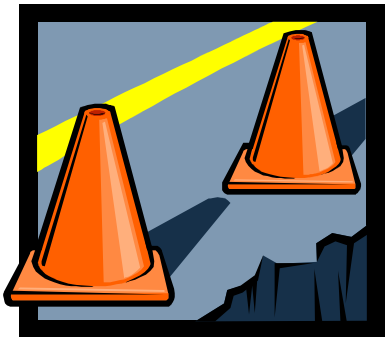
Scotts Bluff County

Public Works

Safety Manual



Revised 2012

Preface

This manual's purpose is accident reduction, elimination of unsafe practices and general safety consciousness of the Scotts Bluff County employee. The manual's intent is to identify potential hazards in the employee's work area and to remind employees and supervisors of their responsibilities.

This manual relies on the professionalism of each individual to put forth an example of competence and skill in the performance of their duties. No manual can cover every conceivable event, but this manual is meant to strengthen the notion that safety performance is an essential role of the job responsibilities for each and every position within Scotts Bluff County.

All Scotts Bluff County employees shall adhere to the current edition of the Scotts Bluff County Personnel Manual.

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A. Successful accident prevention requires a minimum of four fundamental activities

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2. A study of all operating methods and practices

3. Education, instruction, training and discipline to minimize human factors which contribute to accidents

4. Thorough investigations of accidents to determine contributing circumstances

II. ACCIDENTS ARE PREVENTABLE

A. Many persons believe that accidents are the inevitable results of unchangeable circumstances, fate or a matter of luck

B. Accidents do not happen without cause. The identification, isolation and control of these causes are the underlying principles of all accident prevention techniques

C. No person in a supervisory position can be effective in their job of accident prevention unless they fully believe that accidents can be prevented and constantly strive to do so

III. CAUSES OF ACCIDENTS

A. Causes of accidents are divided into three (3) major categories

1. Unsafe acts of people

2. Unsafe physical or mechanical conditions

3. Acts of God (flood, hurricanes, etc.)

B. Statistics indicate that 88% of all accidents are caused by unsafe acts of people, 10% by unsafe conditions and 2% by acts of God. Obviously the greatest percentage of accidents is caused by unsafe acts; therefore, emphasis of any accident prevention program would be on the elimination of these unsafe acts.

IV. UNSAFE ACTS

A. The majority of unsafe acts of persons may be assigned to one or more of the following classifications:

1. Failure to follow instructions or proper job procedure

2. Cleaning, oiling, adjusting or repairing equipment that is moving, electrically energized or pressurized

3. Failure to use available personal protective equipment such as gloves, goggles, hard hats, vests, etc.

4. Failure to wear safe personal attire

5. Failure to secure or warn

6. Improper use of equipment

7. Improper use of hands or body parts

8. Making safety devices inoperative

9. Operating or working at unsafe speeds

10. Taking unsafe position or posture

11. Unsafe placing, mixing or combining

12. Using tools or equipment known to be unsafe

13. Driving errors

14. Horseplay

B. Unsafe acts are brought about by:

1. Lack of knowledge, skill, coordination or planning

2. Improper attitude

3. Physical or mental defects

4. Temporary lack of safety-mindedness at time of accident

V. UNSAFE CONDITIONS

A. Most unsafe or hazardous conditions can be grouped into one or more of the following classifications:

1. Defective, inferior or unsuitable tools, machinery, equipment or materials

2. Hazards of surroundings (poor housekeeping)

3. Hazardous methods or procedures

4. Placement hazards (person not mentally or physically compatible with job requirements)

5. Inadequate guarding of machinery, equipment, work areas, etc.

VI. CONTROL OF ACCIDENT CAUSES

A. There are three main methods utilized in the control of accident causes

1. Engineering: Environmental causes of accidents, or unsafe conditions, can be eliminated through the application of engineering principles. Machines are less apt to fail than people. It may be necessary to make mechanical revisions or modifications to eliminate existing unsafe conditions and, in some cases, to prevent unsafe acts. Design of machine guards, automobile brakes, traffic signals, pressure relief valves and hand rails are varied examples of safety engineering at work.

2. Education and Training: Just as safety engineering is the most effective way of preventing environmental accident causes (unsafe conditions), safety education is the prevention of human causes (unsafe acts). Through adequate instruction, employees gain useful knowledge and develop safe attitudes. In addition to education, safety consciousness will be supplemented by specific instructions

in safe working habits, practices and skills. Training is a particularly important accident prevention control, as it gives each individual a personal safety tool by developing habits of safe practice and operation.

3. Enforcement: Usually accidents can be prevented through adequate safety engineering and education; however, there are some people who are a hazard to themselves and others because of their failure to comply with accepted safety standards. It is these persons for whom the strict enforcements of safety practices are necessary, backed by prompt corrective action. No organized accident prevention effort can be successful without effective enforcement, because accidents are frequently the direct result of violations of safety principles. This is particularly true of vehicle accidents, many of which are caused by unsafe acts that constitute traffic law violations. Department heads and supervisors are responsible for enforcing safety standards and regulations. Failure to do so would be condoning conduct that leads to preventable accidents.

B. To be completely effective, accident prevention controls cannot be applied to "hit or miss". All engineering, education, training, supervision and enforcement measures will be directed toward the solution of specific problems based on collection of facts relating to unsafe acts or unsafe conditions.

VII. ELIMINATION OF UNSAFE CONDITIONS

A. One of the most effective means of preventing accidents is the elimination of unsafe conditions. To preach safety while permitting unsafe conditions to exist is bound to create an obstacle to cooperation required from employees. The supervisor must take the initiative in these matters without need for instructions from higher authority. If the elimination is beyond the supervisor's scope of authority, they must bring the matter to the attention of their immediate supervisor or to the head of their department.

B. Following are some of the procedures that should be carried out to eliminate unsafe conditions

1. Remove all obstacles and impediments to the safe movement of personnel, vehicles or machines

2. Repair damaged floors, broken steps, broken glass, cracked walls and ceilings

3. Replace worn or damaged tools

4. Provide proper equipment for the hoisting and movement of heavy objects

5. Install guards for moving parts of machinery, fans, etc.

6. Provide protective equipment such as goggles, hard hats and safety vests

7. Insist on good housekeeping practices - remove debris, waste material and obsolete or useless equipment

8. Replace worn electrical wiring and fixtures

9. Post signs warning of hazards in certain areas

C. The important part of eliminating unsafe conditions is doing so BEFORE an accident occurs - the principle goal of the supervisor should be to search out hazardous conditions and eliminate them before they cause work interruption or bring injury. Too often an unsafe condition is allowed to exist simply because it has not caused an accident - yet. The job must be made as safe as possible.

VIII. CONTROL OF WORK HABITS

A. Regardless of the degree of safety built into a job, unsafe actions on the part of human beings will always be a cause of injuries. Teaching employees good work habits means showing them how to do their tasks

with less risk to themselves, less spoilage of materials and less damage to equipment. Much of this instruction can be narrowed down to a few simple principles or job rules. By concentrating on these, by showing the "why" as well as the "how" and by constant supervising to correct promptly, safe work habits can obtain acceptance by employees.

B. Whenever possible, actual demonstration of correct and incorrect performance of tasks should be conducted, accompanied by the basis for preferring one work habit to another. The initial instruction is just as important as the vigilant observation on subsequent performance. When the proper operation has been presented and agreed to by the individual worker, it is essential that failure to comply should be noted.

C. It may be necessary to insist that a certain step be repeated or a job be redone to emphasize the importance of safe practices by the department. Flagrant or repeated disregard of safety rules should be met with appropriate disciplinary action up to and including discharge. No matter how skillful an employee may be in performing their duties, if they do not perform them safely they are not considered a worthy employee.

IX. SAFETY ORIENTATION OF NEW EMPLOYEES

A. When a new employee comes to work they immediately begin to learn things and form attitudes about the job, their supervisor and fellow employees. If their department head, supervisor and fellow employees appear to be unconcerned about accident prevention, the new hire will most likely believe that safety is unimportant.

B. To form good safety attitudes, the new employee must be impressed by everyone's concern with the prevention of accidents at the time they begin their duties. They must be told that unsafe workers will not be tolerated and that they will be required to obey safety rules and instructions, wear protective equipment whenever necessary and attend safety meetings in order to remain employed by the County.

C. It shall never be taken for granted that previous experience and apparent qualifications means that the new employee has learned to do the job the safe way. For example, a driver's license plus years of driving experience does not automatically exempt a newly hired vehicle operator from being thoroughly instructed in safe driving practices - they must be made aware of what is expected of them in the capacity of operating a County vehicle, and they must be checked to ensure that they understand.

D. The supervisor will review safety rules and procedures with the new employee, pointing out possible hazards involved in doing the job. The new employee should be assigned to work with a safety-minded employee during the first few weeks. The new employee should be checked at frequent intervals, asked about any problems that may have arisen and reminded of safe practices. Any tendency to overlook safety procedures should bring a prompt and vigorous warning.

SECTION II

GENERAL SAFETY

As the title implies, this section of the manual will contain subsections dealing with safety guidelines pertaining to all of the Public Works Department. Employee dress and behavior, shop and office safety, and vehicles and equipment that are used on a common basis by Public Works Department employees are focused on. Also covered are hand and power tools that employees of the Department will use as part of their day to day activities.

I. SAFETY RULES FOR EMPLOYEES

A. Attire

1. Recommend that field employees wear hard-soled foot protection, at least ankle high with toe protection

2. Shorts or cut-offs are not allowed. Shirts are required

3. Safety wear, such as gloves, vests, hard hats, respirators, ear protection and safety glasses will be worn as the situation demands

4. Keep pockets free of objects that could poke or cut

5. When working around moving equipment do not wear ties, loose fitting clothing, rings or watches, which can get caught by said equipment

B. Intoxicants and narcotics

1. The use of drugs and alcohol prior to or during working hours is strictly prohibited

2. Supervisors will not allow an employee to work if that employee reports to work while under the influence of narcotics or alcohol

C. Conduct

1. Horseplay, practical jokes and intentional misuse of equipment is prohibited

2. Employees are expected to develop and maintain a safety attitude at all times

3. Don't let on- and off-job personal problems detract from safety awareness

4. Never use unsafe shortcuts. The only correct way to perform a job is the safe way

5. When working or walking on a busy street, do so facing traffic if at all possible. Wearing a safety vest is required when working under traffic, on arterials or at night

D. Proper lifting techniques

1. Inspect the area around the object and the route over which it will be carried

2. Inspect the object to determine the best way to grasp it

3. If the object is too heavy to lift alone, get additional help

4. Make a preliminary heft to make sure the load is within your lifting capability

5. Set your feet solidly and well apart with one foot slightly ahead of the other

6. Crouch as close to the object as possible

7. Keep the spine as straight as possible. Do not arc your back

8. Grip the object firmly, lifting one end slightly. Grip it firmly so it will not slip

9. To lift the object, straighten legs, keeping the spine as straight as possible

E. Employee safety orientation

1. Each employee will keep a current address and phone number on record with the Public Works Department. It is the employee's responsibility to update these records

2. Each employee will receive training in the use of the Public Works Department Safety Manual

3. Employees shall review all sections of the manual pertaining to their job periodically

4. Supervisors are responsible for arranging training on the details of this manual with new employees and answering any questions they may have

II. ACCIDENT REPORTING

A. All accidents

1. All accidents must be reported regardless of size or nature

2. Accident report forms are available at the Public Works office

B. Traffic accidents

1. If involved in an accident with privately owned vehicle or other property, stay at the scene until a police officer arrives

2. Make NO statements about the accident to anyone other than a police officer or supervisor

3. An automobile loss form must be filled out as well as all accident forms required by law

4. Personal injury to the employee will require a First Report of Injury Form

5. All employees involved in a vehicle accident will be immediately taken for drug and/or alcohol testing

C. In-house accidents

1. In-shop accidents involve County property only. No police investigation is involved unless there is personal injury

2. A First Report of Injury Form will need to be filled out

D. Personal injury accidents

1. Accidents which require medical attention must be reported on a First Report of Injury Form

2. Accidents not serious enough to require medical attention will be reported on a First Report of Injury Form. Should the accident be more serious than originally thought and require later medical attention, Worker's Compensation forms may be filled out later, provided a First Report of Injury form was submitted at the time of the accident

III. GENERAL EQUIPMENT OPERATION SAFETY RULES

A. All equipment operators must:

1. Abide by traffic laws

2. Adjust the speed of the vehicles to driving conditions. Clear windows and mirrors frequently during inclement weather

3. Use extreme caution when backing, changing lanes, exiting alleys or any situation where a blind spot becomes a factor

4. Use your turn signals, beacon lights and flashers

5. ALWAYS WEAR YOUR SEAT BELT. FAILURE TO DO SO MAY RESULT IN DISCIPLINARY ACTION

6. Maintain the unit in a safe condition. During daily walk around inspections check doors for proper operation, service and park brakes, headlights and turn signals, mirrors and tires. If the vehicle's safety is suspect, remove the key and report it immediately to a supervisor. Minor defects should be reported on a Vehicle Inspection Report

7. Do not exceed manufacturer's vehicle weight specifications or weight restrictions imposed by law

8. Never work under an elevated piece of equipment, such as a dump box, unless such equipment has been securely blocked or propped. Never leave an unsecured piece of equipment unattended

