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1.1 Safety Responsibilities

Introduction

The purpose of this information is to provide specific safety instruction to Survey Division field personnel on hazards and situations unique to our section. This is also to advise and assist the employees of the Survey Section in the promotion of safe practices during working hours and in the prevention of accidents by calling their attention to the necessity of eliminating unsafe acts and conditions. General safety instructions are located in the “City of Los Angeles Injury and Illness Prevention Program”.

In California, all employers are subject to the Safety Orders of the State of California, Division of Industrial Safety. This document is part of our effort to bring our safety program into compliance with these Safety Orders and to provide guidelines for the safe performance of survey operations. When unsafe conditions are found during routine Survey work, an “Unsafe Conditions reporting Form” (Appendix H) should be filled out and given to your immediate Supervisor.

Sound judgment and careful appraisal must be exercised in the approach to all activities. However, should an on-the-job injury occur, refer to the Personal Injury Instruction Card found in the accident package in every vehicle (also outlined in this document), which outlines the procedure for obtaining the necessary medical care.

1.2 Individual Responsibilities

Employees shall have a practical working knowledge of, and adhere to, the provisions laid out in this manual.

Employees shall be alert for possible unsafe conditions and/or unsafe acts. Report unsafe conditions and/or acts to the supervisor or lead worker “in charge”.

Employees shall promptly report all accidents and personal injuries to their supervisors and render or find aid for injured persons.

Employees who fail to comply with safety and health policies, procedures, regulations, laws or rules shall be subject to discipline as outlined in “Personnel Policy # 7” the “Guide to Employee Discipline”.

Employees must report for work properly dressed to protect themselves from exposure to conditions found on the work site. Garments that expose upper body parts (midriff and shoulders are inappropriate. Employees shall wear appropriate footwear for the assigned task and work area.
1.3 Personal Protective Equipment

Each employee is furnished personal protective equipment which shall be appropriately used.

**Safety Vest:** Yellow/Green safety vests issued by the City of Los Angeles Survey Division must be worn whenever working outside of the Survey vehicle. Safety vests are required whether working on City or private property.

**Hard Hat:** Employees are responsible for wearing hard hats issued by the City of Los Angeles Survey Division during any work activity that may expose them to head injury. Hard hats must be worn on all construction projects, within State Highways and when working within Railroad rights of ways.

When conditions warrant the following personal protective equipment should be utilized by employees:

- Safety Glasses or goggles (each Survey Vehicle is equipped with two pair)
- Dust Masks
- Gloves
- Hearing protection
- Snake Guards (Chaps)
- Rainwear
- High visibility apparel (such as safety vests)
- Fall protection gear (Sewer gauging and possibly work on slopes)
- Rubber boots
- Toe protectors (each Survey Vehicle is equipped with a pair)

*Note: See also “Appropriate Clothing” (See 4.7)*
1.4 Survey Party Chief

Responsibilities

A Survey Party Chief is the lead-worker of the survey party. Each Party Chief is responsible for the work methods and safety practices of the survey party. It is the Party Chief's responsibility that all safety rules and procedures are followed and that all work is performed safely. In some cases the "lead person" may not be a Survey Party Chief. A Land Surveying Assistant or a Field Engineering Aide may act as the lead person on a Survey Party. This person would assume the same responsibilities as the Survey Party Chief. This responsibility may not be delegated. The following summarizes the common responsibilities of the Party Chief:

- Ensure that a copy of this manual is always available to employees.
- Give safety first priority in planning each survey.
- Before starting work, inspect each job-site for safety hazards and place protective equipment accordingly.
- Conduct an onsite safety tailgate meeting to make sure that everyone on the party is aware of any safety concerns. (*Document in your calendar book*)
- Ensure that each party member is aware of the nearest approved medical facility.
- Continue to monitor for changing conditions.
- For large construction projects, coordinate with the on site engineer and contractor to ensure a safe work environment.
- Cease work and notify supervision immediately if any field conditions are such that safety is jeopardized.
- Train and provide lookouts or flaggers whenever necessary.
- Utilize protective vehicles whenever appropriate.
- Avoid assigning party members to solo tasks that isolate them from the other party members. Try to have each member working with a buddy.
- Ensure that each party member possesses the required personal safety equipment and uses the equipment as required.
- Train new employees to safely perform required work tasks before assigning them to work independently.
- Ensure that all tools are used and stored safely.
1.5 Supervisor Responsibilities

Survey Supervisors are responsible for communicating safety procedures to multiple Survey Parties. Survey Supervisors are responsible for conducting City of Los Angeles business in the safest possible manner. This includes:

- Ensuring that employees who fail to comply with safety and health policies, procedures, regulations, laws, or rules are disciplined in accordance with the provisions described in “Personal Policy # 7” the “Guide to Employee Discipline”.
- Ensuring that safety equipment and supplies are available and are in good condition.
- Ensuring that all employees receive appropriate safety training for traditional survey projects as well as for special circumstances.
- Ensuring that employee safety issues are discussed and assessed annually at the time of issuing employee evaluations.
- Scheduling safety meetings with pertinent safety topics every 10 working days.
- Providing and disseminating safety information on pertinent or new topics.
- Conducting periodic “safety checks” of short term job-sites to ensure that the Survey Party Chiefs are following the prescribed safety procedures. See “Safety Checklist for Inspection of Short term Jobsites”. (Appendix E3)
- Conducting on site “safety checks” of ongoing construction projects. See “Safety Checklist for Inspection of Construction Projects”. (Appendix E4)
- Ensuring that personnel assigned to a project considered hazardous choose and train their crew accordingly.
1.6 Safety Meetings

Policy

Supervisors shall schedule, conduct, and document safety meetings with their employees to discuss occupational safety and health issues. All safety meetings shall be documented as to the subject discussed and the attendees. (Appendix A1). A copy of the sign in sheet, including the subject discussed shall be sent to the “Division Safety Person”.

