JOB DEMANDS ANALYSIS

Company: City of Burnaby **Location:** West Building

Job Title: Data Entry Clerk - Payroll **Classification:** Regular Duty

Purpose of Activities

The purpose of the Data Entry Clerk position is to input the data from the daily timesheets and timecards into the computer system.

Tools and Equipment

The Data Entry Clerk will use the following tools and equipment to perform their duties:

- Computer monitor (11") with orange type (10pt.) on black background. This monitor is connected to a mainframe computer.
- Computer keyboard with right hand number keys.
- Telephone.
- Two-Hole Punch.
- Hand Stamp.
- Stapler (manual).
- Adding Machine.
- Desk (29" in L configuration) with document holder and a choice of chairs (all fully adjustable with short backs).

Usual Methods - Batch

The following will be carried out (while seated) about 25 times each day by each clerk, except Thursday when it can be as low as eight times.

1. Stand-up and take timesheets from "In" basket.**
2. Count through pages to a total of 50 lines of input (1 – 5 lines per page).**
3. Hand stamp the pages.**
4. Check with adding machine by holding papers in left hand and flipping pages while inputting on the machine with the right hand.**
5. Hand staple the timesheets together.**
6. Write batch information on the cover sheet and paperclip to the batch.**
7. Write batch information on separate control sheet.**

Usual Methods – Data Entry

The following activities will be carried out (while seated) for each of the batches described above each day.

1. Place batch in document holder to the left of the screen.**
2. Enter information from each line with right hand (50 keystrokes and six seconds per line). Tab through fields (eight fields) and occasionally change letters with the left hand.
3. Reach with left hand to document holder to change sheet every five to ten seconds (occasionally longer, even up to a minute if the timesheet has more than ten lines on it).**
4. Repeat steps two and three for 30 or 40 repetitions for each batch (up to 25 batches per day).
5. Using a small hand stamp, stamp each sheet and write on some before setting aside.**

Usual Methods – Filing/Bundling

At the end of each day, filing and bundling activities are usually carried out.

1. Time sheets are two-hole punched and placed in binding boxes.**
2. These boxes are then placed in a under-counter cabinet.**
3. Timecards are placed alphabetically in a filing sorter laid flat on the desk. The clerk holds the cards in their hand and then slips them under the appropriate divider.*8
4. Each section is then resorted for alphabetical order.**
5. The cards are carried to the filing cabinets (about 6 metres).**
6. The clerk pulls open the appropriate file drawer (just large enough to hold file cards) and slips each card in at the correct spot. This can involve crouching to access lower files. It can also require some forceful pinch grips to access some of the more crowded drawers.**

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 clerks work from 0800 to 1715 from Monday to Thursday. They receive two ten-minute breaks and one 30 minute lunch break each day.

This is a time sensitive job and all the work has to be completed each day. Monday is the heaviest day of the week and Thursday is the lightest. It is normal for deadline pressure to lift on Thursdays whereas it is omnipresent on all other days.

There are two individuals who usually work in Payroll data entry. They are located in an open-style (bullpen) office environment with some natural light penetrating the space from the windows at the perimeter of the work area.

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.

- Enter data from hard copy into a computer by using a keyboard.
- Work from a seated position.
- Meet daily deadlines.
- Carry out tasks under fluorescent light source.
- File cards in filing cabinet drawers.
- Use a portable adding machine.
- Work in an open environment.

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 (outside of remaining seated).
- Order and technique for carrying out filing duties.
- 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 static and largely seated postures.
2. People with shoulder injuries such as rotator cuff tendinitis, bursitis and instability may have difficulty with static loading and reaching activities.
3. People with any upper extremity problems may have difficulty with this position.
4. Post-whiplash and other neck problems may have difficulty with this position.
5. The sitting required for this position would aggravate individuals with hemorrhoids or suffering from vascular insufficiency in the legs
6. Individuals who do not cope under deadline pressure or in open low-autonomy work environments would have difficulty with this position.
7. There is no significant learning curve associated with the tasks, only a proficient keyboarding ability is required.

