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DENVER, COLORADO | OCTOBER 22-25, 2024

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ICRI Committee 120
Environmental Health And Safety

Total Worker Health Initiative

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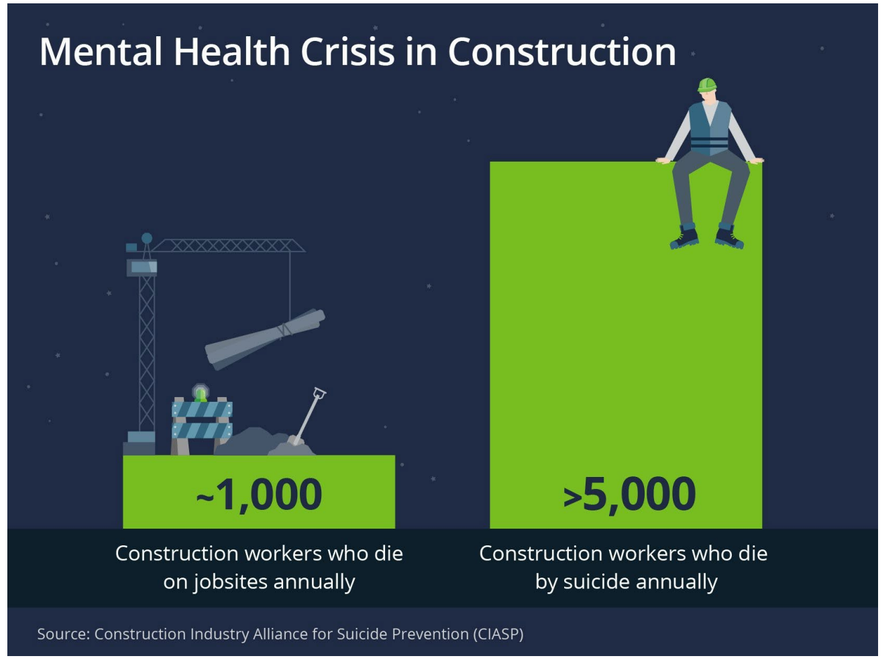
Environmental Safety and Health Committee
Total Worker Health Initiative

- Mental Health and Wellness
  - Suicide awareness and prevention in the construction industry.
  - Opioid addiction in construction.
- Physical Health and Wellness
  - Hard Hats to Helmets
  - ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry
  - Advancements in PPE
  - Hot topics in safety
- Safety Management Improvements
  - Behaviorally based safety culture
  - Improvements in Risk Assessment
  - Improving safety performance – How to do it.
- Structural Safety
  - Maintaining structural safety and stability in the concrete repair industry

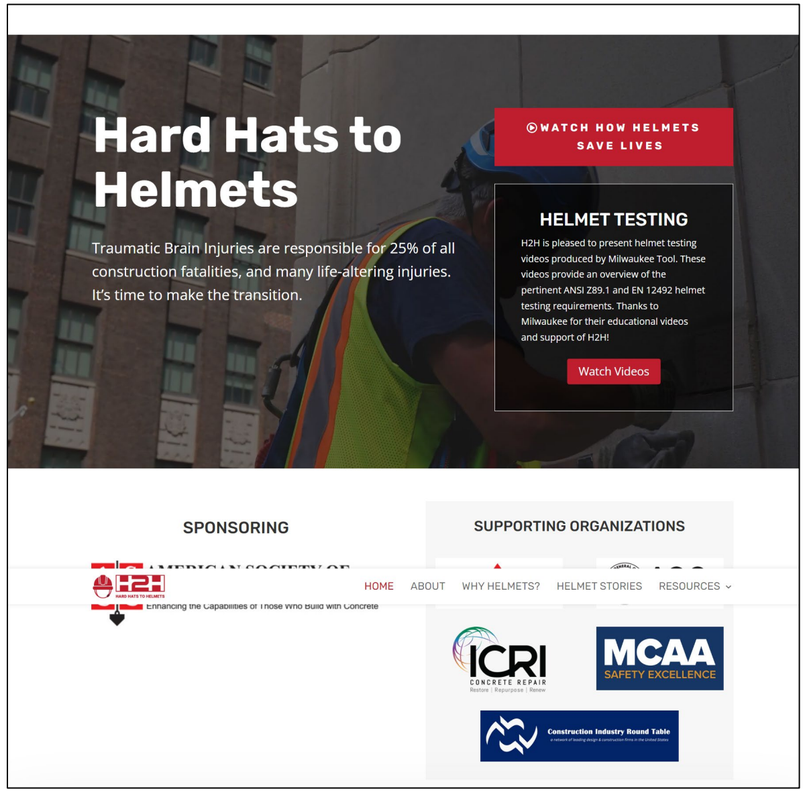
Environmental Safety and Health Committee
Total Worker Health Initiative

