

WINTER WEATHER HAZARDS: HOW TO PREPARE AGAINST AND PREVENT INJURY

By Melanie Franner, DEL Staff Writer

Executive Summary

Winter can introduce a whole new range of hazards to the work site. Cold temperatures, blowing snow, icy conditions – all can affect equipment and people. Although there isn't much that can be done to prevent Mother Nature from having her say, employers and employees both can do well to mitigate the risk through proper training and awareness.

Workers need to be familiar with weather conditions and prepare accordingly – from using the proper layering techniques for clothing to partnering with a buddy for added visual protection and monitoring. Winter may bring added complications to the job site, but there are reasonable and proven ways to reduce your risk of injury.

Although winter often produces mixed feelings in most of us – gone are the dog days of summer – it also brings with it some feelings of trepidation and concern for many in the construction industry. This is the season that typically results in increased risks on construction sites. From snowstorms to freezing temperatures to equipment malfunctions, the winter months can play havoc on any site. But there are ways to avoid these hazards. A little bit of preventative action can go a long way to reducing risk – and keeping workers safe.

A View From Above

The Saskatchewan construction industry recorded the second-highest number of any other sector of accepted time-loss injuries from 2011 to 2013, beaten only by the province's

health and social services industry – according to the Association of Workers' Compensation Boards of Canada. The numbers show that there were 1,393 such incidents in 2011, 1,244 in 2012 and 1,311 in 2013.

Unfortunately, when it comes to number of fatalities during this same period, the province's construction industry scored the lowest. The one fatality recorded in 2011 was overshadowed by the 17 recorded in 2012 and the 10 recorded in 2013 – by far, the highest number of fatalities of any other sector in the province. (Note: the numbers include commercial and heavy construction.)

Although winter may not be the number-one season when most construction incidents occur – peak injury time seems to be the summer months and Q3 according

to the Saskatchewan Workers' Compensation Board 2010 to 2014 – the significant exception is with "falls". In this case, statistics show the number of claims rising in the winter months and tailing off considerably in the summer. The major cause of falls also changes between summer and winter – from summer incidents like falling off scaffolding or ladders to coming into contact with the ground during the winter months.

"Falls are the top cause of injuries in the construction industry," says Collin Pullar, President of the Saskatchewan Construction Safety Association (SCSA). "The numbers just become more acute in the winter. The category probably accounts for about one third of all WCB claims. It is the most common injury source and, by far, the most costly and most preventative."

Changing Conditions



According to Roger Berriault, Member Services Representative with the SCSA, winter conditions can change the risk factor on construction sites in a matter of mere seconds.

“Winter construction on the prairies can see strong, windy snow storms appear out of nowhere,” he says. “Snow can reduce visibility and increase worker risk. If someone is carrying a four-by-eight-foot sheet of plywood, for instance, and there is a bit of wet snow or freezing rain, that worker is going to find themselves in a very slippery situation. Wind chill is another significant factor in Saskatchewan. We had a whole week and a half last year where conditions were -40. That brings in the significant risk of frostbite.”

Berriault goes on to say that the risks associated with winter weather conditions can be mitigated with proper training and preparation. The first thing that should be done, he says, is to stay updated on current weather conditions.

The Canadian Centre for Occupational Health and Safety (CCOHS) publishes threshold limits for different wind-chill temperatures. Workers should abide by these guidelines.

“It really is all about being aware,” says Berriault. “In the case of wind-chill, for example, know the threshold limits. And take the extra precaution of having a co-worker monitor you. The first things to get cold are the feet, hands and face. A co-worker can see if you’re starting to show signs of frostbite or hypothermia on your extremities.”

