

# **ON-SITE CONSTRUCTION SAFETY**



**BEST  
PRACTICES**

# COMMEMORATION

Michelle Krsek

*The On-Site Construction Safety Committee was formed as a result of the loss of life of Michelle Krsek due to a construction incident.*

*The purpose of this BEST PRACTICES guide is to help prevent injuries through education, training, advocacy and partnership.*

The Calgary On-Site Construction Safety Committee is an initiative between the Calgary Construction Association, The City of Calgary and Occupational Health & Safety and was formed as a result of concern over incidents. The BEST PRACTICES guide was developed to raise awareness of the various hazards and conditions at and adjacent to construction sites. Being that construction activities occur in diverse environments, pre-planning for public safety is essential.

Committee members include representatives from the Calgary Construction Association, The City of Calgary and the Alberta Occupational Health & Safety Program (Branch of Alberta Employment and Immigration), who have volunteered many hours to support the development of this guide. The main purpose of the committee is to develop and communicate industry recommended practices for safe working conditions on construction sites.

## **This booklet is published for the benefit of all industry stakeholders.**

Founding committee members include:

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Joe Chisholm (EllisDon Construction Services Inc.),  
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The following organizations have endorsed this booklet:

**Alberta Construction Association**  
**Alberta Construction Safety Association**  
**Calgary Construction Association**  
**Canadian Home Builders' Association – Calgary Region**  
**The City of Calgary**

Alberta Employment and Immigration has reviewed this booklet and as of the date of publication finds the set out information meets occupational health and safety legislative requirements. Users are cautioned that the booklet is a guideline only and that proper compliance requires a customized program that addresses the conditions of the specific worksite.

This On-Site Construction Safety Best Practices guide does not exempt readers from their responsibilities under applicable legislation. In case of inconsistency between this booklet and Alberta Occupational Health & Safety legislation, the legislation will always prevail.

Whilst every effort has been made to ensure the accuracy of the information contained in this publication, neither the Calgary Construction Association nor any of its members past, present or future guarantees its accuracy or will, regardless of its or their negligence, assume liability for any foreseeable or unforeseeable use made thereof, which liability is hereby excluded. Consequently, such use is at the recipient's own risk on the basis that any use by the recipient constitutes agreement to the terms of this disclaimer. The recipient is obliged to inform any subsequent recipient of such terms.

*NOTE: Photographs are for general illustration purposes only and may not represent the exact work site setting or be interpreted as actual depiction of the OH&S Act, Regulation and Code requirements.  
Not all possible options are represented by the photographs.*



