

---

## Part 12      General Safety Precautions

### Highlights

This Part contains sections dealing with restraining hoses and piping, securing equipment and materials, skeleton structures, signallers, tire servicing, vehicle traffic control and working on ice.

### Requirements

#### Section 185   Housekeeping

Slipping and tripping are common workplace hazards. Employers are responsible for making sure that the work site, and in particular entry and exit routes at a work site, are free of waste, materials and equipment. Obstructed entry and exit routes can pose a serious hazard to workers having to leave a work site quickly, as might be required during an emergency. Obstructions may reduce visibility at a work site and may also present a tripping hazard.

For more information

 [http://employment.alberta.ca/documents/WHS/WHS-PUB\\_ph015.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_ph015.pdf)  
Slips, Trips and Falls

#### Section 186   Lighting

##### Subsection 186(1)

The OHS Code does not specify minimum lighting levels. Employers must determine if lighting at the work site is adequate for the tasks being performed and the conditions at the site. Tasks requiring the ability to distinguish detail, such as an electrician working on live circuits at a panel board or a sewing machine operator stitching a fall protection full body harness, will, for example, need to be provided with more lighting than a labourer performing housekeeping duties.

---

Employers should consider the following factors when establishing lighting levels:

- (a) the type of activity or task being performed;
- (b) the importance of speed and accuracy in performing the visual task; and
- (c) the worker's needs.

Employers and workers interested in recommended types of lighting and minimum lighting levels under various conditions should refer to the *Lighting Handbook - Reference and Application (8th Edition)*, published by the Illuminating Engineering Society of North America (IESNA).

For more information



Lighting Handbook - Reference and Application (9th Edition). Illuminating Engineering Society of North America (IESNA).

### Subsection 186(2)

The employer is responsible for protecting light sources above a working or walking surface against damage. Such damage may result in the partial or total loss of light at the work site or a work area, may expose workers to contact with energized electrical components, or may expose workers to the sharp debris or surfaces of broken bulbs. Each of these examples presents a safety hazard that can be prevented by protecting the light source against damage.

### Subsections 186(3) and 186(4)

Emergency lighting must be available if workers are in danger if the normal lighting system fails. Natural daytime lighting cannot be relied upon as a dependable source of emergency lighting.

The employer is responsible for ensuring that an emergency lighting system provides sufficient light to allow workers to safely leave the work site, start any necessary emergency shutdown procedures or restore normal lighting. Where appropriate, emergency lighting must meet the requirements of the *Alberta Building Code*.

## Section 187 Pallets and storage racks

All goods, materials and equipment at work sites must be stacked, stored, and secured in such a way that they do not flow, move, roll or collapse. Workers responsible for stacking, storing, or securing goods, materials, and equipment must

---

be trained in the safe methods for doing so (see Part 14 of the OHS Code and sections 13, 14 and 15 of the *OHS Regulation*).

Pallets and storage racks are commonly used in storage and warehousing applications. Pallets and storage racks may support heavy loads that have the potential to injure workers and damage equipment if the pallets and racks fail and loads fall. Storage racks in particular must remain structurally sound.

Incidents involving pallets occur for five main reasons:

- (1) poor pallet design;
- (2) poor pallet construction;
- (3) inappropriate use of a pallet for the load or storage method;
- (4) continued use of a damaged pallet(s); and
- (5) poor handling.

The leading causes of storage rack system failure, acting alone or in combination, are:

- (1) poor storage rack design – the rack is inherently unsafe;
- (2) incorrect installation and assembly;
- (3) using the wrong material handling equipment to load and unload the storage system;
- (4) operator error when using material handling equipment; and
- (5) structural problems with the floors or walls of the storage area – supporting structures may be overloaded, floors may not be sufficiently level.

Stacks, shelving and other fixtures for holding or storing materials should be laid out and designed so that there is sufficient access for safe loading and unloading. Storage areas should be specifically designated and be clearly marked. Aisles should be wide enough for the type of storage, and be kept free of obstacles and waste materials. Stacks should not block aisles, walkways, and doors and exits.

