



## **JOB DEMANDS ANALYSIS**

**Company:** City of Vancouver

**Location:** Transfer Station

**Job Title:** Abandoned Garbage

**Classification:** Regular Duty

### Purpose of Activities

The purpose of the Abandoned Garbage crew is to collect garbage not gathered on regular garbage collection routes.

### Tools and Equipment

The Abandoned Garbage worker will use the following tools and equipment to perform his duties:

- Garbage Truck
- Shovel

### Usual Methods

1. Receive work order from the Foreman.
2. Perform a pre-trip vehicle inspection.
3. Geographically organize work-order locations.
4. Climb into the truck.
5. Drive to the first location.
6. Climb out of the truck.
7. Manually load the garbage from the street to the truck. Use a shovel if required.
8. Climb back into the truck.
9. Proceed to subsequent locations to complete work order.

### Administrative Issues

The Abandoned Garbage crew works 0700 to 1530, with a 30-minute lunch break. Days of work vary; the crew is scheduled once enough work orders accumulate (minimum twice per week). There are two workers per crew per shift (a third worker may be sent for particularly heavy jobs). Any repairs and mechanical maintenance needed to the vehicle are recorded on a standard form by the driver, and submitted directly to the mechanics' shop.



### 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 large vehicle.
- Walk over uneven ground.
- Lift, carry, grip and handle unpredictable loads.
- Meet daily deadlines.
- 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.
- Placement of the truck with respect to the garbage.
- Frequency and timing of switching duties.

### 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 tendonitis, 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 constant gripping and carrying of loads.
4. Post-whiplash and other neck problems may have difficulty with this position because of constant upper extremity load and elevated arm postures
5. Individuals with knee, hip or ankle difficulties may find have difficulty with this job because of constant walking over unpredictable ground while carrying load.
6. 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.
7. Individuals recovering from systemic illness should be carefully screened before entering this activity.
8. Individuals who do not cope under deadline pressure or in outdoor high-autonomy work environments would have difficulty with this position.
9. There is no significant learning curve associated with the tasks.



## 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.

### 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.

**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 tendonitis, 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 tendonitis, 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, muscular strength, muscular endurance and flexibility. Especially cardiovascular endurance.
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.
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 from the residence to the truck, get the truck as close as possible.
8. Take a moment to extend the spine and warm up the body when switching from driving to swamping.
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.

