



Student Workbook

Avoiding Runovers and Backovers

Internal Traffic Control Planning

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How Can I Use OSHA



The Occupational Safety & Health Administration (OSHA) was created in 1970 through the "Occupational Safety and Health Act," also known as the Williams-Steiger Act. It was developed to consolidate several other safety laws (including the Construction Safety Act) into one agency, and to correct what was perceived as a failure of existing programs to adequately protect workers. OSHA is part of the U.S. Department of Labor.



There are five primary activities for OSHA:

- Develop standards
- Inspect employers
- Investigate injuries and fatalities
- Issue citations and impose penalties (civil or criminal)
- Assist in occupational safety and health training

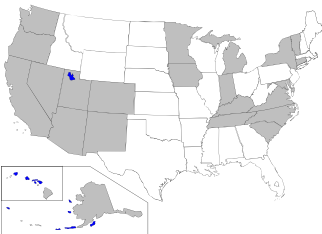


OSHA was designed to make EMPLOYERS responsible for the safety and health of their EMPLOYEES. Under the OSH Act, both employers and employees have safety responsibilities, but OSHA only enforces the law against employers.

- An EMPLOYER is defined as a person engaged in a business affecting commerce who has employees; it does not include the United States or other government entity.
- An EMPLOYEE is defined as a person employed by an employer who affects commerce.



State Plans—Another provision of the OSH Act allows states to assume responsibility for enforcing occupational safety and health regulations in lieu of federal OSHA. If a state chooses to do this, it must issue and enforce standards that are substantially equal to the federal standards. Approximately 26 states have taken this option and enforce their own regulations, with assistance from federal funds.



This state plan option creates several interesting problems. Because of constitutional and federal legal limitations, the U.S. government cannot enforce OSHA regulations against employees of state governments. Therefore, in states that operate under federal OSHA, OSHA cannot issue citations against the state if its employees are not working in safe and healthful conditions. For example, if an OSHA compliance officer arrived at a road construction site and noticed a state DOT inspector walking on a bridge without necessary fall protection, OSHA cannot cite the state DOT.



The creation of OSHA provided workers the right to a safe and healthful workplace. Section 5(a)(1) of the OSH Act states: "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are



causing or are likely to cause death or serious physical harm to his employees." A safe and healthful workplace means that hazards are removed and workers are trained. If a hazard cannot be removed completely, protection (for example, respirators or earplugs) must be provided.

Some examples of a safe/healthful workplace include:

- Fall protection and training are provided and required when working at high levels on a construction site.
- Trenches are inspected and have protective systems in place.

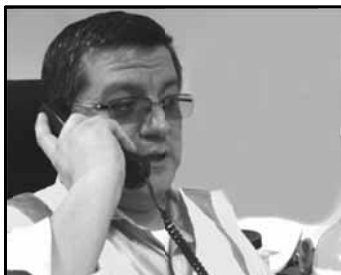


Workers have rights to be protected under the OSHA act from unsafe conditions. In addition, they can ask OSHA to inspect and unsafe work place, receive information about hazards and training in safe work practices, and can review their medical records created by their employer.

Filing a Complaint:

- **Online** - Go to the Online Complaint Form Written complaints that are signed by workers or their representative and submitted to an OSHA Area or Regional office are more likely to result in onsite OSHA inspections. Complaints received on line from workers in OSHA-approved state plan states will be forwarded to the appropriate state plan for response.
- **Download and Fax/Mail** - Download the OSHA complaint form* [En Español*] (or request a copy from your local OSHA Regional or Area Office), complete it and then fax or mail it back to your local OSHA Regional or Area Office. Written complaints that are signed by a worker or representative and submitted to the closest OSHA Area Office are more likely to result in onsite OSHA inspections. Please include your name, address and telephone number so we can contact you to follow up. This information is confidential.
- **Telephone** - your local OSHA Regional or Area Office. OSHA staff can discuss your complaint and respond to any questions you have. **If there is an emergency or the hazard is immediately life-threatening, call your local OSHA Regional or Area Office or 1-800-321-OSHA.**

**1-800-321-
OSHA**



Workers have a right to seek safety and health on the job without fear of punishment. That right is spelled out in Section 11(c) of the OSH Act. It says the employer shall not punish or discriminate against employees for exercising such rights as complaining to the employer, union, OSHA, or any other government agency about job safety and health hazards. Workers are also protected for participation in OSHA inspections, conferences, hearings, and other OSHA-related activities. Workers have the right to refuse to do a job if they believe in good faith that they are exposed to an imminent danger. "Good faith" means that even if an imminent danger is not found to exist, the worker had reasonable grounds to believe that it did. Since the conditions necessary to justify a work refusal are very stringent, refusing work should be a last resort. If time permits, the condition should be reported to OSHA or the appropriate government agency. If you believe you have been punished for exercising your safety and health rights, you must contact OSHA within 30 days.

Notes:



OSHA recommends that employees try to resolve safety and health issues first by reporting them to their supervisors, managers or the safety and health committee. At any time, however, employees can complain to their local OSHA Area or Regional Office and ask for an inspection or an investigation. Complaints to federal OSHA from workers in states with OSHA-approved state plans will be forwarded to the appropriate state plan for response.



Who Can Complain?

- Employees or their representatives have a right to request an inspection of a workplace if they believe there is a violation of a safety or health standard, or if there is any danger that threatens physical harm, or if an "imminent danger" exists. Employee representatives, for the purposes of filing a complaint, are defined as any of the following:
- An authorized representative of the employee bargaining unit, such as a certified or recognized labor organization.
- An attorney acting for an employee.
- Any other person acting in a bona fide representative capacity, including, but not limited to, members of the clergy, social workers, spouses and other family members, and government officials or nonprofit groups and organizations acting upon specific complaints and injuries from individuals who are employees.
- In addition, anyone who knows about a workplace safety or health hazard may report unsafe conditions to OSHA, and OSHA will investigate the concerns reported.



Employees or their representatives must provide enough information for OSHA to determine that a hazard probably exists. Workers do not have to know whether a specific OSHA standard has been violated in order to file a complaint.



You need not have all the information listed, but enough so your claim is credible, such as:

- How long (to your knowledge) has the condition existed?
- Have any attempts been made to correct the problem?
- On what shifts does the hazard exist?
- Has anyone been injured or made ill as a result of this problem?
- Have there been any "near-miss" incidents?



How Can We Contact OSHA?

Phone: 1-800-321-OSHA

Web: www.osha.gov

Browse: "OSHA 1926" for construction standards

Notes:

How Should I Use OSHA?

The following exercise is a “worst case” example of how an employee might have to respond to unsafe work practices. This has been developed for teaching purposes only. In most cases, ARTBA recommends you work with your employer to resolve safety concerns and create a good safety climate. Most responsible employers are anxious to solve safety problems that are brought to their attention. While contacting OSHA should be a last resort in most instances, if you have a serious concern for your safety, do not hesitate to contact the agency, or if you are in a union, you may contact your local representative.

Scenario Part I: You have recently become employed with Kareless Contracting, Inc. As a new employee, you are assigned to work as a flagger, stopping traffic on a two-way road when it becomes necessary for construction equipment to cross it.

You have never flagged before, but your supervisor gives you a few brief instructions in the morning and sends you to work. You notice there are no signs on the road, warning drivers of construction activities ahead.

What should you do?

