

ICF SAFETY MANUAL

VERSION 5.0.0

Coworker safety rules for ICF Laborers
and Placing Crew.



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CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Note! *Co-worker Safety Rules* is intended to be a reference tool kept close at hand for the purpose of educating the people working near the pump or boom. It contains the safety points needed by your co-workers to keep them out of harm's way throughout the course of the day's work. You should make an effort to see that all persons involved with your pour have access to this information, even if it must be verbally transmitted or translated.

version 5.0.0

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Manufacturer's recommendations supercede
any and all information provided by the ACPA.

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I. ICF Co-worker Safety

1. Safety Rules For Workers Assigned To The Pump.

- 1.1 **⚠️WARNING!** You must know how to stop the pump and boom. Have the operator show you the locations of the emergency stop switches.

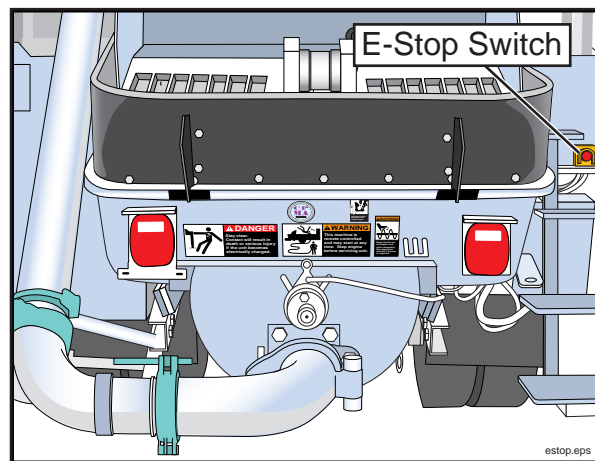


Figure 1
Know how to stop the unit in an emergency

- 1.2 **⚠️WARNING!** You should wear the same personal safety equipment as the operator. Goggles, hard hat, ear protection, and rubber gloves are especially important when working near the hopper (Figure 2).

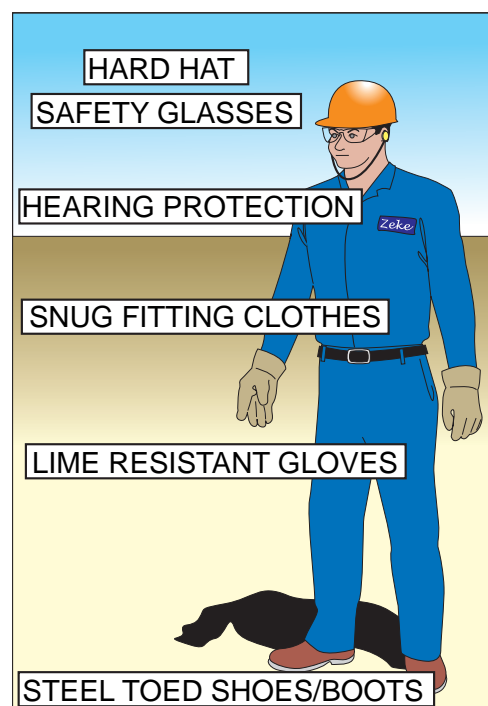


Figure 2
Wear the same protective clothing as the operator

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1.3

⚠ DANGER! **Electrocution hazard!** If the pump or boom becomes energized with high voltage and you are in contact with **any** part of it, you are at **risk of electrocution!** You should monitor the movement of the boom and **alert the operator** if he allows the boom to come within 17 feet of an electrical wire. (See Figure 3.)

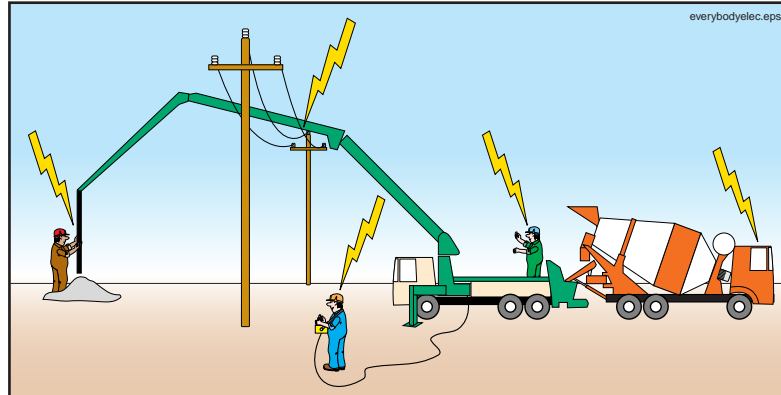


Figure 3
If the pump becomes energized, everything that touches the pump is also energized