- Mental Health and Wellness
  - Suicide awareness and prevention and substance abuse in the construction industry
    - CRB Article
    - Annual Conference Presentations
    - Team with Industry Leaders
    - Provide access to training and awareness programs



Environmental Safety and Health Committee
Total Worker Health Initiative

- Physical Health and Wellness
  - Hard Hats to Helmets
    - Published Article in CRB
    - Survey ICRI members regarding H2H transition
    - Develop strategies to help members with H2H transition
    - Promote H2H website
  - ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry
  - Advancements in PPE
    - Lead industry awareness of latest advancements in PPE developments, availability and efficacy
  - Hot topics – Keep concrete repair industry up to date on regulatory and safety industry advancements
    - OSHA Heat Injury and Prevention Rule
    - OSHA Walk Around Rule



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Environmental Safety and Health Committee
Total Worker Health Initiative

- Safety Management Improvements
  - Behaviorally Based Safety Culture
  - Improvements in Risk Assessment
    - Serious Injury and Fatality Prevention
  - Improving safety performance – How to do it.
  - Safety Award Program
  - ICRI Dedicated Website Tab
  - ICRI Local Chapter Interaction and Support

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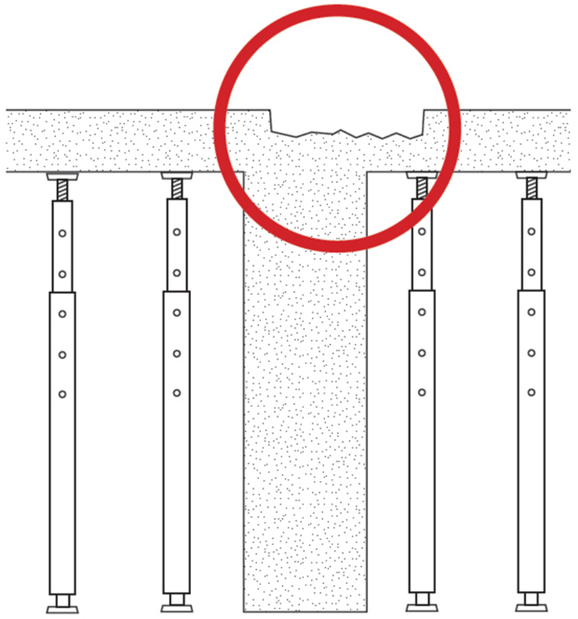
Environmental Safety and Health Committee
Total Worker Health Initiative

- Structural Safety
  - Maintaining structural safety and stability in the concrete repair industry
    - Risk Assessment
    - Engineering Principles
    - Training
    - Learning from shared experiences



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Environmental Safety and Health Committee

ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

- This Guideline was created and has been updated to be an illustrated tool to be used by the field forces actually performing the work.
- Project Managers, Supervisors, and other leadership individuals should familiarize themselves with the contents of this Guideline and share the information with their field crews.
- The individual pages within this Guideline can be used as training and task planning tools to be reviewed prior to and during the specific task described.

