GUIDELINES TO IMPLEMENTING AND PERFORMING PHYSICAL DEMANDS ANALYSIS HANDBOOK

Occupational Health Clinics
for Ontario Workers Inc.

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INTRODUCTION

How Do I Use This Book?

The purpose of this workbook is to provide guidelines and information to workplace parties (workers, employers, union representatives, health & safety professionals, human resources personnel, nurses, and engineers) on how to conduct a physical demand analysis (PDA) of a job. This workbook is divided into several sections. If you are only interested in understanding PDA, read the Physical Demands Analysis section. If you are planning, developing and implementing a PDA program, read the main section of this manual. If you are interested in performing a PDA in your workplace, read the main section and follow all exercises in the appendix of this manual.

Why Should I Read This Book?

In the field of disability management, how would you know when an injured worker is ready to return to work? If the injured worker is returning to work, but has many physical limitations, what job or task should you offer this injured worker? How would you accommodate the injured worker, given his/her functional abilities? If the injured worker cannot return to pre-accident job, what other job or task can you offer without causing overexertion injury? If you are not in the field of disability management, but are interested in workplace safety, how do you determine a job is safe or hazardous? How do you prioritise these problems? What approach do you use to meet your return to work obligation and injury prevention?

If you are concerned with many of the areas indicated above, then *this book is for you*. The Occupational Health Clinics for Ontario Workers Inc. (OHCOW) produced this workbook because we are often asked questions about physical demands analysis.

PHYSICAL DEMANDS ANALYSIS

What Is A Physical Demands Analysis (PDA)?

A Physical Demands Analysis is a systematic procedure to quantify, and evaluate all of the physical and environmental demand components of all essential and non-essential tasks of a job. PDA is a process of establishing what a job is… in its entirety… in a way that complies with the Ontario Human Rights Code. For the purpose of employee rehabilitation and return to work, a PDA is the "cornerstone" of the analytical process used to determine compatibility between a worker and a specific job.

Why do we need a PDA?

With the recent passing of Bill 99 (Workplace Safety and Insurance Act, 1997), the Workplace Safety and Insurance Board (WSIB) has the right to request information about an injured worker's functional abilities from a treating health professional (Sec. 37.3). The required information must be provided on a prescribed form distributed by WSIB (Appendix A). The purpose of obtaining an injured worker's functional abilities is for "facilitating the worker's timely return to work".

One of the primary goals of a Functional Ability Evaluation (FAE) is to match an injured worker's work capability to a job or task, without causing an overexertion injury. If the functional abilities of an

injured worker are used to assess whether a worker can return to work (RTW), a PDA describing the job should also be developed. Without any information about the physical demands of a job's essential and nonessential duties, the functional ability information is not useful.

What Role Does PDA Play In The Workplace?

PDA can have a variety of roles in the workplace. These roles fall into two main categories, a reactive role in rehabilitation and return to work process, and a pro-active role in accident and injury prevention program.

The role of PDAs in rehabilitation and return to work process:

- ✓ Communicate the job requirements to WSIB, and health care providers.
- ✓ Provide data for use in job matching and accommodation process.
- ✓ Clarify benefits entitlement (i.e. determining work-related injury, WSIB appeals, long-term disability decisions etc.).
- ✓ Identify suitable alternate work or modified work programs.

The role of PDAs in injury and accident prevention program:

- ✓ Identify jobs, work processes, and equipment that require further ergonomic analysis and intervention.
- ✓ Identify and prioritise safety concerns, engineering and administrative improvements.

IMPLEMENTING A PDA PROGRAM IN YOUR WORKPLACE

Implementation a PDA program in your workplace can be a very costly and time-consuming process. It can also require a lot of commitment by both employer and workers. If your work organisation is planning or considering putting into effect a PDA program, the following procedures should be considered.

Step 1: Decide On Who Should Be Conducting The PDA

Performing a PDA should be conducted jointly by a worker and employer representative knowledgeable about task analysis, and the identification of ergonomic risk factors. If in-house staffs do not have any training on task analysis or knowledgeable in risk factor identification, external consultants should be retained. When an external consultant conducts the PDA, the worker and employer representatives should sign-off on the PDA information to indicate the accuracy and completeness of the consultant's analysis.

When deciding on who should perform PDAs, the cost of obtaining the PDA should also be considered. The cost of obtaining PDA information will depends upon the complexity of the job and the use of external consultants or in-house staff. In a job that is performed in a single location and the activities are repetitive, the PDA can be carryout in less than one hour. However, if the job is performed in a variety of work locations, and varies according to the day or season, the PDA may require several days to complete.

Cost of a PDA can also vary according to the people who conduct the PDAs. Performing a PDA using in-house staff will have the lowest cost; however, in-house staff knowledgeable in task analysis and risk factors for injury may be limited. External agencies may charge as much as $700 per PDA depending on the complexity of the jobs. However, contracting-out will likely provide the most competent person to conduct a PDA in a non-biased manner. It should be noted that there is no standard PDA structure or

form. Different external agencies will provide different PDA information and structure. Thus, when hiring a consultant, make sure that the service provided for your organisation meets your specific needs. For further information on PDA information and structure, please refer to *Step 4: Decide On The Format Of The PDA.*

When determining the cost of a PDA, you should cost the information based on the type of job being analysed. In situation where a job is performed repetitively, cost of a PDA should be based on an hourly rate. For job that varies from one day to the next, a cost analysis procedure should be conducted according to cost per PDA.

Implementing a PDA program may seem costly; however, when appropriate PDAs are implemented in the workplace, the initial capital can be money well spent. For example, if the cost of a PDA is $300, the payback period can be as low as two days if an injured worker returns to work earlier than two days. Furthermore, if the PDA prevents an overexertion injury through appropriate job matching or ergonomic intervention, the cost saving can be as much as $6,000-$7,000 per case.

When performing PDAs, try to avoid having one job analysis or having a supervisor fill out the PDA forms for jobs under his/her direction. Experience has shown that in many situations, there is a lack of consistency among investigators. Due to the low reliability of the PDA information, the usefulness and accuracy of the PDA will be low. Furthermore, when the PDA is challenged in arbitration or an appeal, the PDA information will be very difficult to defend.

Step 2: Decide On When The PDA Should Be Performed

Collecting job and PDA information can be conducted using two processes:

1. Reactive - perform PDAs whenever case arises; or
2. Proactive - perform in advance to form a databank to call upon when and if the need arises.

Each of the above approaches has its advantages and disadvantages (see Table 1 & 2). When deciding the approach that best fits your organisation's needs, you should consider the intended use of the PDAs, and the cost associated with implementing the PDA program. If the intent of the PDA information is to have the widest range of applications, advance collection of PDAs should be performed. If limited resources are available and/or specific detailed information is required, then reactive collection of PDA information should be considered.

Many organisations have successfully implemented a hybrid approach in collecting PDA information. Organisations that implement a hybrid approach usually establish a priority schedule of data collection. The first priority should be for jobs that have the largest number of accidents or jobs with the highest number of employees. The next priority should be positions which are defined by supervisors and employees as "light duties", "modified positions", or "return to work" jobs. After collecting PDAs for these jobs, you may continue to collect information for the remaining jobs or collect the database on an as-needed basis. The purpose of using this method is to collect PDA information for a large percentage of workers, while performing a small number of PDAs. This in turn will decrease the cost associated with data collection.

Table 1: Pros and cons regarding a *proactive* approach in PDA data collection.

Advantages	Disadvantages
➢ Allows widest range of applications ➢ PDA information can be useful from the first day of the claim ➢ Allows identification of alternate work placements through search of database ➢ Tackles ergonomic intervention of jobs in priority order ➢ Provides relevant PDA information in job ads and promotion calls	➢ Requires large amount of resources and costs ➢ Difficult to maintain a database of PDAs (i.e. the need to update PDAs when changes occur) ➢ Current PDA information may not be as specific as desired in every injury case

Table 2: Pros and cons regarding a *reactive* approach in PDA data collection.

Advantages	Disadvantages
➢ Specific detailed information for the injury case can be obtained ➢ Accommodation solutions can be considered and investigated when the job analysis is performed ➢ Requires fewer resources and costs	➢ Lowest range of applications ➢ Difficult to find alternate work placements (i.e. job/task search from database is limited)

Step 3: Inform All Workplace Parties Of The PDA Process

Implementing a PDA program in your workplace can be much smoother if all levels of management, workers, and union representatives are co-operative and support the process. To gain support and co-operation, all workplace parties should be informed in advance of what to expect. This may involve:

- ❖ Contacting union representatives, senior management, and supervisors to explain the PDA process. Ask for their co-operation, and inform various parties to pass the information through their ranks.
- ❖ Pass out information pamphlets and sample PDAs to workers so that they would know what to expect.
- ❖ Clearly explain the intended purpose of the PDA program. Explain to workers that PDAs will not affect wage levels or to increase work demands.
- ❖ Organise an information meeting at union meeting to address workers' concerns.

Step 4: Decide On The Format Of The PDA

Choosing a PDA format to meet the needs of your organisation is one of the most critical aspects of the PDA program. There are many ways in which physical demands analysis of a job can be structured. OHCOW suggests the use of the PDA structure outlined in Appendix B.

The PDA format OHCOW recommends consists of a one-page narrative description of the work location, work hours/shifts, job purpose, essential and nonessential functions, and general observations of the work area. The PDA format also consists of a two-page chart form description of all physical activities involved in various essential and nonessential tasks. The purpose of structuring the PDA in this manner is to allow users to obtain physical demands information for a particular task. This in turn

will allow the workplace parties to develop a modified work program, identify tasks for accommodation of workers with a disability, and provide a risk factor assessment for each task.

Regardless of the variety of PDA structure, all PDA forms should have the following:

- ✓ Brief information about the job
- ✓ List of all essential and non-essential duties
- ✓ List of all *activities* associated with *each duty*.
- ✓ Easy to read and understand by many users.
- ✓ Cover the needs of workers with a variety of injuries or illnesses.
- ✓ PDA information is reliable and consistent across the organisation.
- ✓ Identify safety and ergonomic concerns, engineering and administrative improvements.

When PDA information is used for the purposes of RTW, it should have the following structure:

- ✓ Ability to document a job in a non-discriminatory manner;
- ✓ Comply with Ontario Human Rights Code (OHRC) – identify the essential and non-essential job functions, describe the work, and document the physical requirements of the job and the worksite;
- ✓ Use "objective" measurements to determine what is the standard requirement of each job and task;
- ✓ Able to assist the injured worker to return to their previous job by identifying specific jobs or tasks that are within the worker's working capacities;
- ✓ Provide detailed information to allow therapists to design appropriate treatment goals;
- ✓ Develop restricted duties or modified work programs from the physical demands information;
- ✓ Provide union representatives, and employers with information about reasonable accommodations for injured workers;

Step 5: Conducting The Job Analysis

A PDA is a process of breaking up a job in order to examine its individual tasks. When conducting a physical demand analysis, investigators will objectively quantify and evaluate the environmental conditions, use of machines, equipment, tools, work aids, and physical demands of each task. To quantify the physical and environmental demands of the job, direct and indirect observation techniques are utilised.

The following is a general step-by-step discussion of the four components of the PDA Process. If detailed information on the PDA process is required, please refer to Appendices C, D and E.

Procedure 1 – Determine Job Function:

Worker and employer investigators meet to discuss the existing information of the job title and job description. In most cases, there will already be a narrative job description.

