

COWORKER SAFETY RULES

SAFETY MANUAL 7

VERSION 7.0.1

Rules for Laborers, Oilers,
and the 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.

VI. Coworker Safety

16. Safety Rules For Workers Assigned To The Pump

16.1

⚠ WARNING You must know how to stop the pump and boom. Have the operator show you the locations of the emergency stop switches (Figure 74).

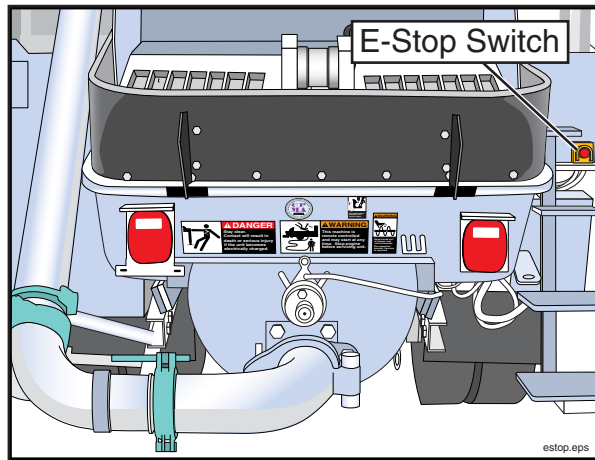


Figure 74
Know how to stop the unit in an emergency

16.2

⚠ WARNING You should wear the same personal protective equipment (P.P.E. or just PPE) as the operator. Goggles, hard hat, ear protection, and rubber gloves are especially important when working near the hopper (Figure 75).

* Breathing mask needed when cement dust (or other toxic dust) is present in the air.



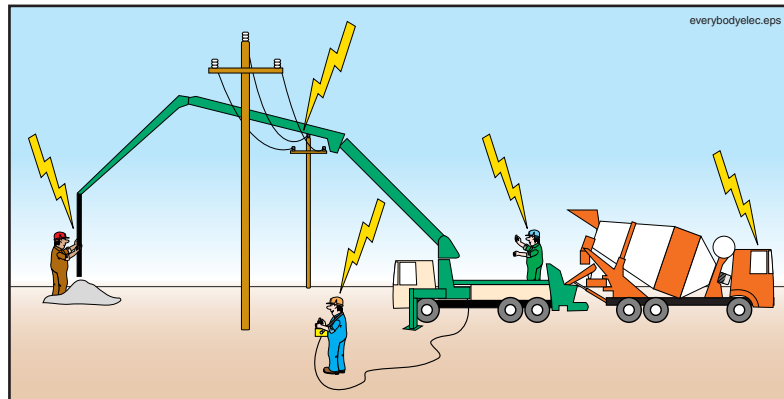
Figure 75
Wear the same PPE as the operator

SAFETY MANUAL

16.3

⚠ 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 the boom comes within 20 feet of power lines (50 feet above 350 Kv).** (See Figure 76.)

Figure 76
If the pump becomes energized, everything that touches the pump is also energized



16.4

⚠ DANGER When power lines are in the area where the boom will be moving to complete a pour, a spotter must be employed whose only job is to warn the operator if the boom comes within 20 feet (50 feet above 350 Kv) of power lines. The spotter must understand the responsibilities assigned, and must be able to judge a 20- or 50-foot distance. Use visual aids such as cones to help the spotter to understand the danger zone. (Figure 77.)



Figure 77
Use of cones can assist with identifying the danger zone

16.5

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

16.6

⚠ 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 78).

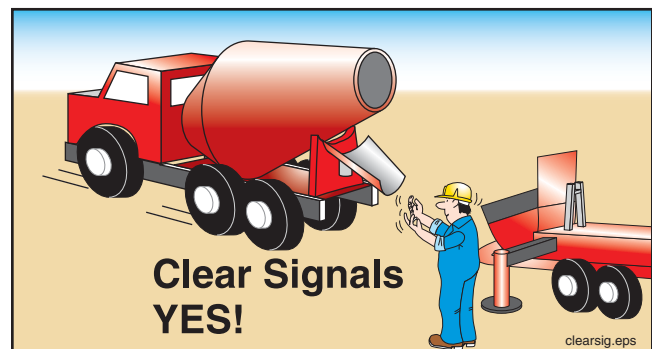
Figure 78
Never stand between
the ready mix truck and
the pump



16.7

⚠ WARNING When backing in ready mix trucks, use clear and concise hand signals (Figure 79).