1.4

⚠ WARNING! Keep an eye on the movements of the boom, even when there are no electrical wires nearby. Alert the operator if he is nearing any obstruction or hazard. Where job site safety is concerned, two sets of eyes and ears are better than one.

1.5

⚠ WARNING! **Crushing hazard.** Never, ever position yourself between the ready mix truck and the pump! Stand to the side, where the driver can see you (Figure 4).

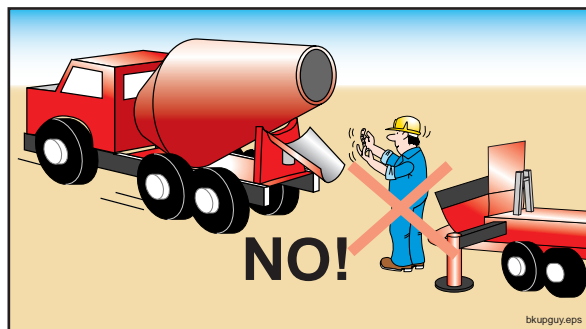


Figure 4
Never stand between the ready mix truck and the pump

1.6

⚠ WARNING! When backing in ready mix trucks, use clear and concise hand signals (Figure 5).

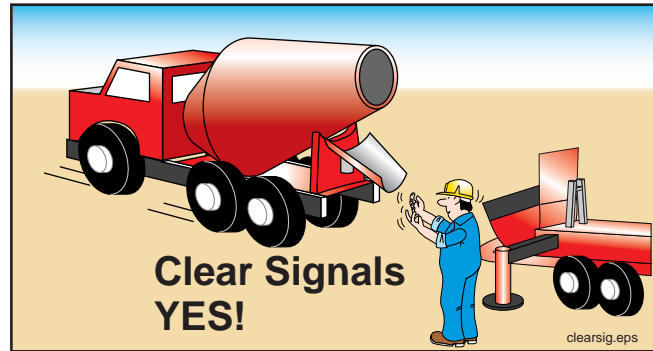


Figure 5
Use clear, concise hand signals

- 1.7** **⚠️WARNING!** Do not allow the ready mix driver to put concrete in the pump hopper until the pump operator gives him the OK. Filling the hopper early can cause the pump to plug.
- 1.8** **⚠️WARNING!** If you see foreign material that could create a blockage coming from the ready mix truck, alert the operator to stop the pump. If you can't get the operator's attention, push an E-stop. Do not attempt to remove the material from the hopper or grate while the hydraulic system is ready to work. (See point 1.17 on page 6).
- 1.9** **⚠️WARNING!** Never allow the ready mix driver to clean his equipment out into the hopper, because it can create a blockage. (Water will wash the cement and fine sand from the course aggregate causing segregation).
- 1.10** **⚠️WARNING!** Do not operate the pump or boom unless you are a trained operator and the regular operator has released the controls to you. **There must not be more than one operator at a time.** This does not apply to emergency stopping of the pump or boom if there is a need to do so.
- 1.11** **⚠️WARNING!** Do not let the concrete level in the hopper become low enough that you can see the top of the valve mechanism! If air is sucked into the material cylinders, the pump will compress the air. Compressed air always poses a hazard as it is expelled from the hopper or the delivery pipeline (Figure 6). If air is taken into the material cylinders, take the following steps to minimize the hazard:
1. Stop the pump immediately. Hit the emergency stop button if that is the quickest way to stop the pump. There may be an expulsion of compressed air the next time the concrete valve shifts, which can be safely absorbed by filling the hopper with concrete.
 2. Alert the operator of the problem. It is his job to know the procedures for safe removal of air from the pump and delivery system. These procedures may include pumping in reverse for a couple of strokes.