Suitable racks should be provided for materials capable of rolling such as steel tubes, bars and piping. Large diameter tubes or pipes can be stored on their sides as drums might be stored (see Figures 12.1 and 12.2).

Figure 12.1 Example of drum rack

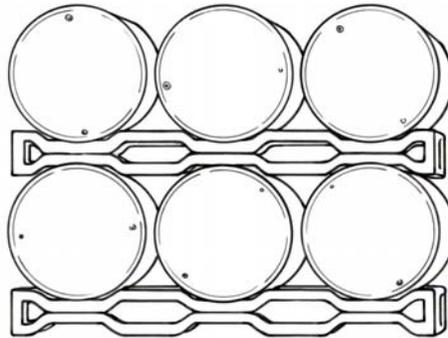
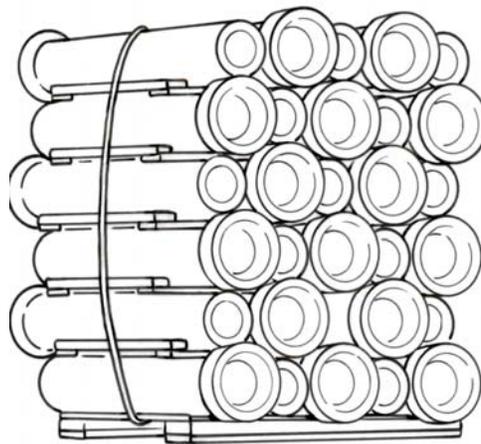


Figure 12.2 Example of pipe storage



Wedges, chocks, stakes or other means should be used to restrain the bottom tier of round objects that are stacked or tiered and that could cause the stack to collapse by rolling or moving.

Racks, shelving, fixtures, etc. should be regularly inspected for damage and other defects that might cause loss of strength or result in injury or damage. Workers must report to their employer any damage to storage racks as soon as is practical. It is expected that the employer will assess the damage and based on that assessment, may have the damage repaired or the rack replaced.

For more information

 [www.osh.govt.nz/order/catalogue/archive/safestacking.pdf](http://www.osh.govt.nz/order/catalogue/archive/safestacking.pdf)  
Guidelines for Safe Stacking and Storage

 [www.osha.gov/SLTC/etools/grocerywarehousing/index.html](http://www.osha.gov/SLTC/etools/grocerywarehousing/index.html)  
Grocery Warehousing: Ergonomics – U.S. OSHA

## Section 187.1 Placement of roofing materials

Roofing materials are typically placed on a roof by the workers of a material supplier, often using a mechanical lift or conveyor. Roofing materials such as bundles of shingles must be placed at least 2 metres away from the roof edge. This reduces the possibility of workers coming too close to the roof edge and falling off. The materials must also be evenly distributed over the roof surface. This ensures that the weight of the material is not concentrated in a single spot that may not be strong enough to support it. Bracing must be installed if there is a chance that the material might slide due to the roof's steepness, weather conditions, etc. (see section 189). If it is necessary for the supplier's workers to be on the roof, they must be protected from falling.

## Section 188 Restraining hoses and piping

Hazards associated with hoses or piping and their connections operating under pressure are mainly the result of failures caused by leaks, pulsation, vibration, and excessive pressure. Besides the damage resulting from the release of high-pressure gases or liquids when a vessel or pipe ruptures, fatal injuries can result from the blowout of gauges and valves, and the uncontrolled whipping actions of pipes, tubing, and hoses.

