

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Introduction

"Safety Is Job #1"
"Safety Starts With You"
"Safety First"

Everyone has heard different slogans or themes about safety. But what do they really mean? What are these slogans and themes trying to achieve?

Safety is not a slogan, or a set of policies and procedures. It is a frame of mind, an **attitude** that the CDP must develop in the performance of his or her daily tasks. Having the proper attitude, safety becomes second nature. The CDP does not have to think about safety - he or she knows what is safe behaviour, and what is not without thinking about it. Having the proper safety attitude, the CDP can expect to work a lifetime without serious injury.

It is very easy in the hectic nature of the ready mixed concrete industry to take short cuts, or violate good safety practice in order to get the job done quickly. There is always pressure to hurry up, go faster, unload quicker, and get back to the plant for the next load. Accidents can happen if the CDP gives in to that pressure. It is possible to work safely **and** efficiently, but only if the CDP has the right safety attitude.

Every company will have their own detailed safety policies and procedures, which must be followed at all times. The information presented in this module is a brief overview of the safety issues the CDP must be familiar with.

The objectives of this module include:

- ◆ Providing information and procedures for the CDP to work safely
- ◆ Educating the CDP about safety rules and regulations in the construction industry
- ◆ Illustrating safe operation of the truck mixer under most jobsite conditions

To learn more about the information presented in this module, please see the list of references and recommended readings in the appendix.

Chapter 1 - Personal Safety

Chapter Objectives:

After studying this chapter, the CDP candidate should be able to:

- ◆ Understand potential hazards of the CDP environment; particularly those which can affect personal vision, hearing and respiratory functions.
- ◆ Identify the purpose, correct use and care of Personal Protective Equipment (PPE).
- ◆ Understand the correct and incorrect methods of lifting objects to avoid back injury.
- ◆ Recognize the causes of cement burns and how to prevent them.
- ◆ Understand Hazard Communication regulations, and be able to read and use information presented in a GHS (MSDS) form.
- ◆ Understand the physical and legal effects of alcohol & drug use.
- ◆ Recognize how fatigue can affect CDP performance.

Injury in the Workplace

Every minute of every working hour somewhere, someone is injured or becomes ill as a result of their workplace activities. Occupational injuries and illnesses not only affect the injured worker and the company; they affect the worker's family, other company employees and customers. Most people think of the cost of injury only in terms of lost wages for the employee, but that is only the "tip of the iceberg".

There are many other costs of workplace injury such as:

- ◆ Loss of employee self-esteem and family stress
- ◆ Cost to the company for medical expenses and compensation wages
- ◆ Lost time and lower productivity
- ◆ Lost business because of worker absence
- ◆ Loss of employee morale
- ◆ Replacing or repairing damaged or destroyed equipment and parts
- ◆ Cleaning up after an accident and restoring production
- ◆ Damage to company image
- ◆ Training of replacement workers
- ◆ Retraining of injured employee on return to work
- ◆ Administrative expenses in processing and handling lost time accidents
- ◆ Fines or penalties imposed by government agencies.

All these factors can mean a great deal of cost to both the employee and the company. Because of these high costs, it is much more effective to spend time and money preventing workplace accidents and injury.

Safety in the Ready Mixed Concrete Industry



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Statistically, the ready mixed concrete industry is a relatively safe place to work when compared with other types of construction jobs. If proper procedures are followed with the right attitude toward safety, the CDP can expect to work a lifetime without significant injury.

This module will cover safety hazards that the CDP may encounter in their daily job. The text will discuss specific safety issues, and recommended procedures for the CDP to follow. The CDP must always follow his or her own company safety guidelines if there is any question on safety policy or procedure.

Who is Responsible for Safety?

Both the company and the CDP share responsibility for workplace safety. It is the responsibility of the company to provide a safe working environment that is free from hazards, which can cause death or serious harm to employees. The company must furnish any special protective equipment required to work in a safe manner, and training on their use. The company must also make employees aware of any hazards they may face while performing their job. Companies should also have written safety policies and procedures that employees could be trained on and held responsible for.

The CDP has the responsibility to work in a safe, yet productive manner. He or she must follow company safety policy and procedure at all times, and consider safety first when performing any tasks. The CDP must also warn the company of any hazards that may cause injury, and report any injury promptly. Because the actions that the CDP takes are completely within his or her control, the CDP is primarily responsible for their own personal safety.

Injuries

Injury or harm may occur in the CDP's daily environment to several specific body areas. They are listed here along with several examples of how injury may be caused:

Vision

Splashed concrete in eye, metal or wood splinters in eye

Hearing

Chipping in drum, exposure to loud machinery over time

Respiratory

Inhaling gases or fumes, inhaling dust or dirt

External Injuries

Cement or thermal burns, pinching or crushing injury, tripping or falling

Internal Injuries

Back strains from lifting, repetitive motion injury (carpal tunnel)

Any hazard that the CDP may face in their workplace can be prevented from causing injury by using the proper personal protective equipment (PPE), and following the appropriate safe working practice.



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PERSONAL PROTECTIVE EQUIPMENT

The proper use of PPEs can prevent most workplace injuries (See Figure 4-1). In most companies, the CDP is expected to furnish basic PPEs as follows:

equipment

- ◆ Work boots or safety shoes (no sneakers or sandals) - protects feet from punctures or dropped items, also provides support for ankles
- ◆ Work pants that fully cover the lower body (shorts are not considered a PPE) - protects legs from scrapes or chemicals
- ◆ Shirt (company may require long-sleeve shirt to protect arms) - protects upper body and arms from scrapes or chemicals.
- ◆ The company will usually furnish these basic PPEs:
- ◆ Hard hat - provides head protection from falling objects or striking head on objects
- ◆ Safety goggles or glasses - protects eyes from dust, chemicals or other debris
- ◆ Hearing protection (muffs or plugs) - protects hearing from sudden or continual noise
- ◆ Gloves (leather, cloth or rubber) – protects hands from pinching injuries or chemicals.



Figure 4-1: A CDP's Personal Protective Equipment (PPE) includes a hard hat, safety goggles or glasses, hearing protection, and gloves.

There may be other special PPE required for certain tasks, which will be furnished by the company. Provincial regulations require that companies furnish special PPE where required to protect against specific hazards. The use of head, eye and hearing protection is required in almost any task the CDP may perform. Each province establishes standards for personal protective equipment, and equipment must meet these standards in order to be used. Employees must be trained in their use, and in some cases, the PPE must be specifically fit to the employee (such as certain types of respiratory protection).

Companies will usually require employees to use these PPEs as part of their policy, and many companies have disciplinary procedures in their safety program if PPEs are not used. Proper care and maintenance is also the responsibility of the CDP for any company-issued PPE. The ability of any PPE to protect its user depends on how well it is cared for and maintained. The CDP should be familiar with and carry out the appropriate PPE care and maintenance as part of their regular routine.

The CDP should treat any PPE that he or she uses like their life depends on it - because sometimes it may!

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Back Injury

Lifting and moving objects is part of the daily routine for the CDP. These objects can weigh anywhere from a few kilograms to over 25 kilograms. Extension chutes are the heaviest item that the CDP lifts on a regular basis, and back injuries are one of the most common injuries that occur to the CDP as a result (See Figure 4-2). Back injuries are not limited to lifting chutes, however. Even smaller and lighter objects lifted improperly can cause back injury.

When the CDP lifts objects incorrectly, too much strain can be placed on the muscles of the back and the spine. This strain can cause muscles to spasm and cause pain, or can also damage the vertebrae in the spine itself.



Figure 4-2: Proper lifting technique should always be used when placing extension chutes on the mixer.

Many people have unstable or weak areas in their back or spine caused by a lifetime of lifting objects incorrectly. All it takes then is one wrong lift or move, and severe back injury can occur.

Severe back injuries can permanently damage a person's spine, sometimes causing extreme pain and disability for life!

Back support belts are used by people lifting objects in many industries, but are not

a substitute for proper lifting techniques. These belts provide support for the muscles of the lower back, but will not prevent damage if lifting is done incorrectly.

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Back Injury *continued*

Here are a few suggestions for the CDP to follow in order to lift safely:

- ◆ Keep the back in the “neutral” position. The shoulders are back, and the pelvis is slightly twisted to maintain a slight curve in the lower back. For practice, stand at military “attention”. Feel how the shoulders and back are positioned, and stomach muscles are tight - this is the “neutral” position.
- ◆ Lift all loads with a steady, even motion. Don’t jerk - this places a great strain on the back and spine.
- ◆ When lifting a load that is near the ground, bend the knees. Grasp the object by getting as close to it as possible, and then stand up. Lift with the legs and keep the back in the neutral position.
- ◆ When lifting a load that is higher, such as a chute on a fender bracket, bend the knees as much as necessary to get the shoulders even with the chute. Support the chute and pull it onto the shoulders with the arms, then straighten the legs.
- ◆ Be particularly careful if traction is a problem due to mud, ice, etc. If the CDP should slip when lifting or carrying a heavy object, he or she should try to throw it aside rather than attempting to “save” it and endangering the back.
- ◆ Do not twist while lifting! This puts an uneven strain on back muscles and the spine. Turn the whole body, feet first.
- ◆ Shoveling is also lifting. Follow the same rules.
- ◆ Do not lift heavy objects on first starting work when muscles are cold and tight. Perform some stretching exercises for a few minutes to warm up the body, and then lift using the proper techniques.
- ◆ Start and maintain a routine of daily stretching and flexibility exercises. Many back injuries are caused by a lack of flexibility and strength, not by serious muscle or spinal damage. Good posture also helps keep the back and stomach muscles strong.

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Cement Burns

Concrete and Portland cement products are highly alkaline (high pH) and can cause severe chemical burns to skin and eyes (See Figure 4-3). These types of burns are called “contact dermatitis” and are considered occupational illnesses. Cement burns can range from minor redness and irritation to serious chemical burns, which can scar for life or cause serious disability. In addition, some people are allergic to the chemicals in concrete and can have an allergic reaction to contact with cement products in their plastic state. This allergic reaction can make cement burns worse.

Here are some recommended procedures for the CDP to follow, which can help prevent cement burns:

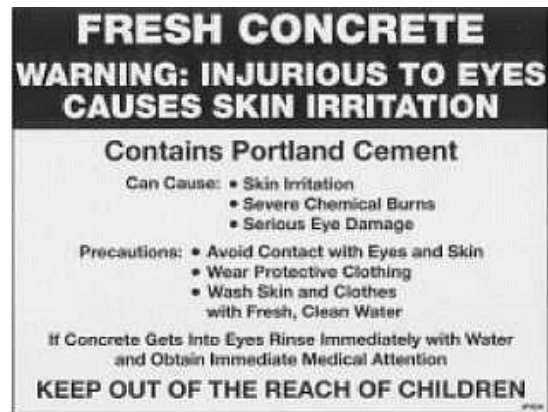


Figure 4-3: Cement burn warning poster.