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3. Persons standing at the discharge end or near the delivery line must be warned to move away until all of the air has been purged. Warn them to stay a prudent and reasonable distance beyond the reach of the end hose (figure 6).
 4. When the pump is restarted, the slowest possible speed should be used until **all** air is removed from the pipeline. Don't assume that the first little air bubble is the end of the compressed air.
 5. Do not go near the discharge until the operator gives you the OK.
- If workers are positioned in high or precarious places, warn them to expect a loud sound as the air escapes the pipeline. (Warn them even if they are well away from the discharge.) That way, we can prevent the worker from falling as a result of being startled by the noise.



Figure 6
 Remove everyone from the discharge area whenever the pump is first starting, restarting after moving, or if air has been introduced into the line

1.12

⚠WARNING! When initially priming the delivery system, when restarting after moving, when restarting after adding or removing hoses, or whenever air has been introduced into the line, warn everyone to stay a prudent and reasonable distance beyond the reach of the end hose until concrete runs steadily and there is no movement of the delivery system. (Figure 6). Air will be in the line when first starting, when restarting after moving, and after the line has been taken apart or opened for any reason.

1.13

⚠WARNING! Never use compressed air to clear a blockage! The operator is responsible for knowing the safe blockage removal procedures. It is unsafe and unnecessary to use compressed air. If the pump pressure can't move it, air pressure won't either.

1.14

⚠️ WARNING! Never stand on, sit on, or straddle a pipe or hose while it's in use, or whenever it is pressurized. Delivery system wears out with each stroke of the pump. If the pipe or hose bursts, the last place you want to be is on top of it (Figure 7).

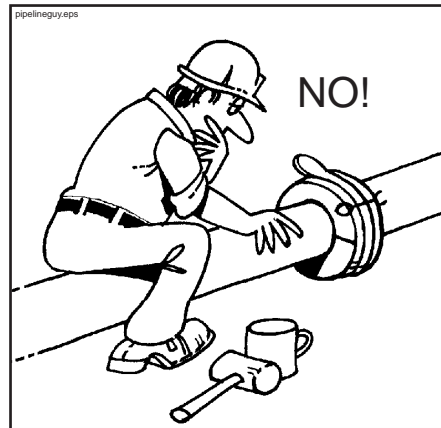


Figure 7
Never straddle or sit on a pressurized pipeline

1.15

⚠️ WARNING! Expulsion hazard! (See Figure 8.) **Never open a pipeline that is under pressure.** The pump must be run in reverse for at least two strokes and then stopped before opening a pipeline. Have the operator reverse the pump. If the pipeline is pressurized, do not open it. The operator is responsible for knowing how to safely release the pressure.

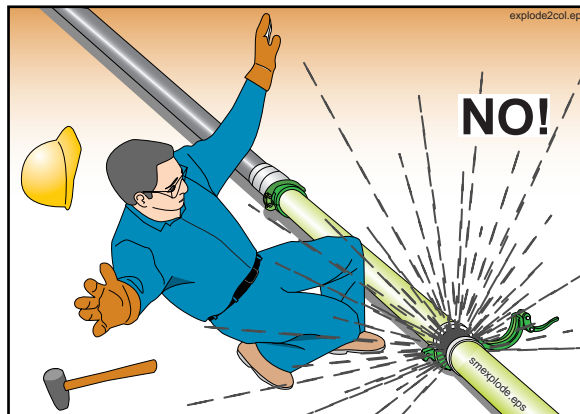


Figure 8
Never open a pressurized pipeline.

1.16

⚠️ CAUTION! Be careful when handling pipeline or any other heavy object. Learn now to lift without using your back. Get assistance if needed.

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1.17

⚠WARNING! Crushing/amputation hazard! Never put your hands, feet, or any other body part into the water box, concrete valve, or hopper when the hydraulic system is operational or ready to operate! Always use a proper lock-out/tag-out procedure! Never stand on the hopper grate! (See Figure 9.)