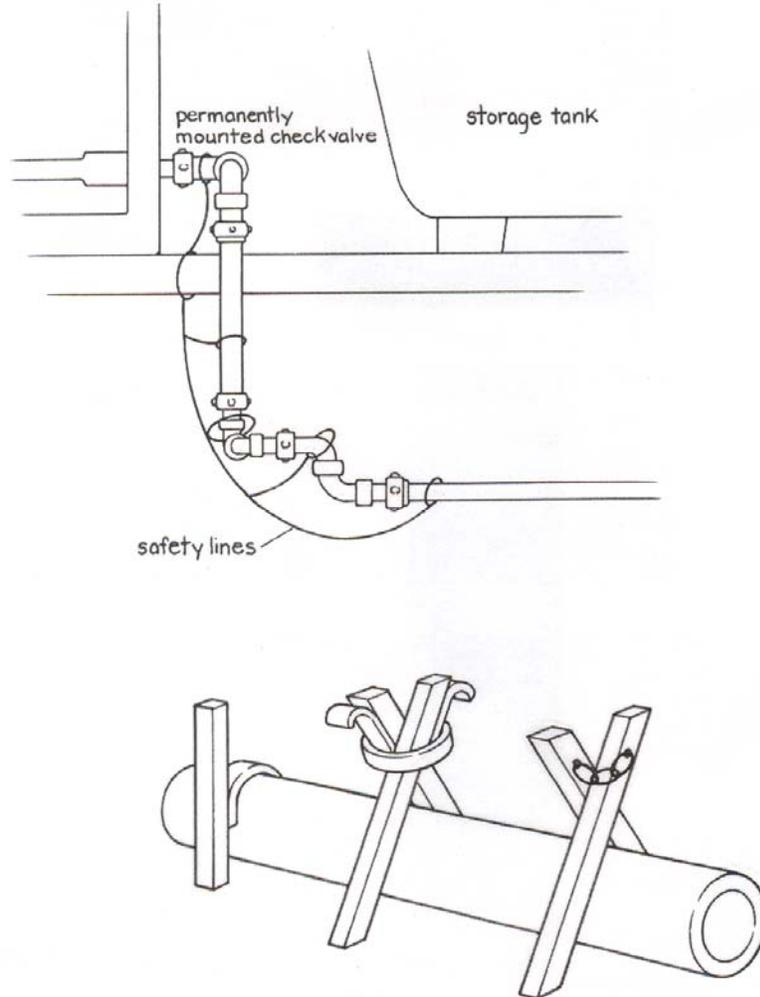
In those cases where failure or disconnection could cause movement that endangers workers, the hoses or piping and their connections must be restrained (see Figure 12.3). Methods of restraint include wiring together hose connections, clamping or bracketing pipe sections, and securing restraint cables at the ends of hoses or pipe that function as loading spouts.

For hoses or piping systems and their connections operating at working pressures of 2000 kilopascals (290 pounds/square inch) or more, an alternative practice is permitted. This alternative requires the employer to ensure that the hoses or piping and their connections are designed, installed, used, inspected and maintained in accordance with the manufacturer's specifications or specifications certified by a professional engineer.

In cases where this provision is used, the employer will be expected to have a copy of the appropriate set of specifications readily available at the work site for inspection by workers or an officer. Inspection and maintenance instructions are expected to include pass/fail criteria for the particular part or function inspected, as well as inspection and maintenance intervals. The employer should be prepared to provide workers and officers with documentation showing that the inspections and

required maintenance were performed as required and that any substandard conditions were corrected.

Figure 12.3 Examples of how to restrain hoses and piping



## Section 189 Securing equipment and materials

This section applies to both equipment and materials that may endanger a worker because of dislodgment, movement, spillage or damage. Bags, containers, bundles, etc. stored in tiers must be stacked, blocked, interlocked and limited in height to prevent sliding or collapse. Loads must be secured by tie-downs, bulkheads, or blocking. Rolling equipment, when parked, should have wheels chocked to prevent unintentional movement.

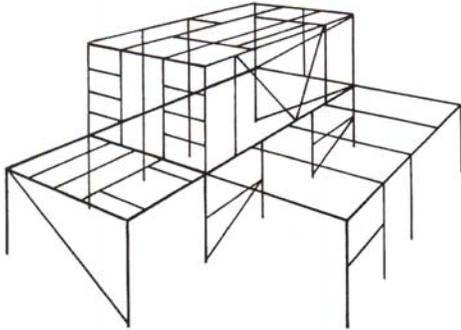
## Section 190 Skeleton structures

A structure is anything that is built or constructed, composed of parts joined together in some definite manner. A structural member is an essential or load-carrying part of the structure. A skeleton structure is therefore a supportive arrangement or framework of essential members.