Tailgate Safety Meetings for Field Personnel

At least once every ten working days, or as necessary for special circumstances, the field supervisor shall conduct a tailgate safety meeting. The tailgate safety meeting should focus on safety considerations pertinent to the current weather, time of year and specific current projects that may warrant specialized safety procedures. The Party Chief or “Person in Charge”, shall document this meeting in their calendar book.
1.7 Construction Surveying Operations

Prior to the start of survey work, the Party Chief shall make a thorough study of the conditions of the construction site to determine if any predictable hazards exist to employees and the kind and extent of safeguards necessary to do the work in a safe manner. All unsafe conditions should be reported to the Project Engineer and Project Inspector. Survey Supervisors should fill out the “Safety Checklist for Inspection of Construction Projects”. (Appendix E4)

- Many potential hazards may be present at construction sites. Due to a large number of activities that may be occurring simultaneously, it is necessary to be constantly alert if injuries are to be avoided. It is the Party Chief’s responsibility to coordinate survey activities with construction activities so the project can progress in a safe, expedient manner.
- Always keep yourself and your equipment clear of contractor’s equipment. Due to dust, drowsiness or distractions, equipment operators may not see you on a fill, in a trench or on a structure.
- Stay off of the contractor’s equipment unless you are on official business.
- Park your vehicles and assemble or disassemble your equipment away from the area where the contractor’s personnel and equipment are working.
- All party members shall wear safety vests, hard hats, long pants and approved boots while performing survey operations.
- Working in trenches, excavations or under bluffs is always dangerous. Be sure that the soil is at the angle of repose or that it is properly shored. You have the right to refuse to enter unsafe areas and should report such areas to your supervisor.
- Do not work in areas under suspended loads, If necessary, work should be done while construction crews are on lunch time, or either before or after their working hours.
1.7-1 Working on Hillsides

Planning the Work:
• Before work begins a pre-job conference or tailgate safety meeting shall be held to discuss the work schedule.
• The effects of adverse weather conditions, slide removal, rock-fall, slope renovation, and the various hazards that are known to be associated with cut slope operations.
• If the slope is found to be unsafe, no work is to be done.

The supervisor’s decision in determining who is “competent” to work on cut slopes and steep hillsides shall include the following factors:
• Previous work experience with slope and steep hill-side operations.
• Employees understanding of the effects of rain on slope stability and terrain conditions.
• Employee’s familiar with the geographical area where the work is to be performed.

Possible equipment needs:
• Boots with ankle support (required)
• Long pants
• Harness or a rope tethered at both ends
• Gloves
• Backpack or other hands free carrying device
2.0 Personal Injury and Accident Reporting

In the event of an injury or health problem to a member or members of a Survey Field Party:

- Render immediate care
- Determine if the injury/health problem requires immediate medical attention
- Call “Emergency Medical Services” (911) if Paramedics are needed
- Call your immediate Supervisor and report all pertinent information (See 2.1 below).
- Transport injured/sick employee to the nearest “First Care Panel” medical facility. “First Care Panel” locations and phone numbers should be kept in each truck)

2.1 Reporting a Minor Injury (Instructions for the Immediate Supervisor)

- As soon as the injury is reported to the Supervisor, as soon as possible, have the injured employee taken to the nearest emergency facility on their “First Care Panel” list (each Survey vehicle should have a copy of the latest approved emergency facilities).
- Call Central office (Senior Supervisor) to inform them of the injury.
- Call the current (person changes often) Workers Comp. representative at: (213) 473-3379 (assistant) 473-3367 (analyst) to report the injury. Tell her/him that you are faxing the temporary copies to them.(Supervisor 473-3337)
  Note: The Personnel web-site has the entire current phone numbers listed under “Workers Compensation” “How to Contact”.
- Have as many facts as possible when you call Workers Comp.
  Get the name of the Workers Comp. Representative
- Fill out the three forms listed below as best as you can (Temporary Copies) and fax to Workers Comp. At (213) 847-9037
  Note: Check fax # each time with the Workers Comp. Rep. It seems to change often.
  a) Form 5020 (Revision 7)
  b) State Workers Compensation Form “DWC 1” (To be signed by the injured party)
  c) Form General 83
  Note: Form General 83 is basically a permission to treat document that is signed by the Supervisor and taken to the Medical Facility with the injured party. If the employee goes directly to the Medical Facility, Form General 83, after being signed by the Supervisor, may be faxed or hand delivered to the Medical Facility by the Supervisor.
- As soon as possible have the injured employee legibly complete Form “5020” and complete and sign form “DWC 1”.
  Send to the Central office to be reviewed by the office staff and sent to Workers Comp.
• If any Medical Orders are given to the injured employee (Referrals, Time off Etc.) Fax a copy to the Workers Comp. Office. Make it to the attention of the original contact person and send a copy to the Central Office staff.
• Keep copies of everything and file it in the employee’s personal folder.
• 9) Perform a complete investigation and fill out form A-24, *Bureau of Engineering “Supervisor’s Investigation Form”*. (Appendix E-6)
2.2 Vehicle Accidents

In the event of an accident involving a City vehicle, follow these guidelines:

1) Stop and pull over to a safe area as soon as possible
2) Render immediate assistance if needed.
3) Follow the amended “Accident Reporting Instructions” found below.
4) Phone numbers change so contact your Supervisor to get emergency phone numbers other than “911”.
5) See below for an amended copy of the information given on the “Accident Reporting Instructions” (Appendix E2).

City of Los Angeles

Accident reporting Instructions
(Amended 3/2006)

I. Notify Police Complaint board (phone number below) in ALL cases involving damage to a City Vehicle regardless of the extent of damage. This includes:
   a. When accidents occur in County area or other incorporated city.
   b. Driver is accused of being involved in an accident but has no knowledge of same.
   c. Animal is seriously injured or killed.
      Search for the owner and report circumstances.

II. IN CASE OF INJURY OR DEATH notify the City Attorney’s Office (phone number below).

   Department of Public Works employees will ALSO notify the Safety Engineer, on nights and weekends through the City Hall Operator.

III. Remain at the scene of accident and obtain the information as follows:
   • All information on the other driver’s license(s) (address, license number etc.).
   • The make, model and year of any other involved vehicles.
   • The names of any other persons or passengers involved either in or out of the vehicle.
   • The names of any witnesses (see IV)
   • The Police report Number, the Police Officers name and the station they are assigned to.
   • Any other pertinent information that may be inherent to this particular incident
IV. Have all available witnesses sign witness cards.

V. Fill out Accident Report Form Gen. 88. Print legibly and be as complete as possible

VI. Submit contents of envelope to your supervisor as soon as possible. Form Gen. 88 must be received by the City Attorney within 24 hours of accident.

Note: Two carbon copies of Form Gen. 88 must not contain information provided on the back portion of the original or City Attorney’s copy.

