

## Job Demands Analysis

### Water Operations Ops III Worker (services/firelines)

#### Purpose

The Ops III (services/firelines) job entails laying new service and firelines and renewals of service from water mains to city property boundaries.

#### Essential Duties

The Ops III (services/firelines) worker has 3 essential duties:	% of shift or # hrs
Duty #1: Preassemble and Lay Pipe (services only)	2 hrs
Duty #2: Pipe preassembly (firelines only)	2 hrs
Duty #3: Site Preparation and Maintenance	5 hrs
Duty #4: Driving (shared 50% with other crew member so of 1 hr driving, Ops III worker does ½ hr)	1/2 hr

#### Description of Non-essential Tasks

The Ops III (services/firelines) worker may be required to perform other work tasks on an occasional basis. Examples of the tasks that may be performed are:

- Talking with home owners or the public
- Keeping truck clean

#### Summary of Demands

	Sedentary	Light	Medium	Heavy	Very Heavy	Comments
<b>Physical (strength)</b>				✓		Strength requirement
<b>Physical (endurance)</b>				✓		Stand/walk 67%-100% of shift
<b>Cognitive</b>			✓			

#### Shift Structure

All Ops III (services/firelines) workers work from 7am-3:30pm, M-F. There is a 30 minute lunch break and two 10 minute coffee breaks that may be taken at any time. Planned overtime may also occur at certain times of the year.

**Frequency Rating Definitions**

The frequency rating definitions used in the Summary Table are from the Dictionary of Occupational Titles (DOT, 1991, 4th edition) published by the US Department of Labor. A similar classification is used for each Essential Duty, but the percentages are changed to reflect % of Duty rather than % of shift.

	<b>Time per Day</b>	<b>Percentage of Shift</b>
<b>Never</b>	0 minutes	0 %
<b>Rare</b>	0 - 5 minutes	0-1 %
<b>Infrequent</b>	6 - 25 minutes	2-5 %
<b>Occasional</b>	26 minutes – 2.5 hours	6-33 %
<b>Frequent</b>	2.6 - 5.25 hours	34-66 %
<b>Constant</b>	5.26 - 8 hours	67-100 %

<b>STRENGTH</b>	
<b>Strength Category</b>	<b>Weight Handled</b>
1. Limited	Up to 5 kg.
2. Light	5 kg. to 10 kg.
3. Medium	10 kg. to 20 kg.
4. Heavy	>20 kg

**Job Demands Analysis – Ops III (services/firelines) worker - Summary Table**

a. Physical Demands		Frequency During Shift					Weight		Comments	
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)		Max (kg)
Strength	Lifting – Floor to Knuckle			x				10	50	D1,2,3 -valves (up to 8”), dunnage, pipe, tools
	Lifting – Knuckle to Waist			x				10	28	D1,2,3 -Pumps, tool box/bucket
	Lifting – Over Shoulder		x					3	10	D3 - Putting tools away on top shelf of truck
	Carrying – with Handles			x				10	28	D1,2,3 -Tool bucket/box, pumps
	Carrying – without Handles			x				5	32	D1,2,3 -Hand tools, pipe, valves, fencing, dunnage
	Pushing – Upper Extremity			x				5	23	D1,2,3 - Sweeping, guiding items moved by excavator, preassembly, laying pipe
	Pushing – Hips/Legs assist			x				5	10	D1,2,3 - Sweeping, tamping, preassembly, laying pipe
	Pulling – Upper Extremity		x					5	23	D1,2,3 -Guiding items lowered by excavator, pre-assembly, laying pipe
	Pulling – Hip/Leg Assist			x				5	91	D1,2,3- Opening/closing hydrants, tamping, preassembly
Mobility	Reach - Shoulder or Above		x					D2 - Putting away tools		
	Reach - Below Shoulder				x			D1,2,3,4 -varies: more for preassembly, using tools, less for D4-pretrip, seat controls		
	Handling					x		D1,2,3,4 - tools, steering wheel, fittings, pipe		
	Fine finger movements		x					D1,2 - small nuts or fittings		
	Neck - Static Flexion				x			D1,2,3 - preassembly, sweeping, digging		
	Neck – Static Neutral				x			D4 - driving		
	Neck – Static Extension		x					D1,2		
	Neck – Static Rotation		x					D1,2,3,4		
	Throwing	x								
	Sitting				x			D1,2,4 - preparing pipe or valves, driving		
	Standing					x		D1,2,3		
	Walking					x		D1,2,3		
	Running/Jumping	x								
	Climbing			x				D1,2,3 - in/out of ditches, in/out tool truck		
	Bending/Stooping			x				D1,2,3 - digging, laying pipe, preassembly		
	Crouching			x				D1,2 - laying pipe, preassembly		
	Kneeling			x				D1,2 - laying pipe, cutting, preassembly		
	Crawling	x								
Twisting				x			D1,2,3			
Balancing		x					D1,2,3			
Travelling				x			D4 - driving			

