dismissed by the court due to insufficient evidence alleged by the paraplegic plaintiff.

Keywords

All Terrain Vehicle, ATV, ATV Safety, Quadriplegic, Paraplegic, Paraplegia, Forensic Engineer

Introduction

The defendant surveyed and subdivided his family's farm and created a residential equestrian subdivision community (referred to as the subdivision). The defendant also created the covenants of the Homeowner's Association and retained complete control of the Homeowner's Association Board of Directors and Architectural Review Board. The plaintiff purchased a lot within the subdivision and built a single family home. All home owners within the subdivision had to abide by the rules set forth by the covenants of the homeowners association. The covenants did not allow the use of ATVs within the subdivision. The plaintiff's family included a partial quadriplegic and total paraplegic male child (collectively referred to as the paraplegic plaintiff). A rehabilitation center had tested the paraplegic plaintiff for the specifications he qualified for in order to operate a motor vehicle on public roads and had trained him to drive an adaptive road legal motor vehicle. The rehabilitation center determined that the paraplegic plaintiff's upper body was in a weakened condition but demonstrated sufficient upper body function to operate an adaptive road legal motor vehicle, and the state in which the paraplegic plaintiff lived issued him a driver's license. The paraplegic plaintiff made written requests and requested an exception to the covenant's prohibition against the use of ATVs within the subdivision. The paraplegic plaintiff used other means to travel around in the subdivision such as and including his motorized wheel chair and his adapted motor vehicle. The ATV would allow another means for the paraplegic plaintiff to travel on the streets in and around the subdivision to visit the homes of friends and neighbors, and if an issue ever arose, that a non-disabled sibling would use the ATV to assist the paraplegic plaintiff. Because the subdivision was without sidewalks, the alternative would be for the paraplegic plaintiff to

depend on someone else for transportation or to travel in the streets with his adaptive motor vehicle, his motorized wheelchair or a specially equipped tricycle. The subdivision's Homeowner's Association Board of Directors delayed their responses to the plaintiff's written request requesting more information from the paraplegic plaintiff. The Board of Directors held public meetings, and the ATV issue was discussed but the Board of Directors reached no decision; however the paraplegic plaintiff did not attend these meetings. The Board of Directors couldn't understand how the paraplegic plaintiff could mount and operate an ATV. The paraplegic plaintiff filed a lawsuit against the defendant that included the Homeowner's Association, its President and Board of Directors citing a violation of "Reasonable Accommodation" under the Fair Housing Amendments Act.

Author's Inspection of Subdivision

At the request of counsel for the homeowners association, the author inspected the subdivision and its roads and streets, the shoulder areas and any obstacles or hazards that could be considered as a risk to an ATV rider. There were a number of internal streets within this subdivision with a posted speed limit of 35 mph. Two of the streets were dead ends but continued on as grassy trails for horses. Each of the streets was bordered by grassy shoulders for horses and their riders. Each shoulder was bordered by the street and a fence that was set back away from the street. The street surfaces were hard packed and covered with gravel. The road shoulders of this subdivision were from approximately 23 feet wide to approximately 48 ½ feet wide. The slope of the shoulders varied from approximately 5° to 20°. The shoulder on one of the streets had an abrupt change in elevation of approximately 4 feet in height which gradually faded downward to the road level.

The utilities for this subdivision were buried underground, and there were a number of metal electrical enclosures above ground that varied in location along the shoulders and varied in location between the fence lines and the streets. Each residential lot had a mail box supported by a wooden post. On the end corner of each street, there were stop and street signs. Two of the streets had culverts that ran underneath the streets. One of the culvert pipe openings was exposed in the street's shoulders and was accessible to pedestrians and horses. Other culvert openings were enclosed by the fence line and were not accessible to horses or pedestrians. All culvert openings were below grade and were bordered and surrounded by large rocks. Driveways throughout the subdivision had culverts that ran underneath the driveways in the street shoulder, and the culvert openings were exposed and accessible to pedestrians and horses.

Paraplegic Plaintiff's Physical Condition

The paraplegic plaintiff suffered a complete first thoracic spinal cord injury with no feeling or function below the chest. The upper body of the paraplegic plaintiff had been weakened by the accident. The paraplegic plaintiff was taking prescription medication to control muscle spasms that could generate undesirable side effects such as dizziness, drowsiness, fatigue, headaches and muscle weakness.