Environmental Safety and Health Committee

ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

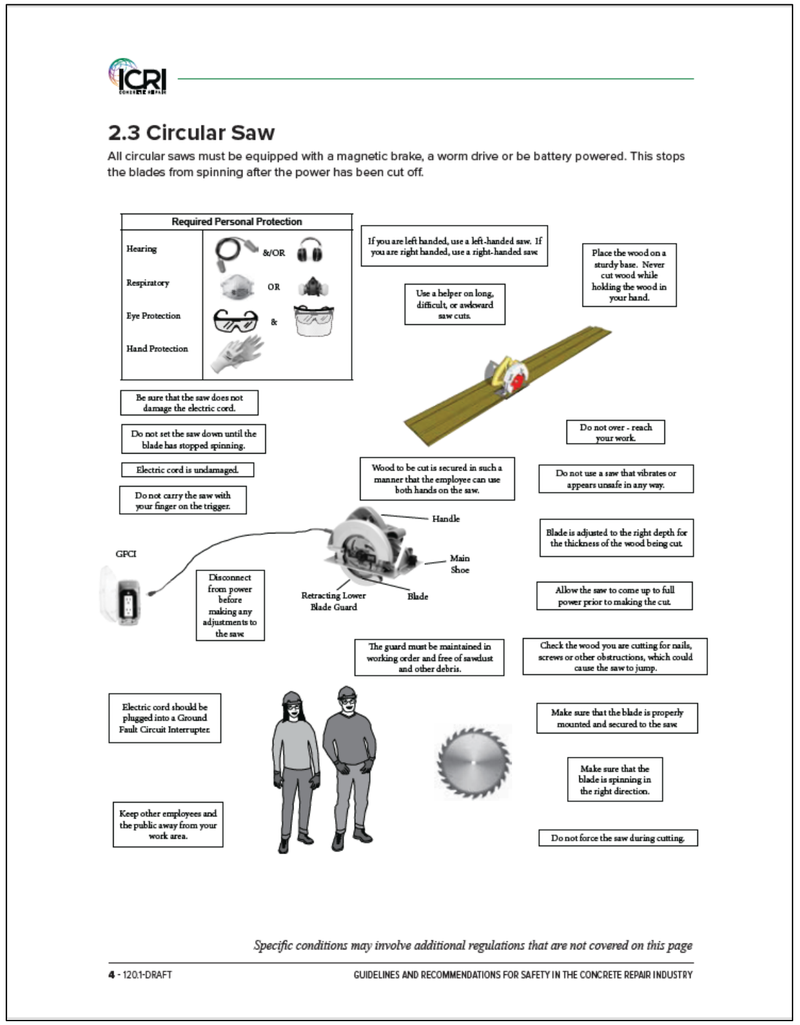
- This is an experience-based Guideline to promote the safety of all involved in the repair process.
- The benefits of a safe workplace are many:
  - Reduced insurance costs
  - Reduced management effort and claims costs
  - More efficient and productive environment that yields a more profitable project
  - Most importantly, the moral obligation that we have to our workers and to the public to ensure that they do not endure the pain and suffering of a work-related injury, illness, or even death

Environmental Safety and Health Committee

ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

- Contents of Guideline
  - General Safety and Health Provisions
  - Personal Protective and Life Saving Equipment
  - Fire Protection and Prevention
  - Signs, Signals and Barricades
  - Materials Handling, Use and Storage
  - Tools- Power and Hand
  - Welding and Cutting
  - Electrical
  - Scaffolds
  - Fall Protection
  - Cranes and Hoists
  - Motor Vehicles and Marine
  - Excavations
  - Concrete, Masonry and Post-Tensioned Construction
  - Demolition
  - Stairways and Ladders
  - Glossary

Environmental Safety and Health Committee
ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry



2.3 Circular Saw

All circular saws must be equipped with a magnetic brake, a worm drive or be battery powered. This stops the blades from spinning after the power has been cut off.

Required Personal Protection

Hearing		&/OR	
Respiratory		OR	
Eye Protection		&	
Hand Protection			

If you are left handed, use a left-handed saw. If you are right handed, use a right-handed saw

Place the wood on a sturdy base. Never cut wood while holding the wood in your hand.

Use a helper on long, difficult, or awkward saw cuts.

Be sure that the saw does not damage the electric cord.

Do not set the saw down until the blade has stopped spinning.

Electric cord is undamaged.

Do not carry the saw with your finger on the trigger.

Do not over - reach your work.

Wood to be cut is secured in such a manner that the employee can use both hands on the saw.

Do not use a saw that vibrates or appears unsafe in any way.

Handle

Main Shoe

Blade

Retracting Lower Blade Guard

GPCI

Disconnect from power before making any adjustments to the saw

Blade is adjusted to the right depth for the thickness of the wood being cut.

Allow the saw to come up to full power prior to making the cut.

The guard must be maintained in working order and free of sawdust and other debris.

Check the wood you are cutting for nails, screws or other obstructions, which could cause the saw to jump.

Electric cord should be plugged into a Ground Fault Circuit Interrupter.