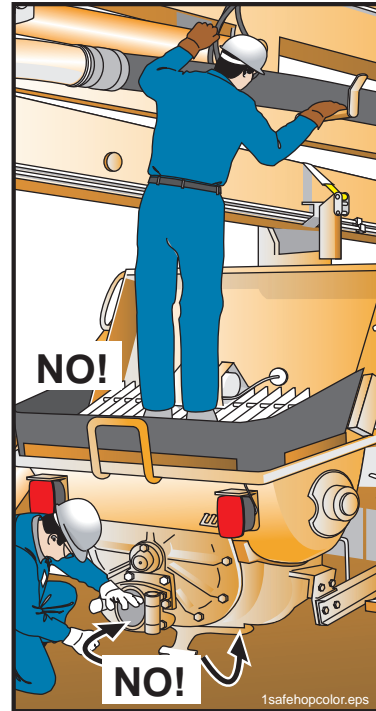


Figure 9
Never put your body in the machine!

1.18

⚠WARNING! Never lift or remove the hopper grate for any reason, unless the machine is de-energized (Figure 10).

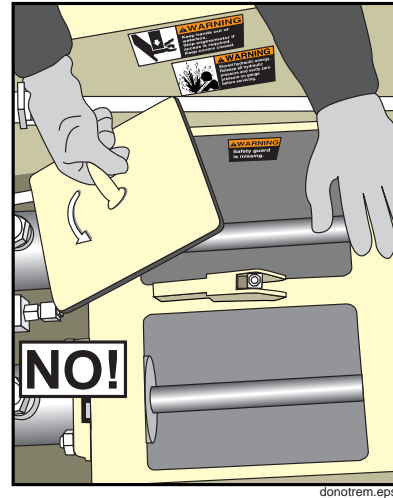


Figure 10
Lifting hopper grate exposes the agitator and the concrete valve

1.19

⚠WARNING! Do not remove the water box covers or grates when the machine is stroking (Figure 11). If you must remove the water box cover (to add water, for example), a proper lock-out/tag-out procedure must be employed to ensure that the machine is de-energized before removing the water box covers. Replace the covers before restarting the pump.

Figure 11
Do not remove the water
box covers when the
machine is stroking



1.20

WARNING! Mount or dismount the pump or truck using the *3 point rule*. One hand and two feet or two hands and one foot are to be in contact with a secure surface at all times (Figure 12).



Figure 12
The 3 point rule

1.21

WARNING! Keep unauthorized personnel off of the pump.

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2. Safety Rules For The Placing Crew

2.1

⚠️WARNING! **Electrocution hazard!** If the pump or boom becomes energized with high voltage and you are in contact with **any** part of it, you are at **risk of electrocution!** You should monitor the movement of the boom and **alert the operator if the boom comes within 17 feet of an electrical wire.** (See Figure 13.)

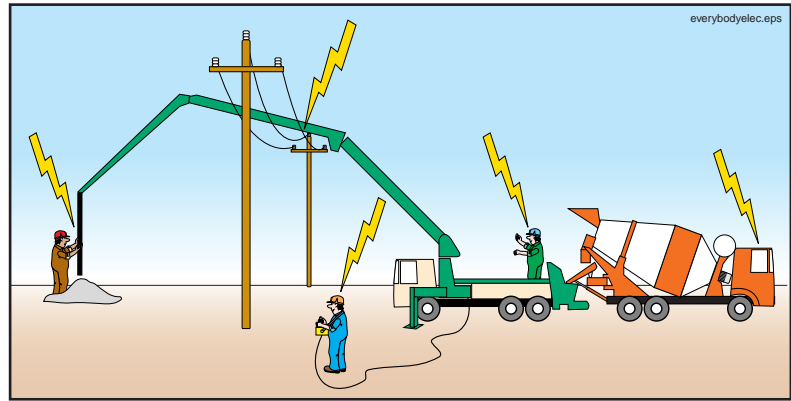
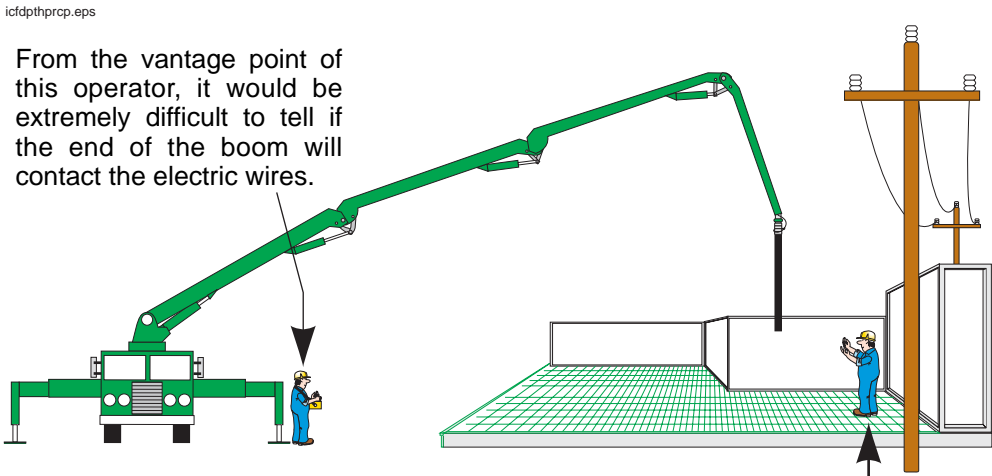