**Job Demands Analysis – Ops III (services/firelines) worker - Summary Table**

(continued)

a. Physical Demands (continued)		Frequency During Shift						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations						x	D1,2,3,4 - Coworkers, public
	Hear/Other Sounds						x	D1,2,3,4 -Vehicles, sirens
	Vision/Far						X	D1,2,3,4
	Vision/Near						x	D1,2,3,4
	Vision/Colour				x			D4 - traffic lights, street signs
	Vision/Depth						x	D1,2,3,4
	Perception/Spatial				x			D1,2,3,4 - connecting up pipe, building barricades, Looking in mirrors, driving
	Perception/Form				x			D1,2,3,4 - Looking for old trench lines or utility lines, driving
	Feeling	x						
	Speech						x	D1,2,3,4
Work Environment	Inside Work				x			D4 - inside truck when driving
	Outside Work						x	D1,2,3
	Slippery				x			D1,2,3,4 - wet weather
	Congested worksite				x			D2, D3, D4 - firelines at construction sites or driving in busy traffic
	Chemical Irritants	x						
	Confined Space Entry	x						
	Vapour Fumes						x	D1,2,3 - vehicle exhaust
	Noise						x	D1,2,3,4
	Proximity to moving objects					x		D1,2,3,4 - excavator, vehicles
	Hazardous Machines				x			D1,2,3 - backhoe/excavator
Electrical hazard			x				D3 - hand exposing utility lines	
Sharp/Hazardous Tools			x				D1,2,3 - saws, pipe cutter	
Radiant/Thermal Energy			x				D2 - pipe saw	
Hot/Cold		x					D1,2,3 - weather dependent	
Humid		x					D1,2,3 - weather dependent	
Environmental Dust				x	x		D1,2,3 - varies depending on if digging	
Organic Substances	x							
Medical Waste	x							
Blood Products		x					D3 - discarded syringes	
Lighting Issues – Direct		x					D1,2,3,4 - dark mornings in winter	
Lighting Issues – Indirect	x							
Vibration – Whole Body				x			D4 - driving	
Vibration – Hand/Arm				x			D1,2,3 - tamping, saws, jackhammer, etc	

b. Cognitive and Psychosocial Demands	Frequency During Shift			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision			x	D1,2,3,4
Time Pressure	x			D1,2,3
Attention to Detail		x		D1,2,4- attaching fittings, cutting pipe, driving
Memory Requirements	x			
Interact with co-workers			x	D1,2,3,4
Interact with public	x			
Work Alone	x			
Reading		x		D1,2,4 - street signs, reviewing plans before starting job.
Writing	x			
Irregular Hours	x			
Operating Equipment		x		D1,2,3,4 -Saws, plate tamper, jack hammer, truck

### **Physical Environment**

The work takes place on city streets and sidewalks and in ditches dug in these areas.

