

# RODWORKERS

## REINFORCING STEEL

Photocopy this profile and distribute it as widely as possible!

Musculoskeletal disorders (MSDs), such as chronic back pain or shoulder problems, often take time to develop. Forceful exertion, awkward positions, hand-arm and whole-body vibration, contact stress, and repetitive tasks can add up over time to produce an MSD.

This profile can help you identify and control MSD hazards in your job. We recommend that you add the best practices outlined here to your company's health and safety program. The hazards in a particular job, however, may be different than the ones on this profile, so evaluate the risks of your particular activities.

In general, when implementing controls, consider the following ergonomic principles:

- 1. Use handling equipment when possible.** The most effective intervention to control the risk of developing an MSD is to eliminate or reduce the frequency of lifting, carrying, pushing, and pulling. Use material-handling equipment such as carts, dollies, pallet jacks, or manual forklifts.
- 2. Don't lift a load from the floor.** Lifting from the floor or below standing knuckle height can expose your back to significant stresses and reduce your lifting capacity. Avoid this procedure by storing objects above standing knuckle height and below standing shoulder height.
- 3. Avoid working on the floor.** Constantly working on the floor can result in injuries to your back, hips, and knees because it usually requires kneeling and bending your back forward. When possible, raise the work height by using a workbench.
- 4. Minimize work above your shoulder.** High lifting or constant reaching above the shoulder level is harmful for three reasons.
  1. Your muscle strength is reduced because most of the muscle work is performed by your shoulders and arms instead of by the bigger muscles in your back and legs.
  2. Your shoulder and arm muscles fatigue more quickly than your back and leg muscles because of reduced blood flow.
  3. Lifting or removing an object from a high shelf can be dangerous because you could drop the object.
- 5. Move smaller weights often or get help.** Smaller weights put less stress on your back than larger weights, even if the frequency of lifting is increased.
- 6. Exercise programs.** Consider exercise programs. They help to prevent MSDs and promote general good health.

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Tasks	What can happen (Hazards/Risks)	Potential Controls
<b>Sorting rebar</b>	<ul style="list-style-type: none"> <li>▶ Back injuries from bending over</li> <li>▶ Overexertion injuries (to back and shoulders) from moving rebar</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sort steel to minimize the amount that it has to be handled.</li> <li>▶ Place steel on deck so that workers can remove it easily in the order it will used.</li> <li>▶ Mark the steel with different coloured paint to identify it for use in different locations.</li> </ul>
<b>Placing rebar</b>	<ul style="list-style-type: none"> <li>▶ Overexertion injuries (to back and shoulders) from lifting rebar from ground level, and from carrying rebar</li> <li>▶ Injuries from attempts to carry rebar alone (if there are not enough workers to help)</li> <li>▶ Back injuries from frequent bending over and pushing</li> <li>▶ Strains and sprains to arms and shoulders from gripping bars when fatigued</li> <li>▶ Injuries from slips and trips because of poor housekeeping, or sagging steel mat due to insufficient ties and chairs</li> </ul>	<ul style="list-style-type: none"> <li>▶ Deliver and store rebar in laydown area as close as possible to the work location to minimize material handling.</li> <li>▶ Store rebar at knee height to reduce bending and to reduce the load on your lower spine.</li> <li>▶ Use a crane to lift prefabricated steel into position (e.g., column cages), and to lift rebar close to the placement location.</li> <li>▶ Provide enough workers for the task (e.g., lifting large-diameter bars requires two people).</li> <li>▶ Limit the amount of rebar lifted at a time. The amount should be limited to an average of 28 kg per lift per person for an 8-hour workday.</li> <li>▶ Rotate workers among different tasks.</li> <li>▶ Coordinate your work with the other trades working on the deck (e.g., coordinating with the crane operator to reduce your material handling).</li> <li>▶ Ensure that the work area is clean. This will make material handling easier.</li> <li>▶ Use an adequate number of ties and chairs.</li> </ul>
<b>Fixing rebar</b>	<ul style="list-style-type: none"> <li>▶ Back strains and sprains because of frequent bending at the waist (greater than 45 degrees)</li> <li>▶ Injuries because of repetitive bending and twisting when tying and cutting wire with pliers</li> <li>▶ Injuries due to awkward posture (kneeling, crouching, or lying down) when tying rebar below ground level</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stretch your muscles for five minutes during a “mini break” every hour.</li> <li>▶ Use alternative tying methods or tools that reduce bending at the waist.</li> <li>▶ Rotate workers among different tasks.</li> </ul>

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Tasks	What can happen (Hazards/Risks)	Potential Controls
<b>Twisting tie wire</b>	<ul style="list-style-type: none"> <li>▶ Overexertion injuries to the upper arms from repetitive tying</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reduce tying tension applied to the wire. This reduces the amount of hand exertion.</li> <li>▶ Work at an appropriate speed to avoid injury.</li> <li>▶ Explore alternative tying methods or tools. For example, choose nips with long handles so that you use less pressure when cutting wire. Use spring-loaded pliers to reduce hand exertion. Use pre-tie wires or mechanical tying tools.</li> </ul>
<b>Working with pre-fabricated cages</b>	<ul style="list-style-type: none"> <li>▶ Back injuries from lifting and lowering cages manually</li> <li>▶ Upper-arm injuries from repetitive tying</li> </ul>	<ul style="list-style-type: none"> <li>▶ Explore the use of mechanical devices that can lower cages to the ground without using on-site cranes.</li> <li>▶ See the controls for “Twisting tie wire.”</li> </ul>
<b>Working with post-tensioning cables</b>	<ul style="list-style-type: none"> <li>▶ Injuries from awkward postures when placing conduit for tensioning strands</li> <li>▶ Injuries from pulling strands</li> <li>▶ Overexertion injuries from working with jacks and materials associated with stressing cables</li> </ul>	<ul style="list-style-type: none"> <li>▶ Coordinate with other trades to ensure proper timing and access to the work area.</li> <li>▶ Use material-handling equipment to deliver rolls of wire.</li> <li>▶ Use mechanical devices to pull strands.</li> <li>▶ Store material between waist and shoulder height.</li> </ul>

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