Figure 79
Use clear, concise
hand signals



16.8

⚠ WARNING If handling the chutes of a ready mix truck, keep your hands clear of the hinged areas.

16.9

⚠ WARNING Do not allow the ready mix driver to put concrete in the pump hopper until the pump operator gives him the okay. Filling the hopper early can cause the pump to plug.

16.10

⚠ WARNING If you see foreign material that could create a blockage coming from the ready mix truck, alert the operator to stop the pump. Do not attempt to remove the material from the hopper or grate while the hydraulic system is ready to work. (See point 16.19 on page 64.) If necessary, push the emergency stop switch (E-stop) to stop the pump and alert the operator.

16.11

⚠ WARNING Never allow the ready mix driver to clean out in the hopper, because it can create a blockage. (Water will wash the cement and fine sand from the coarse aggregate causing segregation.)

16.12

⚠ WARNING Do not operate the pump or boom unless you are also 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 stopping the pump or boom if there is a need to do so.

16.13

⚠ WARNING Do not let the concrete level in the hopper become low! 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 80). 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 switch (E-Stop) if that is the quickest way to stop the pump. There will be an expulsion of compressed air the next time the concrete valve shifts. If possible, fill the hopper with concrete to help contain the expulsion. Do not put your face directly over the hopper.
2. Alert the operator of the problem. It is the operator's job to know the procedures for safe removal of air from the pump and delivery system. These procedures include pumping in reverse for a couple of strokes.
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 reasonable and prudent distance beyond the reach of the end hose or point of discharge (Figure 80).
4. When the pump is restarted, don't assume that the first little air bubble is the end of the compressed air.
5. Do not allow anyone near the discharge until concrete runs steadily from the end and there is no movement of the delivery system.
6. 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, it's possible to prevent the worker from falling as a result of being startled by the noise.

Figure 80
Remove everyone from the discharge area whenever the pump is first starting, restarting after moving, or if air has been introduced into the line



16.14

⚠ 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 away from the discharge until concrete runs steadily and there is no movement of the delivery system. Personnel should stay back a reasonable and prudent distance beyond the reach of the end hose or point of discharge (Figure 80). Air will be in the line when first starting, when restarting after moving, when a blockage has been successfully removed by “rocking” the concrete, and after the line has been taken apart or opened for any reason.

16.15

⚠ 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.

16.16

⚠ WARNING Never stand on, sit on, or straddle a pipeline while it’s in use, or whenever it is pressurized. 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 81).



Figure 81
Never straddle or sit on
a pressurized pipeline

16.17

⚠ WARNING Expulsion hazard! (See Figure 82.) **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. If the pipeline is pressurized with air, do

SAFETY MANUAL

not open it. The operator is responsible for knowing how to safely release the air pressure. Even after the pump is reversed, use a shovel or other tool that will assure a safe distance from clamps to avoid concrete blowing in your eyes.

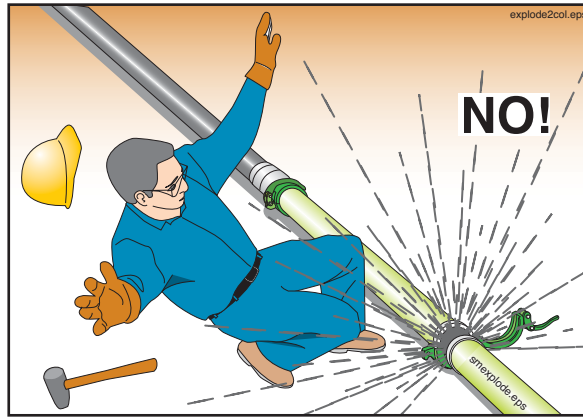


Figure 82
Never open a pressurized pipeline

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

16.19 **⚠ 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! Never stand on the hopper grate! (See Figure 83.)