### **Staffing Levels**

The Ops III worker usually works as part of a 2 man team for services and a 3 man team for firelines.

### **Tools and Equipment Used**

The Ops III (services/firelines) worker primarily uses pipe saws, hacksaws, pipe cutters, service keys, pumps, jack hammers, drills, plate tampers, shovels and brooms.

### **Other Equipment**

The Ops III (services/firelines) worker must wear CSA approved boots at all times as well as a hard hat and safety vest. Safety glasses are required when cutting pipe with saws and ear protection when around loud noises.

### **Data Collection**

Mandy Gallant, an ergonomic consultant from ErgoRisk Management Group conducted the JDA assessment on July 24<sup>th</sup> and 25<sup>th</sup>, 2008. Data was collected using a tape measure, industrial scale, Chatillon push/pull force gauge, digital camera and through observation and discussion with selected employees, safety support staff and the sub-foreman.

### **Contact for the on-site assessment**

Mark Stevenson was the contact for the on-site assessment.

## Description of Essential Duties

This section describes the work tasks that comprise the 4 essential duties of the job. Tables 1 - 4 (located at the end of this report) provide the physical, cognitive and psychosocial demands for performing each of the essential duties.

### **Essential Duty 1: Preassemble and Lay Pipe (services)**

Services crew works with pipes of less than 4" diameter, typically laying new service or renewing service to a single residence. When performing renewals, existing 3/4" copper pipe is typically being replaced by larger diameter Kaitec, plastic-coated aluminum pipe. Neither of these types of pipe needs to be wrapped in plastic, regardless of soil conditions. Before starting the job Ops III workers turn off the water service at the main (Figure 1).



Figure 1: Ops III worker turning off service at the main with a wrench.



Figure 2: Ops III worker attaching service saddle to main.

To connect new pipe up to the main the Ops III worker installs a service saddle onto the main to guide the cut for the pipe connection (figure 2). Once the hole is drilled (not performed by the Ops III worker), the Ops III worker connects the new service pipe to the main. If it is new service he will lay Kaitec pipe along the ditch from the main to the property line and connect the pipe to the existing property service pipe.

If it is a renewal of service the Ops III worker must remove the existing ¾” copper pipe and replace it with new pipe. To remove the old copper pipe the worker cuts the pipe at both the main and the property boundary (figure 3). He then inserts a cable into the pipe from the property side, the end of which is attached to the new larger pipe (figure 4). Once fed through the existing copper pipe, the cable is attached to the backhoe which pulls the copper pipe out and new pipe into place at the same time.



Figure 3: Ops III worker cutting ¾” copper service pipe with a pipe cutting tool.



Figure 4: Ops III worker feeding cable through the ¾” pipe to perform a renewal of service.

## **Essential Duty 2: Pipe Preassembly (firelines)**

Firelines crews work with pipe of a diameter larger than 4”, typically 6”-8” and occasionally even larger. This pipe provides service to multiple residence buildings or commercial buildings. A pipe layer who is not an Ops III worker performs the pipe laying work and the Ops III worker may assist the pipe layer and perform pipe preassembly work.

Pipe preassembly duties are performed in advance of the pipe being laid. If digging is not occurring then Ops III workers may spend the majority of their shift performing pipe preassembly, but on average this work is 2 hrs of an Ops III worker’s day. At the beginning of the day workers collect their tools from the tool shack and they are transported by the excavator to the site where they are to be used. Preassembly duties include cutting the DICTL (ductile iron, cement lined) pipe with a pipe saw and attaching

collars or other fittings. Valves are also assembled above ground and then lowered into place by the excavator (Figure 5).

Depending on soil conditions the pipe may need to be wrapped in plastic before being laid and this work is typically performed by two Ops III workers (Figure 6).



Figure 5: Valves in place that were assembled above ground by Ops III workers.



Figure 6: File photo of Ops III workers wrapping pipe, (this is larger diameter than firelines pipe).