* * *

POLICE COMPLAINT BOARD
485-2681 or for an emergency Number, Dial 911
Paramedics 884-3131
* * *

CITY ATTORNEY’S OFFICE
Automobile Liability Division
485-3634

IF NO ANSWER, CALL CITY HALL OPERATOR AT 485-2121 AND ASK TO HAVE YOUR CALL RELAYED

(FORM GEN. 84A)
3.0 Public Relations

3.1 General

Public relations are an important duty of the Survey Party Chief. The wide variety of situations that a Party Chief encounters requires a constant awareness of the rights and needs of the general public and an ability to adjust to them.

3.2 Relationship with the General Public

- The outdoor nature of surveying keeps a survey party in the public eye much of the time. Most jobs can be carried out with good-natured bantering among party members, but when the bantering becomes boisterous and is accompanied by insensitive language or horseplay, the surveyor’s public image suffers and the way is open for accidents and complaints from the public.
- All direct contact with the public should be pleasant, courteous and businesslike. This includes answering questions, taking criticism (right or wrong) and listening to suggestions.
- Questions from the general public concerning the work should be referred to the party chief or the person in charge. Although the purpose of most job assignments is not secret, the party chief should have an understanding of what information can be released to the general public.
- Do not involve yourself in speculation or giving of personal opinions or advice to residents.
- Refer them to the "Public Affairs Office" for further information. Phone # (213) - 978 - 0320
3.3 Relations with Property Owners

- Although there is a state law permitting surveyors to enter lands for the purpose of using or setting survey monuments, a property owner or occupant should be contacted before a survey party enters their property. Identification should be worn to identify that you are a City Of Los Angeles employee. The purpose of this contact is to inform the owner or occupant what survey activities are to be performed, to indicate the duration of the survey and any effect it may have on the property.
- The “Project Engineer” should have given notice to the affected property owners of our intention to enter onto their property for surveying purposes.
- Contact the Project Engineer if there are any problems with residents.
- The method chosen for the survey should be the one which will have the least effect on the property.
- If actual damage to the property is anticipated, a written consent from the property owner must be obtained. On most projects the requesting party (Project Engineer) should secure a “Right of Entry” and forward a copy to the Survey Division. Examples of activities that may cause damage are: digging holes, cutting trees, cutting shrubs, clearing land areas, and using vehicles or equipment not normally used on the property.
4.0 General Daily Safety Practices

4.1 Drinking Water:

The Southern California climate is desert-like and often extremely hot and staying hydrated during the work day is very important.

- An adequate supply of fresh potable water should be provided in field vehicles which carry survey parties.
- Potable containers used to dispense drinking water should be kept tightly closed and equipped with a tap.
- Containers should be kept clean and the water should be changed daily.
- Any container used to distribute water should not be used for any other purpose. Nothing but potable water should be put into the container.
- Disposable drinking cups should be provided.

4.2 Hand Tools:

- Hand tools should be inspected on a daily basis and be maintained in good working condition or be replaced.
- Tools should be used only for the purpose intended.
- Tools should never be thrown from one location or employee to another.
- Do not carry pointed or unguarded sharp-edged tool in your pockets.
- Edged tools must be sharp if they are to cut cleanly and with minimum effort. Dull blades are more likely to slip or rebound than sharp blades.
- When not in use, tools should be sheathed if possible, placed against a wall, bank, stump, or laid down with sharp edges down.
- Care should be taken to place tools in a position that discourages tripping.
- When using a pick or maul (sledge hammer), be sure that the areas behind you and to the side of you are clear. Wear eye protection if there is a danger of flying chips of rock or other debris. Never attempt to strike an object at or above the level of your shoulders.
- If a file is used to sharpen a tool. Always use a file with a secure handle.
- Spray paint cans should be stored upright in a secured area.
4.3 Natural Disasters

In the event of a “Natural Disaster” or other “Catastrophic Event”:

- Render immediate assistance if required
- Contact your Survey Supervision
- Receive instructions from your Survey Supervision

If no contact can be made with Survey Supervision, refer in order the following procedures:

- **Alternate Emergency Work Locations**
  
  Since the street and freeway systems may be severely impaired following a disaster, Bureau personnel will report to work locations in the following order:
  
  a. Regular, assigned work site.
  
  b. The nearest Bureau of Engineering District office.
  
  c. The nearest Department of Public Works yard. The primary Public Works yards all have emergency power systems and radio communications. A list of the yards is included at the end of this section.
  
  d. The nearest City of Los Angeles facility such as Fire Stations, Police Stations, etc.

  If telephones are in operation, call your regular or alternate work site nearest your residence for reporting instructions.

- **Access to Restricted Areas**

  During an emergency, employees may be required to present their Bureau of Engineering I.D. card to enter areas restricted by roadblocks, security guards, etc. It is imperative that employees who expect to have a need to enter restricted areas keep valid I.D. cards in their possession at all times. Identification requests are to be made by the Division Head to the Administrative Services Division.

  If any appropriately authorized employee is refused access to a restricted area, they should immediately contact their emergency supervisor, if possible.
## ALTERNATE EMERGENCY REPORTING LOCATIONS

### For Major Emergencies

Where normal telephone service is not available and/or travel on the street or freeway system is severely limited, the following Public Works Yards are designated as alternate emergency work locations:

<table>
<thead>
<tr>
<th>Yard Name</th>
<th>Address</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harbor Yard</td>
<td>1400 N. Gaffey St.</td>
<td>San Pedro</td>
</tr>
<tr>
<td>Southwest Yard</td>
<td>5860 S. Wilton Pl.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Venice Yard</td>
<td>2000 Abbot Kinney Blvd.</td>
<td>Venice</td>
</tr>
<tr>
<td>East Yard</td>
<td>452 San Fernando Road</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>N. Hollywood/Studio City Yard</td>
<td>10811 Chandler Blvd.</td>
<td>N. Hollywood</td>
</tr>
<tr>
<td>Sunland Yard</td>
<td>9401 Wentworth St.</td>
<td>Sunland</td>
</tr>
<tr>
<td>Reseda Yard</td>
<td>6015 Baird Ave.</td>
<td>Reseda</td>
</tr>
<tr>
<td>Granada Hills Yard</td>
<td>10210 Etiwanda</td>
<td>Northridge</td>
</tr>
<tr>
<td>Asphalt Plant #1</td>
<td>2484 E. Olympic Blvd.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>North Sewer Maintenance Yard</td>
<td>2335 Dorris Place</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Street Lighting Yard</td>
<td>4550 Santa Monica Blvd.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>N. District Maint. Yard (Van Nuys)</td>
<td>14832 Raymer St.</td>
<td>Van Nuys</td>
</tr>
</tbody>
</table>
4.4 First Aid

Some Survey personnel have had first aid and rescue breathing training. This training conforms to the “Red Cross” program. However because some personnel have not been trained and the training may not be up to date, specific first aid procedures will not be detailed.

