



JOB DEMANDS ANALYSIS

Company: City of Burnaby Parks

Location: Bonsor, Eileen Dailly,
C.G. Brown Pools

Job Title: Pool Janitor

Classification: Regular Duty

Purpose of Activities

The Pool Janitor is responsible for the industrial cleaning of the pool and building, regular pool maintenance and upkeep, chemical application to maintain water quality and day to day general building maintenance.

Tools and Equipment

The Pool Janitor will use the following tools and equipment to perform his duties:

- Cleaning tools – brooms, mops, buckets, doodle bug, spray bottles, foam applicator, garden hose, squeegee
- Floor scrubber, floor polisher, vacuum, shop vac, wet/dry vac, carpet cleaner, power pressure washer, pool dolphin, water pump
- Hand tools – wrenches, screwdrivers, sockets, furniture dolly, etc.
- Assorted hand held power tools
- One ton hoist and elevator
- Barricades, ladders (step, 6 foot, 8 foot, 10 foot extension ladder), rope
- Grade level loading dock
- Pool chemicals – chlorine gas, ozone gas, soda ash, calcium chloride, sodium bicarbonate, activated carbon
- Cleaning solutions, chemicals and supplies – bleach, stripper, TNL (vinyl, tile, chrome cleaner), TLC (slide, tile, glass cleaner – corrosive), muriatic acid (stubborn cleaning, pool application – highly corrosive), general cleaners, hand cleaners, hand soap, vanguard antiseptic, furniture polish, Sani urinal and bowl cleaner, solvents, disinfectants, Ajax, SOS pads, toilet bowl cleaner, glass cleaner, Aqua ammonia, plastic garbage bags, toilet paper, hand napkins, fluorescent lights, incandescent lights, silicone, gum remover, WD-40, defoamer, spray adhesive, metal cleaners, salt mix

Usual Methods

The Pool Janitor follows a day, night and weekly task checklist for the cleaning and maintenance of the pool and building that he is assigned. General cleaning and maintenance duties are performed during the day, while more extensive cleaning and maintenance duties are performed at night. Also, work on the pool deck and in the pool is primarily performed at night when no one is in the building.

During the day, the Pool Janitor will also receive pool supplies and equipment at an above grade loading dock. Items are unloaded from the delivery vehicle by hand, or power



tailgate if the vehicle is equipped with one, and then delivered to the required location in the building. Some buildings have a one ton hoist that can raise or lower items to the mechanical area of the pool which is located one floor above or below the loading dock. On occasion, items may be carried by hand up or down the stairs to their storage location. The Pool Janitor may have a pallet jack to move items on pallets (pool chemical bags, pumps, motors, etc.) within the building. Outdoor and some indoor pools are not equipped with pallet jacks.

During the day, the Pool Janitor will perform water quality checks on the pool water. Samples are gathered and chemicals are added to the water. The water will then turn a specific colour to indicate its quality. Based on the results of the test, the Pool Janitor will determine whether further action is warranted.

The Pool Janitor will add chemicals to the circulating water in the soda ash room. The chemical bags are stored and stacked from the floor to approximately 1.8 metres high. The bags typically weigh, when full 23 kg. The Pool Janitor will pull a bag off the pile, lift and carry (< three metres) it to the slurry container (1.8 metres to top of container), lift it up, cut the bag open and dump the contents into the slurry. The bag is then thrown into the garbage. In some instances the Pool Janitor will transfer the chemical compound into a smaller container before dumping it into the slurry container. A dust mask or carbon filter mask is usually worn when performing this task. Soda ash and activated carbon bags must be lifted by hand from the hallway to the storage area, as the door is not wide enough to allow the pallet jack into the room. ** The bags are stacked from the floor to in some cases above the Pool Janitor's shoulders. **

The pool is shut down to the public for approximately three to four weeks during the year for regular maintenance and cleaning. The Pool Janitor will perform regular duties as well as those performed on this yearly basis. The Pool Janitor is not directly involved with the maintenance performed on the pool's mechanical system.

