



## APPENDIX W MATERIAL HANDLING AND BACK SAFETY POLICY

### **Hazard potentials:**

Potential injuries that can occur when manually moving materials, including the following:

Strains and sprains from lifting loads improperly or from carrying loads that are either too large or too heavy,

Fractures and bruises caused by being struck by materials or by being caught in pinch points, and

Cuts and bruises caused by falling materials that have been improperly stored or by incorrectly cutting ties or other securing devices.



Of particular concern for VSC are back and overexertion injuries. Back injuries occur when the muscle, ligaments and/or tendons in the back are damaged due to overstretching or overuse of the muscles in the back. These injuries can result in strains, sprains, and tears. Herniated disks are also a type of back injury found in workplace situations. A herniated disk occurs when an injury to the spine causes the outer layer of the disk resulting in the cushioning gel to bulge out. Overexertion injuries are the result of excessive repetitive handling, (i.e., lifting, pushing, pulling, holding, turning, carrying, or throwing of an object), and/or the use of excessive force for a single handling. These injuries involve the nerve, tendons, muscles and supporting structures of the body.



### **Hazard Assessment-**

#### **VSC EMPLOYEE MATERIAL HANDLING TASKS & HAZARDS:**

Tasks:

- Receiving and transporting material & equipment on construction sites.
- Receiving, handling, transporting, loading, and sorting material in VSC warehouse.
- Material handling of material and equipment at customer facilities e.g. factory, industrial manufacturing, retail, residential, commercial and overhead while working from an elevated MEWP.
- Manual and mechanical transport of material & equipment from ground level to floor levels of multistory structures.
- Assisting in rigging and handling material transported by means of crane.
- Use of forklift in unloading and transporting material & equipment on construction sites.
- Unloading materials from vehicles.
- Demo and removal of existing fire protection systems. (Renovation projects)

Unsafe conditions:

- Multiple other trades, employees, residents, staff, customers, and pedestrians.
- Elevators, passageways, stairwells.
- Rough terrain, unlevel surfaces and obstacles associated with constructions sites.



- Weather.
- Vehicle and equipment traffic.
- Obstructed view of pathway and insufficient indoor lighting.
- Access to job site e.g., parking, limited construction entry.
- Travel distance to tasks and staging area.
- Handling material pre-dawn hours with low visibility.
- Never lift more than you can handle, always ask for help

### **Personal protective equipment:**

Using the following personal protective equipment prevents needless injuries when manually moving materials: Hand and forearm protection, such as gloves, for loads with sharp or rough edges, Eye protection, Steel-toed safety shoes or boots, with soles that are not overly worn to prevent slipping, and Metal, fiber, or plastic metatarsal guards to protect the instep area from impact or compression Refer to the Personal Protective Equipment Program for more details.

### **Lifting & Back Safety**

To reduce back injuries at work it is important to identify and avoid risk factors that increase your chance of injury. When any of the following occur separately or in combination your risk of a back injury is increased:

1. Overexertion.
2. Repetition.
3. Fatigue.
4. Dehydration.

### **Unsafe Work Practices**

Your body posture determines which joints and muscles are used and the amount of force that is generated. When standing or sitting, there is a neutral position for your back. Postures that differ from the neutral position increase stress on the back, especially when combined with other risk factors.

### **What to Avoid:**

- Strenuous activity while the body is in a twisted or bent position.
- Repeated bending, twisting and reaching.
- Bending forward while lifting.
- Traveling a long distance while carrying item(s).
- Poor condition of walking surface (uneven surface, obstacles, stairs, multiple elevation changes, ladders).

Where unsafe work practices or conditions exist, STOP what you are doing, consult with your supervisor and determine how to eliminate the hazard before engaging any further in the activity that may lead to injury.