Environment Canada Wind Chill Chart

		Actual Air Temperature T_{air} (°C)										
Wind Speed V_{10m} (km/h)	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70
30	0	-6	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
35	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
50	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76
55	-2	-8	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

where
 T_{air} = Actual Air Temperature in °C
 V_{10m} = Wind Speed at 10 metres in km/h (as reported in weather observations)

Notes:

1. For a given combination of temperature and wind speed, the wind chill index corresponds roughly to the temperature that one would feel in a very light wind. For example, a temperature of -25°C and a wind speed of 20 km/h give a wind chill index of -37. This means that, with a wind of 20 km/h and a temperature of -25°C, one would feel as if it were -37°C in a very light wind.
2. Wind chill does not affect objects and does not lower the actual temperature. It only describe how a human being would feel in the wind at the ambient temperature.
3. The wind chill index does not take into account the effect of sunshine. Bright sunshine may reduce the effect of wind chill (make it feel warmer) by 6 to 10 units.

Frostbite Guide
Low risk of frostbite for most people
Increasing risk of frostbite for most people within 30 minutes of exposure
High risk for most people in 5 to 10 minutes of exposure
High risk for most people in 2 to 5 minutes of exposure
High risk for most people in 2 minutes of exposure or less

HYPOTHERMIA

Hypothermia is a condition that results from the cooling of the body at a rate that exceeds the body's ability to generate warmth. This can occur slowly, as in the case of a person who has put in a full day of work under cold conditions, and is in need of food and rest to allow the body to restore to normal body core temperature. It can also occur quickly, as in the case of a person who has fallen through ice into frigid water.

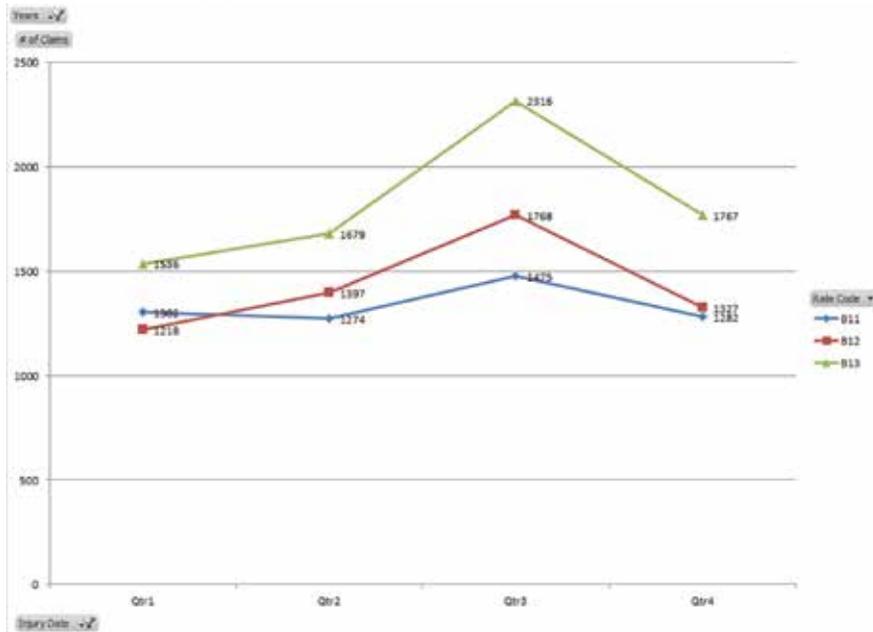
- Typical signs and symptoms include:
- Increasing slowness of physical and mental response;
 - Stumbling, cramps and shivering;
 - Slurring of speech;
 - Impaired vision;
 - Unreasonable behaviour or irritability; and
 - Increased pulse and respiration as long as the body can still respond by shivering.

(Reprinted from Northwest Territories Department of Transportation's A Field Guide to Ice Construction Safety)

