

Job Demands Analysis

Worker's Occupation: Labourer in Sewer and Drainage (LiSD)

Prepared for: City of Richmond

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OVERVIEW OF POSITION

The Labourer in Sewer and Drainage (LiSD) is a manual labour position, which involves the preparation, installation, finishing, and maintenance of sewer and drainage pipes to residential and commercial users within the City of Richmond.

WORK HOURS/WORK SCHEDULE

- Fulltime Hours: 9.5 hours/day
- Shift: 5 days work, 4 days work and one day off (5-4-1)
- Breaks: two 15-minute breaks and one 30-minute lunch break or one full 60-minute break
- Overtime: as required
- Frequency of overtime: varies depending on need

PERSONAL PROTECTIVE EQUIPMENT

- Hard hat
- Steel toed boots
- Gloves
- Overalls
- Knee pads (Optional)
- Safety glasses (Task-specific)
- Hearing protection (Task-specific)
- Full body harness (Task-specific)
- Respiratory protection equipment (Task-specific)
- Disposable coveralls with a hood (Task-specific)

TOOLS AND EQUIPMENT

A LiSD may use the following tools and equipment to perform their duties:

Up to 20 lbs:

- | | |
|----------------------------------|--------------------------------------|
| • Hammers | • Brooms/brushes |
| • Screwdrivers (hand/electrical) | • Rakes |
| • Wrenches | • Portable hand tools (sander/drill) |
| • Saws (hand/electric) | • Metal rods |
| • Measuring tape | • Multi-gas monitor/detector |
| • Crowbar | • Portable gas containers |
| • Sledgehammer | • Various sizes of buckets |
| • Grinder | • Traffic cones |
| • Shovel | • Measuring tape |

21-50 lbs:

- Portable generators
- Portable blower ventilator fan

51-100 lbs:

- | | |
|--------------|-----------------|
| • Compactor | • Safety tripod |
| • Jackhammer | |

100+ lbs:

- Vibratory Plate Compactor
- Jumping jack / Vibratory Rammer

Vehicles

- City trucks/trailer
- Hydro Excavator

WORK ORGANIZATION

Workers tend to operate in small crews and/or individually. An onsite supervisor directs each crew and their specific tasks for the day. A foreman supervises and organizes groups of crews.

REQUIRED EDUCATION & QUALIFICATIONS

- Class 5 driver's license
- Class 3 driver's license with air brakes for Hydro Excavator Operators
- General orientation courses as required by the City of Richmond eg) flagging, traffic control
- Confined spaces course

ESSENTIAL - PHYSICAL DEMANDS

Labourer in Sewer and Drainage (LiSD) staff perform multiple duties. The following duties from 1 – 5 were demonstrated and/or discussed:

1. Preparing and transporting materials from the City Works Yard to the work site
2. Preparing the work site
3. Installing sanitary pods
4. Repairing/maintaining sanitary/sewer lines, water meters and pumps
5. Cleaning up the work site (sweeping, disposal, returning tools/machines)

Additional duties that a LiSD may be required to perform depending upon the need:

6. Installing water metres
7. Installing storm pumps

The aforesaid duties (1-7) contain a range of common movements and activities. The following movements are physically repetitive and common amongst these duties:

- Walking
- Standing
- Climbing
- Stooping from the waist/hip
- Bilateral reaching below chest level
- Bilateral reaching between chest and shoulder level
- Bilateral elbow flexion/extension
- Neck flexion, twisting, turning and tilting

If a LiSD is working directly below street level, he/she needs to tolerate sustained:

- Crouching
- Squatting

A description of the essential tasks for the first 5 duties will be covered in the next section.

1 - Preparing and transporting materials from the City Works Yard to the work site

Labourers in Sewer and Drainage (LiSD) meet at the City Works Yard on Lynas Lane at the start of each work shift. Work tasks/schedules for the day are reviewed. Supplies and tools are loaded into City vehicles (Figure 1). LiSDs drive to their designated work sites for the day.