1. Walk away from the job.
2. Tell your supervisor you are uncomfortable with the task, but continue working.
3. Ask your supervisor for more training and for traffic control signs.
4. Call OSHA

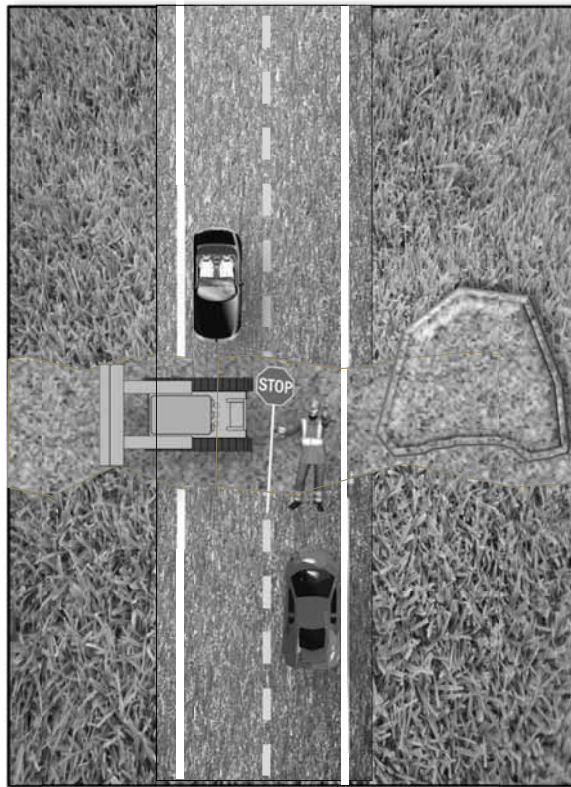


STOP AND DISCUSS

Scenario Part II: You decide to talk to your supervisor. He sends you to another job. A week later, you are assigned back to the original site. There are still no traffic control signs and you have not received any more training. When you express your concerns again to the supervisor, he says if you are uncomfortable, you are welcome to quit.

What should you do?

1. Continue to work.
2. Refuse to work.
3. Ask your foreman/supervisor to consult with the company safety officer.
4. Call your local union steward.



Notes:

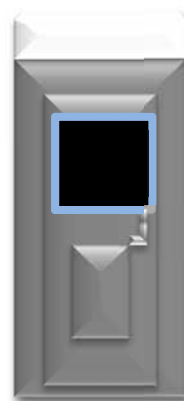


STOP AND DISCUSS

Scenario Part III: Since this is not a union job, you don't have a steward to call. You refuse to work in these unsafe conditions, so your employer gives you the task of cleaning all the portable toilets on the site and gets another worker to perform the flagging operation.

What should you do?

1. Get some good rubber gloves.
2. Tell your supervisor you will perform the flagging assignment.
3. Call OSHA.
4. Quit.



STOP AND DISCUSS

Scenario Part IV: Now you feel frustrated and angry so you decide to call OSHA. What should you be prepared to discuss when you file a complaint?

1. An explanation of the hazard to which you and/or your fellow employees are exposed.
2. The number of workers exposed.
3. The type of work you are doing.
4. Your efforts to talk to your employer about the problem.
5. How often you are in the dangerous situation.
6. Has anyone been hurt, or have there been any "near-misses."



STOP AND DISCUSS

Scenario Part V: You are nervous about filing a complaint with OSHA since your boss has already told you to quit if you feel unsafe. Who can you get to file the complaint for you?

1. A co-worker
2. An attorney
3. Your local minister
4. Your spouse



STOP AND DISCUSS

Scenario Part V: Your co-worker, who is also worried about his safety, agrees to file a complaint with OSHA. How should he contact the Area or Regional OSHA Office?

1. Go online.
2. Send a fax.
3. Send a letter.
4. Make a call.



STOP AND DISCUSS

www.OSHA.gov 1-800-321-OSHA

Notes:

Scenario Part V: You file a complaint and OSHA soon arrives to conduct an inspection. Shortly after the inspection, you are fired because the boss says you are a troublemaker and are stirring up problems. You suspect it is because he knows you were involved in filing a complaint with OSHA. What can you do?

1. Find a new job.
2. Complain to OSHA within 30 days of being fired.
3. Write a letter to the local paper exposing the discrimination.
4. Handout flyers at the jobsite to your fellow employees expressing your concerns.



STOP AND DISCUSS

REVIEW THE FOLLOWING:

When you believe working conditions are unsafe or unhealthful, you should call your employer's attention to the problem. If your employer does not correct the hazard or disagrees with you about the extent of the hazard, you also may file a complaint with OSHA.

Refusing to do a job because of potentially unsafe workplace conditions is not ordinarily an employee right under the OSH Act. (Your union contract or state law may, however, give you this right, but OSHA cannot enforce it.) Refusing to work may result in disciplinary action by the employer. However, employees do have the right to refuse to do a job if they believe in good faith that they are exposed to an imminent danger. "Good faith" means that even if an imminent danger is not found to exist, the worker had reasonable grounds to believe that it did exist.

But, as a general rule, you do not have the right to walk off the job because of unsafe conditions. If you do and your employer fires or disciplines you, OSHA may not be able to protect you. So, stay on the job until the problem can be resolved.

Your right to refuse to do a task is protected if all of the following conditions are met:

- Where possible, you have asked the employer to eliminate the danger, and the employer failed to do so; and
- You refused to work in "good faith." This means that you must genuinely believe that an imminent danger exists. Your refusal cannot be a disguised attempt to harass your employer or disrupt business; and
- A reasonable person would agree that there is a real danger of death or serious injury; and
- There isn't enough time, due to the urgency of the hazard, to get it corrected through regular enforcement channels, such as requesting an OSHA inspection.

When all of these conditions are met, you take the following steps:

- Ask your employer to correct the hazard;
- Ask your employer for other work;
- Tell your employer that you won't perform the work unless and until the hazard is corrected; and
- Remain at the worksite until ordered to leave by your employer.

If your employer discriminates against you for refusing to perform the dangerous work, contact OSHA immediately.

Source: <http://www.osha.gov/as/opa/worker/refuse.html>

Notes:

Principles of “Internal Traffic Control”



In simple terms, ITCs are a protocol to inform all parties operating within the work space about the location of others. ITCs create “zones” designed to minimize interaction between workers on foot and construction vehicles by designating routes and operating procedures for large trucks delivering materials inside the “cone zone.”



An effective plan enables communication among all work zone parties in advance of arrival to the construction site, making sure all parties know the location of access points and the proper path for truck and equipment movement, including pickup trucks and other work vehicles.



When construction drivers understand there is an ITC Plan, they will be motivated to take ownership of the program and contribute to its success. The drivers may also provide input if they see a problem if they feel part of the “team.” Drivers rarely receive a “thank you” for their efforts, and expressions of gratitude for safe performance can go a long way towards getting their buy-in and cooperation. Once all parties understand how an ITC operates, they will better understand instructions and verbal communications used to explain daily plans and changes.



Those involved in roadway construction are likely familiar with temporary traffic control plans (TTCP) which describe how a specific work zone is to be set up to ensure the safety of the motoring public. Activity in the work space (hatched area) of the TTCP is not addressed in most TTC plans or MUTCD Typical Applications. This is the area where construction workers, equipment and vehicles interact. Internal Traffic Control Plans address this planning gap.



Temporary Traffic Control Plans are defined and prescribed in the U.S. Federal Highway Administration’s “*Manual on Uniform Traffic Control Devices*” or “*MUTCD*.” Internal Traffic Control is an industry *recommended practice* and is not prescribed by law.



The movement of workers and equipment within the work space should be planned in a manner similar to the way the TTC plan guides road users through a work zone. Whereas Temporary Traffic Control Plans focus on moving traffic safely through a work zone, Internal Traffic Control Plans focus on keeping workers on foot from being struck by construction equipment and large trucks.

TTCPs and ITCs contain common principles, including:

- Providing clear direction to drivers
- Separating moving vehicles from workers on foot



- Using temporary traffic control devices to mark traffic paths, and
- Maintaining a smooth traffic flow

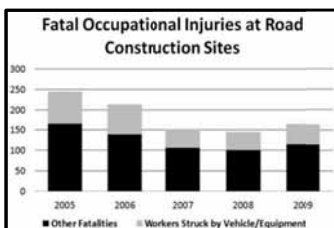
Workers on foot – or pedestrian workers - ground workers – are those employees who perform their tasks outside construction equipment and other vehicles. They are exposed to the hazards of being struck by motorists and construction vehicles. While there are many terms used to describe such workers, in this course we will refer to them as “workers on foot.”