Reviewing the existing job description, investigators should determine:

- ✓ If the job information is current;
- ✓ The purpose or intent of the position;
- ✓ Identify all different components of the job (i.e. all related tasks); and
- ✓ All essential and non-essential functions. Please refer to Appendix C for detailed information concerning essential and non-essential functions.

Procedure 2 - Verification of Job Function:

This process verifies that the duties and tasks outlined by the job description are actually performed in the job being analysed. The common work areas where the normal performance of the duties take place must also be verified. Job analysts should obtain a clear understanding of the flow of the work going into and out of the workstation being analysed, and identify the relationship of the position being analysed to other positions in the department.

Procedure 3 - Identify Job Function:

The third component of the PDA process is to identify or break down what functions of the job are essential and non-essential (see Appendix C for definition). Next, the investigators should determine as objectively as possible the various tasks, subtasks or functional components of the job/position. After determining the various tasks, subtasks, or functional components of the job/position, the investigators should quantify the duration of each task/subtask by:

1) Timing the time spent performing each function using a stop watch;
2) Calculating the percentage of time per day, week, or shift spent on various tasks; or
3) Counting the cycles or repetitions of functions being performed.

A worksheet will provide a coding system for documenting the frequency and/or duration of the tasks involved in each essential function (see Appendix D). They will be listed in numerical order. All the tasks should be job related or are required for completion of the job. For example, there may be 6 essential tasks and of those 6 essential functions, 2 of the functions may have 2 subtasks and 2 of the other functions may have 3 subtasks. The worksheet will provide the tools to document what is involved in each task (see Appendix D). Detailed information on how to use the Job Specific Data Collection Form is outlined on Appendix E.

Procedure 4 - Quantify Physical Demands Of Each Job Function

The fourth component of the job analysis process is to objectively quantify the physical and environmental requirements for each task/duty using the *Job Specific Data Collection Form*, outlined on Appendix D. In order to objectively measure the intensity, frequency, and duration of physical functions, the following instruments should be used:

- A portable weight scale (used to weigh loads lifted or carried).
- A tape measure (used to measure work heights, load size and carrying distance).
- A push-pull gage (used to measure pushing and pulling force).
- A grip and pinch force gage (used to measure gripping and pinching force).
- A camcorder or still camera (used to study details of tasks after the observation, and description of workplace layout, equipment, work tools etc.).
- A stop watch (used to record cycle time and duration of task).
- Other measurement devices specific to the workplace (i.e. vibration instruments).

To quantify the physical elements for each task use the following activities (definitions of these activities are explained in Appendix E):

1) mobility (walking, sitting, standing, crouching, stooping, climbing, balancing, crawling, and kneeling);
2) manual material handling (lifting, pushing, pulling, and carrying);
3) reaching (vertical and horizontal work);
4) handling;

5) fingering; and
6) propioception (feeling, seeing, taste/smell, talking and hearing).

For each essential and nonessential duty, the investigators should determine if any of the physical elements are required to perform the task. If physical demands are required to perform a task, objective quantification of the intensity, frequency, and duration of each physical function should be recorded.

For example, in Appendix B, a PDA sheet is shown. The job title in this example is a Meterman/Learner job. The purpose of this job is to learn the correct procedure to clean and change residential and industrial meters. The job consists of three essential functions and two non-essential duties. Observing table 1 (Material handling by task requirement), you will notice that essential task #1 is performed 60% of the shift. The physical demands for this task are lifting, carrying, reaching, handling, and fingering. The frequency, intensity, and various work parameters are outlined on the second column.

For essential task #2, the physical demands consist of lifting, pushing, pulling, reaching, handling, and fingering. The duration of essential task #2 is 20% of the shift. The frequency, intensity, and various work parameters are outlined on the third column.

From these two examples, you will notice that many tasks do not require the investigators to quantify all physical demands. However, if the investigators observed that a physical demand is required in order to perform the task/duty, quantification of all work parameters associated with the physical demand should be performed. For a detailed explanation of each physical demand element and how to quantify the activities, please refer to Appendix D and E.

Step 6: Record Results And Perform Risk Factors Assessment

Once all physical demands of each task are quantified, the following process should be followed:

1) Enter the PDA data into a spreadsheet or word processor and create the initial report including the identification of all essential and nonessential functions of the job (see Appendix B for examples).
2) Submit an initial report to the department head, supervisor, and worker representatives for review and sign-off.
3) The Employer and Union representatives return the initial report with any modifications/corrections to the essential and nonessential function of the job.
4) Perform risk factors assessment to identify any injury/accident potential. For example, in assessing lifting/lowering demands, the job analysts can compare the specific aspect of the lifting/lowering task to the NIOSH Lifting Equation or the Mital Tables. This step may takes a little extra time, however it can be a huge payback in terms of reducing injury incidence. For further information about the NIOSH Lifting Equation or the Mital Tables, please contact the Occupational Health Clinics for Ontario Workers Inc.
5) Investigators prepare the final PDA report according to all modifications/corrections and potential risk of injury/accident. A separate report that includes only the risk factors assessment and recommendation should also be submitted to the Joint Health and Safety Committee.
6) The final PDA report should be signed-off by a worker and employer representatives, to indicate the accuracy of the physical demands analysis of the job. This is not only to indicate the accuracy of the information, but also to ensure that the PDAs will be more defensible in any legal or arbitration hearing.

Step 7: Update PDA Information As Required

Updating PDA information is crucial for the continuous effectiveness of PDAs and injury prevention. There are several ways to maintain the accuracy of the PDA content. Some of these methods are:

- Update PDAs whenever there is a job redesign, job merger or when a new equipment or work tool is purchased;
- Include a memo with all RTW packages that asks the injured worker to review the enclosed PDA for accuracy; or
- Annual review of the current PDA information and sign-off process by both a worker and employer representatives.

Appendix A: Proposed WSIB Timely Return To Work FAE Form

(As Of January, 1998)

WSIB ONTARIO CSPAAT — Workplace Safety & Insurance Board / Commission de la sécurité professionnelle et de l'assurance contre les accidents du travail — 200 Front Street West, Toronto ON M5V 3J1 / 200, rue Front Ouest, Toronto ON M5V 3J1

Functional Abilities Form for Timely Return to Work

The following information should be completed by the employer or the injured worker. Please read the information on the following page.

Health No.	Claim No.	☐ Initial form ☐ Follow-up form

Date of Accident (day / month / year)	Employer Telephone No. (Area Code / Telephone)
	( )

Employer's Name

Full Address (No., Street, Apt.)

City/Town | Province | Postal Code

Worker's Last Name	First Name
Full Address (No., Street, Apt.)	
City/Town	Province
Postal Code	Area Code / Telephone No. ( )
Social Insurance No.	Date of Birth (day / month / year)

Accident Information *(This information should be completed by the employer or the injured worker.)*

Type of Job at Time of Injury (Where available, attach description of job activities) | Area of Injury

The following information should be completed by the Health Professional:

1 Date of examination on which the report is based | Area of Injury

2 Rehabilitation/Treatment Required? ☐ yes ☐ no | Is the worker capable of returning to work immediately without restrictions? ☐ yes ☐ no | If no, please complete the next section.

3 Please complete where capabilities are known or limitations recommended. Note: 'as tolerated' implies that restrictions are recommended but must be quantified in the workplace.

Capabilities

Walking: short distance only ☐ ; as tolerated ☐ ; other (eg. uneven ground) ☐ _____

Standing: less than 15 min ☐ ; less than 30 min. ☐ ; as tolerated ☐ ; other ☐ _____

Sitting: less than 30 min ☐ ; less than 1 hour ☐ ; as tolerated ☐ ; other ☐ _____

Lifting floor to waist: less than 10 Kg. ☐ ; less than 25 Kg ☐ ; as tolerated ☐ ; other ☐ _____

Lifting waist to shoulder: less than 10 Kg ☐ ; less than 25 Kg. ☐ ; as tolerated ☐ ; other ☐ _____

Stair climbing: none ☐ ; 2-3 steps only ☐ ; short flight ☐ ; own pace ☐ ; as tolerated ☐

Ladder climbing: none ☐ ; 2-3 steps only ☐ ; 4-6 steps only ☐ ; own pace ☐ ; as tolerated ☐

Limited ability to use hand to: hold objects ☐ ; grip ☐ ; type ☐ ; write ☐

Limitations

☐ Bending or twisting of _____ ☐ Repetitive movement of _____

☐ Chemical exposure to _____ ☐ Environmental exposure to _____

☐ Operating motorized equipment _____ ☐ Restrictions related to medications: (specify) _____

☐ Above-shoulder activity _____ ☐ Below-shoulder activity _____

Exposure to vibration: high frequency ☐ ; low frequency ☐

Limit physical exertion to: mild ☐ ; moderate ☐ ; as tolerated ☐

General Comments/Specific Limitations

4 Recommendation for Work Hours: ☐ Full-time hours ☐ Modified hours ☐ Graduated hours

5 Complete Recovery Expected? ☐ no ☐ yes

Estimated Duration of Limitations

Health Professional - please complete section below for payment and send ONE copy by fax or mail to the WSIB.

Health Professional's Name (Please print)	Health Profession	Date of Next Appointment for Review of Capabilities (day / month / year)
Full Address	City/Town / Province	Postal Code
Date (dd/mmm/yyyy)	Area Code / Telephone ( )	Signature

Are you registered with the WSIB? ☐ Yes ☐ No — If yes, please enter the WSIB Provider Billing number in box provided below:

WSIB Provider Billing No.	Your own invoice No.	Service date (d d / m m / y y y y)	Fee code 9 0 1

2647A (11/00) **Copy 1 - WSIB**

Appendix B: Example Of A PDA Summary Form

PHYSICAL DEMANDS ANALYSIS SUMMARY

Employer:
Job Title: Meterman/Learner
Dept/Div: Meter Department
Effective Date: 01/01/9_

Location: Toronto, ON
Plant: Downtown
Job Contact:

Work Hours/Shifts:

The average week is 40 hours, Monday to Friday. Meterman/Learner are assigned to work either one of two shifts, either 8am to 4pm or 8am to 6pm. Two 10 minute breaks and one 20-minute lunch are provided per shift.

Job Purpose:

Learning to clean and change residential and industrial meters.

Essential Functions:

1. Dissemble and re-assemble meters to clean moving parts using pliers, brush, screwdriver, and air tool.
2. Dissemble damaged meters, current and potential transformers to scrap individual parts using wrench, and screwdriver.
3. Mount current transformer to coil plate using wrench, screwdriver, and power tool.

Non-Essential Functions:

1. Perform housekeeping duties such as dusting, working with ladders etc.
2. Transport materials from basement using skid.

General Observations:

Meterman/Learner will be trained and become qualified in all aspects of shop and field work for a duration of approximately 6-8 months. A Meterman/Learner is expected to be able to clean a minimum of 16 meters per shift within 6 months of employment. The work is self-paced, but production volume for the day must be met.

Once every 3-4 weeks, a Meterman/Learner will be expected to work from 8am to 6pm. On that week, the Meterman/Learner will work 4 days per week.

Most work areas have good lighting. On days in which work is performed outside, Meterman/Learner will be exposed to a variety of temperatures and weather conditions. These working conditions will vary, depending on the seasonal climate. The most significant physical demand is the potential to handle 100 lb transformers, and frequent standing. On heavy manual material handling tasks, teamwork (2-3 co-workers) will be provided.