Hoarding of a  
Construction Site

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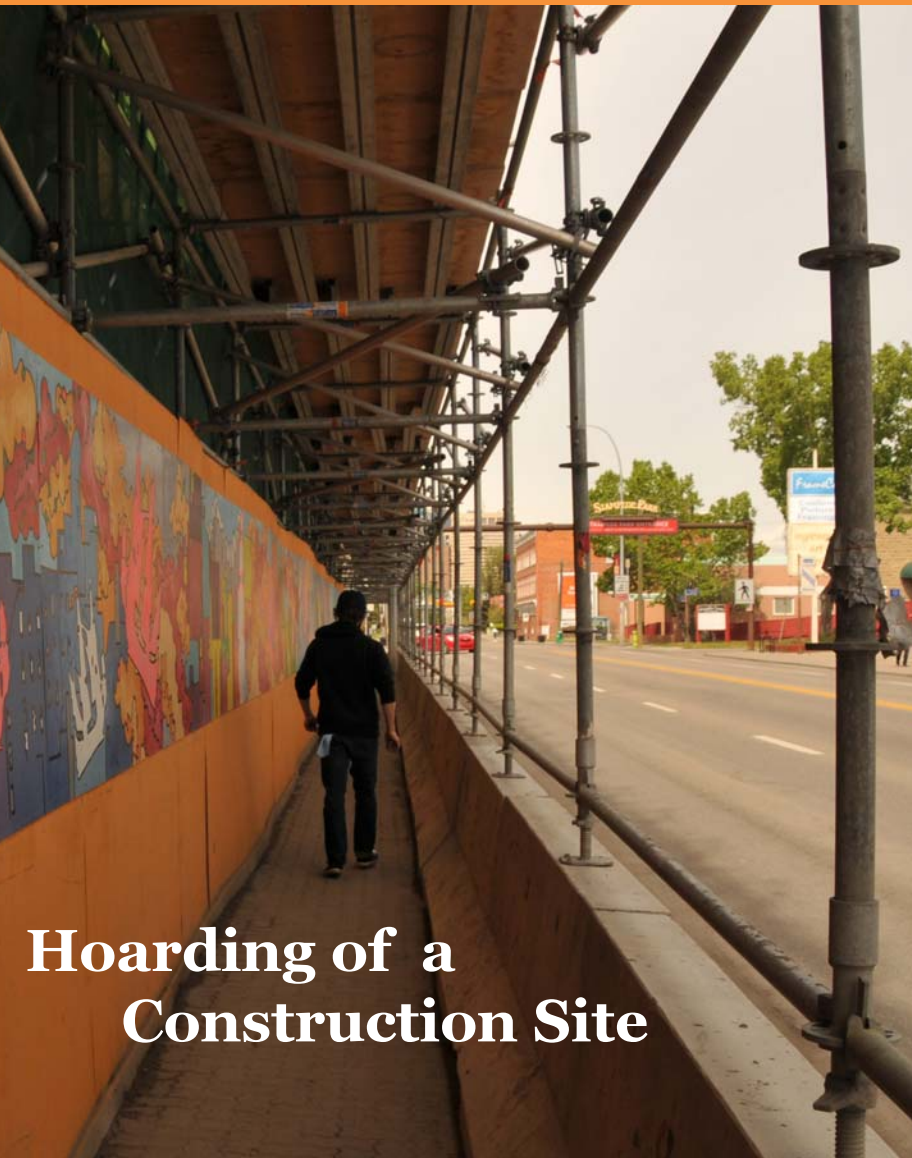
### **Lifting and Hoisting Operations**



Securing Construction  
Materials and  
Equipment On-Site

## **SECTION 4** **page 32**

### **Securing Construction Materials and Equipment On-Site**



# Hoarding of a Construction Site

## TASK

To ensure hoarding is adequately constructed to provide protection to the public from construction/demolition sites and secured to withstand wind and snow loads.

## HAZARDS

To protect the public from overhead hazards on a construction site.

### ***BEST PRACTICES FOR HOARDING AT CONSTRUCTION and DEMOLITION SITES***

- Construction workers must ensure that when building hoarding, the proper material is used (e.g., lumber, plywood, scaffold frames, tarps)
- All hoarding must be designed to sustain loads that it is likely to be subjected to such as wind and snow loads and falling debris.
- Hoarding must be constructed in accordance with all local regulatory requirements.
- Perimeter fencing around excavation sites must be a minimum of 2.4 meters (8 feet) in height. This may be accomplished by using plywood affixed to jersey barriers or may be secured to horizontal supports positioned at intervals no greater than 3.0 meters (10 feet) on centre. Fencing must be set back an appropriate distance from the edge of an excavation which varies depending on site conditions.

- Jersey barriers can be utilized at strategic points around a construction site to protect the public and construction workers from high incident traffic intersections that are in close proximity to the entrance gates of work sites. Jersey barriers may also be used to protect fire hydrants, gas valves and main power distribution equipment. The location of Jersey barriers would be at the discretion of the jurisdiction having authority.



- Consider having viewing cutouts in solid fencing supplied with wire mesh to allow for public viewing.

