



JOB DEMANDS ANALYSIS

Company: City of Delta

Location: Boundary Bay Cemetery

Job Title: Cemetery Caretaker

Classification: Regular Duty

Purpose of Activities

The purpose of the Cemetery Caretaker position is to co-ordinate and carry out burials while maintaining the safe and attractive appearance of the cemetery and interacting with the public and their needs.

Tools and Equipment

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

- Kubota tractor.
- Half-ton truck.
- Ride-on Mower.
- Push Mower.
- Powerwasher.
- Leaf Blower.
- Weedeater.
- Shovel, straight-bar, pick

Usual Methods – Full Burial

The following will be carried out between once and twice per week (total of about 60 times per year).

1. Take order from customer in office (order can also come over fax from City of Delta offices).
2. Check map in office for appropriate location in cemetery for burial.
3. Go out to site (with template, tape and paint) and measure for burial.
4. Place template on ground.
5. Spray paint location for excavation.
6. Load up to 60 4x8 sheets of half and three-quarter inch plywood from compound into bucket of the backhoe.**



7. Remove sheets from bucket at gravesite and place on the ground.**
8. Guide shoring cage into excavation after backhoe is finished and disconnect chain.
9. Bring out lowering device and set up over the excavation.
10. Lower a sump pump into the excavation to pump water out.
11. Hook up the Kubota to the shelter tent and pull it out to the gravesite.
12. Guide individuals to the site for the ceremony (if necessary).
13. Use lowering device to carefully lower the casket into the excavation.
14. Connect chain to backhoe so that the shoring cage can be removed.
15. Guide backhoe and/or dump truck to backfill the excavation.
16. Use a shovel to even out the backfill job.
17. Repeat steps six to nine and return materials to the compound.**
18. Use equipment to bring marker or monument out to site.**
19. Position marker or monument.**

Usual Methods - Cremation Burial

About 120 cremation burials are conducted each year.

1. Measure space.
2. Spray paint outline.
3. Edge around outline.
4. Dig 60 to 90 cm into topsoil and hard pan with spade and straight bar.
5. Place 30 by 30 cm terracotta flute into excavation.
6. Bring marker out to the site.**
7. Place 30 by 20 cm marker (about 30 kg).
8. Backfill with spade if necessary.
9. Set-up tarp and artificial turf.
10. Direct traffic for service.
11. Put away turf and tarp.

Usual Methods – Lawn Maintenance

Maintaining the Boundary Bay Cemetery involves dealing with 10.5 acres and 3800 markers. The North Delta cemetery is smaller (3 acres) and has soil that is extremely rocky. Some of these activities involve occasional assistance from grass cutting crews or other assistance depending on the time of year and other circumstances. Maintenance activities include the following:

1. Cutting the grass (grass has to be cut every nine days).
2. Weedeater work (carrying equipment across shoulder, swinging from side to side).
3. Leaf Blowing (carrying leaf blower equipment on back and walking in cemetery)



4. Raising markers.
 - delivered by companies and moved into place by caretaker (up to 140 kilograms that have to be dragged between one and six metres).**
5. Power washing markers.
6. Horticultural activities like planting weeding and shrub bed maintenance.

When engaging in maintenance activities it often requires the careful movement of tributes and mementos that people have left on or beside markers. It usually involves moving up to fifty such items at a time. Some weigh up to 40 kilograms. This involves a considerable amount of bending and crouching along with lifting. Other maintenance activities include maintenance of equipment in the cemetery that can take up to 30 minutes each day.

Usual Methods – Public Relations

This activity includes dealing with people using the telephone and in person (sometimes with an appointment and sometimes not). This includes communication with individuals, funeral homes, churches and marker supply companies as well as the City of Delta employees.

This activity can occur when directing traffic or being involved in a burial or daily conversations with members of the public, tour groups, especially individuals visiting the burial sites of family and friends.

Usual Methods – Clerical Duties

These duties involve keeping the maps up to date, managing the files in the office and handling phone calls or faxes. This is carried out indoors.

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 cemetery caretaker works from 0800 to 1630 from Monday to Friday and a some overtime every second Saturday. They receive two ten-minute breaks and one 30 minute lunch break each day.

There are time limitations associated with this job because of regulations concerning burials. The person carrying out these duties must be prepared to work in all weather conditions including wind and rain. There is a significant issue of psychological strain for the cemetery caretaker since they are regularly dealing with grieving individuals and groups of people, often while under pressure to carry out customer



service related requirements and see to the safe and dignified burial of people's loved ones.

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.

- React to grounds conditions (e.g., length of grass).
- Operate and use equipment according to design.
- Work around items left by visitors.
- Hand digging required.
- Interaction with grieving individuals.
- Meet deadlines.
- Interaction with the public.
- Order of burial activities.
- Work in variable and often wet environments.

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 (limited in some cases by equipment or locations).
- Placement of some items in the workspace.
- Some control over timing and extent of conversation with others.

