



## JOB DEMANDS ANALYSIS

**Company:** Greater Vancouver Regional District

**Location:** Capilano Park

**Job Title:** Park Operator

**Classification:** Regular Duty

### Purpose of Activities

The purpose of the duties of the Park Operator is to organize and assist in the maintaining the condition of the parks in the GVRD for the safe enjoyment of all the visitors.

### Tools and Equipment

The Driver/Swamper will use the following tools and equipment to perform their duties:

- Pick-up Truck.
- Computer with mouse and keyboard.
- Telephone.
- Gloves.
- Safety Boots.
- Safety Vest.
- Shovels, spades and other hand tools.
- Pressure washer.
- Leaf blower.
- Power broom.
- Chainsaws.
- Handheld radio.

### Usual Methods – Rounds

Typically, this is carried out by two individuals and will take between one and two hours to complete. It can take longer if there is only one person available for the activity.

1. Check over truck at base.
2. Drive truck out to route area.
3. Stop and get out of the vehicle.
4. Empty garbage can, put bags in back of the truck (lift 1.5 metres).
5. Climb back into truck and drive slowly off.
6. Repeat steps 3 to 5 between 16 and 18 times.
7. Open washrooms (2) and sweep, mop, clean toilets as well as change garbage.
8. Do light litter pick-up along roadway, parking lots, turf areas with a trigger picker and a garbage bag.
9. Clear ditches and drains with shovel, pressure washer or leaf blower as necessary.



### Usual Methods – Bridge Repairs/Trail Rehabilitation

This activity includes the construction and repair of bridge structures and trails in the parks. It usually involves a team of several people working in different conditions (e.g., on a slope, flat area, over a stream, over a gorge) and can require the use of harnesses and other safety equipment. Much of the material is brought to the repair site via an ATV with a trailer while other elements are carried by hand. These can include hand tools (chainsaws, timber winch), bags of concrete, timbers and other very heavy and/or awkward items.

Some of this work will involve the removal of blowdowns and the clearing of landslides. This is extremely heavy work featuring chainsaw and lifting activities.

### Usual Methods – Gardening/Turf Management

Spending time in flower beds weeding, planting and pruning. Cutting grass with tractor, operating a walk-behind blower. Prolonged exposure to stooped and kneeling postures is possible.

### Usual Methods – Patrol

On foot or in the vehicle, more likely on foot during the weekends. This involves considerable public interaction and can include enforcing bylaws as they relate to dogs, cycling, dumping and parking.

### Administrative Issues

The Park Operator works with the Park Assistants and there are 3 – 4 of those on duty during any given day of the summer and 1 – 2 on weekend at Capilano. A larger park like Pacific Spirit may have as many as 13 or 14 staff. Staff provide coverage between the hours of 0730 and 1930 daily. The Operator is responsible for delegating and overseeing the work of the assistants.

The Operator will spend time with budgeting issues and other sedentary tasks so they are less likely to be involved in the heavy work as the assistants are. They will spend time driving to meetings elsewhere in the region.

The environmental conditions can change this job appreciably. It is possible to be exposed to extreme hot conditions that have implications for hydration, sunburn and heatstroke. Wet weather is common and can make footing less reliable even treacherous. Cold is also a possibility as is snow, although this is less likely than wet conditions. There are also requirements for Basic Rescuer CPR certification in this position.

### Activity Demand Variables

These variables are tasks that must be carried out by the employee and are implicitly or explicitly required as objectives of the job.

- Drive a vehicle through a variety of different road surfaces.
- Walk over uneven ground, on steep slopes.
- Lift, carry, grip and handle unpredictable and awkward loads.
- Carry out tasks under unpredictable outdoor conditions that often include steady rainfall.



### Worker Decision Variables

These variables are the sub-routines and cognitive/physical decisions made by the worker in carrying out the objectives of the job.

- Choose postures for carrying out duties (e.g. lifting using hips and maintaining neutral spine, creative energy saving techniques).
- Planning of lifts and routes for carrying.
- Frequency and timing of switching duties. Delegation.

### Accommodative Considerations

1. People with injuries to the spine in any region may have difficulty with constant movement of loads from near ground level to the back of the truck.
2. People with shoulder injuries such as rotator cuff tendinitis, bursitis and instability may have difficulty with the frequent and often challenging loads and the frequent elevated arm postures.
3. People with any upper extremity problems may have difficulty with this position because of regular gripping and carrying of loads.
4. Individuals with knee, hip or ankle difficulties may find they have difficulty with this job because of constant walking over unpredictable ground while carrying load. This includes steep slopes and loose rock.
5. A very high level of general fitness is preferred for this job and individuals who do not present with this feature are likely to be at higher risk for mechanical injury.
6. Individuals recovering from systemic illness should be carefully screened before entering this activity.
7. Individuals who do not cope well in outdoor high-autonomy work environments would have difficulty with this position.
8. There is a significant learning curve associated with the tasks.