9. Store equipment or tools carried on vehicles (when not being used) in compartments or securely fastened by other means

10. Never fuel a vehicle while smoking or while the engine is running

11. Do not ride on the outside of a moving vehicle, on a trailer, motor grader, front-end loader, motorized mower or similar equipment, except as the operator. Never ride in a dump or pickup box

12. Make sure that running boards, steps and handrails are clean and in good condition before climbing into or out of a unit. Always use the steps and handrails. Never leap out of a vehicle

13. Do not operate a unit unless you are certain you can operate that unit in a safe manner. A determination on an employee's operating capability will be made by the district supervisor

14. Remove keys from unattended equipment parked at a job site or other public location. Failure to do so invites theft, vandalism and

poses the possibility of use by unauthorized persons, such as children starting and moving such equipment

15. Be constantly aware of overhead power lines or low ceilings whenever a truck box is to be raised or a piece of equipment is extended beyond normal height

16. Keep floorboards free of debris which might interfere with pedal operation

17. Drive defensively - look out for the other guy

16. Cell phone use while operating equipment is prohibited

IV. SPECIALIZED EQUIPMENT COMMON TO THE PUBLIC WORKS DEPARTMENT

A. Front end loaders

1. Lower the bucket to the ground before dismounting the machine

2. Keep all four wheels on the ground at all times

3. Keep bucket low when moving, especially with a loaded bucket. This gives the loader operator better vision and the loader better balance

4. Avoid working on an incline whenever possible

5. Do not dig from vertical banks higher than the loader's reach. This could cause undercutting and poses the threat of the bank collapsing

6. Stay away from bank edges where the footing is soft or where the bank could collapse

7. Don't make sudden brake stops with a raised or loaded bucket

B. Backhoes

1. Do not operate the control levers while standing on the ground

2. While operating, the stabilizers must be in the down position. Where possible, the loader bucket must also be lowered

3. Retract the stabilizer and bucket before transporting the backhoe

4. Do not swing the bucket over personnel or vehicle cabs when loading

5. Be aware of underground utility locations before digging. Perform a one-call service in advance

C. Gradalls

1. Do not reach into gradall boom holes unless booms are securely anchored together

2. Do not swing the bucket over workers or equipment

3. Do not stand on the deck while the machine is being operated

4. Keep the unit on as level an operating surface as possible to reduce the possibility of tip over

5. Beware of underground utility locations before digging. Inform the utility company or companies in advance by calling the Digger's Hotline, (800) 331-5666

D. Trailers and trailering

1. Trailer jack stands and tongues must be in sound working condition

2. Trailer ramps and deck must be kept free of mud or other slick elements and must be in sound working condition

3. Trailers must be securely attached to the towing vehicle with both hitch and safety chains

4. Tail light hookups must be used

5. When transporting equipment, be especially cautious of low overhead clearance

6. Material or equipment being trailered must be secured with chains, chain tensioners or other securing methods

7. Reduce speed when trailering, especially over rough areas such as railroad tracks

8. Loading and unloading equipment is perhaps the most dangerous aspect of trailering. Be certain that vehicle wheels are squarely on the ramps and that the trailer is secured in place. DO NOT take shortcuts

9. Block trailer wheels after disconnecting and parking to avoid unexpected rolling or movement

10. When backing up to a trailer, don't put your body in a position where it can be pinned between vehicles. Get another employee to work with the truck driver in backing up and hooking up procedures. Keep feet clear, should the trailer tongue drop by accident

E. Dump trucks

1. A spotter should be used whenever possible when backing a truck

2. Whenever possible, trucks should park at a loading position so that the loading machine does not swing over the cab

3. Dump trucks shall not be driven with the dump box raised unless it is a required part of the job at hand

4. Make certain that the end gate is released when dumping to avoid upending

5. Make certain that the end gate is locked when hauling material
6. Rocking a truck to loosen its load is dangerous and hard on equipment

7. When entering or exiting a dump truck use hand holds and steps. Use care not to strike your head on the cab guard overhanging the cab

8. Never “coast” or drive a truck out of gear

9. Material being hauled must be covered or loaded in such a fashion so as not to blow or fall out of the dump truck

10. Never stand in the area under a raised dump box unless it is propped or blocked

11. When parking, the unit should be left in gear with the park brake set

12. Use extreme caution when changing lanes or any other driving activity which may involve the unit’s blind spot

F. Motor grader safety

1. Operator must remain seated while operating the grader. Never run a grader standing up

2. When plowing snow, keep the moldboard laid forward

3. Use seat belts at all times

4. When the moldboard is side shifted for blade replacement or other servicing, it should be supported to avoid injury from the blade unexpectedly falling and at least one other person shall assist

5. DO NOT attempt to change a grader blade, mount or dismount a grader blade alone. GET HELP

6. Graders are notorious for poor rear visibility. Use extra caution when backing

7. Be constantly aware of potential hazards. High manholes, curbs and other unseen items are proven hazards. A grader blade might strike a fixed object three times before the operator can release pressure on the drive train

8. Use steps and grab bars for entry and exit

9. Lower raised equipment when the machine is not in use

V. HAND AND POWER TOOL SAFETY

A. Non-powered

1. Tools with mushroomed heads or split handles should NOT be used. Heads must be firmly attached

2. Hoes or rakes will be laid down with tines turned down

3. Sharp edged tools should be kept sharp and NOT carried in pockets

4. All tools should be properly stored when not in use and NOT left lying around to pose a tripping threat

5. Jacks will be in good operating condition and need to be the correct size for the job. Jacks should be placed on a firm, level footing

6. Use the correct tool for the job. Pliers are NOT wrenches, screwdrivers are NOT chisels, etc.

7. Eye protection is recommended while driving nails, chiseling or any activity that involves flying debris

8. Be alert for the presence of other employees in the vicinity while using hand tools

9. Above all else, remember that a tool is not being used properly if it poses a threat to the user or bystander

B. Power tools and equipment

1. Electric saws

   a. All portable electric tools should be grounded

b. Keep track of the electric power cord so as not to cut through it

c. All guards provided with electric tools will be kept on the tool and NOT wedged back out of use

d. Saw operators must use eye protection

e. Use pusher sticks when cutting short stock

f. Never leave a saw running when the job is complete or if the saw will be unattended

g. Radial saws shall be fitted so that the blade cannot be pulled out beyond the edge of the cutting table

h. DO NOT wear loose fitting clothing when sawing

i. Cutting tables will be of adequate size to handle the material being cut

j. Use the proper blade for the job

2. Bench grinders and portable grinders

a. Grinding wheels must be securely attached and in good condition

b. The use of machine guards, eye protection and gloves are recommended

c. Work shall be done in such a way that prevents the finger from being brought into contact with the wheel. Keep both hands on the object being ground

d. Cracked or otherwise defective grinding wheels must NEVER be used

e. Additional information may be found in the Equipment Management section of the manual under the heading "Welding Shop"

3. Drills

a. Use the proper bit for the material being drilled

b. Provide a center punch or pilot hole for the drill bit

c. Stock should be secured to prevent spinning

d. DO NOT exert undue pressure on the drill. This could cause the bit to bind and the drill to turn in your hand

e. Protect against damage on the hidden side of the work by using a depth guide

f. Keep extremities clear and wear eye protection. DO NOT wear loose clothing

C. Pneumatic tools and equipment

1. Impact wrenches

a. Should NOT be used with cracked or otherwise defective attachments

b. Use only at manufacturer's recommended P.S.I.

c. Air couplings must be in good condition

d. Use only sockets designed for impact wrench use

2. Jackhammers

a. Recommend use of ear and eye protection

b. Due to the weight of the jackhammer, proper lifting techniques must be used

c. Should the blade become stuck, release the jackhammer from the blade and use another jackhammer setup to free the stuck blade

d. Couplings and hoses must be free of defect to insure against the air hose coming loose and whipping wildly

e. Do not cut the air hose with the blade

f. Keep hands and feet clear of the blade and jackhammer chuck

g. Wear steel toed shoes

3. Hand tamps

a. Pad the leg against which the tamp rests

b. Keep your feet clear. Do not tamp your foot

c. Air hose couplings must be in good condition

d. Wear steel toed shoes

4. Sandblaster

a. At least two employees are needed to operate

b. Wear approved sandblasting headgear and heavy gloves. DO NOT expose any body areas

c. Check the face plate of the headgear to make sure there are no obstructions to vision

d. Be aware of your surroundings. NEVER point the nozzle at people, or articles you do not wish to sandblast

e. One employee should stand by the sandblaster to shut it down quickly in case of emergency. All other personnel should stand well away from the area

f. DO NOT sandblast the supply hose by accident

5. Portable air compressors

a. Require proper towing techniques (See Trailering)

b. Shut off valves must be in good condition

c. Any accessories such as tamps, jackhammers or air hoses must be put away or secured before transporting the compressor

D. Portable electric generators

1. Should be secured while using as they have a tendency to vibrate a good distance

2. Be careful not to run extension cords through water puddles to avoid the threat of electrocution

3. Nearby employees should stand clear when starting. Should a pull cord break, it could cause the loss of an eye or other injury

VI. ROPES, CABLES AND CHAINS

A. General safety

1. Never stand or work under an object being lifted, supported or held in place by ropes, cables or chains

2. Guide lines are to be used for the positioning of objects suspended by cables, ropes and chains. These will be attached before the object is raised with enough length to insure worker safety if the object should fall

3. When pulling or towing, never straddle the line being used. Stand far enough back so that if the line breaks, it would not strike you

4. When running a tow line between two objects, clear the area of any item which would prevent the tow line from pulling in a straight line

5. Bent hooks must not be straightened and put back into use. They must be replaced

6. Safety hooks or clevises will be used where the possibility of a hook being snagged or falling off exists

7. Put tension on a line slowly. DO NOT jerk or snap it

B. Ropes

1. Ropes must NOT be used when they are damaged, frayed or rotted

2. Use gloves when handling moving rope

3. Rope must be properly dried after being wet. Failure to do so can result in rotting and subsequent loss in strength

4. Knots reduce rope strength by 50%

5. Never attempt to use rope for heavy jobs suited to the use of cable or chain

C. Chains

1. DO NOT use chain when kinked or twisted

2. Chain which has been stretched beyond its original length can lose strength and must be replaced

3. Bolts must NOT be used to fastened chain links together

4. Chain is less reliable than cable or rope because it can break without warning

D. Cable

1. The use of gloves is recommended while handling wire cable

2. Cable should NOT be allowed to kink

3. Cables which are frayed or damaged will NOT be used

4. Properly fitted wire cable is the strongest of the three pulling and lifting lines

VII. OVERHEAD UTILITY LINE SAFETY

A. Common types are electrical, telephone and cable television lines

1. Lines are normally hung at a height of not less than 15 feet over streets and alleys

2. The voltage carried, distance between poles and anticipated type of traffic under the lines are determining factors in the height at which these are suspended

3. Services to homes and businesses may be found at heights less than 15 feet

B. Dangers to personnel

1. The greatest hazard associated with contacting an overhead line is death or serious injury caused by electrocution

2. Contact could be made with hand-held devices such as screeds or surveyor's poles or from a raised machine bucket or raised dump body

3. Since all lines may appear alike to the untrained eye, assume that all are dangerous. This includes ANY downed lines

4. Interrupted service, expensive repairs to damaged lines and the possibility of fire started by sparks are also negative aspects of accidental overhead line contact

C. Employee Safety

1. Avoid contact with overhead lines at all costs

   a. Lengthy tools, especially conducive metal types, should be used around power lines ONLY when there is no possibility of overhead line contact

   b. Crew leaders are responsible for the safety of the crew members in this regard

   c. Operators must be certain that adequate clearance exists before raising a dump body, loader bucket or other machine extremity in an area where overhead lines are present. Damage caused by this type of contact is subject to disciplinary action

   d. Operators must be constantly alert for lines which may be hanging below normal height for any reason. These should be reported immediately

2. In the event of accidental line contact

   a. Remain in the vehicle until qualified personnel determine that a safe exit is possible

   b. All line damage, obvious or suspected, must be reported at once

   c. All downed lines will be treated as dangerous. Avoid contact of any kind and warn any bystanders to stay clear

3. Emergency first aid

a. Treat injured parties only if they can be treated safely. In a situation where a live power line is lying on or near a victim, the risk of electrocution is equal for the rescuer. DO NOT make two victims

b. A long, dry, non-conductive object such as a wood pole can be used to separate the victim from the electrical contact

c. Use the quickest means of communication available to gain access to the "9-1-1" system

VIII. UNDERGROUND UTILITY LINE SAFETY

A. Common types are electrical, telephone, cable TV, natural gas, water and sewer system lines

1. Aside from the expense involved in repairs and property damage, water and sewer system lines would generally not be considered life threatening if ruptured

2. Lines are generally buried at depths of 18" or more, though occasionally these lines lay just below ground level

3. It is virtually impossible to determine the presence of underground lines with the naked eye. For example, there may be buried electrical lines even though there are overhead electrical lines at the same location

4. Before digging by hand or with a machine, call the Digger's Hotline, (800) 331-5666, 24 hours in advance so that the depth and location of lines can be marked

B. Dangers to personnel

1. Electrocution can result from contact with buried electrical lines either by hand tools or machines

2. All cable type lines should be treated as dangerous since these may appear similar to the untrained eye

3. Natural gas lines pose the threat of fire, explosion and injury by inhalation when ruptured

4. Interrupted service, expensive repairs and damage or injury to people and property can result from digging without first contacting the utility

C. Employee safety

1. Working around buried utilities

a. A spotter will be used when machinery is involved, especially when the operator does not have a good viewing angle

b. Care must be used when hand digging around lines so as not to gouge or otherwise damage lines. A shovel could be a direct conductor of electricity should it be driven into an electrical line. A spark could be deadly around a damaged gas line

c. See Section VI, Specialized Equipment, Rapid ram, for information on backfilling around utility lines

d. DO NOT work in a utility cut where the smell of gas is present or where bare wire is found

e. Crew leaders are responsible for the safety of the crew

2. In the event of line damage

a. Report damage immediately, especially if natural gas is involved

b. Stay clear of damaged lines

c. When natural gas lines are involved, clear the area. DO NOT start a vehicle, light a match or create a spark of any kind. Keep bystanders and traffic away

d. When the situation is potentially life threatening contact “9-1-1” by the quickest means possible

3. Emergency first aid

a. Electrical shock will be handled as given in Section II, Subsection II, Subsection VII, Subheading C, Part 3

b. Natural gas incidents can result in injury by inhalation or by explosion and fire. Give First Aid for burns, breathing stoppage and shock as the situation requires

c. Move a victim only if it is safe for the rescuer to do so. Movement may be necessary to place the victim where it is safe to start First Aid

SECTION III

SHOP SAFETY

A Public Works shop is the base from which working operations begin. As such, it is a location which deals with a set of safety problems aside from all others. Foot and vehicle traffic are concentrated into a relatively small area, which increases the possibility of accidents. In this section the requirements for a safely run shop, yard and office area are covered.