Two “Struck-By” Hazards

- Workers Killed by Motorists
- Workers Killed by Construction Trucks and Equipment

More workers are killed by construction vehicles than by motorists.



On average, 50-60 workers are killed in struck-by incidents on roadway construction sites. Greater industry and public education needs to be focused on eliminating distractions, such as cell phone use, which can contribute to these deaths and injuries to reduce incidents caused by motorists. ITCPs can protect against accidents caused by construction vehicles. *See article on worker fatalities by Stephen Pegula contained in the Instructor Background Materials.*



More workers are killed by construction-related vehicles or equipment (38 percent) than by cars, tractor-trailer trucks, and vans (33 percent). Coordination of workers and equipment doing different activities in close proximity can improve work flow and reduce conflicts between workers on foot and equipment operators. (See state –by-state statistics in instructor materials.)



Compliance with the MUTCD and OSHA regulations is a necessary first step in providing a safe work environment. However, these sources, taken together, do not provide comprehensive guidance to ensure worker safety in roadway work zones. The interaction between workers on foot and construction trucks and equipment is the single biggest hazard in the heavy and highway industry. There are several exposures workers should be aware of to enable them to protect themselves against work zone hazards.



The constant movement of vehicles in and out of the work area can create hazards if the travel paths are not set and coordinated. ITCPs can also be used to communicate the need to keep entry and exit points free of parked vehicles and equipment. Note the tire marks on the pavement indicating vehicles are turning around in the work area. Ideally, ITCPs minimize backing and turning. Start each day with a risk assessment discussion with workers and subcontractors (including employees).

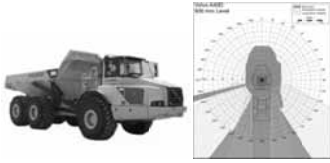


Note the size of workers on foot in relation to the size of the construction equipment and vehicles. Because workers are relatively short compared to construction vehicles, it can be difficult or impossible to see them, especially in areas known as “blind spots.”

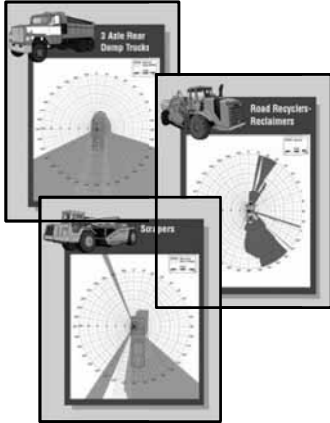
Notes:



A blind spot (or blind area) is the area around a vehicle or piece of construction equipment that is not visible to the operator, either by direct line-of-sight or indirectly by use of internal and external mirrors. Blind areas can be reduced by properly setting mirrors on equipment in a “mirror check station.”



Each vehicle has its own, unique blind spots. Operators should be familiar with the blind spots surrounding each piece of equipment he or she operates and should be sensitive to the fact workers and other objects cannot be seen – even when using mirrors.



Note the gray areas in the diagrams indicating the various shapes and sizes of blind spots for different vehicles. The yellow hatched lines show areas visible using the mirrors. More examples can be found at: <http://www.cdc.gov/niosh/topics/highwayworkzones/BAD/imagelookup.html>. (See also Blind Spot poster from the National Work Zone Safety Information Clearinghouse. These posters are available for free from the Clearinghouse and would make a good handout for this section.) You can create maps like these—and appreciation for the blind areas for your vehicles—by having workers on foot take turns sitting in the cab and viewing their surroundings. Have another worker walk around the vehicle so the person in the cab can identify the blind spots.



As a worker on foot, if you can't see the driver and the driver can't see you, you're in a dangerous situation. Companies and projects should identify a specific side of the vehicle where a worker should walk for each operation. Consistency is important for safety.

Notes:

Safety for Workers on Foot



Workers, operators and other drivers navigating the work space need to know planned routes and locations for equipment and delivery vehicles before they arrive on the site. Fundamental information about the ITCP should be provided to key personnel on the project, including inspectors, subcontractors and vendors. This could be done with paper copies, radio communications, or even using a phone or other mobile device. The ITCP should be updated daily at safety meetings. Subcontractors should be required to attend ITCP briefings. During the project, the ITCP should be consulted when reviewing construction progress and adapting to the daily changes that are routine will all projects. During construction, the safety officer, site supervisors and foremen should update and review the ITCP with workers daily. The plan is useful in showing the project owner and personnel that worker safety is being addressed. The primary objective of these efforts is to inform workers of the hazards present to they can stay clear of danger.



The organization of the work space can and does impact worker behavior. Workers are more likely to take risks such as entering the traffic space if circumstance entice or compel them to do so. When creating your safety/ITCP plan, consider the location of rest areas, water stations, parking, etc. To the extent feasible, these should be located to minimize workers crossing traffic or construction vehicle pathways. For example, where are workers likely to stand or congregate? On hot days, is there shade nearby? Where are the latrines? Where might workers stand when cold? If raining? If workers are likely to walk to a location, is there a safe route for them to get there? A good ITCP will include such considerations.



Radio and cell phone use occurs with increasing frequency. Can workers use phones on the job? How does the foreman communicate with all the other parties? When talking on the phone, people frequently plug the ear away from the phone and look to the ground so they can concentrate on the call in a busy, noisy environment. When they do so, they will not see dangers or hear alarms. How might the ITCP control for this behavior? Can a place(s) be designated to making and receiving calls? Human factors play an important role in ITCP development and should be considered carefully.



Construction equipment is typically large and has an enclosed cab. These characteristics can make the blind areas very large and difficult for the operator to see. Also, the size of construction vehicles and equipment often place truck drivers and equipment operators high above the ground. They cannot see workers on foot crossing close in front of them. There is an ANSI standard that addresses issues of worker visibility in roadway work zones. ANSI A10.47 standard, "Work Zone Safety for Highway Construction." is a worker safety standard



specifically defining roadway construction terminology and best practices in the following areas: Traffic Control, Flagger Safety, Runover/Backover Prevention, Equipment Operator Safety, Excavation, Electrical and Power Tool Safety, Fall Prevention, Materials Handling, Health Hazards, Night Work, and Personal Protective Equipment.



Workers must be clearly visible to drivers and operators. High visibility garments are now required by both FHWA and OSHA for all workers, not just those exposed to motorists/on-road traffic. These agencies require workers to be dressed in a minimum *ANSI Class II* vest. The make-up of these vests is explained in a standard known as the ANSI/ISEA 107 "American National Standard for High-Visibility Apparel." The standard also recommends high visibility hard hats for workers to improve worker visibility.

During night time hours, inclement weather and other low-light conditions, ANSI/ISEA Class III garments are highly recommended.



It is difficult for workers to tell if the operator is looking at them or someone or something directly behind or in front of them. The worker may think the operator is looking at him or her and it is safe to approach when in fact the operator is focused on something else. Before approaching a vehicle, wait for a clear signal from the operator that you have permission to do so.



The majority of construction activities are regular and relatively safe. Operations become more risky when the ordinary has changed, such as when there is a change in the operational process, the asphalt plant breaks down, the operation is in tight quarters (i.e. aprons, bridges, drainage areas), and even mobilizing to begin a new lift of asphalt. All these operations cause modifications to the normal plan.

Simple things, like holding trucks in place while workers finish setting up the equipment, help save lives and do not reduce overall productivity. Such precautions ensure everyone is out of the way and focused when equipment begins to move.



It can't be overstated . . . Any change from the routine creates risk. When something out of the ordinary takes place, be on guard for safety hazards.



There are several key principles to safe backing in work zones:

- Backing should be controlled, used only when necessary and under specified conditions;
- There should be clear communication between the operator and workers on foot before backing begins;
- Everyone should understand the blind areas around the equipment on site.