Prepared By:

Greg Hart, Kinesiologist

February 24, 1999



## Summary of Stresses

### **Metabolic Stresses**

The aerobic energy system supplies the vast majority of energy required to complete the tasks in this position since the work is ongoing in nature. It is a paradox that using good mechanical form in lifting and carrying actually increases energy consumption. Individuals with low aerobic power will take increasing mechanical risks with their bodies as a result of mounting fatigue. There are also high anaerobic power requirements associated with climbing a steep slope or maneuvering a heavy object (e.g., timber) into place.

### **Structural Stresses**

**Spine** – there are a number of issues impacting the spine. While the individual is driving, the spine becomes flexed and the muscles do not act to support it. There is also increasing laxity of the rear ligaments and the outer ring of the disc with increased pressure on the disc nucleus. This time of inactivity is followed by a period of intense, repetitive exertion that requires significant stabilizing of the spine. There is a profound emphasis on the strength and endurance of the torso stabilizers. If there is bending involved in the lifting, it exacerbates the problems brought on by sitting. If there are asymmetrical lifts and twisting motions while carrying load, the risk of damage to the structures in the spine increases dramatically. Many of these postures are possible in this job.

**Shoulders and Neck** – due to the considerable load being carried by the upper extremities and the frequent positioning of the arms away from the body, this activity places individuals at increased risk for rotator cuff tendinitis, sub-acromial bursitis and damage to the labral surfaces of the joint. The shoulder is mechanically ineffective when the arms are away from the body, especially under load. This also contributes to significant tension through the muscles of the neck and upper back. When the arm is held above the shoulder, it is in an impingement position which can lead to a number of the conditions stated above.

**Arms and Hands** – frequent heavy gripping increased the risk of injuries to the elbows and wrist tendinitis which can lead to nerve entrapment scenarios. The gripping is made worse by the wearing of gloves (obviously necessary) and wet materials. As muscles in the shoulder, trunk and legs fatigue, more work often comes from the arms which will also increase loads at the elbow and forearm and could lead to epicondylitis type conditions (i.e., tennis or golfer's elbow).

## **INTERVENTIONS**

Recommendations that could be implemented to increase productivity and lessen the risk of injury are listed below:

1. Encourage the workers to maintain an increased level of fitness away from work that will focus on cardiovascular endurance, anaerobic power, muscular strength, muscular endurance and flexibility. Especially cardiovascular endurance. This is the type of work where the most impactful intervention is always going to be with the person doing the work due to the variability of the presentation of tasks.



2. Provide regular education in effective use of the body and neutral joint positions for this type of work. This cannot be standard bend your knees and lift information, but creative work aimed at the precise issues of the job in these very challenging environments.
3. Avoid asymmetrical lifts wherever possible.
4. Avoid twisting with a load to avoid damage to discs in the spine.
5. Keep arms and loads close to the body at all times.
6. Test a load before it is lifted.
7. Plan the route when manually handling materials.
8. Take a moment to extend the spine and warm up the body when switching from driving to strenuous activities.
9. Be careful to not increase grip forces unnecessarily.
10. Review footwear to insure that safety wear also is as light as possible with excellent heel and forefoot support.
11. Consider a program of pre-employment physical testing to ensure that candidates are able to safely carry out the essential job demands.
12. Insure that the radios utilized are effective in all parts of the park so that the assistants aren't cut off from the communication loop.
13. Insure that a crane or other heavy equipment is utilized wherever safe and possible to decrease manual loads on workers.
14. Insure that the workstation in the office is set-up ergonomically so that extended bouts of computer work do not increase injury risk.