In the event of a sickness or injury, follow the procedures in Section 2.0 “Personal Injury and Accident reporting”.

**Note:** Every Survey Vehicle is equipped with a complete “First Aide” kit. Each kit is sealed and dated. If the seal is broken, the kit is to be inspected using the “First Aide” kit “Item Checklist” (Appendix E1). Seal and date the kit with masking tape after inspection.

4.5 Motor Vehicles

Specific rules for Survey Division vehicles

- **Backing Up:**
  When backing up any Survey vehicle, one member of the crew shall stand to the rear of the vehicle and assist the driver, keeping eye contact with the driver at all times. When there are no passengers, the driver will get out of the vehicle and check clearance behind the vehicle prior to backing up.

- **Cone at Rear of Vehicle:**
  The driver of the survey vehicle shall place a cone at the rear of the vehicle, on the traffic side after parking to prevent parking and backing-up accidents. Immediately prior to departure, the driver should circle the vehicle (circle of safety) and pick up the cone checking for any obstacles or safety concerns.

- **Fire Extinguishers:**
  Fire extinguishers are supplied for each Survey vehicle. The driver and passengers should be aware of its location, operation and condition.

- **Storage of Equipment:**
  All tools and equipment being transported should be stored in a secure area. Any equipment being transported in the passenger compartment shall be secured to insure that passengers will not be injured by flying objects in the event of a sudden stop or accident.

Drive at a speed that is reasonable and proper, with due regard for the size and weight of the vehicle. At all times keep a safe distance from the vehicle in front of you.
4.5-1 General rules for safe operation of City vehicles are as follows:

- All employees of the Survey Division must have a valid California driver’s license in their possession at all times.
- The driver and all passengers shall wear safety belts at all times while in a City of Los Angeles vehicle.
- The driver shall be responsible for the safe driving condition of the vehicle. All vehicles shall be inspected for safe operating conditions each morning prior to being put in to service.
- Any unsafe condition must be reported to the supervisor and remedied prior to vehicle use.
- Unauthorized persons shall not be permitted to ride in City vehicles.
- Vehicle headlights shall be turned on when driving in rainy or foggy weather.
- Cell phones or other distractions shall not be used while driving a vehicle.
- All Vehicles are to be “Safety Checked” monthly using the “Monthly Vehicle and Equipment Safety Checklist”. (Appendix E5)
- All vehicles are to have a complete and sealed “Vehicle Accident Report Envelope”. (Appendix E1)

4.5-2 Use of amber warning lights and emergency flashing lights

Definitions:
- Amber warning lights-Rotating amber lights and other types of flashing amber lights
- Emergency flashing lights-Factory installed flashing lights on all survey vehicles.

When to use:
- **Amber warning lights:**
  The vehicle is parked in the center median or on the right shoulder in the immediate vicinity of the work and for short periods of time.
  The vehicle is moving against traffic (Do not drive vehicle against traffic except as a last resort).
  To warn traffic that the vehicle is slowing to enter a median, shoulder or lane closure, or to re-emerge from those areas back in to traffic.

**DO NOT USE AT NORMAL HIGHWAY SPEEDS.**

**DO NOT USE AS A SUBSTITUTE FOR ARROW SIGNS.**

Emergency flashing lights:
- The vehicle is parked on the right shoulder during periods of restricted visibility; for example, at night or in foggy weather.
- The vehicle is parked within an established lane closure.
- The vehicle is moving within an established lane closure.
4.6 Off-Highway Vehicle Operation

Occasionally, survey crews have to operate trucks or four-wheel drive vehicles off of the paved road and in rough terrain. The following safety procedures should be observed:

- When driving vehicles through rough terrain, seat belts should be fastened securely to keep body from bouncing, wear a hard hat to protect head from roof and door frame. Hold the steering wheel firmly, but do not allow fingers or thumbs to wrap around the wheel: steering wheel spokes have caused broken thumbs and sprained wrists.
- In crossing deep ditches, use the lowest gear and four wheel drive if available. When you reach the bottom, accelerate enough to keep rolling as you go up the other side.
- When ascending hills do not travel diagonally. The danger lies in losing traction and slipping sideways with the possibility of tipping.
- Yield the right of way to stock animals, hikers and trail bikers.
4.7 Appropriate Work Clothing and Personal Protection (see individual responsibilities - 1.12)

- Wear appropriate clothing and footwear for the job. Use good judgment and common sense.
- Any alternative clothing, such as the wearing of shorts, and/or alternative foot wear shall have the daily approval of the district office supervisor prior to beginning the work period. Some projects such as construction and railroad work will require long pants, boots and a hard-hat.

**Note:** Changing job conditions warrant that any employee choosing to wear shorts must have a pair of long pants available while at work. Any employee choosing to wear alternative footwear must have a pair of ankle high boots available at all times while at work.

**SAFETY VESTS WITH THE CITY OF LOS ANGELES SEAL, ISSUED BY THE CITY OF LOS ANGELES SURVEY DIVISION, MUST BE WORN AT ALL TIMES WHILE ON THE JOB SITE**

- Work boots or high-top leather shoes with non-slip soles should be worn to protect against snakebites and other hazards in rough terrain and on construction projects. Lace type boots are preferred because they afford more ankle support. (Shin guards are also available).
- In areas of poison oak and insects (ticks):
  a) Long sleeved shirts should be worn
  b) The product *Tecnu*, or its equivalent, should be used before and after entering potential poison oak areas.
  c) If necessary, disposable coveralls can be obtained through the survey supplies at Piper Technical Center.
  d) When working in tick infested areas, be sure to thoroughly check clothing and body for ticks.
  e) White paper jump suits are available through Central Survey Supply.
- Gloves shall be worn when employee safety requires them.
- Safety goggles or eye shields shall be worn where potential eye hazards exist.
- Hard-hats shall be worn where workers are subjected to the hazard of falling or flying objects or where required on any construction site or by Contract Administration. All work done within 20 feet of Railroad tracks requires a Hard-hat.
- Ear protection shall be worn when required by the Safety Engineer. Work at airports requires this protection.
- Wading and mud boots are available for use in water operations.
- Sleeveless shirts shall not be worn at any time during working hours.
- Use toe protectors when lifting M.H. lids or when using the digging bar. Employees wearing steel-toed boots should continue to use caution during these activities.
5.0 Surveying in or near traffic