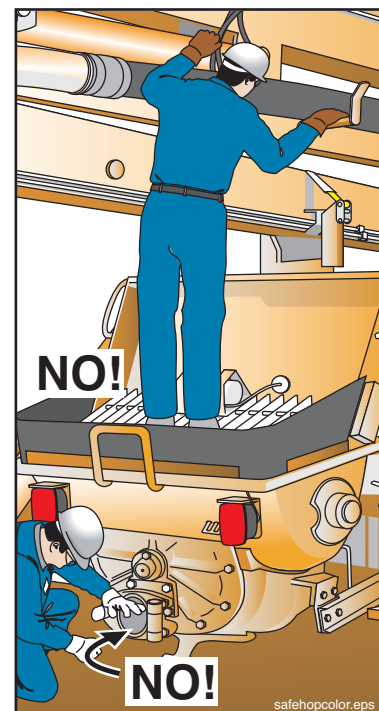


Figure 83
Never put your body in the machine!

16.20



Never lift or remove the hopper grate for any reason (Figure 84).



Figure 84
Lifting hopper grate exposes the
agitator and the concrete valve

16.21



Do not remove the water box covers or grates when the machine is stroking (Figure 85). Do not remove the water box cover (to add water, for example), until the operator has disabled the machine. Replace the covers before the operator restarts the pump.

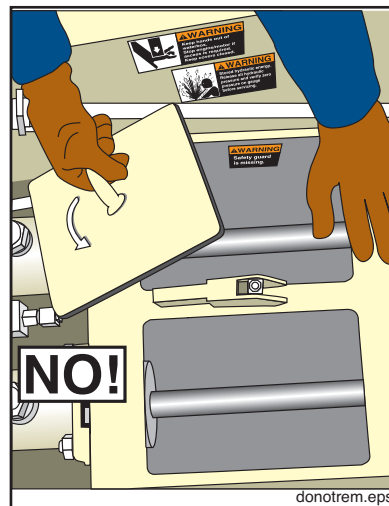


Figure 85
Do not remove the water box covers
when the machine is stroking

16.22



Keep unauthorized personnel off of the pump.

SAFETY MANUAL

16.23

⚠ 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 86).

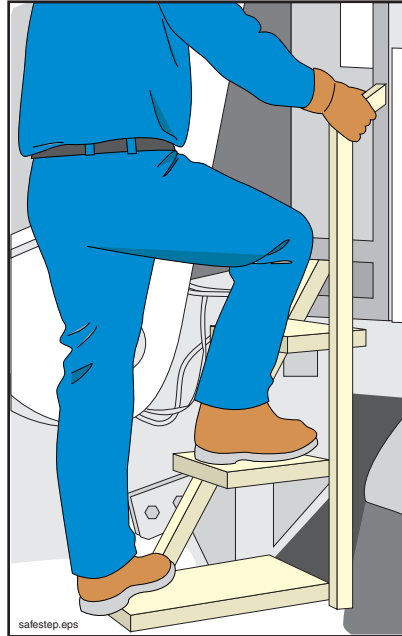


Figure 86
The 3-Point Rule

17. Safety Rules For The Placing Crew

17.1

⚠ 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 the boom comes within 20 feet (50 feet above 350 Kv) of power lines.** (See Figure 87.)