Notes:



- Operators and drivers must walk around their vehicle to check for hazards
- Operators, drivers and workers on foot should be aware of blind areas
- Operators and drivers should use a spotter **whenever possible** when backing or maneuvering near workers on foot or other hazardous conditions. (This would not apply if no workers on foot or other vehicles are in the area.)



The operator needs to be fully aware of his or her surroundings. This includes objects at ground level, other vehicles and workers on foot. An important practice is to communicate site conditions and safety practices with truck drivers before they enter the work space, and then continuously during operations. Keep them informed about the site safety plan and changing conditions.



Before moving vehicles or equipment, the operator should walk around it to ensure no person or obstacle is in the blind areas. An alternative plan is for the operator to use a spotter.

Trained spotters are essential in work areas where there are numerous workers on foot nearby, many vehicles operating in a confined area, or obstacles that may not be visible to the driver. A member of the crew should be designated to carry out this duty when needed.



Spotters are recommended by ANSI and other agencies. They are required by some states when camera/radar systems not used, including Virginia and Washington State. A spotter can be designated from the on-site crew, but should be trained in proper signaling and self-positioning. If multiple people are near the spotter, or more than one person tries to give the driver directions, it will be confusing. Designate ONE spotter and have other workers remain clear of him or her. A good practice is to conduct a morning risk assessment of the day's operations to determine if a spotter should be designated.

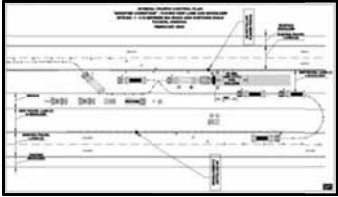


A critical step in developing an ITCP is plotting where pedestrians will normally be located, the types of equipment in the work area, and the path for each piece of equipment. The paths for truck and construction vehicle movement should be planned in conformance with the principles of safe construction traffic control. Long backing maneuvers for dump trucks should be avoided and points of access and egress of trucks moving within the work space should be controlled. TTCDs may be used inside the work space to separate areas designated for workers and routes for construction vehicles and equipment. When creating vehicle pathways, the primary concerns are ensuring the drivers/operators know where they should- and should not go and ensuring workers know the areas to avoid. Route planning occurs before vehicles arrive on site. Workers on foot should be located as far as possible from vehicle paths. Parking, toilet, and break areas should be staged away from the principal conflict points involved with the paving rollers and dump trucks.

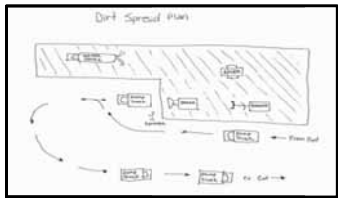
Notes:



In some instances, workers must enter “worker free zones” to perform their duties. This might include those performing quality control and density measurement for asphalt, as the worker free zone would include the roller area. In this instance there must be clear and constant communication between the QA technician and the roller operators as to where the QA tech will stand during roller passes.



The key principles for creating vehicle pathways are 1) Planning routes in advance; 2) Communicating the routes to site personnel and delivery drivers; 3) Delineating worker-free zones and equipment-free zones so all workers and operators know where they are expected to be. This is a sample of a plan for delivering asphalt to a paving operation. It shows how delivery trucks will enter the work space, queue for delivery, back-up to a paver, empty their load, then exit.



While this is an example of a detailed “model” plan, the same can be accomplished with hand-drawn diagrams. More detailed information on creating ITCs will be presented later in the course.



ITC plans can be detailed, such as the CAD (computer aided design) drawing on the previous slide, or as uncomplicated as a hand drawing seen here. The only purpose is to communicate equipment paths and worker zones. In this dirt spread operation, the simple drawing demonstrates how dump truck access points are limited. Backing operations are controlled by the spotter and dirt spreaders.

Delivery vehicles should be made aware of the procedures that will be employed when workers approach them to receive information or provide instruction. This notification will alert drivers where to anticipate seeing workers on foot.



In most work zone situations, there are technological solutions that can alert drivers and operators to the presence of workers on foot. These technologies include alarms, cameras, radar, sonar, and tag systems. Each of these technologies have unique deployment challenges, ranging from dirty lenses to high cost. As this equipment grows in use and experience, many of these challenges are being overcome. *(For an in-depth presentation on technology solutions, the instructor may elect to show Module Seven, which goes into greater detail.)*

Notes:

Vehicle Access and Egress



The establishment and maintenance of safe access and egress points are key determinants of project safety. In order for roadway construction jobs to maintain safe operations, there must be procedures to allow for safe and efficient passage of work vehicles into and out of the work space and for motorists to travel through the work zone. Effectively addressing safe access and egress at the project level requires planning during the project development phase and implementing traffic control plans throughout the entire project.



The primary challenge with regards to work zone access and egress is getting materials in and out of the work space. Of necessity, this involves acceleration and deceleration of large, heavy trucks and equipment hauling the materials. These construction vehicles must leave and enter the traffic space, where motorists often drive at high speeds, and transition to the work space, filled with slow moving equipment and workers on foot.



Note the entrance to the work area is provided via an earthen ramp between the work area and travel lanes. The truck must enter from and exit to the high speed left travel lane without much acceleration or deceleration space.

- Acceleration / Deceleration Lanes
 - Short or Non-existent
- Signage Indicating Merge / Exit Points
 - Signs give vague information
 - Messages left up 24 / 7
- Flagging Operations
 - Works best with low traffic and moderate trucks
 - Low trucks = intermittent flagging
 - Proper rules are forgotten
- Night Work
 - Poor sight distance, impaired drivers, others?



The work area can be complex with delivery trucks entering and exiting the work space near workers on foot and other operating/moving equipment. The ITCP should coordinate these activities so all know what the other is doing and each stays out of the path of the other. In this slide, the employee vehicle and worker on foot would be in direct path of a vehicle entering the work area. A risk analysis would identify the location of the parked vehicle as a hazard; a different parking site should be identified. Employer should train employees on where to and where not to park on site. Employers should also train on particularly hazardous areas like access and egress points.



Access and egress challenges can be addressed by an ITCP in the following ways:

- Isolating workers on foot from trucks and equipment;
- Limiting/controlling vehicle access points;
- Coordinating truck and equipment movements;
- Providing guidance to workers on foot, truck drivers, and equipment operators.
- Designating locations for parked vehicles and equipment
- Raising awareness about vehicle intrusions with workers and operators/drivers



Entering and exiting the work space can require rapid acceleration and deceleration. (Discuss with the class the dynamics of how this situation is impacted if the truck is loaded or empty. Taking the load into consideration, how might that knowledge be used to make the work environment safer?



Activities that occur under the direction of construction contractors include maintaining a clear/open area around access/egress points where equipment or vehicles should not be parked. Contractors are also responsible for educating on-site employees about areas near access/egress points that are prone to heavy truck traffic. Workers should avoid crossing open traffic lanes, particularly those on high-speed roadways.



When truck queues form near exit and entry points they create hazards for other vehicles attempting to enter (with little deceleration space) and exit (with little acceleration space). If queues threaten to block these spots, queues should be redirected, or different access and egress spots should be identified for drivers to use.



If queues threaten to block access and egress locations, queues should be redirected, or different access and egress spots should be opened and identified for drivers to use.

Speed differential between traffic lanes and work space is a challenge for truck drivers, and can create significant hazards for both workers and motorists.

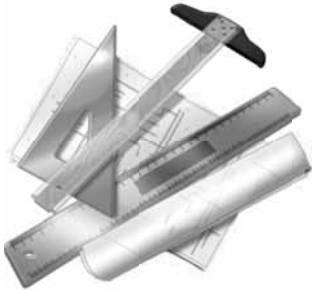


In addition to creating special ramps or other lanes, all access and egress areas should be kept clear of debris, signage, parked vehicles, etc.