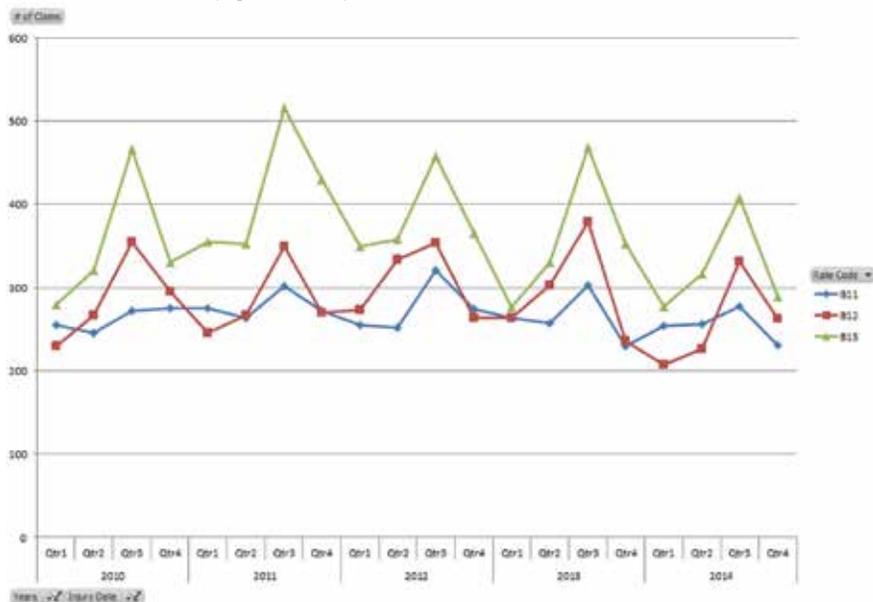
When do most injuries Occur? Summer Vs Winter Months

Injuries occur highest in the third quarter across all 3 rate codes. B13 (commercial) has the largest change between quarters with massive spikes in Quarter 3, and B11 (Trades) are impacted the least by the season, with only a small increase in Q3.

2010 to 2014 claims by quarter:



Rate code breakdown by quarter and year:



Another necessity in winter is being outfitted with the proper personal protective equipment (PPE). “Just wearing the right PPE will help dramatically,” adds Berriault. “Proper clothing, rest allowances, and having the right training to understand the conditions that you’re working in will lower the risks. Workers need to be trained on hazards in order to understand the conditions that they are working in. The biggest challenge is doing a proper hazard assessment. Workers tend to only look at what’s around them in their immediate surroundings, but there are usually additional hazards beyond that they need to be aware of.”

The SCSA offers a variety of construction safety courses, although none tailored specifically for the winter – as of yet.

“Classroom safety instruction is a great option, especially in the winter months when it’s too cold to be outside for long,” says Pullar. “We see a marked increase in our training numbers in the winter. It’s a good opportunity to keep employees informed.”

Another area in which the SCSA can help is through the association’s safety advisors – individuals who visit construction sites or company offices to discuss ways to improve worker

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safety or provide hands-on, onsite training.

Government Action

Saskatchewan's Ministry of Labour Relations and Workplace Safety is also committed to increasing worker safety on construction sites.



"We feel that the issue of worker safety on construction sites is particularly important all year round," says Ray Anthony, Executive Director of the

Ministry's Occupational Health and Safety Division. "Injury rates for the construction industry are significantly higher than the provincial average and the injuries themselves tend to be more severe."

According to Anthony, OHS is committed to reducing the number of workplace incidents throughout the province, including those that occur in the construction industry.

"We don't look at seasonality," he says. "Our goal is to target inspections in specific areas of the construction industry. In this particular case, the rate of incidents within the residential construction sector is nearly twice as high as it is in the commercial sector - for similar work. As a result, our focus has been more on the residential side, although both the residential sector and commercial sector have higher time-loss injury rates than our provincial average."

In addition to random inspections, OHS recently completed a construction campaign in the residential sector of the province's construction industry.

