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LAND SURVEYORS SAFETY

Introduction

No matter what career path you choose, the safety of you and your colleagues should always be your number one priority. Jobs that involve working outdoors and with heavy equipment are some of the most dangerous professions and thousands of people are injured every single year while on the job. In this article we shall look at land surveyors safety and how you can ensure that you stay safe. Land surveying may be a seemingly safe job; however there are many hazardous situations that land surveyors find themselves in that may compromise their safety. Land surveyors are constantly on the move and working at different sites. In many cases they may be working on construction sites where there are obvious land surveyor safety issues. It is very important that land surveyors are aware of the potential hazards that surround them and take the correct precautions to limit them.

LAND SURVEYORS SAFETY IN DIFFERENT SITUATIONS

1. VEHICLE AND EQUIPMENT

All survey vans shall carry approved fire extinguishers and first aid kits, which shall be so placed in the vehicle as to be readily available. For security reasons all survey vans should have tinted windows and be equipped with burglar alarms. Each operator is responsible for the safe operation of their vehicle and must adhere to and obey all applicable Traffic Law and Regulations. The operator must have a valid driver's licence required for the class of vehicle being driven. All individuals driving, riding in or operating vehicle must wear seat belts. All vehicles that are working or parked on the roadway should be of a colour that is easily visible to the driving public and be equipped with rotating or flashing beacons. As daily routine, the team leader should ensure that survey vehicle is in proper working condition including but not limited to lights, brakes including emergency parking brake, fuel and all fluids, tires. It is the responsibility of all crew members to routinely check tools and other gear and inform the team leader of their condition. The total station instrument is one of the most expensive pieces of equipment used by survey crew. It should be treated with care. Under no circumstances it should be left unattended or else this might happen if left unattended.



2. UNDERGROUND UTILITIES (MANHOLE)

Surveyors are often tasked with measuring the depth of flow lines of sanitary manholes whether the manhole is a storm drain or sanitary sewer, use extreme caution. Most manholes are in traffic areas and require at least one worker, as a flagger with a sole responsibility of protecting the person attending the manhole. Equipment that must be used for opening manholes are **Manhole hook** – Tools that hook through the vent hole on the manhole cover, **Pick** - For sliding manhole covers off sideways, **Crowbars** – Only long crowbars that allows you to

stand while sliding the manhole cover are acceptable, **Wedge tools** (shovel, crowbars, large screwdriver, hammer) - These should never be used alone to move manhole covers, but only for initial unseating of lid. Use another device to move lid. Do not try to move a manhole cover with your hands. If you must use your hands be extremely careful. Always wear steel-toed safety boots when moving manhole covers. Never look away from a manhole cover when being moved, often they will slip roll or wobble enough to injure a foot or hand. Know your limit and get help with heavy or large diameter covers. To close a manhole, slide the cover back into place. Always test the cover by stepping on the sides of the cover when in place. If unstable, reopen it and clean debris from the lip of rim, close and retest. Even though surveyors don't climb down in the manholes, potential harmful fumes can have an affect just by popping open the manhole and looking down inside. The atmosphere in a manhole presents many dangers to workers e.g.

- a. Explosive (gas or vapours) – Gasoline usually enters sewers from leaking gas station tanks, Methane is a colourless odourless gas that is the product of the natural breakdown of sewage and is usually found at the top of manhole. It can explode
- b. Toxic gases produced by natural processes in the sewage or from certain chemicals dumped or leaked into the sewer can be fatal.

Looking down a manhole



3. WOODED AREAS

Clothing: Surveyors should wear high safety boots with non-slip soles. The lace types are preferable because they afford more ankle support than loose pull-on types. Other cloth shoes shall not be worn, nor should boots with thin or worn out soles. They are easily penetrated by sharp stubs, nails or glass. Trousers should be without cuffs and short shall not be worn at any time during working hours. Lightweight clothing that is light in colour is recommended for summer surveying work. When it is necessary to work in these areas, bright coloured clothing should be worn to provide a safer environment