Table 1: Material handling by task requirement.

Manual Material Handling Activities	Essential Task 1 (60%/shift)	Essential Task 2 (20%/shift)	Essential Task 3 (5%/shift)	Noness. Task 1	Noness. Task 2
Lifting:					
Beginning Heights(in)	6-40"	9-34"	36"	18-20"	30-35"
Ending Heights(in)	6-34"	9-36"	55"	17-20"	71-75"
Weights (lbs)	6-32 lb	6-50 lb	20-80 lb	38-50 lb	20-35 lb
Frequency(#/min)	0.04	0.01	(1-2/month)	Occasional	0.01
Carrying:					
Weight (lbs)	6-32 lb		20-80 lb		
Distance(in)	960		20-25"		
Frequency(#/min)	0.03		(5-10/month)		
Pushing:					
Push Heights(in)		30-33"			34-46"
Horizontal Force(lbs)		45-60 lb			30-40 lb
Frequency(#/min)		(1-2/week)			(1/day)
Pulling:					
Pull Heights(in)		30-33"			34-46"
Horizontal Force(lbs)		45-60 lb			30-40 lb
Frequency(#/min)		(12/week)			(1/day)
Reaching (<10 lb):					
Front Distance(in)	25-28"	25-30"	25-30"		
Vertical Height(in)	9-60"	36"	36"		
Reach Direction	Front	Front	Front		
Frequency(%/shift)	17.9	9.9	1.5		
Handling:					
Weight of Object(lbs)		3-35 lb	6-10 lb		
Grip Force(lbs)	3-8 lb	40-50 lb	30-50 lb		
Diameter(in)	4-7"	2-7"	2-6"		
Frequency(%/shift)	9.8	4.64	1.6		
Fingering:					
Weight of Object(lbs)	4-6 lb	4-6 lb	1-4 lb		
Pinch Force(lb)	6-15 kb		10-15 lb		
Pinch Type	key, 3-pt	key, 3-pt	2 pt		
Finger Flexion (x)			X		
Frequency(%/shift)	32.3	5.5	1.8		

Table 2: Body Posture by type of activity. All values are weighted average (in percent) per shift.

Activities	Essential task 1: cleaning meters (60%/shift)	Essential task 2: dissemble meters (20%/shift)	Essential task 3: mount CT on coil plate (5%/shift)
Back:			
Straight/neutral	57.1% (Frequent)	12.2% (Occasional)	2.7% (Occasional)
Stoop/flex	2.9% (Occasional)	5.8% (Occasional)	2.2% (Occasional)
Twist/side bend	0% (Never)	1.7% (Occasional)	0% (Never)
Twist & stoop	0% (Never)	0.29% (Occasional)	0% (Never)
Arms:			
Below shoulder	54.8% (Constant)	20% (Occasional)	4.0% (Occasional)
At/above shoulder	5.2% (Occasional)	0% (Never)	0.96% (Occasional)
Overhead	0% (Never)	0% (Never)	0% (Never)
Legs:			
Sitting	36.4% (Frequent)	0% (Never)	0% (Never)
Standing still	21.8% (Occasional)	19.1% (Occasional)	4.3% (Occasional)
Walking	1.7% (Occasional)	0.87% (Occasional)	0.5% (Occasional)
Kneeling	0% (Never)	0% (Never)	0% (Never)
Crouching	0% (Never)	0% (Never)	0.2% (Occasional)
Crawling	0% (Never)	0% (Never)	0% (Never)
Lying	0% (Never)	0% (Never)	0% (Never)

**Frequency defined by the Ministry of Labour is 1-33% for Occasional, 34-66% for Frequent, and 67-100% for Constant.

VERIFICATION AND ACCEPTANCE

The job description for Meterman/Learner has been reviewed on January 1, 199_, and is believed to be an accurate representation of the job content.

Superintendent – Meter Department **Union Representative**

APPENDIX C: Essential vs. Nonessential Functions

The term essential function means the fundamental job duties of the employment position the individual holds. The term "essential function" does not include the nonessential functions of the position. It is important to understand that the Ontario Human Rights Code (OHRC) does not tell companies what jobs to have or how to define each job. It does mandate that hiring policies do not discriminate against a qualified applicant or employee on the basis of the person's disability.

OHRC states that job functions should be divided into 2 categories: essential and nonessential. This division is critical for the following reasons:

1. It allows for the development of accurate and objective jobs descriptions.
2. It provides the basis for development of appropriate interview questions.
3. It assists in determining whether an employee or candidate can perform each function.
4. It assists in the identification of reasonable accommodations.

For employers covered by the OHRC, "essential functions" are the key to determining applicant qualifications. The OHRC prevents an employer from discriminating against a qualified person with a disability who can "perform the essential functions of the job" with or without a reasonable accommodation.

The concept of reasonable accommodation creates a new way that employers must look at their jobs. The OHRC distinguishes between functions that are essential and those that are not. Employers are required to "forgive" a qualified individual with a disability a nonessential function that cannot be performed because of the disability. The employer must also provide "reasonable accommodation", when necessary, to such a person to do an essential job.

How do you determine whether or not the function is fundamental, and therefore, essential? The following questions should be considered in determining essential functions:

1. Why does the job exist?
2. Does the incumbent actually perform the function?
3. Would the overall purpose of the job be accomplished if this function was not performed?

Both of question #2 and #3 need to be answered "yes" if the function is to be considered essential.

Nonessential functions are those not essential to the specific job or those shared by many different employees. Nonessential functions must not influence placement of an individual in a particular position.

The following list of words defining essential and nonessential may assist in identifying which work functions are essential and nonessential:

ESSENTIAL	NONESSENTIAL
Critical	Peripheral
Fundamental	Borderline
Primary	Extra
Required	Nonessential
Main	Passable
Necessary	Incidental
Integral	Minimal
Crucial	Accessory
Vital	Secondary
Indispensable	Auxiliary
Basic	Supplementary
Imperative	Supporting
Key	Ancillary
Intrinsic	Dispensable
Central	Collateral

Some common jobs with some of their essential and nonessential functions identified are listed below as examples:

JOB	ESSENTIAL FUNCTION	NONESSENTIAL FUNCTION
Cafeteria Worker	-serve customers	-unload supply truck
Receptionist	-answer incoming calls	-hand deliver phone messages
Airline Pilot	-land aeroplane	-greet passengers
Assembler	-produce required product	-sweep area
Bus Driver	-drive bus	-clean trash from bus
Auto Mechanic	-fix car	-speak with customers
Teacher	-teach students	-play sports with students

Appendix D: Job Information Collection Form

Job Specific Data Collection Form

Position Information

Department No. & Title: _____ Supervisor Title: _____

License/Certification Registration: _____

Training: _____

Job Title: _____

Assignment

Production Days:

o Mon
o Tue
o Wed
o Thu
o Fri
o Sat
o Sun

Production Shifts:

o 1 ____am/pm to ____ am/pm
o 2 ____ am/pm to ____ am/pm
o 3 ____ am/pm to ____ am/pm

Shift Rotation:

o No
o Yes, Explain
_____
_____

Breaks:

o 1st _____ minutes
o Lunch _____ minutes
o 2nd _____ minutes
o 3rd _____ minutes
o Extra _____ minutes

Overtime:

o Never …..... 0% of the time
o Occasional …..... 1-33% of the time
o Frequent ...……..... 34-66% of the time
o Regular ....……..... 67-100% of the time
o Mandatory

Production Variables:

Maximum_____ (units/shifts)
Average _____ (units/shifts)
Minimum_____ (units/shifts)

Job Rotation:

o No
o Yes – Scheduled
o Yes – Unscheduled

Rotation Job Titles:

_____
_____
_____
_____

o Self Paced
o Production Paced
o Production Incentives
o Safety Incentives

Job Duties

Essential Duties:	**Task Duration (%/shift)**
1)	
2)	
3)	
4)	
5)	
6)	
Non-Essential Duties:	**Task Duration (%/shift)**
1)	
2)	
3)	
4)	

Job Title: _____ **Date:** _____ **Dept:** _____

LIFTING

DUTIES/TASK	Weight	Start Height	End Height	Lift Direction L,R,S	Hands Used L,R,B,E	HORIZ. REACH		FREQUENCY	
						Horiz R/L	Horiz Front	Time Second	Day # or %
1) Ave:									
Range:									
2) Ave:									
Range:									
3) Ave:									
Range:									
4) Ave:									
Range:									
5) Ave:									
Range:									
6) Ave:									
Range:									
7) Ave:									
Range:									
8) Ave:									
Range:									

L=Left R=Right S=Sagittal B=Both E=Either

Comments:

CARRYING

DUTIES/TASK	Weight	Distance Carried	Level Kn,Wst, Sh, Abv	How Carried with H,A,S	Frequency	
					Time Second	Day # or %
1) Ave:						
Range:						
2) Ave:						
Range:						
3) Ave:						
Range:						
4) Ave:						
Range:						

Comments:

_____
_____
_____
_____
_____
_____
_____

Kn=Knee Wst=Waist Sh=Shoulder Abv=Above Shoulder H=Hand A=Arm S=Shoulder

PUSHING

DUTIES/TASK	Force	Push Height	Push Distance	Hands Used L,R,B,E	Body Position Sit, Stnd, Knl, Crch	FREQUENCY	
						Time Second	Day # or %
1) Ave:							
Range:							
2) Ave:							
Range:							
3) Ave:							
Range:							
4) Ave:							
Range:							

Comments:

_____
_____
_____
_____
_____
_____
_____

L=Left R=Right B=Both E=Either Sit=Sit Stnd=Stand Knl=Kneel Crch=Crouch

PULLING

DUTIES/TASK	Force	Pull Height	Pull Distance	Hands Used L,R,B,E	Body Position Sit, Stnd, Knl, Crch	FREQUENCY	
						Time Second	Day # or %
1) Ave:							
Range:							
2) Ave:							
Range:							
3) Ave:							
Range:							
4) Ave:							
Range:							

Comments:

_____
_____
_____
_____
_____
_____
_____

L=Left R=Right B=Both E=Either Sit=Sit Stnd=Stand Knl=Kneel Crch=Crouch

REACHING

DUTY/TASK	Weight	Vertical Height	HORIZONTAL REACH		Reach Direction L,R,F,B	Hands Used L,R,B,E	FREQUENCY	
			Distance Right/Left	Distance Front			Time Second	Day # or %
1) Ave:								
Range:								
2) Ave:								
Range:								
3) Ave:								
Range:								
4) Ave:								
Range:								

Comments:

_____
_____
_____
_____
_____
_____
_____

L=Left R=Right F=Front B=Both E=Either

HANDLING

DUTIES/TASK	Weight	Grip Force	Hands Used L,R,B,E	Turn in° / Turn Out°	Wrist Flex° / Wrist Ext°	Diameter	FREQUENCY Time Second	FREQUENCY Day # or %
1) Ave:								
Range:								
2) Ave:								
Range:								
3) Ave:								
Range:								
4) Ave:								
Range:								

L=Left R=Right S=Sagittal B=BothE=Either

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

FINGERING

DUTIES/TASK	Weight	Pinch Force	Hands Used L,R,B,E	Pinch Type 2, 3, Key Multiple	Finger Flexion [X]	FREQUENCY Time Second	FREQUENCY Day # or %
1) Ave:							
Range:							
2) Ave:							
Range:							
3) Ave:							
Range:							
4) Ave:							
Range:							

