



JOB DEMANDS ANALYSIS

Company: City of Burnaby

Location: Works Yard

Job Title: Catch Basin Cleaner

Classification: Regular Duty

Purpose of Activities

The purpose of the duties of the Catch Basin Cleaner is maintain clear catch basins and respond to special requests for unclogging other utilities in the City of Burnaby.

Tools and Equipment

The Labourer will use the following tools and equipment to perform their duties:

- Vacuum Truck
- Gloves.
- Safety Boots.
- Safety Vest.
- Safety Helmut.
- Vacuum Hose.
- 1.5-cm water hose with trigger.
- Straight bar.
- T-bar for pulling grates.
- Control box for running boom.

Usual Methods

1. Check over truck at work's yard.
2. Climb into the truck (1.5 m).
3. Drive vehicle in traffic to first work site (standard transmission – 5-Speed).
4. Climb down from truck at site.**
5. Take straight bar out of the holster on outside of truck.**
6. Probe catch basin with bar.
7. Replace bar on truck.**
8. If the basin is clear go to Step 18.
9. Pick up T-bar grate removing tool and walk to the grate.**
10. Pull the grate up and out of the catch basin.**
11. Drag grate for about one metre.**
12. Pick up control device (attached to front of truck) and raise the boom (being careful of overhead wires).ll
13. Using hand controls and gentle nudges, maneuver the vacuum hose into the Catch Basin.**
14. Push and pull vacuum hose to direct it in the basin.



15. Occasionally grab the small fresh water hose and squeeze the trigger so that basin is kept clear and debris is washed away.
16. Using hand control raise the boom and reset the vacuum hose on its travelling position on the front bumper of the truck.**
17. Drag grate into position with T-bar tool.**
18. Climb into truck.**
19. Repeat steps 2 to 19 between 40 and sixty times each day.

The presence of ** indicates non-value added tasks. These are tasks that do not contribute to the stated purpose of the work.

Administrative Issues

The operator works from 0700 to 1530, Monday to Friday. Overtime is possible in the night hours due to serious rainfall and/or flooding from drain back-ups.

Working around water is a key element of this job. They are responsible for cleaning catch basins and culvert drain.

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, hoses more slippery and grip forces much higher. Cold is also a possibility as is snow, although this is less likely than wet conditions.

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 and through water.
- Handle hoses and attachments.
- Carry out tasks under unpredictable outdoor conditions that often include steady rainfall.
- Respond to traffic conditions.

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).
- Positioning of equipment (usually).
- Timing of breaks.
- Driving techniques.



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 usually of low intensity. Periodically, there could be heavy demands on the anaerobic energy systems to supply energy when pulling off a catch basin grate.

Structural Stresses

Spine – forward bending over culverts and catch basins places potential flexion loads on the lumbar and thoracic spine. Sometimes this includes handling light loads and it is possible to adopt neutral spine postures in these instances but it is difficult. This activity can increase asymmetrical loading on the discs of the spine which can weaken the outer ring of the disc and leave it more susceptible to failure over time. The most significant issue is the heavy vibration riding in the vehicle while the spine is loaded in sitting.

Knees and Ankles/Feet – straddling ditches and catch basins and climbing in and out of the truck up to 60 times a day.

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 since the position does not entail high energy expenditures and there is a risk of weight gain associated with such 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.
3. Maintain a neutral spine whenever possible.
4. Keep arms and loads close to the body at all times.
5. Be careful to not increase grip forces unnecessarily.
6. Seek out a replacement vehicle that has an air-ride seat to decrease the high frequency of high magnitude vibration exposure.