## PJDC-Abandoned Garbage

|  |   |   |                                      |                  |            |          |          |  |                        |  |          |  |
|--|---|---|--------------------------------------|------------------|------------|----------|----------|--|------------------------|--|----------|--|
| Referral: Debbie Craig   |   |   | Organization: City of Vancouver      |                  |            |          |          |  |                        | Title: Abandoned Garbage                       |          |  |
| Dept.: Engineering   |   |   | Division: Solid Waste                |                  |            |          |          |  |                        | Contact:                                       |          |  |
| PHYSICAL DEMANDS   |   |   | R<br>E<br>Q<br>U<br>I<br>R<br>E<br>D | S<br>I<br>D<br>E | FREQUENCY* |          |          |  | Max.<br>Weight<br>(kg) | Usual<br>Weight<br>(kg)                        | COMMENTS |  |
|  |   |   |                                      |                  | Sel<br>1   | Low<br>2 | Mod<br>3 | High<br>4  |                        |  |          |  |
| S<br>T<br>R<br>E<br>N<br>G<br>T<br>H   | Lifting - Floor to Knuckle  | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects with gloves, wet/dry surfaces |          |  |
|  | Lifting - Knuckle to Waist  | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects with gloves, wet/dry surfaces |          |  |
|  | Lifting - Waist to Shoulder   | X | B                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects with gloves, wet/dry surfaces |          |  |
|  | Lifting - Over Head   |   |                                      |                  |            |          |          |  |                        |  |          |  |
|  | Carrying - With Handles   | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects with gloves, wet/dry surfaces |          |  |
|  | Carrying - Without Handles  | X | B                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects with gloves, wet/dry surfaces |          |  |
|  | Pushing - Upper Extremity   | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage on pile, on edge of truck              |          |  |
|  | Pushing - Hip/Leg Assist  | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage on pile, on edge of truck              |          |  |
|  | Pulling - Upper Extremity   | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage on pile, on edge of truck              |          |  |
|  | Pulling - Hip/Leg Assist  | X | E                                    | X                |            |          |          | 50   | <1-30                  | garbage on pile, on edge of truck              |          |  |
|  | Reach - Shoulder or Above   | X | B                                    | X                |            |          |          | 50   | <1-30                  | garbage on pile, on edge of truck              |          |  |
|  | Reach - Sho. or Above extnd   |   |                                      |                  |            |          |          |  |                        |  |          |  |
|  | Reach - Below Shoulder  | X | E                                    | X                |            |          |          | 50   | <1-30                  | lift, carry garbage to truck                   |          |  |
|  | Reach - Bel. Shoulder extnd   | X | E                                    | X                |            |          |          | 50   | <1-30                  | lift, carry garbage to truck                   |          |  |
|  | Handling  | X | D                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects                               |          |  |
| 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 | Gripping  | X | D                                    | X                |            |          |          | 50   | <1-30                  | garbage, objects with gloves, wet surfaces     |          |  |
|  | Fine Finger Movements   | X | E                                    | X                |            |          |          | max.   | low                    | grasp garbage/objects                          |          |  |
|  | Aerobic (percent)   | X |                                      | 90               |            |          |          | load garbage from ground to truck, some walking, lifting, sit to drive |                        |  |          |  |
|  | Anaerobic (percent)   | X |                                      | 10               |            |          |          | heavy lifting on occasion  |                        |  |          |  |
|  | High Energy Expenditure   | X |                                      | X                |            |          |          | heavy lifting on occasion  |                        |  |          |  |
|  | Low Energy Expenditure  | X |                                      | X                |            |          |          | load garbage from ground to truck, some walking, lifting, sit to drive |                        |  |          |  |
|  | Neck - Static Flexion   | X |                                      | X                |            |          |          | view garbage on ground, pick up garbage                                |                        |  |          |  |
|  | Neck - Static Neutral   | X |                                      | X                |            |          |          | sit, stand, walk   |                        |  |          |  |
|  | Neck - Static Extension   | X |                                      | X                |            |          |          | look up from bend/stoop, talk with driver                              |                        |  |          |  |
|  | Neck - Rotation   | X | E                                    | X                |            |          |          | shoulder check to drive, aware of surroundings/dangers                 |                        |  |          |  |
|  | Throwing  | X |                                      | X                |            |          |          | garbage into truck hopper  |                        |  |          |  |
|  | Sitting   | X |                                      | X                |            |          |          | driving truck to pick up site(s) and transfer station                  |                        |  |          |  |
|  | Standing  | X |                                      | X                |            |          |          | at pick up site, transfer station                                      |                        |  |          |  |
|  | Walking   | X |                                      | X                |            |          |          | at each pick-up site from truck to garbage <5 -20 metres               |                        |  |          |  |
|  | Running/Jumping   |   |                                      |                  |            |          |          |  |                        |  |          |  |
| G<br>E<br>N<br>E<br>R<br>A<br>L  | Climbing - Arms and Legs  | X |                                      | X                |            |          |          | in/out vehicle   |                        |  |          |  |
|  | Climbing - Legs Only  | X |                                      | X                |            |          |          | stairs or hills to access garbage                                      |                        |  |          |  |
|  | Bending/Stooping  | X |                                      | X                |            |          |          | picking up garbage from pile, ground                                   |                        |  |          |  |
|  | Crouching   |   |                                      |                  |            |          |          |  |                        |  |          |  |
|  | Kneeling  |   |                                      |                  |            |          |          |  |                        |  |          |  |
|  | Crawling  |   |                                      |                  |            |          |          |  |                        |  |          |  |
|  | Twisting  | X | E                                    | X                |            |          |          | in/out vehicle; garbage toss (work style varies)                       |                        |  |          |  |
|  | Balancing   |   |                                      |                  |            |          |          |  |                        |  |          |  |
|  | Traveling   | X |                                      | X                |            |          |          | in city of Vancouver to pick up site(s) transfer station               |                        |  |          |  |
|  | Work Alone  |   |                                      |                  |            |          |          | two man truck  |                        |  |          |  |
|  | Interact with Public  | X |                                      | X                |            |          |          | possibly at street/curb side   |                        |  |          |  |
|  | Operate Equip/Machinery   | X |                                      | X                |            |          |          | garbage collection truck   |                        |  |          |  |
|  | Irregular/Extended Hours  | X |                                      | X                |            |          |          | not daily; as needed   |                        |  |          |  |
|  | * Frequency Legend                      1 = Seldom; Not Daily   2 = Low Daily Activity; < 1hr<br>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-Abandoned Garbage