I. SHOP AREA SAFETY

A. Sanitation

1. Floors must be kept free of litter, dirt and debris

2. Grease and oil spills should be treated with Hi-Dri or another absorbent compound

3. Employees must be especially careful of footing on wet floors. Puddles of water should be squeegeed off to promote drying

4. Trash containers must be emptied on a regular basis and maintained in an orderly fashion

5. Work benches and tool storage areas must be kept orderly and clean

B. Storage

1. Gasoline, oil and other flammable material shall be stored in proper containers and NOT be left in open containers around the shop

2. Hoses such as air, water, etc. will be properly coiled and stored so as not to pose a hazard

3. Tools should NOT be left lying around to pose a hazard

4. Any acidic or toxic materials must be stored in closed containers and clearly marked as such

5. Containers with lids should be used for the storage and disposal of greasy or oily rags

6. Any piece of equipment, item or tool in the shop area will be stored in an orderly manner to pose the least amount of interruption to normal foot and vehicular traffic

7. Each container shall be clearly marked stating its contents

C. Vehicle traffic

1. Observe speed limits - usually 15 mph in the yard and 5 mph in the shop area

2. Never assume that an open garage door you are entering is going to stay open. Slow down and sound the horn before passing through

3. When closing a garage door, look inside and outside to be certain that another vehicle is not about to pass through

4. Equipment should be parked in an orderly fashion to expedite rapid exit in case of a fire

5. Keys should be left in vehicles parked in shops unless parked for mechanical reasons

D. Shop safety environment

1. Shops should be well lit

2. Shops should be well ventilated to avoid the possibility of carbon monoxide poisoning, especially during winter months

3. Employees should know the location of fire routes and fire doors

4. Employees should be familiar with the fire alarm system if the building is so equipped

5. Employees should know the location and proper operation of fire extinguishers

6. Gasoline or diesel fuel should NOT be used as a cleaning agent. Use a non-flammable solvent

7. Shop maintenance repairs will be made by authorized Maintenance personnel or hired professional help from outside the Public Works Department. This applies to situations where things such as high voltage, natural gas-powered appliances or other potentially lethal repairs are involved.

8. Floor grates should be kept clean and in good repair and kept flush with floor surface

9. Smoke only in designated areas

E. Lockout - tag out procedures

1. Equipment that is in need of repair must be parked and personnel must employ lockout - tag out procedures

   a. Remove the key from the machinery to be repaired

b. Affix the lockout tag and key in a conspicuous place, i.e. a door handle or steering wheel, using a zip tie

c. Disconnect battery terminal

d. Notify personnel in the area that the equipment is out of order and not to be started or moved

e. Perform repairs as necessary

f. Safety gear must be used, such as eye protection

g. Be sure to remove lockout tag once repairs have been completed

II. YARD SAFETY

A. Outside storage

1. Stockpiles should be maintained in an orderly fashion

2. Any stored item or material should be stacked or stored in a safe and orderly fashion

3. Items listed above should be stored in a location that would cause the least amount of disruption to normal traffic flow

4. Vehicles parked both temporarily and permanently on the property must be parked to allow access to the building, in & out of the building so as to cause the least amount of disruption

5. Employees' personal vehicles must be parked in designated parking areas only. NO personal vehicles are allowed to be parked inside any Public Works Department building

B. Outside yard maintenance

1. Driveways and sidewalks should be kept free of excessive amounts of loose gravel, mud, dirt or debris

2. Driveways and sidewalks should be kept free of ice and snow during the winter months

3. Outside lights should be maintained in good operating condition, especially in high activity areas such as the salt domes

III. SAFETY IN THE OFFICE AND ADJOINING AREAS

A. Foot traffic

1. Transport carts or dollies should NOT be left in hallways. If they must be left temporarily, they should be parked close to a wall but away from doorways and intersections

2. Loose carpet, bad floor tiles or any other problem which poses a potential tripping hazard should be reported for repair

3. Handrails should be used when ascending or descending stairs

4. Approach corners and blind doors with caution. Keep to the right in corridors and at corners

5. Personnel must know fire escape routes and be familiar with fire alarm and fire extinguisher locations and also tornado shelters

6. If work must be done in an area on either side of a closed door, the door should be locked or notice given to potential door users that an employee is working in the area

B. Office equipment

1. Use scissors, paper cutters and other sharp items with great caution

2. Telephone and other power cords should NOT be left loose on the floor where they pose a tripping hazard

3. File drawers must NOT be left open while unattended

4. The heaviest file drawers should be located on the bottom

5. DO NOT open more than one file drawer at a time

6. File cabinets should be fastened together

7. Electrical office machines must be unplugged while servicing

8. DO NOT use unstable office equipment such as a swivel chair for climbing purposes

9. Defective and unsafe chairs and tables must NOT be used

C. Office and adjoining areas sanitation

1. Eating areas will be kept in a clean and sanitary condition

2. Restrooms and washroom areas will be provided for employees

3. Restroom and washroom areas will be kept in a sanitary state and will be stocked with soap and hand towels. These actions are necessary to discourage the spread of disease and parasites

4. Good hygiene should be practiced by all employees with consideration shown to fellow employees

SECTION IV

STREET AND HIGHWAY MAINTENANCE

Bridge and guardrail maintenance are dealt with in this section.

A properly placed guardrail can prevent a minor accident from becoming a potential fatality by protecting traffic from areas adjacent to the roadway which may contain steep drop-offs, ravines or ditches. Also included are overpass and bridge rails which are designed to keep errant drivers and pedestrians from falling from heights.

I. GUARDRAIL AND BRIDGE WORK SAFETY GUIDELINES

A. General safety

1. Guardrails must be maintained in sound condition at all times. Posts must be replaced when rotted, damaged or otherwise defective or deteriorated. Report any defect to your supervisor

2. Rails will be replaced when damaged or otherwise defective

3. Railing and posts that have been removed for repair or because of damage will be temporarily set up with barricades or restraint devices to minimize protection deficits

B. Personnel safety

1. Use proper moving and lifting procedures when handling material

2. Use extreme caution when working around heights or sharp drop-offs

3. Stay clear of the turning auger when drilling post holes

4. Protect the job site with a vehicle when working along streets with narrow shoulders or on bridges

5. Use scaffolding or hydraulic snorkel trucks for working at heights such as under a bridge. DO NOT lean over the edge. A static line tie-off is also recommended

6. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

C. Specialized equipment

1. Hand-held power augers

a. Two employees are required for safe operation. Hold the unit firmly. Be constantly alert. If a hidden obstacle is hit while drilling, the auger could bind and spin the grab handles, causing injury. Avoid wearing loose clothing

2. Scaffolding

a. Scaffolds must be designed to carry the weight expected and must be cross braced in two directions

b. Tie in scaffolds every eight (8') feet to a solid object if possible

c. All vertical scaffold members must be plumb and horizontal members must be level

d. Legs should be set on mud sills

e. Scaffold platforms must be a minimum of twenty (20") inches wide and a minimum of twelve (12") inches overhead on each side

f. Adequate entry/exit ladders will be provided

g. Scaffolds over six (6') feet tall will be equipped with guardrails

h. Scaffolds will be maintained in top condition and set up by trained personnel

i. Hanging scaffolds will be set up by trained personnel only and will be set up to carry four times the anticipated load

j. Scaffolds will be protected at ground level from vehicle traffic or anything else that could cause unexpected scaffold movement

k. Scaffolds should be moved only from ground level and only when no personnel are on the scaffold

SECTION V

PAVED ROADWAY MAINTENANCE

The Public Works Department has a goal to maintain paved surfaces in as near the original condition as possible.

The employees involved in this endeavor are exposed to a wide range of equipment and material, the majority of which has the capability to cut, burn, crush or otherwise injure people and property. These employees are also exposed on a daily basis to traffic, often on arterials with higher speed limits. It is for these reasons that paving maintenance is perhaps the stiffest test of a safety program.

This section has been divided into three parts: Breakout, Concrete Replacement and Asphalt Replacement.

BREAKOUT

I. PERSONNEL SAFETY GUIDELINES FOR HANDLING MATERIAL

A. Use proper lifting techniques when loading cut asphalt or concrete

B. Be aware of the other workers and equipment working around you

C. Asphalt and concrete pieces may have jagged edges or pieces of wire in them. The use of gloves is recommended when handling these materials

D. When shoveling, make sure that fellow employees are NOT in the path of the shoveled material or standing behind in the path of the shovel backswing

E. Stay behind the protection of barricades and equipment, especially in high volume traffic areas

F. Before lifting any material overhead, be certain that the material is solid. Some material, especially deteriorated asphalt, could break into pieces and fall on an employee's head

G. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

II. SPECIALIZED EQUIPMENT SAFETY

A. Concrete saws

1. Blade guards must remain in place while the machine is running

2. Saw blades must be secured so as not to come loose and cause injury

3. Steel blades should be kept from overheating by using the machine's water system

4. Don't attempt to lower the blade too quickly into the surface to be cut

5. Cut in a straight line. This will prevent the blade from binding

6. Use proper trailering guidelines

7. It is NOT recommended to use the saw on rough or uneven surfaces. This could cause blade binding

8. DO NOT leave a running concrete saw unattended

9. Above all else, keep hands and feet clear of the saw blade unless the machine is shut off

10. Eye protection is required. Hard hats, safety vests and gloves must be worn in construction areas

11. Support the saw to prevent tip-over while pulling the starter cord

B. Wheel saw

1. The use of respirators, ear protection and eye protection is required for all employees involved with wheel saw operations

2. Stay clear of the rotating cutting wheel and the area in front of the cutting wheel while the unit is running

3. All guards must remain in place while the machine is running

4. The machine wheels should be set on a level surface to eliminate the possibility of the cutting wheel binding

5. DO NOT attempt to force the cutting wheel into the paving surface too quickly. Stay within manufacturer's recommendation for the material being cut

6. The operator must be constantly aware of the machine's position in relation to the adjacent driving lanes. The nature of the wheel saw dictates that in most cases the unit will be crosswise on the roadway being worked on. In most cases, lane closures and flaggers will be necessary safeguards

7. The operator should disengage the cutting wheel gears whenever the unit is to be moved

8. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

CONCRETE PLACEMENT

I. PERSONNEL SAFETY GUIDELINES

A. Concrete finishing

1. Bare skin should NOT be exposed to fresh concrete for extended periods of time, as it may result in cement burns. Wash hands frequently and use a lanolin-based ointment to prevent skin cracking and possible infection

2. When using long wooden or aluminum screeds, be cautious of overhead power lines

3. Personnel are encouraged to wear knee pads or other knee protection

4. Protect the job site with a vehicle when possible

5. Personnel are encouraged to wear rubber boots when walking in fresh concrete

6. If fresh concrete gets into the eye, rinse it out immediately

7. Avoid breathing of cement dust as much as possible. Respirators are recommended when working with cement powder

8. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

B. Setting up

1. Rolled up wire mesh must be weighted on both ends once cut from the roll. Failure to do so could allow it to recoil and cause injury. The cut end on the wire roll must be secured to prevent unexpected unrolling

2. When chipping concrete from forms, eye protection is required

3. Use proper lifting techniques when lifting forms

4. When shoveling fill sand off a dump truck, be certain that the area below is cleared of personnel

5. When pulling fill sand off of a partially raised dump box, employees should stand far enough back that they are not knocked over should the entire load break loose at once

6. Hard hats, safety vests and gloves must be worn in construction areas

II. SPECIALIZED EQUIPMENT

A. Drum-type Concrete Trucks

1. Never put your hand into the open end of the drum while the machine is on or the drum is turning

2. Stay on walkways provided on the unit. Never try walking on a drum

3. Chute and accessories must be properly secured when in transit

4. DO NOT walk in the area under the concrete plant discharge chute

5. Follow the instructions of the crew chief when backing or moving on any job where other employees are present

6. Concrete removal from equipment will require the use of eye, ear and respiratory protection

7. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

ASPHALT PLACEMENT

I. PERSONNEL SAFETY GUIDELINES

A. Material Handling

1. Asphalt is an extremely hot, sticky substance, usually about 360°. Avoid contact with bare skin. Avoid standing in hot asphalt if at all possible

2. Be constantly aware of the location of fellow employees when raking or shoveling asphalt so as not to inflict injury

3. Asphalt rakes should be laid down with the tines down only

4. When burning asphalt buildup off of tools, use extreme caution as the possibility of fire is high

5. The use of gasoline is NOT recommended for cleaning purposes. Use diesel fuel or a non-flammable cleaning solvent

6. Only trained, authorized personnel will operate the asphalt plant. Remain in the truck at all times

7. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

SECTION VI

TRENCHING AND BACKFILLING

Any time that employees are required to work in a trench or utility cut, they are faced with a proven killer - the cave-in. In this section the safety requirements and the dos and don'ts of below-ground level work are laid out.