- Light duty scaffold, although designed of sufficient strength to provide the minimum building code or OHS Code standard for an overhead protection system, the arch frame has restricted width. It should only be used in the event that the exterior public walkway or sidewalk is too narrow to provide a wider frame work system. Considerations should be made to the width for ease of access and travel for the handicapped.
- Heavy duty scaffold is the preferred system if a contractor is planning to utilize the space on top of the hoarding for storage of materials or for locating their field office. This system must be engineered to comply with the building code and OHS Code and have a height of not less than 2.5 meters (8' - 3") and a clear width of not less than 1.5 meters (5' - 0"). The roofing system must be designed and constructed to safely support a minimum of 2.4 kPa (50 PSF). The roofing system must also be watertight and sloped towards the construction site. Splash boards with a minimum height of 300 mm (12") must be installed on the street side. A railing of 1070 mm (42") is required on the street side where the covered way is supported by posts. The structure must also be totally enclosed on the street side with a smooth surface.
- All walkways/hoarding must be installed and inspected as per local requirements.
- When heating equipment is used within a hoarding, adequate fire protection must be used. A minimum of a 20lb. ABC fire extinguisher must be placed outside the hoarding in an easily accessible location in the vicinity of propane/gas heaters.

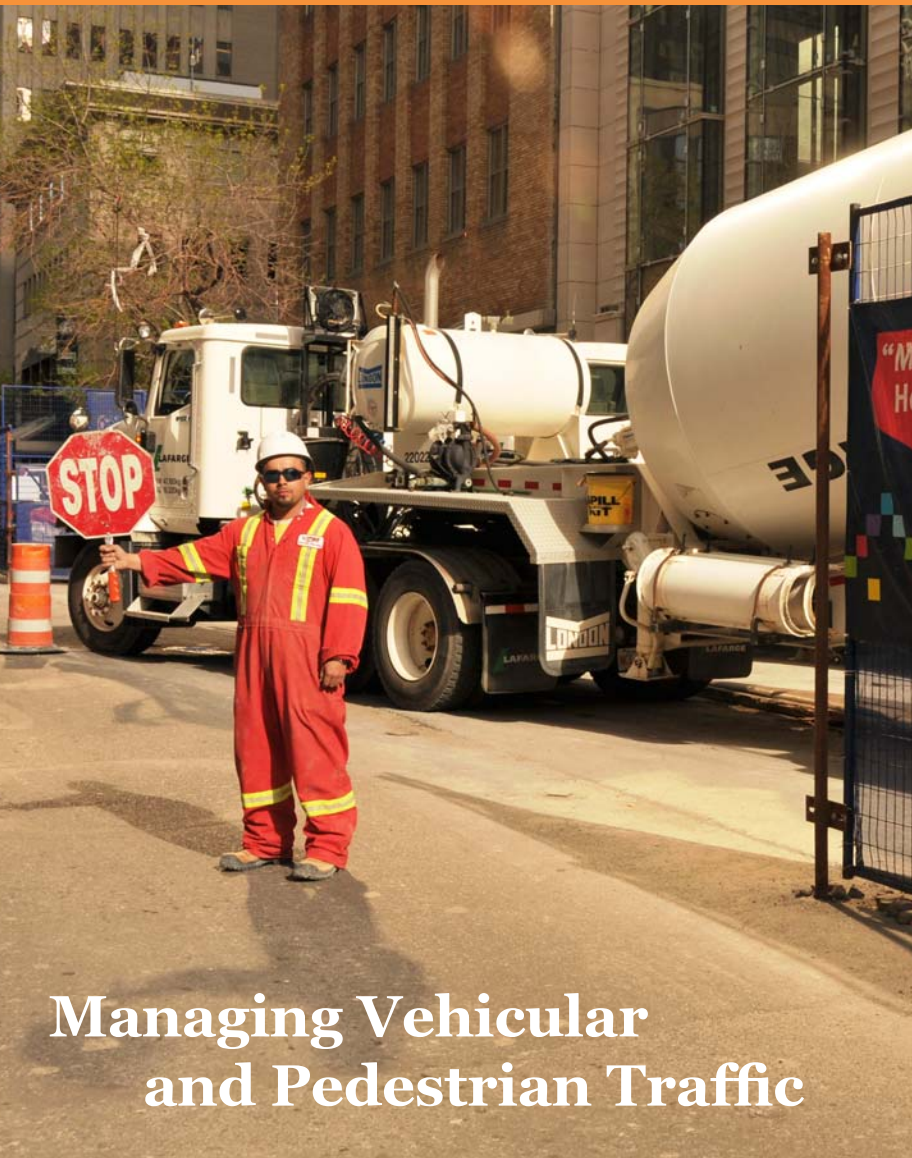
- Adequate temporary lighting must be inside the hoarding and at all entry and exit points.
- Access gates must be clearly marked as per traffic management plan.
- Adequate signage must be placed outside the hoarding warning of all hazards that may exist.
- Hoarding must be marked clearly “No Trespassing - Construction Personnel Only”, and personal protective equipment requirements clearly marked (e.g., “Hard Hats and Safety Footwear Must Be Worn Beyond This Point”).