L=Left R=Right B=Both E=Either 2=2-point pinch 3=3-point pinch Key=Key (lateral) pinch Multiple=Multiple pinch

Comments:

_____

_____

_____

_____

_____

_____

L=Left R=Right S=Sagittal B=Both E=Either

SITTING

DUTIES/TASK	FREQUENCY	
	Time Second	Day # or %
1)		
2)		
3)		
4)		

STANDING

DUTIES/TASK	FREQUENCY	
	Time Second	Day # or %
1)		
2)		
3)		
4)		

STOOPING

1)		
2)		
3)		
4)		

TRUNK TWISTING/LATERAL BENDING

1)		
2)		
3)		
4)		

HAND(S) AT/ABOVE SHOULDER

1)		
2)		
3)		
4)		

WALKING

1)		
2)		
3)		
4)		

KNEELING

1)		
2)		
3)		

CROUCHING

1)		
2)		
3)		

BALANCING

1)		
2)		
3)		

CLIMBING

1)		
2)		
3)		

CRAWLING

1)		
2)		
3)		

TASK/SMELL

1)		
2)		
3)		

TALKING

1)		
2)		
3)		

HEARING

1)		
2)		
3)		

FEELING

DUTIES/TASK	Hands Used L,R,B,E	Feel For Size, Shape, Temp, Text	FREQUENCY	
			Time (Second)	Day (# or %)
1)				
2)				
3)				

L=Left R=Right B=Both E=Either Temp=Temperature

SEEING

DUTIES/TASK	Eyes Used L,R,B,E	See Function Near, Far Depth, Acc Field, Colour	FREQUENCY	
			Time (Second)	Day (# or %)
1)				
2)				
3)				

L=Left R=Right B=Both E=Either Acc=Accommodation

Environmental Conditions Code (E.C.C.):

1) Exposure to Weather
2) Extreme Cold, Non-Weather
3) Extreme Heat, Non-Weather
4) Wet/Humid, Non-Weather
5) Noise - V,Q,M,L,E
6) Vibration
7) Atmospheric Conditions
8) Moving Mechanical Parts
9) Electric Shock
10) Working in High, Exposed Places
11) Radiation Exposure
12) Explosion Exposure
13) Toxic or Caustic Chemical Exposure
14) Other - Explain

ENVIRONMENTAL CONDITIONS

E.C.C.#	DUTIES/TASK	FREQUENCY	
		Time Second	Day # or %
	1)		
	2)		
	3)		
	4)		
	5)		
	6)		
	7)		
	8)		
	9)		
	10)		

APPENDIX E: Physical Demands Functional Elements

The sections that follow will provide instructions for measuring and recording the 21 elements that comprise the Physical Demands.

1. Lifting

Definition: Raising or lowering an object from one level to another (includes upward pulling and/or exerting upward force to hold an object in static position).

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Weight: Measure the weight of the object. Record the average and minimum and maximum weights if the weight is variable. When average weight cannot be determined, use the midpoint between the minimum and maximum weights as the usual weight. In put the minimum and maximum value in the range cell.

Start Height: Measure the vertical start height of the object in inches (see diagram). This distance is measured from the floor to the position of the hand when initiating the lift. Record both minimum and maximum values if the start height of the object is variable (i.e. depalletizing boxes). If the object is always lifted from the same height (i.e. conveyor, assembly bench), record the value in both boxes.

End Height: Measure the vertical end position of the object in inches. This distance is measured from the floor to the height of the hands at the final resting place. Record both minimum and maximum values if the end position is variable. If the end position is always the same, record the value in both boxes.

Lift Direction: This field describes any dynamic lifting that occurs to the left (L), right (R) or sagittal (straight-ahead - S) planes. For dynamic lifting to occur in either the left or right direction, the body trunk must rotate more than 20 degrees.

Hands Used: Identify Left (L), Right (R), Both (B) or Either (E) hand.

Horizontal Reach: Measure the horizontal distance that the object is from the body. The measurement is from the midpoint of the ankles to the location of the 3rd knuckle. All lifts will have a "Horizontal Front" value. Asymmetrical and one-handed lifts will have "Horizontal Right/Left" values. Record minimum and maximum values if the reach distance is variable. This variable can be ignored if ergonomic risk factor is not important in the PDA.

Frequency: Enter the frequencies of the lift in lift per minute (#/min) per shift or duration of the task. This variable should be measure during the on-site visit.

Examples (See Appendix F):

Production line worker: The objective of the job is to assemble the product. Two lifts are observed. The first is the product. The product weighs 6 kg, and is lifted when moving the assembled product from a conveyor to a rack. The conveyor is 75 cm high. The rack has shelves at 30 cm, 60 cm, 90 cm, 120 cm and 180 cm. The horizontal reach is variable from 30 – 46 cm. The cycle time is 60 seconds, and the duration of the lift is 4 seconds. Either hand is used with no body rotation in excess of 20 degrees left or right.

The second is a box of parts. The box of parts weighs 16 kg and is lifted from the floor to a flow rack shelf at a height of 152 cm, 51 cm horizontally. The box is lifted 4 times each day. The duration of the lift is 6 seconds. Both hands are used with body rotations in excess of 35 degrees left or right.

Method & Techniques:

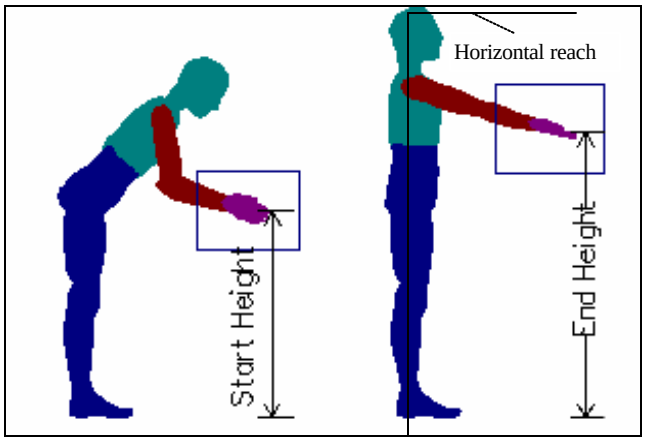
Obtain weight values by weighing the object with a scale or suspended from a dynamometer. Some items may be labelled with a product weight or weight values may possibly be obtained from production or shipping records. Observe workers performing the lift. When measuring weights of objects lifted, obtain at least three examples of items where appropriate.

Special Concerns:

A common problem in job analysis is over-rating the frequency and weight of lifting. Frequency is determined by the actual number spent performing the lift task per shift. Two (or more) person lifts should be recorded at 50% (33% if 3 person, etc.) of the total weight of the object. If material-handling equipment is always available to lift an object, do not record it as a lift. Make a note in the General Observation section of the report regarding the availability of this equipment.

Tools:

Dynamometer, scale, nylon straps, tape measure, video camera, production or shipping records.



2. Carrying

Definition: Transporting an object, usually holding in the hands, arms or on the shoulder.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Weight: Measure the weight of the object. Record the average and minimum and maximum weights if the weight is variable. When average weight cannot be determined, use the midpoint between the minimum and maximum weights as the usual weight. In put the minimum and maximum value in the range cell.

Distance Carried: Measure the distance, in feet, centimetre or meter, from the starting point to the resting point that the object is carried.

Level: Observe the level that the object is carried at. Record knuckle (Kn), waist (Wst), shoulder (Sh), above shoulder (Abv).

How Carried: Identify Hand (H), Arm (A) or Shoulder (S).

Frequency: Enter the frequencies of the lift in lift per minute (#/min) per shift or duration of the task. This variable should be measure during the on-site visit.

Examples (See Appendix F):

Production line worker: At the end of the assembly line, the production worker lifts and carries the product to the packing station. The product weighs 6 kg, it is carried at waist height in the hands for a distance of 3.60 m. The duration is 5 sec., cycle time 45 sec.

Warehouse Worker: Foam pieces are moved every 75 seconds from the warehouse to the truck trailer. The pieces weigh 8 kg and are carried 12 m. The workers carry the pieces by resting them on their shoulders. Loading trucks with foam pieces comprises 50% of the workday.

Method & Techniques: Obtain weight values by weighing the object with a scale or suspended from a dynamometer. Some items may be labelled with a product weight or weight values may possibly be obtained from production or shipping records. Observe workers performing the carrying task. When measuring weights of objects carried, obtain at least three measurement of the item where appropriate.

Special Concerns: Determine which objects carried support the objectives of the essential function. Some carries are not essential. Carts, dollies, hand trucks or forklifts may be available. Ask the worker and confirm with the management if there are questions.

Tools: Dynamometer, scale, tape measure, stop watch, video camera.

3. Pushing

Definition: Exerting force upon an object so that the object moves away from the force (including stooping, striking, kicking, treading and exerting force to hold an object in static position).

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Force: Measure the force exerted on the object. Record the average and minimum and maximum weights if the weight is variable. When average weight cannot be determined, use the midpoint between the minimum and maximum weights as the usual weight. In put the minimum and maximum value in the range cell. When measuring the force, avoid sudden, or heavy pushing motions. This will result in incorrect data. A steady, slow motion should be utilised with the force meter. See exception to this rule under "Special Concerns".

Push Height: Measure the vertical height that the hands apply force to the object.

Hands Used: Identify Left (L), Right (R), Both (B) or Either (E).

Body Position: Observe and record the body positions while the force is being exerted. Record Sit, Stand (Stnd), Kneel (Knl) or Crouch (Crch).

Frequency: Enter the number push per minute per shift.

Examples (See Appendix F):

Production line worker: The essential function requires that bolts be fastened onto a frame. The worker uses a pneumatic hand ratchet to perform the work. Use of the tool requires a push to secure the ratchet socket onto the bolt head. The force exerted was measured 3 times and averaged 7 kg. The height of the application is 89 cm. Either hand is required. The worker performs the activity in a standing position every 30 seconds for duration of 5 seconds.

Material Handler: The worker moves a cart with product from the production line to the shipping warehouse. The initial force required moving the cart is measured at 11 kg, whereas the tracking force (once the cart is in motion) is 5 kg. The handles for the cart are measured at 84 cm. Both hands are used during the activity. It is observed that the activity occupies 25% of the workday at a frequency of 1/min. The activity is performed in a standing position. Pushing distance is 30 cm.

Method & Techniques: Position the force meter on the point where the push is applied, and with a steady, slow motion obtain a measurement.

Special Concerns:

Improper use of the dynamometer or force measurement tool will result in incorrect data. A steady, slow increase in force will yield accurate results. An exception to this rule is when the force exertion *absolutely requires* a sudden jerking motion. In this case, try to duplicate the speed of force exertion to gain the most accurate reading. It is also a good practice to obtain at least three examples of objects pushed.

Some push forces are difficult to measure due to the nature of the task. An example of this is a worker exerting a static push force to hold a metal casting against a bench grinder. In this case it would be acceptable to have the worker hold the dynamometer and simulate the force against a fixed object. Take an average of 3 measurements.

Tools:

Dynamometer, tape measure.

Push

4. Pulling

Definition: Exerting force upon an object so that the object moves toward the force (including jerking and exerting force to hold an object in static position).