- ◆ Keep all cement products off the skin and out of the eyes. The CDP should always protect himself or herself from direct exposure to fresh concrete. Eye protection should be used around concrete in its plastic state such as checking the load in the drum and during unloading. Long pants and a long-sleeve shirt should be worn to protect the body, as well as the appropriate gloves and boots.
- ◆ Do not let concrete or other cement products soak into clothing or rub against the skin. Rubbing or abrasion greatly increases the risk of serious injury. Clothing that is wet from concrete that stays in contact with the skin poses a real danger! Gloves and protective clothing are important in avoiding cement dermatitis, but a contaminated glove or clothing that traps cement against the skin can be as bad or worse than no glove at all.
- ◆ Wash the skin promptly after contact with cement products. Use a lot of water to help wash away cement particles and to dilute alkaline cement solutions. Buffering or neutralizing solutions are commercially available. They can be applied to the skin before and after exposure to minimize the affect of alkaline cement solutions. Mildly acidic solutions such as vinegar or citric acid may also work to counter the alkalinity of cement on the skin, but should be used only with a physician's consent. **DO NOT APPLY ANY OTHER ACID TO THE SKIN!**
- ◆ If cement or cement mixtures get into the eyes, flush immediately and repeatedly with water. Follow the company's emergency first aid procedures and get medical attention.
- ◆ The CDP should protect their skin, just like they would protect their hearing or vision. Working around concrete on a regular basis can dry the skin, and exposure to sun can create a risk of skin cancer. The CDP should use a sunscreen on a regular basis and a moisturizing lotion to keep the skin healthy, but should be careful which type and when it is used. Lotions that contain lanolin or limonene, for example, may act as sensitizers; causing cement alkalis to soak faster and deeper into the skin. Applying the right sunscreen before work and lotion after going home and showering is a good idea, but applying the wrong one before work can actually do more harm than good. Certain soaps are very alkaline, and should be avoided in favor of a pH neutral soap. Skin is mildly acidic and alkaline substances break down the skin's natural protection.

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Cement Burns *continued*

Customers are also at risk from cement burns. The CDP should be familiar with the company's cement burn warning strategy, which should notify customers about the potential risks associated with handling concrete or cement products. The delivery ticket should have a warning to alert customers about the potential risks of cement exposure, and there may be a

separate release clause for the customer to sign or initial. Homeowners or do-it-yourselfers have no experience with these dangers and may be particularly at risk.

The CDP should follow company procedures to advise customers about the risks of cement burns before unloading.

After concrete placement is underway, if the CDP sees anyone standing, kneeling, or working in fresh concrete so that their clothes, skin or eyes are exposed, he or she should immediately advise the customer of the potential dangers (See Figure 4-4).

They should be advised to remove any concrete-soaked clothing and thoroughly wash the exposed skin, and wear eye protection. In some cases, companies have authorized the CDP to stop the job until the customer is properly protected.

The liability possibilities are severe if the CDP and company management does not advise the customer of the potential hazard. The CDP should also make written notes about any issues or problems with potential cement burns on the delivery ticket.



Figure 4-4: A CDP should advise anyone who is working in an unsafe manner about the possibility of cement burns.

Hazard Communication

Provincial regulations require all employers to develop a program that informs employees and the general public of any chemical hazards in the workplace.

Under the new Globally Harmonized System of Classification and Labeling of Chemicals (GHS) and the Workplace Hazardous Management Information System (WHMIS) legislation employers must:

- ◆ Make a comprehensive list of all potentially hazardous chemicals used or stored at the workplace
- ◆ Provide employees with detailed information about potential hazards
- ◆ Develop and use a warning label system for containers of hazardous chemicals used in-house
- ◆ Develop a detailed, written company hazard communication program.

In addition, employees exposed to hazardous substances must receive information and training in:

- ◆ Recognizing each hazardous substance
- ◆ Understanding its properties and hazards
- ◆ Safe handling procedures
- ◆ What to do in the event of a spill or other accidental release
- ◆ How to control exposure to the substance.

Any company who manufactures a chemical product must also inform its customers or users of any potential hazards, and how to deal with the product safely. Ready mixed concrete is considered a chemical in most provinces, and falls under the WHMIS regulations. Concrete producers are required to supply information to their customers about the chemical hazards of concrete, and train employees on how to work around the product safely.

Each producer will develop a WHMIS program according to their own needs and operations. For companies with multiple plants or locations, the type of chemicals stored at each location may be different.

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The CDP must be familiar with the requirements of the program in order to work safely no matter where their job duties are.

Material Safety Data Sheets (old system)

The Material Safety Data Sheet (MSDS) is used to communicate any chemical hazards in the workplace or with their products. Most MSDS sheets are broken down into sections as follows:

Section I	Manufacturer information such as name, address, emergency telephone numbers
Section II	Hazardous ingredients such as chemical names and exposure limits
Section III	Physical and chemical characteristics, such as boiling point and evaporation rate
Section IV	Fire and explosion hazards of the chemicals
Section V	Potential reactions of the chemicals in the product with other chemicals or environments
Section VI	Health hazard data and first aid procedures
Section VII	Precautions for safe handling and use
Section VIII	Control measures such as respiratory and eye protection required.

The SDS under the new GHS must include information under the following headings in the order specified:

1. Identification
2. Hazard(s) identification
3. Composition/ information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure control/ personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information.

Samples of an MSDS and an SDS for ready mixed concrete can be found in the appendix of this Module.

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The CDP must be familiar with the chemical hazards associated with concrete and cement products, as well as any other chemicals that may be used in the workplace. In particular, the CDP must know the precautions for safe handling and use of each product and the recommended PPE to use.

Customers must be provided with the (M)SDS sheet on ready mixed concrete according to provincial regulations. The information must only be provided once to the customer, and updated only if chemical ingredients change. It is a good idea for the CDP to carry a copy of their company's (M)SDS for concrete, which can be provided to the customer at delivery on request. Some companies provide an (M)SDS sheet on the job along with their required cement burn warning procedure. This is particularly useful when delivering to a homeowner or do-it-yourselfer, so that the customer can use the product safely and the company is protected from liability. The CDP may be called on to explain the information in an (M)SDS to a customer, and should therefore be familiar with all of the information on the (M)SDS form.

Alcohol and Drug Use

Working safely requires that the CDP be 100% mentally and physically alert. The use or abuse of alcohol and illegal drugs will impair the CDP's ability to work safely, as well as threaten his or her ability to make a living. In addition, the improper use of prescription or over-the-counter drugs may cause a safety hazard. These drugs may be legal to use, but they can affect the CDP's ability to function safely by reducing reaction time and impairing decision-making ability.

The CDP must be aware of the provincial regulations on alcohol and drug use. These regulations must be strictly followed, or the CDP may lose his or her Commercial Drivers License (CDL). All concrete producers are required by provincial regulations to have a substance abuse policy. This policy enforces the regulations and makes sure that all CDL holders are alcohol and drug free while operating a motor vehicle (See Figure 4-5).

**Alcohol & Drugs
on the job?**
- Lose your CDL!
- Lose your job!

*Figure 4-5:
Companies typically enforce
severe penalties if an employee
uses or is under the influence of
drugs or alcohol on the job*

Testing after an accident under certain conditions may be required under provincial regulations or police department requirements.

The producer is required as part of their substance abuse policy to provide training on the effects of drug and alcohol use. The producer is also required to provide information on substance abuse professionals, who can counsel and assist employees with a substance abuse problem.

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Fatigue



Figure 4-6: A CDP should never get behind the wheel when he/she is too tired to drive safely.

The construction industry can be very seasonal. Business demands may require the CDP to work long hours, especially in the summer during the height of the construction season. These longer hours can cause fatigue. Fatigue can cause the CDP to be less alert, affect judgment, and increase the risk of accidents or injury. Fatigue can be caused by other factors besides working long hours. Stress, physical condition, and a person's attitude all have an influence on how fatigue can affect the CDP.

In an effort to reduce accidents caused by fatigue, the Departments of Transportation have regulations that limit the number of hours an operator of a commercial motor vehicle can work. These regulations control the total time the CDP may work in a seven-day period, as well as the number of hours "under the wheel". The CDP is required to have a certain number of rest hours during this time. (See Figure 4-6).

The CDP should be familiar with the hours of service regulations, and keep track of their hours worked in order to comply with these rules. The producer should also have a system in place that monitors hours worked, and schedule the CDP to avoid violating hours of service regulations. The CDP must rely on their own judgment whether he or she is too fatigued to operate a truck mixer safely, and not rely on limits set by Provincial regulations. These requirements cannot be exceeded, but sometimes the CDP may be too fatigued to work safely before these limits are reached.

The CDP is the only one qualified to decide if their fatigue levels are too high. If the CDP becomes too fatigued to work safely, he or she should notify their supervisor or dispatcher immediately so that work schedules are not interrupted too severely.

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Safety and First Aid

No matter how safely the CDP or people around them work, accidents can and will happen without warning. Knowledge of first aid and other lifesaving techniques can mean literally the difference between life and death, should someone be injured in the workplace. The CDP should have training in basic first aid and cardio-pulmonary resuscitation (CPR), and be prepared to use these skills in an emergency. This training is available in many areas through local fire departments, ambulance services, the Canadian Red Cross or the Canadian Heart and Stroke Foundation. Many companies will sponsor this training for their employees at no charge. These skills are also valuable to know should the CDP themselves or their family members become injured or require immediate medical attention.

This training should be updated or refreshed every few years, because these skills are harder to remember if they are not used. The CDP should only administer first aid or CPR to the level of their training, and not try to perform a technique they have not been specifically trained for. Liability may be created if the CDP tries to perform a first aid or emergency skill that he or she is not trained to do. Watching an emergency skill performed on television does not make a person qualified to do it!

If a medical emergency occurs, the first step is always to get help. The CDP should make sure that the fire department or rescue squad has been called before starting first aid or CPR. Contact the company dispatcher by radio and inform him/her of the situation, or send a bystander for help. Provincial DOT regulations require that a first aid kit be carried in each truck. The CDP should be familiar with its contents and have it accessible at all times.

Chapter 2 - Truck/Mixer Safety

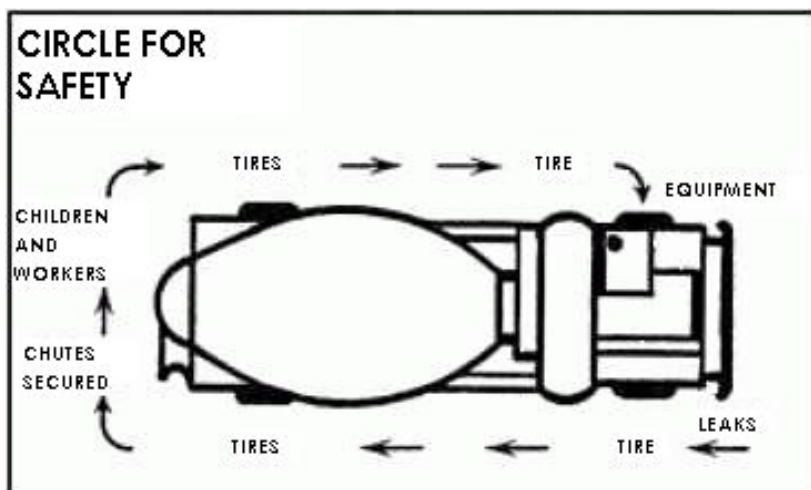
Chapter Objectives

After studying this chapter, the CDP candidate should be able to:

- ◆ List the steps of the “Circle for Safety” method for checking hazards around vehicle.
- ◆ Identify proper ladder climbing techniques, proper entry and egress from the truck cab, and the “three-point” climbing rule.
- ◆ Recognize proper chute handling & cleaning procedures.
- ◆ Understand the purpose of lockout/tag out policies and recommended lockout/tag out procedures for truck mixers, as well as other heavy equipment.
- ◆ Understand confined space regulations and safe drum cleaning procedure.
- ◆ Recognize how to prevent objects from falling off, or being thrown from, the truck mixer in-transit.