PJDC-Catch Basin Cleaner

Referral: Lana Ho			Organization: City of Burnaby						Title: Catch Basin Cleaner		
Dept.: Engineering			Division: Sewers						Contact: Dan Stewart		
PHYSICAL DEMANDS			R E Q D	S I D E	FREQUENCY*				Max. Weight (kg)	Usual Weight (kg)	COMMENTS
					Sel 1	Low 2	Mod 3	High 4			
S T R E N G T H	Lifting - Floor to Knuckle										
	Lifting - Knuckle to Waist	X	B				X		20	20	Pulling off basin grate with T-bar
	Lifting - Waist to Shoulder	X	D					X	arm +	arm	Guiding the action of the hose in the basin
	Lifting - Over Head										
	Carrying - With Handles										
	Carrying - Without Handles	X	D				X		5	5	Metal testing bar and T-bar (less than 5 m/time)
	Pushing - Upper Extremity	X	D					X	15	5	Positioning hose when it is in the basin
	Pushing - Hip/Leg Assist										
	Pulling - Upper Extremity	X	D					X	15	5	Positioning hose when it is in the basin
	Pulling - Hip/Leg Assist	X	B					X	30	20	Drag the basin grate about one metre/time
	Reach - Shoulder or Above	X	B			X			min.	min.	During some driving/steering
	Reach - Sho. or Above extnd										
	Reach - Below Shoulder	X	R					X	15	5	Shifting gears on truck, positioning hose
	Reach - Bel. Shoulder extnd	X	B					X	15	5	Shifting gears on truck, positioning hose
	Handling	X	B					X	Max.	Mod.	Hose, metal bars, control box, steering wheel
Gripping	X	B					X	Mod.	Min.	Trigger on water line, steering wheel, control	
Fine Finger Movements	X	B			X			min.	min.	Operate signals, truck controls, boom controls	
E	Aerobic (percent)	X					90	Most activities although at rates approaching 4 METS			
N	Anaerobic (percent)	X		10				While pulling on and off catchbasin grates			
R	High Energy Expenditure							During walking through heavy brush, heavy labour activities			
G	Low Energy Expenditure	X					X	Many activities including standing and riding in the truck			
	Neck - Static Flexion	X					X	Looking down into catch basins, culverts			
P	Neck - Static Neutral										
O	Neck - Static Extension										
S	Neck - Rotation	X	B				X	Normal dyanmic activity, shoulder checking while driving			
T	Throwing										
U	Sitting	X					X	In vehicle on a bench seat			
R	Standing	X	B				X	On a variety of surfaces for a max. of10 minutes per occasion			
E	Walking	X				X		Usual < 5 m, sometimes up to 20m			
+	Running/Jumping	X		X				Jump over ditches, obstacles			
M	Climbing - Arms and Legs	X	B				X	In/out of truck (1.5 metres, 40 - 70 times per day)			
O	Climbing - Legs Only	X	B			X		Up and down ditches			
B	Bending/Stooping	X					X	Look into a sewer, culvert or pipe, positioning hose			
I	Crouching	X				X		Check truck in the morning, look for lost articles in basin			
L	Kneeling			X				Look for lost articles in basin			
I	Crawling										
T	Twisting										
Y	Balancing	X					X	Standing on the edge of catch basins, culverts			
G E N	Traveling	X					X	Within the Burnaby city			
	Work Alone						X	This is a position for a single operator only			
	Interact with Public	X					X	As a driver, in person while cleaning basins of culverts			
	Operate Equip/Machinery	X	B				X	Drive large truck, operate suction equipment			
	Irregular/Extended Hours	X		X				Some overtime at night, emergencies			
* Frequency Legend											

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

SIDE refers to the side or limb required to execute a task. If it is marked **E**, it indicates either side, the most common choice is listed first. **D** refers to dominant and **B** to both sides.

PJDC-Catch Basin Cleaner

Referral:		Organization:						Title: see 1st page header	
Dept.:		Division:						Contact:	
PHYSICAL DEMANDS		R E Q U I R E D	S I D E	FREQUENCY*				COMMENTS	
				Sel. 1	Low 2	Mod. 3	High 4		
P E R C E P T I O N	Hearing - Conversations	X	B		X			Co-workers over the noise of equipment, via radio	
	Hearing - Other Sounds	X	B				X	Equipment and traffic sounds	
	Vision - Far	X					X	Most all activities including driving and working truck equip.	
	Vision - Near								
V I S I O N	Vision - Colour								
	Vision - Depth	X					X	Working in traffic, judging distances in catch basins	
	Perception - Spatial	X					X	Reaching around equipment and obstacles, driving	
	Perception - Form								
F E E L I N G	Feeling (Tactile)	X	D	X				Feeling inside culverts, water while searching for objects	
	Reading	X			X			Work orders, signs	
	Writing	X	D		X			Notes	
	Speech	X			X			Communicate with co-worker, public, others via radio	
I N S I D E	Inside Work	X					X	Time spent in the truck	
	Outside Work	X					X	In all weather conditions every day	
	Hot Conditions >25 deg. C	X		X				Occasionally during summer months	
	Cold Conditions <10 deg.C	X				X		Regularly in the winter months	
H U M I D	Humid	X			X			During rain and in summer months	
	Dust	X				X		On dry days this is common in many areas	
	Vapor Fumes	X					X	Sewer gases, diesel and gasoline fuels	
	Hazardous Machines	X					X	Truck and suction equipment	
P R O X I M I T Y	Proximity to Moving Object	X					X	Working around traffic, boom with hose	
	Noise	X					X	Equipment is loud when running for suction	
	Electrical Hazard	X					X	Overhead wires	
	Sharp Tools								
R A D I A N T	Radiant/Thermal Energy	X				X		Sunlight through truck windows	
	Slippery Conditions	X					X	Mud and water on asphalt, grass, culverts, ditches	
	Vibration and Related						X	Riding in the truck on bench seat	
	Chemical Irritants	X		X				Spills of a variety of substances, oil and gasoline	
O R G A N I C	Organic Substances	X					X	Raw sewage, dead animals, rotting vegetation	
	Medical Waste			X				Syringes in catch basins or culverts	
	Blood Products								
	Congested Worksite								
L I G H T I N G	Lighting - Direct	X					X	Sunlight, outdoors or through cab windows	
	Lighting - Indirect	X				X		Reflections from buildings, vehicles and water	
	Lighting - Adjustable	X				X		Portable light for checking culverts and manholes	
	Lighting - Fluorescent								
	Lighting - Incandescent								
	Lighting - Shadows etc.	X				X		Behind buildings or truck, in ditches	

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