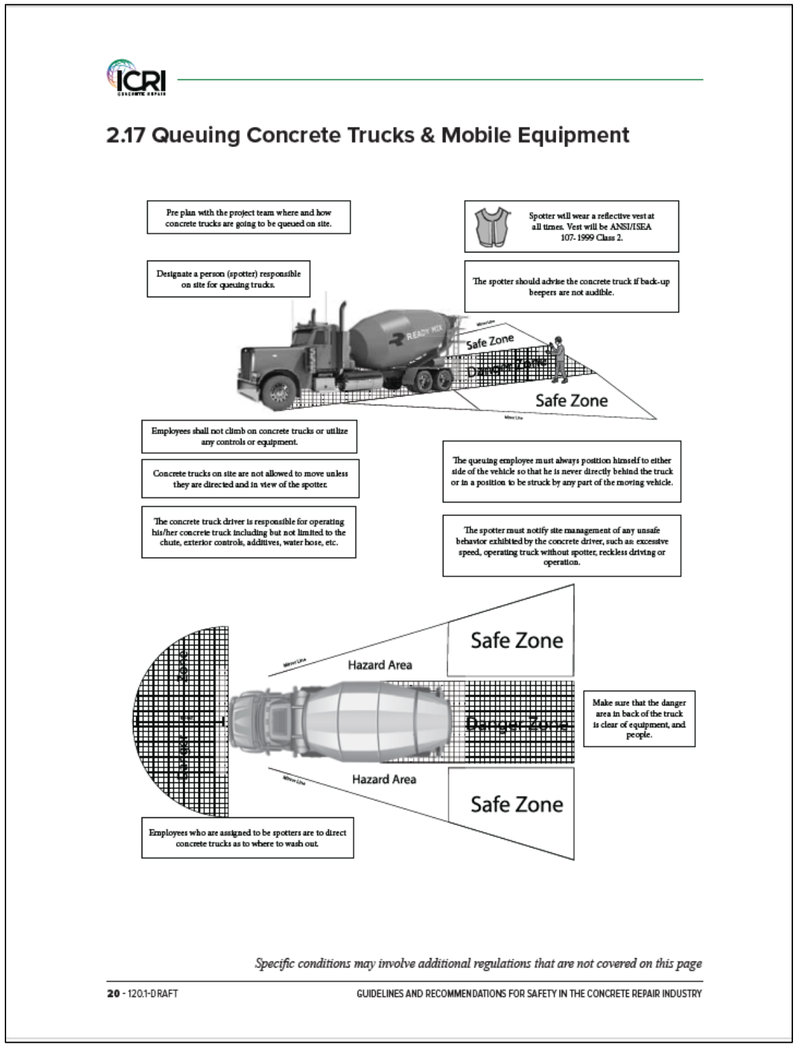
Make sure that the blade is properly mounted and secured to the saw

Make sure that the blade is spinning in the right direction.

Keep other employees and the public away from your work area.

Do not force the saw during cutting.

Specific conditions may involve additional regulations that are not covered on this page



2.17 Queuing Concrete Trucks & Mobile Equipment

Pre plan with the project team where and how concrete trucks are going to be queued on site.

Spotter will wear a reflective vest at all times. Vest will be ANSI/ISEA 107-1999 Class 2.

Designate a person (spotter) responsible on site for queuing trucks.

The spotter should advise the concrete truck if back-up beepers are not audible.

Safe Zone

Danger Zone

Safe Zone

Employees shall not climb on concrete trucks or utilize any controls or equipment.

Concrete trucks on site are not allowed to move unless they are directed and in view of the spotter.

The concrete truck driver is responsible for operating his/her concrete truck including but not limited to the chute, exterior controls, additives, water hose, etc.

The queuing employee must always position himself to either side of the vehicle so that he is never directly behind the truck or in a position to be struck by any part of the moving vehicle.

The spotter must notify site management of any unsafe behavior exhibited by the concrete driver, such as excessive speed, operating truck without spotter, reckless driving or operation.

Safe Zone

Hazard Area

Danger Zone

Make sure that the danger area in back of the truck is clear of equipment, and people.

Hazard Area

Safe Zone

Employees who are assigned to be spotters are to direct concrete trucks as to where to wash out.

Specific conditions may involve additional regulations that are not covered on this page

Environmental Safety and Health Committee
ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

2.12 Lock-Out / Tag-Out

Employee must be trained for Lock-out / Tag-out

- Should be supervision

Prepare for Shut Down

- Identify type of energy
- Identify potential hazards
- Identify switches, valves and other control devices

Communicate with Affected Employees

- Turn off the machine
- Locate & isolate all energy sources
- Lock out the switches and other energy controls
- Remove any stored energy from system
- Test controls to be sure that machine cannot operate
- Put operating controls in the off or safe position
- Perform the necessary work

Define who has control of LOTO

High Danger

Prepare for Start Up

- All tasks complete
- All tools have been removed
- All employees clear of the area

Re-Install Machine Guards

High Danger

Communicate with other Employees that Equipment is Operational

Remove lock-out devices

Specific conditions may involve additional regulations that are not covered on this page

2.10 Flammable Liquids

Flammable liquids can be classified into four categories:
Category 1: Flashpoint below 73.4°F (23°C) and boiling point at or below 95°F (35°C)
Category 2: Flashpoint below 73.4°F (23°C) and boiling point above 95°F (35°C)
Category 3: Flashpoint at or above 73.4°F (23°C) and at or below 140°F (60°C)
Category 4: Flashpoint above 140°F (60°C) and at or below 199.4°F (93°C)

Can must include "Gasoline" or "Diesel" label and be properly colored
Red = Gasoline
Yellow = Diesel
Blue = Kerosene

OSHA Approved Safety Cans

Properly labeled in accordance with HazCom regulations.

