

# CITY OF VICTORIA

## PHYSICAL DEMANDS ANALYSIS

Effective Date: March 1, 2010

<b>Job Title:</b>	Parks Equipment Serviceperson	<b>Date of Job Site Visit:</b>	Jan. 8, 2010
<b>Department:</b>	Parks, Recreation & Culture	<b>On-Site Contact</b>	Todd Stewardson
<b>Division:</b>	Parks	<b>Person(s):</b>	(Manager – Parks
<b>Section:</b>	Parks Operations		Construction & Natural Systems)
<b>Location:</b>	Parks Mechanic Shop, and Various City Parks, Trails, Playgrounds, Sports Fields	<b>Classification:</b>	Regular Duty

### **POSITION FUNCTION**

The Parks Equipment Serviceperson is responsible for the installation and repair of \*park irrigation systems, as well as the installation and repair of sport field / parks / playground structures and equipment within the City of Victoria. This involves a vast array of tasks including (but not limited to) the following:

- Assembling / constructing / repairing / painting of various park, playground and sports-field equipment / structures, including (but not limited to) the following: benches, pedestrian barriers, vehicle barriers, signage, picnic tables, swings, playground structures, goal posts, chain link fences, wooden fences, drinking fountains, etc.
- Transporting and installing various park, playground and sports-field equipment / structures as outlined above (including the construction of concrete forms and pouring of concrete pads that the equipment will be secured to),
- Conducting routine inspections of park, playground and sports-field equipment / structures for safety,
- Operating vehicles to conduct inspections and transport equipment and materials as needed,
- Laying out playgrounds from plans,
- Repair of boulevard hydrant services,
- Reading and interpreting engineering plans, and laying out irrigation systems for construction,
- Installing, maintaining, and repairing irrigation systems and controls,
- Operating a tractor with related attachments (e.g. blade, hoe, etc.),
- Operating various equipment, including (but not limited to) the following: 'ditch-witch', and turf equipment,
- Winterizing irrigation systems, drinking fountains, and park washrooms,
- Installing, testing, certifying, and maintaining irrigation backflow-prevention devices,
- Maintaining accurate records, sketches, and reports for maintenance and new installations,
- Determining and ordering materials and equipment as required,
- Completing daily work records and equipment slips.

*\*Note: the Parks Equipment Serviceperson is also required to perform all job tasks associated with the position of 'Irrigation Technician' (i.e. the job duties of an 'Irrigation Technician' are outlined within a separate Physical Demands Analysis report).*

## **TOOLS & EQUIPMENT**

The Parks Equipment Serviceperson uses the following tools / equipment to perform his/her duties:

- Vehicles – tractors, pick-up trucks (3/4 tonne, including with lift-gate)
- Hand Tools – paint brush/ roller, sandpaper, shovels, picks, mattocks, pry bars, digging bars, hack saws, ratchet cutters, sledge hammers, trowels, assorted hand tools (e.g. hand-drills, hammers, wrenches, screwdrivers, etc.)
- Equipment / Power Tools – drill press, power saws, sanders, grinders, routers, oxyacetylene and arc welding equipment, demo-hammer (hydraulic), jack-hammer (hydraulic), trenchers, 'ditch-witch', plate-tamper, jumping-jack tamper, 'hole-hog', propane torch, air compressor, and turf equipment
- Clean-Up Tools – rakes, square-mouth shovels, push-brooms, corn-brooms, hoses, buckets, sponges, wipes
- Chemicals – PVC glues & primers, 'Bondo-Glass', paint (enamel & acrylic), paint thinner, solvents, grease, graffiti-removal products, oil / gas mixtures, gasoline in jerry cans
- Ladders – extension ladders, and 6 & 8-foot step-ladders
- Safety Equipment – nitrile gloves, leather gloves, utility gloves, safety footwear, hard hats, knee pads, metatarsal guards, dust masks, respirators, safety glasses, full-face shields, ear plugs / muffs, high-visibility reflective vests, coveralls, rain gear, flashlight, first aid kit, sharps container

## **ADMINISTRATIVE ISSUES**

The shifts for Parks Equipment Servicepersons extend from 07:00 am to 15:30 pm. Shifts are scheduled Monday to Friday, and the workers receive two 15-minute rest periods, and one 30-minute lunch break during each shift. This position is classified as Full-Time Permanent. Work is performed according to seasonal schedule, or is assigned by supervisor; and is reviewed while in progress. Any repairs or mechanical maintenance that vehicles or power equipment require is completed within the Parks Operations mechanical shop.