Figure 1

2 - Preparing the Worksite

LiSD staff prepare the worksite. This may include the following:

- Diverting traffic and setting up traffic cones
- Transporting equipment
- Liaising with other City departments (Roads) or 3rd party providers
- Loading/unloading supply and materials for the task at hand (Figure 2)



Figure 2

3 – Installing sanitary pods

LiSD are required to install sanitary pods for residential and commercial users. This typically involves working with a heavy equipment operator (HEO) to excavate a hole. The same HEO maybe involved in the delivery and placement of the concrete hub into the same hole. A LiSD will direct the HEO with hand signals on the depth and direction of where the hole and hub should be dug and placed. LiSDs will need to use hand shovels to move dirt and soil to ensure that the hole and hub are correctly placed. The LiSD will be required to walk and work on wet and uneven terrain (Figure 3).



Figure 3

4 – Repairing/maintaining sanitary/sewer lines, water meters and pumps

There are several steps in this process:

- i. If required, the surrounding ground is leveled and compacted with a vibratory plate compactor or a jumping jack / vibratory rammer. This is to ensure that the surface is level and stable (Figure 4). Any excess material is leveled with a rake.



Figure 4

- ii. A manhole cover weighing 25 lbs is removed with a pickaxe (Figure 5). A LiSD needs to exert 37.5 lbs of force to pull a manhole cover off and place it to the side.



Figure 5

The surrounding interior of the manhole is sprayed with a disinfectant. A LiSD needs to obtain this prepared solution from the Hydro Excavator (Figure 6). Upon pulling the appropriate length of hosing, a LiSD will maneuver the sprayer and its nozzle into the manhole.



Figure 6



Figure 7

A multi-gas detector is used to analyze and monitor the levels of noxious fumes emanating from the sanitary line (Figure 7). The chemical levels need to be a safe level before a LiSD can enter a sanitary line.

To limit the build up of fumes within a manhole, a portable ventilator blower fan will be set up and extended into the manhole (Figure 8). This task may require the LiSD to attach a portable generator to the fan if so a LiSD needs to pull a cord to initiate the generator.



Figure 8

- iii. A safety tripod needs to be set up (Figure 9). This task requires the LiSD to carry, unfold and erect a safety tripod that weights up to 65 lbs. Before it can be used, a winch is secured to one leg of the tripod and the suspension wire needs to be threaded through the top of the tripod. Once the tripod is setup, it's placed directly over the manhole and a safety barrier is erected around the tripod.



Figure 9

- iv. A LiSD adorns safety equipment in advance of entering a manhole and/or sanitary line below grade. This includes personal protective equipment such as a hard hat, gloves, safety glasses, respiratory protection equipment, disposable coveralls with a hood and a full body harness (Figure 10).

The LiSD will secure his full body harness to the suspension wire of the safety tripod with a karabiner. Once this is completed, the LiSD can safely enter into the manhole and continue with his/her duties (Figure 11). A LiSD working in a manhole needs to be able to tolerate sustained stooping, squatting and crouching within a confined space and be able to tolerate noxious smells and sights of feces and other related matter.



Figure 10



Figure 11

- v. If a repair is required, a LiSD working above ground will prepare the required materials and hand it to the LiSD in the manhole (Figure 12). This could be a range of activities such as the mixing of cement/concrete (Figure 13).



Figure 12



Figure 13

Over the course of the time that a LiSD is underground, a couple of LiSDs will monitor his/her status. Records of toxicity levels are monitored and recorded continuously (Figure 14) as a LiSD is working underground (Figure 15).



Figure 14



Figure 15

5 – Cleaning up the work site (sweeping, disposal, returning tools/machines)

Upon completing their work, a team of LiSDs will clean up the surrounding environment by replacing their tools and re-loading any heavy machinery. In the latter, a LiSD will need to ensure that the machinery is secured on a City truck before departing (Figure 16). This requires a LiSD to step up/down off of a City truck (Figure 17) and to apply consistent force via a ratcheting system (Figure 18). This requires up to 15 lbs of force.



Figure 16



Figure 17



Figure 18

PHYSICAL DEMANDS OF WORK TASKS

The following guide/descriptors have been used to identify the frequency, and the load of the specific steps as outlined in the preceding pages (3-9) of this document.