Funnel

Flash arrester

Do not remove flash arrester.

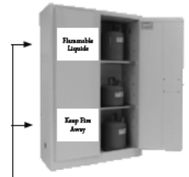
No more than 25 gallons (94.5L) stored in a room outside an approved storage cabinet.

Properly maintained. No holes or damage which could affect the can's ability to hold a flammable liquid.

Do not store flammable liquids near exits or under stairs normally used for safe passage of people.

OSHA Approved Storage of Flammable Liquids

Wrong



Door must have 3-point lock (top, bottom, side)

Required Labels

No more than 120 gallons (454L) of Class III flammable liquids, or 60 gallons (227L) of Class I or II flammable liquids per cabinet.

Wrong

Do not store flammable liquids near exits normally used for safe passage of people.

Do not store flammables within occupied structure unless they are in a fire cabinet.

Specific conditions may involve additional regulations that are not covered on this page

Environmental Safety and Health Committee
ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

2.9 Silica Standard

OSHA Table 1: Matches 18 tasks with effective control methods and some respirator requirements. Employers that fully and properly implement controls on Table 1 do not have to comply with the PEL or conduct exposure assessments for employees engaged in those tasks.

If the controls in Table 1 are fully implemented, and the dust exposure is under the PEL, respiratory protection may not be required. See Table 1 in 29 1926.1153 for task-specific requirements.

The controls in Table 1 are mandatory and must operate as defined by the manufacturer.

List of OSHA Table 1 Entries

Stationary Masonry Saw		
	Controls: Use saw equipped with integrated water delivery system that continuously feeds water to the blade	Respiratory Protection: None required

Walk-Behind Saws		
	Controls: Use saw equipped with integrated water delivery system that continuously feeds water to the blade	Respiratory Protection: Half-face if used indoors or in an enclosed space 

Dowel Drilling Rigs for Concrete		
	Controls: Use outdoors only AND Use shroud around drill bit with dust collection system AND Use HEPA-filtered vacuum when cleaning holes	Respiratory Protection: Half-face required 

Walk-Behind Milling Machines and Floor Grinders		
	Controls: Use integrated continuous water delivery at surface OR Use equipped with dust collection system and HEPA filter for loose dust	Respiratory Protection: None required

Specific conditions may involve additional regulations that are not covered on this page

2.8 Respiratory Protection

Two Strap Disposable N-95 Filtering mask

Half Face Cartridge Respirator

Full Face Cartridge Respirator

- Written standard operating procedures. Written site specific respiratory protection plan is required.
- Respirator chosen for specific hazard. See pg. C.2 for Assigned Protection Factor (APF) for each respirator.
- The user shall be instructed and trained in the proper use and limitations.
- Respirators shall be cleaned and disinfected daily.
- If a dust mask is voluntary, employee does not need a medical questionnaire.
- Respirators shall be stored in bags in a convenient, clean, and sanitary location and protected from UV light if clear.
- Respirators shall be inspected during cleaning. Worn, damaged or deteriorated parts shall be replaced. SCBA type respirators shall be inspected on a monthly basis. Annual fit testing must be completed before employees are permitted to wear tight fitting respirators (ie… ½ and Full Face Masks).
- Appropriate surveillance of work area conditions and degree of employee exposure to stress shall be maintained.
- Regular inspection and evaluation to determine the continued effectiveness of the respiratory protection program.
- Persons should only be assigned to tasks requiring use of respirators when physically able to perform the work and use the equipment.
- The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed.
- Employees shall be fit tested annually to ensure that they are physically able to use respirators and to ensure proper fit.

Respirators are unsafe if used improperly

All activities must comply with silica protection requirements.