I. TRENCH & UTILITY CUT SAFETY

A. Physical conditions which promote cave-in

1. Pressure of ground water or surface water

2. Subgrades consisting of clay, loam, silt or any other unstable subgrade material

3. Material placed too close to the edge of the trench

4. Inadequate or non-existent shoring

5. Vehicular traffic close to the trench

6. Undercutting of the trench wall

7. Vibrations from trains or other nearby activity

8. Extremes in wet or dry weather

B. General trench and shoring safety requirements

1. Any trench or utility cuts more than five (5') feet deep or eight (8') feet long that an employee is required to enter must be shored or otherwise secured

2. Trenches or cuts to be secured by sloping will be sloped according to guidelines given in Table B-1

3. Cuts which cannot be secured by sloping the sidewall (such as cuts in paved streets) will be secured by shoring. Shoring requirements will meet those given in Figure B-1

4. Ladders or other means of exit will be provided in trenches more than four (4') feet deep and shall require no more than twenty-five (25') feet of lateral travel

5. Excavated material should be placed around the excavation to deter entry of surface water. All water must be removed from an excavation before employees begin work in the trench

6. Whenever working in a trench containing pipe of more than six (6') feet in diameter and in which the sidewall is to be sloped, a bench of four (4') feet minimum shall be provided at the toe of the sloped portion

7. Materials used for shoring must be in sound condition and should be placed from the bottom of the trench to six (6") inches above the ground line

8. Cross braces must be truly horizontal and spaced vertically and secured to prevent kick out or fallout. Braces will NOT be removed until all employees have cleared the hole. The use of ropes may be needed to safely remove these braces

9. When using aluminum foot plates, the hydraulic pressure should be taken to 1500 PSI and held momentarily to ensure stable footing

10. When an excavation is adjacent to a footing or foundation, they shall be underpinned or otherwise supported

II. TRENCHING AND BACKFILLING

A. Job site safety

1. Removed material should be placed between oncoming traffic and the excavation, but not close enough to the edge of the trench to cause a cave-in or for such material to fall back into the excavation

2. Care must be taken when operating equipment near an excavation. The vibration and weight of the machinery could cause a cave-in if it is too close to the trench edge

3. Machinery will NOT be operated overhead of employees who are in the excavation

4. Excavations will NOT be left exposed to traffic, foot or vehicle, while work is in progress or at any other time

5. Backfill material will NOT be pushed or dumped into an excavation while an employee is in said excavation

6. At the completion of a backfill operation, excess fill and other debris should be completely cleaned up, especially on paved roadways. A slippery surface and subsequent hazard could result if residual dirt is not removed from traffic areas

7. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

B. Specialized equipment safety

1. Rapid ram

a. The ram operator must exercise extreme caution when backfilling around underground utilities to NOT rupture or damage these lines. It is necessary to hand tamp the first lifts around these utilities

b. The ram operator's assistant can be used as a spotter when the excavation is too deep for the operator to clearly see the bottom of the trench

c. The ram operator must use caution not to tear or rupture the exposed hydraulic lines on the tamping head

d. Guidelines dealing with tractor-type equipment such as the rapid ram can be found in the "Specialized equipment safety" section under "Backhoe"

2. Backhoe

a. Call any the Digger's Hotline (1-800-331-5666) twenty-four (24) hours in advance before digging anywhere. Severed underground utility services pose a major health threat to employees and the public in general

b. When digging around underground services, use extreme caution and a spotter if necessary

c. Additional safety guidelines can be found in the "Specialized equipment safety" section of this manual under "Backhoe"

TABLE B-1[1]
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK TYPE A (2) TYPE B TYPE C	VERTICAL (90º) 3/4:1 (53º) 1:1 (45º) 1 ½:1 (34º)

Footnote(1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63º) is allowed in excavations in Type A soil that are 12 feed (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53º).

Footnote(3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

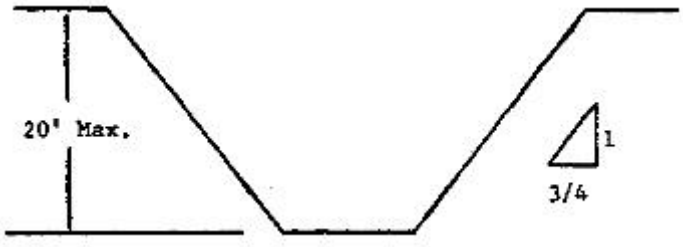
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

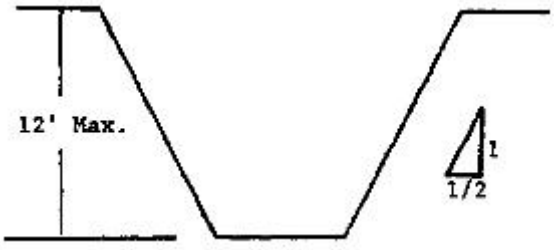
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of ¾:1.



SIMPLE SLOPE -- GENERAL

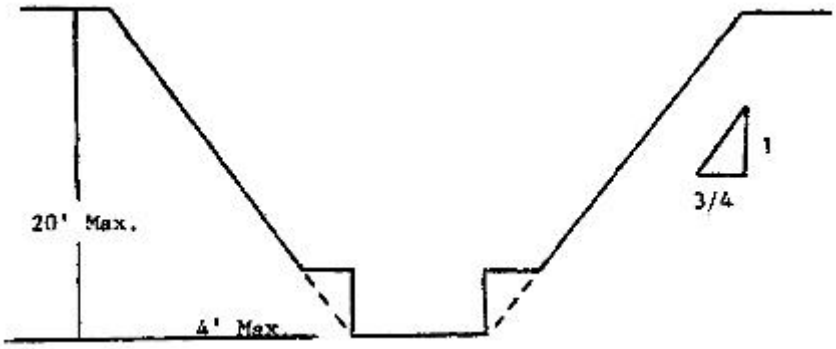
Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.



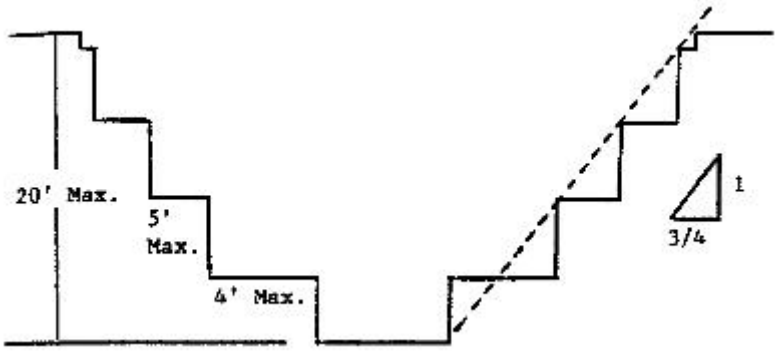
SIMPLE SLOPE -- SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

[1] U.S. Department of Labor, Occupational Safety & Health Administration, http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10932

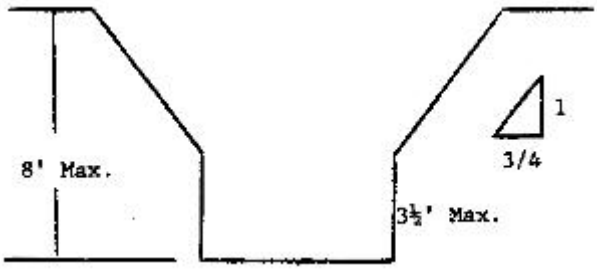


SIMPLE BENCH



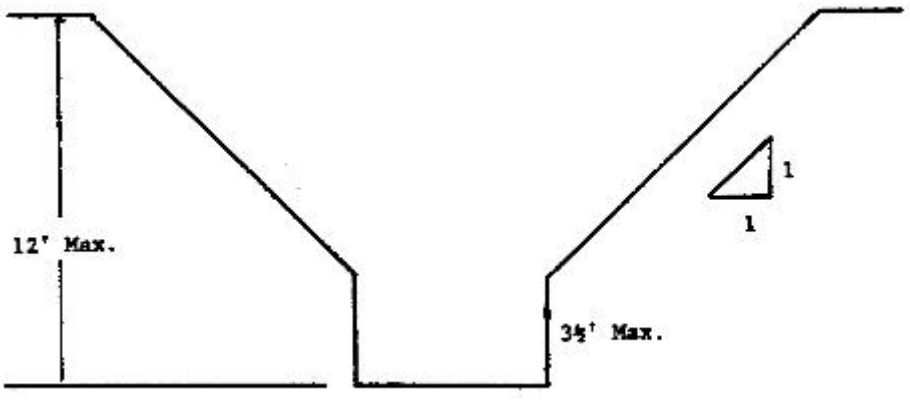
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



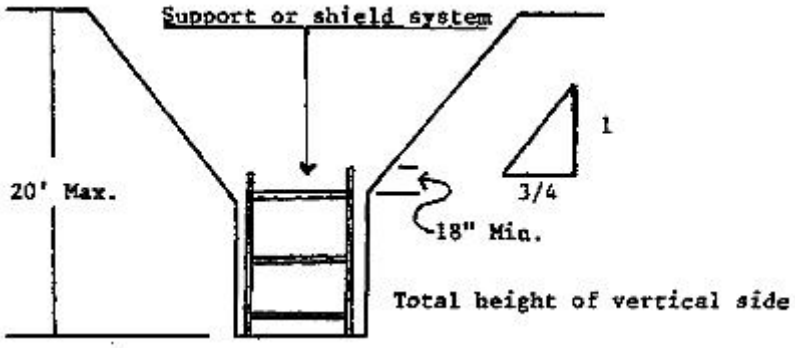
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 8 FEET IN DEPTH)

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 12 FEET IN DEPTH)

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

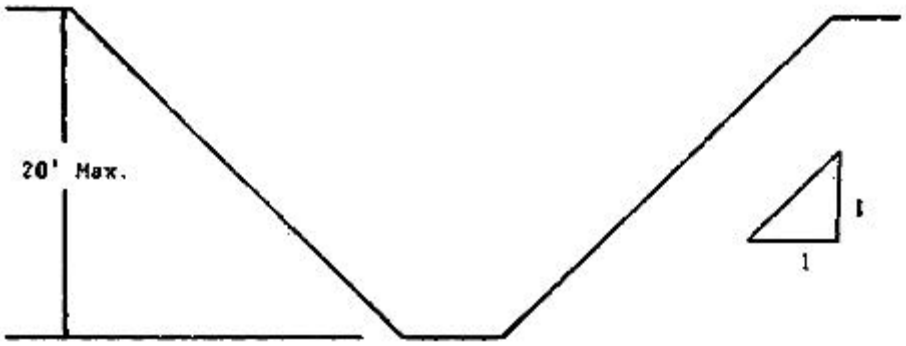


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

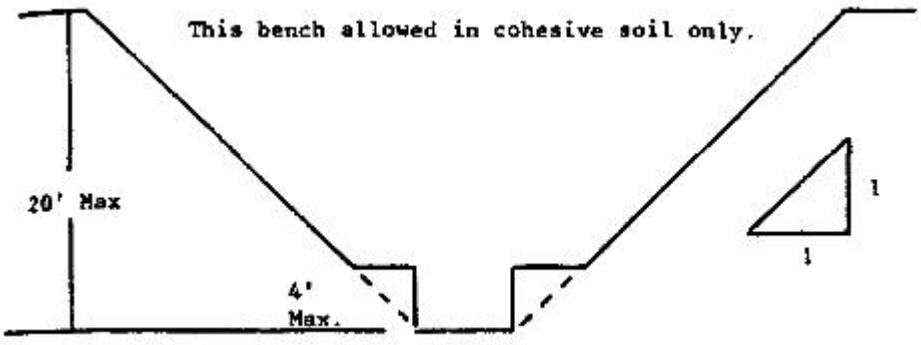
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