- Gates must be locked to provide security against public access during off work hours.



- Conduct daily inspections of hoarding for hazards such as puncture, snagging, adequate lighting, trip hazards etc. to provide public safety.
- Post Emergency Names and Telephone Number(s) on the hoarding.



# Managing Vehicular and Pedestrian Traffic

## TASK

To prevent vehicular traffic on roadways adjacent to a construction project from becoming a hazard to:

- Workers on-site
- Pedestrians near a construction site
- All vehicles travelling on the adjacent streets and alleys
- Mobile construction equipment

## HAZARDS

### *A. Controlling Vehicular Traffic*

Uncontrolled vehicular traffic entering and exiting a construction site and all other vehicular traffic travelling the streets adjacent to the project pose a hazard to workers on the project, pedestrians and other vehicles utilizing the streets and alleys that surround the construction site.

The potential hazards include, but are not limited to:

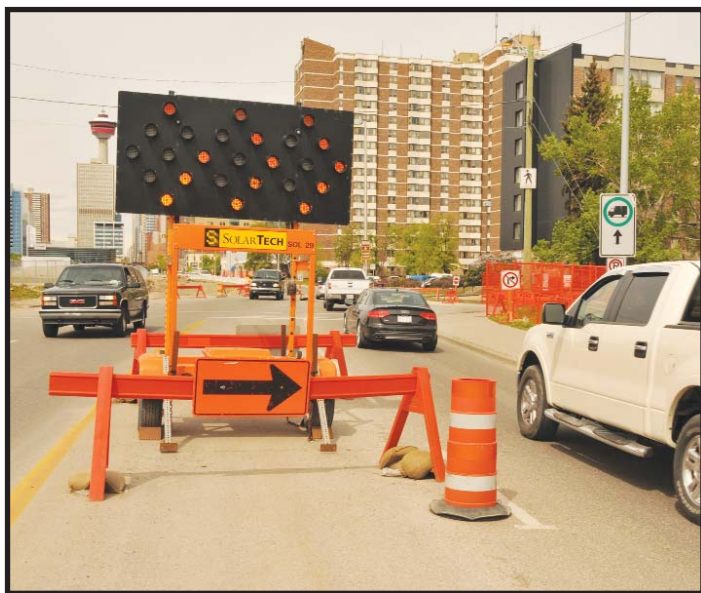
- Vehicle to vehicle collision
- Vehicles colliding with construction barriers
- Vehicles striking pedestrians
- Vehicles striking workers on construction sites

### **BEST PRACTICES FOR CONTROLLING VEHICULAR TRAFFIC**

The Prime Contractor or Owner will:

- Conduct a hazard assessment in relation to the vehicular traffic that both enters/exits the work site, and traffic that utilizes the streets adjacent to the project.