### **Essential Duty 3: Site Preparation and Maintenance**

Site preparation and maintenance encompasses a variety of different tasks and makes up the majority of the Ops III (services/firelines) worker's job. To access services and firelines, digging is primarily performed by the excavator, but Ops III workers hand expose in areas where utility and other lines are located (Figure 7). Ops III workers also put up barricades and signs to stop or divert traffic around the worksite (figure 8).

Workers perform shovelling to help prepare the pipe bed and smooth the fill around a laid pipe prior to the ditch being filled by the excavator. In the case of firelines the Ops III worker may also guide cement being poured into the ditch by the excavator and uses a sledgehammer to bang residual cement out of the drum (Figure 9). The Ops III worker also shovels and smooths the wet cement into place to create a thrust block behind the valves (figure 10).



Figure 7: Ops III worker and sub-foreman hand exposing lines.



Figure 8: Worker with barricades to divert traffic.



Figure 9: Ops III worker hammering drum to release residual cement on a fireline job.



Figure 10: Ops III worker shovelling cement to create thrust block.

The Ops III worker also performs some tamping once the ditches have been filled in by the excavator. Once the job is completed the Ops III worker performs some sweeping and general area clean up. He is also responsible for cleaning and putting tools away back in the truck at the end of the day

#### **Essential Duty 4: Driving**

Ops III workers typically share driving duties 50% with the sub-foreman. Crews pick the truck up in the yard in the morning and perform a pre-trip inspection (figure 11). Pre-trip inspection of the truck includes, checking tires, lights, fluid levels, windshield wipers, etc. If necessary the driver will fill the vehicle with gas either at the beginning or end of the shift.

Depending who is driving first, the inspection may be performed by the Ops III worker or the sub-foreman. At the end of the day the crew may drive to the next day's job site to erect barricades or no parking signs in preparation for the next day's work. The truck is then driven back to the yard at the end of the day.



Figure 11: Ops III worker performing pre-trip vehicle inspection.

**Essential Duty 1: Ops III (services/firelines) worker – Preassemble and Lay Pipe (services)**

a. Physical Demands		Frequency During Duty					Weight		Comments	
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)		Max (kg)
Strength	Lifting – Floor to Knuckle			x				3	32	Tools, pipe, fittings
	Lifting – Knuckle to Waist			x				3	10	Hand tools, tool bucket
	Lifting – Over Shoulder		x					3	10	Putting tools away on top shelf of truck
	Carrying – with Handles			x				10	10	Tool bucket
	Carrying – without Handles			x				3	32	Hand tools, service key, pipe
	Pushing – Upper Extremity				x			<1	15	Feeding cable through pipe, attaching fittings, using wrench
	Pushing – Hips/Legs assist			x				10	23	Attaching fittings, preassembly
	Pulling – Upper Extremity			x				5	15	Cable, turning wrench
	Pulling – Hip/Leg Assist			x				10	23	Attaching fittings, preassembly
Mobility	Reach - Shoulder or Above		x					Top shelf of truck		
	Reach - Below Shoulder					x		Laying pipe, attaching fittings, cutting pipe		
	Handling					x		Pipe, tools, fittings		
	Fine finger movements		x					Turning small nuts or screws		
	Neck – Static Flexion					x		Looking down at pipe when working on it		
	Neck – Static Neutral		x							
	Neck – Static Extension		x							
	Neck – Static Rotation		x							
	Throwing	x								
	Sitting			x				When working on pipe		
	Standing					x				
	Walking					x				
	Running/Jumping	x								
	Climbing			x				In/out of ditch or back of truck		
	Bending/Stooping				x			Laying pipe, assembly work		
	Crouching				x			Working on pipe		
	Kneeling			x				Feeding cable through pipe, attaching fittings		
	Crawling	x								
Twisting				x			Attaching fittings, laying pipe, assembly			
Balancing		x								
Travelling	x									

**Frequency Rating Definition for % of Duty**

The definitions for frequency ratings are contained at the end of the Table (page 14).