## **WORK ENVIRONMENT**

### **Physical Effort:**

- Lift, move, and utilize heavy materials and equipment (occasional to frequent)
- Work in awkward positions (occasional)
- Dig by hand (occasional to frequent; more so if working on irrigation projects)

### **Mental Effort:**

Within normal limits

### **Visual / Auditory Effort:**

Within normal limits

### **Work Environment:**

- \*Work outside in all weather conditions (frequent to continuous, approx. 85% of shift)
- Work inside (rare to occasional, approx. 15% of shift)
- Work in close proximity to moving traffic (occasional to frequent)
- Exposure to equipment-noise (frequent; e.g. drills, power saws, sanders, grinders, routers, hydraulic demo-hammer, hydraulic jack-hammer, tractors, trenchers, 'ditch-witch', plate-tampers, jumping-jack tampers, 'hole-hog', air compressor, turf equipment, etc.)

- Exposure to equipment-vibration (occasional to frequent; e.g. drills, power saws, sanders, grinders, routers, hydraulic demo-hammer, hydraulic jack-hammer, tractors, trenchers, 'ditch-witch', plate-tampers, jumping-jack tampers 'hole-hog', air compressor, turf equipment, etc.)
- Exposure to exhaust / chemical fumes, airborne particulates – dirt / dust or saw-cutting particulates (occasional); including working in an environment where protective measures must be taken to avoid exposure to welding fumes as well as chemical fumes from paint, primers, and glues. (occasional)

\*Note: the environmental conditions can considerably alter the degree of challenge of this job. It is possible to be exposed to widely varying conditions, including:

- extremely hot conditions (i.e. with implications for dehydration, sunburn, and heat stroke)
- extremely wet conditions (i.e. with implications for less reliable footing, less stability of trenches, increased heaviness when shovelling wet dirt / mud / clay, a need for higher grip forces due to slipperiness of shovels / tools / equipment / irrigation components, and potential for increased awkwardness of lifting due to slipperiness of items & less reliable footing as noted above)
- extremely cold conditions (i.e. with implications for less reliable footing due to snow / ice, less stability of trenches due to slushy wetness, increased heaviness when shovelling wet dirt / mud / clay, a need for higher grip forces due to slipperiness of shovels / tools / equipment / irrigation components, and potential for increased awkwardness of lifting due to slipperiness of items & less reliable footing as noted above)

## **KEY SKILLS AND ABILITIES**

- Understand and discuss job-related matters.
- Organize and prioritize work.
- Ensure schedules, procedures, and established performance-standards are met.
- Perform carpentry, painting, basic welding, finishing, plumbing, metalworking and concrete finishing (i.e. including the operation of various hand-tools, power equipment, and a variety of light to heavy industrial equipment and vehicles).
- Understand and apply all aspects of irrigation; including operation of software program for water management & irrigation scheduling.
- Read and interpret engineering plans, and lay-out irrigation systems for construction.
- Maintain accurate records, sketches, and reports for maintenance and new installations.
- Establish and maintain effective working relationships.
- Respond appropriately to enquiries from the public, staff, and outside agencies regarding general parks information.
- Deal with the public in a courteous and tactful manner.
- Work safely on widely varying job sites (i.e. city parks, trails, playgrounds, sports fields, etc.).

## **INDEPENDENCE**

- Level of independence when completing work tasks can vary widely (i.e. depending on work tasks being completed), and may range from fully independent to fully supervised.
- Work is completed according to an assigned schedule, or assigned by supervisor.
- Issues such as plan changes to work projects are discussed with supervisor.
- Issues such as major changes to approved designs are referred to supervisor.
- Work quality is reviewed by assistant supervisor on a regular basis, and further follow-up (if required) will involve the supervisor.

- Parks Equipment Serviceperson independently performs equipment maintenance as required.
- Malfunctioning or damaged tools / power equipment are reported to supervisor and Parks Operations mechanical shop.
- Problems such as an inability to complete certain tasks or complaints are referred to supervisor.

## **QUALIFICATIONS**

### **Formal Education, Training and Occupational Certification:**

- Grade 12 education minimum,
- Cross Connection Control Certification (40 Hours),
- Current and valid Class 5 B.C. Driver's Licence.