Figure 13
If the pump becomes energized, everything that touches the pump is also energized

2.2

⚠️WARNING! If the boom can contact overhead wires a spotter must be used to warn the operator if the boom is coming near the wires. (Figure 14.)



From the vantage point of this operator, it would be extremely difficult to tell if the end of the boom will contact the electric wires.

The operator should put himself in this position. If this is impossible, he **MUST** use a spotter. **DO NOT RELY ON DEPTH PERCEPTION WITH HIGH VOLTAGE WIRES!**

Figure 14
Use a spotter near obstructions or wires

2.3 **⚠️WARNING!** Keep an eye on the movements of the boom, even when there are no electrical wires nearby. Alert the operator if he is nearing any obstruction or hazard. Where job site safety is concerned, two sets of eyes and ears are better than one.

2.4 **⚠️WARNING!** Wear personal protective clothing when working around a concrete pump (Figure 15). The gloves should resist concrete lime burns. If you will be working **in** the concrete, which is highly caustic to the skin, protect your feet and hands with rubber boots and gloves.

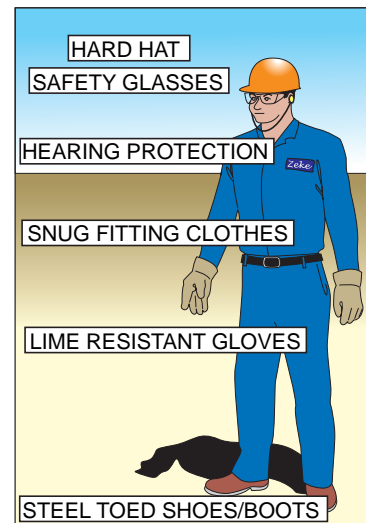


Figure 15
Wear safety gear

2.5 **⚠️WARNING!** When the operator is initially priming the delivery system, restarting after moving, restarting after adding or removing hoses, or any time that air has been introduced into the delivery pipeline, you should stand away from the tip hose or point of discharge. Do not get near the discharge until concrete runs steadily and there is no movement of the material pipeline. Stay back a prudent and reasonable distance from the end hose until concrete flows smoothly. Compressed air in the line can cause rubber hose to move violently (Figure 16). If the operator tells you that air is coming, proceed as follows:

- Get to ground level (if in a high place) and remain well away from the discharge or at least take cover.
- Stay away from the discharge. Be sure that **all** the air is gone before getting near the point of discharge again. It is the operator's job to know when it's safe to go back to pumping.

2.6 **⚠️WARNING!** Never use compressed air to clear a blockage! It is unsafe and unnecessary. If the pump pressure can't move it, air pressure won't either. Stand away from anyone that is attempting to use compressed air in this manner.

2.7 **⚠️WARNING!** Do not look into the end of a plugged hose or pipe!

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Figure 16
 Stay away from the point of discharge
 when starting or restarting, and when
 there's air in the pipeline

2.8 **⚠️WARNING!** When the pump crew is using compressed air to clean the boom or system pipeline, stay away from the discharge area. **Never try to hold down a pipe or hose that is being cleaned with air.**

2.9 **⚠️WARNING!** Never open a pressurized pipeline (Figure 17). The pump operator must release the pressure before you open the line. If the line is pressurized with compressed air, let the operator release the pressure and verify that the air has escaped before you proceed.