Accommodative Considerations

1. People with injuries to the spine in any region may have difficulty with the awkward lifting and ground level work.
2. People with shoulder injuries such as rotator cuff tendinitis, bursitis and instability may have difficulty with some maintenance tasks, and some lifting tasks.
3. Individuals with injuries to the neck or post-whiplash may find the sustained neck flexion in many elements of this job to be difficult as well as carrying the weedeater.
4. People with some lower extremity problems (e.g., knee, ankle or hip) may have difficulty with this position due to crouched postures and extensive walking over uneven surfaces.
5. Individuals with poorly developed aerobic capability would find this job very taxing.
6. Individuals who do not cope under deadline pressure or in outdoor, high-autonomy work environments would have difficulty with this position.



7. There is a significant learning curve associated with the tasks in this job which makes it difficult to accommodate although temporary assistants to the caretaker would be appropriate for accommodation/modified work issues.

Prepared By: Greg Hart, Kinesiologist

February 4, 1999



Summary of Stresses

Metabolic Stresses

The aerobic energy system supplies the majority of energy required to complete the tasks in this position since the work can be characterized as being prolonged at low intensities of effort. There are certain activities that require significant anaerobic contributions. This would include any activity that requires the development of significant forces such as the handling of the plywood sheets, digging, moving markers and repositioning heavy items around grave sites. The demand on the aerobic system is regular and any day can involve significant amounts of walking and other physical work. Individuals with poor aerobic power and capacity would become fatigued by the duties of this position.

Structural Stresses

Spine – there are a number of risk points for the spine in this job. The considerable amount of lifting (including shoveling), in awkward postures, of awkward objects, and often at heavy loads, presents risks to all the soft tissues of the spine. Low-level work regularly involves stooping postures that flex the spine, often under load, and place significant compression on discs and stretch forces on the disc and posterior ligaments of the spine. Carrying equipment like the leaf blower and weedeater on the back force the spine to compensate into forward flexion to maintain centre of gravity position. Care can be taken to avoid twisting motions of the spine. This motion, especially when combined with flexion, places the spinal structures at significantly increased risk for damage or failure.

Shoulders and Neck – the neck is often held in prolonged flexion looking down at the ground and in instances like using the weedeater or leaf blower, it is conjunction with loading through the neck and shoulder which aggravates this posture further. There is regular stress on the shoulders, especially in some lifting activities (i.e., moving and placing large sheets of heavy plywood) and spade or straight-bar work. This can lead to increased stress on the rotator cuff musculature as well as the ligaments in the gleno-humeral joint. These stresses are worst when the arm is brought close to or above shoulder level.



INTERVENTIONS

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

Engineering Controls

1. Explore different options for the use and movement of the sheets of plywood since there is considerable physical risk and non-value-added activity associated with this task.
2. Move away from equipment carried on the back of the operator towards equipment that can be pushed or operated in other ways. If back carrying is required, try to insure that the equipment is as flat to the back as possible and some weight transferred to the hips.
3. Explore a re-design of the support system for the weedeater to insure the best possible balance and distribution of the load with as much load going to the hips as possible.

Administrative Controls

4. Work with vendors of markers and monuments to arrange for the truck to deliver and crane into position the markers at the actual specific grave-site.
5. Provide regular education in effective use of the body and neutral joint positions for this type of work, including use of equipment and creative ways of using the body when working in awkward positions.
6. Provide training in dealing with grieving individuals. People in this type of work have historically suffered from high levels of stress and much of it has been attributed to lack of training and confidence in these situations.
7. A related recommendation (to #6 above) is to make counseling available to cemetery caretakers if they need it.
8. There are a few elements in this position that appear to be non-value-added. It would be worth reviewing the work flow and job purposes (with the involvement of the employees) to determine possible refinements that will reduce injury risk and increase productivity.