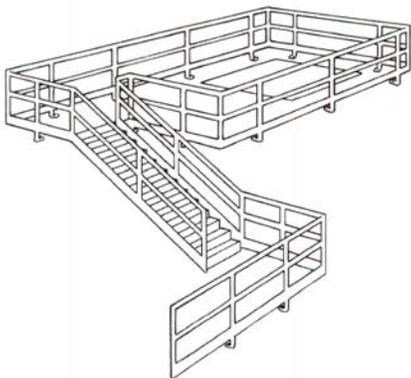
This means that structural members of a skeleton structure are the essential or load-bearing parts of a supportive arrangement or framework of parts that give a structure stand-alone support and stability when erected. This means those columns and beams that are intended to support the remaining parts of the building, including joists and trusses. This does not include “accessory” components such as stairs, guardrails, gratings, platforms, material handling systems and sheeting for floors, walls and roofs. Figure 12.4 shows the difference between skeleton structures and accessory components. Skeleton structures can be built of steel, wood, or any other material considered appropriate for the structure.

Figure 12.4 Examples of skeleton structures and accessory components

12.4 (a) Example of a skeleton structure



12.4(b) Example of accessory components



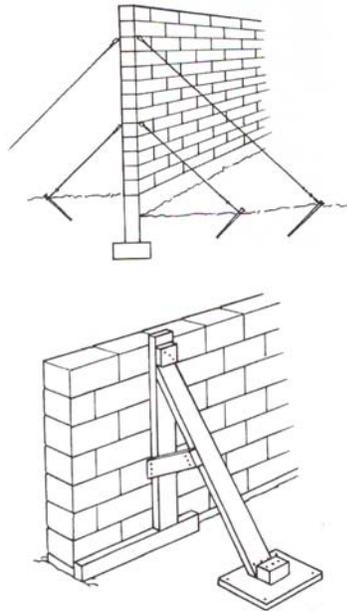
## Section 191 Signallers

These general requirements highlight the importance of using and sending signals effectively. Specific requirements appear elsewhere in the OHS Code describing specified duties or actions of signallers.

## Section 192 Stabilizing a masonry wall

Figure 12.5 shows two acceptable methods of supporting a masonry wall during its erection.

Figure 12.5 Examples of how to support a masonry wall



## Section 193 Tire servicing

This section is intended to prevent worker injury caused by the explosion or violent separation of parts of multi-component wheel assemblies. Blowoffs, the sudden, violent springing of tire lock rings, rims or flanges from tires being assembled, are the main hazard. Blowoffs usually happen when tires have just been mounted on their rims and are being inflated. The cause is generally incorrect positioning of tire fastenings but may also include out-of-true rims and defective component parts. Blowouts involving the sudden rupture of a tire or tube may be due to overinflation.

The employer must make sure that the tire manufacturer's inspection and servicing requirements are followed. Truck tire servicing manuals and videos are available from most manufacturers. The manuals must be kept on hand and readily available so that all workers can access the service manuals.

Only competent workers are permitted to service, inspect, disassemble and reassemble tire and wheel assemblies. If a worker is not competent to perform this work, the worker must be under the direct supervision of a worker who is competent. All of this work must be performed according to the manufacturer's specifications or instructions. Workers performing this work must be trained and understand how to properly inspect and safely service tire and wheel assemblies.

Tires mounted on a split-rim or locking ring wheel (see Figure 12.6) must be inflated in a safety cage as shown in Figure 12.7 or be suitably restrained to contain flying parts in the event of tire rupture or component failure. Some manufacturers recommend partial inflation in a safety cage and full inflation once the tire and wheel assembly is mounted on the vehicle axle.