Roadway construction involves moving operations. As the work progresses, so moves the work site. With continual changing conditions, access and egress points may change. Crew, operators, inspectors, subcontractors and others may not be up-to-date on access/egress locations as work progresses.

Notes:

Developing ITCPs



Ideally the ITCP should be considered from the very beginning of a project because some important elements--such as the size of the work space--will be dictated by the amount of right-of-way, number of lane closures, etc. To facilitate proper separation between workers on foot and mobile equipment, adequate space is necessary. If such considerations are not anticipated from the beginning, it will be more difficult to organize a complete ITCP.

The first phase (design) is when the project is first bid and won, a general plan should be created at that point. The second phase (planning) takes place when projects are being laid out, the original plan is flushed out into phases and plans are developed for those phases. The third phase (pre-construction) is the week before the work begins. In that phase any additional modifications should be added to that plan like other activities on site or changes to internal traffic in the plan. The final phase (construction) begins the day of construction; any final changes need to be communicated to everyone on site that day.



State and local agencies have significant influence upon decisions made during early planning of a project that impact the options available to the contractor when developing an ITCP. For example, planners can ensure the project has access and egress points that are not encumbered by roadway geometry or structures such as bridges. Forethought to ITCP needs will impact the amount of right-of-way obtained for acceleration/deceleration lanes, access/egress points, and parking and staging of vehicles. Some consideration may be allowed for contractor selection based on past safety performance. Such consideration during the planning phase is being encouraged by OSHA and other organizations under the concept of "Prevention through Design." It should be noted, however, it is NEVER too late to set up and ITCP. Even if such a plan is conceived when construction is underway, many ITCP concepts can be employed to improve worker safety.



The Contractor Planning Phase is an ideal time to negotiate responsibility for executing certain elements of the ITCP. Duties can be allocated to the roadway owner, project engineer, superintendent, foremen and other personnel. Risk can be properly allocated and process can be assigned such as participation in safety meetings, how and if law enforcement will be used, location of access and egress points, and the amount of lane encroachments.

The ITCP is implemented during the construction phase. It should be part of the project's safety plan. The site supervisor/foreman should oversee implementation and will likely develop the site plan. As noted, foremen, supervisors, lead persons and others are crucial for plan implementation and should be taught the principles of safe



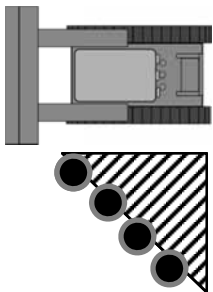
construction traffic control. They will be in charge of daily set-up and monitoring of the ITCP. Responsibilities for key personnel are assigned and any remaining training is conducted during this phase. Onsite workers are provided training in both overall ITCP concepts and specific implementation elements at their assigned work area. To function properly, the ITCP must be reviewed and modified each day before the beginning of each shift so employees can receive instruction on how it will be implemented that day. In addition, ITCPs may be modified more frequently as conditions change throughout the day.



A good communications plan is essential during the construction phase. A process must be engaged to coordinate the ITCP and site conditions among all those who will enter the work space. At this point, subcontractors will need to be engaged as their operations will be impacted by the creation and implementation of the ITCP. When seeking to identify all those impacted by the ITCP, it is imperative that all subcontractors and their operations are considered and educated about the program. A failure by one subcontractor can impact the safety and production of the entire site.



The notes are critical to execution of the plan. They should include specific elements such as vehicle speed limits in the work space near workers; how to identify and locate employees taking tickets; requirements for drivers to keep their window down (when appropriate) so they can hear site sounds and warnings. These notes become site audit tools that will assist supervisors in auditing the success of their safety program.



The legend explains the symbols used on the ITCP diagram. Standard symbols are based on those used in the MUTCD. However, additional details on classes of personnel and vehicle types are needed in developing an ITCP for a paving operation. In this example, the orange hatched area is a worker-free zone which we will go over later. The orange circle is a construction barrel; the icon below that is a grader. A dump truck with a black bed is a full truck, while the dump truck with a yellow bed is an empty truck. The icon up in the right corner is a paver and the icon below that is the roller. The other icons on this slide are a tack truck, a water truck and a passenger car. The key may also be hand drawn. The important thing is that you provide a key so someone reading the diagram understands the symbols you have used.



The first step is to recognize the scope of the operation and each of the tasks that will be performed. Based on these planned operations, the contractor will identify personnel who will be involved.



The next step is to review the site plan. Identify what will take place and where. Is there space for workers to park cars and safely access the work area? Where will restrooms, water coolers and break areas be located? What equipment will be on sight? How many workers are needed to operate the equipment? What work will be done by workers on foot? Can they be physically separated from equipment operating areas and vehicle travel paths? How is the TTCP organized? Are workers sufficiently protected by the TTCP? By asking and

Notes:

answering these questions, you will begin to formulate your internal traffic control plan.



Next, you will need to assess how your work will proceed once operations begin. How quickly will the operation move? For example, earth moving and site preparation work may remain in the same location for weeks, even months. Paving operations, particularly resurfacing, will move down the road more quickly. How often will access and egress points need to be relocated? How frequently will asphalt, aggregate or other materials be delivered to- or removed from the site? By addressing these questions you will begin to understand how frequently your ITCP will need to change or be updated.

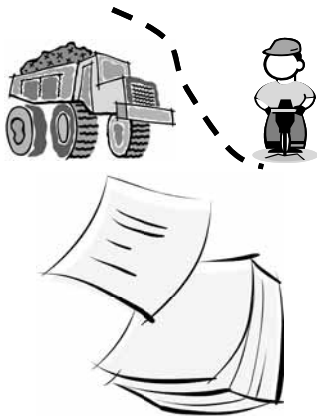


The final phase in ITCP development is implementing the communications plan—including training. Who will update the plan and stay in constant communication with site supervisors, foremen, subcontractors, workers, operators, etc. The most challenging part of ITCP implementation will be communicating with drivers of delivery trucks (dump trucks) and other site visitors who are not direct employees of the contractor. These communications can be difficult and require constant monitoring.



Site specific ITCPs should be developed for different phases of the project as the site conditions change. Remember, ITCPs are “living” documents that must be updated to reflect current conditions.

Once you have the basic work area drawn out, plot where workers on foot and construction equipment will operate. Next plot the path of vehicles approaching and leaving the operation. Show on the drawing areas where ground workers are to avoid (worker-free-zones) and the path workers will take to complete their duties, check on materials, etc. Finally, plot the location of overhead and underground utilities, storage and staging areas, and any other known obstacle or hazard. This process creates the ITCP diagram, which can be used to show workers, equipment operators, dump truck drivers, and others how workers on foot and equipment will move about the site.



Remember, the main goal of the ITCP --- to the extent possible—is to remove workers from the risk of being struck by construction vehicles and equipment. To do this, layout on the ITCP diagram equipment paths and worker free zones.

Now that the ITCP diagram is drawn up, create plan notes to explain important aspects of the diagram (such as worker-free zones) and any other site-specific safety points (such as on-site speed limits, spotting instructions for overhead power lines, or instructions for the ticket taker to stay on the driver’s side of dump trucks). Explain in the notes if special signage will be used to direct construction vehicles inside the work space.