PJDC-Cemetary Worker

Referral: Cathy Cook		Organization: City of Delta							Title: Cemetary Caretaker	
Dept.: Parks and Recreation		Division: Cemetary							Contact: Guy Carscadden	
PHYSICAL DEMANDS		R E Q U I R E 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	X	B			X		55	30	Flat gravemarkers (few cm), 4x8 sheet (to 60)
	Lifting - Knuckle to Waist	X	B				X	35	8	Shovel, lift rock/4x8 sheets (up to 60 times)
	Lifting - Waist to Shoulder	X	D			X		30	4	Ladder, small implements, binders in office
	Lifting - Over Head	X	R			X		20	5	Right arm on straight bar
	Carrying - With Handles	X	E		X			5	5	Weedeater (weight supported on shoulders)
	Carrying - Without Handles	X	E			X		35	5	Tools, flowers, decorations left at graves
	Pushing - Upper Extremity	X	B			X		55	10	Spade, shovel, gravestone
	Pushing - Hip/Leg Assist	X	B		X			200	10	Spade, lawnmower, marker
	Pulling - Upper Extremity	X	B		X			Max.	5	Raking, adjusting stone
	Pulling - Hip/Leg Assist	X	B		X			Max.	25	Shelter tent, marker stone
	Reach - Shoulder or Above	X	B		X			arm +	arm +	Pruning etc.
	Reach - Sho. or Above extnd	X	B		X			arm +	arm+	Pruning and trimming trees and shrubs
	Reach - Below Shoulder	X	B			X		high	low	Below ground adjustments
Reach - Bel. Shoulder extnd	X	B			X		high	low	Adjusting stone markers, 4x8 wood sheets	
Handling	X	B				X	high	mod	Shovels/stone markers/4x8 sheets	
Gripping	X	B				X	high	mod	Shovels/markers/tools/4x8 sheets of wood	
Fine Finger Movements	X	D		X			low	low	Switches, keys, smooth dirt	
E N R G	Aerobic (percent)	X					70			Walking, cutting grass, standing/stooping
	Anaerobic (percent)	X				30				Full body exertion - dig/place stone(15 min), load 4x8 sheets
	High Energy Expenditure	X				X				Continuous moving with frequent full body activity
	Low Energy Expenditure	X			X					Lower paced walking, paperwork, standing
P O S T U R E + M O B I L I T Y	Neck - Static Flexion	X					X			Dig, place stones, weedeater - often sustained + prolonged
	Neck - Static Neutral	X			X					While walking, cutting grass
	Neck - Static Extension	X		X						Pruning trees/shrubs - can be sustained for up to 30 sec
	Neck - Rotation	X	E			X				Normal movement
	Throwing									
	Sitting	X			X					Driving in Kubota, chair to work in office
	Standing	X					X			Almost always on grass, dirt, wood or tarmac, at office
	Walking	X					X			Almost always over grass, dirt and tarmac
	Running/Jumping				X					Jump 2 metres into grave
	Climbing - Arms and Legs	X		X						Ladders into/out of graves
	Climbing - Legs Only	X			X					Up gentle hills on the grounds (3% grade)
	Bending/Stooping	X					X			Place stones,dig,move things,lower casket
	Crouching	X				X				Place stones, level sites, move things left by mourners
Kneeling	X				X				Placing stones, leveling sites, trimming around stones	
Crawling										
Twisting	X			X					Happens although not required	
Balancing	X			X					Edge of excavation, on ladders	
G E N E R A L	Traveling	X			X					Around cemetary in the Kubota or on foot
	Work Alone	X				X				Usually, backhoe operator is around
	Interact with Public	X				X				Depends on day, can be at anytime-often emotional/groups
	Operate Equip/Machinery	X			X					Kubota, weedeater, blower, mower,lowering device
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: [shaded box] Modifications should be considered

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-Cemetery Worker

Referral:		Organization:						Title: see 1st page header	
Dept.:		Division:						Contact:	
PHYSICAL DEMANDS		R E Q D	S I D E	FREQUENCY*				COMMENTS	
				Sel. 1	Low 2	Mod. 3	High 4		
P E R C E I V E N T S	Hearing - Conversations	X	B				X	Listen to public (perhaps mourning) + co-workers, outdoors	
	Hearing - Other Sounds	X	B		X			Vehicles	
	Vision - Far	X					X	Most tasks	
	Vision - Near	X				X		Ground prep. and leveling, some paperwork	
	Vision - Colour								
	Vision - Depth	X					X	Judging distance in small excavation, guiding backhoe	
	Perception - Spatial	X					X	Working around backhoe, connecting chains and buckets	
	Perception - Form	X		X				Irregularities in ground, threading/combining parts	
	Feeling (Tactile)	X	B			X		Leveling ground w/hand, sense dig depth	
	Reading	X			X			Work orders, plot plans	
W O R K E N V I R O N M E N T S	Writing	X	D		X			Minor notations	
	Speech	X					X	Communicating with co-workers/public	
	Inside Work	X			X			Phone calls, paperwork, client meetings	
	Outside Work	X					X	Nearly constant in all conditions	
	Hot Conditions >25 deg. C	X						Occasionally during summer	
	Cold Conditions <10 deg.C	X		X				Outside work during winter	
	Humid			X				Occasionally in summer	
	Dust	X					X	Outside sources when digging, from wind	
	Vapor Fumes					X		Exhaust, esp. from weedeater, decomposing materials poss.	
	Hazardous Machines	X			X			Backhoes, vehicles, mower, weedeater	
O T H E R F A C T O R S	Proximity to Moving Object	X						Backhoe, vehicles, monument truck/crane	
	Noise						X	Ear protection required around equipment	
	Electrical Hazard								
	Sharp Tools	X					X	Spade, straight bar, pick	
	Radiant/Thermal Energy					X		From weedeater - motor near head	
	Slippery Conditions	X			X			Water, mud and ice can be on surfaces	
	Vibration and Related	X					X	Jarring in digging, vibration in weedeater	
	Chemical Irritants	X			X			Fertilizer, concrete	
	Organic Substances	X			X			Decomposing vegetable matter, animal feces	
	Medical Waste			X				Human body fluids and tissues	
N O T E S	Blood Products			X				Human blood	
	Congested Worksite				X			Working around graves or shrubbery	
	Lighting - Direct	X					X	Daylight	
	Lighting - Indirect								
	Lighting - Adjustable								
	Lighting - Fluorescent				X			In office	
	Lighting - Incandescent								
Lighting - Shadows etc.	X			X			Possible depending on time of day		

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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