PJDC-Park Operator

|                                                                              |                             |                    |                  |          |          |          |                                                                          |                        |                                         |                                               |
|------------------------------------------------------------------------------|-----------------------------|--------------------|------------------|----------|----------|----------|--------------------------------------------------------------------------|------------------------|-----------------------------------------|-----------------------------------------------|
| Referral: Keith Arkell                                                       |                             | Organization: GVRD |                  |          |          |          |                                                                          |                        | Title: Park Operator                    |                                               |
| Dept.: Parks                                                                 |                             | Division: Capilano |                  |          |          |          |                                                                          |                        | Contact:                                |                                               |
|                                                                              |                             | FREQUENCY*         |                  |          |          |          |                                                                          |                        | Date: March 19, 1999                    |                                               |
| PHYSICAL DEMANDS                                                             |                             | R<br>E<br>Q<br>D   | S<br>I<br>D<br>E | Sel<br>1 | Low<br>2 | Mod<br>3 | High<br>4                                                                | Max.<br>Weight<br>(kg) | Usual<br>Weight<br>(kg)                 | COMMENTS                                      |
| S<br>T<br>R<br>E<br>N<br>G<br>T<br>H                                         | Lifting - Floor to Knuckle  |                    | B                |          | X        |          |                                                                          | 55                     | 8                                       | Varies - shovel, logs, brush, power tools     |
|                                                                              | Lifting - Knuckle to Waist  |                    | B                |          | X        |          |                                                                          | 55                     | 8                                       | Varies - shovel, logs, brush, power tools     |
|                                                                              | Lifting - Waist to Shoulder |                    | B                |          | X        |          |                                                                          | 20                     | 5                                       | Logs and debris into the back of the truck    |
|                                                                              | Lifting - Over Head         |                    | B                |          | X        |          |                                                                          | 25                     | 5                                       | Bracing and placing timbers in bridge repair  |
|                                                                              | Carrying - With Handles     |                    | B                |          | X        |          |                                                                          | 10                     | 3                                       | Tools for short distances                     |
|                                                                              | Carrying - Without Handles  |                    | B                |          |          | X        |                                                                          | 30                     | 4                                       | Logs, light equipment                         |
|                                                                              | Pushing - Upper Extremity   |                    | B                |          | X        |          |                                                                          | 40                     | 10                                      | Saws, materials into position in construction |
|                                                                              | Pushing - Hip/Leg Assist    |                    | B                |          | X        |          |                                                                          | 40                     | 10                                      | Saws, materials into position in construction |
|                                                                              | Pulling - Upper Extremity   |                    | B                |          | X        |          |                                                                          | 40                     | 10                                      | Saws, winch for trees                         |
|                                                                              | Pulling - Hip/Leg Assist    |                    | B                |          | X        |          |                                                                          | 90                     | 10                                      | Saws, winch for trees                         |
|                                                                              | Reach - Shoulder or Above   |                    | B                |          | X        |          |                                                                          | 10                     | 3%BW                                    | Placing articles in the back of the truck     |
|                                                                              | Reach - Sho. or Above extnd |                    | D                | X        |          |          |                                                                          | 10                     | 3                                       |                                               |
|                                                                              | Reach - Below Shoulder      |                    | D                |          | X        |          |                                                                          | 10                     | 4                                       | Repairs, working in awkward locations         |
|                                                                              | Reach - Bel. Shoulder extnd |                    | D                |          | X        |          |                                                                          | 10                     | 4                                       | Repairs, working in awkward locations         |
|                                                                              | Handling                    |                    |                  |          |          | X        |                                                                          | max.                   | min.                                    | Tools, shovel, logs, brush, bags, winch       |
| Gripping                                                                     |                             |                    |                  |          |          | X        | max.                                                                     | min.                   | Tools, shovel, logs, brush, bags, winch |                                               |
| Fine Finger Movements                                                        |                             | D                  |                  |          |          | X        | mod.                                                                     | min.                   | Writing, computer keyboarding           |                                               |
| E                                                                            | Aerobic (percent)           |                    |                  |          |          | 90       | Riding in vehicle, sitting, light walking & climbing, standing           |                        |                                         |                                               |