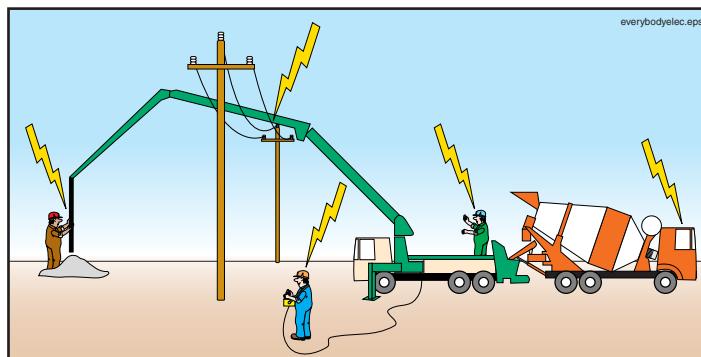


Figure 87
If the pump becomes energized, everything that touches the pump is also energized

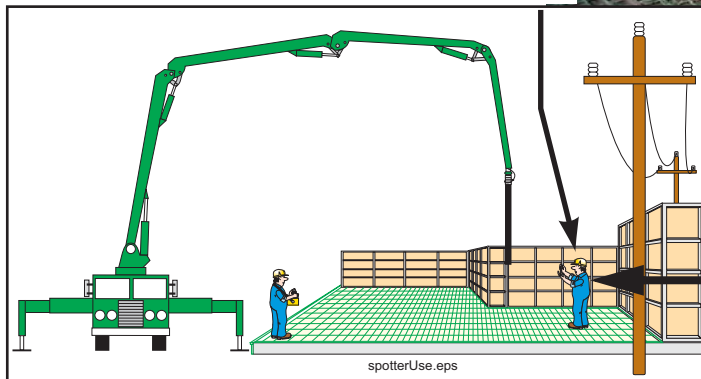
17.2

⚠ DANGER When power lines are in the area where the boom will be moving to complete a pour, a spotter must be employed whose only job is to warn the operator if the boom comes within 20 feet (50 feet above 350 Kv) of power lines. The spotter must understand the responsibilities assigned, and must be able to judge a distance of 20 or 50 feet. (Figure 88.)

Figure 88
Use cones to assist with identifying the danger zone



When the boom will be used near electric wires, a spotter must stand in this position to alert the operator if the boom enters the danger zone.



Use a spotter near obstructions or wires

17.3

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

17.4

⚠ 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 the discharge and the line if anyone attempts to use compressed air in this manner.

17.5

⚠ WARNING Do not look into the end of a plugged hose or pipe while it's pressurized!

SAFETY MANUAL

17.6

⚠ WARNING Wear Personal Protective Equipment (P.P.E. or just PPE) when working around a concrete pump (Figure 89). The gloves should resist concrete lime burns. If you will be working **in** the concrete, protect your feet and hands with rubber boots and gloves.

* Breathing mask needed when cement dust (or other toxic dust) is present in the air.

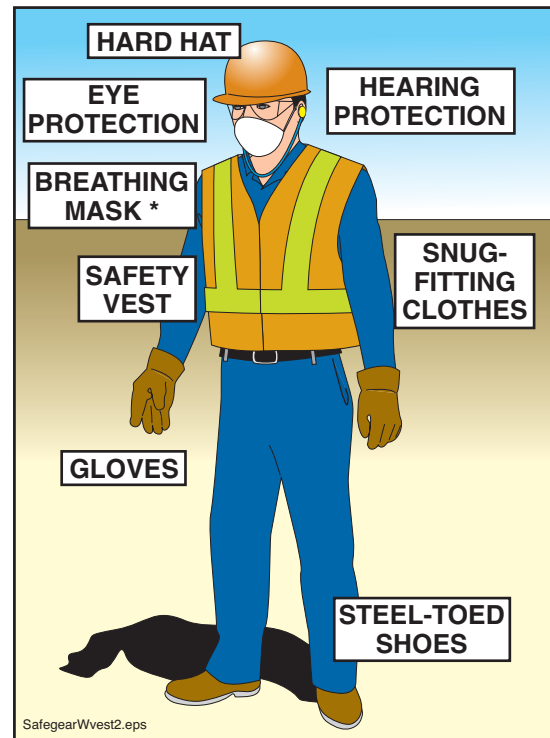


Figure 89
Wear Personal Protective Equipment (PPE)

17.7

⚠ WARNING When the operator is: initially priming the delivery system; restarting after moving; restarting after adding or removing pipes or hoses; or any time that air has been introduced into the delivery system; stand a reasonable and prudent distance away from the tip hose or point of discharge. Do not get near the discharge until material runs steadily and there is no movement of the delivery system. (Figure 90). Compressed air in the line can cause rubber hose to move violently. If the operator tells you that air is coming in the delivery system, 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 normal pumping.