### **Experience:**

- 3 years of related experience as identified under certification ... *or* ... an equivalent combination of education and experience.

### **OTHER:**

- May be requested to substitute in a more senior position.

## PARKS EQUIPMENT SERVICEPERSON - SUMMARY TABLE

JOB TASK	TASK DETAILS
<b>Lifting</b> Floor to Waist	<p><b>Max</b> = 101 lbs (rare, when lifting 'hole-hog' while working on irrigation systems)</p> <p><b>Avg</b> = 30 - 50 lbs (occasional to frequent)</p> <p>e.g. Lifting of various items, including (but not limited to) the following:</p> <ul style="list-style-type: none"> <li>• 101 lbs when lifting 'hole hog' (while working on irrigation systems),</li> <li>• 88 lbs when lifting bag of cement (40 kg),</li> <li>• two workers lifting 12 ft. length of 6-gauge chain link mesh weighing 160 lbs (80 lbs/person),</li> <li>• two workers lifting 4" X 10" X 16 ft. wooden parking barrier weighing 120 lbs (60 lbs / person),</li> <li>• two workers lifting 10 ft. X 6 ft. temporary outfield fence-panel weighing 100 lbs (50 lbs/person),</li> <li>• Note: <i>very heavy</i> loads are required for several workers to lift one end of concrete drinking fountain weighing 485 lbs in total (this manual-lift is only necessary when the location of the fountain is not accessible to machinery).</li> </ul>
<b>Lifting</b> Waist to Shoulder / Head	<p><b>Max</b> = 85 lbs (rare, four workers lifting 340 lb steel picnic table)</p> <p><b>Avg</b> = 10 - 50 lbs (occasional)</p> <p>e.g. Lifting of various items, including (but not limited to) the following:</p> <ul style="list-style-type: none"> <li>• four workers lifting a 340 lb steel picnic table (85 lbs/person) onto pick-up truck bed, such that workers' gripping hands travel between waist-level and shoulder / head-level,</li> <li>• two workers lifting a 120 lb steel component (60 lbs/person) to overhead-level for mounting onto playground equipment structure,</li> <li>• four workers lifting a 220 lb steel park bench (55 lbs/person) onto pick-up truck bed, such that workers' gripping hands travel between waist-level and shoulder / head-level,</li> <li>• four workers lifting a 190 lb wooden picnic table (48 lbs/person) into pick-up truck bed, such that workers' gripping hands travel between waist-level and shoulder / head-level,</li> <li>• lifting various materials (5 - 10 lbs) into storage bins.</li> </ul>

<p><b>Lifting</b></p> <p>Floor to Shoulder / Head</p>	<p><b>Max</b> = 85 lbs (rare, lifting 21 ft. length of structural steel pipe onto truck-rack 86 inches above ground-level)</p> <p><b>Avg</b> = 30 - 50 lbs (occasional)</p> <p>e.g. Lifting of various items, including (but not limited to) the following:</p> <ul style="list-style-type: none"> <li>• 21 ft. length of structural steel pipe (85 lbs) lifted prior to pushing pipe onto truck-rack 86 inches above ground-level (note: shorter lengths of structural steel pipe are also lifted),</li> <li>• tipping up one end of a 12 ft. length of 6-gauge chain link mesh (requires 80 lbs of lifting-load),</li> <li>• 16 ft. length of 2" X 10" lumber (weighing 45 lbs dry-weight, but weighing significantly more when waterlogged).</li> </ul>
<p><b>Carrying</b></p> <p>Two-Handed</p>	<p><b>Max</b> = 110 lbs (rare, two workers carrying 220 lb steel park bench over a distance of 10 - 20 feet)</p> <p><b>Avg</b> = 30 - 50 lbs (occasional to frequent)</p> <p>e.g. Bilateral Carrying of various items, including (but not limited to) the following:</p> <ul style="list-style-type: none"> <li>• two workers carrying 220 lb steel park bench (110 lbs/person) over a distance of 10 - 20 feet,</li> <li>• two workers carrying 190 lb wooden picnic table (95 lbs/person) over a distance of 10 - 50 feet,</li> <li>• generator (75 lbs) carried over distances of 20 - 30 feet,</li> <li>• two workers carrying 4" X 10" X 16 ft. wooden parking barrier weighing 120 lbs (60 lbs/person) over a distance of 30 feet,</li> <li>• two workers carrying 10 ft. X 6 ft. temporary outfield fence-panel weighing 100 lbs (50 lbs/person) over a distance of 30 feet.</li> </ul>
<p><b>Carrying</b></p> <p>One-Handed</p>	<p><b>Max</b> = 130 lbs (rare, two workers carrying a garbage-can style container 40% filled with concrete weighing 260 lbs ... i.e. each worker is holding onto the can with only one hand, with the can situated between the workers)</p> <p><b>Avg</b> = 10 - 40 lbs (occasional)</p> <p>e.g. Unilateral Carrying of various items, including (but not limited to) the following:</p> <ul style="list-style-type: none"> <li>• two workers carrying 260 lb garbage-can style container 40% full of concrete (130 lbs/person) over a distance of 10 feet,</li> <li>• toolkit (20 - 40 lbs) carried a distance of 100+ feet within parks / playgrounds / sporting venues</li> <li>• lightweight hand-tools, paint cans, etc. carried in one-hand style over varied distances.</li> </ul>