***If an injury occurs immediately report it to your supervisor!***

### **Safe Work Practices**

Complete a job hazard analysis ahead of time to identify hazards so that adequate measures can be taken to:

- Eliminate the hazard completely, or
- Redesign the workflow, or
- Make available the necessary manual equipment, or



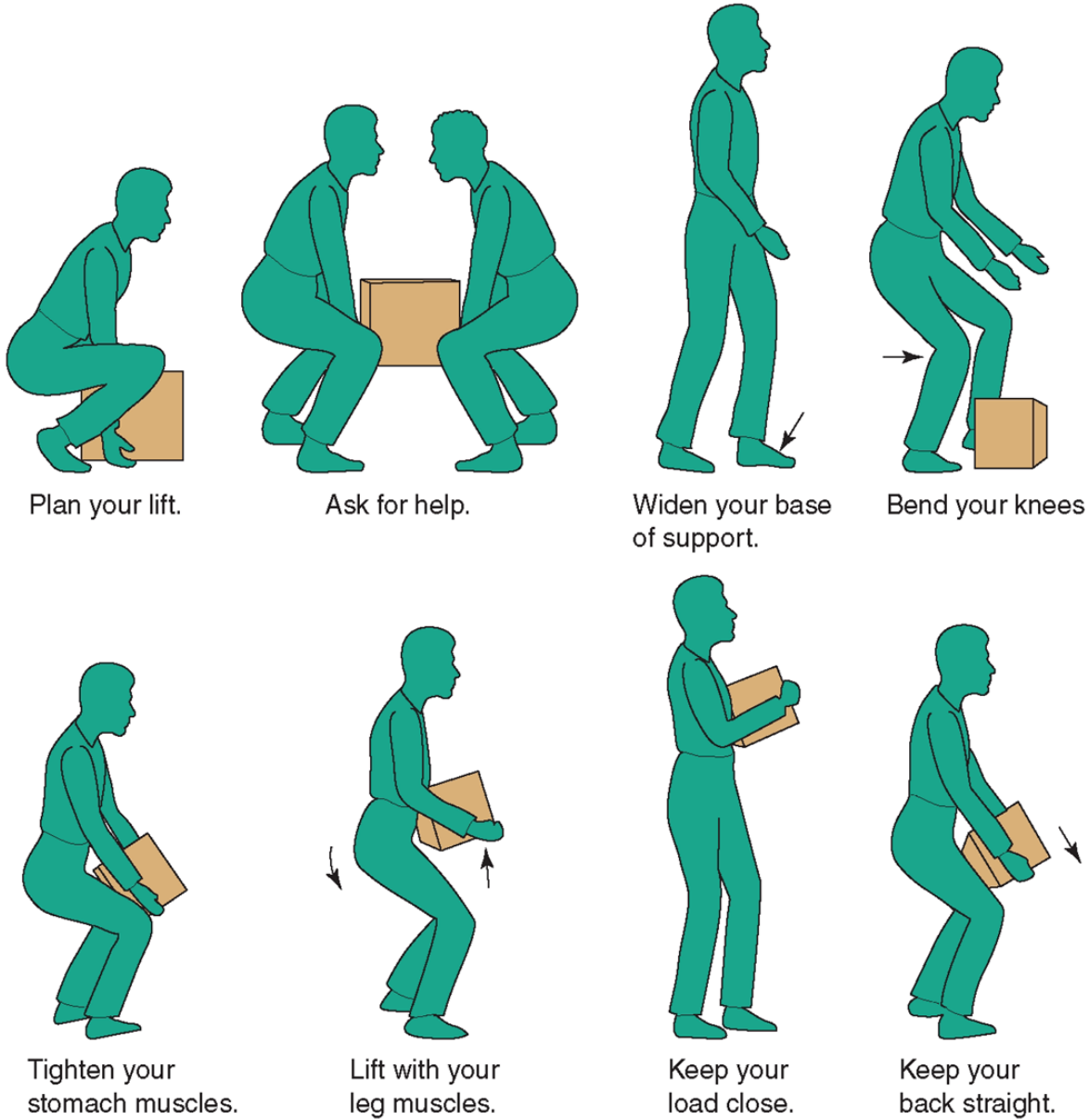
- Provide adequate team coordination to ensure the activities are completed safely.