17.8

⚠ 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.**

17.9

⚠ WARNING Falling hazard! When pouring columns, slabs, or walls above ground, secure yourself from falling.

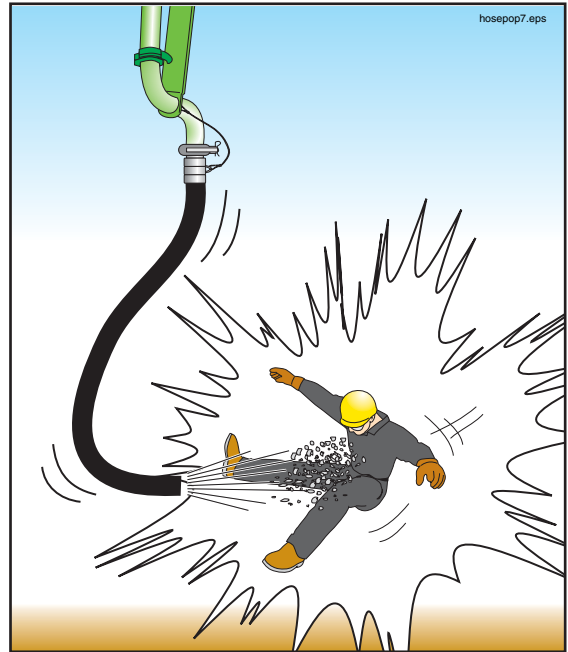


Figure 90
Stay away from the point of discharge
when starting or restarting, and when
there's air in the pipeline

17.10

⚠ WARNING Never open a pressurized pipeline (Figure 91). 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. Even then use a shovel or other tool that will assure a safe distance from clamps to avoid concrete blowing in your eyes.

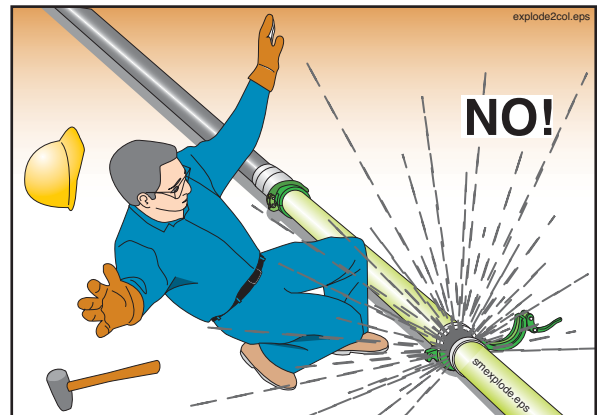


Figure 91
Never open a pressurized pipeline

17.11

⚠ 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.

17.12

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

SAFETY MANUAL

17.13

⚠ WARNING The hose-person should not hug the hose, but hold it with both hands, to allow the hose to move freely (Figure 92).



Figure 92
Do not hug the boom hose

17.14

⚠ WARNING The hose-person should not walk backwards (Figure 93). Walking forward allows obstacles and tripping hazards to be seen.