Prepared By: Greg Hart, Kinesiologist February 4, 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 can be characterized as being very sedentary. There are possible exceptions in localized regions of the body, specifically the upper extremities and possibly muscles around the spine and in the region of the neck and shoulder. The tasks are very static in nature and there are repeated actions that increase static load in some of the aforementioned areas for stabilization purposes. This can interfere with normal blood flow and thus, oxygenation. If this is the case, the tissues will be increasingly required to turn to the anaerobic energy system for their requirements. This can produce a sensation of fatigue and can also lead to tissue damage.

Structural Stresses

Spine – the sedentary nature of this work can place significant passive loads on the spinal structures. Prolonged sitting increases disc compression forces alone. If great care is not taken to control posture, it is not unusual to have people adopt a flexed spine posture that 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.

Shoulders and Neck – due to the static positions required and the frequent reaching for documents, the muscles in the rotator cuff of the shoulder (especially left) and the upper trapezius and scalene muscles of the neck, maintain significant and often constant static load. Sorting of papers and the use of stamps and staplers requires the shoulders and neck to hold the arms above the desk. This can lead to the development of pain and eventually to tendinitis and even possibly contribute to adverse neural tension. If individuals are too low in their position with respect to the desk, this increases the load on the neck and shoulders further since the arms must be lifted and held above the level of the top of the desk. The position of the document holder to the left of the monitor screen requires that the clerk maintain a left rotated head position that contributes to muscle shortness and soreness.

Arms and Hands – clerks make between 60,000 and 80,000 keystrokes a day with just the right hand over the number pad. Since the keyboard is on the desk it forces the clerk to hold the hand in extension which increases pressure in the Carpal Tunnel and transmits constant static load to the lateral epicondyle (outside) of the elbow. This can increase the risk for developing Carpal Tunnel Syndrome and lateral epicondylitis (tennis elbow) respectively. There are other risks for the carpal tunnel including pinch grips in filing activities and stamping motions. High force motions like stapling and stamping are difficult from the seated posture since only the small muscles in the extremity and the mechanically inappropriate shoulder muscles are available to assist with the action.

INTERVENTIONS

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

1. Encourage the clerks to maintain an increased level of fitness away from work that will focus on cardiovascular endurance, muscular strength, muscular endurance and flexibility. This can help compensate for the lack of movement in the job.

2. Provide regular education in effective use of the body and neutral joint positions for this type of work.

3. Adjust monitor heights so that the individual is maintaining a neutral head position when looking at the screen (this varies according to individual visual bias).

4. Increase the size of the monitor and the font size displayed on the screen to decrease visual strain and static muscle tension.

5. Remove existing document holder and obtain a Vu-Ryte document holder to place under the monitor so that the documents can be positioned in front of the worker. This will also decrease the rotated neck posture in the current arrangement and eliminate the frequent reaching for documents.

6. Insure that the operator is maintaining a neutral elbow and shoulder position while working at the keyboard (chair height may need to be increased).

7. Provide a footrest if necessary to maintain normal contact with the floor.

8. Provide a work station where the clerk can stand to carry out batching, filing and bundling activities thus reducing neck and shoulder strain. It will also decrease sitting and vary postural options. This work area should not include the computer but be dedicated for the previously described activities.

9. Position the adding machine so that it is directly in front of the arm when in use.

10. Provide an automatic stapler.

11. Encourage employee to rest hands in the lap momentarily (less than five seconds) every few minutes to allow static load to abate.