Specific conditions may involve additional regulations that are not covered on this page

2.2 Preventing Heat Related Injuries

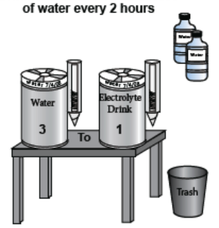
3 Stages: Heat Cramps, Heat Exhaustion, Heat Stroke

Heat cramps: Symptoms include muscle pain and muscle tightness

Heat exhaustion: Symptoms include muscle cramps, dizziness, mild confusion, fast heart rate or breathing, headache, irritability, extreme thirst, nausea or vomiting, pale skin, heavy sweating, or fainting

Heat stroke: Symptoms include body temperature over 104F, irrational behavior, confusion, rapid shallow breathing, rapid or weak pulse, seizures, loss of consciousness, or dry skin

To Avoid Heat Related Illness, Drink one or two 12 oz bottles of water every 2 hours



Avoid Caffeinated, Alcoholic and Energy Drinks During Work and Evening Prior

If you experience any of the above symptoms, seek medical treatment immediately.

Medical Treatment

- Take to a cool place, wet down and fan to enhance cooling.
- Provide water, if conscious
- Loosen clothing
- Remove unnecessary clothing Protective Coveralls,Rain Suit, etc.
- Seek medical assessment as directed
- If employee is unconscious, incoherent, sick or unstable, call EMS immediately.

Specific conditions may involve additional regulations that are not covered on this page

Environmental Safety and Health Committee
ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

2.13 Modular Scaffolds

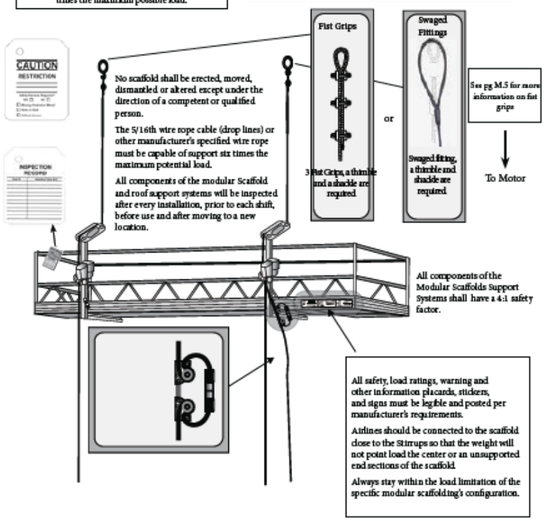
Tiebacks straight back, in line with beam and no slack in line.

The number of counter weights must maintain the 4:1 safety factor.

For 5/16" wire rope:
- Distance between fist grips shall be minimum 6 rope diameters or 1 7/8 in. (4.8 cm)
- Amount of turnback (distance from end of thimble to dead end) shall be 5 in. (12.7 cm)
- Fist grips shall be tightened to a torque of 30 ft-lbs (40.7 N-m)

All cantilevered beams are tied back to a substantial building structure that is capable of supporting four times the maximum possible load.

The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.



No scaffold shall be erected, moved, dismantled or altered except under the direction of a competent or qualified person.

The 5/16th wire rope cable (drop lines) or other manufacturer's specified wire rope must be capable of support six times the maximum potential load.

All components of the modular Scaffold and roof support systems will be inspected after every installation, prior to each shift, before use and after moving to a new location.

All components of the Modular Scaffolds Support Systems shall have a 4:1 safety factor.

All safety, load ratings, warning and other information placards, stickers, and signs must be legible and posted per manufacturer's requirements.

Airlines should be connected to the scaffold close to the Stirrups so that the weight will not point load the center or an unsupported end sections of the scaffold.

Always stay within the load limitation of the specific modular scaffolding's configuration.

Specific conditions may involve additional regulations that are not covered on this page

2.19 Concrete Pump / Pour Safety

Inspect concrete pump to ensure safety equipment and guards are in place and in good condition, and for no other damaged parts. Make sure the emergency stop switch functions properly, and that there are no dents, cracks, or wear in the pipeline.

When operating the concrete pump, utilize proper hand signals and communication

Properly prime the delivery system before pumping concrete.

Look out for blockages. If there is a blockage, disconnect and de-energize the pump and its components before clearing the blockage. Do not remove the blockage with compressed air!

Never leave the pump unattended.

There should be no coupler on the hose if pumping into valves and ports.

If the discharge end is open and the crew is not pumping into valves or ports, the end hose shall be bare rubber. Remove any couplers on the end. Couplers attached to the hose that are not fastened to a valve or port can cause a pressure buildup and hose whips.

If using a portable/towable pump, ensure that drop leg jack is activated and that the wheels are chocked.

If pouring concrete via buggies, operate safety. See pg O.8

Ensure all vertical steel reinforcement bars are properly capped to avoid impalement.