Notes:

Name: _____ Date: _____ Job Location: _____

Internal Traffic Control Plan Development Check List Ideas to Consider for ITCP Drawing

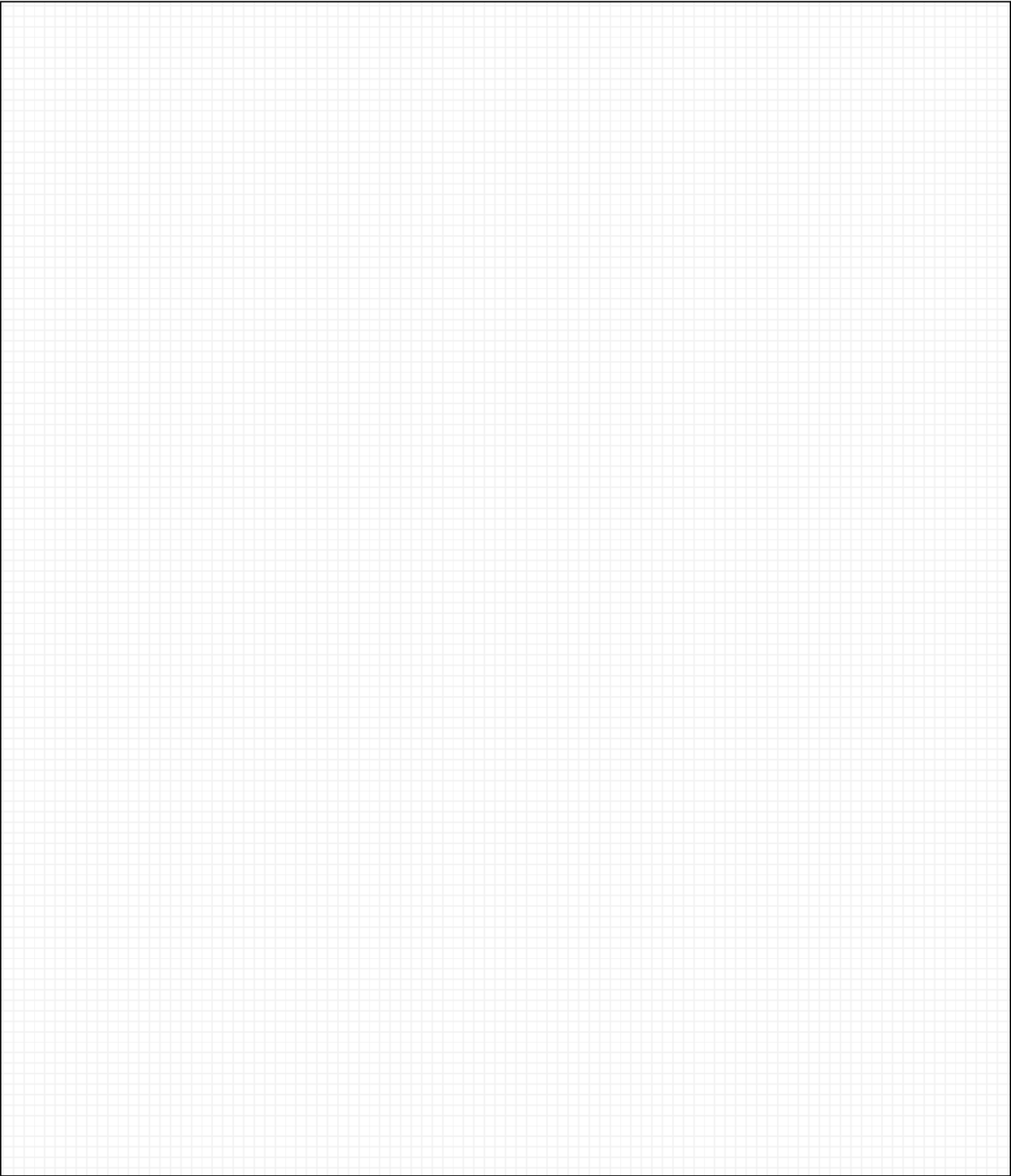
- ☐ Draw basic work area layout, which can be taken from project drawings or the traffic control plan
- ☐ Plot where work activities will take place
- ☐ Plot the vehicle access points
- ☐ Identify where equipment will be backing and create pedestrian free zones
- ☐ Plot how workers will get to and from work areas
- ☐ Draw the traffic flow for large equipment
- ☐ Determine the storage areas
- ☐ Plot how materials will get to and from staging areas
- ☐ Establish parking areas for workers and visitors
- ☐ Establish restroom and break areas
- ☐ Plot utilities
- ☐ Write notes to explain the diagram and specify duties of personnel

Exercise: Using the following worksheets and the checklist above, practice sketching an internal traffic control plan for an operation of your choice, or use the included drawings. Remember to include safe traffic control principles, including:

- **Limit vehicle backing**
- **Control vehicle access points**
- **Isolate workers from vehicle and equipment movements**
- **Design buffer spaces to protect workers from vehicles and equipment**
- **Consider use of signage**