5.1 General Procedures

- Maintain the maximum space that can safely be achieved between moving traffic and your work area. This includes shoulder work as well as working in the traveled roadway.
- Face the traffic whenever feasible. If it is not possible to face the traffic, a lookout should be used.
- Move deliberately: do not make any sudden moves that might alarm or confuse a motorist and cause an accident.
- Signal cautiously: Whenever feasible, use radio communication. Carefully and deliberately use surveying hand signals so they will not startle or confuse motorists or be mistaken for a flagger’s direction.
- Avoid interrupting traffic flow: Minimize crossing traffic lanes and never run across traffic lanes.
- Distractions to motorists: Minimize working in traffic when the attention of motorists may be diverted from surveying work by other ongoing activities. Some of these may include: traffic accidents, construction operations, children getting out of school or movies being filmed.

5.2 Lookouts

While working on foot on or near the traveled roadway, workers should normally be protected by adequate cones and high-rises. A lookout person should be used whenever one or more persons will be working and cannot watch traffic on their own. The lookout should be:

- Standing up at all times to warn the other crew members of any impending traffic hazards.
- Constantly in communication with crew members.
- Aware of the intended movements and actions of the crew members.

5.3 Flaggers

A flagger is a trained person who gives motorists, pedestrians, and cyclists exact instructions, enabling them to move through temporary traffic control zones safely. Flaggers should be carefully chosen because they are responsible for public safety as well as the safety of the Survey Party. Flaggers should be used anytime two-way traffic must share the same lane because of work in other lanes.

Traffic Control using Flaggers:

- Flaggers shall be used where barricades and warning signs cannot safely control traffic.
- Flaggers should be logically placed in relation to the work area and survey equipment so as to give adequate warning to the motorists and being approximately 100 feet ahead of impact point.
- Flaggers should be equipped as shown and specified in the “Work Area Control Handbook” or “W.A.T.C.H.” whenever possible.
5.4 Protective Vehicles

Protective vehicles may be used as a protective barrier whenever a situation warrants. There are two types of protective vehicles:

- **Barrier Vehicle**: A vehicle, usually unoccupied, which is parked between oncoming traffic and a stationary work site.
- **Shadow Vehicle**: A vehicle with a light bar which follows a survey operation moving in the direction of traffic.

5.5 Temporary Traffic Control

Temporary traffic controls are used to establish a “working area-of-protection” for employees.

**Methods of traffic control include use of:**
- Portable warning/control devices such as cones, hi-rise etc.
- Prescribed procedures (see *W.A.T.C.H. Manual* and “*Manual on Uniform Traffic Devices*”).
- Personnel such as lookouts and flaggers.

**General**
- The currently available edition of the Work Area Traffic Control Handbook, *(W.A.T.C.H.)*, shall be kept in all Survey vehicles and consulted as a guide. As most Survey jobs are temporary job-sites, it is impractical to set up the equipment exactly as outlined in the manual. Survey activities on roadways shall be planned and scheduled to minimize interference with traffic flow and maximize employee safety.
- Activities in arterial streets shall be planned and scheduled to minimize interference with traffic flow. Except for emergency situations, no work shall encroach into moving lanes of traffic ((The Survey Manual also outlines safety in section J 170.)
- Another good reference (very detailed) for working in traffic is the” *Manual on Uniform Traffic Control Devices*” for streets and highways “Part 6”. This is published by the “Federal Highway Administration” and available on the internet. A copy should be kept in each office.
- Before entering upon any street or highway to perform work, all members of the survey party shall discuss the nature of the job and the traffic patterns to determine the proper type, quantity and placement of traffic control devices required. If the work area is deemed unsafe for either the safety devices on hand or the personnel on your crew, the Party Chief should ask for additional personnel and/or safety equipment.
5.5-1 Traffic control procedures:
After a decision is made as to how to safely set up the work-site, two persons should place the cones and the high-rises in their positions. After placing the warning devices, a visual check should be made to ensure safe traffic flow before beginning survey work in the street.

Safety Vests:
- All personnel working in roadways or construction sites shall wear safety vests.
- Employees shall ensure the vest is kept in usable condition.
- Reflective vests shall be worn during night work.

Traffic Cones and Delineators:
- Cones or delineators shall be a minimum of 28 inches high and should be spaced at 15 foot intervals at a 20’ taper in the transition area where traffic is being shifted and at 50 foot intervals at other locations. Refer to the W.A.T.C.H. manual.
- Traffic cones may be used to direct traffic around work areas.
- Cones used as delineators for night use must be adequately reflectorized or illuminated.
- Temporary lanes should be a minimum of 10 feet in width for vehicles to safely get by the work area.
- High level warning devices (High-Rises) shall be used where survey work is being performed within or immediately adjacent to a traffic lane. High-Rises should be protected by a minimum of two cones. (Per the "WATCH" Manual)
- The "WATCH" manual states that high-rises should be a minimum of 150' from the impact area.
- However well placed high-rises at each end of the job may be our best choice.
- In some cases only one high-rise may be appropriate.
- On curved streets high-rises should give enough warning for cars to slow down well before they get to your work area.
- High-rises should be a minimum of eight feet high (per the “WATCH” manual). However this is not always possible due to truck traffic and wind.
- High-rises should be set up as high as possible with a minimum of three flags.
- Traffic signs must be authorized and furnished by the Department of Transportation.
- Survey vehicles, when not being used for traffic control, should use off-street parking areas whenever possible. All warning devices, survey sights and other equipment placed upon a traveled roadway should be removed as soon as possible when not in use.
- Never kneel or squat below the eye level of motorists on any roadway unless protected by adequate traffic control. The “buddy” system shall be practiced when working in roadways.
6.0 Specialized Survey Work and Situations

6.1 Confined Space

Working in a confined space may be a regular part of your job, or it may be a one-time situation. Always think of confined spaces as potentially dangerous. Confined spaces include, but are not limited to, the following: Silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, storm drains, pipelines, vaults, bin, tubs, and pits.

Confined Space can be defined as:

- A space that is large enough and so configured that an employee can bodily enter and perform work.
- Has a limited or restricted means of entry or exit, (e.g. maintenance holes have limited means of entry).
- Is not designed for continuous employee occupancy.