**Essential Duty 1: Ops III (services/firelines) worker – Preassemble and Lay Pipe (services)**

a. Physical Demands (continued)		Frequency During Duty						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations						x	Co-workers and occasionally public
	Hear/Other Sounds						x	Vehicles, sirens
	Vision/Far						x	
	Vision/Near						x	
	Vision/Colour	x						
	Vision/Depth						x	
	Perception/Spatial			x				Orienting fittings
	Perception/Form		x					
	Feeling	x						
	Speech						x	Talk to co-workers and public
	Work Environment	Inside Work	x					
Outside Work							x	
Slippery					x			During wet weather
Congested worksite					x			Vehicle traffic, tools and equipment, small spaces at times
Chemical Irritants		x						
Confined Space Entry		x						
Vapour Fumes							x	Vehicle exhaust, generators
Noise							x	Vehicles, excavator, tools
Proximity to moving objects						x		Cars, excavator
Hazardous Machines					x			excavator
Electrical hazard			x					
Sharp/Hazardous Tools					x			Pipe cutter, saws
Radiant/Thermal Energy		x						
Hot/Cold			x					Weather dependent
Humid			x					Weather dependent
Environmental Dust					x			
Organic Substances		x						
Medical Waste		x						
Blood Products		x						
Lighting Issues – Direct			x					Occasional dark mornings in winter
Lighting Issues – Indirect	x							
Vibration – Whole Body	x							
Vibration – Hand/Arm			x				saws and other power tools	

**Essential Duty 1: Ops III (services/firelines) worker – Preassemble and Lay Pipe (services)**

b. Cognitive and Psychosocial Demands	Frequency During Duty			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision			X	
Time Pressure	X			
Attention to Detail		X		Attaching fittings, cutting pipe
Memory Requirements	X			
Interact with co-workers			X	
Interact with public	X			
Work Alone	X			
Reading		X		Reviewing plans and cut sheets
Writing	X			
Irregular Hours	X			
Operating Equipment		X		Saws and other tools

**Frequency Rating Definitions for % of Duty**

The frequency rating definitions are from the Dictionary of Occupational Titles (DOT, 1991, 4th edition) published by the US Department of Labor.

	Percentage of Duty
<b>Never</b>	0 %
<b>Rare</b>	0-1 %
<b>Infrequent</b>	2-5 %
<b>Occasional</b>	6-33 %
<b>Frequent</b>	34-66 %
<b>Constant</b>	67-100 %

STRENGTH	
Strength Category	Weight Handled
5. Limited	Up to 5 kg.
6. Light	5 kg. to 10 kg.
7. Medium	10 kg. to 20 kg.
8. Heavy	>20 kg

**Essential Duty 2 – Ops III (services/firelines) worker – Pipe Preassembly (firelines)**

a. Physical Demands		Frequency During Duty					Weight		Comments	
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)		Max (kg)
<b>Strength</b>	Lifting – Floor to Knuckle			x				5	50	Tools, valves, fittings, dunnage
	Lifting – Knuckle to Waist			x				5	28	Hand tools, tool box, pumps
	Lifting – Over Shoulder		x					3	10	Putting tools away on top shelf of truck
	Carrying – with Handles				x			20	28	Tool box, pumps
	Carrying – without Handles				x			10	25	Hand tools, pumps, fittings
	Pushing – Upper Extremity				x			5	15	preassembly
	Pushing – Hips/Legs assist			x				10	45	preassembly
	Pulling – Upper Extremity			x				5	15	preassembly
	Pulling – Hip/Leg Assist			x				10	91	Opening/closing hydrants, preassembly
<b>Mobility</b>	Reach - Shoulder or Above		x							Top shelf of truck
	Reach - Below Shoulder					x				Preassembly, attaching fittings, cutting pipe
	Handling					x				Pipe, tools, fittings
	Fine finger movements		x							Turning small nuts or screws
	Neck - Static Flexion					x				Looking down at pipe when working on it
	Neck – Static Neutral		x							
	Neck – Static Extension		x							
	Neck – Static Rotation		x							
	Throwing	x								
	Sitting				x					When working on pipe, cutting, etc
	Standing					x				
	Walking					x				
	Running/Jumping	x								
	Climbing			x						In/out of ditch or back of truck
	Bending/Stooping					x				Pre-assembly work, assisting pipe layer
	Crouching			x						Working on pipe
	Kneeling			x						Working on pipe, attaching fittings
	Crawling	x								
	Twisting				x					Attaching fittings, pre-assembly, positioning pipe/valves
	Balancing		x							
Travelling	x									