There are many ways that hazards can “sneak up” on the CDP during the delivery process. Children may be playing around a truck mixer temporarily parked on a residential street while the CDP is inspecting the job site. Fuel or air lines may become snagged on obstructions without the CDP's knowledge. Someone may have parked a vehicle in the CDP's blind spot. The Circle for Safety (See Figure 4-7) is a quick and easy method the CDP can use to check for these hazards and move the truck mixer safely.

Before moving the truck mixer after it has been parked or left unattended, circle the truck and look for hazards. Look for children, other people, vehicles or obstacles that may be in the truck



mixer path. Check for flat, low or damaged tires. Look for fluid leaks and other mechanical problems. Make sure the chutes and water hoses are properly stowed. With practice, the CDP should be able to complete this important safety check in 30 seconds or fewer and not delay the delivery process.

Figure 4-7: Before moving the vehicle after it has been parked or stopped, the CDP should perform the “Circle for Safety”,

checking the immediate vicinity for people, vehicles or obstacles that may be potential hazards. The CDP should also check for fuel leaks, damaged tires, or unsecured chutes.

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Climbing Safely

The CDP must climb in and out of the truck mixer cab many times in a day, as well as climb up and down the mixer ladder to check the load. Proper climbing techniques should be used to minimize the danger of falling and injury. Statistically, many injuries are caused by improper climbing, such as jumping out of the cab instead of climbing out. In order to climb safely, the “three point rule” must always be followed (See Figure 4-8).

This means that the CDP must always have three points of contact with the ladder or vehicle. This is either:

- ◆ Two feet and one hand
- ◆ Two hands and one foot

Make sure that the soles of shoes, as well as the cab and ladder steps, are free from oil, fuel, ice or other materials that may limit traction and cause the CDP to slip. Climbing up and down the truck cab or ladder must always be done facing the vehicle. When exiting the cab, the CDP should turn on the top step and face the cab. Grab the door or cab handholds and climb down. The CDP should have a firm footing on the ground before letting go of any handholds. Do not jump off the cab!



Figure 4-8: Always maintain at least three points of contact when climbing truck ladders.

When climbing the ladder, use the three point rule and maintain contact with the truck mixer at all times. During wash down and checking the load, continue to maintain the three-point rule of contact with the mixer at all times. **DO NOT** try to work outside any guards or safety devices on the truck mixer that are designed to keep people away from drum rollers, or from leaning too far into the charge hopper.

If the CDP has to add material into the truck mixer, such as fibres or color, doing so from a platform or elevated area is the safest way. If a platform is not available, the CDP should climb the ladder and have someone pass the material up to the charge hopper while maintaining three points of contact. Trying to balance the material on a shoulder and carry it up the ladder can be dangerous and result in slips or falls.

The three-point rule should always be followed whenever the CDP has to climb any other portion of the truck mixer, as well as climbing any other piece of equipment or structure. Use extra caution in climbing any areas that do not have ladders or handholds, and do so only when absolutely necessary.

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Handling the Chutes

The CDP must handle the truck mixer chutes constantly, and is also responsible to make sure the chutes are handled in a safe manner. Aside from the potential for back injury, the CDP must be aware of the other injuries that chutes can cause:

- ◆ Improperly handled chutes can cause pinching or crushing injury to hands (See Figure 4-9).
- ◆ Chutes being swung down into place can cause head injuries to people working under the chute area.
- ◆ Chutes being swung with a full load of concrete on them have tremendous momentum and can knock people off walls or into excavations.
- ◆ Follow these guidelines to safely handle truck mixer chutes:
- ◆ Always use the proper PPE when working with chutes. Wear gloves to protect hands, and a hard hat to protect against head injury.
- ◆ When handling the chutes, always be careful to avoid pinch points in chute pivots.



Figure 4-9: The CDP must be extremely careful to avoid pinch points in chute pivots when handling extension chutes.

- ◆ Be on the lookout for untrained workers near the chute. The CDP may have to explain to the customer that the chute is quite heavy when it is full of concrete. Care should be taken to assure that the person responsible for the chute is prepared for this weight when the concrete starts discharging. Both the CDP and the person handling the chute need to make sure that other workers are not potentially at risk if the chute swings free. When possible, position the truck on level ground prior to discharging concrete. If the right side of the truck is higher than the left, or vice versa, the danger of the chute swinging out of control is much greater.
- ◆ Never stand or allow others to stand in the path of an unfolding chute. Do not allow chutes to flop down into place - this can damage the chute and also injure someone under it. Guide them into place while supporting the ends.
- ◆ Do not allow anyone to walk underneath the chute. They may strike their head on the chute and suffer a head injury, or be injured if the chute support fails and the chute drops suddenly.
- ◆ Be aware of others around the truck mixer when moving short distances when the chute is extended. Remove and stow the chute sections before moving long distances.

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Handling the Chutes *continued*

Follow these rules when lifting, handling and deploying the truck mixer chutes:

- ◆ The CDP should handle his or her own chutes at all times. There is a tendency for customers to try and put chutes on in order to speed up the unloading process. The CDP should advise the customer that they are responsible for the chutes and that the CDP will handle them.
- ◆ Make certain there is adequate footing before lifting and deploying chute sections.
- ◆ Place fingers around the side edges of the chute. Never hold the ends of a chute.
- ◆ To carry the chute, hold it close to the body between the waist and shoulder, or place the chute on the shoulder with the hook in front.
- ◆ If a chute starts to fall while carrying it, the CDP should let the chute drop rather than try to save it and risk a back injury. If the chute begins to drop, push it away from the body rather than allow it to fall on the feet or legs.

Lockout/Tag out

Whenever machines or equipment are used in industry, there are hazards not only to the employees who work with the machines or equipment, but also to other people who work in or are near the immediate area. Also, when it is necessary to perform maintenance or servicing on machinery, these activities can be hazardous if the machinery can be activated during servicing. According to provincial authorities, nearly 10 percent of the serious accidents in industry are due to failure of energy control in these situations.

The lockout/tag out standard was designed to prevent personal injury and property damage caused by starting up a machine or piece of equipment while it is being worked on or repaired. It is impossible for provincial regulators to provide specific standards for every piece of equipment or machinery. The regulations provide guidelines and a set of goals which when followed, will result in safe machinery or equipment service.

It is up to the company to develop a specific lockout/tag out policy and specific procedures for each piece of equipment. Employees must also be trained on the lockout/tag out policy for each specific piece of equipment they may work on or near.

Generally, each piece of equipment must be “locked out” or made incapable of starting up while servicing. The purpose of the lockout is to prevent the machine or equipment from being energized, or turned on. Depending on the machine or equipment, this requires a lock on a switch or starting device, as well as disconnecting a battery or energy source if possible. The equipment must be “tagged” out of service, so other employees know the equipment is being serviced (See Figure 4-10). Some equipment cannot be locked out, so tagging the equipment out of service may be the only method of complying with the provincial standards.

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

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Lockout/Tag out *continued*

The CDP must be familiar with the company lockout/tag out policy for truck mixers, since the CDP will usually work on them to perform various tasks. This particularly applies to drum cleaning and chipping operations. No one can enter the mixer drum to clean or repair it without the truck mixer being properly locked out. The CDP must also be familiar with the lockout/tag out procedure for any other equipment they may operate or help maintain.

Figure 4-10:

All lockout/tag out procedures must be strictly followed when drum cleaning is in progress.



Confined Spaces

A confined space is defined by provincial regulations as any area with a potential hazard to personal safety, that is not designed for people to stay in, and that is difficult to enter and exit. Many people think of a confined space as a small area, but size is not the determining factor. The confined space regulations provide guidelines to prevent injury while working in these areas. A typical ready mixed concrete operation has many confined spaces including truck mixer drums, aggregate bins, cement silos, and conveyor tunnels.

Confined spaces are divided into permitted and non-permit spaces. A non-permitted confined space is one that does not contain any hazard or atmosphere capable of causing death or serious physical harm. Truck mixer drums are normally considered a non-permit confined space. A confined space becomes a permitted confined space if it has a hazardous atmosphere, a material that can trap someone entering it, or any other serious safety or health hazard. Permitted confined spaces require special procedures and equipment to enter safely, as well as extensive training for personnel. Aggregate bins and cement silos are usually considered permitted confined spaces. (See Figure 4-11)

Regardless of whether the confined space is permitted or non-permitted, any company with confined spaces must establish specific policies and procedures for their entry. Employees must be trained on these procedures, and follow them each time a confined space is entered. In some cases, lockout/tag out policies will also apply if the confined space is associated with equipment or machinery.



Figure 4-11: Cement silos and aggregate bins are considered confined spaces.

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Safe Drum Cleaning

The mixer drum is an area that requires compliance with lockout/tag out rules, and compliance with confined space regulations. The ready mixed concrete producer should have a written policy and procedure (see appendix for sample) for this operation, and the following is a suggested procedure for safe drum cleaning:

- ◆ The first step in safe drum cleaning is for the CDP to prevent excessive buildup in the mixer drum. This can be accomplished by using proper washout procedures on every load. Certain materials such as silica fume will create buildup faster than regular concrete, but proper washout procedures will delay cleaning inside the drum.
- ◆ Begin the lockout procedure by telling anyone who may be affected by the work that the truck will be out of service. For example, the shop foreman, mechanic(s) and any other CDP(s) who might use the truck being worked on should be told that the truck is out of service for maintenance.
- ◆ Park the truck and set the brakes. Chock the wheels. Place an “Out of Service” placard on the truck so that others can see it.
- ◆ Isolate all energy source(s) needed to start the truck. Remove the ignition key and keep it in a pocket. Disconnect the battery and relieve the air pressure on trucks that use an air starting system.
- ◆ Lock or tag all of the mixer controls on the truck and in the cab.
- ◆ Secure the drum to prevent it from rotating or turning. This may require the use of rubber or wooden wedges to block the drum; or a strap, cable or chain to tie down the drum.
- ◆ Check to be sure that the truck is disabled and cannot be started.
- ◆ Open the hatch to the drum and place a ventilating fan at the charge hopper. A respirator will still be required.
- ◆ Assemble the personal protective equipment that will be needed to work in the drum. Usually this includes a hardhat, respirator, goggles, hearing protection, safety shoes, long sleeve shirt (coveralls), long pants and gloves. Some producers also require persons entering a drum or confined space to wear a personal alert device. This device will activate if the wearer is motionless for 30 seconds, and may also be activated manually. It produces an extremely loud siren, which is a signal for distress (See Figure 4-12).



Figure 4-12: This CDP is cleaning a drum. What PPE is he not wearing?

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Safe Drum Cleaning Procedures *continued*

- ◆ The CDP should review and be familiar with cement burn precautions. While the CDP will be dealing with hardened rather than fresh concrete, this will also be in a damp, sweaty environment. Do not take for granted that cement burns cannot occur.
- ◆ Assemble the tools and equipment that will be needed in the drum, then begin the cleaning and/or chipping procedure.
- ◆ If the drum must be turned, this means the lockout condition must be interrupted. Clear the area, start the truck, rotate the drum. BEFORE RETURNING TO THE DRUM, repeat the lockout procedure.
- ◆ When the work is finished, inspect the drum, and remove tools and supplies. Check for other employees in the drum, and near the truck.
- ◆ Remove the devices used to secure the drum. Clean and replace the hatch cover(s) properly so they do not leak.
- ◆ Remove the locks, tags, and posters that were placed on the controls and the truck. Tell the supervisor and others that the truck is available.