"We work with employers that have the highest injury rates," says

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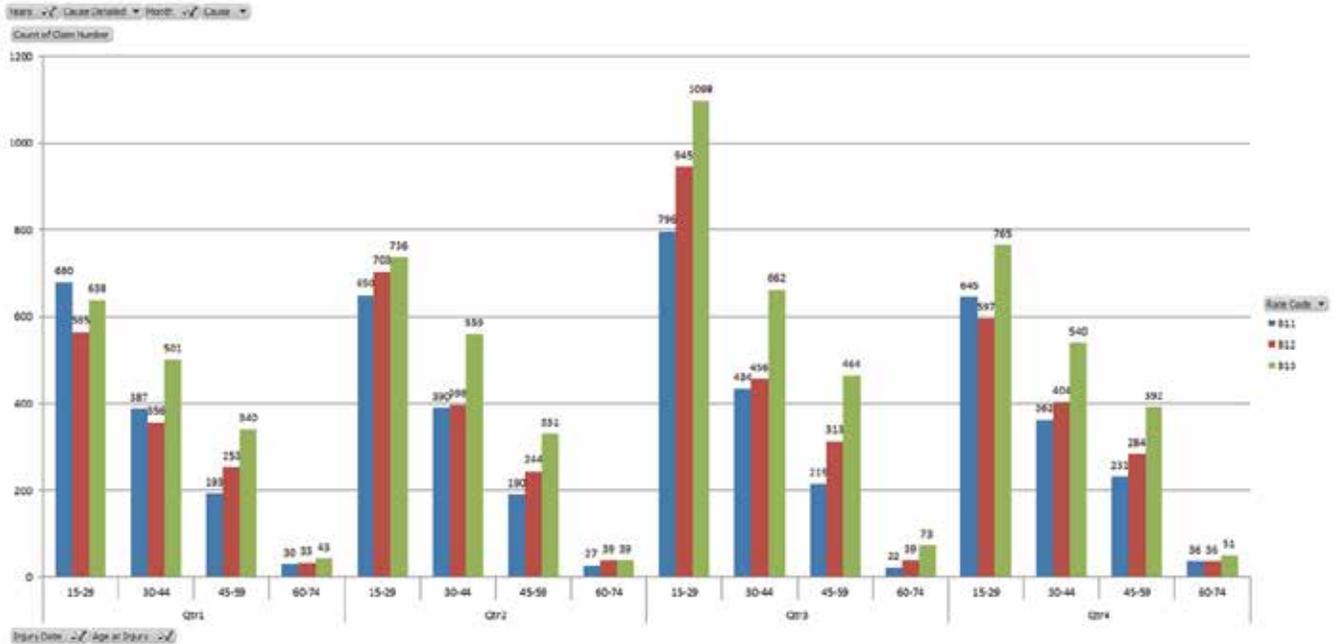
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Age at the time of injury follows the same trends. Young workers get injured much more often and they tend to work more in the summer months. These injuries of younger workers are the primary reason for the big spike in the summer months/3rd quarter.



Other Notes:

- Other stats such as Body Part injured don't change that much during season. Any changes are driven more by the injuries happening (eg less hitting your hand with a hammer VS slipping and landing on your shoulder).

- When looking at Occupation the same trends hold true, where occupations that young workers enter into (namely Trade Helpers/Laborers) having a large spike in the summer months.

Tips For Working In The Cold

According to OHS, cold environments pose challenges for workers in three different ways:

- air temperature;
- air movement (wind speed); and
- humidity (wetness).

These challenges need to be counterbalanced by proper insulation (layered protective clothing), by physical activity, and by controlled exposure to the cold (work/rest schedule).

Although there are no maximum exposure limits for working in cold environments, OHS refers to the “work warm-up schedule” that was developed by the Saskatchewan Ministry of Labour Relations and Workplace Safety and has since been adopted by the American Conference of Governmental Industrial Hygienists as Threshold Limit Values for cold stress. The schedule provides worker exposure recommendations for varying environments.

Additionally, OHS recommends the use of heated warming shelters for work in temperatures below the freezing point. It further advises that the risk of cold injury can be minimized by:

- Proper equipment design (metal handles and bars should be covered by thermal insulating material, machines and tools should be designed to be operated without having to remove mittens or gloves);
- Safe work practices (regular monitoring of temperature, having procedures in place for the provision of first aid, proper instruction on the symptoms of adverse effect exposure to cold, proper clothing habits, safe work practices, physical fitness requirements and emergency procedures in case of cold injury, the use of a buddy system to watch for symptoms of hypothermia; and
- Appropriate clothing (layered clothing, appropriate footwear, appropriate socks, and face and eye protection).

Further information may be found at the Canadian Centre for Occupational Health and Safety, http://www.ccohs.ca/oshanswers/phys_agents/cold_working.html.