INTERNAL TRAFFIC CONTOL PLAN DRAWING

Name: _____ Date: _____ Job Location: _____



INTERNAL TRAFFIC CONTROL PLAN DRAWING

Name: _____ Date: _____ Job Location: _____

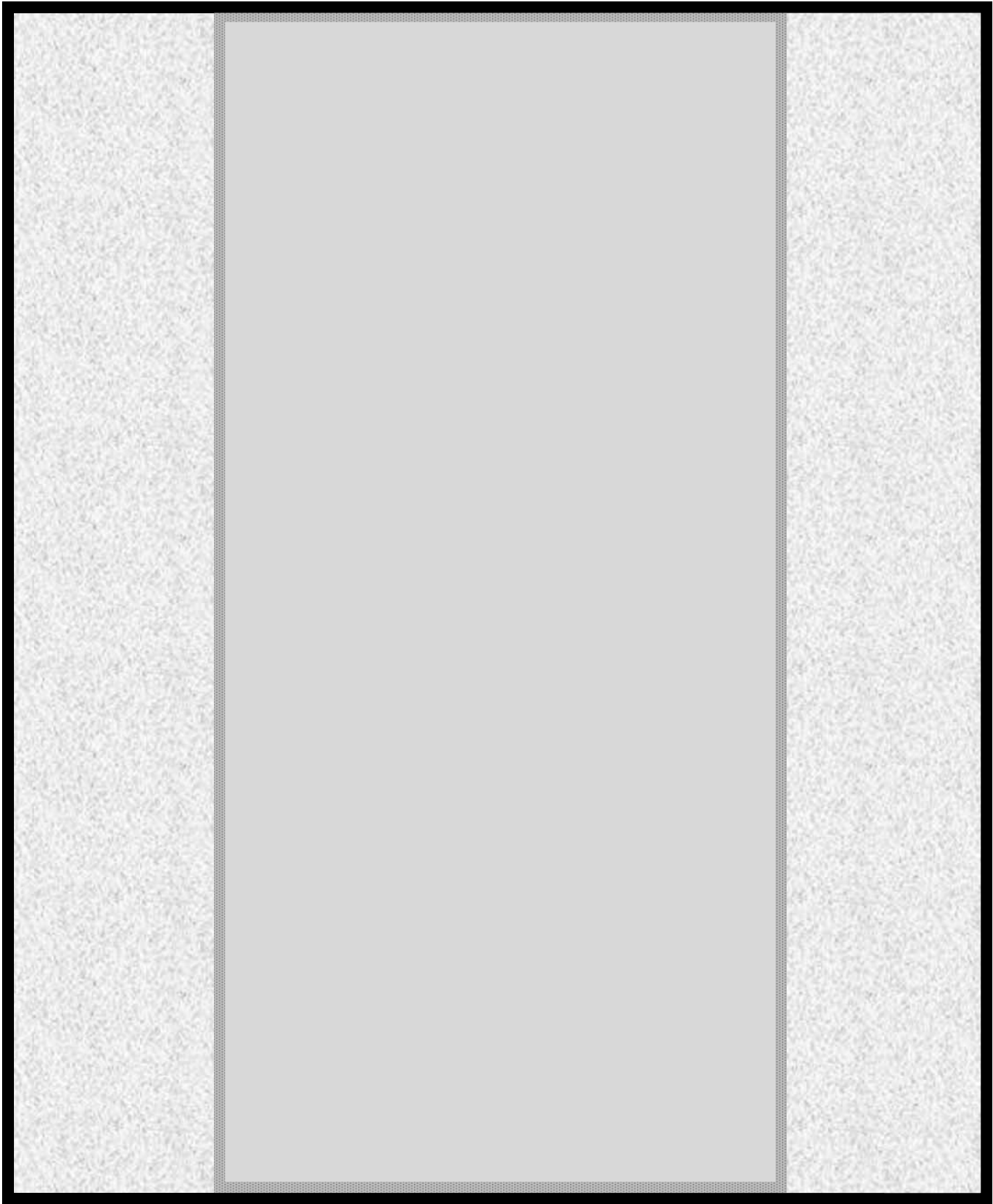
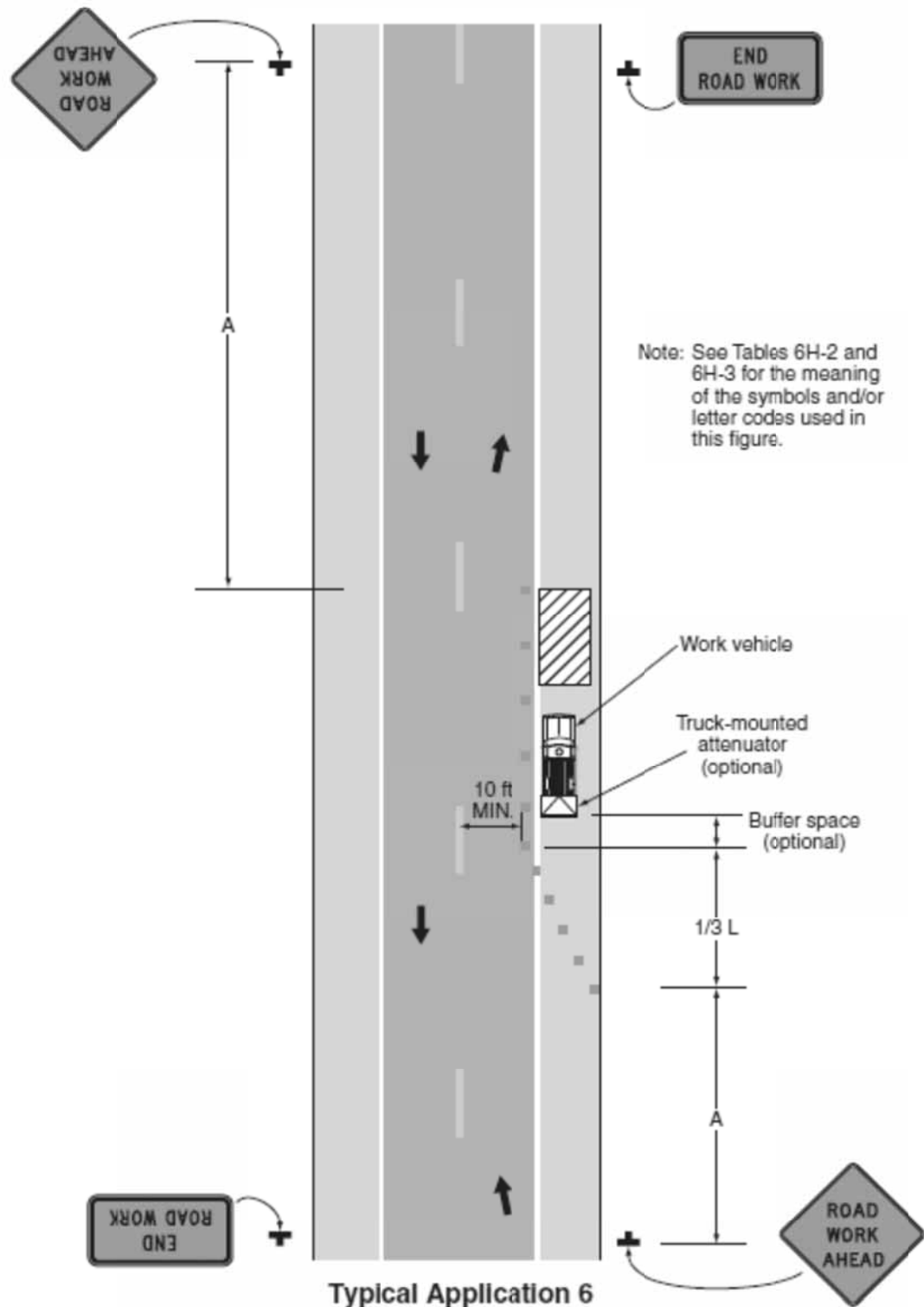


Diagram illustrating the layout of a two-lane road construction zone, showing lane closure and lane shift. The diagram includes the following elements:

- Signs:**
 - ROAD WORK AHEAD (diamond)
 - LEFT LANE CLOSED XX FT (diamond)
 - LEFT LANE CLOSED XX FT (diamond)
 - END ROAD WORK (rectangle)
 - Temporary white edge line (rectangle)
 - 1/2 L MIN. (rectangle)
 - 1/2 L MIN. (rectangle)
 - XX MPH (optional) (rectangle)
 - RIGHT LANE CLOSED XX FT (diamond)
 - RIGHT LANE CLOSED XX FT (diamond)
 - ROAD WORK AHEAD (diamond)
- Layout and Dimensions:**
 - Buffer space (optional)
 - 1/2 L MIN.
 - Temporary yellow lines
 - Shoulder taper (see Note 2)
- Arrows:**
 - Downward arrows indicating traffic flow in the left direction.
 - Upward arrows indicating traffic flow in the right direction.

23

Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)

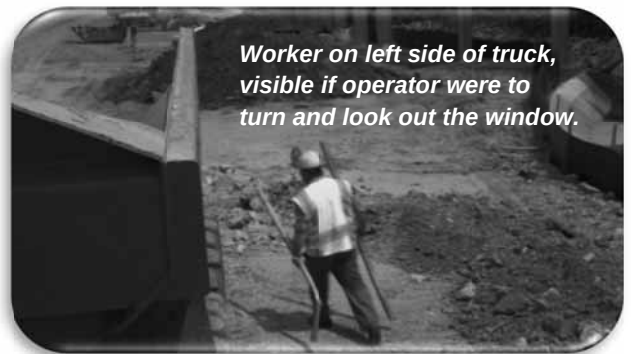
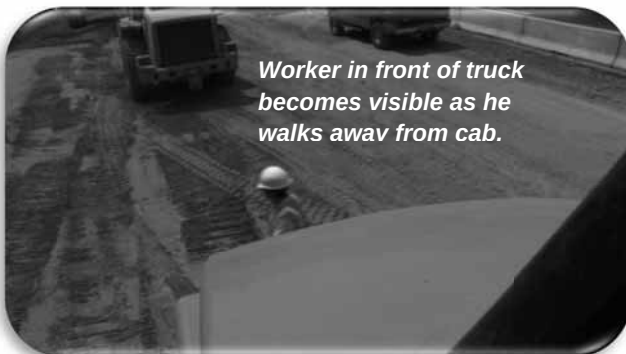
Blind Spot Activity

1. Stage a dump truck (or other large piece of equipment) in an open area or parking lot. If possible, secure several different types of equipment to demonstrate how blind spots vary from one piece of equipment to another. Lock-out the vehicle and remove keys from cab. Instruct one worker to sit in the cab and observe workers through his mirrors and windows.
2. Position employees in various positions around the vehicle, including directly in front, on the right-side and behind the parked truck.
3. Instruct the employees on foot to move to various locations, extending distances until the driver can see them in the mirrors. Place cones on the ground when they become visible.
4. By completing this exercise around the vehicle you will be able to obtain the length and width of areas where workers are not visible, helping them realize the size and location of blind spots.

.....

Variations: Park a heavy piece of equipment and stage a pickup truck in different blind areas around the equipment. Let workers sit in the operator's seat to visualize the blind areas. (Be sure to lock out the equipment and pickup when performing these types of exercises.)