Be aware of these hazards working in and around truck mixer drums:

- ◆ The first hazard that needs to be controlled is the rotating drum. The drum must be secured from moving in either direction before entry. If the drum is free to roll while the CDP is in it, he or she could be seriously hurt or killed.
- ◆ The blades can be sharp after the mixer has been in service to produce concrete. Be careful when climbing over the blades during entry or exit. While in the drum, use care stepping over the blades or handling a chipping hammer close to the edge of a blade.
- ◆ Watch out for wet spots or puddles inside the drum. They could cause a slip or fall. The drum should be reasonably dry before entry.
- ◆ Be alert to the danger of chunks of concrete falling from overhead. Do not work overhead.
- ◆ Use only an approved 12 volt drop light inside the mixer drum. The steel drum will act as an electrical ground and any stray 110-volt current (for example, from an electric hand tool) will be drawn to the drum.
- ◆ A pneumatic chipping hammer is a specialized, powerful tool. Make sure that the bit is locked in place before using the hammer. All of the air hose couplings must have hitch pins. If the CDP has not used a pneumatic hammer before, he or she should ask for training on this device.

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Safe Drum Cleaning Procedures *continued*

- ◆ It can get hot working inside the drum, especially in the summer. Park the truck in the shade, if possible. Drink lots of water, and take a 10-minute break every hour when chipping in hot weather. If possible, chip concrete as a two-person team; this allows one person to chip while the other monitors. If two people are not available to chip, the CDP should use a personal alert device and make sure that someone checks the CDP's safety at least every 15 minutes.

Here are some safe chipping procedures to follow:

- ◆ Follow the company's written confined space program and lockout/tag out procedure.
- ◆ Wear all the appropriate personal protective equipment, especially hearing protection no matter what tools are used to clean the drum.
- ◆ Inspect the inside of the drum before chipping begins. Plan the cleaning procedure to work on existing cracks and holes in the concrete.
- ◆ Use a small sledgehammer to knock off as much concrete as possible before using the pneumatic hammer.
- ◆ Start at the back of the drum and work forward. Always check overhead for pieces that may have been vibrated loose before they fall and cause injury.
- ◆ Keep the footing area clean. Keep equipment clear of the concrete "drop zone".
- ◆ While cleaning, check the condition of the drum and fins. If necessary, inform a mechanic or supervisor if the drum itself needs repair.
- ◆ Clean the bottom fins first and then clean halfway up on each side. **DO NOT CLEAN OR CHIP CONCRETE OVERHEAD.**
- ◆ To clean the other half of the drum, get out of the drum and rotate the drum a half-turn. This means that the lockout must be interrupted, and **THEN LOCK OUT THE DRUM AGAIN BEFORE REENTERING THE DRUM.**
- ◆ Dump the chipped concrete. Be sure that the chunks are small enough to be discharged without damaging the truck's charging hopper.
- ◆ Rinse out the drum at the wash rack. Discharge the rinse water to the washout pond, pit, or appropriate disposal point.

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"Identified" Flying Objects

The truck mixer can be a source of hazards during normal delivery operations. Besides chutes, the truck mixer may carry chute scrapers, buckets, brooms, and materials that are sold to customers (See Figure 4-13). These items can fall off the truck if not properly secured and damage other vehicles, property or create a road hazard.



*Figure 4-13:
Extension chutes should
be strapped while not in
use, which prevents them
from falling off the truck
mixer.*

During the loading process, aggregate may spill onto the truck mixer. The aggregate may fall off the truck while driving to the job site and cause damage, especially to car windshields. Built-up concrete on the chutes and on the rear of the truck may also break loose and cause windshield damage. Stones and other debris can become lodged in the truck mixer tires and be thrown up in the air when the mixer is on the roadway, again causing damage to windshields.

In order to prevent objects from falling off or being thrown from the truck mixer, the CDP should always complete the Circle for Safety before moving the truck. Make sure that all items carried on the truck are secured, that all fenders and chutes are clear of aggregates or built-up concrete. The tires should be clean and the tire treads free from stones or other debris.

Chapter 3 - Road Safety

Chapter Objectives

After studying this chapter, the CDP candidate should be able to:

- ◆ Identify proper driving tactics relating to truck mixers, particularly the causes and prevention of rollovers.
- ◆ Recognize procedures to safely operate truck mixer during inclement weather.
- ◆ Identify proper procedures to follow if truck mixer is involved in an accident.

Truck Mixer Operating Hazards

There are several factors that make operating a truck mixer different from a normal heavy truck. These factors can create safety hazards if the CDP does not take them into consideration:

- ◆ The concrete load is a fluid that can shift and change the truck mixer's center of gravity (higher slumps make these situation worse)
- ◆ The rotating drum and the angle it rests on carries the load at a much higher center of gravity.

These factors combine to make the truck mixer less stable than a regular straight truck. Reduced stability means that the truck mixer is more likely to roll over. Preventing a rollover requires the CDP to be aware of conditions likely to cause a rollover.

- ◆ Maintain a safe following distance: Emergency stops can cause the load to shift or the truck to spin and shifting the center of gravity. A rollover could result.
- ◆ Take corners slowly: Cornering too fast, especially on sweeping turns such as freeway on and off ramps, can cause the load to shift suddenly and roll the truck mixer. A loaded rear discharge mixer is more likely to rollover in a sweeping right turn than in a sweeping left turn. This is because the concrete "climbs" the left side of the drum as it turns, making that side heavier (See Figure 4-14).
- ◆ Maneuvering on hills: The CDP must exercise extreme caution when maneuvering in hilly terrain. Use low gears at all time. Do not drive parallel to the side of a hill, where the load can shift and a rollover result.
- ◆ Use booster axles properly. Too much pressure can take weight from other axles, shift the load and cause a rollover.
- ◆ Know environment off the road. Driving off road in adverse conditions without being prepared or know where hazards exist can lead to a rollover.



Figure 4-14: A loaded rear-discharge mixer is more prone to rollover while making a sweeping right-hand turn.

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Rollover

If the truck mixer rolls over, the CDP's safety is the most important consideration. Keeping the seat belt fastened at all times while the truck mixer is being driven or maneuvered can save the CDP from serious injury or death. It will prevent the CDP from being thrown from the cab and crushed by the truck during the rollover. Most injuries during rollovers are caused due to the lack of seat belt use. Should the truck mixer roll on its side and the CDP is uninjured, damage to the truck engine can be minimized if the engine is shut off as soon as possible. The CDP should then notify the company immediately.

Inclement weather

Weather is an important factor in truck mixer operations. Driving a truck mixer in good weather is challenging enough, but poor weather or weather conditions can create a major safety hazard. Driving at night creates an additional set of hazards. The CDP should be familiar through their basic training to receive their CDL how to safely operate in poor weather. This study guide will briefly cover some specific weather-related hazards that may affect the CDP and the truck mixer.



Figure 4-15: A CDP must give vehicles more following distance during low light or inclement weather driving conditions.

Combine the reduced visibility with the reduced stability of a concrete truck mixer, and the potential for accidents are increased (See Figure 4-15).

- ◆ Cold weather - besides the potential for slippery conditions and reduced visibility, cold weather conditions increase the risk of other vehicles losing control and being involved in an accident with the CDP's vehicle.
- ◆ Hot weather - operating in hot weather places a greater strain on the truck mixer, as well as the efficiency of the CDP. Mechanical breakdowns are more likely, and these failures can cause safety hazards.

◆ High wind - because of the high center of gravity and lower stability, high winds can be a factor in causing a rollover. The CDP should be cautious operating in any high wind condition, especially when turning corners.

◆ Tornado - when operating in areas of the country that are prone to tornados, the CDP should be aware of the weather conditions that cause them. If the CDP sees a tornado approaching, he or she should immediately notify dispatch and get out of the tornado's path by driving at a right angle away from the funnel cloud.

◆ Reduced visibility - anytime visibility is reduced by fog, snow, smoke, dust, or at night, driving can be more hazardous.

"Defensive" Driving

Always drive following safe, courteous and defensive driving principles. The basic principles of defensive driving are: be aware of the hazards that you may encounter, know what defensive action to take, and act in time to avoid trouble. The CDP should know and constantly practice defensive driving skills to reduce the hazards of truck mixer operations. Expect the unexpected!

- ◆ Start the trip prepared. Make sure the truck mixer is in good shape as well as the CDP! Know the route and an alternative in advance, so that the CDP does not create a hazard by stopping to turn around or maneuver.
- ◆ Drive alert. Scan ahead at least 12 seconds and know the location of other vehicles. Do not fix on any object for more than a fraction of a second.
- ◆ Maintain a safe following distance. Use the two-second rule as a minimum, longer at night and inclement weather.
- ◆ Communicate intentions. Do not surprise the operators of other vehicles. Pay attention to other turn signals, and turn on the truck mixer signals at least eight seconds before turning, changing lanes or passing. Drive with headlights so that others can see the vehicle more clearly.
- ◆ Always have an emergency route. Scanning ahead allows the CDP to pick an emergency route, which can be used to avoid hitting other vehicles or people if an accident occurs.

If an Accident Occurs

Accidents do not "just happen to the other person." The CDP must be mentally prepared for the unfortunate occurrence of an accident with their truck mixer, and be ready to think clearly and act quickly to help themselves and other involved parties. Some suggestions on what to do and what not to do are listed here. As in all cases, the CDP must always follow established company procedure in the event of an accident.

What To Do

- ◆ The CDP should stop at once at the scene of any accident they are involved in. Keep calm. Alert the dispatcher immediately and let him or her know of the accident. Let the dispatcher know if there are personal injuries involved and whether there is a need for emergency medical attention. If the CDP can quickly assess that a wrecker will be needed for their truck or another vehicle involved, let dispatch know that, too. If the CDP is not involved in the accident, stop and assist only if it is safe to pull over and park the truck mixer and if the CDP feels their assistance is needed under the circumstances. Otherwise, report the accident to the dispatcher. The dispatcher can be of help by reporting any accident whether the CDP is involved or not.
- ◆ If the CDP is injured, advise the dispatcher to summon help. If possible, use the radio or have someone else call. If the CDP is not injured, find out if anyone else is injured and how badly. Persons at the accident scene may not realize immediately that they are injured. Do not move any injured person unless they are in immediate danger from fire, passing cars, or similar hazards. If the injury looks serious, call for an ambulance. While waiting, the CDP should **ONLY GIVE FIRST AID THAT THEY ARE QUALIFIED TO GIVE**. This includes observing several precautions if there is a possibility the CDP might contact another person's blood.

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What To Do *continued*

- ◆ Take precautions to prevent traffic congestion at the scene of the accident. Such congestion frequently causes other accidents. Set up emergency warning devices such as flares and warning triangles.
- ◆ The CDP should give their name, address and license number to the other involved party.
- ◆ Report all accidents (vehicular, property damage, personal injury, etc.) promptly, even if they seem minor and/or the CDP feels that they are not at fault. Do not rely on someone else's word that everything will be taken care of." Damage claims have a way of appearing months after an accident, especially when all reporting and documentation details are not handled correctly.
- ◆ It is unlawful to leave the scene of an accident the CDP is involved in until the police have arrived in most cases. Wait for the police to give permission to move the truck mixer. The CDP should cooperate with the police in every possible way.