Table ST1 - Physical Demand Characteristics Of Work (Dictionary of Occupational Titles - Volume II, Fourth Edition, Revised 1991)			
Physical Demand Level	OCCASIONAL	FREQUENT	CONSTANT
	0-33% of the workday	34-66% of the workday	67-100% of the workday
Sedentary	1 - 10 lbs.	Negligible	Negligible
Light	11 - 20 lbs.	1 - 10 lbs.	Negligible
Medium	21 - 50 lbs.	11 - 25 lbs.	1 - 10 lbs.
Heavy	51 - 100 lbs.	26 - 50 lbs.	11 - 20 lbs.
Very Heavy	Over 100 lbs.	Over 50 lbs.	Over 20 lbs.

Action	Weight / Force (Lb.)	Travel Distance	Frequency	Task Parameters (Essential/non-essential)
Lifting				
Floor to Waist	11-20 lbs	0-36 Inches	Frequent	Essential – various tools (Page 3 'Tools and Equipment – Up to 20 lbs') while working. Steps 1-5. Figs 1-18.
	21-50 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 21-50 lbs') while working. Lifting a manhole cover weighing up to 25 lbs with a pickaxe. Steps 1-5. Figs 1-18.
	51-100 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 51-100 lbs') while working. Steps 1, 2 & 5. Figs 1, 2, 4, 5, 9, & 18.
	100+ lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 100+ lbs') while working. Steps 1, 2 & 5. Figs 1, 2 & 18.

Action	Weight / Force (Lb.)	Travel Distance	Frequency	Task Parameters (Essential/non-essential)
Lifting				
Waist to Shoulder	11-20 lbs	0-36 Inches	Frequent	Essential – various tools (Page 3 'Tools and Equipment – Up to 20 lbs') while working. Steps 1-5. Figs 1-18.
	21-50 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 21-50 lbs') while working. Steps 1-5. Figs 1 - 18.
	51-100 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 51-100 lbs') while working. Steps 1, 2 & 5. Figs 1, 2, 4, 5, 9, & 18.
	100+ lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 100+ lbs') while working. Steps 1, 2 & 5. Figs 1, 2 & 18.
Shoulder to Overhead	11-20 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – Up to 20 lbs') while working and obtaining or returning tools and materials from City trucks or trailers. Steps 1, 2, 4 & 5. Figs 1, 2, 4, 6, 9, 11, & 15-18.

Action	Weight / Force (Lb.)	Travel Distance	Frequency	Task Parameters (Essential/non-essential)
Carrying				
Bilateral Carrying	11-20 lbs	0-36 Inches	Frequent	Essential – various tools (Page 3 'Tools and Equipment – Up to 20 lbs') between City trucks and trailers to the worksite. Steps 1, 2, 4 & 5. Figs 1, 2, 4-6, 8-9, 11, & 16-18
	21-50 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 21-50 lbs') while working. Steps 1, 2, & 5. Figs 1, 2 & 18.
	51-100 lbs	0-36 Inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 51-100 lbs') while working. Steps 1, 2, & 5. Figs 1, 2 & 18.
	100+ lbs	0-36 inches	Occasional	Essential – various tools (Page 3 'Tools and Equipment – 100+ lbs') while working. Steps 1, 2, & 5. Figs 1, 2 & 18.

Action	Weight / Force (Lb.)	Travel Distance	Frequency	Task Parameters (Essential/non-essential)
Carrying				
Unilateral Carrying – Right / Left	11-20 lbs	0-36 Inches	Frequent	Essential – various tools (Page 3 'Tools and Equipment – Up to 20 lbs') between City trucks and trailers to the worksite and while ascending/descending a manhole. Steps 1-5. Figs 2, 3, 8, 12, 13, 14, & 15.
	21-50 lbs	0-36 Inches	Occasional	Essential – while setting up tools (Page 3 'Tools and Equipment – 21-50 lbs') at the worksite. Steps 1-5. Figs 1, 2, & 8.