There are two levels of training that personnel in the Survey Division could be required to take:

- Permit Required Confined Space (Permit Space) entry:
  This type of training is provided by the specific project that requires “Confined Space Entry”. Survey Division employees may not enter any area deemed a “Confined Space” without specific training.

- Alternate (Non-Permit) Confined Space entry:
  This training can be provided by the Survey Division and limits the entry of the physical body to the upper most 24 inches of the maintenance holes. Prior to entry, assigned employees shall be trained as required in Title 8, California Code of Regulations (CCR), General Industry Safety Orders, Section 5157 (GISO5157) and The Survey Division Confined Space Operations Program (See Appendix C1)

6.2 Sewer and Storm Drain Safety Precautions:

Guidelines/Precautions for Lifting Maintenance Hole Covers

1. General rule #1: Except for Smoke Testing, Sewer Gauging and setting Maintenance Hole Monuments it is not necessary to test for explosive gases before lifting a M.H. cover.

2. General rule #2: No one will break the plane (reach into an access structure) until they have been trained for confined space entry. (See Survey Division Confined Space Operations)

3. General rule #3: Do not smoke or use any lighted materials near open M.H. structures.
6.3 Lifting M.H. Covers:

Special safety precautions need to be taken when opening and lifting M.H covers. Many M.H. covers may be “stuck” shut due to debris, dirt or an asphalt seal. Some M.H. covers are “locked” and require the lid to be twisted or turned in order to lift the lid. These guidelines should be followed to prevent injury:

- Wear safety goggles and steel toe boots whenever raising M.H. covers. (Knee pads are also recommended)
- Provide adequate safety equipment to secure an area large enough to work with a digging bar and/or pick.
- When chipping the asphalt around the M.H. rim, protect passing vehicles from flying asphalt chips.
- If a chisel and hammer is used, a lookout person must be standing and watching traffic while you are kneeling or bending down.
- Strike the M.H. cover only near the rim, never in the center. (M.H. cover could shatter)
- Inspect M.H. hook for bad welds prior to use.
- When the cover is loose, use a M.H. hook to lift with.
- Keep your back straight and lift with your legs. Lift straight towards you and don’t twist your body.
- When the lid is loose, pull away from the M.H. opening using your legs.
- The lid should not be pulled toward traffic.
- The M.H. hook should not be left sticking out towards the traffic or toward the work area.
- All tools should be kept away from traffic and in a place that will not cause tripping.
- Prior to replacing the M.H. cover, clean off the area that the rim will rest on.
- Pull the M.H. cover over the opening using the same pulling method shown above.
- Do not leave debris (broken asphalt pieces in roadway). This could cause damage to vehicles.

**Note:** When a locked M.H. is encountered, it must be turned in order to “unlock” and lift the Lid. This will require two persons and two M.H. hooks. Special care should be taken to prevent back injury.
6.4 Smoke Testing (Required on rare occasions)

A. Protective clothing and equipment:
   All smoke-testing personnel are to wear appropriate eye and skin protection while performing their tasks. Although the smoke-testing program is currently inactive, periodic requests do come in for this activity. The Survey Section will continue to follow all safety practices described herein.

Appropriate eye protection includes safety goggles, safety glasses, and/or clear plastic face shields of the type worn by gardeners or while using grinding wheels. Appropriate long sleeve clothing and gloves will help protect the skin. Smoke bombs are no longer used. However, these guidelines are proven, safe practices and will continue to be in force.

Note: All Survey crews working on projects requiring opening of Sewer Maintenance Hole lids for the purpose of smoke testing will test for explosive gases prior to opening the structure. See Appendix G.

6.5 Working in Tunnels:

The Survey Division has been involved in numerous large tunneling projects. Tunnel training is job specific and is normally provided by the project requiring the work. Confined space training would normally be part of this training. No employee may enter a tunnel without approved tunnel training.

Channels, Trenches, Tunnels, Bridges and Buildings:

1. Tool bags and ropes shall be used to safely lower tools into trenches or tunnel shafts.
   No materials or tools will be dropped into these areas at any time.
2. Employees should always face the ladder or scaffold when ascending or descending.
3. Hard hats shall be worn on construction projects.
4. Tunnel Safety Instructions:
   Refer to "Tunnel Safety Orders" Subchapter 20, Chapter 4 of "Title 8 - Industrial Safety" State of California with particular attention to the following sections.
   a. All employees working in tunnels shall be instructed in safe tunnel procedures and shall read "Safe Practices and Operation Code" which is Appendix A of "Tunnel Safety Orders".
   b. First Aid Training: All Survey Party Chiefs and at least one other person on each tunnel crew shall have had First Aid training within the past two years and be competent to give proper emergency treatment.
   c. Tunnels classified as potential gassy or gassy, under Article 8 - "Tunnel Safety Orders", shall require permissible equipment and gas monitoring by a certified gas tester.

Most electronic survey equipment has not been certified as permissible by the U.S. Bureau of Mines and should be checked for compliance.
6.6 Railroads:

No member of a Survey Party may work within twenty feet of a railroad track without **Railroad Safety Training**. Different railroad organizations provide their own specific training. (Southern Pacific Railroad and Metro-Link may not accept each others training). Normally the project requesting the Survey will provide the training. Railroad training is usually valid for one year. A card or sticker for your hard hat is often issued. Flag-persons provided by the Railroad are often required. They are in contact with the trains and can provide advanced warning.

Some general rules for working in Railroad right of ways are:

- Safety vests are required at all times (no red colors may be used)
- Hard hats are required at all times
- Long pants are required at all times
- Approved boots are required at all times
- Steel tapes across both rails may activate signals; support tapes across rails at all times.
- Avoid the color red. Red means danger to trainmen. No red vests or clothing should be worn. Red markers paint and lights should be avoided.
- Never crawl under or walk between stopped cars. They could be bumped at any time.
7.0 Field Surveying Safety

7.1 Brush and Tree Cutting Safety

Misuse of sharp-edged tools can cause serious injury. It is imperative that survey party members follow safe procedures. Some general rules for brush cutting safety include the following:

- Always use sharp edged tools.
- Party members using sharp edged tools shall always maintain a safe distance from each other.
- Safety goggles should be worn.
- When walking through brush, cutting tools should be sheathed if possible. Special care should be taken whenever cutting tools are carried.
- Maintain a safe distance between party members when walking through dense vegetation or brush. Beware of rebounding branches that can cause eye injuries. Eye protection should be worn.
- Beware of sharp protruding branch stubs.