- Develop a traffic management plan for the project that meets all local government agency requirements and addresses the control of and safe movement of all traffic that enters and exits the site along with traffic that travels the streets adjacent to the project.
- Obtain all necessary permits from the jurisdiction having authority for planned lane and street closures.
- Appoint qualified persons to supervise traffic control procedures to ensure they are in accordance with the traffic management plan.



- Ensure workers appointed to control traffic are trained and competent in their duties.
- Ensure trained and competent traffic control persons wear all required high visibility personal protective equipment and use the appropriate traffic control devices (e.g., stop/slow paddle, illuminated wand for night time traffic control)
- Ensure all trained and competent traffic control persons are instructed in the details of the project management plan.
- Provide all necessary traffic signage at strategic locations that warns motorists of changes to traffic patterns
- Provide all traffic barriers and delineators necessary to funnel traffic into appropriate laneways
- Consider the use of newspaper notices to communicate substantive planned traffic pattern changes to major commuting routes

### *B. Controlling Pedestrian Traffic*

Pedestrian traffic entering/exiting public sidewalks or other thoroughfares adjacent to the project are at risk of injury from work activities on the project that may expose the public to hazards which may include but is not limited to:

- being struck by operating equipment
- tripping on uneven surfaces
- being struck by uncontrolled vehicular traffic
- being struck by material that may fall from the structure

### **BEST PRACTICES FOR CONTROLLING PEDESTRIAN TRAFFIC**

The Prime Contractor or Owner will:

- Conduct a hazard assessment in relation to the pedestrian traffic that will access sidewalks, crosswalks and other thoroughfares immediately adjacent to the project.
- Ensure all covered walkways are installed and maintained over public walkways adjacent to the project in accordance with the jurisdiction having authority.



- Conduct daily inspections of the project perimeter protective measures (e.g., fencing, gates, hoarding) to prevent the general public from entering into restricted areas.
- Obtain all necessary permits and permissions from the jurisdiction having authority when temporarily closing sidewalks adjacent to the project.
- Install adequate signage to communicate change in pedestrian traffic access to sidewalks/crosswalks in accordance with the jurisdiction having authority.
- Assign trained and competent traffic control persons to assist all vehicles entering/exiting the project where they cross active sidewalks.
- Ensure that trained and competent traffic control persons who come in contact with the public have good communication skills and act professionally at all times.



# Lifting and Hoisting

## TASK

To provide guidance for all mechanical lifting and hoisting activities in construction by:

- Planning
- Control
- Equipment
- Load Integrity and Stability
- Competence

## HAZARDS

Lifting and hoisting operations are one of the major causes of fatalities and serious incidents in construction. Every type of lift has a set of risks that need to be managed if the lift is to be undertaken in a safe and efficient manner.

Despite the vast number of regulations, standards and guidelines that apply to lifting, incidents continue to occur. In an effort to protect the public, construction workers and property, it is the construction industry's expectations that all companies conducting lifting activities have a management system that includes specific procedures based on a full assessment of the risks and control measures required.

### **BEST PRACTICES FOR LIFTING AND HOISTING SAFELY ON CONSTRUCTION SITES** *PLANNING*

- Proper planning is required for every lift. If the lift deviates from the process, make safe and revise the lift procedures.
- Hazard identification and risk assessment (e.g., weather conditions) must be carried out as part of planning a lift.