Action	Weight / Force (Lb.)	Travel Distance	Frequency	Task Parameters (Essential/non-essential)
Push / Pull				
Static / Dynamic Pushing & Pulling	11-20 lbs	0-36 Inches	Frequent	Essential – push/pulling tools, while tightening belts on a City truck with a ratcheting system that needs up to 10 lbs of force to pull or push, while setting up a leveling platform from the City truck that needs up to 10 lbs of force to pull or push. Steps 1, 2, 4 & 5. Figs 2, 4, 6, & 8.
	21-50 lbs	0-36 Inches	Occasional	Essential – push/pulling equipment (compactor, dolly), securing the door of a truck that requires 30 lbs of force to push, pulling a manhole cover with a pickaxe that requires up to 37.5 lbs of force. Steps 1, 2, 4 & 5. Figs 2, 4-6, 17 & 18.

Action	Force Required	Frequency	Task Parameters (Essential/non-essential)
Gripping			
Right Hand & Left Hand	11-20 lbs	Constant	Essential – all hand tools (Page 3 'Tools and Equipment' up to 100+ lbs). Steps 1-5. Figs 2-13, 16-18.
	21-50 lbs	Frequent	Essential – all hand tools (Page 3 'Tools and Equipment' up to 100+ lbs). Steps 1-5. Figs 2-13, 16-18.

Action	Force Required	Frequency	Task Parameters (Essential/non-essential)
Fine Finger Movement			
Right Hand & Left Hand	11-20 lbs	Frequent	Essential – manipulating all hand tool, equipment toggles and switches on machinery, latches on City trucks and trailers, and when setting up a safety tripod. Steps 1-5. Figs 2-13, 14, 16-18.

The table in the subsequent page highlights the frequency of the most common movement patterns performed by the City of Richmond's Labourers in Water (LiSD).

The numeral in the "Task #" column refers to the tasks described in these 5 duties:

1. Preparing and transporting materials from the City Works Yard to the work site
2. Preparing the work site
3. Installing sanitary pods
4. Repairing/maintaining sanitary/sewer lines, water meters and pumps
5. Cleaning up the work site (sweeping, disposal, returning tools/machines)

The "Frequency" column is described as follows:

N = Not required, R = Rarely (<2%), O = Occasional (3-33%), F = Frequent (34-66%), C = Constant (67-100%)

PHYSICAL DEMAND	TASK #	FREQUENCY					DESCRIBE ACTIVITY Note distances, durations and surfaces	
		N	R	O	F	C		
MOBILITY								
Walking	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Walking ~ 66% of time	
Standing	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Obtaining materials and operating tools/machinery	
Sitting	1, 4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Standing ~ 66% of time	
Crawl	3, 4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Speaking with the public, peers	
Driving (Forklift/Vehicle/Other)	1, 5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Obtaining and setting up supplies/machinery	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sitting/driving ~ 10% of time	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Driving and operating city vehicles and machinery	
POSTURE – Back								
Bending Forward	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forwards ~ 66% of time	
Bending Backwards	1-5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Shoveling, raking, spraying and preparing the site	
Twisting	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Laying pipe/concrete water main pods	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Twisting ~ 33% of time	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Obtaining supplies	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Compacting the soil, obtaining tools	
POSTURE – Reaching								
Note forward and/or side reach distances								
Above Shoulder Level	1,2,4,5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Both	Above ~ 33%
Chest to Shoulder Level	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Both	- Obtaining tools, climbing ladder
Below Chest Level	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Both	Chest to shoulder ~ 66%
Behind Body	1-5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Both	- Obtain/return supplies/tools
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		- Preparing the environment/tools
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Below chest ~ 66%
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		- Shoveling, sparying H2O, manhole
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		- Preparing/cleaning materials
POSTURE – Elbow/Forearm/Wrist								
Elbow Flexion/Extension	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Both	Elbow ~ 66%
Wrist Flexion/Extension	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Both	- Tool use (levers, ratchet, machines)
Wrist Rotation	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Both	Wrists Flex/Ext/Rotation ~ 33%
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		- Operating levers on machines
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		- Carrying supplies/tools
POSTURE – Neck								
Forward Bending/Flexion	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forwards/Twisting/Turning ~ 66%	
Backward Bending/Ext.	1-5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Backwards ~ 25%	
Twisting/Turning/Tilting	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Monitoring the environment while working	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Completing tasks below ground	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Monitoring overhead equipment	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Climbing ladders	
POSTURE – Hip/Knee/Ankle/Foot								
Crouching/Squatting	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Crouch / Squat ~ 66%	
Kneeling	2-4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Lifting and carrying supplies and materials	
Climbing (Stairs/Other)	1-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Repairing/laying drainage lines	
Jumping	1,5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Digging, shoveling, checking H2O meters	
Foot Pedal/Action	1,5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Climbing ~ 66%	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Ascending/descending ladders	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Ascending/descending trailer and work trucks	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Foot pedal ~ 10%	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Operating City vehicles and tools	
N = Not required, R = Rarely (<2%), O = Occasional (3-33%), F = Frequent (34-66%), C = Constant (67-100%)								