Figure 12.6 Example of locking ring rim

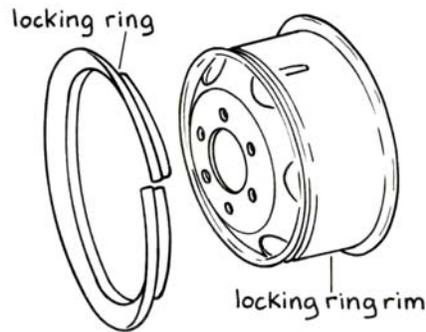
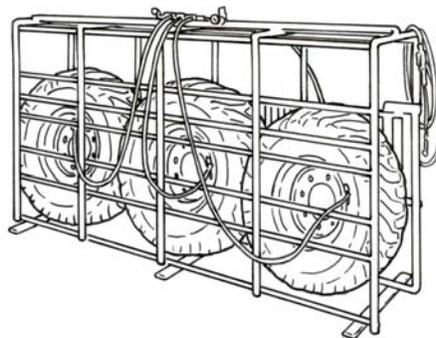
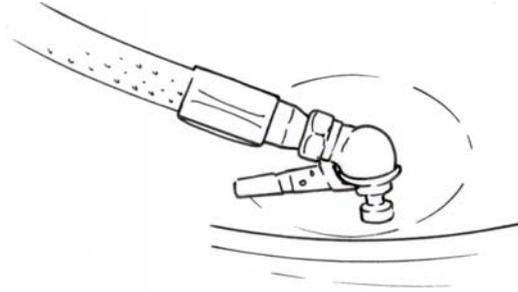


Figure 12.7 Example of cage used to restrain split rim wheel assemblies



When inflating split rim and locking ring wheels, only a clamp-on type connector is allowed. A clamp-on type connector attaches securely to the valve stem and does not require the worker to hold it in place against the valve during inflation (see Figure 12.8). This permits the worker to inflate the tire while standing a safe distance away from the tire.

Figure 12.8 Clamp-on connector

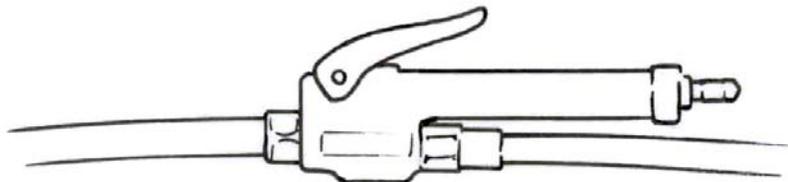


Other types of inflation devices usually require the worker to forcibly hold them against the tire's valve stem, requiring the worker to stand immediately next to the wheel. Such inflation devices are unacceptable because their use places the worker at risk of serious injury in the event of a blowoff or other tire failure.

When a clamp-on air connector is used to inflate a tire, the inflation hose to which it is attached must

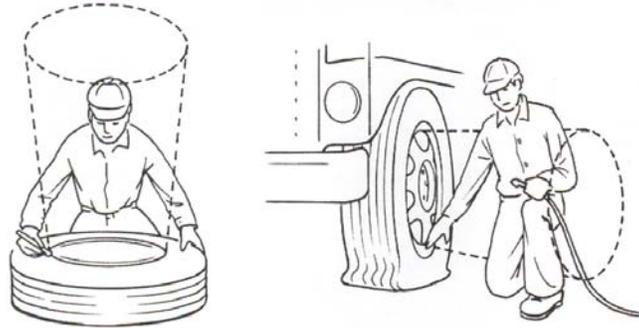
- (a) *permit the use of an in-line pressure gauge* – this eliminates the need for the worker to approach the tire to take a pressure reading with a pencil-type pressure gauge. The pressure gauge can be built directly into the inflation control or the control may have a check valve that permits pressures to be taken using a pencil-type pressure gauge (see Figure 12.9). The worker must be able to monitor tire pressure at a safe distance away from the tire being inflated, and
- (b) *be under positive pressure control by the worker filling the tire* – air can only be delivered to the tire while the worker squeezes or depresses a control. The flow of air must stop immediately upon the worker releasing the control.