When finishing concrete, be careful using extra long floats and handles. Keep away from electrical hazards and other people.

Properly wear PPE so that skin is not exposed to potential cement burns.

Specific conditions may involve additional regulations that are not covered on this page

2.14 Steel Frame Scaffold

All tools must be tethered when working at heights.

Guardrails are required on scaffolds above 6 feet (1.8 m). Guardrail systems are comprised of:
- Top Rail (42 inches) (1067mm)
- Mid Rail (21 inches) (533mm)
- Toe Board (1" x 4") (25 x 102mm)

Screening between toe board and guardrails may be required when working over walkways or employees.

- Planks shall be scaffold grade or equivalent.
- Planks should extend a minimum of 6 inches (152mm), but not more than 12 inches (305mm) from end supports. Secure with tire wire or cleat.
- Cross bracing properly placed and connected.
- Bracket access ladder or equivalent.
- Pole, legs and uprights must be plumb.

Keep scaffold 10 ft (3 m) from overhead power lines less than 50 kV. When over 50 kV, keep scaffold 10 ft plus 0.4 inches for each 1 kV over 50.

Scaffold tags required to document inspection for every shift. Inspection must be performed by a competent person.

Scaffold competent person must have training or knowledge in these areas in order to identify and correct hazards encountered in scaffold work.

Scaffold shall not be painted with an opaque finish.

Manufactured pins and couplers should be used to connect levels together.

Erectors, dismantlers and users shall be properly trained before operations commence

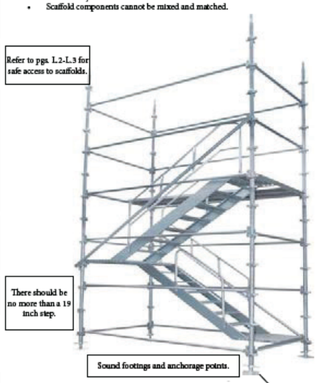
Retractable lanyards shall be used on ladders for a scaffold with at least three levels.

Working level must be fully planked per manufacturers requirements.

Scaffold shall be fully decked.

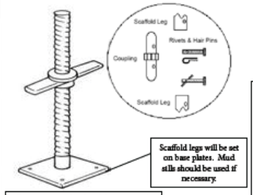
Some General Rules of Use
- Scaffolds must be capable of carrying 4 times the intended load.
- No scaffold should be erected, moved, dismantled or altered except under the supervision of a competent person.
- Any part of the scaffold that becomes damaged or weakened should be repaired or replaced immediately.
- Scaffold components cannot be mixed and matched.

Refer to pgs. L.2-L.3 for safe access to scaffolds.



There should be no more than a 19 inch step.

Sound footings and anchorage points.



Scaffolds cannot be erected more than 4 times the minimum base dimension, without securing the scaffold to the structure.
Example:
- 4'x4' base (1.2 x 1.2m)
- Height of unsecured scaffold cannot exceed 4' x 4 = 16ft (1.2m x 1.2m = 4.8m)

Scaffold legs will be set on base plates. Mud sills should be used if necessary.

The maximum height of the screw jack adjustment must not pass 12 inches.

Specific conditions may involve additional regulations that are not covered on this page

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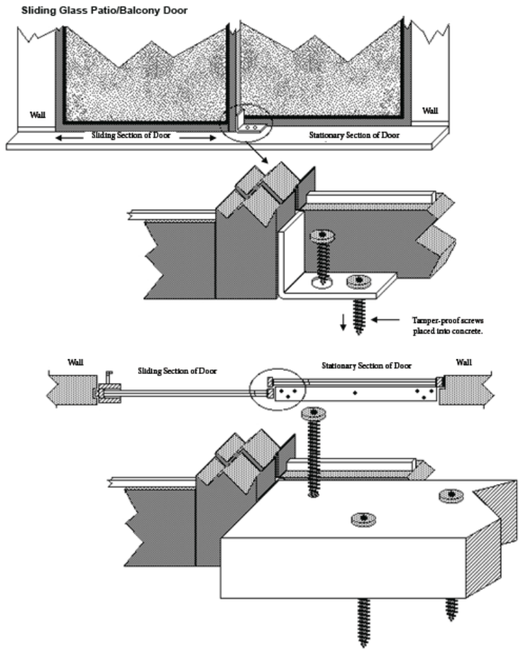
ICRI 120.1 Guidelines and Recommendations for Safety in the Concrete Repair Industry