ESSENTIAL – NON-PHYSICAL DEMANDS

A Labourer in Sewer and Drainage (LiSDs) is required to account for environmental variables. These variables (wind, warm or cool temperatures, and weather) can impact the rate and effectiveness of a LiSDs work. LiSDs also need to be

LiSDs are also required to demonstrate their understanding of the following:

- Knowledge of the occupational hazards
- Knowledgeable of the toxicity levels venting from underground sewer lines.
- Knowledge of the safety precautions ie) safety harnesses, safe toxicity levels
- Converse, instruct, follow and direct work as required with their co-workers

These demands (environment, hazards, safety) require the following range of cognitive and sensory skills.

Attention/concentration

- Sustained - attending to the environment, traffic, tools and heavy machinery
- Divided – attending to materials, conversing with crew, minding traffic, and heavy machinery
- Alternating - conversing with equipment operators, directing traffic, and other tasks

Memory

- Procedural - knowledge of the methods, materials, tools, equipment and use of same
- Immediate and delayed visual - written directions, location of materials/manholes, and tools
- Immediate and delayed auditory - verbal directions, conversations with crew/leader
- Prospective - project timelines, schedules, and delivery of materials

Executive Functioning

- Initiation - beginning task/project
- Working memory - short term directions/changes, one off instructions
- Sequencing - identifying and/or following an order of activities/actions
- Problem solving - identifying and/or addressing unexpected issues
- Termination - completing a task/project

Sensory

- Vision - observation of the immediate environment and task at hand
- Hearing - attending to sounds within the environment
- Touch - to hold and manipulate tools/equipment

The table in the subsequent page summarizes the key environmental conditions that may influence and impact a LiSDs ability to do their job.

ENVIRONMENTAL/PSYCHOSOCIAL FACTORS:

ENVIRONMENTAL & OTHER CONDITIONS	YES	NO	TASK DESCRIPTION
Inside Work Location		X	
Outside Work Location	X		
Electronic	X		Hand held device to monitor toxicity levels.
Mechanical	X		Various tools, machinery, levers and ratchets.
Fumes, Gases or Odours	X		Various smells emanating from the sewer line, during the fabrication of concrete or fumes from diesel machinery
Dust	X		Dust from soil/ground, dust while raking or compacting gravel, or dust while preparing concrete
Toxic Conditions	X		Limited to LiSDs working underground in a man hole
Explosives		X	
Wet/Humid	X		Above ground level and the LiSD working below ground in a man hole
Noise	X		Traffic, immediate environment, various tools, generator, fresh air pump and concrete mixer
Vibration	X		From various tools such as handsaws, hand sanders and/or compressors.
Exposure to Changes in Temperature	X		Sun, rain, and wind while working above and below street level.
Confined and/or Awkward Spaces	X		Limited to LiSD's working below grade in a manhole.
Talking	X		Interacting with co-workers, and public.
Hearing	X		Interacting with co-workers, and public.
Near Vision	X		Reading schedules/timelines and phones. Securing safety supports/harness.
Far Vision	X		Directing traffic. Driving City vehicles.
Depth Perception	X		Preparing, setting, and finishing tasks.
Reading	X		Signage, materials handling, written directions/memos, or emails.
Writing	X		Completing permits, reviewing air quality readings from an electronic device.
Driving	X		City vehicles to and from worksites.
Operating Hand/Foot Controls	X		Driving City vehicles to and from worksites.
Travel	X		Driving City vehicles to and from worksites.
Deadline Pressures	X		At the direction of the foreman.
Work Alone	X		Specific tasks/steps.
Work in Group	X		Within crews to complete the tasks.