| N                                                                            | Anaerobic (percent)         |                    |                  |          | 10       |          | Heavy lifting, extended stair or climbing, other forceful short exertion |                        |                                         |                                               |
| R                                                                            | High Energy Expenditure     |                    |                  |          | X        |          | Working in rough terrain, heavy exertion work (lifting, climbing)        |                        |                                         |                                               |
| G                                                                            | Low Energy Expenditure      |                    |                  |          |          | X        | Seated activity (computer and meeting work)                              |                        |                                         |                                               |
| P<br>O<br>S<br>T<br>U<br>R<br>E<br>+<br>M<br>O<br>B<br>I<br>L<br>I<br>T<br>Y | Neck - Static Flexion       |                    |                  |          |          | X        | Working on tasks below waist level                                       |                        |                                         |                                               |
|                                                                              | Neck - Static Neutral       |                    |                  |          |          |          |                                                                          |                        |                                         |                                               |
|                                                                              | Neck - Static Extension     |                    |                  |          | X        |          | Looking up during prolonged bridge repair                                |                        |                                         |                                               |
|                                                                              | Neck - Rotation             |                    | B                |          |          | X        | Survey area while driving or walking                                     |                        |                                         |                                               |
|                                                                              | Throwing                    |                    |                  | X        |          |          | Rope or chain around tree, etc.                                          |                        |                                         |                                               |
|                                                                              | Sitting                     |                    |                  |          |          | X        | In vehicle, at meetings or shop for extended periods of time             |                        |                                         |                                               |
|                                                                              | Standing                    |                    |                  |          |          | X        | On a variety of surfaces including steep slopes                          |                        |                                         |                                               |
|                                                                              | Walking                     |                    |                  |          |          | X        | Varying distances over a variety of terrain (concrete to forest)         |                        |                                         |                                               |
|                                                                              | Running/Jumping             |                    |                  |          | X        |          | Jump down off of a rock or log/felled tree                               |                        |                                         |                                               |
|                                                                              | Climbing - Arms and Legs    |                    |                  |          |          |          |                                                                          |                        |                                         |                                               |
|                                                                              | Climbing - Legs Only        |                    |                  |          |          | X        | Up/downhill on trails or through bush                                    |                        |                                         |                                               |
|                                                                              | Bending/Stooping            |                    |                  |          |          | X        | Clearing ditches, picking up trash, cleaning, construction projects      |                        |                                         |                                               |
|                                                                              | Crouching                   |                    |                  |          | X        |          | Clearing ditches, picking up trash, cleaning, construction projects      |                        |                                         |                                               |
|                                                                              | Kneeling                    |                    |                  |          |          |          |                                                                          |                        |                                         |                                               |
|                                                                              | Crawling                    |                    |                  |          |          |          |                                                                          |                        |                                         |                                               |
| G<br>E<br>N<br>E<br>R<br>A<br>L                                              | Twisting                    |                    | B                | X        |          |          | Possible in awkward locations and confined spaces                        |                        |                                         |                                               |
|                                                                              | Balancing                   |                    |                  |          |          | X        | On ladders and near the edges of cliffs and rivers                       |                        |                                         |                                               |
|                                                                              | Traveling                   |                    |                  |          |          | X        | Around the watershed area and to meetings in the GVRD                    |                        |                                         |                                               |
|                                                                              | Work Alone                  |                    |                  |          |          | X        | On most routine duties, in group for project work                        |                        |                                         |                                               |
|                                                                              | Interact with Public        |                    |                  |          |          | X        | A large part of the job involves interaction with public (bylaws)        |                        |                                         |                                               |
|                                                                              | Operate Equip/Machinery     |                    |                  |          |          | X        | Drive trucks/ATV, operate chainsaws, log winch, power broom              |                        |                                         |                                               |
|                                                                              | Irregular/Extended Hours    |                    |                  |          |          |          |                                                                          |                        |                                         |                                               |