Hazard: Is something with the potential to cause harm to someone

Bees and Wasps

Fortunately the nest of these insects are not difficult to see and avoid .There are usually a few flying around the entrance of the nest, so caution should be used when working in that area



Poison Ivy

This is the single most common cause of allergic reaction. Each year many of surveyors develop an allergic rash after contact with these poisonous plants. The rash is an allergic contact rash caused by contact with oil called “urushiol”. Urushiol is found in a sap of poison ivy. It is colourless or pale yellow oil that oozes from any cut or crushed part of the plant including the roots, stem and leaves. Once this oil touches the skin it begins to penetrate within minute’s. In those individuals who are sensitive, a reaction appears as a line or streak of rash, usually within 12 to 48 hours. Redness and swelling occur often followed by blisters and severe itching. The best protection is to recognize the plant and avoid contact. If you need to be in the area of plants you should wear long pants, long sleeves, boots and gloves. Barrier skin creams such as lotion containing **Benoquatam (Ivy Block)** offer some protection before contact with this poisonous plants

Animal bites

Dogs: Angry dogs are very common when surveying property. Most of the time they are on chains or are inside of a fence but occasionally, in the rural areas, unleashed dogs come right after you. They may sometimes infect you with rabies. Rabies is a disease caused by a virus found in saliva of infected animals e.g. dogs and is transmitted to humans and pets by bites. Treatment of the infected person is critical. Untreated rabies cause painful death. If a surveyor is bitten by these infected animals, immediately cleanse the wound with soapy water. Get medical attention, do not delay you may need treatment.

Chiggers: Very tiny insect, the larva of which attaches itself to skin and injects a digestive fluid. Itching from secreted enzymes results several hours after contact. To minimise chiggers’ bites, apply powder sulphur or insect repellent prior to going into field. Avoid sitting on grounds or logs

Spiders: It is not uncommon for surveyors working in places like forests and bush areas to come into contact with insects and spiders. Most spiders prefer dark places in old rubbish piles, rough ground, under stones, logs and hollow stumps. To avoid being bitten surveyors and colleagues should wear gloves when in these areas

Ticks: Are a very big problem for land surveyors when surveying through trees and bush. Ticks can carry and spread very dangerous diseases e.g. tick bite fever. Ticks are found on low shrubs, grasses, and trees, and especially abundant in pastures and around cattle. To protect against tick bites, cover exposed parts of the body when in tick infested areas. Wear boots and fasten the trouser legs over boot tops. Spray trouser legs with insect repellent

Snakes: Snakes sometimes can be a problem for land surveyors, but they are usually the non-venomous kind. Poisonous snakes are identified by 3 features. A pit or hole between the eye and nostril, Eye pupil looks like vertical slits, all have v shaped head. To minimize the chances of being bitten by snake, wear high boots in snake country. Wear gloves when moving brush, rocks, timber or other objects. Walk heavily to create vibration that can be felt by snakes because they cannot hear. Wear snake- proof boots. If a snake bite occurs, take the patient to the nearest medical facility.



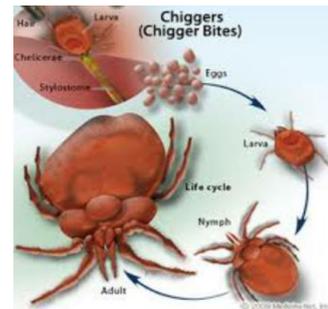
Angry dog



Allergy



Poison Ivy



Chiggers

4. RAILROADS

Under no circumstances is work to be performed on property of active rail roads until permission has been obtained from appropriate railway authorities. Avoid any use of the colour red “Red means immediate danger” and “STOP” to a train operator. Surveyors must not wear red clothing or use red markers, flagging, or lights when working near rails. Surveyors must not leave instrument or other equipment unattended, on or near tracks and must not park vehicle within 15 feet of the tracks and do not leave protruding stakes or any holes within 15 feet of the centreline of the tracks. Always be alert around rail roads. Be wary of shorting metal rods against electric cables.

5. WEATHER

Extreme hot and cold are always dangerous situations. A surveyor needs to always be prepared for these situations with proper clothing and hydration.