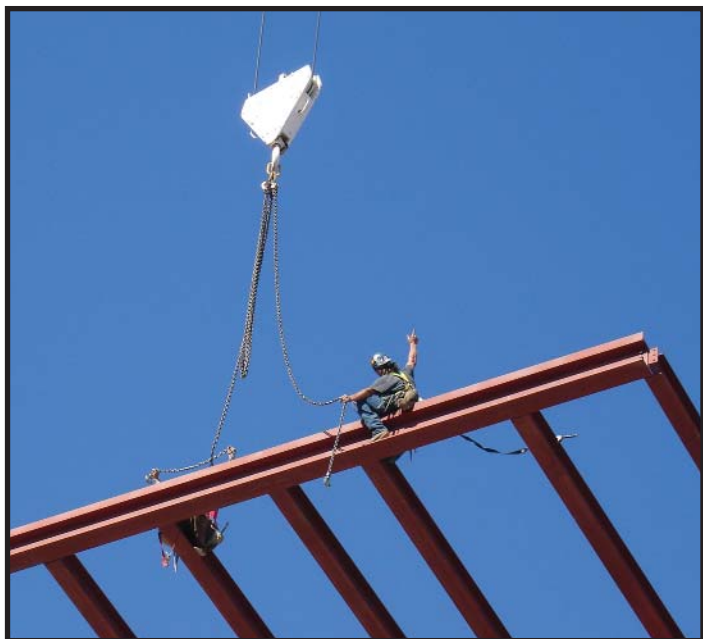
- An assessment of the lift and determination of the lift method, equipment and number of people required are critical to planning of the lift.
- All lifts to have a standard lifting procedure.
- Specific procedures required based on risk assessment.
- All lift plans shall be reviewed and approved by the authority having jurisdiction on site (e.g., safety officer and or hoisting superintendent).

All lifts of materials such as lumber, rebar, concrete buckets, etc. are required to have hoisting procedures. Critical and engineered lifts will require further hazard and risk assessments as per OH&S.



The lift plan shall clearly address, but not be limited to the following:

- Public way protection (traffic, pedestrian) – lane or sidewalk closures, overhead protection (hoarding).
- Completion of a hazard assessment, including communicating with the affected workers prior to beginning a lift.
- The type and number of construction personnel required, their specific roles and competencies, and how they will be briefed.
- The centre of gravity, nature and weight of the load and lifting points.
- Pick up and set down points and constraints such as space and stacking.
- Equipment required and certification checks (e.g., chains, slings, tag lines).
- Step-by step instructions.
- Communication methods to be used (e.g., hand signals, radio).
- Emergency and rescue plan as required by risk assessment logistics.
- Restrictions on the lift (e.g., building interferences, proximity to power lines, weather, daylight, people).
- Entering and exiting for slinging and de-slinging the load.
- Conflicting or nearby operations or work.
- Load integrity check.
- Load charts for generic lift plans and for heavy or complex lifts.
- Weather conditions.



### *CONTROL*

- One person of the lift team shall be designated as the person in charge of the lifting operation (e.g., rigger, crane operator, hoisting superintendent)
- The person in charge ensures that the lift team has tested and understood visual, radio or other communications prior to the lift.
- All personnel involved in the lifting operation shall have their individual responsibilities clearly defined (as per safe work procedure).

- All people shall be kept clear of overhead loads and areas of potential impact.
- The person in control must ensure all permits and procedures are in place before moving loads over public and other work areas.

### *Person in Charge*

The person in charge has operational control of the lift and

- Is designated as being in charge of coordinating, controlling and executing the lift.
- Reviews the lift plan and ensures that the required controls are in place.
- Ensures that the lifting equipment is inspected and appropriate for use.
- Checks that load integrity and stability is satisfactory.
- Ensures the lift is carried out in accordance with the plan. Suspends the lift if changes or conditions (e.g., wind) occur that would cause a deviation from the plan.
- Checks that there is no deviation from standards for routine lifts.
- Shall allow for concurrent or simultaneous operations that may affect or be affected by the lift (e.g., other cranes, moving equipment).

### *Conducting the Lifting Operation*

The following are critical practices in conducting the lifting operation:

- The hoisting equipment operator shall obey an emergency stop signal at all times, no matter who gives it.

- The operator of the hoisting equipment shall not leave the operating controls while the load is suspended.
- Construction personnel shall have an escape route in the event of an unexpected movement of the load or lift equipment.

### *Communication*

- All critical lifts require a documented pre-lift meeting by all involved. Safe work procedures are to be reviewed and acknowledged by all involved.