#### Lifting Techniques:

*If you are unable to perform a lift as outlined in the techniques described below, contact your manager to discuss!*

While no single lifting technique will apply to all situations the following tips will help you avoid back injuries:

- Size up the load (object, material, equipment, etc.), look it over and decide whether you can move it alone or if you need help. (i.e. help from a co-worker or mechanical assistance)
- Seek help if you need it! You will avoid many injuries if someone can assist you or if you use the correct mechanical device to lift and make the move.
- If the lift and move requires mechanical help, assess what is needed: dolly, hand truck, cart, hoist, lift-assist device, etc., and discuss options with your supervisor.
- Prior to lifting and moving the load, inspect your intended path of travel for obstacles or other possible tripping hazards.
- Wear well-supporting work shoes. Get a firm footing. Place your feet at shoulders' width apart.
- Bend at your knees, not your waist! Leg muscles are stronger and more durable than back muscles. Let your leg muscles do the work.
- Grip the load firmly and use the appropriate work gloves when necessary.
- Keep the load close to your body. For greater strength and stability, lift and carry the object near your waist.
- When changing directions, move your feet – DO NOT TWIST YOUR UPPER BODY while carrying the load.



Plan your lift.

Ask for help.

Widen your base of support.

Bend your knees

Tighten your stomach muscles.

Lift with your leg muscles.

Keep your load close.

Keep your back straight.

Lifting Techniques for lifting and moving loads requiring two or more people: (i.e. loads over 10' long or > 50 lbs.)

- In addition to the previously described lifting tips, you need to:
- Designate a leader in advance.
- Plan the lift – Who will lift What, When Where and How.
- Identify team member concerns before engaging in the lift, not during the lift!
- Communicate with your partner(s) during the entire move.
- Inspect your path of travel for trip hazards or changes in elevation.
- Lift and lower in unison and with no sudden moves.
- Communicate to the team when the lift and move is complete.
- Plan for unusual, unforeseen shifts in the load – what's the plan?



- If a participant is injured during the lift and move, determine ahead of time how to ensure the safety of the remaining team members.

Once the lift is complete, keep the object as close to the body as possible. As the load's center of gravity moves away from the body, there is a dramatic increase in stress to the lumbar region of the back.

If you must turn while carrying the load, turn using your feet-not your torso. Keep your eyes up. Looking slightly upwards will help you maintain a better position of the spine.

When moving an item from a hard-to-reach place, position yourself as close to the item as possible. Slide it out to get it closer and be sure that you have adequate room for your hands and arms. Be aware of adjacent obstructions, on either side or above the load.

If an object is too heavy, or awkward in shape, make sure you have someone around who can help you lift. To place the object below the level of your waist, follow the same procedures in reverse order. Remember, keep your back as vertical as possible and bend at the knees.

Think about where the item will be placed once you have lifted it: Will it be:

- Overhead?
- Under an overhang?
- In a narrow spot?
- Near a fall hazard?

Try to allow yourself as much room as possible to set the load down. You can always shift it slightly later. Check your path from place to place - remove tripping hazards, protect openings, set up a "well wheel" or a "bucket and line" if you need to get materials up a ladder. Make sure that the lighting is sufficient to see where you are going. Stabilize uneven or loose ground or choose an alternate route. The shortest way is not always the fastest, or the safest.

Always use both hands when lifting and lift slowly and deliberately. The ideal situation is to have someone or something to help you when lifting, but if that is not possible, follow all the above listed guidelines to minimize your risk of injury.

Note: If the load is heavy, do not turn or pivot on one leg as this type of motion can cause knee injury.

Back Brace: Back Braces are only to be worn when prescribed by the employee's treating physician



Doctors, physical therapists, and fitness experts agree that the easiest and most effective way to prevent strains and sprains to the back and major muscle groups is through physical conditioning. We encourage our employees to follow this simple conditioning program:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Nourish muscles by eating a well-balanced diet</li> <li>• Stay hydrated by drinking plenty of water and avoid drinks loaded with sugar or caffeine</li> <li>• Drink water before you begin to feel thirsty</li> <li>• Use or wear protective equipment for work activity</li> </ul> | <ul style="list-style-type: none"> <li>• Always wear properly fitting shoes</li> <li>• Build muscle strength</li> <li>• Do stretching exercises</li> <li>• Warm up before moderate to strenuous work</li> </ul> |
|--|---|



**Correct Stretching:**  
 Warm up before any moderate to strenuous activity. This will help increase your speed and endurance.