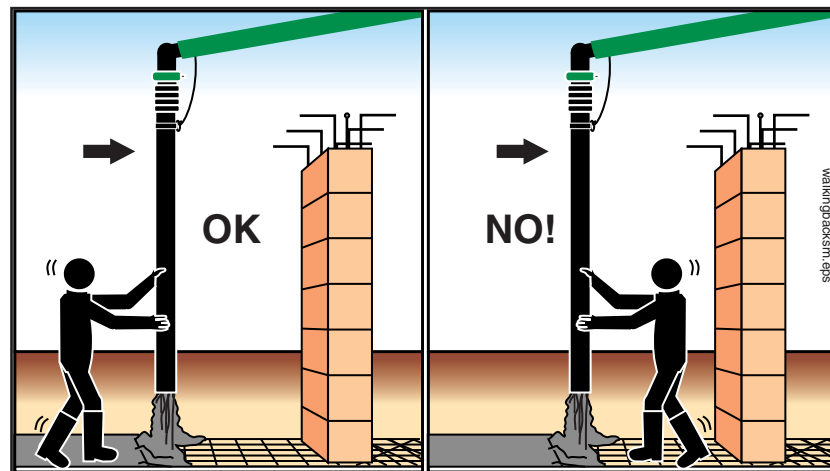


Figure 93
Do not walk backwards; stay out of the path of the boom

17.15

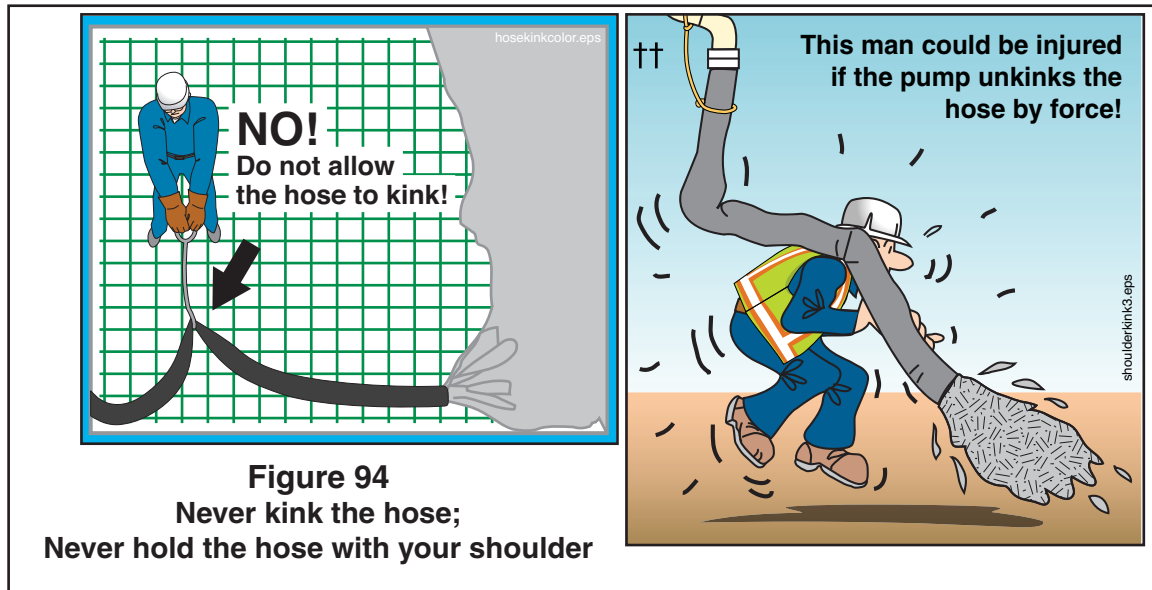
⚠ WARNING The hose-person should never be positioned between the boom or boom hose and any fixed object like a wall or column (Figure 93).

17.16

⚠ 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 94.)

17.17

⚠ WARNING Never try to support the tip hose with your back or shoulders. Let the hose hang from the boom (Figure 94).



17.18

⚠ WARNING When using tools or hooks to drag the hose, be sure they are not sharp enough to damage the hose. When using ropes be sure they are strong enough not to break, and regularly check the rope on the bottom of the hose for wear.

17.19

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

17.20

⚠ 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 95). Watch for clamps lowering with the line, because they have a larger diameter than the pipes/hoses they connect.