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Force: Measure the force exerted on the object. Record the average and minimum and maximum weights if the weight is variable. When average weight cannot be determined, use the midpoint between the minimum and maximum weights as the usual weight. In put the minimum and maximum value in the range cell. When measuring the force, avoid sudden, or heavy pushing motions. This will result in incorrect data. A steady, slow motion should be utilised with the force meter. See exception to this rule under "Special Concerns".

Pull Height: Measure the vertical height that the hands apply force to the object.

Hands Used: Identify Left (L), Right (R), Both (B) or Either (E).

Body Position: Observe and record the body positions while the force is being exerted. Record Sit, Stand (Stnd), Kneel (Knl) or Crouch (Crch).

Frequency: Enter the number of pulls per minute per shift.

Examples (See Appendix F):

Production line worker: The essential function requires that bolts be fastened into a frame. Prior to fastening the bolts, the worker must position the frame on the workstation. This involves a pull motion. The force is measured at 10 kg. Both hands are utilised at a height of 91 cm. The cycle time and duration is 21 seconds and 3 seconds respectively. The worker performs the activity in a standing position.

Material Handler: The worker moves a cart with product from the production line to the shipping warehouse. The initial force required in moving the cart is measured at 25 kg, whereas the tracking force (once the cart is in motion) is 14 kg. It is observed that the activity occupies 25% of the workday. The cycle time and duration is 21 seconds and 3 seconds respectively. The worker performs the activity in a standing position.

Loader Operator: To operate the loader bucket, the operator uses the left hand and pulls the lever. The force to activate the lever is 3 kg. This activity is performed 1300 times in a seated position 75% of the workday. The height of the lever is measured at 71 cm.

Method & Techniques: Position the force meter on the point where the pull is applied, and with a steady, slow motion obtain a measurement.

Special Concerns: Improper use of the dynamometer or force measurement tool will result in incorrect data. A steady, slow increase in force will yield accurate results. An exception to this rule is when the force exertion *absolutely requires* a sudden jerking motion. In this case, try to duplicate the speed of force exertion to gain the most accurate reading. It is also a good practice to obtain at least three examples of objects pulled.

Tools: Dynamometer, nylon straps, tape measure.

Pull

5. Reaching

Definition: Extending hands and arms in any direction from the neutral postures of the arms. A reach is defined as extending the hands in any direction while handling objects that are less than 4.5 kg (10 lbs).

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Weight: Enter the weight in kg of the object moved.

Vertical Height: Measure the vertical height range minimum and maximums for the reach. This distance is measured in cm from the floor to the position of the hands.

Horizontal Reach: Measure the horizontal distance that the hands are from the body. Record the distance in cm as measured from the shoulder joint to the location of the 3rd knuckle. If reaches occur to the side of the body, record the measurement in the "Distance Right/Left" box. Forward reaches are recorded in the "Distance Front" box.

Reach Direction: Record the direction(s) of the reach, whether to the Left (L), Right (R), Front (F) or Back (B – reaching behind the body).

Hands Used: Check which hand(s), Left (L), Right (R), Both (B) or Either (E) used.

Frequency: Enter the data for repetitive (Enter the number per minute per shift) or non-repetitive frequencies.

Examples:
(See Appendix F):

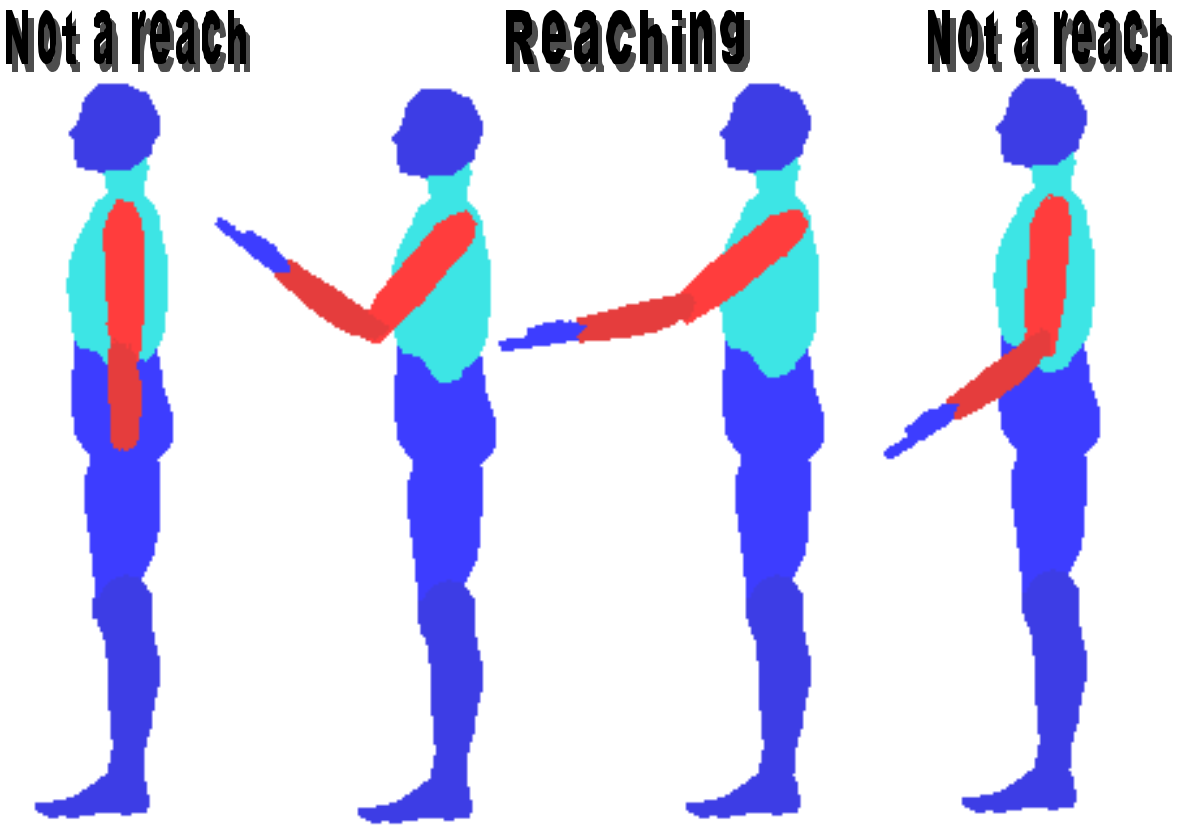
Press Operator: The control panel for the press is located to the right of the operator. The operator utilises the right arm in adjusting the controls on the panel. The distances measured from the operator's shoulder are 58 cm in the front, 60 cm to the right, and 132 cm above the floor. No weight is moved in this reach. The occurrence is observed to be once every 90 seconds for a duration of 10 seconds.

Production Assembler: The objective of the job is to assemble the swing arm. The worker is observed to reach to the front 66 cm and to the left and right 41 cm. The assembly table is 96 cm high. During the reach, the worker is moving a pneumatic socket wrench that weights 2.7 kg. The duration of the reach and move is 10 seconds, with the cycle repeating every 60 seconds. Either hand is utilised.

Method & Techniques: Measure data points with the operator in position. Weigh the objects moved with the scale or dynamometer.

Special Concerns: The forward, left and right horizontal reach distances should be measured in a plane parallel to the floor.

Tools: Dynamometer, scale, tape measure, stop watch.



6. Handling

Definition: Seizing or grasping, holding, turning or otherwise working with the hands. Fingers are only involved to the extent that they are extensions of the hand.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Weight: Enter the weight in kg of the object moved.

Grip Force: Determine the strength utilised in performing the activity.

Hands Used: Check which hand(s), Left (L), Right (R), Both (B) or Either (E) used.

Turn In/Turn Out: In and Out refer to pronate and supinate, respectively. The origin is hand extended, thumb pointing upward. Full pronation is 90 degrees in (palm down), whereas, full supination is 90 degrees Out (palm up).

Wrist Flex/Wrist Ext.: Flex refers to wrist flexion. The neutral position is with the palm and fingers in a straight line with the forearm. A wrist flexion of 90 degrees represents the position where the palm is at an angle directed toward the forearm. Ext. refers to wrist extension. A wrist extension of 90 degrees represents the position where the palm of the hand is at an angle directed away from the forearm.

Diameter: This value represents the diameter of the object being grasped in cm.

Frequency: Enter the data for repetitive (the number per minute per shift) or non-repetitive frequencies.

Examples (See Appendix F):

Press Operator: The operator loads sheet metal blanks into the press at a rate of one every 20 seconds, for a duration of 10 seconds. The blanks weigh 1.4 kg, and it is 0.25 cm thick. Either hand can be used, with forearm pronation of 45-90 degrees and wrist extension of 30 degrees.

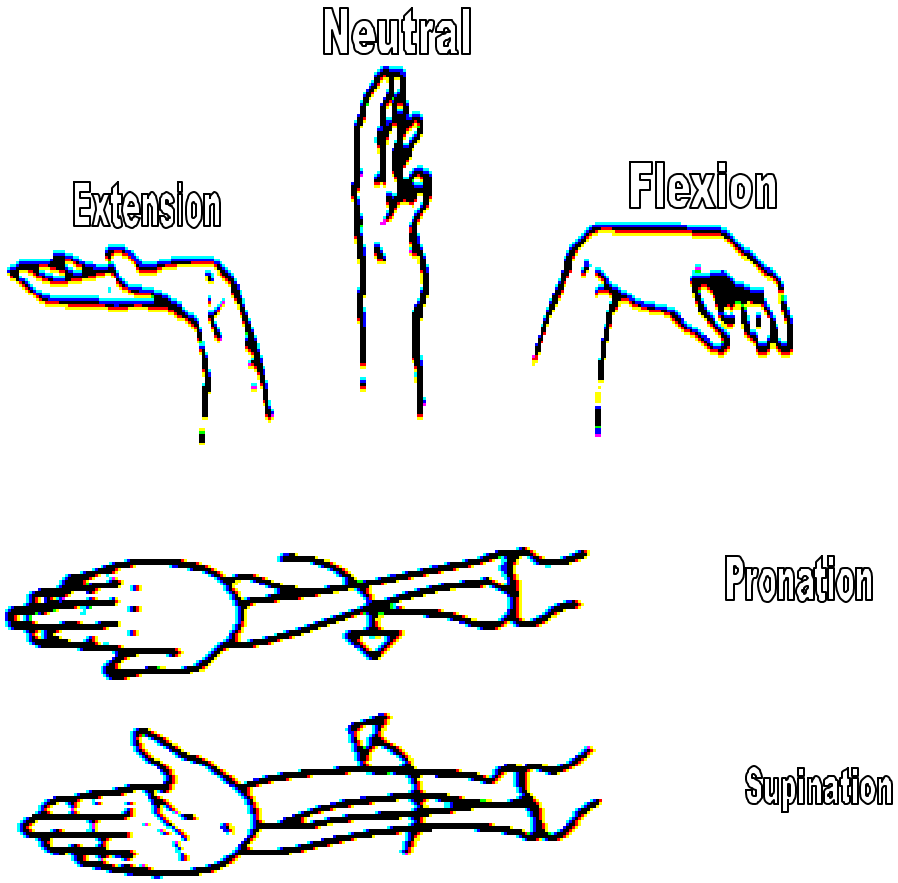
Production Assembler: Parts are fastened to the product that weights 0.5-2 kg. Both hands are used, with forearm supination and pronation to 45 degrees and wrist flexion and extension to 20 degrees. The parts are up to 6.5 cm in diameter. Four parts are added during a 60-second cycle time, with handling duration of 15 seconds.