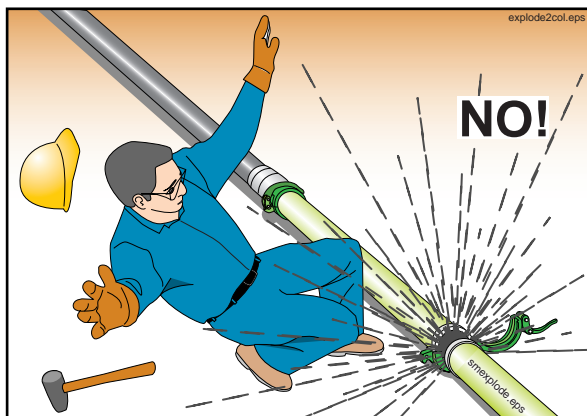


Figure 17
 Never open a pressurized pipeline

2.10 **⚠️WARNING!** After removing pipe sections you must **reassemble using gaskets and clamps**. Pipelines assembled without gaskets will leak cement and water, which can cause a blockage.

2.11 **⚠️WARNING!** Concrete is being moved through the delivery system by pressure. Failure of a pipe, clamp, hose, or elbow is possible. For this and any number of other reasons, spend as little time as possible standing under the boom, and wear protective clothing.

2.12 **⚠️WARNING!** The hose man should not hug the hose, but hold it with both hands, to allow the hose to move freely (Figure 18).



Figure 18
Do not hug the boom hose

2.13 **⚠️WARNING!** The hose man should not walk backwards (Figure 19). Walking forward will allow him to see obstacles and avoid tripping.

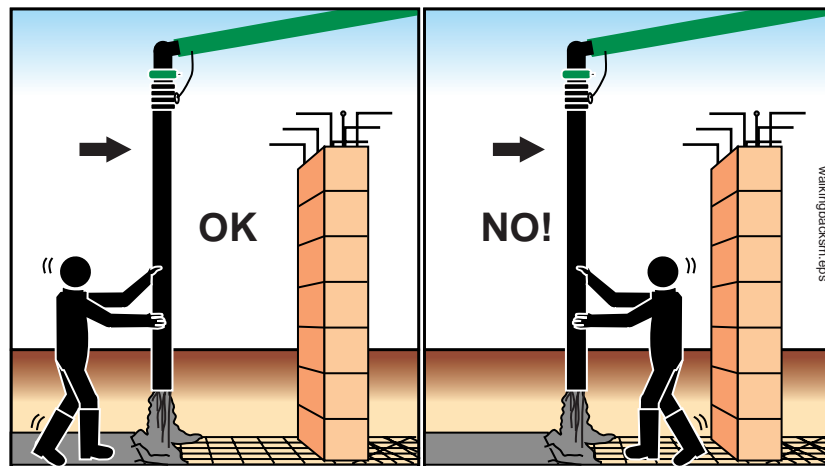


Figure 19
Do not walk backwards, stay out of the path of the boom.

2.14 **⚠️WARNING!** The hose man should never position himself between the boom or boom hose and any fixed object like a wall or column (Figure 19).

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2.15

⚠️WARNING! Never hang more weight than your boom is designed to hold. Double ended hoses with a device like an “s” pipe or a “ram’s horn” Figure 20, not only risk weighing too much for the boom but pose an extreme hazard to the hose man if the hose should whip as shown in Figure 16. If the flow of concrete must be slowed, use a reducing hose instead of hanging a device from the end of the hose.

Figure 20
Devices like these weigh too much and pose a hazard



2.16

⚠️WARNING! Do not kink the end hose. Kinking will cause the pump to create maximum concrete pressure. The pump may unkink the hose by force! (See Figure 21.)