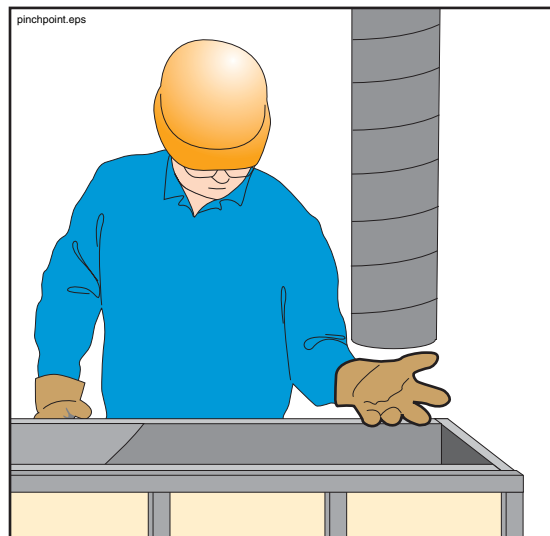


Figure 95
Watch out for the pinch points

SAFETY MANUAL

17.21

⚠ WARNING Do not allow the boom hose to get lower than two feet above the deck to prevent the boom hose from hitting the feet of the hose-person, and to prevent the hose opening from being blocked by the deck, which could cause the hose to whip.

17.22

⚠ WARNING Never stand on, sit on, or straddle a pipeline while it's in use, or whenever it is pressurized (Figure 96). 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 96
Never straddle or sit on a
pressurized pipeline

17.23

⚠ WARNING To avoid confusion and conflicting signals, only one person should act as a signalperson (give operational signals to the pump operator). However, the operator is trained to obey a stop signal from anyone and everyone.

⚠ WARNING Before the pour begins, the hose-person, the operator and the signalperson should agree on hand signals (Figure 97)

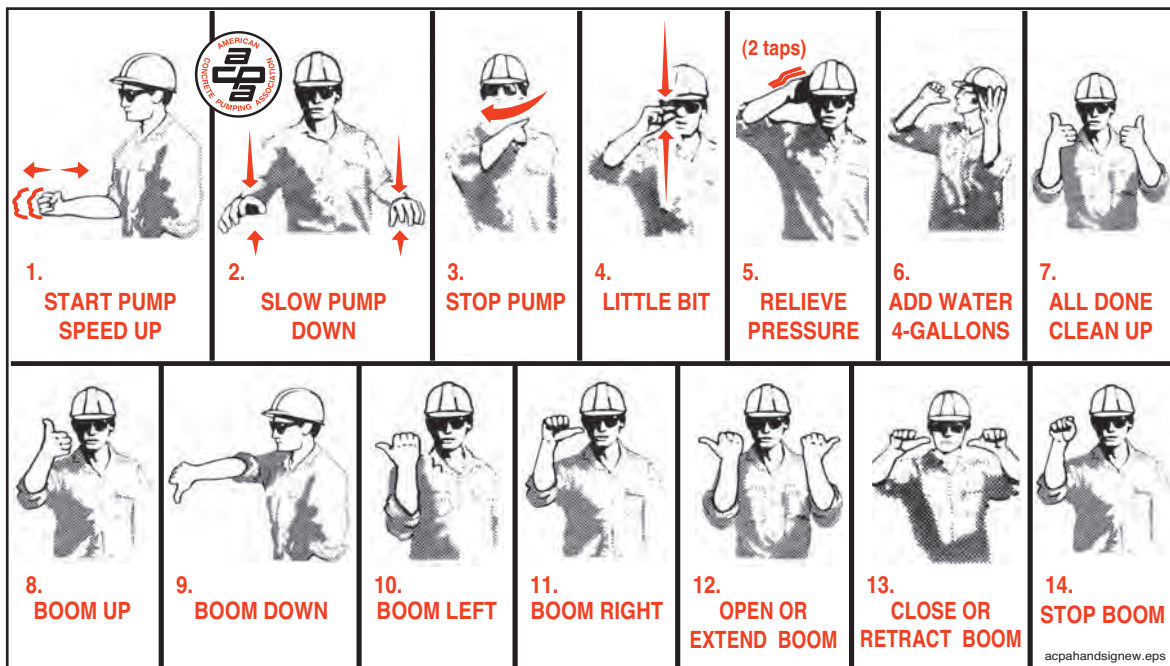


Figure 97
ACPA recommended hand signals

Information contained in this Safety Manual is not intended to supercede the manufacturer's recommendations or company policies.



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