Method & Techniques: Collect data through measurement and observation. Grip requirements are currently not easily obtained. The critical factors in determining grip consist of, coupling, wrist position, direction of force. Coupling refers to the contact of the hand with the object. Variances are attributed to gloves, object surface and

existence of moisture and other material deposits between the hand and object. The position of the wrist and direction of the applied force produces variation in "how" the activity is accomplished. A hand dynamometer can be used to approximate the grip force, although this can be time consuming. If unavailable, leave this box blank.

Special Concerns: It is incorrect to assume that the weight of the object held is the same as the handling force.

Tools: Tape measure, dynamometer or scale, stop watch, goniometer.



7. Fingering

Definition: Picking, pinching, or otherwise working with the fingers, other than with the whole hand or arm as in handling.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Weight: Enter the weight in kg of the object involved in the activity.

Pinch Force: Determine the strength utilised in performing the activity.

Hands Used: Check which hand(s), Left (L), Right (R), Both (B) or Either (E) used.

Pinch Type: Record the type of pinch observed, whether 2 point, 3 point, key, or multiple. A 2 point pinch is use of the thumb and index finger, 3 point is thumb, first and second finger, Key (Lateral) pinch is use of thumb and edge of first finger. Multiple is a combination of pinch types.

Finger Flexion: Mark the box with an "X" if the fingers are flexed at the joints. For example, during keyboarding activities.

Frequency: Enter the percent of shift/day performing this activity for each individual task.

Examples (See Appendix F):

Press Operator: Adjustments of the press utilise turning butterfly bolts 4 cm thick. Either a 3 point or key pinch is observed. The force is estimated at 3 kg. Weight of object is negligible. The fingers are flexed during the activity. The activity occurs 25% of the time. Either hand is utilised.

Sewer: Positions the fabric on the sewing machine using a 2-point pinch. The fabric is less than 3 cm thick. Fingers are held straight during the activity (no flexion). The estimated force is determined to be 2 kg. The task is repetitive every 50 seconds, with the duration of the pinch lasting 35 seconds. Both hands are utilised.

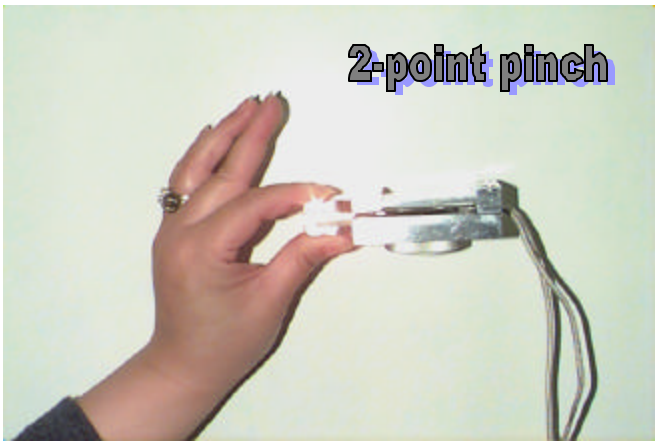
Machine Technician: To service manufacturing equipment the technician must use a computer keyboard to perform diagnostics and service. This is done 50% of the workday. Both hands are utilised to activate the keys.

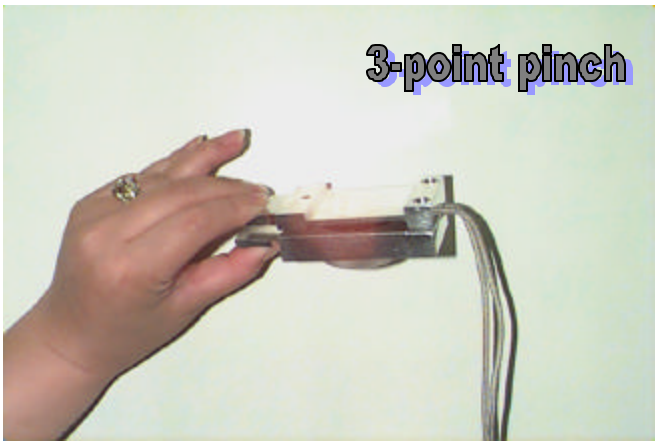
Method & Techniques: Collect data through measurement and observation. Pinch requirements are also not easily obtained. The critical factors in determining pinch consist of, coupling, wrist position, and direction of force. Coupling refers to the contact of the hand with the object. Variances are attributed to gloves, object surface, existence of moisture, and other material deposits between the hand and object. The position of the wrist and direction of the applied force produces variation in

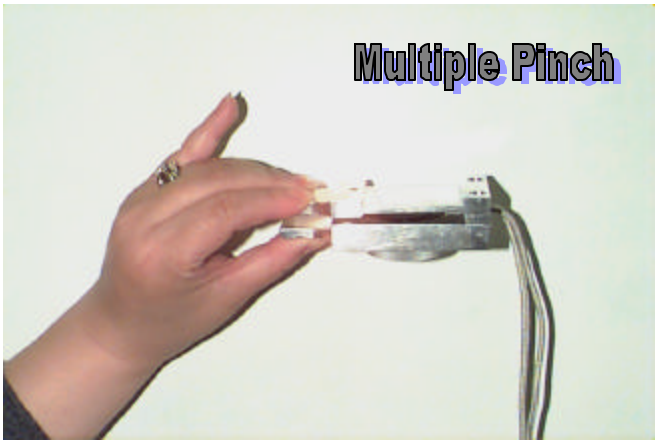
"how" the activity is accomplished. A pinch gauge or hand dynamometer can be used to approximate the pinch force. If unavailable, leave this box blank.

Special Concerns: Full hand grasp interpreted as a pinch. An example is pulling seat covers over foam. The workers "grab" the cover material to the extent that the fingers are in full flexion. Fingering activities are limited to activities where the fingers are not in full flexion.

Tools: **Dynamometer, scale, tape measure, stop watch, pinch gauge.**







8. Sitting

Definition: Remaining in a seated position. Observe and record the duration (in % per day) the worker is in a seated position

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percentage of the day or shift involving this activity.

Examples (See Appendix F):

Production line worker: The position utilises bench assembly methods. Approximately 45 minutes of their 8 hour shift is spent on their feet, obtaining/transporting supplies and finished product. The remainder of the shift is spent performing assembly tasks from a seated position.

Plate room Technician: As part of the work assignment, the technician must examine the plate. A table is available to assist in the process. The table height is 107 cm in height. A stool is available for use during this process. The worker spends 30% of the time at this area.

Machine operator: The employer requires that the operators of sewing machines rotate between a seated and standing posture every hour (1 hour standing followed by 1 hour seated).

Method & Techniques: Collect data through observation and interview.

Special Concerns: The judgement is whether the function requires the individual to remain in a seated position, or if a seated posture is optional. Follow the guidelines for determining essential functions. If sitting is optional, but workers typically do the function sitting, record it as sitting function. Be sure to indicate in the comment section that there is a sit/stand option for that function.

Tools: Observation and interview.

9. Standing

Definition: Remaining on one's feet in an upright position without moving greater than 3 steps. Observe and record the duration the worker is in a standing position

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

Production line worker: The position utilises assembly line production methods. Workers are assigned to an assembly station that is 5 feet wide. Workers remain on the production line for the entire 8-hour shift, with the exception of normal breaks every 2 hours. During the assembly process, the product travels down the conveyor at a rate of 3 m per 50 seconds. The worker is observed to stand and walk 1-2 steps during the 50-second cycle.

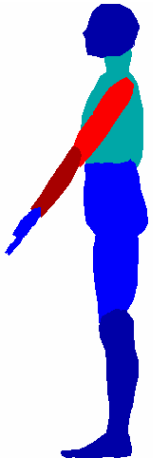
Electrical Technician: As part of the work assignment, the technician must troubleshoot electrical controls. The control cabinet is 152 cm tall and 122 cm wide. The technician services controls within the cabinet for 30 minutes without walking more than three steps. The cabinet is serviced once each day.

Machine operator: The employer requires that the operators of specific machines rotate between a seated and standing posture every hour (1 hour standing followed by 1 hour seated).

Method & Techniques: Collect data through observation and interview.

Special Concerns: Standing and walking are frequently performed together. When observing standing and walking in the same functional task, try to determine the percentage of time spent performing each component. If the activity requires less than 3 steps of walking, record it as a stand.

Tools: Observation and interview.



10. Stooping

Definition: Bending the body forward and downward by bending (greater than 20 degree) spine at waist, requiring full use of lower extremities and back muscles.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

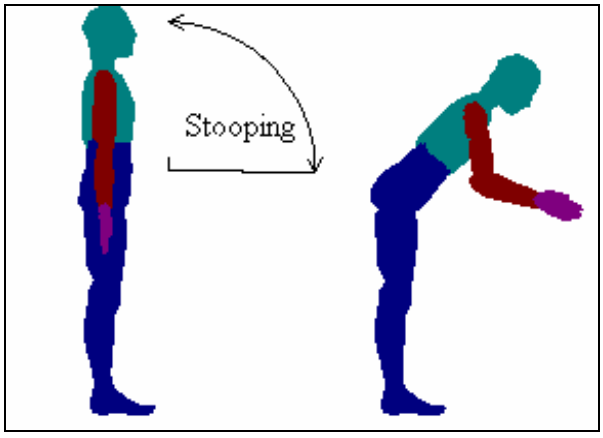
Production Assembler: As part of the work assignment, the worker reaches into a bin to retrieve a part. This occurs once every 60 seconds for duration of 5 seconds.

Material Handler: In stocking the production line, materials are located in areas near the floor. The worker stoops during the lift. This activity is observed to occur 35% of the time. Lifting devices are available for use.

Method & Techniques: Collect data through observation and interview.

Special Concerns: Many jobs in which stooping is observed do not necessarily require stooping, rather it is a work style choice. In the Material Handler example above, the worker could choose to crouch instead. In this case, record how workers typically perform the task. Be sure to indicate in the General Comment section that workers can choose to use other postures to complete the task.

Tools: Observation and interview.



11. Trunk Twisting/Lateral Bending

Definition: Twisting the upper body (trunk) or bending the upper body to the side by greater than 20 degrees at waist.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

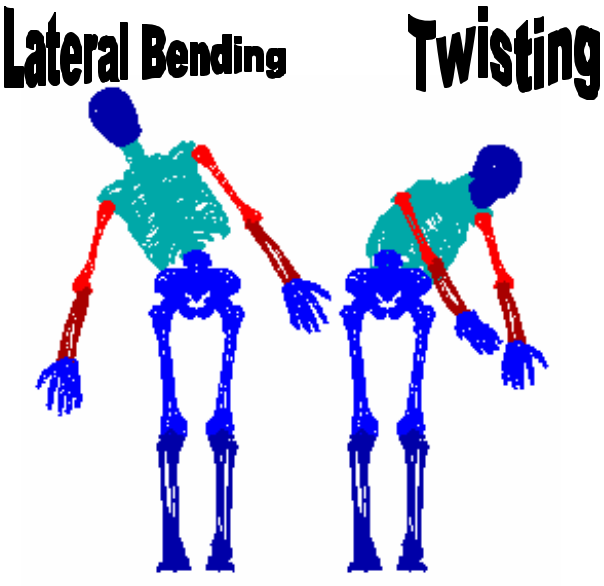
Production Assembler: As part of the work assignment, the worker reaches into a bin, located to the right side, to retrieve a part. This occurs once every 50 seconds for a duration of 5 seconds.