- When lifting operations need to be controlled by signals, a designated signaler shall be assigned. Signals between the lifting device operator and the signaler shall be discernable – audibly or visually – at all times. When using radio communications, continuous verbal instructions shall be used. The operator shall stop whenever there is no clearly understood signal.
- In order to facilitate good communication, it is important that personnel involved in the lifting operation are not distracted. The use of mobile phones or other devices unrelated to the lift should be prohibited.
- Administrative controls such as sub-trade coordination meetings may be utilized to inform trade contractors of hoisting activities in advance.
- Communication from general contractor to the jurisdiction having authority should be established (e.g., permit requirements for traffic lane and pedestrian sidewalk closures). Communication from the jurisdiction having authority to the public advising them in advance of long term closures.

#### *EQUIPMENT*

- Equipment shall be in good working order and utilized for the purpose it was designed.
- Equipment shall be fitted with appropriate safety devices.
- Any safety devices installed on lifting equipment shall be operational and not overridden.

Lifting equipment is comprised of lifting devices (equipment performing the lifting), lifting accessories (devices that connect

the load to the lifting device) and lifted equipment (e.g., containers, baskets). All shall be marked with the safe working load (SWL) or working load limit (WLL) and identification number. An equipment register, including maintenance records and evidence of certification shall be available on site.

### *Equipment Minimum Standards*

To ensure that equipment is fit for its intended purpose, local controlling documentation shall specify design, certification, storage, maintenance and inspection criteria in accordance with a recognized industry standard and or manufacturer's recommendations. The manufacturer or an approved body shall issue a certificate or a letter of conformance to the appropriate standards.

### *Procurement (Services and Equipment)*

The manufacturer or service provider shall supply all lifting equipment with documentation that defines the permissible operating conditions, design criteria, documentation of testing, maintenance and operation manuals and examination/inspection requirements. Pre-used equipment shall also be supplied with operations and maintenance history, including records of any incidents, overload, damage, major repairs, modifications or limitations arising from previous use.

All lifting devices and accessories shall be designed, manufacture, inspected, tested and certified in accordance with applicable standards and industry accepted codes of practice. Engineered lifting accessories (e.g., spreader bars)

shall be designed, manufactured and tested in compliance with the intent of the relevant industry standards. Any lifting equipment not certified to an acceptable code shall be structurally verified by a professional engineer and load tested.

#### *LOAD INTEGRITY AND STABILITY*

- Load shall not exceed the rated capacity of the lifting equipment with consideration to dynamic or static forces.
- The integrity and stability of loads shall be verified before lifting.

Equipment operators shall know the rated lifting capacity of the equipment and understand the effects of changes in configuration on the capacity. They shall be provided with all



the necessary information in an easily understandable form at the place where they are operating the equipment.

The safe working load of the lifting system shall be assessed, taking into account the configuration of the equipment and operating environment. For example, change in sling angles/sheave arrangements will change capacity. Any lifting device operating on a slope will have a different capacity from operation on level ground. The dynamic effects of liquids and shifting or uneven loads must be considered.

The load shall possess sufficient integrity to withstand the forces applied during lifting. The method of rigging the load shall ensure that it remains stable and cannot tip, slip, swing or fall unintentionally. Stability shall be confirmed before lifting and if necessary by a trial lift. The quality, design and labeling of packaging shall be specified at the procurement stage to ensure the load integrity and stability. Cargo in containers shall be secured such that it does not shift during lifting. Wheeled equipment requires direct restraint. The rigger shall have the final say when rejecting loads unfit for hoisting.

Stacking shall only be carried out if a risk assessment of stacking operations has been performed and documented. Equipment shall only be stacked if it is designed for this purpose or uses an approved stacking system. Stacked containers shall be slung so that the crane hook can be attached and or detached while the load handler is standing at floor level, or by other safe means.

*COMPETENCE*

- All persons involved in planning/performing lifting and maintaining lifting equipment shall be trained and competent for their role.
- Refresher training and periodic assessment is necessary to assure competence.