What NOT To Do

- ◆ **Do not discuss the accident with other involved parties, witnesses, etc.** Do not accept responsibility for the accident at the scene, or argue with anyone about the accident.
- ◆ Do not talk about the accident or give details to anyone except the police or a company manager. The company may want the CDP to make a report to an insurance representative. Know who is taking the report. If necessary, request identification of anyone asking questions. Request that any interview with police be held privately. The CDP should record the name, badge number and phone number(s) of any police officer(s) they speak with.
- ◆ Do not give a signed statement to anyone except the police.
- ◆ Unless instructed to do otherwise by the company, do not leave the scene until all details have been recorded, the vehicles involved have been removed and the proper authorities notified.

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Get This Information at the Accident Scene

- ◆ Record the name and address of the owner, driver, and occupant(s) of the other vehicle(s) and the driver's license number. Record their approximate age(s). If injured individuals are taken to a hospital, find out which one(s).
- ◆ Record the names, addresses and/or license numbers of all witnesses (favorable or unfavorable) and any others who appeared at the scene shortly after the accident occurred.
- ◆ Sketch the exact position of the vehicles before and after the accident. Record the width of the road, the length of any skid marks, and the distance from either curb to the spot where the accident occurred. Record the weather and condition of road surface. Take pictures if possible - some companies equip their truck mixers with disposable cameras for this purpose.
- ◆ Record the visible damage to the other vehicle(s). This information will be important in case of a claim for damages. Note any signs of previous damage (dents, rust, etc.) to the other vehicle.
- ◆ In some cases, the CDP may be required to submit to a post-accident alcohol/drug test. A representative from the company may have to drive the CDP there, rather than drive there on their own. The company's drug and alcohol policy, which provides company compliance with DOT regulations, will govern how this situation is handled.
- ◆ Later in the day, as soon as possible after the accident, complete the accident report while the memory of the event is still fresh. Use the company's forms and record as much information as possible. While it may seem bothersome and time-consuming, post-accident report writing is very important. It may be of great assistance if a criminal charge, civil claim or a traffic citation is filed against the CDP or the company.

Chapter 4 - Jobsite Safety

Chapter Objectives

After studying this chapter, the CDP candidate should be able to:

- ◆ Recognize unsafe ground and site conditions, and what to do if customer requires truck mixer to operate in those conditions.
- ◆ Understand safe unloading procedures and how to prevent injuries to customers and other personnel during the unloading process.
- ◆ Identify safety precautions required when placing concrete via concrete pumps, crane buckets, curb machines and other specialized equipment.
- ◆ Identify hazards of power line contact and steps to take if contact occurs.



Figure 4-16: A CDP should look over a job site to ensure his/her and the truck's safety.

Entering the jobsite

Check site conditions thoroughly before entering a jobsite (See Figure 4-16).

If the CDP has not delivered to the site, or has not been there for a long time, walk the terrain before driving in. Always have a spotter back the truck mixer in, even if the CDP has delivered there before. Communicate with other CDP's about changing site conditions and alert one another to any hazards. Watch out for workers that may be in the expected path of the truck. Look for obstacles such as water crocks, gas meters, phone or electrical boxes, septic systems and low overhead wires. Get reliable help in backing into or out of tight spots. Remember, the operation of the vehicle is the CDP's responsibility. Check both sides and overhead while backing. Take care backing downhill when loaded since the front axle may not have much weight on it.

Do not drive sideways on a hill! Get out and reexamine the situation if necessary. Do not drive over curbs, sidewalks or driveways without getting a signed statement from the customer, releasing the company from liability for damage. It is the contractor's responsibility to provide safe access to the job. Notify the dispatcher before driving over curbs, sidewalks or private driveways, if the customer insists the CDP do so.

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Avoid Getting Stuck

Watch for recently filled-in areas. Fresh dirt or new cuts around the job may be a sign of soft spots. If the CDP is asked to go off the road in a residential area, ask if there are any septic tanks. Septic tanks can be anywhere around a house. If the CDP thinks he or she might get stuck, or damage the truck attempting to reach the placement location, advise the contractor and notify the dispatcher immediately. Do not risk injury to anyone or damage to the truck mixer. Never allow the truck to be pushed or pulled into a jobsite without permission from the dispatcher or a company manager.

Use extreme caution on jobs where the soil is very sandy. The weight of a loaded truck mixer could cause the truck to bog down or an excavation to cave in. The lack of stability under the tires could cause the truck to jump, which could damage the rear end. Be sure to operate the inter-axle differential lock properly for on and off road use. Be careful near excavations and trenches, since driving the truck mixer too close can cause a cave-in. A good rule of thumb to follow when working near excavations is to stay at least one foot away from the edge for each foot of depth. Do not operate the truck mixer parallel to the excavation, but back in (or pull in with a front discharge) at right angles to the trench.

If the Truck Gets Stuck...

If the truck mixer gets stuck, there are no specific rules to follow that will apply in each situation. Company policy and procedure must be followed. There are some guidelines that the CDP should follow if the truck mixer gets stuck, however. The first thing to remember is: Don't Make It Worse! Trying to get out can often result in burying the mixer further, damaging the truck, or creating a stability problem where the truck may tip over.

S.T.U.C.K.

A good way of remembering what to do if the truck mixer gets stuck is as follows (courtesy of Morse Bros.):

S -Stop and secure the truck. If the truck is leaning left, stop the drum. If the truck is leaning right, keep the drum rotating to counterbalance the lean. Keep the slump of the load in mind.

T -Think and remain calm. Stabilize the truck and assess what is needed to get the truck out.

U -You are in charge. The CDP is responsible for the truck mixer and should not allow anyone to pressure them into trying to get the truck mixer out prematurely.

C -Call for help. Let dispatch know what the situation is and what is needed. Don't hesitate to ask for help.

K -Keep the customer calm and informed. Work with the customer to keep the placement going if possible by communicating with dispatch and company management.



Figure 4-17: If the truck is stuck and is in danger of tipping over, a CDP may consider using the booster axle to help stabilize the

S.T.U.C.K. continued

If the truck is tipping severely, exit the truck on the high side. Should the truck be leaning more than two feet from the highest point, the danger of rollover is great. If the truck is equipped with booster axles, they may be used to stabilize the truck (See Figure 4-17). Pressure should be applied only to reduce the strain on the rear axles. Too much pressure can damage the truck or cause it to tip over. Customer equipment may sometimes be used to stabilize a truck before it can be pulled out. It is not advisable to allow the customer to try and pull out a truck mixer in most cases. Freeing a heavy truck with a high, fluid center of gravity takes experience and the proper equipment. The CDP should not allow the customer to attempt pulling the truck mixer unless authorized by dispatch or company management. The safest and best method is using an experienced towing service, or a properly equipped company wrecker. A cable at least three-quarter inch thick, or a factory towing strap should be used. The cable or strap must be rated to handle the load. Chains are not recommended because of the danger if a link breaks, which can throw pieces of metal as shrapnel.

Unload Safely

The construction site is a hectic and fast-paced environment. Time is critical and everyone on the job site is normally in a hurry to make schedules and deadlines, or beat the weather. This can create a very hazardous situation, because safety is not always first in everyone's mind at these times. Do not assume that everyone on the jobsite is concerned with safety first!

Be attentive, especially when operating the truck mixer from the cab. Try to be aware of any persons near or behind the truck. The CDP should be familiar with the height and width of the truck to avoid obstacles when placing concrete. Do not let the clutch slip to control the speed. Keep the pedal down and disengaged or let it out all the way so the clutch will not slip. Use a low gear for placements like feeding a curb and gutter machine. If the truck has an automatic transmission, be familiar with the appropriate "gearing down" procedures in different conditions.

Hand Signals

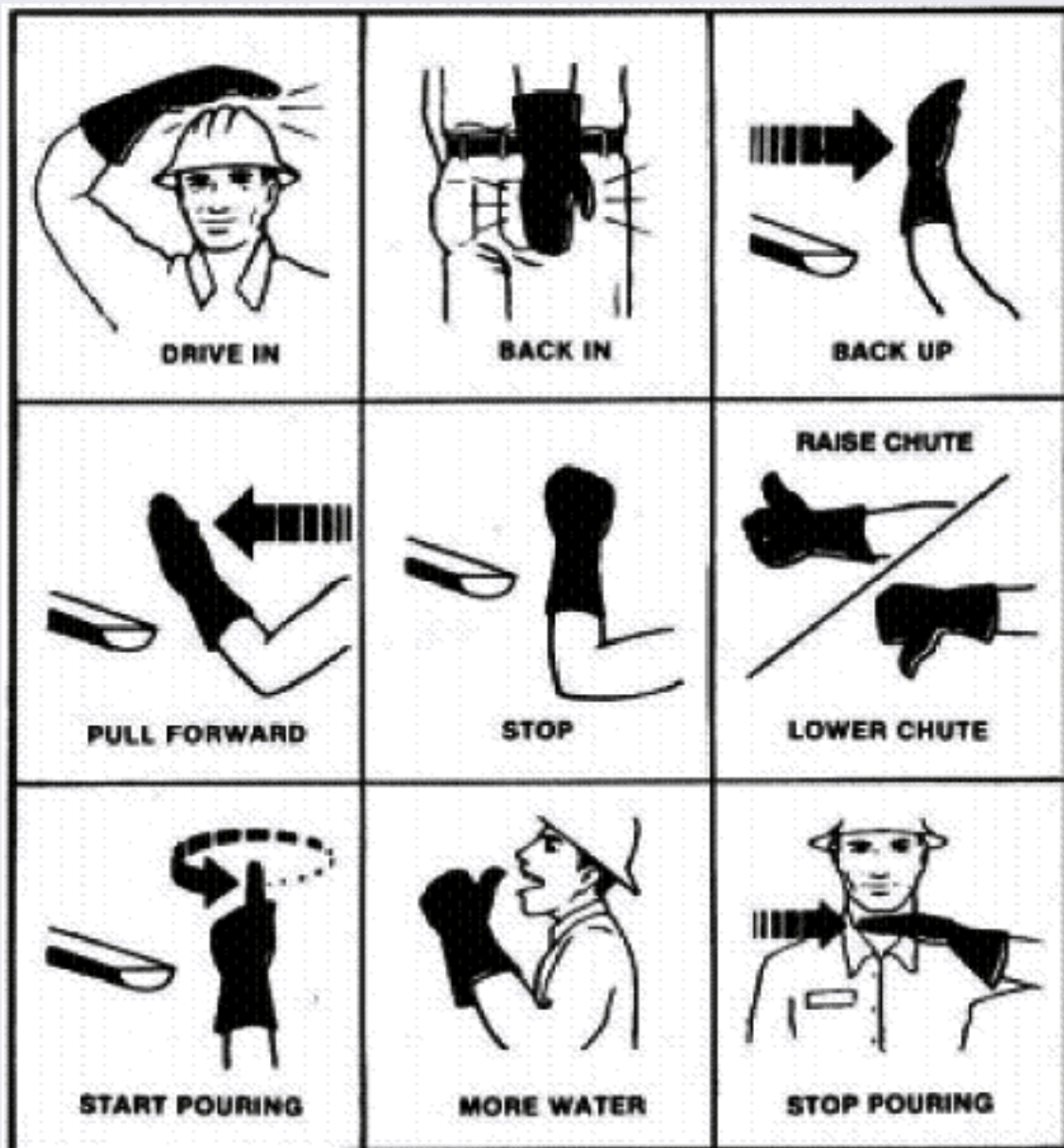
Good communications between the CDP and the contractor are vital to safe unloading. Because verbal communication is often difficult because of noise and distance, hand signals are often used (See Figure 4-18). The CDP should review hand signal use with the customer before unloading, so there is no confusion over which signal to use. There should only be one person designated to signal the CDP during unloading. That person must be in the correct place so the CDP can see him or her in the truck mirrors. The CDP may need to stop the pour if the person responsible for signaling moves out of the CDP's line of sight.