**Frequency Rating Definition for % of Duty**

The definitions for frequency ratings are contained at the end of the Table (page 17).

**Essential Duty 2 – Ops III (services/firelines) worker – Pipe Preassembly (firelines)**

a. Physical Demands (continued)		Frequency During Duty						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations						x	Co-workers and occasionally public
	Hear/Other Sounds						x	Vehicles, sirens
	Vision/Far						x	
	Vision/Near						x	
	Vision/Colour	x						
	Vision/Depth						x	
	Perception/Spatial			x				Orienting fittings
	Perception/Form		x					
	Feeling	x						
	Speech						x	Talk to co-workers and public
	Work Environment	Inside Work	x					
Outside Work							x	
Slippery					x			During wet weather
Congested worksite						x		Vehicle traffic, tools and equipment, large valves and pipe, multiple workers
Chemical Irritants		x						
Confined Space Entry		x						
Vapour Fumes							x	Vehicle exhaust, generators
Noise							x	Vehicles, excavator, tools
Proximity to moving objects						x		Cars, excavator
Hazardous Machines					x			excavator
Electrical hazard			x					
Sharp/Hazardous Tools					x			Pipe cutter, saws
Radiant/Thermal Energy		x						
Hot/Cold			x					Weather dependent
Humid			x					Weather dependent
Environmental Dust					x			
Organic Substances		x						
Medical Waste		x						
Blood Products		x						
Lighting Issues – Direct			x					Occasional dark mornings in winter
Lighting Issues – Indirect	x							
Vibration – Whole Body	x							
Vibration – Hand/Arm				x			saws and other power tools	

**Essential Duty 2 – Ops III (services/firelines) worker – Pipe Preassembly (firelines)**

b. Cognitive and Psychosocial Demands	Frequency During Duty			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision			X	
Time Pressure	X			
Attention to Detail		X		Attaching fittings, cutting pipe
Memory Requirements	X			
Interact with co-workers			X	
Interact with public	X			
Work Alone	X			
Reading		X		Reviewing plans and cut sheets
Writing	X			
Irregular Hours	X			
Operating Equipment		X		Saws and other tools

**Frequency Rating Definitions for % of Duty**

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	Percentage of Duty
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<b>Infrequent</b>	2-5 %
<b>Occasional</b>	6-33 %
<b>Frequent</b>	34-66 %
<b>Constant</b>	67-100 %

STRENGTH	
Strength Category	Weight Handled
9. Limited	Up to 5 kg.
10. Light	5 kg. to 10 kg.
11. Medium	10 kg. to 20 kg.
12. Heavy	>20 kg