7.2 Fences and Walls

- Avoid climbing fences whenever possible.
- If a gate is available, walk the extra distance to use the gate.
- Never attempt to climb fences, walls or other obstructions while carrying instruments.
- When it becomes necessary to go over a chain link fence, have other party members assist you by providing steps using the digging bar or shovel extended through the links. This should be done at a fence post. Care should be taken not to cut your hands and arms on the protruding wire at the top of the chain link fence.
- Wherever possible, go through or over a barbed wire fence at the middle of the span where slack in the wire can be obtained. If it becomes necessary to climb a barbed wire fence at the post, be sure the staples are secure and that the post has not rotted.
- Rock walls can house spiders and snakes. Be alert when working near or climbing these structures.
- On concrete block walls, test the caps first to make sure they are not loose. Use ladders if available.
7.3 Lifting Heavy Objects (General)

Some general rules to apply:
- Keep your back straight while lifting.
- Lift with your legs.
- Make sure that you have a good grip on the object being lifted or the tool that you are using to lift with.
- Never twist your body while lifting or carrying a load.
- Don’t over lift. Get help if you need it.
- Never carry loads that prevent you from seeing where you are going.
- Be aware when carrying large or long objects to prevent striking others.

Note: See Confined Spaces “Lifting M.H. Covers” for additional safe lifting procedures. Section 6.3

7.4 Hot Weather
- To avoid sunburn, wear a shirt and long pants; light colored clothing is preferred.
- Wear a hat when working in the sun.
- Drink plenty of water, but avoid excessive quantities.
- Avoid overexertion.
- People with a history of sunstroke should avoid doing field work during hot weather.

Heat Exhaustion Signs: Cool, moist, pale or red skin; heavy sweating; dilated (large) pupils; headache; nausea; dizziness and weakness; exhaustion; and normal or below normal body temperature.

General First Aid
- Get person out of heat and into a cooler place.
- Place victim on back with feet elevated
- Loosen or remove persons clothing
- Cool victim by fanning and applying cold packs or wet towels.
- Give victim ½ glass of water every 15 minutes if conscious
- Care for shock.
- Call EMS if needed
**Heat Stroke Signs:** Hot, red, dry skin, very high body temperature (can be as high as 106 degrees F.) progressive loss of consciousness: fast, weak pulse; and fast, shallow breathing. This is an immediate and life threatening emergency.

**General First Aid**

- Call EMS system for help (911) immediately.
- Get person out of heat and into a cooler place.
- Treat for shock.
- If conscious offer cool water to drink ½ glass every 15 minutes.

**7.5 Cold Weather**

Although cold weather is rarely a serious matter in Southern California, there are times that may require sufficient clothing to protect against the cold. Every employee should be prepared for situations

**7.6 High Voltage Lines**

- The use of surveying rods or range poles under high voltage lines is very dangerous. It has been shown that electricity can arc from high voltage lines. Even the use of wooden rods can be dangerous in damp conditions.
- Use clean, dry, wooden rods when surveying beneath power lines. At no time should the rod be within ten feet of the lowest wire.
- Never attempt to directly measure the height of electrical transmission lines with a rod. Reflector-less methods or triangulation should be used.
7.7 Poisonous Plants

Preventive measures should be taken before and after possible exposure.

- **Urushiol** is a chemical irritant found in many plants in all parts of the United States. The plants, commonly known as poison oak, poison ivy and poison sumac, can cause skin eruptions on all parts of the body. The plant known as poison oak is found in Southern California. Poison oak is deciduous, but can still cause skin eruptions while dormant.

- Persons known to be highly susceptible to urushiol should be assigned to areas known to be free from poison oak.

- Symptoms of contact with poison oak vary from mild skin eruptions to extreme swelling and itching of the body, often causing eyes to swell shut and requiring hospitalization. These symptoms usually begin several hours to as much as 48 hours after initial contact. If the infected area is scratched, the fingertips become infected and can spread the infection to other parts of the body. Urushiol easily soaks through clothing.

- Recognition of poison oak and avoiding contact is the best way to avoid the problem. See below:

*Poison oak is a deciduous (loses leaves in winter), woody plant that can have a shrub or vine form. In open areas under full sunlight, poison oak forms a dense leafy shrub usually 1 to 6 feet in height. In shaded areas, such as in coastal redwoods and oak woodlands, it becomes a much taller climbing vine, supporting itself on other vegetation or upright objects by means of aerial roots.*

*Leaves normally consist of three leaflets with the stalk of the central leaflet being longer than those of the other two; however, occasionally leaves are composed of five, seven, or nine leaflets. Leaves of true oaks, which are superficially similar, grow singly, not in groups. Poison oak leaves are alternate on the stem. Each leaflet is 1 to 4 inches long and smooth with toothed or somewhat lobed edges. The surface of the leaves can be glossy or dull, sometimes even somewhat hairy, especially on the lower surface. In spring, poison oak produces small, white-green flowers at the point where leaves attach to the stem. Whitish-green, round fruit form in late summer. In early spring the young leaves are green or sometimes light red. In late spring and summer the foliage is glossy green, and later turns attractive shades of orange and red.*
DON'T TOUCH!!!!!!

• There are some products on the market including **Tecnu** that can be applied prior to exposure and after exposure that can lessen the effects of Urishiol. Check with the Survey Division Central Supply for the products available.
7.8 Bees, Wasps and Spiders

Bee or wasp stings:

Bee or wasp stings generally cause burning or itching with localized swelling. However some persons are allergic and more serious reactions can occur.

If stung by a bee or wasp:

- Remove stinger by scraping it away from the skin.
- Wash area with soap and water.
- Cover it to keep it clean.
- Apply a cold pack to the affected area.
- If dizziness, cramps, nausea, difficulty breathing or hives appear, the victim should be taken to a doctor immediately.

7.8-1 Spiders:

- Spider bites are normally no more than a nuisance. However in Southern California at least two types of spider bites can be dangerous.