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Hand Signals *continued*

*Figure 4-18: Verbal communication is not always possible.
The CDP should be able to recognize these commonly accepted hand signals.*



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Working Around Customer Equipment

- ◆ Customers can use many types of equipment and methods to unload the truck mixer. Most of these methods involve machinery that can create additional equipment safety hazards. The CDP must be familiar with the equipment used to unload the truck mixer, and how to work safely around them.
- ◆ Wear the appropriate PPE around customer equipment, especially hard hats and safety glasses.
- ◆ Be alert for any potential hazard to the CDP or the customer.
- ◆ Be aware of where customer personnel are on the site when maneuvering.
- ◆ Avoid conveyor rollers and other moving parts that can catch clothing or body parts.
- ◆ When unloading with a crane and bucket, always be aware of the bucket position at all times.
- ◆ Always use a spotter to direct the movement of the truck mixer when placing into curb and slip form machines, or concrete pumps.

Power Line Contact

Because of the height of the truck mixer, it is possible to come into contact with power lines or other overhead cables (See Figure 4-19). If the truck mixer comes into contact with any overhead lines, the CDP should always assume that they are electrical and live. If this happens and the CDP is in the cab, do not move or try to get out. Wait until help arrives. If the truck mixer comes into contact with overhead lines as a result of an accident, the CDP should stay in

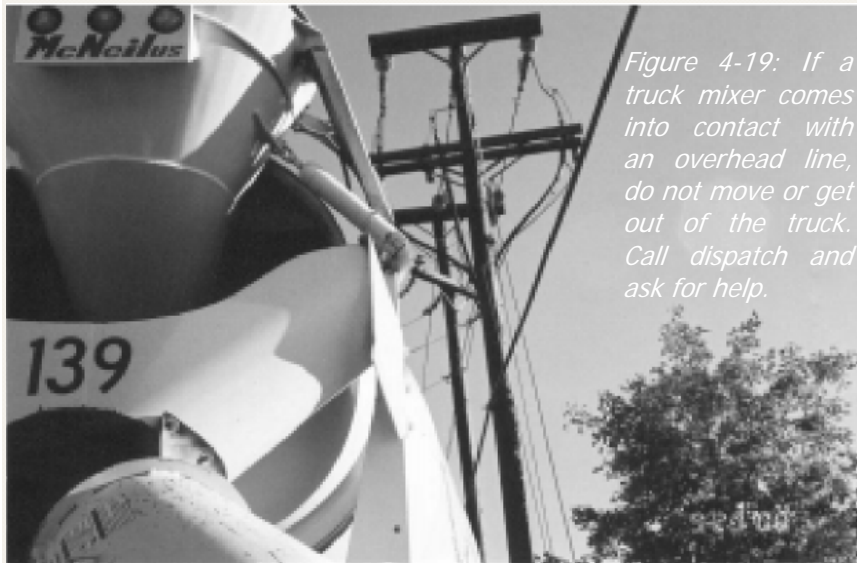


Figure 4-19: If a truck mixer comes into contact with an overhead line, do not move or get out of the truck. Call dispatch and ask for help.

the cab of the truck unless the truck is on fire. If the CDP has to leave the cab in an emergency, he or she should open the cab door and jump clear as far as possible.

Beware of any overhead electrical lines near the boom of a concrete pump, crane, or conveyor. If the equipment contacts a live electric line, electricity can and will flow through concrete and metal. (The water in the concrete conducts the electricity.) If the equipment becomes energized, the entire truck

mixer can become energized, too. When working around overhead concrete placing equipment

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that is near overhead wires, the CDP should keep a sharp lookout in case of overhead wire contact.

Review Workbook

Introduction

Each module contains short review workbook that is designed to help you study for the CDP certification exam. You can use each Module's workbook to learn key concepts that will be on the exam, and then as your study guide for the exam itself.

We have organized each Module's set of review questions in chronological order by section. The section title on the left refers to the section in the module where this information is covered. Fill in the blank for each question and then check your answers at the end of each Module's Review Workbook.

Key concepts in this workbook may be on the test. If you can't answer a fill-in-the-blank question, read that section in the chapter again. Not all the material on the CDP certification exam is in this workbook so remember to read all five Study Guide Modules carefully for additional important topics you might find on the exam.

Good Luck!

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Module IV - Chapter 1: Personal Safety

SECTION TITLE	QUESTION
Who is Responsible for Safety?	1. The CDP is the one who is _____ responsible for his or her own safety.
Back Injury	2. Extension chutes or any heavy objects should be picked up with _____ and the object held close to the _____.
Cement Burns	3. Skin lotions made with _____ or _____ may actually make a cement burn worse.
(Material) Safety Data Sheet	4. The _____ gives information about a chemical that might be harmful, as well as the first aid treatment.
Fatigue	5. Personal fatigue levels must be used as well as DOT _____ regulations to decide whether the CDP can operate the truck mixer.

Module IV - Chapter 2: Truck/Mixer Safety

SECTION TITLE	QUESTION
Circle for Safety	1. The Circle for Safety should always be performed before moving the truck mixer after it has been _____ or _____.
Climbing Safely	2. Whenever climbing a ladder or the truck cab, the CDP should always face the vehicle and follow the _____.

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Module IV - Chapter 2: Truck/Mixer Safety *continued*

SECTION TITLE	QUESTION
Lockout/Tagout	3. The purpose of locking out is to _____ the energy source from a machine and make it unable to start while being serviced.
Confined Spaces	4. A confined space is defined as any area with a potential hazard to safety, not designed to stay in, and difficult to _____ and _____ from.
Safe Drum Cleaning	5. A _____ must be worn while chipping inside a mixer drum even if the area is well ventilated.

Module IV - Chapter 3: Road Safety

SECTION TITLE	QUESTION
Truck Mixer Operating Hazards	1. A truck mixer is more likely to roll over carrying _____ concrete than _____ concrete because of a more fluid center of gravity.
Truck Mixer Operating Hazards	2. A truck mixer is more likely to roll over in sweeping _____ turns than in sweeping _____ turns.
What to Do	3. The first thing to do when involved in an accident is to _____ and _____.
What Not to Do	4. The CDP should never _____ the accident with involved parties or witnesses.

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Module IV - Chapter 4: Jobsite Safety

SECTION TITLE	QUESTION
Entering the Jobsite	1. The CDP should always have a _____ to help back in the truck mixer, even if he or she has delivered there before.
Avoid Getting Stuck	2. A truck mixer should always be operated at _____ to any trench or or excavation.
If the Truck Gets Stuck	3. The first thing the CDP should do if the truck mixer gets stuck on the jobsite is to make sure the truck is _____.
Power Line Contact	4. If a concrete pump boom comes into contact with a power line, electricity can flow through the concrete and _____ the truck mixer.

Review Workbook Answers

Chapter 1

1. primarily
2. legs bent, chest
3. lanolin, limonene
4. (M)SDS or (Material) Safety Data Sheet
5. hours of service

Chapter 2

1. parked, left unattended
2. three-point rule
3. isolate
4. enter, exit
5. respirator

Chapter 3

1. high slump, low slump
2. right, left
3. stop, remain calm
4. discuss

Chapter 4

1. spotter
2. right angles
3. stable
4. energize

SAMPLE MATERIAL SAFETY DATA SHEET (MSDS)

SECTION 1 – HAZARDOUS INGREDIENTS

Concrete is a mixture of inert gravel or rock, sand, Portland cement, and water. It may also contain chemical admixtures, and/or fly ash, and/or granulated slag, and/or silica fume, which have no effect on the hazards associated with the use of the product. The chemical admixtures are present in quantities comprising less than 1% of the material by weight.

Hazardous Ingredients		
Portland Cement	(CAS 65997-15-1)	10-20%
Quartz (SiO ₂)	(CAS 14808-60-7)	3-7%
Portlandite (Ca(OH) ₂)	(CAS 1305-62-0)	2-4%

The hazardous ingredients in plastic (wet) concrete cannot become airborne. However, water added to the materials reacts with some of the ingredients to form calcium hydroxide, a corrosive chemical which will irritate the eyes and skin upon contact. Concrete dust from dried Portland cement concrete may also contain hazardous ingredients in sufficient concentrations to cause skin, eye, or respiratory irritation. Concrete contains cement which is manufactured from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis such as; potassium and sodium sulphate compounds, chromium compounds, nickel compounds, and other trace amounts.

LD50 of Material (Specify species and route): Not Applicable.

LC50 of Material (Specify species and route): Not Applicable.

SECTION 2 – PREPARATION INFORMATION

Prepared by: Atlantic Concrete Association

Address: 301-3845 Joseph Howe Dr, Halifax, NS B3L 4H9

Tel: 1 902 443 4456

Date of MSDS: August 18, 2012

The information contained on the Material Safety Data Sheet is based on hazard information from sources considered to be technically reliable and has been prepared in good faith in accordance with available information. No warranty, express or implied, is made and the supplier will not be liable for any damages, losses, injuries, or consequential damages which may result from the use of or reliance on any information contained herein.

SECTION 3 – PRODUCTION INFORMATION

Manufacturer's Name:

Address:

Supplier's Name:

Address:

Material Name: Portland Cement Concrete

Trade Name and Synonyms: Ready Mixed Concrete, Concrete, Freshly Mixed Unhardened Concrete, Portland Cement with Sand and Gravel, Portland Cement Concrete, Plastic Concrete

Material Use: Concrete is widely used as a structural component in construction applications

SECTION 4 – PHYSICAL DATA

Physical State: Plastic until it becomes solid upon setting. Semi-fluid, flowable, granular paste.

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Odour and Appearance: Odourless, gray, plastic flowable, and granular . Variety of colour (usually gray)
Odour Threshold (ppm): None
Specific Gravity: Normal range 1.5 to 2.9
Vapour Pressure (mm): Not Applicable
Vapour Density (Air = 1): Not Applicable
Evaporation Rate: Not Applicable
Boiling Point (°C): Not Applicable
Freezing Point (°C): 0
pH (25°C): pH12 – pH13
Coefficient of Water/Oil Distribution: Not applicable

SECTION 5 – FIRE OR EXPLOSION

Flammability: No
Extinguishing Media: Ready-Mix Concrete does not burn. Use extinguishing media appropriate to surrounding fire conditions.
Flashpoint (°C) & Method: Not applicable. Non-combustible
Upper Flammable Limit (% by volume): Not applicable
Lower Flammable Limit (% by volume): Not applicable
Auto Ignition Temperature (°C): Not applicable
Hazardous Combustion Products: None
Explosion Data:
 Sensitivity to Mechanical Impact: Not applicable
 Sensitivity to Static Discharge: Not applicable

SECTION 6 – REACTIVITY DATA

Chemical Stability: Hardened concrete is stable. Avoid contact with incompatible materials.
Incompatibility: Wet concrete is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetra fluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.
Reactivity: Yes. Silicates dissolve in hydrofluoric acid producing a corrosive gas – silicon tetra fluoride.
Hazardous Decomposition Products: None

SECTION 7 – TOXICOLOGICAL PROPERTIES

Plastic Concrete

Toxicological Properties: Plastic concrete has an alkalinity level of pH12 to pH13 that can cause skin and eye irritation.
Route of Entry: Skin contact, eye contact, and ingestion
Effects of Acute Exposure: Plastic concrete can cause alkali burns and eye irritations and burns.
Ingestion may cause irritation of the throat
Effects of Chronic Exposure: Damage to the epidermis and dermis (outer layers of skin)

Hardened or “Set” Concrete

Sawing or other demolition techniques may result in exposure to dust that may contain hazardous ingredients of the constituent products as follows:

Portland Cement and Portlandite **Toxicological Properties:** The hazardous ingredients when in contact with water produce calcium hydroxide, with an alkalinity level of pH12 to pH13. This level of alkalinity can cause skin and eye irritation.