### Essential Duty 3 – Ops III (services/firelines) worker – Site Prep and Maintenance

a. Physical Demands		Frequency During Duty					Weight		Comments	
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)		Max (kg)
Strength	Lifting – Floor to Knuckle			x				<3	25	Dunnage, brooms, shovels
	Lifting – Knuckle to Waist			x				10	23.5	tool bucket/box, fencing, pump
	Lifting – Over Shoulder		x					<3	10	Putting things away on high shelves in truck
	Carrying – with Handles			x				10	20	Tool bucket, gas can
	Carrying – without Handles			x				<3	25	brooms, shovels, dunnage
	Pushing – Upper Extremity			x				3	5	sweeping
	Pushing – Hips/Legs assist				x			5	23	Sweeping, tamping, guiding items moved by excavator
	Pulling – Upper Extremity			x				5	15	guiding items moved by excavator
Pulling – Hip/Leg Assist			x				5	91	Opening/closing hydrants, tamping	
Mobility	Reach - Shoulder or Above		x							Top shelf in tool truck
	Reach - Below Shoulder				x					Digging, using tools
	Handling					x				Brooms, shovels, tools, tamper, fencing, etc
	Fine finger movements	x								
	Neck - Static Flexion				x					Looking at ground when digging, sweeping, tamping, etc
	Neck – Static Neutral		x							
	Neck – Static Extension		x							
	Neck – Static Rotation		x							
	Throwing	x								
	Sitting		x							
	Standing					x				
	Walking					x				
	Running/Jumping	x								
	Climbing			x						In/out of trenches, steps into truck
	Bending/Stooping				x					Sweeping, shovelling
	Crouching		x							
	Kneeling		x							
Crawling	x									
Twisting			x						Shovelling, digging, moving equipment	
Balancing		x								
Travelling	x									

#### Frequency Rating Definition for % of Duty

The definitions for frequency ratings are contained at the end of the Table (page 20).

**Essential Duty 3 – Ops III (services/firelines) worker – Site Prep and Maintenance**

a. Physical Demands (continued)		Frequency During Duty						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations						x	Co-workers and occasionally public
	Hear/Other Sounds						x	Vehicles, sirens
	Vision/Far						x	
	Vision/Near						x	
	Vision/Colour	x						
	Vision/Depth						x	
	Perception/Spatial	x						
	Perception/Form			x				When hand exposing lines
	Feeling	x						
	Speech						x	Talk to co-workers and public
Work Environment	Inside Work	x						
	Outside Work						x	
	Slippery				x			During wet weather
	Congested worksite				x			Vehicle traffic, tools and equipment
	Chemical Irritants	x						
	Confined Space Entry	x						
	Vapour Fumes						x	Vehicle exhaust, generators
	Noise						x	Vehicles, power tools
	Proximity to moving objects					x		Cars, excavator
	Hazardous Machines				x	x		Varies depending on whether digging or not. Often near excavator, tamper
	Electrical hazard			x				When hand exposing utility/power lines
	Sharp/Hazardous Tools			x				Saws and other tools
	Radiant/Thermal Energy	x						
	Hot/Cold		x					Weather dependent
	Humid		x					Weather dependent
	Environmental Dust				x	x		Varies: Worse when digging going on
	Organic Substances	x						
	Medical Waste	x						
	Blood Products		x					Discarded needles occasionally found on site
	Lighting Issues – Direct		x					Occasional dark mornings in winter
Lighting Issues – Indirect	x							
Vibration – Whole Body	x							
Vibration – Hand/Arm				x			Tamper, jackhammer	

**Essential Duty 3 – Ops III (services/firelines) worker – Site Prep and Maintenance**

b. Cognitive and Psychosocial Demands	Frequency During Duty			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision			X	
Time Pressure	X			
Attention to Detail	X			
Memory Requirements	X			
Interact with co-workers			X	
Interact with public	X			
Work Alone	X			
Reading	X			
Writing	X			
Irregular Hours	X			
Operating Equipment		X		Tamper, jackhammer

**Frequency Rating Definitions for % of Duty**

The frequency rating definitions are from the Dictionary of Occupational Titles (DOT, 1991, 4th edition) published by the US Department of Labor.