Figure 12.9 In-line valve and gauge



The worker is responsible for staying in a safe position while inflating the tire. Figure 12.10 shows examples of the trajectories a wheel assembly might take if it should separate. The hose should be long enough between the clamp-on connector and the in-line valve to allow the worker to stand in a safe position.

Figure 12.10 Examples of trajectories and dangerous work positions



For more information

 [http://employment.alberta.ca/documents/WHS/WHS-PUB\\_gs003.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_gs003.pdf)  
Safety Bulletin – Servicing Tires Safely

## Section 194 Vehicle traffic control

### Traffic hazards

This section addresses the importance of protecting workers from traffic hazards. As examples, it applies to

- (a) workers at a construction site assisting with the positioning, loading or unloading of dump trucks;
- (b) workers grading lumber at a sawmill yard where forklifts or front end loaders are used to move logs or lumber;
- (c) workers collecting shopping carts in a parking lot;
- (d) a police officer speaking with a motorist at a roadside location that is not protected from moving traffic by barricades or other effective traffic control; and
- (e) workers at a road construction project where work takes place within an area protected from “public” traffic by barricades.

When determining the presence and degree of danger from traffic to workers, the employer should consider the speed of the moving vehicles and the duties and work location of workers relative to vehicles and powered mobile equipment. Subsection

---

194(7) lists numerous traffic control devices. Published by the Transportation Association of Canada, the *Manual of Uniform Traffic Control Devices for Canada* presents optimum standards and preferred methods in the design, dimensions and application of traffic control devices.

For more information

 [www.tac-atc.ca/english/](http://www.tac-atc.ca/english/)

Manual of Uniform Traffic Control Devices for Canada – September 1998.  
Transportation Association of Canada.

### High visibility apparel

The risk of injury from traffic hazards should first be controlled or eliminated through the use of engineering or administrative controls. Highly visible apparel should be considered to be a second line of defense against such hazards. Environmental conditions such as lighting, rain, fog, snow, smoke and dust can significantly affect the visibility of apparel.

Workers on foot and exposed to the hazards of moving vehicles are required to wear highly visible apparel that is clearly distinguishable. Depending upon conditions at the work site, highly visible apparel may be fluorescent, retroreflective, or a combination of both. A fluorescent material is one that absorbs ultraviolet light in daylight conditions and then emits it as visible light. This property allows the material to radiate more visible light than actually falls on it, making it appear brighter than a non-fluorescent material under the same conditions.

A retroreflective material is one that reflects light back in the direction of the source of the light. Retroreflective materials are preferred over bright colours under dark conditions. The OHS Code does not require fluorescent or retroreflective materials used on apparel be of a particular colour or size.

Apparel is considered to be clearly distinguishable if it is of a colour that contrasts with the surroundings in which it is worn. The greater the contrast between the background and workers' apparel, the more distinguishable the workers. Brighter colours are more distinguishable than duller colours under daylight conditions, while bright colours are less effective than fluorescent colours under low light conditions.

---

Visibility enhancing trim often has both fluorescent and retroreflective properties. Stripes on the arms and legs of apparel can indicate the motion and nature of the object they cover. Such apparel can be more easily distinguished than apparel without stripes.

For optimal performance, apparel should be kept clean and worn as intended – done up properly around the body with no loose or dangling parts, and worn in a way that ensures that no other clothing or equipment obscures the high visibility materials.

Additional information and guidance can be obtained from CSA Standard CAN/CSA Z96-09, *High-visibility safety apparel*.

## Section 195 Working on ice

This section makes the employer responsible for performing tests on the ice to make sure it can support the loads that will be placed on it.

For more information



[http://employment.alberta.ca/documents/WHS/WHS-PUB\\_sh010.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_sh010.pdf)

Travelling, Standing and Working on Ice