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 Pool Janitor works a six to eight hour day shift between the hours of 1000 and 1800 or a six to eight hour night shift between the hours of 2200. and 0630. The pools are open seven days per week, except for a three to four week period for Shut Down Maintenance. The Pool Janitor will work a 32 to 38-hour work week. The Pool Janitor will work alone during the day or possibly with a partner at night. Some pools do not have a day shift and some Pool Janitors may work alone during the night, but there may be others in the building at this time. One ten-minute rest period in the first part of the shift, a 30-minute lunch break and a ten-minute rest period in the latter part of the shift are taken by the Pool Janitor.

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.



- Walking, standing on concrete, tile or wet floor
- Lifting carrying, pushing, pulling light to heavy objects (<1-23 kg) from below feet to above shoulder height
- Exposure to chlorine and ozone gas
- Exposure to cleaning chemicals and agents from inert to highly corrosive
- Hand and power tool use to clean and maintain pool and building
- Follow day and night shift routine check list for cleaning and maintenance

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.

- Body posture and lifting technique
- Some task organization

Accommodative Considerations

1. People with injuries to the spine in any region may have difficulty with the dynamic and static movements required for industrial cleaning and pool maintenance.
2. People with shoulder injuries such as rotator cuff tendinitis, bursitis and instability may have difficulty with static loading and dynamic reaching activities found in industrial cleaning and pool maintenance.
3. People with any upper extremity problems may have difficulty with this position.
4. Individuals who do not cope in open low-autonomy work environments would have difficulty with this position.
5. Pool Course 1 and 2 and the Building Service Worker courses are recommended.

Prepared By: Jeffrey J. McGinn, Kinesiologist

February 24, 1999



Summary of Stresses

Metabolic Stresses

The aerobic energy systems will supply the major source of energy while performing the duties and responsibilities of the Pool Janitor. This energy system will be required to maintain the low to moderate energy requirement necessary for this work. Occasionally, high-energy demand, for prolonged periods of activity will be supplied by the aerobic energy system. Short intense periods of activity will be supplied by the anaerobic energy systems. Performing tasks and duties using poor posture or technique will decrease the metabolic demand required throughout the shift but these postures and techniques will increase the structural stress to the spine and upper and lower extremities.

Structural Stresses

Spine – the static and dynamic nature of this position will require concentric, static and eccentric muscle contractions of the cervical, thoracic and lumbar spine in flexion, extension, lateral flexion and rotation. Typically, these movements will be performed during cleaning and maintenance tasks. Postural control (loaded or unloaded) is critical to maintaining a healthy spine. If spinal control is not maintained during task, a flexed spine posture is adopted. This posture requires no activity from the torso musculature, but increases asymmetrical disc compression, passive stretch on the posterior ligaments and disc fibres. This can contribute to disc integrity problems over time as well as contributing to deconditioning of the torso support musculature. Shear forces to the discs, ligaments and fibres are also increased during the repeated manual handling (spinal flexion, extension, lateral flexion and rotation) of pool chemicals and supplies.

Shoulders, Upper Extremities and Neck – due to the static upper extremity positions and the frequent reaching during pool maintenance and industrial cleaning, the muscles in the rotator cuff of the shoulder (especially dominant extremity) and the upper trapezius and scalene muscles of the neck, maintain significant and often constant static load. Lifting pool chemical bags above shoulders and overhead will also tax this area as described above. Static grip and compression forces through the upper extremity are high during tool and equipment use.

Hips and Lower Extremities – will be taxed in the many dynamic movements associated with walking, standing, climbing up and down stairs and ladders, bending, stooping, crouching or kneeling. Often these actions are performed on wet concrete or tile, which will decrease the Pool janitor's stability in these movements. The concrete and tile floor and pool decks dramatically increase the forces transferred up through the ankles, knees and hips into the Pool Janitor's spine, which will increase the pressure on the intravertebral discs and associated structures of the spine.