Other variations of these exercises can be done by using different sized objects to illustrate how blind areas change depending upon the size of the object. Generally, blind spots become larger as objects are closer to ground level.



Backing Safety Program

Backing can be extremely hazardous. Backing accidents statistically account for approximately 50% of all fatalities involving construction equipment in roadway work zones. These accidents can also result in serious disabling injuries. The following are some practical steps that should be used by drivers and pedestrian workers to eliminate backing accidents.

Before Driving:

1. Ensure mirrors are positioned properly for the driver before operating the vehicle.
2. While pickup trucks generally are not equipped with backup alarms, all vehicles equipped with backup alarms must be checked prior to operation to ensure they are in proper working condition.

Parking:

1. Avoid backing whenever possible. Evaluate the area to find a route to arrive at your destination while moving forward.
2. Keep the driver's window down, and if possible, the passenger window down when backing or driving in the vicinity of pedestrian workers.
3. Turn off radio or other distracting devices.
4. Park in a manner where you can leave in a forward motion. Pull straight through when possible. Remember, the closest space is not always the best place. Choose a place that is free of congestion. You can see more when you first arrive at any location, so if you must back, this is the time to do it.
5. Any time you have been stationary for more than 2 seconds, conditions change. Get out of your vehicle and walk around it before moving. Never trust the scene you checked to stay the same. A person walking three miles-per-hour will travel 9 feet in 2 seconds. A child riding a bike at 10 miles-per-hour will travel 30 feet in 2 seconds.

Backing:

1. Always beep your horn 2 times before reversing. This will alert others that you are doing something different. Everyone should be trained/informed that 2 beeps means you are backing.
2. If your vehicle is equipped with a backup alarm it must be working. If it is not working you are required to fix it. In an emergency, if you must finish the task at hand when the alarm stops working you must use a spotter while in reverse.
3. Always use all mirrors when backing and preferably always use a spotter. You should always agree on signals before backing. Always back at an extremely low rate of speed (walking speed) and do not back more than 50 – 100 feet before stopping and rechecking the area for a clear zone. Evaluate the area for more stringent guidelines in confined areas.



Adjust and clean mirrors; check back-up alarm.



Avoid backing; drive with windows down.

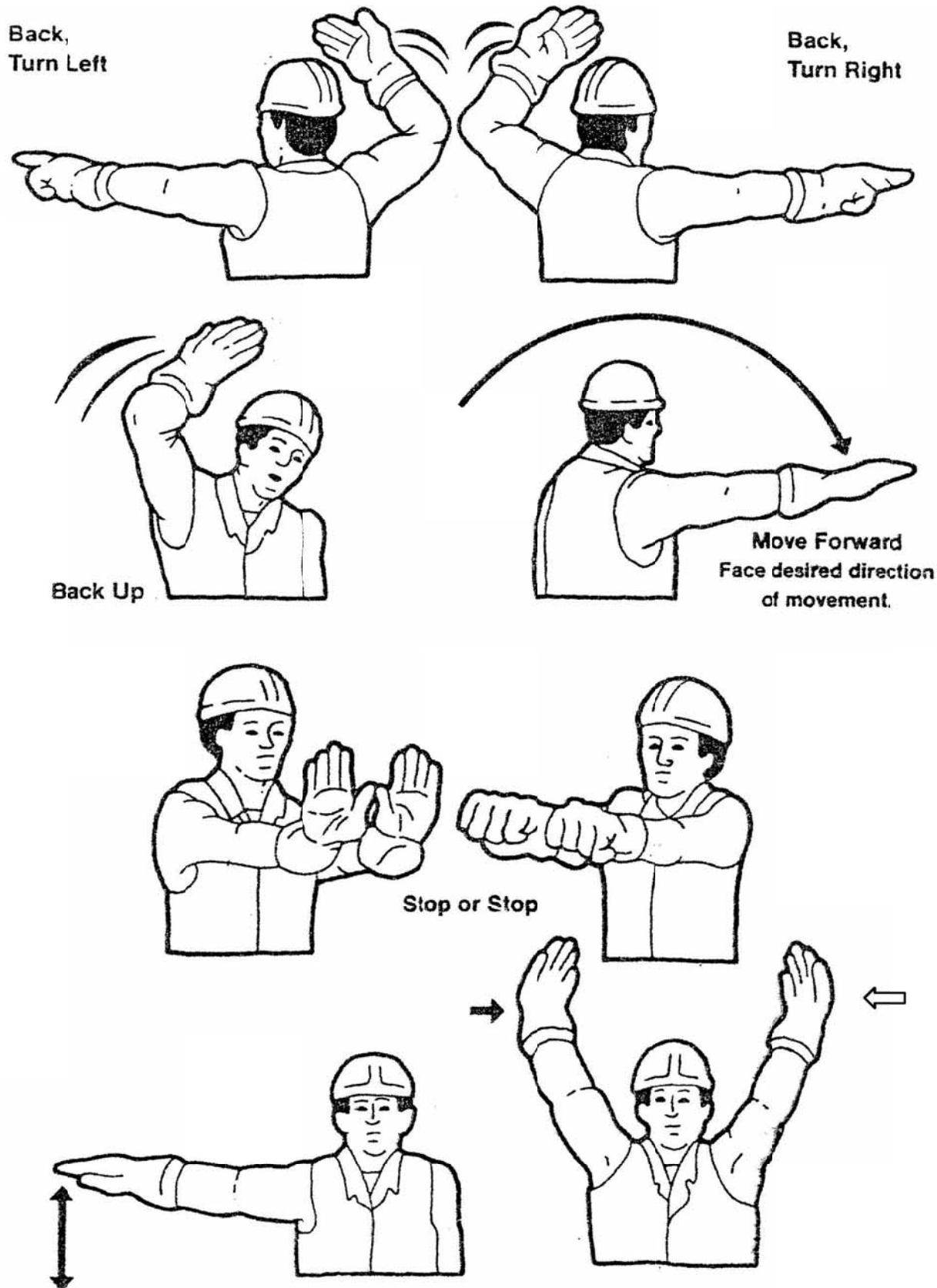


Park so you can exit forward; walk around vehicle before moving.



Use a spotter to assist in backing when possible.

Backing Hand Signals



Pedestrian Workers

The primary cause of worker fatalities and injuries in the heavy and highway construction industry is being run-over or backed-over by motorists and construction equipment—primarily dump trucks. While most workers assume the biggest threat is an errant driver who breaches the barricades and strikes construction workers, the fact is most workers are killed by construction vehicles.

The following steps are critical to the safety of roadway construction workers:

1. The area directly in front or behind trucks and large equipment is a prohibited zone. Do not walk or work in front or behind the equipment unless you receive verbal and visual communication from the operator that it is safe to do so. Do not approach a vehicle unless the operator signals his or her approval.
2. Don't be a victim of complacency. Stay alert and do not underestimate the risk of tasks you perform regularly or fail to notice a change in your surroundings. Be careful not to stray into open traffic lanes or pathways of trucks delivering materials.
3. Position yourself so that you have peripheral vision of everything in the area where you are working. Don't stand in shadows or in areas where you may be hard to see.
4. Create a routine to glance around in all directions for awareness of surroundings.
5. Wear appropriate high-visibility garments that comply with industry standards. Keep vest closed in front and on sides to ensure visibility.
6. Listen for back-up alarms, horns or other signals warning you of nearby vehicles. Don't "learn to ignore" alarms. Look up when you hear one.
7. Stay in your assigned area. Remain behind barriers or other traffic control devices designed to separate you from traffic and construction equipment.
8. **STAY ALERT!** What you don't see can kill you.



Do not stand directly in front or behind equipment.



Don't become complacent with routine tasks.



Pause to look around and note activities near you.



STAY ALERT!

ACKNOWLEDGEMENTS:

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Hand signal chart developed by City and County of Honolulu, Department Of Human Resources Division of Industrial Safety and Workers' Compensation



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