<b>Carrying</b> Over-the-Shoulder	<p><b>Max</b> = 20 lbs (occasional, carrying 20-foot length of PVC pipe in an ‘over-the-shoulder’ style while working on irrigation systems)</p> <p><b>Avg</b> = 10 - 20 lbs (occasional)</p>
<b>Pushing / Pulling</b>	<p><b>Max</b> = 80 lbs of <u>force</u> (rare, when using wrench to loosen firmly-tightened pipe fittings)</p> <p><b>Avg</b> = 10 lbs - 20 lbs of push / pull <u>force</u> (occasional)</p> <p>e.g. Pushing / Pulling associated with varied tasks, including (but not limited to) the following:</p> <ul style="list-style-type: none"> <li>wrench to loosen firmly-tightened pipe fittings (up to 80 lbs of push / pull <u>force</u>),</li> <li>42 lbs of <u>force</u> to push a length of 2” structural steel pipe (up to 21 ft. in length) onto overhead truck-rack 86 inches above ground-level,</li> <li>varied, but high push / pull <u>forces</u> when using digging bar to lever large rocks in the ground in order for their removal (while working on irrigation systems),</li> <li>two workers pushing steel park bench onto pick-up truck bed (18 lbs of <u>force</u> per person),</li> <li>13 lbs of <u>force</u> to pull a 2” X 10” X 16 ft. length of lumber from the storage bin (or equivalent force to push a piece of lumber back into the storage bin),</li> <li>varied, but moderate to high push / pull <u>forces</u> required with wheelbarrow usage (heaviest loads involve transport of rock and wet soil),</li> <li>moderate pulling <u>forces</u> are required to drag a picnic table or park bench across the concrete floor of the Parks repair shop.</li> </ul>
<b>Reaching</b> Above Shoulder	<p><b>Max Duration</b> = *15 minutes (rare, position of approx. 135° of shoulder flexion is required when prone-lying on the ground with arm extended in order to access valve box situated below ground-level while working on irrigation systems).</p> <p>*Note: realistically there would be an option to <i>interrupt</i> this sustained posture; however, this would add time to overall task completion.</p> <p><b>Avg Duration</b> = 30 seconds of head-level reaching completed on highly <i>repetitive</i> basis (i.e. repeated 30 sec. bouts of overhead reaching, with 10 sec. of rest between each reaching-rep) while tying-off lengths of 6 ft. tall chain link fencing. Total duration of this cycle of repetitive reaching could be 15 - 60 min.</p> <p>Note: brief non-repetitive bouts of high-level reaching are also required during various tasks; such as pulling PVC pipe in / out of storage racks, structural steel pipe on / off overhead truck-racks, accessing items that are stored on high storage shelves, etc.</p>
<b>Reaching</b> Below Shoulder	<p><b>Frequency</b> = Frequent</p> <p>e.g. Reaching: to low levels during the vast majority of job tasks.</p>