The management system shall define the standards required for critical roles and the process for assuring the competence of those involved in planning and executing lifting operations. Generally, to be regarded as competent, a person shall have received the necessary training and subsequently demonstrated their ability to perform at the required level in the field.





# Securing Construction Materials and Equipment On-Site

## TASK

To safe guard construction workers and the public from falling materials, equipment, tools and debris from a construction project.

## HAZARDS

Any object that falls from a building has the potential to cause injury to any person or create damage. When dropped or blown from a building, the following objects constitute a considerable hazard:

- Objects that are susceptible to wind (e.g., plywood, plate glass, q-decking)
- Hand tools
- Fasteners and other connecting devices such as bolts and taper ties
- Loose objects (e.g., steel plates, scaffold sections, piping)
- Fresh concrete or hardened concrete

### ***BEST PRACTICES FOR SECURING MATERIALS, TOOLS, EQUIPMENT AND DEBRIS ON A CONSTRUCTION SITE***

- Conduct pre-job safety assessments to evaluate the potential of falling tools, equipment and material, and to establish control measures to prevent the hazard. Construction workers are held accountable; they have consequences for their actions.
- Develop a safe work practice to prevent tools, equipment and materials from falling from a building.
- Provide material storage containment areas.

- Requiring the use of tool lanyards.
- Install and maintain netting around the perimeter of the building. Netting of a substantial surface area, be it vertical between floor levels or suspended out bound of the floors below the active floor under construction, will assist and prevent tools, equipment, materials and debris from falling from the building. Netting systems must be engineered and installed in accordance with manufacturer's specifications.
- Require trade specific daily material inspection sign-off sheets. Issues that may be included are: clean-up, guardrail installation, re-shore post restraints, etc.
- Develop a wind alert warning system, whereas all construction personnel on a construction site are notified of high wind gusts and the potential of such winds to blow materials, equipment and tools from the building and or construction site.
- Conduct regular inspections of work areas for unrestrained tools, equipment and material that can fall from a building.
- Provide education and training to construction personnel on proper methods of securing building materials, equipment and tools.
- Ensure proper installation of perimeter edge guardrails and containment meshing.



*Making Construction Safety  
a way of life.*



For information on  
*Construction Safety Coordinator*  
Gold Seal Certification, please visit:

[www.goldsealcertification.com](http://www.goldsealcertification.com)

Other Gold Seal designations include:

- Project Manager
- Superintendent
- Estimator
- Owner's Project Manager





## Alberta Construction Safety Association

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[www.acsa-safety.org](http://www.acsa-safety.org)





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(except Edmonton & area)  
(780) 415-8690 (Edmonton & area)



*Promoting Excellence  
in Construction Safety*



THE CITY OF  
**CALGARY**  
DEVELOPMENT &  
BUILDING APPROVALS

## SITE SAFETY RULES

1. All visitors are to report to Site Office before proceeding to site.
2. Hard Hats, Safety Footwear, and Personal Protective Equipment as required must be worn at all times.
3. All Employees are to receive a Site Orientation on this Project.
4. Report any medical conditions to First Aid Station prior to work.
5. Worker Compensation/ Occupational Health and Safety Regulations must be followed by all personnel.
6. Submit all Material Safety Data Sheets for all materials regulated by W.H.M.I.S. Legislation to the Site Superintendent or Construction Safety Office, prior to use on site.
7. Alcohol or Drug use will not be tolerated on site.
8. "Horseplay" will not be tolerated on site.
9. Any unsafe act or hazardous conditions must be reported immediately to the Site Superintendent or Safety Officer.
10. All accidents, injuries, or near-misses must be reported immediately to the Site Superintendant or Safety Officer.

**TO ORDER THIS BOOKLET,  
OR FOR MORE INFORMATION, CONTACT:  
THE CALGARY CONSTRUCTION ASSOCIATION**

**WWW.CCA.CC**

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