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Route of Entry: Skin contact, eye contact, inhalation, and ingestion.

Effects of Acute Exposure: Cement and wet cement mixtures can dry skin, cause alkali burns and irritate the eyes and the upper respiratory tract. Ingestion can cause inflammation of the throat.

Effects of Chronic Exposure: Cement dust can cause inflammation of the tissue lining, the interior of the nose and the cornea (white) of the eye. Hypersensitive people may develop allergic dermatitis.

Exposure Limits:

0. Reg. 654/86 (8hr TWAEV)*.....10 mg/m³ (total dust)

ACGIH (TLV-8hr TWA)..... 10 mg/m³ (total dust)

MSHA (8hr - TWA)..... 50 mppcf**

OSHA (PEL 8hr TWA)..... 50 mppcf

* Time Weighted Average Exposure Value (for 8hr day - 40 hr week)

** Million particles per cubic foot

Portland Cement and Portlandite are not known to constitute a carcinogenic, reproductive, teratogenic, or mutagenic hazard.

Quartz (SiO₂)

Route of Entry: Skin contact, eye contact, and inhalation chronic.

Effects of Acute Exposure: Exposure to dust may irritate respiratory system, eyes, and skin.

Effects of Chronic Exposure:

(1) Chronic exposure to respirable dust at levels exceeding exposure limits has caused pneumoconiosis.

(2) Chronic exposure to respirable sand and gravel dust containing quartz at levels exceeding exposure limits has caused silicosis, a serious and progressive pneumoconiosis which can be disabling, and in extreme instances, lead to death. Symptoms may appear at any time, even years after exposure has ceased. Symptoms of silicosis may include shortness of breath, difficulty in breathing, coughing, diminished work capacity, diminished chest expansion, reduction of lung volume, and right heart enlargement and/or failure. The only reliable method of detecting silicosis is through a chest X-ray. Silicosis may aggravate other chronic pulmonary conditions and may increase the risk of pulmonary tuberculosis infection. Smoking aggravates the effects of silica exposure.

Exposure Limits: Respirable silica dust - 0.2 mg/metre³ (TWAEV)

TWAEV - Time Weighted Average Exposure Values. For additional information on the above exposure limits, consult Ontario Regulations 654/86 and 769/83, amended 23/87.

Carcinogenicity, Reproductive Effects, Teratogenicity, Mutagenicity: As of the date of preparation of this MSDS:

(1) Sand and gravel are not included on the ACGIH, IARC, NTP or OSHA lists of potential carcinogens.

(2) Silica, in the form of crystalline Quartz and as a component of this material, is listed as a potential carcinogen by IARC, but not by ACGIH, NTP or OSHA. IARC (International Agency for Research on Cancer) has determined that there is sufficient evidence of carcinogenicity of crystalline silica to experimental animals, and that there is limited evidence of the carcinogenicity to humans. Limited evidence of carcinogenicity indicates that causal interpretation is credible, but alternate explanations such as chance, bias or confounding factors could not adequately be excluded. There is no evidence that sand and gravel is a teratogen, mutagen or has a reproductive effect.

Irritancy of Material: Respiratory system, eyes, and skin.

Sensitization to Product: Sensitization to hexavalent chromium (skin and respiratory tract)

Synergistic Materials: None reported.

SECTION 8 – PREVENTIVE MEASURES

Personal Protective Equipment (PPE): Wear waterproof gloves, rubber boots, head protection, approved eye protection, and clothing sufficient to protect the skin from contact with fresh concrete. Clothing saturated from contact with plastic concrete should be removed promptly to prevent continued contact with skin.

Gloves (Specify): Waterproof gloves.

Respiratory (Specify): Under ordinary conditions no respiratory protection is required when handling plastic concrete. However, cutting, crushing, or grinding hardened concrete will release respirable crystalline silica. Wear a NIOSH approved dust respirator when exposed to dust above exposure limits.

For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.1mg/m^3 , a NIOSH approved (N/R/P95) dust respirator is recommended. For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.5mg/m^3 , a NIOSH approved HEPA (N/R/P100) filter respirator is recommended. For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 5.0mg/m^3 , a NIOSH approved positive pressure (SAR), full face respirator or equivalent is recommended.

Eyes (Specify): ANSI, CSA, or ASTM approved safety glasses with side shields. Tight fitting dust goggles should be worn when excessive (visible) dust conditions are present. Do not wear contact lenses without tight fitting goggles when handling.

Footwear (Specify): Waterproof boots.

Clothing (Specify): Fully covering skin to protect the skin from contact with plastic concrete.

Other (Specify): Evaluate degree of exposure and use PPE if necessary.

Engineering Controls (e.g. ventilation, enclosed process, specify): Provide ventilation when placing, finishing. Also provide ventilation when sawing or using other demolition techniques to maintain dust concentrations below exposure limits listed in section 7.

Leak and Spill Procedure: Limit access to trained personnel. Avoid contact with skin. Plastic concrete should be removed and placed into a container. Allow material to dry or solidify before disposal. Prevent spilled materials from inadvertently entering stream, drains, or sewers.

Waste Disposal: Dispose of waste materials in accordance with applicable federal, state, provincial, and local environmental laws and regulations.

Handling Procedures and Equipment: Wear personal protective equipment (PPE) and apply adequate engineering controls. Avoid skin and eye contact with plastic concrete. Respirable crystalline silica – containing dust may be generated when hardened concrete is subjected to mechanical forces such as in demolition work and surface treatment. Minimize dust generation. Contact lenses should not be worn.

Storage Requirements: Not applicable

Special Shipment Information: Not Applicable (For Discussion)

SECTION 9 – FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to plastic concrete.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately. Consult physician in cases of severe exposure.

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SAMPLE SAFETY DATA SHEET

Product: CONCRETE

Issue Date: November 2013 Issue no: 5

1. Identification of Substance/Preparation & Company/ Undertaking

Substance name: READY- MIXED CONCRETE

Company Details:

Ready Mix Concrete Ltd.

Web: www.readymixconcrete.sample

Email: info@readymixconcrete.sample

90 Concrete Road

NS, Canada B2W AX1

Telephone: 902 353 5220

Fax: 902 353 9200

Emergency Telephone: 902 353 5220 (during office hours)

2. Hazard Identification

Classified as hazardous (irritant) in accordance with the Chemicals (Hazard Information and Packaging for Supply) Regulations.

Wet concrete can cause serious alkali burns if in direct contact with skin or eyes.

- **Skin**

Alkali burns, a form of skin ulceration, may result from contact with freshly mixed concrete. Contact with strongly alkaline solutions such as concrete can initially cause nerve damage. Chemical burns may occur without the person being aware because they do not feel any pain. Contact with wet cement mixes such as wet concrete can cause skin disease. Irritant contact dermatitis is caused by the combination of the wetness, alkalinity and abrasiveness of the ready-mixed concrete. Allergic contact dermatitis may be caused by individual sensitivity to chromium compounds which may occur in cement.

- **Eyes**

Wet concrete in contact with eyes can cause irritation, inflammation or serious alkali burns, which may lead to blindness.

- **Ingestion**

Swallowing small amounts of fresh concrete is unlikely to cause any significant reaction. Larger amounts can cause irritation of the stomach and intestines.

- **Inhalation**

Wet concrete is not likely to create dust, but respirable dust may be released by the surface treatment and cutting or drilling of hardened concrete. If inhaled in excessive quantities over a prolonged period or extended period, respirable dust can constitute a long term health hazard.

3. Composition / Information on Ingredients

Ready-mixed concrete is a mixture of:

- A cementitious material which may be a cement or a mixture of cement with an addition (eg fly ash, ground granulated blast furnace slag or silica fume).
- Fine and coarse aggregate.
- Water
- Admixtures or additives may be added to modify the properties of the fresh or hardened concrete. Pigments may be added to colour the product.

The proportions of the components will vary according to the required properties of the product.

4. First Aid Measures

- **Inhalation**

If concrete dust is inhaled, remove to fresh air. If breathing difficulties or inflammation are experienced, seek medical attention.

- **Skin Contact**

Where skin contact occurs with wet concrete, either directly or through saturated clothing, the concrete must be washed off immediately with soap and water. Where concrete enters boots or gloves, or saturates clothing, the article should be removed immediately and washed before further use.

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MODULE IV - SAFETY

- **Eye Contact**
Immediately and thoroughly irrigate with copious amounts of eye wash solution or clean water. Seek medical attention immediately.
- **Ingestion**
Remove to fresh air. If person is conscious, rinse out mouth and give water to drink. Seek medical advice.

5. Fire Fighting Measures

Concrete is non-flammable and is not combustible.

Suitable Extinguishing Media:

Not applicable.

Unsuitable Extinguishing Media:

Not applicable.

Special Exposure Hazards in Fire:

None.

Special Protective Equipment for Fire Fighters:

None.

6. Accidental Release Measures

Personal Precautions:

Avoid contact with skin and eyes. Wear impervious clothing, gloves and boots. Wear eye protection. See Section 8 for guidance on personal protective equipment. See Section 7 for guidance on handling the product.

Environmental Precautions:

Prevent wet concrete from entering watercourses, ditches and drains.

Methods for Cleaning:

Clean up any spillage before the concrete hardens, using suction or mechanical removal methods.

7. Handling and Storage

Handling

Avoid skin and eye contact. Wet concrete can cause serious alkali burns if in direct contact with skin or eyes. Contact with concrete may also cause skin disease by the combination of the wetness, alkalinity and abrasiveness of the ready-mixed concrete. Allergic contact dermatitis may be caused by individual sensitivity to chromium compounds which may occur in cement. Do not sit or kneel on wet, un-hardened concrete without wearing the correct personal protective equipment. Where concrete enters boots or gloves, or saturates clothing, the article should be removed immediately and washed before further use. Refer to Section 8 for guidance on personal protection.

Storage

Ready-mixed concrete is normally used upon receipt. However, the hardening process of ready-mixed concrete can be delayed by the use of additions and/ or admixtures, extending the period during which the precautions given in this data sheet should continue to be taken and during which time access by unauthorised persons should be prevented. Refer to the relevant Technical Data Sheet for the specific product.