Lightning: is a very real danger because of all the metal equipment we carry. If you see lightning at all you need to stop, put the equipment away and get out of the field.

Hot weather (Heatstroke, Heat Exhaustion, Heat cramps, Skin cancer): Safety tips for surveyors who always work in the sun they should use sunscreen of SPF 30 or higher, Apply sunscreen to all exposed areas of the skin. Wear protective clothing, including a broad brimmed hat to shade the neck and ears, wear sunglasses to prevent damage to the retina. Drink lots of water

Cold Weather (Hypothermia): Is a severe chilling of the entire body and it is life threatening. Hypothermia risks are much higher when cold and wet conditions exists. The first line of defence is to stay warm and dry.

Frostbite is the freezing of parts of the body due to exposure to very low temperatures .Occurs when ice crystal form in the fluid in the cells of the skin and other body tissues.

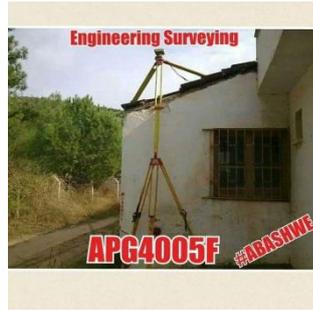


6. FIRST AID

All survey vehicles should be equipped with stocked first aid kits. Although some form of first aid should be administered immediately, in the case of injury other than minor wounds, cuts, sprains or abrasions, emergency medical service (10111) should be obtained. All survey personnel receive CPR and first aid training and re-certification at regular intervals.

7. THE WORK AT HEIGHT

Surveyors need to be assessing whether any of their work activities might place them at risk of falling a distance likely to cause personal injury and plan their work accordingly. The regulations make it very clear that anyone involved in working at height must comply with requirements to organise and plan how such work is to be carried out, avoid risks from working at height, and where working at height cannot be avoided, select appropriate equipment.



8. PEOPLE AND LIVE SUBSTATIONS

People can become a danger to surveyors as well. By hijacking their cars, stealing their working equipment and personal belongs e.g cell phone, watches, earings etc. There is the occasional irate land owner that makes physical threats when surveying around their property. These confrontations have the chance to escalate quickly and calling the police is always the best thing to do. Surveyors sometimes survey at substations, and they must make sure that there is a standby who is assisting when carrying out their work. Wear safety boots with no metal, do not use metal rods, if use, be careful make sure that the correct height is maintained or electricity will jump through your rod, no working in rain.



9. CONSTRUCTION SITE AND HEAVY EQUIPMENT

Construction work presents the most dangerous industry in terms of injury. Though land surveyors aren't necessarily classed as construction workers, they do their jobs in similarly hazardous situations. When land surveyors are called out to construction sites, they should be briefed on that site's safety procedure. It is the surveyors duty to wear appropriate safety gear such as hard hats, eye and ear protection. Surveyors sometimes have to survey around bulldozers, excavators, and dump trucks, on big construction sites. The equipment operators don't always keep a sharp eye out for surveyors setting stakes. The surveyors have to keep their eyes peeled and be aware of their surroundings.



CONCLUSIONS

In order for land surveyors to be safe while doing their work they must always follow these procedures :

General Survey Safety Procedure and Standards

- PPE to be issued – safety shoes, Hard Hat, safety vest, Gloves, Traffic cones, Early warning device
- All survey crew members shall wear their PPE issued to them
- A member of the survey crew shall be assigned to watch and control the flow of traffic around the area of the survey work
- Traffic cones or early warning devices shall be installed at least 10 meters before and after the locations of the survey instruments used in the survey
- Ensure that all communication devices are properly charged and functioning within the range of the survey work
- Ensure that survey vehicle is in road worthy condition.
- Wear sunscreen, limit your exposure, and protect yourself
- Know the dangerous plants and animals in your areas of practice
- Know their habits / habitats and learn how to protect yourself and your crew



(Survey assistants in their PPE)

WEAR SAFETY VESTS AT ALL TIMES AND USE YOUR SIGNS AND CONES LIBERALLY AND WITHOUT FAIL. THEY JUST MIGHT SAVE YOUR LIFE””