INTERVENTIONS

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

1. Teach postural awareness or body care sessions that focus on the importance of proper body posture and how it relates to their ultimate physical comfort and fatigue level.
2. Non-value added movements are prevalent, especially with the manual handling of some pool chemical materials. The chemical bags are large and heavy (up to 23 kg). These bags may be handled up to three times (truck to pallet, pallet to storage, storage to slurry container) before they are disposed of. The height at which these bags are stored and then dumped into the slurry containers can be at least shoulder height or higher for the Pool Janitor. Investigate a way to reduce the manual handling of these bags in each pool and reduce the height the bags are handled at or the weight of each individual bag as it is handled.
3. Encourage the Pool Janitor to maintain an increased level of fitness away from work that will focus on cardiovascular endurance, muscular strength, muscular endurance and flexibility.
4. Encourage the Pool Janitor to ask for assistance when handling large or heavy objects.

PJDC-Pool Janitor

Referral: Lana Ho			Organization: City of Burnaby							Title: Pool Janitor	
Dept.: Parks, Recreation & Culture			Division: Recreation							Contact:	
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	X	D		X			36	<1-2	cleaning agents/supplies,soda ash	
	Lifting - Knuckle to Waist	X	D			X		25	<1-2	cleaning supplies,tools/equip.soda ash	
	Lifting - Waist to Shoulder	X	D			X		25	<1-2	soda ash, cleaning agents/supplies	
	Lifting - Over Head	X	D		X			25	<1-2	soda ash, cleaning agents/supplies	
	Carrying - With Handles	X	D		X			20	<1-2	cleaning equip.,dolphin	
	Carrying - Without Handles	X	D				X	25	<1-2	cleaning equip., chemical bags	
	Pushing - Upper Extremity	X	D			X		30	<1-2	mops, brooms, doodle bug	
	Pushing - Hip/Leg Assist	X	D				X	30	<1-2	power cleaning equip., soda ash bags	
	Pulling - Upper Extremity	X	D			X		30	<1-2	mops, brooms, doodle bug	
	Pulling - Hip/Leg Assist	X	D				X	30	<1-2	power cleaning equip., soda ash bags	
	Reach - Shoulder or Above	X	D			X		25	<1-2	clean above shoulders, soda ash bags	
	Reach - Sho. or Above extnd	X	D		X			25	<1-2	clean above shoulders	
	Reach - Below Shoulder	X	D				X	36	<1-2	tool/equipment use,clean/maintain pool	
	Reach - Bel. Shoulder extnd	X	D		X			36	<1-2	lift, carry tools, equipment, supplies	
	Handling	X	D				X	36	<1-2	tools, equipment, supplies	
Gripping	X	D				X	50	20	tools, equipment, supplies		
Fine Finger Movements	X	D				X	mod	low	tool use, minor repair, lock repair		
E	Aerobic (percent)	X					95	clean/maintain pools and building, moderate activity			
N	Anaerobic (percent)	X		5				heavy lift, carry of heavy tools, equipment, supplies			
R	High Energy Expenditure	X						heavy lift, carry of heavy tools, equipment, supplies			
G	Low Energy Expenditure	X					X	clean/maintain pools and building, moderate activity			
P O S T U R E + M O B I L I T Y	Neck - Static Flexion	X					X	work below shoulders to clean/maintain pool/building			
	Neck - Static Neutral	X					X	stand, walk, sit to clean/maintain pool/building			
	Neck - Static Extension	X				X		work above shoulders to clean/maintain pool/building			
	Neck - Rotation	X	L/R			X		access equipment in machine/pump rooms			
	Throwing										
	Sitting										
	Standing	X					X	on concrete/tile floor, wet surface on pool deck, showers			
	Walking	X					X	on concrete/tile floor, wet surface on pool deck, showers			
	Running/Jumping										
	Climbing - Arms and Legs	X		X				step and extension ladders			
	Climbing - Legs Only	X			X			stairs, ladders			
	Bending/Stooping	X					X	clean/maintain pool/building			
	Crouching	X			X			clean/maintain pool/building			
	Kneeling	X			X			clean/maintain pool/building			
	Crawling	X		X				confined space during shut down			
T	Twisting	X	L/R				X	mop, tool equipment use			
Y	Balancing	X			X			edge of pool deck, stairs, ladders			
G E N I R E G U L A R / E X T E N D E D H O U R S	Traveling	X		X				pick up and delivery to tools and supplies			
	Work Alone	X					X	tasks alone,in building with others,possibly on night shift			
	Interact with Public	X					X	work around public on days, not on night shift			
	Operate Equip/Machinery	X				X		pool equipment, cleaning equipment			
	Irregular/Extended Hours	X					X	days, nights, 6-8 hour shift, 7 days per week			
* Frequency Legend											