Figure 1



Figure 2



Figure 3

ATVs Can Be Dangerous Vehicles if Operated by Untrained Riders

A factory stock type 1 general category ATV is designed for a single rider and no passengers. It has a relatively high center of mass for its wheel base and wheel track. Type 1 ATVs for adults have a center of mass that is approximately 18.5 inches from the ground and have a wheel base of approximately 48 inches with a wheel track approximately 36 inches. Because of these physical characteristics, an ATV can be overturned even during routine maneuvers. Additionally, a rider could lose control of or fall off of the ATV which creates a danger not only for the rider but also for persons in the area in which the ATV is being operated.

The owner's manual for many ATVs produced today state the following warning: "Before you ride, be sure you are well and are in good physical and mental condition and don't have any alcohol or drugs in your system." An ATV should not be ridden when the rider is under the influence of alcohol, over the counter or prescription medication. Drugs and alcohol can have undesirable side effects that can impair a person's riding abilities by altering a person's perception/reaction time, make a person feel weak, dizzy, drowsy or overly aggressive. These substances can also affect the person's vision, coordination and judgment. A person should also not ride an ATV when tired or fatigued. These things can affect a rider's ability to safely control and operate an ATV.

Operation of an ATV Requires Significant Upper and Lower Body Strength and Control

An ATV is a rider active vehicle and is physically demanding to operate. In order to safely operate an ATV, a rider must be in good physical condition and have full strength and use of the entire body. The rider must have sufficient upper body strength in the shoulders, arms and hands to hold on to the handlebar grips and steer, control and operate the ATV. The rider must also have a strong core and sufficient lower body strength in the legs to lift the body with the legs to shift the weight of the rider forward, backward and from side-to-side in order to operate the ATV through routine maneuvers, such as turns and ascending and descending hills. There was no evidence that the paraplegic plaintiff could perform these functions.

ATVs Should Not Be Operated on Roads

ATVs utilize low pressure knobby tires and are designed specifically for operation on off-road dirt terrain. ATVs are difficult for drivers of road motor vehicles to see. ATVs do not come equipped with legal road equipment such as road legal head and brake lights or other devices to make them visible to vehicles on the road. It is also illegal in many states to operate an ATV on public roads.

Standard Warnings Stated in an ATV's Owner's Manual:

Typical warnings in an operator's manual for ATVs included such as:

“Warning – Operating this ATV at excessive speeds increase your chances of losing control of the ATV which can result in an accident. Always go at a speeds that is proper for your vehicle, the terrain, visibility and other operating conditions, and your experience.”

“Warning – Failure to use extra care when operating this ATV on unfamiliar terrain could result in the ATV overturning or going out of control. Go slowly and be extra careful when operating on unfamiliar terrain. Always be alert to changing terrain conditions when operating the ATV.

ATV Rider's Course

A person who has never ridden an ATV or plans on purchasing and ride an ATV should first receive the necessary rider's training provided by the ATV Safety Institute prior to riding one of these vehicles. There was no evidence that the paraplegic plaintiff could participate in such training and that would offset the physical limitations of the paraplegic plaintiff.

Professional Opinion

In my professional opinion, based on a reasonable degree of engineering and scientific certainty, the plaintiff should never be allowed to operate an ATV anywhere at anytime because he would be a danger to himself, pedestrians, horses and their riders in the subdivision in which he lived. He could also be struck by an on-coming motor vehicle.

Riding an ATV is physically demanding and is rider active. In order to safely operate an ATV, a rider must be in good physical and mental condition and have full use of his entire body. The rider must be able to firmly grip the handlebars and hold onto the ATV, turn the front end assembly to steer the ATV to the left and right, open the engine's throttle using the right hand thumb, actuate the front and rear brake levers to slow or stop the ATV and stand on the footwells using the legs to lift the body to shift the weight of the upper body when turning, ascending or descending hills. There was no evidence that the plaintiff was capable of such control.

The Court Grants Summary Judgment in Favor of the Defendant as to the ATV Request

The defendant argued that the ATV accommodation was not safe for the paraplegic plaintiff or for other members of the subdivision and urged the court to conclude that the accommodation was not reasonable. The defendant also argued that the ATV accommodation was not necessary because the paraplegic plaintiff had other means of transportation around the subdivision using his adaptive motor vehicle, his motorized wheel car or a specially equipped tricycle. The defendant argued that the paraplegic plaintiff offered no facts or evidence including an ATV Safety Institute certification that showed that he could safely operate an ATV or to counter the author's expert testimony. The paraplegic plaintiff could not demonstrate that the use of an ATV was a reasonable accommodation. The court agreed that the paraplegic plaintiff failed to meet the evidentiary burden. The court found that expert testimony was necessary by the plaintiff to demonstrate a direct link between the proposed ATV accommodation and the equal opportunity to which a person with a handicap was entitled. The claim with regard to the ATV was dismissed.

References

ATV Safety Institute
Honda Motor Company