Stretch slowly and gradually, holding each stretch to give the muscle time to respond and lengthen.

Relaxed, slow and frequent!  
 No bouncing or stretching to the point of pain.

Hold for 3-5 relaxing breaths.  
 Do both sides.

**WARM-UP EXERCISES**

- **Warm-up** prepares your body for physical exertion.
- Athletes warm up to improve performance and avoid injury.
- Eating a meal brings blood from the muscles to the internal organs.
- You are especially injury-prone *right after meals!*
- Warm-up gets blood flowing back to the muscles.



**Simple stretches for office employees**



FIRE · SECURITY



10-20 seconds  
2 times



10-15 seconds



8-10 seconds  
each side



15-20 seconds



3-5 seconds  
3 times



10-12 seconds  
each arm



10 seconds



10 seconds



8-10 seconds  
each side



8-10 seconds  
each side



10-15 seconds  
2 times



Shake out hands  
8-10 seconds





### **Construction sites:**

Materials & equipment:

- ✓ Pipe, sprinkler components in individual pieces and boxes (heads, fittings, valves etc...).
- ✓ Threader / power machine, toolbox, tools & equipment.
- ✓ Fire pump and assembly components.
- ✓ Pallet truck, forklift, crane
- ✓ Rigging, hand carts and mobile pipe racks.

Before manually moving material or equipment walk the job site to identify pathway & access to your designated work zone and material staging area. Look for hazards such as:

- Obstructions-  
Other trades material & equipment, debris (housekeeping) for trip hazards, holes, heavy equipment movement, large objects & restricted access that limit your visibility, unlevel walking surfaces, inclines, drop-offs, personnel, inadequate lighting.
- Fall hazards-  
Handling material near open edges, holes, overhead fall hazards.
- Long travel distance-  
Reduce travel distance and time in manually handling materials by parking VSC delivery vehicle as close to project as allowed, identify shortest & safest distance to work zone, use carts or forklift with an authorized operator as needed to unload & transport material closer to building.
- Multi-story building-  
Identify how materials are to be transported to upper floor levels e.g. stairwells, elevator, crane, or forklift.
- Small or enclosed spaces-  
Maneuvering material in mechanical & utility rooms, contact with mechanical operations or electrical panels.

### **Pre-planning**

Identify your handling and transporting of material in a Job Hazard Analyses (JHA) and contact VSC Risk Management for assistance when needed.

Supervision must periodically evaluate work areas and employees' work techniques to assess the potential for and prevention of injuries. New operations should be evaluated to engineer out hazards before work processes are implemented.

### **Handling materials in MEWP**

MEWP operator and occupants must pre-plan and coordinate proper procedure's when lifting and maneuvering materials such as pipe and large heavy objects into overhead areas.



Handling materials in the elevated position of a MEWP increases strains and over exertion due to small space and limited movement in an aerial lift or boom lift.

Some common safe practices to prevent injury and dropping material:

- Limit the number of material and objects inside the platform such as one section of pipe instead of multiple pieces.
- Use securing devices to prevent material from falling off platform.
- Do not use MEWP as a crane by hanging or suspending material or pipe over handrail or other MEWP structure.
- Reduce the number of small objects by putting them in buckets or boxes to prevent trip hazards.
- Ensure weight of material, personnel and equipment does not exceed load capacity of MEWP.
- Do not use a MEWP for tasks for which it was not designed.
- When maneuvering large sections of pipe into hangers or support structure operator and occupants must coordinate a safe lift plan to avoid injury and dropping material (overhead fall hazard).
- Use ropes or other devices as needed to lift large sections of pipe overhead.
- Position MEWP as needed to prevent coming in contact with overhead objects or utilities while handling positioning material into overhead areas.