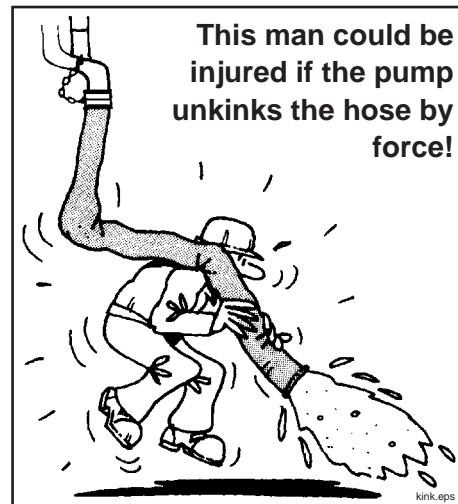
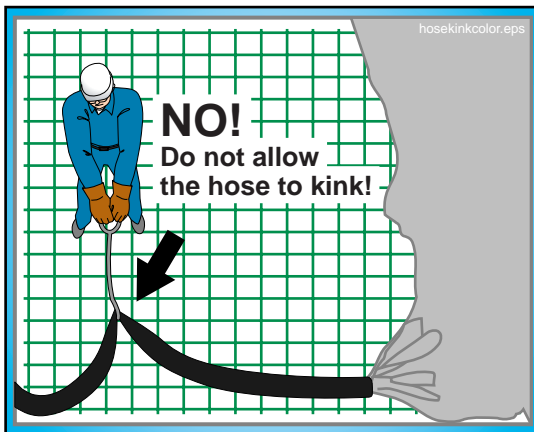


Figure 21
Never kink the hose;
Never hold the hose with your shoulder

2.17

⚠️WARNING! Never try to support the tip hose with your back or shoulders. Let the hose hang from the boom (Figure 21).

2.18

⚠️CAUTION! Be careful when handling pipeline or any other heavy object. Learn how to lift without using your back. Get assistance if needed.

2.19

⚠️WARNING! Crushing hazard! Never position your hands or any body part between the end of the delivery system and a fixed object (e.g., between the tip hose and the concrete form) (Figure 22). Watch for clamps lowering with the line, because they have a larger diameter than the pipes/hoses they connect.

pinchpointcf.eps

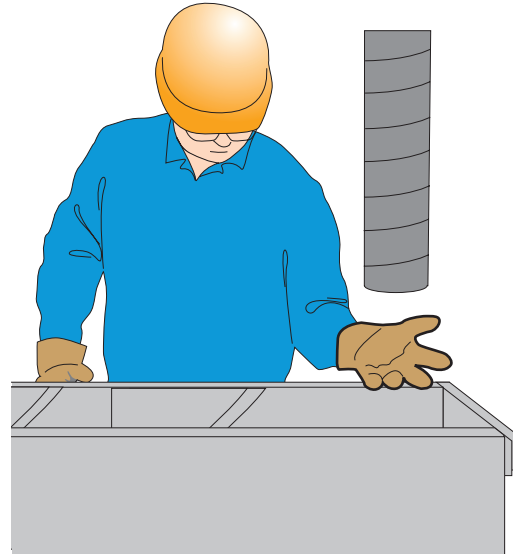


Figure 22
Watch out for the
pinch points

2.20

⚠️WARNING! Try to keep the boom hose no lower than two feet above the deck. As the boom moves up and down, it may hit the feet of the hose man, or the hose opening may be blocked as it contacts the deck, which could create back pressure and cause the hose to whip.

2.21

⚠️WARNING! Falling hazard! When pouring columns, slabs, or walls above ground, secure yourself from falling. Use scaffolding, NEVER tie yourself off to the boom (Figure 23).