2.11 Locking Balconies



Specific conditions may involve additional regulations that are not covered on this page

2.12 Chipping Gun Safety

Inspect chipping guns twice daily

When chipping, exert the proper amount of force. Using chipping guns or rivet busters without proper force being applied can create a condition called "Dry Fired" and can cause wear parts to prematurely fail

Pre-shift inspection of internal wear items: Physically remove spring, take retainer off and visually inspect all internal parts including bumper, spring, and upper/lower sleeves

Mid-shift visual inspection: inspect retainer end to determine if there is protrusion of the lower sleeve through the retainer. If protrusion is noticed, equipment must have a detailed inspection (above)

Replace all items showing wear

See pgs 1.11-1.12 for compressed air safety

Whip checks shall connect through the handle housing, not the whip connection itself, to prevent separation if airline connection fails.

Extreme wear - bumper completely worn down

No wear - bumper with no sign of wear

Lock spring

Illustration of a worn out sleeve assembly

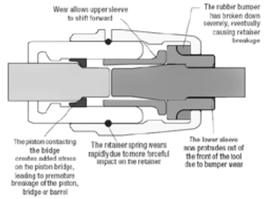
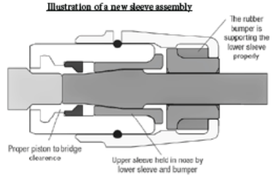


Illustration of a new sleeve assembly



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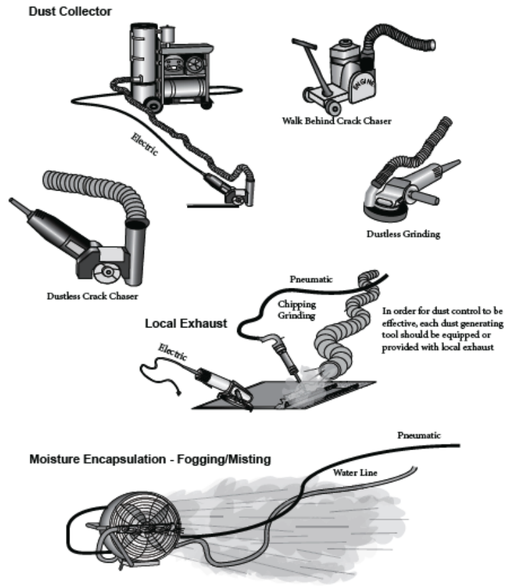
2.0 Tools and Equipment

2.1 Dust Control



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TECHNICAL
GUIDELINES

Prepared by the International Concrete Repair Institute September 2024

GUIDELINES AND RECOMMENDATIONS FOR SAFETY IN THE CONCRETE REPAIR INDUSTRY

Guideline No. 120.1–DRAFT

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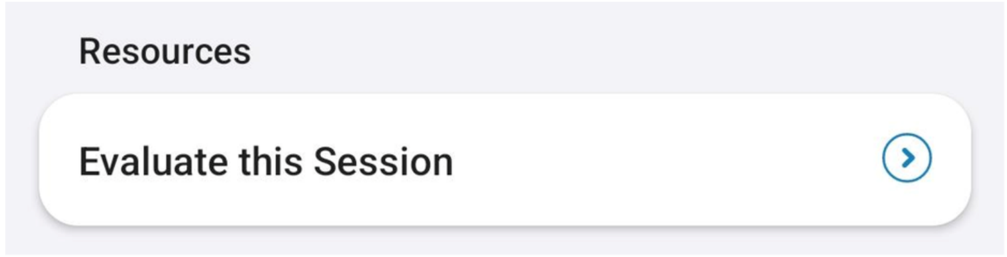
OCTOBER 22-25, 2024

SESSION EVALUATION



To complete the session evaluation, open the ICRI Convention App.

Under **Plan Your Event,** select Schedule, and then the Technical Session you are attending. Select the sub-session you are attending, scroll down to Resources, and select Evaluate this Session.

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OCTOBER 22-25, 2024

Cal Beyer, CWP

- Over 30 years professional experience in risk management, safety & wellness focusing on human capital risk management and wellbeing
- Helped launch mental health & suicide prevention movement in the AEC industry
- Appointed to the Executive Committee of National Action Alliance for Suicide Prevention & Lived Experience Advisory Committee of the Suicide Prevention Resource Center (SPRC)
- Serves on Advisory Boards for Goldfinch Health and MindWise Innovations
- Formerly served on Advisory Boards for the Center of Workplace Mental Health, AGC of America & Youturn Health
- Frequent presenter at industry events & regular contributor to industry publications

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