#### Stairwells:

- Reduce weight of material by removing items from boxes.
- Use two persons carry for large and longer material such a pipe.
- Use a spotter when needed to warn other trades using the same stairwell.
- Reduce the length of pipe if possible.
- Inspect steps and landing for obstructions or work activity.
- Stop at landings and place item on floor as needed to rest. Never rest on steps.
- ***DO NOT USE STAIRWELL if handrail is missing or does not meet OSHA standards.***
- ***DO NOT USE STAIRWELL with pan stairs where the treads and/or landings are to be filled in with concrete or other material later, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan.***
- ***DO NOT USE STAIRWELL with skeleton metal stairs where permanent treads and/or landings are to be installed later, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.***

***Examples of dangerous stairs:***



#### Unloading material and equipment from vehicles:

- Organize and secure items in truck or van so that you do not have to climb or crawl over material to retrieve items.
- Use two-person rule as needed to unload vehicles.
- Never attempt to lift and maneuver heavy items such as pipe threader machines from truck or van alone. Ask for assistance or use material handling equipment or devices such as hand truck to move heavy items.
- Never jump down from tailgate while holding material. Move material to the tailgate then remove it once you are on the ground.
- Ask for assistance when unloading ladders.
- Wear cut resistant gloves when handling sharps and equipment with pinch points.

#### Crane:

If a crane is provided for transporting material to upper floor levels the VSC supervisor must meet with the general contractor and crane company to discuss a lift plan. Lift plans include verifying with the rigging supervisor that all rigging equipment has been inspected.

**Only VSC employees who are trained certified riggers are allowed to perform any rigging tasks including detaching rigging when receiving material at the designated landing area.**

The VSC supervisor must ensure the proper cart or other mobile device is of adequate size and capacity to transport materials from landing to the work zone to avoid tipping over or displacement of material.

To avoid tipping cart or mobile pipe rack when transporting pipe always use the two-person rule and secure load.

#### Forklift:



Only trained authorized operators are allowed to operate a forklift.

Before lifting material meet with the forklift operator to review a lift plan to discuss the following requirements:

- Establish type of communications with operator e.g. verbal, radio or visual.
- Inspect pallet, rigging and any other rigging devices to prevent dropping or displacement of load.
- Verify the landing / material receiving area for each designated floor level.
- Ensure fall protection and proper anchorage system is provided before receiving material at each floor level.
- Use spotter or barricade as needed when unloading materials from delivery truck.
- Ensure bundles of pipe are secured to avoid displacement and do not come in contact with objects or overhead power lines.
- Ensure each load is within the forklift load capacity.
- Never put hands on load once material is lifted.
- Only unload material after operator has placed pallet on floor or ground level.
- Wear cut resistant gloves when cutting banded material from pallet or bundle.

#### Manually lifting and maneuvering large sections of pipe overhead.

Hazards:

Back, neck, shoulder & arm strains. Dropped pipe, Ladder tilt over, Overhead fall hazard to passerby.

- Before installing 21-foot sections of sprinkler pipe from ladders reduce the length of pipe by cutting in half to reduce the weight.
- Inspect ladder for safe condition and ensure ladder is of adequate height.
- For shorts lengths of small diameter pipe a second person must assist the employee on the ladder by handing up the pipe.
- For longer lengths of pipe (6'-21') and large diameter (3' or greater) 2 employees will lift pipe up to employee on the ladder and help secure the pipe.
- As needed rigging equipment e.g. rope, chain and pully system will be used to lift and secure long and large diameter pipe overhead with a minimum of two employees.
- Podium ladders are much more stable for installing pipe overhead and provided additional fall protection. (See figure below)



*Podium ladder*

**Manually Receiving, handling, transporting, loading, and sorting material in VSC warehouse.**

Field employees must coordinate material handling, loading, and retrieving items from shelves with VSC warehouse supervisor before loading or unloading material.

Use of warehouse forklift must only be operated by an authorized operator.