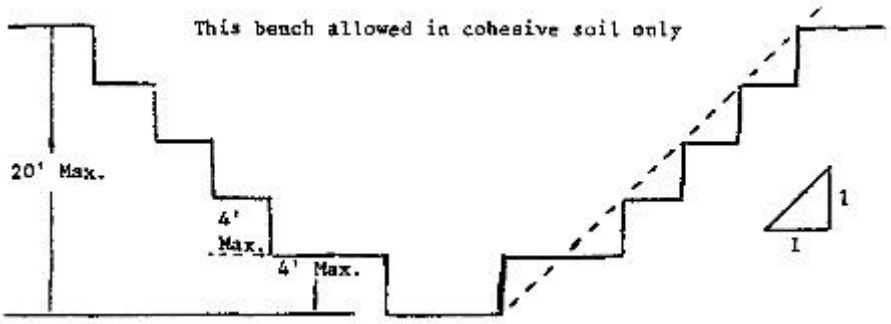


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

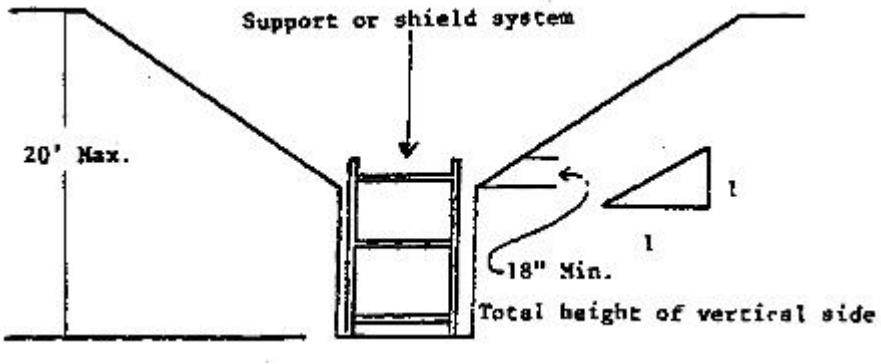


SINGLE BENCH



MULTIPLE BENCH

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

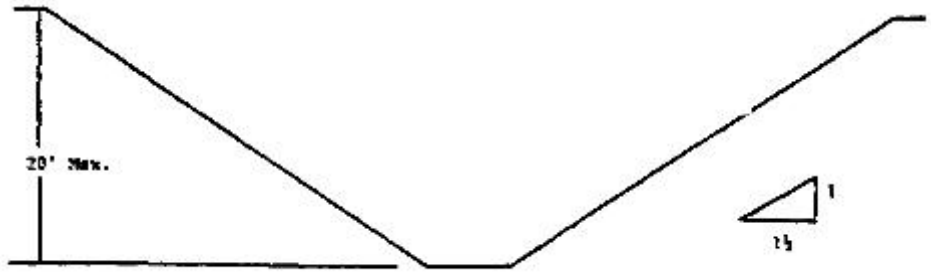


VERTICALLY SIDED LOWER PORTION

4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

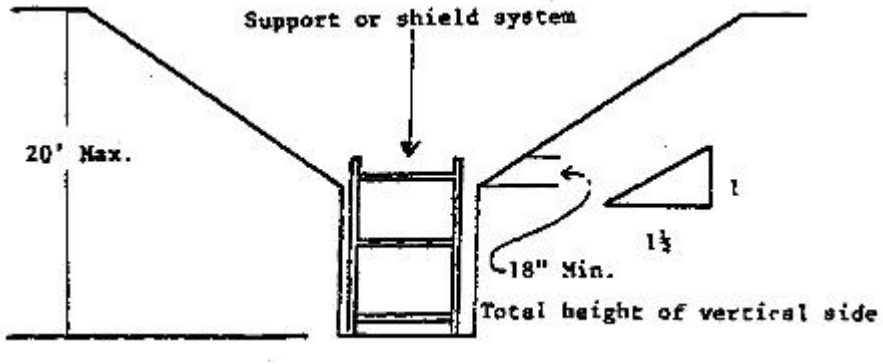
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

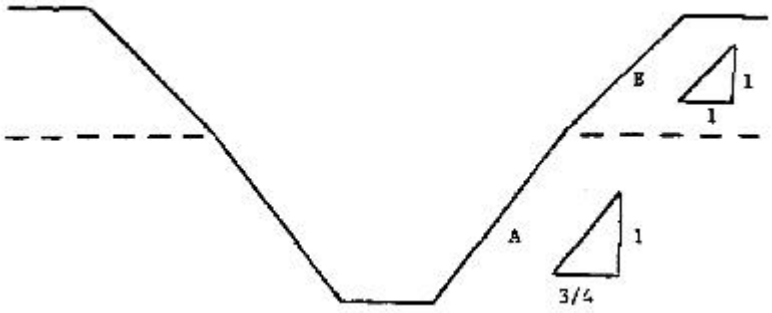


VERTICAL SIDED LOWER PORTION

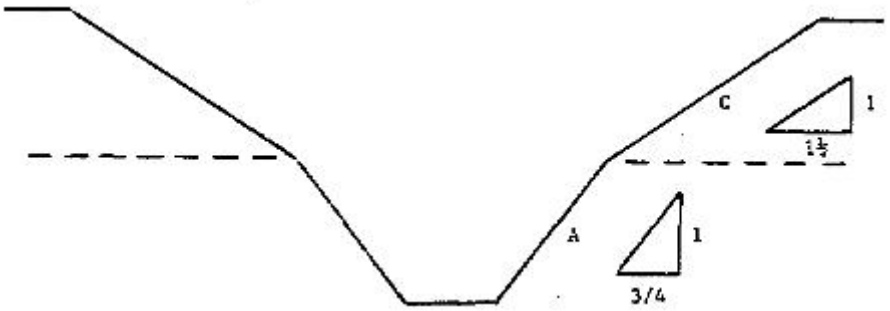
3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B-1.4 Excavations Made in Layered Soils

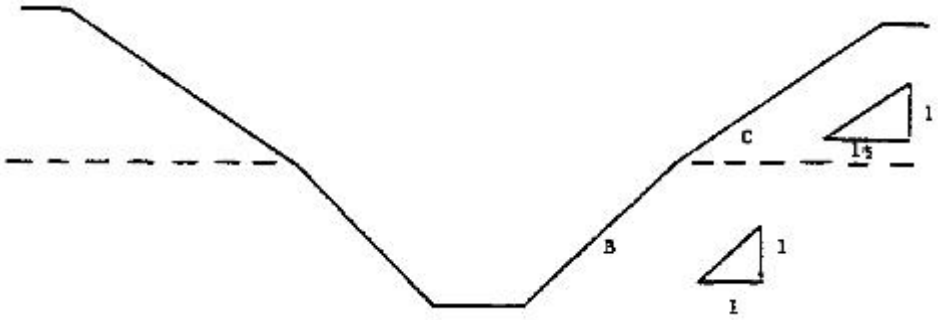
1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



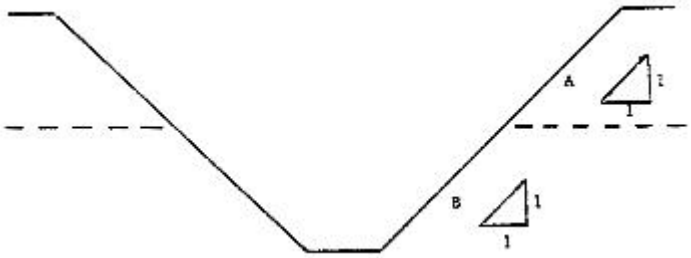
B OVER A



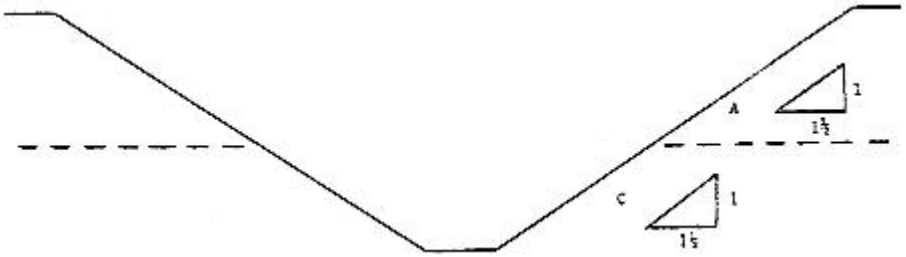
C OVER A



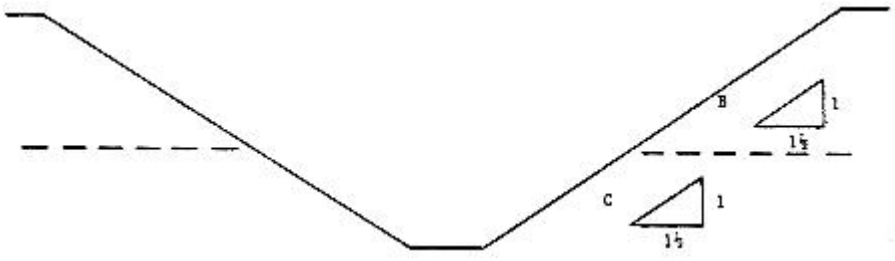
C OVER B



A OVER B



A OVER C



B OVER C

2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

SECTION VII

BARRICADING

Barricading is perhaps the most prominent of the Public Works Department's safety features. Barricading serves notice to foot and vehicle traffic that a potentially dangerous situation lies ahead and lays out a safe path around the hazard.

Barricade needs are as varied as the jobs that require the barricades. In most cases, a trained barricade technician will place the barricades, using acquired job skills and a thorough knowledge of the most current Manual on Uniform Traffic Control Devices (MUTCD). In this section, common barricading situations will be addressed.

I. COMMONLY USED TYPES OF BARRICADING DEVICES

A. Type III barricades

1. Usually consist of three horizontal panels held in place by vertical upright posts or legs

2. Are usually permanent in nature and are found at locations such as dead ends

3. Portable Type III barricades are used to work in place of multiple Type I or II barricades. They are also used for total lane closures, especially in long term closures

4. Can be equipped with lights and signs if the situation requires it

B. Type II barricades

1. Most commonly used style of barricade

2. Usually consist of four horizontal panels mounted on four vertical legs which are hinged at the top

3. Type II barricades are usually equipped with lights and are used widely because their size allows them to be easily transported

C. Type I vertical panel barricades

1. Consist of one (1) vertical panel mounted on a stand

2. Used almost exclusively for traffic channelization and must be equipped with lights

3. Type I barricades are not normally used on a permanent basis

D. Traffic cones

1. Traffic cones are fluorescent orange and are used primarily for short term traffic channelization. These should NOT be left on roadways or jobs on an overnight basis

2. Barricades must be used in conjunction with cones when the area to be protected is a drop-off or a cavity

E. Advance warning signs

1. Used to warn or otherwise advise traffic of upcoming situations

2. The MUTCD dictates what signs to use and where they will be placed

3. Signs fall into three categories: Regulatory, Guide and Warning signs. The Public Works Department primarily uses the latter

II. GENERAL BARRICADING RESPONSIBILITITES

A. Barricading technician

1. Proper placement of barricading devices, including the use of sand bags

2. Maintain these devices once set. Portable devices should be checked at least once every twenty-four (24) hours

3. Respond quickly to requests for barricades, especially in emergency situations

4. Consult with the Engineering Department for assistance when a large or otherwise unusual situation arises

B. All employees

1. Put barricades back into the position where they were originally set on a job site

2. Report any damaged, malfunctioning or missing barricades

3. Assist the barricading technician with pickup and placement of barricades, if needed

4. Stand up downed barricades. Erect the barricade using good judgment. If in doubt about placement, contact the barricading technician

5. Hard hats, safety vests, gloves and eye protection must be worn in construction areas

6. Request additional barricades as the size or location of a job site changes

7. Notify the barricade technician when barricades are no longer needed

C. Crew chiefs

1. Crew chiefs should see to it that employees work behind the protection of barricades, especially on arterial streets

2. Employees will be otherwise protected when not working behind barricades

3. Crew chiefs should familiarize themselves with the MUTCD enough to spot an inadequate barricade job and to make advance barricading arrangements before starting work on a location

III. COMMON WORKSITE BARRICADING REQUIREMENTS

A. Off-road barricading

1. Involves sidewalk, guardrail, off-street utility cuts, inlets and manholes or any other off-road situation

2. Requires enough barricades to eliminate the possibility of pedestrians passing through the barricades and into the protected area

3. Usually do not require the use of advance warning signs

B. Roadway barricading guidelines

1. Roadways

a. Require barricade taper or tapers and enough barricades to protect the work area. The taper may not be required if the worksite is in a parking land adjacent to driving lanes

b. Will require advance warning signs

c. In some cases will require channelization in addition to the barricade taper and signs such as reduced speed limit

d. The MUTCD will govern the dimensions and requirements of a taper

2. Residential streets

a. In most cases will not require a taper but will need to be well protected around the job site

b. Where an entire lane is to be shut off, advance warning signs are required

C. Temporary barricading guidelines (1 hour or less)

1. Temporary lane closing

a. If a residential street lane is to be closed for one hour or less, it is acceptable to use vehicle beacon lights and flashers as protection

b. On arterial roads, use a short taper, either cones or barricades, and advance warning signs along with flasher and beacon lights. The use of flagmen is recommended on two lane two-way arterials

2. One day closures

a. In residential areas, cones or barricades may be used provided that they are tapered or otherwise provide a clearly defined driving path for motorists. Protect each closed area after the taper

b. On arterial streets, cones or barricades may be used provided that a taper is set up and that each closed area after the taper is protected. Use advance warning signs in conjunction with one day closures on arterials

c. Cones will NOT be left to guard any roadway overnight

D. Curb and gutter repair barricading guidelines

1. Barricades will be spaced according to speed limits: approximately twenty-five (25') feet apart in 25 mph speed zones, thirty-five (35') feet apart in 35 mph speed zones, etc.