Black Widows:

- Black Widows spin their untidy, but strong, webs in dark secluded areas. They may, therefore be found in hollow stumps, brush piles, long grass, hedges, or under rocks or woodpiles. Garages and outbuildings are common habitats.
- The adult black widow, including the legs, is about one inch or more in diameter.
- The entire body is usually a hard, shiny black color except for an orange to red hour glass shape on the underside or belly.
- The venom of the black widow is reputed to be proportionately fifteen times as poisonous as that of the rattlesnake. Fortunately there is much less of it to inject, and the bite is, therefore, not considered as critical as that of a rattlesnake.
- The typical sensation a victim experiences after injection of the venom is similar to that of a prick of a very sharp needle, which is followed by a burning sensation at the point of attack. The area immediately surrounding the wound usually becomes swollen and inflamed. In case of severe poisoning, pain is felt almost instantaneously and has been described as comparable to a current of electricity running through the arms and legs. Pain reaches maximum intensity in one to three hours and might persist for twelve to forty-eight hours before gradually subsiding.
Black Widows (Continued)

- The victim of a black widow’s bite should be kept warm and quiet. In order to prevent a second infection, a reliable antiseptic should be applied to the wound as soon as possible. An ice pack may be put on the wound to ease the pain and slow the absorption of the poison. The victim should be taken to a doctor that is close at hand. Contrary to popular belief, the black widow’s bite is rarely fatal.

7.8-2 Recluse Spiders

Recluse spiders are found all over the United States. In the Southern California area, they are rare. The “Desert Recluse” is the most likely variety that would be found in Southern California. All recluse spiders pose a danger and their bites should be attended to as soon as possible. The recluse is identified by only having six eyes, arranged in two pairs of three. Other spiders have eight eyes. If you are bitten by a recluse, you will develop a large raised red bump with a definite center. Usually it will become infected and the center will widen. See a doctor if these symptoms arise. Antibiotics will stop the infection. If not caught in time, scarring can occur.

7.8-3 Ticks and Lyme disease

Ticks are oval shaped bugs that have small heads. Their bodies are grey or brown and are not divided into definite segments. The tick attaches itself to the skin and sucks blood. It sometimes carries and spreads Rocky Mountain Spotted-Fever, Tularemia, Lyme disease, and Tick Fever. Ticks are found in long grass, low shrubs and trees.

To protect against tick bites:

- Cover exposed parts of the body when in tick infested areas.
- Periodically wipe the back of your neck with your hand.
- Inspect body and clothing twice a day to remove ticks.
- Don’t crush them with your fingernails because this may transmit disease carrying organisms to your skin.
Ticks (Continued)

First Aid: If a tick imbeds itself into your skin.
- Grasp tick with fine tipped tweezers, close to the skin, and pull slowly and firmly.
- Use plastic wrap, paper or leaf if you do not have tweezers.
- Do not try to burn tick off with a hot match or cigarette. Do not apply petroleum jelly or nail polish to tick.
- If you cannot remove tick, or if its mouthparts remain imbedded, get medical attention.
- Wash bite area with soap and water. Apply antibiotic ointment.
- If rash or flu like symptoms appear, get medical attention immediately.

7.9 Rattlesnakes

Precautions should be taken to minimize exposure to rattlesnakes

- Do not go into snake infested areas alone. It is very difficult to administer adequate first aid measures to yourself.
- Rattlesnakes are active mostly at night in warm weather. They hide during the hottest part of the day or when not hunting.
- Wear high boots or shin-guards in snake country.
- Keep hands away from areas that could hide rattlesnakes such as logs, rocks, brush piles, or rodent burrows.
- Be observant around places obscured by foliage and look carefully before you move rocks on the ground. Use extra caution when climbing a rock ledge and reaching for a hand-hold.
- Use a stick to rustle the bushes ahead of you and to the side to alert rattlesnakes and other animals.

First Aid for Snakebites:

- Call EMS system for help (911) or transport victim if EMS is more than 30 minutes away.
- Keep victim calm.
- Wash wound and keep bitten part still.
- Keep bitten area below the level of the heart.
- Splint the area if it is on an arm or a leg to keep it from moving.
- Carry a victim who must be transported or have them walk slowly.
- Do not apply cold to snakebite.
- Do not give aspirin to snakebite victim.
7.10 Animal Hazards

If confronted by a bothersome dog:

- Face the dog and stand still.
- Speak to him confidently; make friends if possible but don’t attempt to pet him.
- If this fails, retreat very slowly still facing the dog.
- If possible identify the owner of the animal.
- Try to arrange with the dogs owner to have vicious dogs chained or confined if you are working on private property.
- If bitten by a dog or cat, the Police and Animal Regulation should be contacted to report the animal bite.
- The pet should be confined by “Animal Regulations” for observation for ten days.
- A bite or wound should be washed thoroughly with soap and water. Get to a medical facility for further treatment which may include tetanus inoculation and anti-rabies serum.

7.11 Laser Hazard

Most Survey Crews are equipped with “Reflectorless Total Stations”. These instruments use Class 2 and Class 3A laser technology and require caution when in use. Every laser is a potential eye hazard. Laser hazard controls should be designed to minimize the opportunity for ocular exposure to direct laser beam or specular (mirror like) reflections. The controls should be reasonable, while not hampering the operation or creating a new hazard. Trained personnel shall operate laser equipped instruments **only**.

- Employees should avoid looking directly at a laser beam. Setups should avoid projecting the beam at normal eye levels. Electronic instruments that use infrared do not create eye hazards.
- Despite the potential hazards, they can be used safely if proper procedures and necessary precautions are followed. No employee other than trained persons should be permitted to work in an area where they could come into direct contact with a laser beam.
7.12 Water Operations

All work performed in or around water requires extra care during the operation. Additional safety equipment is also needed so as not to endanger the employee or the public.

- At least two life buoys or life rings with appropriate lines attached shall be kept in conveniently accessible and clearly visible places where the employees work exposes them to the hazard of drowning.
- Each employee so exposed, shall wear a life vest.
- Life lines shall be available in areas of water danger, such as protection from swift currents.
- Boats shall be used in a safe manner per the safe operating procedures of the U.S. Coast Guard.

Night Surveying

- Most hazards encountered in daytime operations increase at night when darkness limits visibility. All hazards become “hidden” hazards and are much more difficult to identify and neutralize. Safety must have the number one priority in planning of night surveys.
- When a survey requires night work, it is good practice to notify local law enforcement agencies as well as property owners. This enables law enforcement to be aware of the source and reason for the appearance of unusual lights and activity.
- When working at night in terrain with steep slopes and high bluffs or uneven terrain, party members should work in pairs. To guide personnel, all roads and trails to the work areas should be flagged with reflective material.
- Groups of party members should have radio equipment and be able to make contact with other groups in case of emergency.