	Percentage of Duty
<b>Never</b>	0 %
<b>Rare</b>	0-1 %
<b>Infrequent</b>	2-5 %
<b>Occasional</b>	6-33 %
<b>Frequent</b>	34-66 %
<b>Constant</b>	67-100 %

STRENGTH	
Strength Category	Weight Handled
13. Limited	Up to 5 kg.
14. Light	5 kg. to 10 kg.
15. Medium	10 kg. to 20 kg.
16. Heavy	>20 kg

**Essential Duty 4 – Ops III (services/firelines) worker – Driving**

b. Physical Demands		Frequency During Duty					Weight		Comments
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)	
Strength	Lifting – Floor to Knuckle	x							
	Lifting – Knuckle to Waist	x							
	Lifting – Over Shoulder	x							
	Carrying – with Handles	x							
	Carrying – without Handles	x							
	Pushing – Upper Extremity	x							
	Pushing – Hips/Legs assist	x							
	Pulling – Upper Extremity	x							
	Pulling – Hip/Leg Assist	x							
Mobility	Reach - Shoulder or Above		x						Adjust rear-view mirror, close hood
	Reach - Below Shoulder			x					Adjust seat controls, checking tires and fluid levels during pre-trip
	Handling						x		Steering wheel, oil dipstick, dashboard controls, etc
	Fine finger movements	x							
	Neck - Static Flexion	x							
	Neck – Static Neutral						x		Looking at road ahead
	Neck – Static Extension	x							
	Neck – Static Rotation	x							
	Throwing	x							
	Sitting						x		
	Standing	x							
	Walking	x							
	Running/Jumping	x							
	Climbing	x							
	Bending/Stooping			x					During pre-trip inspection
	Crouching			x					During pre-trip inspection
	Kneeling	x							
	Crawling	x							
	Twisting			x					Shoulder check, parallel parking, getting in/out of vehicle, pre-trip inspection
	Balancing	x							
Travelling						x			

**Frequency Rating Definition for % of Duty**

The definitions for frequency ratings are contained at the end of the Table (page 23).

### Essential Duty 4 – Ops III (services/firelines) worker – Driving

c. Physical Demands (continued)		Frequency During Duty						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations					x		Co-workers
	Hear/Other Sounds						x	Traffic noise, sirens, etc
	Vision/Far						x	
	Vision/Near						x	
	Vision/Colour						x	
	Vision/Depth						x	
	Perception/Spatial				x			Checking mirrors
	Perception/Form		x					Poor visibility conditions
	Feeling	x						
	Speech					x		Co-workers
Work Environment	Inside Work						x	
	Outside Work	x						
	Slippery				x			Depends on road conditions and weather
	Congested worksite				x			Depends on traffic conditions and time of day.
	Chemical Irritants	x						
	Confined Space Entry	x						
	Vapour Fumes			x				Exhaust fumes if windows down when driving
	Noise						x	
	Proximity to moving objects						x	Other vehicles
	Hazardous Machines	x						
	Electrical hazard	x						
	Sharp/Hazardous Tools	x						
	Radiant/Thermal Energy	x						
	Hot/Cold	x						
	Humid	x						
	Environmental Dust		x					If windows down and driving past construction site.
	Organic Substances	x						
	Medical Waste	x						
	Blood Products	x						
	Lighting Issues – Direct		x					Dark mornings in winter, poor weather
Lighting Issues – Indirect	x							
Vibration – Whole Body						x		
Vibration – Hand/Arm	x							

**Essential Duty 4 – Ops III (services/firelines) worker – Driving**

d. Cognitive and Psychosocial Demands	Frequency During Duty			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision			x	Sub-foreman in vehicle
Time Pressure	x			
Attention to Detail			x	Watching the road
Memory Requirements			x	Remembering directions and road signs
Interact with co-workers		x		
Interact with public	x			
Work Alone	x			
Reading		x		Road signs
Writing	x			
Irregular Hours	x			
Operating Equipment			x	truck

**Frequency Rating Definitions for % of Duty**

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