2. MUTCD guidelines governing temporary street closure on arterials will apply while the work is actually being performed

3. When the work is completed, advance warning signs and barricades protecting the curb line should be left in place

4. If more of the street than the curb line is affected, MUTCD guidelines governing arterial roadway barricading will be used

5. Private driveways and sidewalks affected by curb and gutter repair will need to be barricaded

SECTION VIII

OFFICE SAFETY

A. Good housekeeping in the office is a must. Keep your desk and cabinets clean and orderly

B. An open cabinet or desk drawer is a hazard which can cause you or others to trip or collide. Keep drawers and cabinets doors closed

C. The standard four-drawer filing cabinet can cause injury if it upsets as a result of opening a heavily loaded top drawer. Open only one drawer at a time

D. Use handles when closing desk drawers, files, safes and doors

E. All chairs should be used sensibly. DO NOT tilt them or slump back. The added strain on the chairs can cause them to break or slip, resulting in injury to the occupant. DO NOT keep defective chairs in use

F. If you must reach high or do any climbing, use a safe ladder and not make-shift boxes, cabinets, etc. DO NOT use a chair for climbing

G. Make sure that typewriters, adding machines and computer monitors are properly fixed in place

H. DO NOT attempt any electrical repairs

I. Cords on electrically operated machines and telephones create a tripping hazard when left on the floor or on walkways. Arrange the work area to avoid this hazard

J. When using extension cords, place them so that they do not lie in a traffic area (tripping hazard) or through doors which may be closed and cut the cord

K. DO NOT remove the ground prong of a three-prong plug. Electrical equipment with a three-prong plug requires a three-hole receptacle. If an adapter must be used to accommodate a two-prong receptacle, have maintenance personnel assure that the adapter is properly grounded

L. Walk, don't run. When walking in hallways, keep to the right, especially at corners

M. Do your reading at your desk, NOT while walking

N. When using stairways, take your time and use the handrails

O. DO NOT stand and talk in front of a closed door that may be suddenly opened

P. Smoke only in designated areas

Q. Avoid spilling or splashing liquids on the floor. This might cause someone to slip or fall

R. Slips of paper, a pencil or even a paper clip on the floor can cause a slip or fall. Remember good housekeeping

S. Daydreaming is a dangerous habit. Keep your mind on the job

T. Sharpened pencils should be placed point down in pencil holders. Other sharp objects - scissors, letter openers, etc - should be covered or positioned to prevent puncture wounds

U. Carry pencils, pens, scissors, etc. in such a way that the sharp end cannot cause puncture wounds to you or others

V. Report all defective equipment to your supervisor for repair

W. Remember to report all on-job injuries to your supervisor immediately

X. Specific safety instructions

There are specific safety rules developed for various on-the-job activities. Make yourself familiar with all of these rules and pay strict attention to those rules governing your activities. If your duties are not covered by this manual, check with your supervisor or foreman.

Y. Building maintenance

a. When replacing bulbs or fluorescent tubes, observe the following precautions

1. Ask persons to move from under the fixture

2. Select ladder of proper height

3. Remove fitting and place on desk or floor beneath ladder

4. Remove bulb with protective device if bulb is hot

5. Be sure fluorescent tubes are properly locked in place

6. Replace fittings using both hands, making sure they are secure

SECTION IX

WEED ABATEMENT AND MOWING

The weed abatement and mowing programs involve a wide range of vegetation control. The machines and tools involved in these activities have a great capability to cut or maim the object or individual that happens into its path. Many of the areas mowed each year have uneven terrain and hidden debris which could potentially cause personal injury, property damage or both. In many areas, the operator may be working along a busy highway which poses the threat of injury by traffic accident.

I. HAND-HELD POWER CUTTING TOOLS

A. Weed eaters

1. Use factory guards if the unit is so equipped

2. Keep hands and feet clear of the moving cutting line at all times

3. DO NOT attempt to cut vegetation heavier than the weed eater is rated to handle

4. Adjustments to the cutting line length should be made with the machine OFF unless it is designed to do so without danger of injury

5. Fuel the machine only when the engine is cool. Fueling a hot unit poses the threat of fire or explosion

B. Chain saws

1. Chain saws should be held using both hands and cuts made so that the blade cannot come into contact with legs or other parts of the body when the blade cuts through. The chain blade is unguarded and will cut on top or bottom

2. The chain saw should NOT be operated with a dull cutting chain

3. Material being cut should be positioned in such a manner that the chain saw blade does not become pinched or bound up

4. Be aware of what is being cut. Solid objects hidden from view could cause the saw to "kick back" at the operator, causing injury

5. Bystanders should stay six (6') feet away from the chain saw operator

6. Operator should wear ear and eye protection. DO NOT wear loose clothing

7. Place the chain saw on the ground before using the pull start cord

8. NEVER touch the tip of a running chain saw to a solid object

II. MOWERS AND TRACTORS

A. General safety rules

1. When making adjustments, working on, refueling, lubricating or clearing debris from the cutting area or discharge chute, the machine must be shut OFF

2. Before dismounting the tractor, disengage the power mower drive clutch and shut OFF the engine to avoid the possibility of being run over by the tractor

3. Keep the transmission in gear when going down steep grades

4. Engage the traction clutch gently, especially when pulling out of a ditch or when going uphill

5. DO NOT place the machine on an incline so that tip over is possible

6. DO NOT attempt to unplug the discharge chute or remove entangled debris from the cutting area while the machine is running. Keep hands and feet clear at all times while the machine is running

7. NEVER operate a mower that has a serious mechanical defect. If there is any indication that the mower is not in good working order, have it checked out

8. NEVER allow passengers on the tractor

9. Be constantly alert for debris laying in the cutting area. If an object is struck by a mower blade it can become a high speed projectile capable of injuring people and property

10. When parking the tractor, the mower shall be lowered to the ground. The transmission should be set in park or neutral and the park brake set if the unit is so equipped

11. V belts should be checked regularly for proper tension

12. While mowing ROW, operators shall wear fluorescent safety vests and tractors shall be equipped with a “Slow Moving Vehicle” emblem

13. Guards and shields should be left in place while the machine is running

14. If the machine or cutting area is raised while being worked on, it should be securely blocked or propped so as not to fall

SECTION X

SNOW REMOVAL

Each snow season the Public Works Department is charged with the responsibility of keeping traffic areas in drivable condition. This endeavor involves all of the Department's shops and requires long hours of service day and night.

The equipment used to perform the task ranges from hand shovels to large snow blowers.

I. GENERAL SAFETY GUIDELINES

A. Personnel

1. Take enough clothing along to stay warm in the event of equipment failure

2. If fatigued to the point where it is impossible to carry on safely, contact a supervisor and seek replacement

3. Stay alert and get fresh air periodically

4. Keep a window cracked in the unit being operated. This reduces the possibility of carbon monoxide poisoning

5. When walking on slick surfaces or climbing on any piece of equipment, be sure of your footing. Many injuries are caused by falls each year

B. Equipment operation safety guidelines

1. Adjust your driving to road and sight conditions

2. Keep glass and mirrors clean

3. Use flashers and beacon lights as required

4. When moving in and out around parked vehicles, check to be sure someone isn't trying to pass your vehicle at the same time

5. Cell phone use while operating equipment is prohibited

II. MISCELLANEOUS SNOW REMOVAL

A. Handwork

1. When working outside, care must be taken to prevent frostbite and hypothermia. When symptoms appear, get to a warm place

2. DO NOT overexert. Stop and catch your breath periodically

B. Snow blowers (sidewalk size)

1. Use proper lifting and trailering techniques

2. Keep hands and feet clear of the intake augers

3. NEVER direct blown snow at people or property

4. Be alert for foreign objects in the snow to be blown

C. Snow fence installation

1. Wear leather gloves when handling snow fence

2. Defective posts should NOT be used

3. Snow fence rolls must be secured when in transit

4. When driving posts, use manual or powered post drivers, NOT sledgehammers

5. Snow fence and posts must be stored in an orderly fashion when not in use

III. MATERIAL SPREADING

A. Operating safety guidelines

1. Extreme care must be used by the operator while driving on untreated roadways

2. NEVER allow the spread width to be large enough for material to strike passing cars or pedestrians

3. Allow extra time for stopping, starting and turning a loaded spreader. When cornering, bear in mind that spreaders tend to be top-heavy and susceptible to tip over

4. Keep frozen chunks of material cleaned off of the spreader grates. These could fall off on a passing car

5. DO NOT exceed weight capacity of catwalks

6. Disconnect power to the spinner before attempting to unplug a spinner chute or material gate. NEVER use hands or feet to unplug a spinner chute or material gate. Use a shovel bar or other tool

7. Spreaders should be equipped with warning signs on the back of the unit

8. Avoid breathing calcium dust when breaking calcium bags

9. DO NOT run a loader right into the side of the spreader when loading

IV. PLOW OPERATION SAFETY GUIDELINES

A. Truck plow operation

1. Plow teams should work closely together, but not so close so as to increase the likelihood of an accident

2. Be on the alert for unseen hazards such as high manholes

3. Watch for more obvious problems such as traffic, parked or stalled vehicles and mailboxes

4. NEVER pass over railroad tracks with the blade lowered

5. Due to the oversized nature of the plow blade, be especially careful when passing between parked cars and using garage doors to leave or enter

6. Plows must never be chained so as to interfere with the tripping action of the blade assembly

B. Truck plow maintenance

1. When changing plow blades or working on plows, prop or jack stand the plow frame and place blocks of wood in the area under the plow blade

2. All plow and plow frame components must be checked for rust, damage or missing bolts before leaving the yard. An unexpected failure could result in an accident

3. DO NOT attempt to change a plow blade, mount or dismount a plow alone. GET HELP

C. V-plow units

1. Loader-mounted

   a. These units tend to be front heavy so allow for this when traveling

   b. The plow must be kept level. If not kept level, the point of the blade could dig in and throw the loader sideways

2. All V-plows

   a. Since V-plows are used for heavy drifting situations, look out for vehicles buried in the snow

   b. All safety guidelines pertaining to truck plowing are applicable to V-plows

D. Tractor-mounted plows

1. Guidelines governing truck plowing are applicable to tractor-mounted plows

V. COMPLETE SNOW REMOVAL

A. Snow blowers

1. Keep all personnel away from the front of the blower while the machine is in operation

2. Be prepared to shut auger off if contact is made with a foreign or solid object, such as a high manhole or car muffler

3. If the blower becomes plugged, power to the augers must be shut down before clearing or working on them

4. NEVER aim snow where injury to persons or property is likely

5. Operators must use good judgment in maintaining a safe distance between the blower and trucks being loaded

6. Loader-mounted snow blowers are front heavy. Use caution in transit

7. Caution must be used in regard to height clearance when the discharge chute is extended, especially when entering or exiting garages or when working around overhead utility lines

8. Blower operators should avoid overloading trucks to a point where material will fall off when the truck is in transit

9. Use beacon lights and flashers at all times during blowing operations

B. Dump trucks

1. Always park the truck outside for 20 to 30 minutes before hauling snow so that the box cools off. This helps prevent the load from sticking

2. Drivers should take care to provide adequate clearance between the dump truck and the blower

3. When being loaded, the operator should remain in the cab and keep windows rolled up

4. At night snow dumps are dark and congested with traffic. Before backing or any other movement, make sure that your path is free of people and equipment

5. Be certain that the end gate is tripped when dumping to prevent upending

6. NEVER stand between the end gate and the box while the box is raised to check the load after dumping

7. Dump boxes should be raised only for dumping operations.

8. Rocking a truck to loosen a load is hard on the vehicle and potentially dangerous

9. Stay in the cab when the box is being lowered

10. Dump truck drivers shall maintain a position that will cause the least disruption to traffic flow while waiting to be loaded

11. Use beacon lights and flashers while occupying a through traffic lane for being loaded

12. P.T.O.s on dump bodies have a governed speed. Depressing the accelerator too far will cause damage to P.T.O. assemblies

SECTION XI

EQUIPMENT MANAGEMENT

The Equipment Management area of the Public Works Department involves the personnel and equipment required to keep County equipment in proper mechanical condition, including the upkeep and supply of the fueling facility.

Working at close quarters repairing this machinery exposes the mechanical staff to a set of dangers differing from those of other Public Works personnel. The tire repair, welding, main shop area and fueling facility are covered in this section.