Material Handler: In stocking the production line, materials are located in areas near the floor. The worker bends laterally during the lift. This activity is observed to occur 10% of the time.

Method & Techniques: Collect data through observation and interview**.**

Special Concerns: Many jobs in which twisting and lateral bending are observed do not necessarily require the performance of this activity. In the Material Handler example above, the worker could choose to turn the upper body by moving the legs and hip. In this case, record how workers typically perform the task. Be sure to indicate in the General Comment section that workers can choose to use other postures to complete the task.

Tools: Observation and interview.



12. Hand(s) At/Above Shoulder

Definition: Working with one or both hands at or above shoulder level, without any external support to the upper and lower arm (s). The location of the glenohumeral joint is defined as the "shoulder level".

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

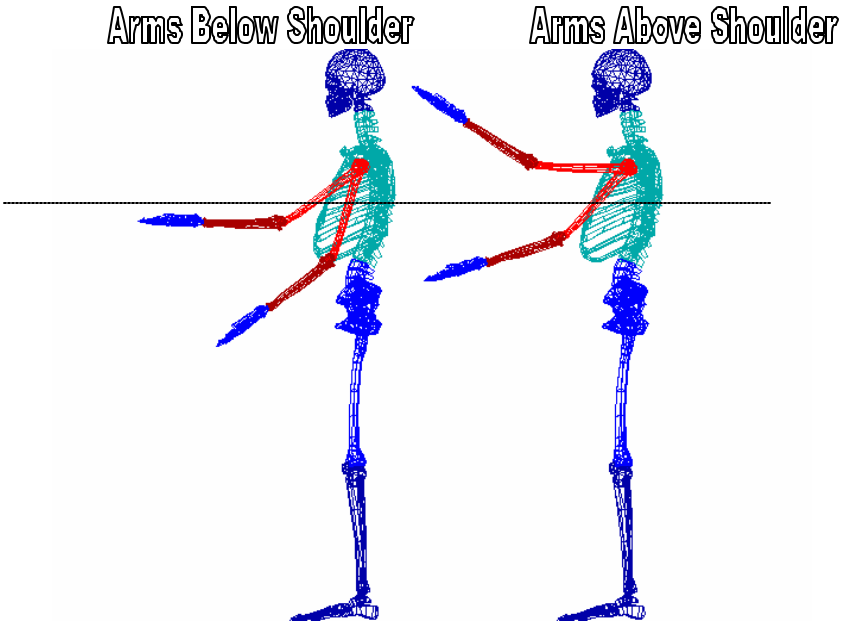
Frequency: Enter the percent of shift/day this activity is performed for each task.

Examples (See Appendix F): **Grocery Stock Clerk:** As part of the work assignment, the worker stock products onto display shelves located at various heights. While stocking, it was observed that one or both arms are above shoulder level for 240 min of an 8 hour shift, with two 15-min. breaks and a 30-min. lunch period.

Method & Techniques: Collect data through observation and interview.

Special Concerns: Many jobs, in which twisting and lateral bending are observed, do not necessarily require the performance of this activity. In the Material Handler example above, the worker could choose to turn the upper body by moves the legs and hips. In this case, record how workers typically perform the task. Be sure to indicate in the General Comment section that workers can choose to use other postures to complete the task.

Tools: Observation and interview.



13. Walking

Definition: Moving about on foot greater than 3 steps. Observe and record the duration the worker is walking.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

Production line worker: The position utilises assembly line production methods. Workers remain on the production line for the entire 8-hour shift, with the exception of normal breaks every 2 hours. During the assembly process, the worker walks with the product travelling down the conveyor, installing parts. The assembly station is 6 m wide and the product moves down the conveyor at a rate of 12 m per minute. The worker can walk back to the beginning of the assembly line in 10 sec.

Electrical Technician: As part of the work assignment, the technician must troubleshoot electrical controls. The technician walks between the tool crib and the cabinet for parts duration of 15 minutes, 2 times each day.

Method & Techniques: Collect data through observation and interview.

Special Concerns: Standing and walking are frequently performed together. When observing standing and walking in the same functional task, try to determine the percentage of time spent per shift performing each component. If the activity requires more than 3 steps of walking, record it as a walk.

Tools: Observation and interview.

Walking

14. Kneeling

Definition: Bending one or both legs at the knees to come to rest on knees.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

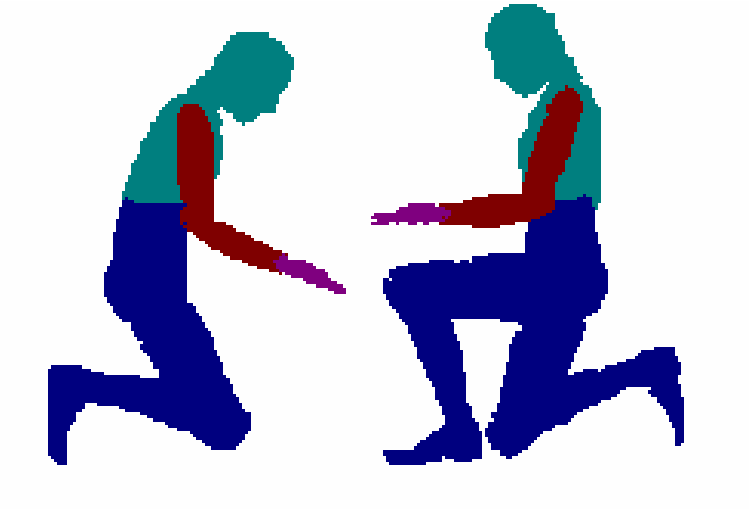
Production Assembler: During the set-up process, the worker remains in a kneeling posture. This occurs once each day for 10 minutes.

Maintenance Mechanic: As part of the work assignment, the mechanic must clean and lubricate large conveyor rollers recessed into the floor. The mechanic kneels to perform this task. This task is observed to occur 10% of the time.

Method & Techniques: Collect data through observation and interview**.**

Special Concerns: A half-kneel (one knee down, the other up) should also be recorded as a kneel.

Tools: Observation and interview.



15. Crouching

Definition: Bending body forward and downward by bending legs and spine.

Information Required

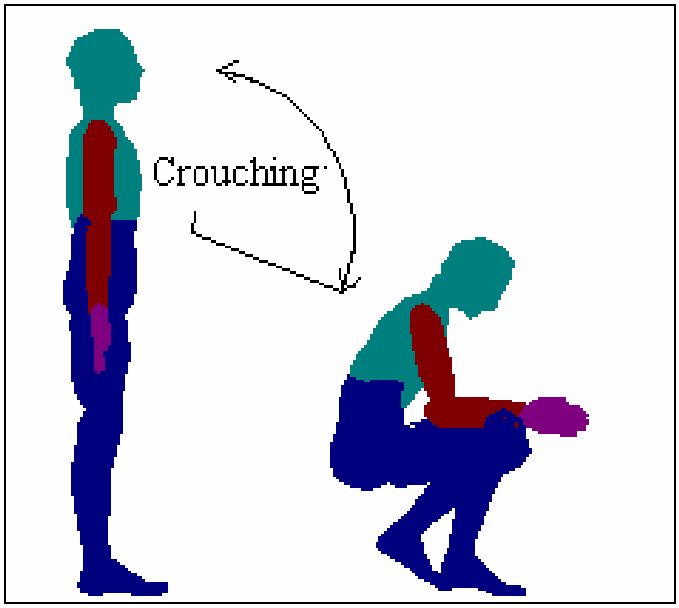
Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F): **Material Handler:** In stocking the production line, materials are located in areas near the floor. When lifting these materials, a crouch occurs. This occurs 200 times each shift for duration of 4 seconds each.

Method & Techniques: Collect data through observation and interview.

Tools: Observation and interview.



16. Balancing

Definition: Maintaining body equilibrium to prevent falling when walking, standing, crouching, or running on either elevated and unguarded, narrow, slippery, sloped or erratically moving surfaces.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

Print press operator: The worker adjusts the ink well which is accessed by a narrow (30 cm wide) plank. The plank has no rails and is positioned 127 cm from the floor. The ink well is adjusted once each hour for a duration of 3 minutes.

Electrical Technician: As part of the work assignment, the technician must service electrical conveyor motors. The conveyor system and motor is located 12 m above the floor with minor guardrails. The conveyor requires service 10% of the time.

Method & Techniques: Collect data through observation and interview.

Special Concerns: Balancing is more than the ability to stand or walk. Positions where the worker is close to moving parts on raised platforms or walkways are usually conditions that utilise balancing.

Tools: Observation and interview.

17. Climbing

Definition: Ascending or descending ladders, stairs, scaffolding, ramps, poles and the like, using feet and legs, or hands and arms. Observe and record the climbing activity. List the object used most often, ladder, stairs, etc.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

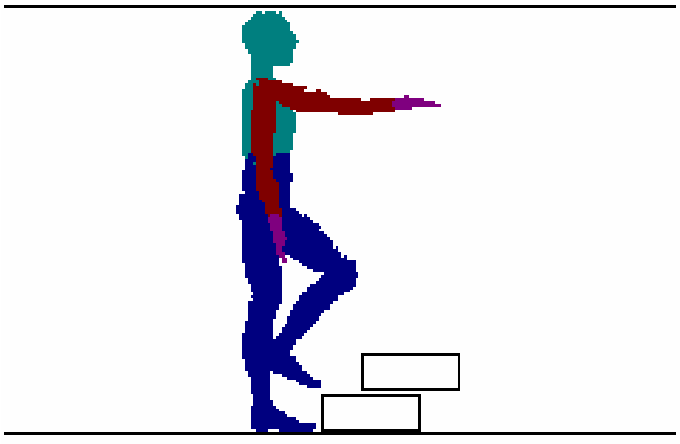
Tend Hopper: The job objective is to stock the hopper with plastic cores. The hopper is located 183 cm from the floor. A 2-step stair is provided so that the hopper can be reached. This results in the worker having to climb in order to load the hopper. The hopper is loaded once each day. The observed duration is 20min.

Electrical Technician: As part of the work assignment, the technician must troubleshoot electrical controls. The control cabinet is located on top of the conveyor system, and is accessible only by climbing a set of stairs. The technician is observed to service the controls 5% of the time.

Method & Techniques: Collect data through observation and interview.

Special Concerns: Access to the workstation is not part of the job analysis scope. A frequent occurrence is where the work assignment is on a raised platform or in a control room that is accessible only by stairs or ladders. This situation should be described in the General Observations section that describes access to the job and facilities.

Tools: Observation and interview.



17. Climbing

Definition: Moving about on the hands and knees.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F): **Press Operator:** During the set-up of the press, the operator must access the underside of the machine. The method utilises a crawling activity. This occurs once each day for 5 minutes.

Method & Techniques: Collect data through observation and interview.

Special Concerns:

Tools: Observation and interview.

19. Tasting/Smelling

Definition: Distinguishing, with a degree of accuracy, differences or similarities in intensity or quality of flavours and/or odours, or recognising particular flavours and/or odours, using the tongue and/or nose.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

Paper Machine Attendant: The smell of smoke signals fire and appropriate warning/prevention procedures must be enacted. The employer established their activity occurs 10% of the time.