\* Frequency Legend      1 = Seldom; Not Daily    2 = Low Daily Activity; < 1hr  
3 = Moderate Demand; Repetition 1 - 3 hrs daily      4 = High Frequency Demand; Repetition > 3 hrs daily

The following shading denotes a      HIGH RISK TASK:      Modifications should be considered

**REQD** is marked with an X if the particular demand or category is relevant to the purpose of the job.

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PJDC-Park Operator

|                                                |                                                                         |                  |                  |                            |          |           |                                  |                                                              |
|------------------------------------------------|-------------------------------------------------------------------------|------------------|------------------|----------------------------|----------|-----------|----------------------------------|--------------------------------------------------------------|
| Referral:                                      |                                                                         | Organization:    |                  | Title: see 1st page header |          |           |                                  |                                                              |
| Dept.:                                         |                                                                         | Division:        |                  | Contact:                   |          |           |                                  |                                                              |
| PHYSICAL DEMANDS                               |                                                                         | R<br>E<br>Q<br>D | S<br>I<br>D<br>E | FREQUENCY*                 |          |           |                                  | COMMENTS                                                     |
|                                                |                                                                         |                  |                  | Sel.<br>1                  | Low<br>2 | Mod.<br>3 | High<br>4                        |                                                              |
| P<br>E<br>R<br>C<br>E<br>P<br>T<br>I<br>O<br>N | Hearing - Conversations                                                 |                  | B                |                            |          |           | X                                | Communication with co-workers and members of the public      |
|                                                | Hearing - Other Sounds                                                  |                  | B                |                            |          |           | X                                | Machinery, water flow                                        |
|                                                | Vision - Far                                                            |                  | B                |                            |          |           | X                                | Most activities                                              |
|                                                | Vision - Near                                                           |                  | B                |                            | X        |           |                                  | Fine repair work, reading notes                              |
|                                                | Vision - Colour                                                         |                  |                  |                            | X        |           |                                  | Determine condition of water/flora/fauna                     |
|                                                | Vision - Depth                                                          |                  | B                |                            |          |           | X                                | Working in environments where distances are to be judged     |
|                                                | Perception - Spatial                                                    |                  | B                |                            |          |           | X                                | Working around obstacles and reaching to specific points     |
|                                                | Perception - Form                                                       |                  |                  |                            |          |           | X                                | See differences in water flow patterns and flora/fauna       |
|                                                | Feeling (Tactile)                                                       |                  |                  |                            | X        |           |                                  | Sense grip pressure                                          |
|                                                | Reading                                                                 |                  |                  |                            |          | X         |                                  | Signs, directions, work requests, manuals                    |
|                                                | Writing                                                                 |                  |                  |                            | X        |           |                                  | Short notes and reports                                      |
|                                                | Speech                                                                  |                  |                  |                            |          |           | X                                | Talk to co-workers and members of the public                 |
|                                                | W<br>O<br>R<br>K<br>E<br>N<br>V<br>I<br>R<br>O<br>N<br>M<br>E<br>N<br>T | Inside Work      |                  |                            |          |           | X                                |                                                              |
| Outside Work                                   |                                                                         |                  |                  |                            |          |           | X                                | In variety of park conditions or in wilderness spots         |
| Hot Conditions >25 deg. C                      |                                                                         |                  |                  | X                          |          |           |                                  | In summer                                                    |
| Cold Conditions <10 deg.C                      |                                                                         |                  |                  | X                          |          |           |                                  | Can be frequent in winter because of elevation in some parks |
| Humid                                          |                                                                         |                  |                  |                            |          | X         |                                  | Considerable rainfall, especially fall/winter                |
| Dust                                           |                                                                         |                  |                  |                            |          | X         |                                  | Inside and outside exposure to dust                          |
| Vapor Fumes                                    |                                                                         |                  |                  |                            |          | X         |                                  | From equipment and vehicles                                  |
| Hazardous Machines                             |                                                                         |                  |                  |                            |          | X         |                                  | ATV tractor, winch, power broom                              |
| Proximity to Moving Object                     |                                                                         |                  |                  |                            | X        |           |                                  | Vehicles, trees being moved or felled                        |
| Noise                                          |                                                                         |                  |                  |                            |          | X         |                                  | Background machine/water noise                               |
| Electrical Hazard                              |                                                                         |                  |                  |                            |          |           |                                  |                                                              |
| Sharp Tools                                    |                                                                         |                  |                  |                            |          | X         |                                  | Saws, chainsaws                                              |
| Radiant/Thermal Energy                         |                                                                         |                  |                  |                            |          | X         |                                  | Reflected off of water, concrete and through windshield      |
| Slippery Conditions                            |                                                                         |                  |                  |                            |          |           | X                                | Possible outside since water is everywhere                   |
| Vibration and Related                          |                                                                         |                  |                  |                            | X        |           |                                  | Some jarring while riding in the vehicle                     |
| Chemical Irritants                             |                                                                         |                  |                  |                            |          | X         |                                  | Potential for exposure to chlorine and sulphur dioxide       |
| Organic Substances                             |                                                                         |                  |                  |                            |          | X         |                                  | Dead animals, rotting plant material                         |
| Medical Waste                                  |                                                                         |                  |                  |                            |          |           |                                  |                                                              |
| Blood Products                                 |                                                                         |                  |                  |                            |          |           |                                  |                                                              |
| Congested Worksite                             |                                                                         |                  |                  |                            | X        |           |                                  | On some projects                                             |
| T                                              | Lighting - Direct                                                       |                  |                  |                            |          |           | X                                | Sunlight                                                     |
|                                                | Lighting - Indirect                                                     |                  |                  |                            |          |           |                                  |                                                              |
|                                                | Lighting - Adjustable                                                   |                  |                  |                            | X        |           |                                  | Flashlight                                                   |
|                                                | Lighting - Fluorescent                                                  |                  |                  |                            |          |           | X                                | In some shop areas                                           |
|                                                | Lighting - Incandescent                                                 |                  |                  |                            |          |           | X                                | In some shop areas                                           |
| Lighting - Shadows etc.                        |                                                                         |                  |                  |                            | X        |           | Variety of possibilities outside |                                                              |

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For detailed descriptions of each of the different categories, please refer to the reference guide or inquire with Human Effort at 1-888-4EFFORT