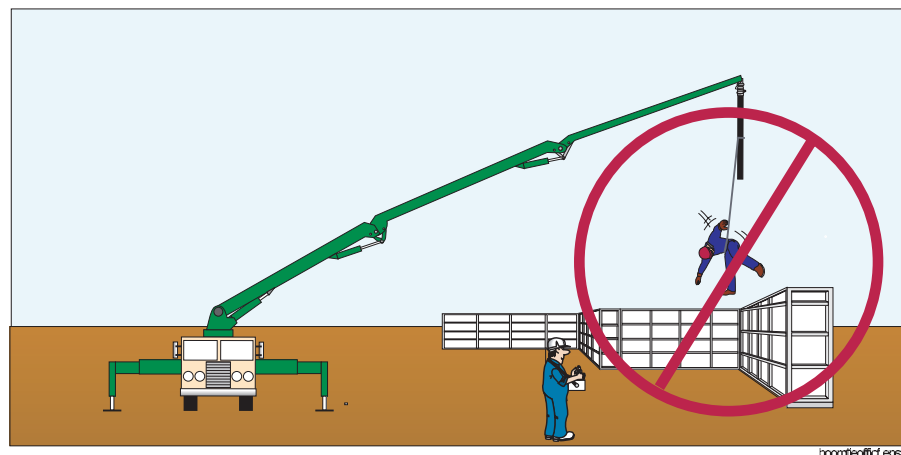


Figure 23
Never tie yourself off
to the boom

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2.22

⚠️WARNING! Never stand on, sit on, or straddle a pipeline while it's in use, or whenever it is pressurized (Figure 24). Pipeline wears out with each stroke of the pump. If the pipe bursts, you want to be to the side of it, not on top of it.

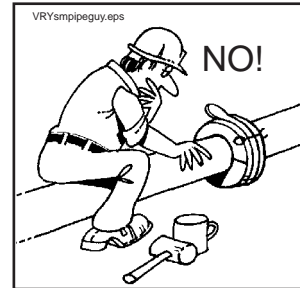


Figure 24
Never straddle or sit on a pressurized pipeline

2.23

⚠️WARNING! To avoid confusion and conflicting signals, only one person should signal the pump operator.

2.24

⚠️WARNING! Before the pour begins, the hose man, the operator and the spotter should review and agree on the hand signals (Figure 25). It is very important that the operator and hose man understand each other.

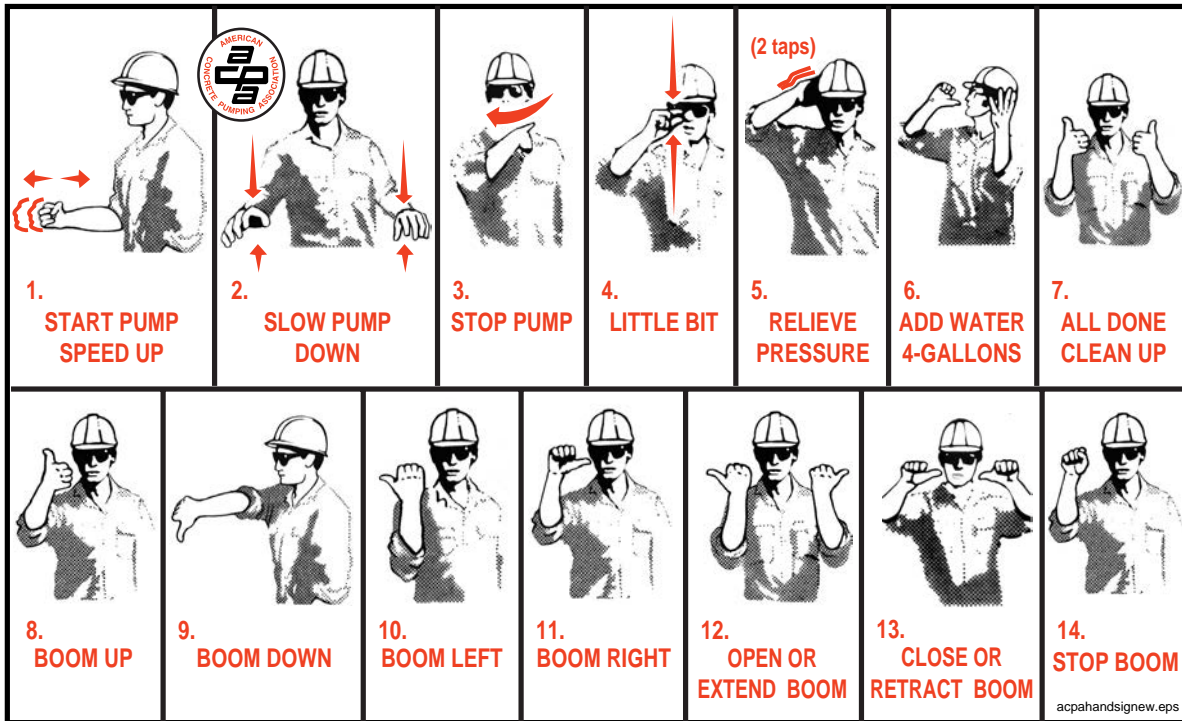


Figure 25
ACPA recommended hand signals