|                    |                            |                  |                  |            |          |                            |           |   |  |
|--------------------|----------------------------|------------------|------------------|------------|----------|----------------------------|-----------|---|--|
| 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 |   |  |
| PERCEPTION         | Hearing - Conversations    | X                |                  | X          |          |                            |           | co-workers, public  |  |
|                    | Hearing - Other Sounds     | X                |                  | X          |          |                            |           | traffic, equipment  |  |
|                    | Vision - Far               | X                |                  | X          |          |                            |           | driving   |  |
|                    | Vision - Near              | X                |                  | X          |          |                            |           | drive in traffic, load garbage to truck                         |  |
|                    | Vision - Colour            | X                |                  | X          |          |                            |           | street signs, traffic lights                                    |  |
|                    | Vision - Depth             | X                |                  | X          |          |                            |           | drive/maneuver truck in lanes                                   |  |
|                    | Perception - Spatial       | X                |                  | X          |          |                            |           | drive maneuver truck in lanes                                   |  |
|                    | Perception - Form          | X                |                  | X          |          |                            |           | garbage, dangerous materials                                    |  |
|                    | Feeling (Tactile)          | X                | D                | X          |          |                            |           | grasp garbage/objects with gloves                               |  |
|                    | Reading                    | X                |                  | X          |          |                            |           | work-orders, reports  |  |
| WORKING CONDITIONS | Writing                    | X                |                  | X          |          |                            |           | reports   |  |
|                    | Speech                     | X                |                  | X          |          |                            |           | co-workers, public  |  |
|                    | Inside Work                | X                |                  | X          |          |                            |           | driving between pick up site(s) and transfer station            |  |
|                    | Outside Work               | X                |                  | X          |          |                            |           | collecting garbage  |  |
|                    | Hot Conditions >25 deg. C  | X                |                  | X          |          |                            |           | possibly spring, summer, fall                                   |  |
|                    | Cold Conditions <10 deg.C  | X                |                  | X          |          |                            |           | possibly fall, winter, spring                                   |  |
|                    | Humid                      | X                |                  | X          |          |                            |           | rainy wet weather   |  |
|                    | Dust                       | X                |                  | X          |          |                            |           | dust and debris from abandoned garbage                          |  |
|                    | Vapor Fumes                | X                |                  | X          |          |                            |           | diesel truck fumes, vehicle exhaust, possibly abandoned garbage |  |
|                    | Hazardous Machines         | X                |                  | X          |          |                            |           | rear of vehicle   |  |
| ENVIRONMENTAL      | Proximity to Moving Object | X                |                  | X          |          |                            |           | curb-side pick-up may be along busy street                      |  |
|                    | Noise                      | X                |                  | X          |          |                            |           | vehicle / traffic   |  |
|                    | Electrical Hazard          |                  |                  |            |          |                            |           |   |  |
|                    | Sharp Tools                | X                |                  | X          |          |                            |           | possibly sharp edges in garbage or on objects                   |  |
|                    | Radiant/Thermal Energy     | X                |                  | X          |          |                            |           | sun burn, chemicals in garbage                                  |  |
|                    | Slippery Conditions        | X                |                  | X          |          |                            |           | wet pavement, grass, mud  |  |
|                    | Vibration and Related      | X                |                  | X          |          |                            |           | driving to and from pickup site(s) and transfer station         |  |
|                    | Chemical Irritants         | X                |                  | X          |          |                            |           | possibly in/around abandoned garbage                            |  |
|                    | Organic Substances         | X                |                  | X          |          |                            |           | possibly in/around abandoned garbage                            |  |
|                    | Medical Waste              | X                |                  | X          |          |                            |           | possibly in/around abandoned garbage                            |  |
| TASKS              | Blood Products             | X                |                  | X          |          |                            |           | possibly in/around abandoned garbage                            |  |
|                    | Congested Worksite         | X                |                  | X          |          |                            |           | in traffic, laneways  |  |
|                    | Lighting - Direct          | X                |                  | X          |          |                            |           | sunlight  |  |
|                    | Lighting - Indirect        | X                |                  | X          |          |                            |           | daylight  |  |
|                    | Lighting - Adjustable      |                  |                  |            |          |                            |           |   |  |
|                    | Lighting - Fluorescent     |                  |                  |            |          |                            |           |   |  |
|                    | Lighting - Incandescent    |                  |                  |            |          |                            |           |   |  |
|                    | Lighting - Shadows etc.    | X                |                  | X          |          |                            |           | depends on time of day and location                             |  |

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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