Processed Meat Quality Inspector: In addition to bacterial testing, the inspector must smell and taste samples of products to ensure conformance with quality standards. This is done approximately 5% of the shift.

Method & Techniques: Observe and interview workers to determine the use of this perception**.**

Tools: Observation and interview**.**

20. Talking

Definition:	Expressing of exchanging ideas by means of the spoken work to impart oral information to others, and to convey detailed instruction to others accurately, loudly or quickly.

Information Required

Duty/Task:	Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.
Frequency:	Enter the percent of shift/day this activity is performed for each individual task.
Examples (See Appendix F):	**Mechanic:** More than two workers are utilised to replace the motor. While replacing the motor, the workers co-ordinate their actions by means of verbal communication. Verbal communication was observed 50% of the time.
Method & Techniques:	Observe and interview workers to determine method of communication.
Tools:	Observation and interview.

21. Hearing

Definition: Perceiving the nature of sound by the ear.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F): **Production Assembler:** Warning signals by forklifts occur by means of a loud horn. These occur 40% of the time.

Method & Techniques: Observe and interview workers to determine method of communication**.**

Special Concerns:

Tools: Observation and interview.

22. Feeling

Definition: Perceiving attributes of objects, such as: size, shape, temperature, or texture by touching with skin; particularly that of fingertips. Feeling is the ability to perceive size, shape, texture and temperature with the fingers. Record the observed situations where these events occur.

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Hands Used: Check which hand(s), Left (L), Right (R), Both (B) or Either (E) used.

Feel For: Record the types of perception the job utilises: Size, Shape, Temperature, or Texture.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

Paper Machine Operator: Bearings and areas where lubrication is applied are checked by feeling the temperature of the housing. Hot areas signal improper lubrication or worn bearing surfaces. This occurs 20 times each day for 40 seconds. Either hand is utilised.

Carpet Sewer: Positioning the fabric on the sewing machine requires the correct "nap" angle when joining pieces. The nap angle is determined by feeling the texture of the carpet. Either hand is utilised. This activity comprises 60% of the workday.

Mechanic: When assembling parts with bolts and other fasteners, determining the size, shape and location are critical to the activity. Many parts are fastened in areas where the mechanic's vision is clouded , requiring feeling to complete the task. This occurs 10% of the time. Either hand can be utilised to perform this activity.

Method & Techniques: Observe and interview workers to determine size, shape, temperature and/or texture perceptions for work tasks.

Special Concerns: Size and shape perceptions are more applicable for hand assembly of small parts than large parts where visual perception is utilised. Texture perception usually occurs with fabrics, carpet, paper products and abrasives. Temperature perception is common where exposure to heated surfaces exists. The perception of vibration is mediated by the same nerve types that feel texture. If the ability to feel vibration is necessary record it as texture. Size, shape and texture are common when operating control panels with multiple types of switching devices.

Tools: Observation and interview.

23. Seeing

Definition: Perceiving the nature of objects by the eye**.**

Information Required

Duty/Task: Record the abbreviated number or a description of the duty representing the essential or non-essential function associated with this task. This box will typically be filled in after the entire essential and nonessential functions have been determined.

Eyes Used: Mark if Left (L), Right (R), Both (B) or Either (E) eye is used.

See Function: Determine the type of perception(s) used:

- ***Near*** refers to distances closer than 51 cm
- ***Far*** considers distances greater than 6 m.
- ***Depth*** is 3-dimensional vision. Ability to judge distances and spatial relationships so as to see object where and as they actually are.
- ***Field*** is peripheral vision (includes vertical and horizontal).
- ***Accommodation*** is the requirement to change focus from objects that are far to near during the work cycle.
- ***Colour*** is the ability to identify and distinguish colours.

Frequency: Enter the percent of shift/day this activity is performed for each individual task.

Examples (See Appendix F):

Production Assembler: The assembly process requires the worker to attach matching parts according to colour. The assembly process is performed at distances less than 50 cm. The cycle time is 50 sec., and matching parts required 20 sec.

Material Handler: Forklift trucks transport materials within the facility creating the need for field of vision, depth and distance (far). Colour is utilised to sort cartons. These activities exist 90% of the time.

Vapour Penetration Test Operator: After loading the filter into the test chamber, the worker must shift gaze to a computer monitor 91 cm away to check test results. This test function occurs 60% of the work shift.

Method & Techniques: Observe and interview workers to determine the use of this perception.

Special Concerns: Many times objects that are normally distinguished by colour are also coded with numbers or symbols. Colour perception would not be required in this situation.

Tools: Observation and interview.

Appendix F: Using Data Collection Forms

(From Examples In Appendix E)

Job Title: _____ **Date:** _____ **Dept:** _____

LIFTING

DUTIES/TASK		Weight (lbs)	Start Height	End Height	Lift Direction L,R,S	Hands Used L,R,B,E	HORIZ. REACH		FREQUENCY	
							Horiz R/L	Horiz Front	Time Second	Day # or %
1) Lift product	Ave:	6 kg	75 cm	105 cm	S	E		38 cm		1/min
	Range:			30 – 180 cm				30–46cm		
2) Lift box	Ave:	16 kg	0 cm	152 cm	L or R	B		51 cm		4/day
	Range:									
3)	Ave:									
	Range:									
4)	Ave:									
	Range:									
5)	Ave:									
	Range:									
6)	Ave:									
	Range:									
7)	Ave:									
	Range:									

Comments:

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CARRYING

DUTIES/TASK	Weight	Distance Carried	Level Kn,Wst, Sh, Abv	How Carried with H,A,S	Frequency	
					Time Second	Day # or %
1) Carry to packing station Ave:	6 kg	3.60 m	Wst	H		1.33/min
Range:						
2) Move foam pieces Ave:	8 kg	12.0 m	Sh	S		0.4/min
Range:						
3) Ave:						
Range:						

Comments:

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PUSHING

DUTIES/TASK	Force	Push Height	Push Distance	Hands Used L,R,B,E	Body Position Sit, Stnd, Knl, Crch	FREQUENCY	
						Time Second	Day # or %
1) Fastened bolts onto frame Ave:	7 kg	89 cm		E	Stnd		2/min
Range:							
2) Move cart with product Ave:	11 kg(ini), 5kg (sus)	84 cm	30 cm	B	Stnd		0.25/min
Range:	5-11 kg						
3) Ave:							
Range:							

Comments:

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PULLING

DUTIES/TASK		Force	Pull Height	Pull Distance	Hands Used L,R,B,E	Body Position Sit, Stnd, Knl, Crch	FREQUENCY Time Second	FREQUENCY Day # or %
1) Fasten bolts into frame	Ave:	10 kg	91 cm		B	Stnd		2.9/min
	Range:							
2) Move cart with product	Ave:	25kg (ini), 14kg (sus)			B	Stnd		0.73/min
	Range:	14-15 kg						
3)	Ave:	3 kg	71 cm		L	Stnd		3.1/min
	Range:							

Comments:

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REACHING

DUTY/TASK		Weight	Vertical Height	HORIZONTAL REACH Distance Right/Left	HORIZONTAL REACH Distance Front	Reach Direction L,R,F,B	Hands Used L,R,B,E	FREQUENCY Time Second	FREQUENCY Day # or %
1) Adjust controls panel	Ave:	0	132 cm	R-60 cm	58 cm	F	R		0.67/min
	Range:								
2) Assemble swing arm	Ave:	2.7 kg	96 cm	L/R-41 cm	66 cm	F	E		1/min
	Range:								
3)	Ave:								
	Range:								

Comments:

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HANDLING

DUTIES/TASK	Weight	Grip Force	Hands Used L,R,B,E	Turn in° Turn Out°	Wrist Flex° Wrist Ext°	Diameter	FREQUENCY Time Second	 Day # or %
1) Load sheet in press Ave:	1.4 kg		E	45-90		0.25 cm		3/min
Range:					30			
2) Ave:	1.3 kg		B	0-45	0-20	6.5 cm		4/min
Range:	0.5-2 kg			0-45	0-20			
3) Ave:								
Range:								

Comments:

FINGERING

DUTIES/TASK	Weight	Pinch Force	Hands Used L,R,B,E	Pinch Type 2, 3, Key Multiple	Finger Flexion [X]	FREQUENCY Time Second	 Day # or %
1) Adjust press Ave:		3 kg	E	3/key	X		25%
Range:							
2) Position fabric on sewing machine Ave:		2 kg	B	2			1.2/min
Range:							
3) Perform diagnostics test Ave:			B		X		50%
Range:							

Comments:

SITTING

DUTIES/TASK	FREQUENCY	
	Time Second	Day # or %
1) Assembly work		89%
2) Examine plate		30%
3) Sewing machine operator		50%
4)		
5)		

STANDING

DUTIES/TASK	FREQUENCY	
	Time Second	Day # or %
1) Assembling job		100%
2) Troubleshoot electrical controls		7%
3) Machine operator		50%
4)		
5)		

STOOPING

1) Reaching into bin to retrieve a part		8.3%
2) Stocking the production line		35%
3)		
4)		

WALKING

1) Assembly work		67%
2) Troubleshoot electrical controls		7%
3)		
4)		

KNEELING

1) Set-up process		2.4%
2) Clean & lubricate conveyor rollers		10%
3)		

CROUCHING

1) Stocking production line		3.2%
2)		
3)		

BALANCING

1) Adjust ink dwell		5.0%
2) Service electric conveyors		10%
3)		

CLIMBING

1) Stock hopper with pl astic cores		5.0%
2) Troubleshoot electrical controls		5.0%
3)		

CRAWLING

1) Set-up of the press		1.2%
2)		
3)		

TASK/SMELL

1) Fire detection		10%
2) Quality inspection		5%
3)		

TALKING

1) Replacing the motor		50%
2)		

3)		

HEARING

1) Assembly work		**40%**
2)		
3)		

FEELING

DUTIES/TASK	Hands Used L,R,B,E	Feel For Size, Shape, Temp, Text	FREQUENCY	
			Time (Second)	Day (# or %)
1) Check temperature of housing	E	Temp		3.1%
2) Positioning fabric on machine	E	Text		60%
3) Assemble parts with bolts	E	Size & Shape		10%

SEEING

DUTIES/TASK	Eyes Used L,R,B,E	See Function Near, Far Depth, Acc, Field, Color	FREQUENCY	
			Time (Second)	Day (# or %)
1) Attach matching parts	B	Near, Color		40%
2) Transport materials	B	Far, Depth, Field, Color		90%
3) Vapour penetration test	B	Acc		60%

Environmental Conditions Code:

1) Exposure to Weather
2) Extreme Cold, Non-Weather
3) Extreme Heat, Non-Weather
4) Wet/Humid, Non-Weather
5) Noise - V,Q,M,L,E
6) Vibration
7) Atmospheric Conditions
8) Moving Mechanical Parts
9) Electric Shock
10) Working in High, Exposed Places
11) Radiation Exposure
12) Explosion Exposure
13) Toxic or Caustic Chemical Exposure
14) Other - Explain

ENVIRONMENTAL CONDITIONS

E.C.C.#	DUTIES/TASK	FREQUENCY	
		Time Second	Day # or %
	1)		
	2)		
	3)		
	4)		
	5)		
	6)		
	7)		
	8)		
	9)		
	10)		