I. MAIN SHOP AREA

A. Non equipment-management personnel guidelines

1. Unauthorized personnel should refrain from being in shop areas unless on business authorized by the garage supervisor

2. Employees passing through the shop areas must stay within clearly defined walkways

3. Walkways must be kept clear of shop equipment or other foot obstructions

4. Employees will not be allowed to idly congregate in the shop area so as to distract the mechanical staff or otherwise interfere with ongoing work

5. Equipment will NOT be moved in or out from the shop area by non-mechanical personnel unless clearance is given by the garage supervisor

B. Lockout - tag out procedures

1. Equipment that is in need of repair must be parked and personnel must employ lockout – tag out procedures

    a. Remove the key from the machinery to be repaired

    b. Affix the lockout tag and key in a conspicuous place, i.e. a door handle or steering wheel, using a zip tie

    c. Disconnect battery terminal

    d. Notify personnel in the area that the equipment is out of order and not to be started or moved

    e. Perform repairs as necessary

    f. Safety gear must be used, such as eye protection

    g. Be sure to remove lockout tag once repairs have been completed

C. Mechanical staff safety guidelines

1. All equipment repair and maintenance personnel

    a. Avoid skin contact with hot vehicle parts

    b. Keep clear of moving fans and fan belts. Avoid wearing loose clothing

    c. DO NOT smoke or produce spark when working on or near batteries. Gasses from batteries may cause explosions. Covering the battery is HIGHLY recommended

    d. Avoid battery acid contact with bare skin

e. Beware of possibility of electrical shock from spark plug and coil wires, etc.

f. Mechanics should NOT lay in an area where the legs will be exposed to vehicle or foot traffic

g. When working under a piece of equipment, the key should be removed, transmission placed in gear or “Park” and the wheels blocked. Eye protection must be worn

h. Air-activated hoists must be used in accordance with manufacturer’s requirements for safe operation. Untrained personnel will NOT operate this equipment

i. NO employee will work under a piece of equipment supported by a jack ONLY. Equipment must be well supported with jack stands, blocks or other solid means

j. When test starting a piece of equipment, mechanics must be certain that the unit is in “Park” or “Neutral” and that the brake is set

k. Tools must be kept free of grease and oil. Use only the proper tool for the job and wear eye protection when hammering and chiseling

l. DO NOT place arms and legs in a situation where an unexpected movement or slip can cause injury

m. Be aware of what you are doing, enough to know what to expect. For example, a spring-loaded vehicle component can become a high speed projectile if loosened unexpectedly

n. Use non flammable cleaning solvents. NEVER use gasoline

D. Shop safety requirements

1. Use exhaust ventilating equipment when working on running equipment or provide alternate means of ventilation such as open garage doors

2. The main shop area will be equipped with eye wash facilities, multi-purpose fire extinguishers and a first aid kit

3. Work benches should be attached to a solid object and maintained in a clean and orderly fashion

4. Fluid spills in stalls must be covered with floor absorbent compound

5. Tools, hoses or other potential tripping hazards should not be left lying unused in the stall area

6. Greasy or oily rags must NOT be left lying around. They must be properly stored or disposed of

7. Garbage should be hauled away on a regular basis and NOT allowed to accumulate

8. When working on or near loud equipment, use ear protection

9. Inventoried items must be kept in an orderly fashion so as not to constitute a tripping hazard or a head injury hazard from falling objects. Unauthorized personnel will not be allowed in the storeroom

10. Old batteries or other such corrosive and acidic items must be stored well away from normal foot traffic lanes and work areas. Such storage areas should be clearly marked as hazardous

11. Drain pans which contain potentially flammable material such as oil or grease must not be left unattended. Storage of such material must be done in closed-top containers

II. FIELD OPERATING GUIDELINES

A. Towing guidelines

1. Towing of disabled units for more than a short distance must be done only under the supervision of authorized mechanical personnel

2. Only authorized personnel may operate the tow truck

3. NEVER work under a unit supported by the tow truck cable ONLY

4. Use moderate speeds when towing

5. The tow truck winch and cable must be kept in safe operating condition

6. Hoisting and winching should not be done at the same time

B. Jump starting safety guidelines

1. Hook positive to positive and negative to engine ground. The final hookup made should be the engine ground to reduce to possibility of sparks and explosion

2. NEVER expose the battery to open flames or sparks. Batteries give off a gas that is flammable and explosive. DO NOT smoke near the battery

3. DO NOT allow the cable clamps to contact other metal during the hookup procedure

4. If battery acid comes into contact with skin, flush the affected area with water

5. Eye protection is recommended when dealing with batteries. Covering the battery will reduce the chance of injury, should it explode

6. DO NOT wear rings, watches or other metal

C. Tire maintenance

1. General safety guidelines

a. Use a jack that's big enough for the job

b. When removing a wheel from a vehicle, loosen all lug nuts and then strike the wheel so that no binding or tension exists behind the lug nuts

c. Block raised units even for short periods of time

d. Personnel may require assistance with the handling of heavy tires or breaking loose tight lug nuts, especially on road calls

e. Unauthorized personnel must not operate tire repair equipment

f. Lug nuts must be properly secured at the finish of a tire repair operation

g. Defective tires and wheels must NOT be placed into service

2. Specialized equipment safety - Air impact tools

a. Should only be used with impact sockets as opposed to regular tool set sockets

b. The use of eye protection is recommended when using impact tools

c. Use the right size impact gun for the job

III. THE WELDING SHOP

A. General cutting and welding guidelines

1. Matches and lighters MUST be removed from pockets before starting

2. The less skin exposed while welding, the better. Use all required safety gear. DO NOT wear cuffs or collars which tend to catch sparks or hot slag

3. Spark resistant footwear is recommended

4. Foam-type fire extinguishers and water source should be kept near by in case of a fire

5. Use tongs or vice grips when handling hot material

6. Shut off all oxygen/acetylene supply valves or unplug arc welding equipment when not in use

7. Unauthorized and untrained personnel must not operate any welding shop equipment

B. Arc welding

1. Eye protection suited to high intensity light must be worn. A professional welder's helmet, gloves and vest are required. A respirator is recommended

2. Arc welding should be performed so as not to expose passersby to high intensity light flashes. NEVER look in the direction of arc welding activity without eye protection

3. NEVER arc weld while standing in water

4. DO NOT operate the welder if the cables are frayed or otherwise defective. Use only the correct gauge cable for the welder in use

5. A correct ground contact is essential to avoiding injury while arc welding

6. Proper ventilation is required to protect the welder operator and nearby employees

C. Oxy-acetylene welding

1. Welder's goggles and gloves MUST be worn

2. DO NOT use a welder if the gauges are broken or defective

3. NEVER stand in front of the gauges when the supply valve is opened. Only gauges designed for welding set ups will be used

4. Acetylene welding will not be performed with defective pressure regulators. NEVER put oil or grease on regulators, gauges or fittings

5. Acetylene welding set ups must be equipped with approved flashback valves

6. Caution MUST be used to avoid accidentally cutting through supply hoses when using the welder

7. Oxygen and acetylene welding tanks will be used under the following guidelines:

   a. Gas cylinders shall NEVER be dropped or struck violently against each other

   b. Cylinder protection caps MUST be in place whenever the cylinder is not in use

   c. Oxygen and acetylene cylinders must NOT be stored together

   d. Cylinders must be used and stored in an upright position and secured from falling over

   e. Open cylinder valves slowly. Open the oxygen tank valves first, then the acetylene

   f. Open oxygen valves as far as they will go and tighten it against the back seat. This takes pressure off the valve stem packing and prevents leakage

   g. NEVER open acetylene cylinder valves more than one (1) turn. Leave the wrench on the tank to expedite rapid shut off in case of fire

D. Grinding wheel safety guidelines

1. Eye and hand protection are required

2. All factory guards MUST be used

3. Grinder stones MUST be professionally resurfaced periodically

4. NEVER leave the grinding wheel running unattended

5. DO NOT use the grinder in such a fashion that stock becomes caught or wedged between the guide rest and the stone

E. Press

1. Eye protection is required

2. Stand to one side when operating the press

3. Untrained and unauthorized personnel must NOT operate the press

IV. FUELING FACILITY SAFETY

A. Vehicle fueling guidelines

1. Shut off the vehicle's motor while fueling

2. NO SMOKING is allowed while fueling or at any time around the fuel island

3. Fueling hoses must be hung up properly so as not to be run over by vehicle traffic

4. The district foreman is responsible for keeping fueling facilities maintained in a safe operating condition

5. No cell phone use within 25 feet of fuel pump

SECTION XII

FIRST AID

The first minutes of any emergency situation can be the most critical. The action or lack of it, by personnel can often spell the difference between life and death.

In this section course requirements, emergency response and procedures and proper radio use are outlined. Also included are sections dealing with two common dangers posed to employees: Extremes in HEAT and COLD. It is not the purpose of this manual to rewrite the book on First Aid, but rather to cover the high points and refer employees to already available classes and material.

I. FIRST AID KITS

A. Each crew will be supplied with a first aid kit which will be replenished as needed

B. First aid kit refill material may be obtained from the district supervisor

C. Each kit should contain the following items

1. Adhesive bandages - regular, triangular and bandage compresses
2. Merthiolate swabs
3. Sting kill swabs
4. Eye wash solution
5. Burn ointment and spray
6. Tylenol

II. EMERGENCY PROCEDURES

A. First response action for field personnel

1. Remain calm. By remaining calm you encourage others to be calm

2. DO NOT move a victim unless absolutely necessary

3. Restore breathing

4. Stop serious bleeding

5. Treat for shock

6. Treat for poisoning (if applicable)

7. Call or delegate someone to call for aid. When using the telephone to request aid, NEVER hang up first. Maintain communication until Emergency Medical Services (EMS) terminates the call

8. If the victim is conscious, reassure them. DO NOT make or allow bystanders to make comments about the nature and severity of the injury

9. Comfort the victim as much as possible while awaiting help

10. Stay at the scene until emergency help arrives

11. Offer assistance to emergency help. Give what factual information you have

B. Office procedure for reporting medical emergencies

1. When a medical emergency is reported via radio, office personnel (other than the one being called) should wait until after three calls have NOT been responded to before intercepting the radio message.

2. A call should be made immediately upon receiving the radio transmission to "9-1-1" with the appropriate information

3. Further actions may be taken depending on the nature of the emergency and its extenuating circumstances, but will be determined as they are necessary

III. COMMUNICATION IN EMERGENCY SITUATIONS

A. Emergency Medical Services System (EMSS) - 9-1-1

1. Within Scotts Bluff County and the surrounding areas, activation of the EMSS will dispatch the Fire Department, a "first response" team

2. EMSS is activated by dialing "9-1-1". When a medical emergency occurs in the field, personnel in the base office will relay information to EMSS

3. EMSS will determine the need for additional response such as an ambulance and/or advance life support personnel based on the caller's information

4. Time is of the essence in an emergency situation. For this reason, the caller must make it plain that an emergency situation exists

5. At the time that an emergency is declared on the two-way radio, all non-emergency communications will cease

B. Example of using emergency procedures

"Scotts Bluff County Unit ### to Gering Office - Emergency!" (This call should notify everyone with a radio NOT to transmit until network has been cleared.)

"Office in, go ahead."

While the office is taking the necessary information, someone else should be calling "9-1-1" and ready to give them the information as it is received such as: "This is John/Jane Doe from the County Highway Department. We have a radio report of an accident at 1123 N 27th Street, in the back yard. Come in from the alley.

"While trimming branches a limb fell, knocking over a ten foot ladder with a man on it. Jim Jones is pinned under the limb and Tom Doe is lying on the ground.

"Both men are unconscious but breathing. Jim is bleeding from the neck area and it has soaked up a handkerchief. Tom's leg seems to be bent backwards and to the side, but he appears to O.K.

"This happened about five minutes ago and we are trying to stop the bleeding and are treating for shock.

"Office to Scotts Bluff County Unit ### -- Emergency help is on the way. Call if you need additional help. Office to all radio units - this net is clear."

IV. WORKING IN HOT WEATHER

A. The following precautions should be observed in HOT weather

1. To avoid sunburn, wear a shirt and long pants. Light colored clothing is preferred. Use of sunscreen is recommended

2. Wear a hat when working in the sun

3. Drink plenty of water, but avoid excessive quantities of ice water

4. Avoid over-exertion

5. Persons with high blood pressure or a past history of sunstrokes should NOT do field work during hot weather

B. Sunstroke or heatstroke is an extreme medical emergency and medical aid MUST be obtained as soon as possible. A delay of one or two hours may mean the difference between life and death

1. Symptoms of sunstroke

a. Hot and dry skin, high temperature

b. Face red and flushed

c. Dizziness, intense headache, hard breathing

d. May have convulsions and lose consciousness

2. Treatment for sunstroke

a. Move to a cool, shady spot

b. Strip to underclothing

c. Lay on back, head and shoulders raised

d. Cool body with water or wet clothes

e. When conscious and able to drink, give cool drink, NOT ice cold. DO NOT give stimulants

C. Heat exhaustion or heat prostration is not as serious as sunstroke, but should be treated promptly

1. Symptoms

a. Skin cold with clammy perspiration

b. Face pale

c. May have chills, cramps or dizziness

d. May feel sick and vomit

e. Pulse weak and rapid

2. Treatment

a. Move to fresh, moving air

b. Keep lying down and head low

c. Loosen clothing

d. Rub arms and legs gently toward heart

e. If able to drink, give frequent drinks of salt solution or saline tablets

f. Get to a doctor or hospital as soon as possible in severe cases

D. Keep in mind this simple rule for first aid in case of either sunstroke or heat exhaustion: If patients are cold, make them warm; if they are hot, make them cool

E. Another danger in hot weather is food poisoning caused by bacterially-contaminated food in lunches which have been at warm temperatures for several hours. Victims are seized with severe cramps and abdominal pain, nausea, retching, vomiting and diarrhea one to six hours after eating

1. To avoid food poisoning from contaminated lunches, DO NOT use mayonnaise, eggs, milk or fish in lunches unless they can be kept at 60° or lower prior to eating

2. A person with a mild case of food poisoning may recover without treatment but if the symptoms are extreme, get the victim to a doctor at once

V. WORKING IN COLD WEATHER

A. Sufficient clothing should be worn to protect against the cold but tight clothing which restricts the circulatory system should be avoided

B. Frostbite on the nose, cheeks, ears, fingers or toes is the most likely danger in cold weather. Frostbite develops most frequently when a high wind is blowing

1. Symptoms

a. Pain is sometimes felt early but subsides later

b. Skin becomes grayish white

c. Affected part feels intensely cold and numb

d. Blisters may appear later

2. Treatment

a. DO NOT rub the affected area with snow or with the hands

b. Re-warm the frozen area with moist rags or towels dipped in water at 90° to 100°

C. Avoid walking on ice-covered streams, ponds or lakes unless the ice has been determined to be at least three (3") inches thick. If you fall through, put your arms in front of you on solid ice, kick to keep your body level, crawl forward on your stomach until your hips reach the ice. Keep rolling until safe. If the ice is too thin to support you, break a way to shore with one hand and support yourself with the other

SECTION XIII

SPECIAL SITUATIONS

As the heading implies, this section will deal with situations which are not faced on a daily basis. The potential for these situations to arise is present, however, and a safety manual would not be complete without proper reaction guidelines being presented.