* 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.

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.

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 P T I O N	Hearing - Conversations	X			X			coworkers in pools, public, tradesman	
	Hearing - Other Sounds	X					X	chlorine/ozone alarms, equipment use	
	Vision - Far	X					X	clean/maintain pool/building	
	Vision - Near			X				repair coin operated locker locks	
W O R K	Vision - Colour	X					X	ozone/chlorine alarms, water test in pool, cleaning agents	
	Vision - Depth	X					X	use dolphin to clean pool, pour cleaning agents	
	Perception - Spatial	X					X	clean/maintain pool/building by hand/equipment	
	Perception - Form	X					X	clean/maintain pool/building by hand/equipment	
I N J U R Y	Feeling (Tactile)	X					X	tighten strainer lids, power shut offs, clean/maintain	
	Reading	X			X			labels, WHMIS, pool readings	
	Writing	X			X			labels, WHMIS, pool readings	
	Speech	X			X			coworkers in pools, public, tradesman	
W O R K	Inside Work	X					X	in pool/building	
	Outside Work	X		X				trash patrol in parking lot, around building	
	Hot Conditions >25 deg. C	X					X	28 deg.C. On pool deck, in compressor rooms	
	Cold Conditions <10 deg.C								
W O R K	Humid	X					X	65% humidity in pool	
	Dust	X			X			soda ash, activated carbon, sodium chloride, dust	
	Vapor Fumes	X		X				potential chlorine, ozone exposure during change or leak	
	Hazardous Machines	X			X			floor scrubber, hoist, pool compressors	
E N V I R O N M E N T	Proximity to Moving Object	X					X	patrons, fan motors, floor scrubbers	
	Noise	X					X	patrons, pumps, motors, tool use	
	Electrical Hazard	X				X		power equipment in pool, on pool deck, locker room	
	Sharp Tools	X			X			hand tools, scrapers	
V I B R A T I O N	Radiant/Thermal Energy	X		X				fan/compressor motors, chemical burns exposure	
	Slippery Conditions	X					X	wet pool deck, locker rooms, compressor rooms	
	Vibration and Related	X			X			power tool use, floor scrubber	
	Chemical Irritants	X				X		use cleaning agents, exposure to chlorine/ozone	
M E D I C A L	Organic Substances	X			X			feces, clean toilets, urinals, vomit	
	Medical Waste								
	Blood Products	X		X				administer first aid to public	
	Congested Worksite	X		X				machine and chemical rooms	
L I G H T I N G	Lighting - Direct	X					X	fluorescent, incandescent, day light	
	Lighting - Indirect	X					X	day light	
	Lighting - Adjustable								
	Lighting - Fluorescent	X					X	pool, locker room, fitness room, lobby	
	Lighting - Incandescent	X				X		compressor rooms	
	Lighting - Shadows etc.	X				X		shadows in pool area, work behind equip.	

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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