12. Encourage employee to approach keying with more arm movement and avoid fixed arm positions. Do not use wrist rests.

13. There are a number of 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 but increase productivity.

Referral: Lana Ho		Organization: City of Burnaby								Title: Data Entry Clerk
Dept.: Payroll		Division:								Contact: Gladys Johansson
				FREQUENCY*						Date: February 4, 1999
	PHYSICAL DEMANDS	REQD	SIDE	Sel 1	Low 2	Mod 3	High 4	Max. Weight (kg)	Usual Weight (kg)	COMMENTS
STRENGTH	Lifting - Floor to Knuckle									
	Lifting - Knuckle to Waist									
	Lifting - Waist to Shoulder		D		X			2	1	Binders and files from overhead cabinet
	Lifting - Over Head		D		X			2	1	Binders and files
	Carrying - With Handles									
	Carrying - Without Handles		B			X		5	<1	Binders, files < 5 m
	Pushing - Upper Extremity		E		X			10	1	Closing file cabinets
	Pushing - Hip/Leg Assist									
	Pulling - Upper Extremity		E		X			10	1	Opening file cabinets
	Pulling - Hip/Leg Assist									
	Reach - Shoulder or Above		L				X	2	arm	To document holder
	Reach - Sho. or Above extnd									
	Reach - Below Shoulder		R				X	arm	arm	Access keyboard, adding machine, papers
	Reach - Bel. Shoulder extnd		R				X	arm	arm	Access adding machine, papers
	Handling		B				X	2	<1	Binders,files to paper, pens + staplers/stamp
	Gripping		B				X	mod.	light	Stamp, stapler, pens, pencils, binders, files
	Fine Finger Movements	X	B				X	light	light	Typing on keyboard/add.-machine, paperclip
ENRG	Aerobic (percent)	X					98	Mostly sedentary and light walking duties		
	Anaerobic (percent)				neg.			Perhaps in holding static postures through shoulders/arms		
	High Energy Expenditure									
	Low Energy Expenditure	X					X	Sedentary work, occasional walking for short distance		
POSTURE+MOBILITY	Neck - Static Flexion					X		In writing, filing, bundling and batching tasks		
	Neck - Static Neutral	X				X		Looking at monitor		
	Neck - Static Extension									
	Neck - Rotation		L				X	Shifting gaze between monitor and documents (to the left)		
	Throwing									
	Sitting						X	Almost the entire day is made up by sitting		
	Standing				X			To do filing		
	Walking				X			Less than 10 m per occasion to access files		
	Running/Jumping									
	Climbing - Arms and Legs									
	Climbing - Legs Only			X				Stairs to another floor		
	Bending/Stooping				X			Look into lower drawers of desk		
	Crouching			X				Look into lower filing cabinets		
	Kneeling									
	Crawling									
	Twisting									
	Balancing									
GEN	Traveling									
	Work Alone							Not away from other people in general		
	Interact with Public	X			X			Telephone and in person		
	Operate Equip/Machinery	X					X	Computer terminal, adding machine, copier		
	Irregular/Extended Hours							Deadlines everyday		

* 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:
	FREQUENCY*	Date:

	PHYSICAL DEMANDS	REQD	SIDE	Sel. 1	Low 2	Mod. 3	High 4	COMMENTS
PERCEPTION	Hearing - Conversations	X					X	In person and over the telephone
	Hearing - Other Sounds							
	Vision - Far	X			X			Moving about the office
	Vision - Near	X					X	Most activities are within arm's length
	Vision - Colour							
	Vision - Depth							
	Perception - Spatial	X					X	Reaching for and around objects
	Perception - Form		D		X			Fishing a paperclip out of a box, filing cards in card drawers
	Feeling (Tactile)		B				X	Holding papers and using paperclips
	Reading	X					X	From paper and computer
	Writing	X	D				X	Mostly short comments
	Speech	X					X	Telephone and in person
WORK ENVIRONMENT	Inside Work	X					X	100%
	Outside Work							
	Hot Conditions >25 deg. C							
	Cold Conditions <10 deg.C							
	Humid							
	Dust							
	Vapor Fumes							
	Hazardous Machines							
	Proximity to Moving Object							
	Noise							
	Electrical Hazard							
	Sharp Tools		D				X	Stapler
	Radiant/Thermal Energy							
	Slippery Conditions							
	Vibration and Related		D				X	Impact from using stapler and handheld stamps
	Chemical Irritants							
	Organic Substances							
	Medical Waste							
	Blood Products							
	Congested Worksite							
	Lighting - Direct						X	Overhead
	Lighting - Indirect							
	Lighting - Adjustable							
	Lighting - Fluorescent						X	Narrow spectrum with large parabolic diffusers
	Lighting - Incandescent							
	Lighting - Shadows etc.							

* 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.

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