8. Exposure Controls / Personal Protection

Take Measures to Prevent

- a) Direct skin or eye contact with fresh concrete. It is also important not to kneel or sit on the fresh concrete as harmful contact can occur through saturated clothing.
- b) Inhalation of dust created by the surface treatment and cutting of hardened concrete which may contain quartz. If inhaled in excessive quantities over an extended period, respirable dust containing quartz can constitute a long term health hazard.

Exposure Control Limits / Source

Total Dust -

W.E.L. 10mg/m³ 8 Hrs T.W.A.

Respirable Dust - W . E . L . 4mg/m³ 8 Hrs T.W.A

Respirable Quartz W .E.L. 0.1mg/m³ 8 Hrs T.W.A

Crystalline Silica SiO₂

W.E.L. = Workplace Exposure Limit

T.W.A. = Time Weighted Average

Inhalation

Avoid breathing dust.

Eyes, Skin & Hands

S24/25 - Avoid contact with skin and eyes.

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

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S36/ 37/ 39 - Wear suitable protective clothing, gloves and eye / face protection.

Control Measures

Dust caused by cutting or drilling hardened concrete should be controlled by containment, suppression and extraction/ filtration where possible.

Respiratory Protection

Suitable respiratory protection should be used to protect against inhalation of dust, and to ensure exposure is below the Workplace Exposure Levels given at the start of this section.

Hand Protection:

Impermeable gloves should be worn.

Eye Protection:

Goggles should be worn if there is a risk of product entering the eyes (including dust).

Skin Protection:

Overalls and/or long-sleeved jackets and full length trousers should be worn to protect skin from contact with wet concrete. Outer clothing should be waterproof if contact with wet concrete is likely. Wear impermeable boots to protect feet. Safety wellington boots should be worn. If working with wet concrete, with waterproof trousers pulled over them to help prevent concrete entering the boots. If concrete saturates clothing, or enters gloves or boots, remove the articles immediately and wash before wearing again. In addition to the above, the use of skin barrier cream and aftercare products is also recommended.

9. Physical and Chemical Properties

Appearance: Grey granular paste unless pigmented.

Odour: Slight, earthy odour

pH: Typically 10-14

Boiling Point / Range: n/a

Melting Point / Range: n/a

Flash Point: n/a

Auto Flammability: n/a

Flammability: n/a

Explosive Properties: n/a

Oxidising Properties: n/a

Vapour Pressure: n/a

Relative Density: Above 2.0

Water Solubility: Dependent on aggregate type

Fat Solubility: n/a

10. Stability and Reactivity

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None

11. Toxicological Information

Inhalation:

If inhaled over a prolonged or extended period, respirable dust from drilling or cutting hardened concrete can lead to respiratory system damage and disease. Respirable crystalline silica has been associated with the lung disease silicosis.

Skin Contact:

Skin contact with wet concrete could result in serious alkali burns. Contact with concrete may also cause skin disease by the combination of the wetness, alkalinity and abrasiveness of the ready-mixed concrete. Allergic contact dermatitis may be caused by individual sensitivity to chromium compounds which may occur in cement.

Eye Contact:

Wet concrete in contact with eyes can cause irritation, inflammation or serious alkali burns, which may lead to blindness.

Ingestion:

Ingestion is very unlikely. Ingestion of large amounts may cause irritation of the stomach and intestines. Seek medical attention.

12. Ecological Information

CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Environmental Assessment:

When used and disposed of as intended, no adverse environmental effects are foreseen, and concrete should not pose a significant ecological hazard. Prevent wet concrete entering watercourses, ditches & drains.

13. Disposal Consideration

Safe Handling of Residues / Waste Product:

Hardened concrete is classed as non hazardous and 'inert' but should be disposed of in accordance with local and national legal requirements. Hardened concrete can be readily recycled.

14. Transport Information

Special Carriage Requirements:

None – not classified as dangerous for transport.

15. Regulatory Information

Classification: **Irritant**

Risk Phrases:

R34 - May cause burns.

R38 - Irritating to the skin. **Xi**

R41 - Risk of serious damage to the eyes.

R43 - May cause sensitisation by skin contact.

Safety Phrases:

S2 – Keep out of reach of children.

S24/25 - Avoid contact with skin and eyes.

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/ 37/ 39 - Wear suitable protective clothing, gloves and eye /face protection.

16. Other Information

Training Advice:

Wear and use of PPE.

Recommended Uses and Applications:

Industrial and construction applications.

Further Information:

Safety Officer

Email: SOAdmin@readymixconcrete.sample

Telephone: 902 353 5220

Web: www.readymixconcrete.sample

Key Data Used to Compile Data Sheet:

HSE Guidance Note EH40/2007

PPE Regulations 1992

COSHH Regulations 2002

Environmental Protection Act 1990

HSE Crystalline Silica EH59

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SAMPLE DRUM CLEANING PROCEDURE Best Practises

GENERAL PREREQUISITES

- Confirm and document ambient temperature and oxygen levels.
- Approval required from Safety Officer (or person having authority) to work in outside temperatures below -10°C or above 25°C (reference hot or cold weather work procedures as per jurisdiction).
- Complete Confined Space permit (if required in jurisdiction) and post at Drum entrance.
- Both Attendant and Worker must have Drum cleaning training.
- Both Attendant and Worker must have Confined Space Training (if required in jurisdiction).
- Both Attendant and Worker must have general safety training.
- Both Attendant and Worker must have training in Emergency Rescue Plan including acetylene torch training (if used in Rescue Plan).
- Both Attendant and Worker must have respirator fit-test.
- Both Attendant and Worker must have Working at Heights training if applicable and/or required by provincial regulations.
- Ensure all documentation is completed and filed once job is complete.
- Review of procedure should be done before commencing job and signed off by person having authority.

ATTENDANT

- Required to be present at the access at all times.
- Must maintain direct visual and/or audio contact with Worker.
- Must have current training in Emergency First Aid and CPR.
- Should pass tools to Worker as required.

Attendant Personal Protective Equipment:

- Hard hat
- Safety glasses
- Hearing protection (as per jurisdiction)
- Safety boots (CSA rated)

Attendant Equipment:

- First Aid Kit
- Fire Extinguisher
- Particulate respirators
- Oxy-acetylene torch.

- Communication to access 911 Emergency system.

RESCUE PERSON (if required by jurisdiction)

Personal Protective Equipment:

- CSA approved Safety Boots.
- Hearing Protection and exposure limits as per provincial regulation.
- Gloves appropriate to task (recommended).
- CSA approved Respirator with (P-100) filters.
- CSA approved eye protection.
- CSA approved Hard Hat.
- Knee pads (optional).
- Coveralls.
- CSA approved Full body harness (if required by jurisdiction).
- Calibrated air monitor – zero it in fresh air before every entry (if required by jurisdiction).

WORKER

Personal Protective Equipment:

- CSA approved Safety Boots.
- Hearing Protection and exposure limits as per provincial regulation.
- Gloves appropriate to task (recommended).
- CSA approved Respirator with (P-100) filters.
- CSA approved eye protection.
- CSA approved Hard Hat.
- Knee pads (optional).
- Coveralls.
- CSA approved Full body harness (if required by jurisdiction).
- Calibrated air monitor – zero it in fresh air before every entry (if required by jurisdiction).

Tools and Equipment:

- Air chisel and/or Chipping hammer (battery powered preferred).
- Air Hose.
- Ventilation (exhaust) Fan (if applicable)
 - Fan should circulate air in Drum every minute.
- Step ladder CSA approved (or guard railed platform or scaffolding – the Attendant waits here).
- Extension cord.
- Explosion proof Light.

Truck:

- Park on level ground away from high traffic volume.
- If outdoors park at 90 degrees to prevailing wind (for air flow).
- Rotate Drum to ensure hatch easy access.
- Remove hatch covers, ensure Drum is completely emptied of all loose “wet” concrete and residual water.
- **Follow lock out procedure:**
 - Chock block Drum and/or secure with 2 ratchet straps between the hatch openings and the frame (secure one end of the first strap to the hatch opening and the other to the driver’s side frame of the truck).
 - Apply parking brakes.
 - Apply maxi-brakes.
 - Block wheels.
 - Shut off engine.
 - Place in zero energy state.
 - Remove keys from ignition and put in Worker’s pocket.
 - Roll up windows.
 - If truck is equipped with a remote operating system, the control(s) must be disabled (turned off or batteries removed) and locked in the cab of the truck.
 - Lock cab of truck.
 - Disconnect battery or disable power through master switch.
 - Place “Do Not Operate” double sided sign in driver’s side window.
 - Place traffic cones or barricades around truck perimeter.

Cleaning Procedure:

- Inspect all tools and protective equipment:
 - Pneumatic tools in good working order. All hose connections secured by whip-checks or equivalent system.
 - Electrical cords should be free of cuts or cracks and must be used with a Ground Fault Circuit Interrupter (GFCI) outlet.
 - Fans must be guarded to prevent inadvertent contact.
- Secure ladder (platform, scaffolding) in place.
- Notify Supervisor and Attendant prior to beginning work.
- Wear PPE.
- If indoors place fan to force air circulation inside Drum – start at least one minute before entering the Drum:
 - Fan must not be placed where it might hinder access/egress from Drum.
 - If fan fails Worker must leave Drum immediately.
- Enter mixer through hatch (do not enter by way of the hopper). Only one person at a time should be in the Drum unless emergency conditions apply.

- Attendant to pass tools to Worker as required.
- Remove build-up by chipping from the discharge end of the Drum to the front.
- Do not chip concrete above shoulder height.
- Keep work areas clean by removing rubble before build-up causes footing to be unstable.
- Ensure removal of rubble does not endanger others in area.
- When bottom half of Drum is cleaned, remove equipment and exit the Drum.
- Remove fan.
- Remove chocks or ratchets from Drum.
- Remove ladder, platform, or scaffolding.
- Visually inspect that Drum is free and clear of any hazards.
- Connect battery or enable power through master switch.
- Unlock cab, start truck.
- Rotate Drum in discharge direction for one minute to empty waste debris.
- Rotate Drum so can clean other half.
- Follow lock-out procedure (above) again.
- Start up fan again.
- Re-enter the mixer and clean the rest of the Drum as above.

Clean-up Procedure

- Remove all loose debris.
- Remove all equipment and return to appropriate storage area.
- Replace hatch covers, checking all bolts and threads.
- Remove fan, Drum chocks, and ladder and return to appropriate storage areas.
- Remove wheel and Drum blocks.
- Remove traffic cones or barricades.
- Connect battery or enable power through master switch.
- Notify supervisor of completion of task and return vehicle status to “in service”.
- Unlock cab of truck and remove “Do not Operate” sign.
- Remove confined space permit (where required by jurisdiction (start time end time to be recorded)) and send copy to Company Safety officer (or those having authority - where it will be kept on file).
- If work cannot be completed in a 24 hour period begin entire procedure as new.

Supervisor

Upon discovery of noncompliance/deviation from procedures the Supervisor will:

- Immediately cease Drum cleaning procedure.
- Review with the crew the reason for the work stoppage.
- Contact the General Manager and/or the area Safety Manager.

- Resolution to non-compliance issue should be documented before resumption of work.
- Disciplinary action if required as per company policy.
- Process should be audited periodically.

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CONCRETE DELIVERY PROFESSIONAL (CDP) STUDY GUIDE

MODULE IV - SAFETY

Safety for Ready Mix Drivers working around Concrete Pumps in the Appendix

http://www.concretepumpers.com/sites/www.concretepumpers.com/files/attachments/readymix_v1.0.3_eng.pdf