Receiving materials from delivery trucks-

- Inspect pallets and boxes for damage and ensure material is secure before unloading.
- Use pallet cart or forklift as needed for heavy & bulk items.
- Lower material from truck to ground level before lifting items.
- Delivery driver is responsible for unstrapping secure loads.
- Stay clear of truck until driver has unsecured load to avoid struck-by and crushing injury from displaced or dropped load.
- Wear cut resistant gloves and steel toe work boots.
- Separate material into smaller containers as needed to reduce weight.
- Ensure truck bed is as close as possible to loading dock.
- Pallet hand cart (see safety alert)

Following is a review list of dos and don'ts when bending and lifting:

**Dos & Don'ts:**

**Do's**

- Do place your feet and knees at least shoulder width apart or front to back in a wide-step position. This will help you bend at the hips, keeping your back relatively straight and stress free.
- Do lean over or squat with the chest and buttocks sticking out. If you do this correctly, your back will be flat, and your neck will balance in a relaxed neutral position.



- Do take weight off one or both arms if possible. When you squat down or push back up, use your hand or elbow as support on your thigh or any available structure. This takes some of the compression and strain off of the lower back.
- Do balance your load on either side if possible, or switch sides so that both sides are equally stressed.
- Do level the pelvis or tuck in your buttocks and suck in your abdomen, when reaching or lifting overhead. Keep your chest up and use a step stool to keep the low back and neck in neutral alignment.
- Do walk around and use backward-bending and/or stomach-lying positions before or after bending or heavy lifting, especially if you have been sitting for a while.

#### **Don'ts:**

- Do not lift things when your feet are too close together. If your feet are closer than shoulder width you will have poor leverage, you'll be unstable, and you'll have a tendency to round your back.
- Don't lift with your knees and hips straight and your lower back rounded. This is the most common and stressful bad lifting move. Twisting the trunk during this bad move compounds the problem.
- Don't tense and arch the neck when lifting. This crams your neck joints together and causes pain especially if maintained for a long period of time.
- Don't twist or turn when carrying a heavy load.
- Don't lift and/or carry an unbalanced load.
- Don't lift and bend too much in a short period of time.
- Don't lift objects that are too heavy for you.
- Don't mistakenly believe that a lifting belt will increase your maximum lifting potential.
- Don't lift heavy objects directly following a sustained period of sitting, especially if you have been slouching.
- Don't lift things overhead with your neck and back arched, if possible.

#### Team lifting:

Whenever team lifting is employed, the participants should carefully discuss the plan for the lift, including any verbal instructions that will be used to initiate actions and to warn of hazards.

When carrying long or large items through office space, retail areas with exposure to customer's or schools where students may come in contact always use the two-person rule.

#### Using equipment to assist with manual lifting:

Ergonomics is defined as the study of work and is based on the principle that the job should be adapted to fit the person rather than forcing the person to fit the job. Ergonomics includes restructuring or changing workplace conditions, to



make the job easier, and reducing stressors that cause musculoskeletal disorders. In the area of materials handling, ergonomic principles may require controls such as reducing the size or weight of the objects lifted, installing a mechanical lifting aid, or changing the height of a pallet or shelf.

Many times, an item could be moved with a piece of equipment, such as a dolly, a hand-truck or a forklift. Consider using mechanical assistance wherever possible. When using mechanical assistance, remember to push, not pull - you'll have more control, and greater leverage. Also, fasten the load to the equipment, so sudden stops or vibration don't jar it off.

Consult with VSC Risk Management for ergonomic assessments of high-risk moving activities. When evaluating a worker's lifting habits, the following variables will be considered: frequency of lifting, angle of body, height of load, duration of such activities, and type of lifting, as well as the worker's state of health, body size, age, and general physical fitness. Material handling tasks may be redesigned to minimize the weight, range of motion, and frequency of the activity. Alternatively, mechanical assistance may be employed.

#### At home modifications:

Sprains, strains and lower back pain on the job can be partially attributed to what you do or do not do outside the workplace. Below are some recommendations to follow to protect against non-workplace injuries:

- Eat nutritious meals, and exercise to maintain well- conditioned muscles.
- Get a good night's rest

***The fire protection and life safety industry are a very physically demanding job with exposure to many different types of work environments and hazards. The potential for strains, sprains and overexerted type of injuries are greatly reduced and preventable when each employee implements the procedures and methods identified in this policy.***

***Revised September 2022***



**FIRE · SECURITY**