Special situations can include acts of nature as well as human acts, both accidental and intentional. Scotts Bluff County has produced an Emergency Operations guide which details responses to various uncommon situations and the responsibilities of each part of the Public Works Department in case of a wide scale disaster. Each front line supervisor should be well acquainted with this guide to insure a quick response in time of disaster.

TORNADO

Tornado WATCHES and WARNINGS are issued by the National Weather Service when the probability exists that a significant threat could develop over a wide area. WARNINGS are issued for much smaller areas and periods of time than WATCHES.

The Civil Defense will issue a tornado warning and the outdoor civil defense siren will be sounded only when a tornado has actually been sighted in the immediate area or when radar or civil defense spotters indicate the tornado is approaching the community.

Upon hearing the civil defense sirens, do these things to protect yourself:

If you are indoors:

1. Move immediately from your work area or office to an interior place of greater safety, closing and securing doors as you leave. (The severe weather shelter area for your building is indicated on

a poster on your building bulletin board.) Be familiar with its location

2. Move quickly to the shelter areas and stay away from windows

3. If time permits, take a cushioning object to protect yourself from potential flying debris and take a battery-operated radio for up-to-date weather information

4. When in the shelter, stay close to the floor and cover your upper body and head with jackets, etc

5. Stay in the shelter area until the “all clear” signal is given

If you are outside:

1. Seek indoor shelter if possible

2. Parked motor vehicles are unsafe. Seek indoor shelter

3. If an indoor shelter is not available and there is no time for escape, always move at right angles to the path of the tornado

If a tornado does hit, use a telephone only for emergency purposes. During disaster situations, telephone overloads make coordination of emergency recovery operations difficult.

LIGHTNING AND ELECTRICAL STORMS

Lightning causes more direct deaths than any other weather hazard, so keep the following safety rules in mind

If lighting threatens while you are inside:

1. Stay inside

2. Stay away from open doors and windows, radiators, metal pipes, sinks and plug-in electrical objects such as radios, electric typewriters, etc.

3. DO NOT use plug-in electrical equipment. Unplug electrical equipment if time permits

4. DO NOT use the telephone. Lightning may strike the telephone lines outside

If you are outside:

1. Seek shelter in a building but avoid small sheds or shelters in exposed locations

2. If buildings are not available, seek shelter in

   a. A ditch or ravine

   b. Dense woods (Be alert for falling trees)

   c. A cave

   d. A deep valley

   e. The base of a steep cliff

   f. The cab of rubber tired vehicle

3. DO NOT handle chain or metallic tape or any other metal object

4. Keep away from wire fences, overhead utility lines, rivers and lakes

5. Avoid tops of ridges, hilltops, wide open spaces, ledges and outcroppings of rock

6. In open country, sit or lie down. Avoid grouping together and avoid large or isolated trees. Avoid being the highest object

7. If you are wearing or carrying anything metal, get rid of it

8. If you feel an electrical charge (hair stands on end, skin tingles) lightning may be about to strike you. Drop to your knees and bend forward, putting your hands on your knees or lie down quickly in a ditch or depression

If someone is struck by lightning:

1. First aid may start immediately, as the victim does not retain electrical charge

2. Most common injuries caused by lightning are burns, possibly accompanied by heart and breathing stoppage

3. Treat victims with mouth to mouth resuscitation, cardiac massage and artificial respiration, if needed

EARTHQUAKE

Scotts Bluff County is in a moderate earthquake hazard zone. Earthquakes are caused by underground volcanic forces or the shifting of rock beneath the surface. They are unpredictable and may strike without warning. Earthquakes range in intensity from small tremors to severe shocks and may last anywhere from a few seconds to as long as five minutes. Earthquake injuries usually result from falling debris rather than from the direct movement of the earth. Disruption of communication lines, light and power lines and sewer and water mains can be expected.

If an earthquake strikes when you are inside:

1. Stay inside

2. Watch out for falling plaster, light fixtures, glass, bookcases, etc.

3. Stay away from windows and mirrors. Either crawl under a table or desk, sit or stand against an inside wall from windows or stand in a strong inside doorway

4. DO NOT use open flame during the tremor

If an earthquake strikes when you are outside:

1. Avoid high buildings, walls, power poles and other objects that may fall. Move to open areas away from hazards

2. If surrounded by buildings, seek shelter in the nearest strong one

If an earthquake strikes when you are in an automobile:

1. Stop in the nearest open area if possible

2. Stay in the vehicle

After the tremor is over:

1. Check for injured people. DO NOT move seriously injured people unless they are in immediate danger

2. If you think that the building may have been damaged, evacuate. Aftershocks can level severely damaged buildings

3. DO NOT use the telephone except to report an emergency. If a call is necessary, dial "9-1-1" and report the emergency situation to the operator. Be sure to give the operator your name, office location and telephone extension

4. DO NOT use plumbing or anything electrical (including elevators) until after the utility and electrical lines have been checked

5. Open doors carefully, watching for objects that may fall

6. DO NOT use matches or lighter. Watch for fires that may have started

7. Keep streets clear for emergency vehicles

8. Be prepared for additional earthquake shocks

CHEMICAL SPILL

Public Works Department personnel do not handle great quantities of chemicals on a regular basis which are potentially harmful, if spilled.

It is far more likely that Public Works personnel will come across chemical spills on the roads and highways on which they perform on a day to day basis.

If a chemical spill occurs in a building:

1. Close the door behind the spill and stay clear of the immediate area

2. Evacuate the building and call “9-1-1”. Tell the operator what type of chemical(s) was spilled, the amount spilled and the exact location (building, room number, etc.) of the spill. Be sure to give the operator your name, office number and telephone extension. DO NOT hang up until the operator releases you

3. After you have completed your call, wait at a safe distance from the spill until help arrives

If a fire starts as a result of a chemical spill:

1. Close the door behind the spill and the fire

2. Pull the nearest fire alarm to evacuate the building

3. Evacuate the building and call “9-1-1”. Tell the operator what type of chemical(s) was spilled, the amount spilled and the exact location of the fire (building, room number, etc.). Be sure to give the operator your name, office number and telephone extension. DO NOT hang up until the operator releases you

4. If a chemical spill has occurred on skin or eyes flush the exposed area with water

5. Wait a safe distance outside the building until help arrives

If a chemical spill occurs outside, the person receiving the call will:

1. Determine the exact location

2. Attempt to identify the material

3. Document the name of the person calling

4. Call “9-1-1”

5. Notify the Public Works Department Director or highest ranking supervisor available

Field personnel should:

1. Call “9-1-1”

2. Protect citizens from the spill area while avoiding contact with the chemical themselves

3. Provide first aid treatment to anyone already affected if it can be done without danger

4. Work with the fire department if help is requested. This help could take the form of loaned equipment, manually helping with the clean up or operating equipment

5. Where deadly chemicals are involved, the fire department will probably handle the clean up from start to finish. When this is the case, the fire department will assume responsibility for any loaned equipment and will return it in a clean and safe condition

6. Less dangerous spills such as diesel fuel may call for more Public Works Department involvement in the clean up. Follow the instructions of the supervising firefighter

7. NEVER make an assumption as to the danger level involved with a spill. Contact the fire department and let trained experts make these judgments

RADIATION ACCIDENT

In the event that any visitor or employee is exposed to an unusual dosage of radioactive material or radiation, there is a spill or loss of radioactive material or there is a fire in the radioactive material area:

1. Call "9-1-1" and tell the operator the exact location of the incident (building, room number, etc.) and any details you know. Be sure to give the operator your name, office number and telephone extension. DO NOT hang up until the operator releases you

2. In case of a spill or ruptured source of radioactive material, proceed with the following:

    a. Tell all personnel not involved in the spill to vacate the area at once

    b. If the spill has occurred on skin, flush the exposed area with water

    c. If the spill has occurred on clothing, discard outer clothing at once

    d. Close all windows and shut off fans and air conditioners immediately

    e. Vacate the area but stay in the area outside the room until you are released by a Radiation Safety Officer

FIRE

A fire emergency may exist alone or in conjunction with another type of emergency (i.e. tornado, chemical spill, explosion, etc.). Until trained firefighters become available DO NOT endanger yourself or others in an effort to put out a fire in your building.

If a fire occurs in your building:

1. Pull the nearest fire alarm to evacuate the building

2. Call “9-1-1” and tell the operator the exact location of the fire. Be sure to give the operator your name, office number and telephone extension. DO NOT hang up until the operator releases you

3. Spread the alarm. Know the exit routes and keep them open

4. Disconnect all electrical equipment on fire. Know location of equipment switches

5. Evacuate the building, closing doors and windows behind you to confine the fire and prevent drafts. Keep doors and windows free of obstructions

6. Assemble a safe distance away from the building. DO NOT block driveways or areas to be used by fire apparatus. Each supervisor shall try to determine if any employees are not accounted for to notify the fire department

7. DO NOT re-enter building until the fire department has declared the building safe

If a fire occurs in a piece of equipment:

1. Shut down the engine or appropriate power source

2. Set the park brake if so equipped

3. Get all personnel or nearby individuals away

4. Use an alternate communications source to call “9-1-1”. DO NOT sit in a burning unit and attempt to call for help on the unit’s radio

5. Attempt to fight the fire ONLY if there is no possibility of explosion. Get any nearby equipment which could be engulfed in fire away from the burning unit

6. Fires on units which have a high possibility of explosion should be handled by fire department personnel only. An example of this would be an asphalt kettle which is equipped with propane bottles

7. NEVER endanger life or limb in case of an equipment fire. Clear all employees and the public from the endangered area. Equipment can be replaced, human life cannot

Fire fighting apparatus:

1. Will be serviced on a regular basis, with a tag attached telling the date and who performed this service
2. Extinguishers must be equipped with a charge indicator. They will be serviced whenever the charge is expended or has gone below acceptable charge levels

3. Extinguishers removed temporarily for servicing will be replaced with substitute units

4. All employees are responsible for reporting fire extinguishers not in proper operating condition

EXPLOSION

If an explosion occurs somewhere in your building:

1. Pull the nearest fire alarm to evacuate the building

2. Call “9-1-1” and tell the operator the location of the explosion and, if known, its seriousness and any possible injuries. Be sure to give the operator your name, office number and telephone extension. DO NOT hang up until the operator releases you

3. After you have completed the call, wait a safe distance outside the building until help arrives

4. Direct responding emergency personnel to the explosion area and any personnel who may have been injured

BOMB THREAT

If you receive a bomb threat over the telephone:

1. Listen carefully to the details of the threat and try to keep the caller talking until you are able to get the answers to the following questions:

    a. When is the bomb going to explode?

    b. Where is it right now?

    c. What does it look like?

    d. What kind of bomb is it?

    e. What will cause it to explode?

    f. Did you place the bomb?

    g. Why?

    h. What is your name?

2. Jot down whether the caller is male or female; any distinctive voice characteristics the caller may have (i.e. accent, slurring, key words used) and any background noise that you may hear

3. When the caller hangs up dial "9-1-1" and relay all of the information you learned from the caller concerning the bomb and its location. Be sure to give your name, office location and telephone extension. DO NOT hang up until the operator releases you

4. After you have contacted "9-1-1", remain quiet about the threat and stay where you are until you are contacted by the police or fire department

5. The police, in cooperation with the fire department, will give the order to evacuate the building if necessary

CIVIL DISORDERS

Where the possibility exists of a facility being taken over by riots or demonstrators:

1. All personnel will leave the facility peacefully

2. Personal property, important files and equipment should be removed if possible

3. Electrical power to the building should be shut off

4. Police must be notified as soon as possible

5. DO NOT antagonize demonstrators. Use force in self defense only. All actions taken against demonstrators will be done by the police