<b>Neck Motion</b> - Flexion (look down) - Extension (look up) - Rotation (side turn)	Flexion: Max Duration = 5 seconds to several minutes (i.e. widely varying) Extension: Max Duration = 5 seconds to several minutes (i.e. widely varying) Rotation Max: Duration = 5 sec
<b>Sitting</b>	<b>Max Portion of Shift</b> = 10% of shift (when working in valve box, or when driving to / from work sites)  <b>Max Sustained Duration</b> = 15 - 20 minutes
<b>Standing / Walking</b>	<b>Max Portion of Shift</b> = 90% of shift (frequent to continuous, while performing a vast array of job demands that require workers to remain on their feet)  <b>Max Sustained Duration</b> = 2.5 hours sustained (i.e. remaining on one's feet until break periods)
<b>Climbing</b> Ladders / Stairs	<b>Ladders</b> = climbing approx. 5 feet up ladder (rare, when using ladder to access irrigation controllers that are mounted in elevated positions on lamp-posts, hydro poles, etc.)  <b>Stairs</b> = climbing one flight of stairs (rare)
<b>Bending / Stooping</b>	<b>Max Duration</b> = up to *1.5 hours sustained in a combined bending + kneeling posture while working on valves of irrigation systems.  *Note: realistically there would be an option to <i>interrupt</i> this sustained posture; however, this would add time to overall task completion.  <b>Avg Duration</b> = 10 minutes sustained bending (i.e. repairing irrigation pipe)  <b>Frequency</b> = Frequent repetitive bending (e.g. 2 - 3 min. bouts of bending or stooping repeated for 15 min. durations, such as when completing repairs or maintenance duties on park benches / picnic tables / playground equipment).  <i>Note: squatting / kneeling may also be acceptable postural-substitutions for bending during certain Parks Equipment Serviceperson job task scenarios (e.g. while repairing park benches / picnic tables / playground equipment). Alternating work-postures may also be a preferred option.</i>



<p><b>Ground-Level Postures</b></p> <p>(i.e. Kneeling and/or Squatting)</p>	<p><b><u>Kneeling</u></b> = up to *1.5 hours sustained in a combined kneeling + bending posture while working on valves of irrigation systems.</p> <p>*Note: realistically there would be an option to <i>interrupt</i> this sustained posture; however, this would add time to overall task completion.</p> <p><b>Frequency</b> = Frequent repetitive bouts of kneeling for up to 2 hours while:</p> <ul style="list-style-type: none"> <li>• tying-off lengths of 6-ft. tall chain link fencing,</li> <li>• completing graffiti-removal tasks on park benches / picnic tables / playground equipment,</li> <li>• completing repairs or maintenance duties on park benches / picnic tables / playground equipment.</li> </ul> <p><b><u>Squatting</u></b> = 10 minutes sustained (e.g. completing repairs or maintenance duties on park benches / picnic tables / playground equipment)</p> <p><b>Squatting Frequency</b> = Rare requirement for squatting, as most workers would choose kneeling for the completion of sustained low-elevation job tasks such as tying-off fencing, removing graffiti, repairing park equipment, etc.</p> <p><i>Note: bending may be an acceptable postural-substitution for kneeling or squatting during certain Parks Equipment Serviceperson job task scenarios (e.g. repairing pipe, tying-off fencing, etc.), depending upon each worker's preference. Alternating work-postures may also be a preferred option.</i></p>
<p><b>Crawling</b></p>	<p><b>Max Distance</b> = crawling on hands &amp; knees over a max distance of 6 ft. during safety inspections of playground equipment / structures (rare to occasional).</p>
<p><b>Sweeping</b></p>	<p><b>Max Duration</b> = 10 - 15 minutes sustained (rare)</p> <p>e.g. Sweeping during the following tasks:</p> <ul style="list-style-type: none"> <li>• using a push-broom to clean dirt off sidewalk upon completion of other Parks-related job tasks that involve digging.</li> </ul>
<p><b>Raking</b></p>	<p><b>Max Portion of Shift</b> = 100% of shift (occasional while working on irrigation systems, e.g. when back-filling trenches)</p> <p><b>Max Sustained Duration</b> = 2.5 hours sustained (i.e. continuous raking of soil until break periods while working on irrigation systems)</p>

<b>Shovelling</b>	<p><b>Max Portion of Shift</b> = 100% of shift (occasional while working on irrigation systems, e.g. cleaning out trench after trencher-machine has finished the initial dig-out process)</p> <p><b>Max Sustained Duration</b> = 2.5 hours sustained (i.e. continuous shovelling until break periods while working on irrigation systems)</p> <p>Note: Parks Equipment Serviceperson might also be required to shovel for up to 2 hours during the process of fence installation, or while laying concrete pads (e.g. for mounting of picnic tables or park benches).</p>
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