

JOB TASK ANALYSIS - PHYSICAL DEMANDS

JOB TITLE: Heavy Equipment Operator 1
Highway Maintenance Laborer
Highway Maintenance Crew Leader



Company Name: RAMSEY COUNTY – PUBLIC WORKS DEPARTMENT
Prepared by: Lisa Peirson, OTR/L

Date: August 16, 2022
Phone : 651-968-5394

JOB OVERVIEW of Essential Job Functions

Heavy Equipment Operator 1/Maintenance Workers perform the manual tasks associated with county roadway construction, reconstruction and snow removal. **Heavy Equipment Operator 1** employees will utilize several types of vehicles for work duties (examples): tandem axle dump truck, single or tandem axle trucks, roadway sweepers, oilers, rollers, etc.. Highway Maintenance Workers are limited to operating equipment and motor vehicles to less than 10K pounds GVWR. Vehicles/equipment are fueled as needed. Examples of job duties is to fill and repair potholes or broken places in roadways with concrete, asphalt or other bituminous material, spread it with rakes, and finish the final surface with tampers and rollers. They apply oil to the road. They construct, repair, and clean/clear culverts, ditches, storm drains, curbs, spillways, and other drain structures of debris, maintain road shoulders, snow fences, berms, and guardrails, and assist in removal of slides from roadways. Additional tasks assigned to **Maintenance Workers** include traffic control, litter pickup, minor tree trimming, and other maintenance of right-of-way. Maintenance workers perform landscaping tasks (i.e.: removing brush, clearing weeds, removing rubbish and tree limbs, spreading crushed rock, shaping ditches, spreading black dirt and laying sod) in areas such as right-of-way and roadside shoulders. Removing snow by use of shovels, snowplows, and sanding trucks at crosswalks, intersections, bridge walks, and drains. Inspect & minor maintenance on all equipment as needed.

Work Hours: 6:30 am - 3:30 pm

Breaks: 1-30 minute & 2-15 minute

Overtime: Occasionally in summer months (averages 1-5 hours per 2 week pay period). Could be frequently in winter during snowfalls; averages 3-5 hours of overtime per day on a “callout during a snow event” and up to a 12 hour day.

Personal Protective Equipment: Required: Steel toe boots/shoes, safety vest. Required as needed per job: safety glasses, hearing protection. Leather /Kevlar/chemical resistant or nitro gloves, hard hat, dust mask, face shield, fall harness, etc..

Special Training Requirements: Commercial drivers’ license

Heavy Equipment: Skid loader (with attachments), bobcat, single/tandem axel truck (1 ton), 18 wheeler truck, snow plow, dump truck, tractor trailer, asphalt roller, cement truck with mobile crane/boom, water and jetter truck, sewer truck, forklift, soil compactor, lift bucket, tampers, etc..

Tools & Equipment (Various types of the following): Chain/concrete/chop saws, asphalt routers, cutting torch, trenching, lawn mowers (push and walk behind), weed whip, generators, tree trimmers, hand tools, power tools, hardware, pneumatic chipping hammer, pneumatic jack hammers/bits, traffic cones/barricades/arrow boards, traffic control flags, sand bags, manhole covers, cement blocks/rings, sledge hammer, roadway materials (asphalt, sand, ½ inch gravel/rock, clay, Class 7 rock, millings), guardrails, posts, air compressors, grade stakes, brooms, cement mixers, curbing machines, tapes, etc..



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Job Task Analysis – Physical Demand Checklist

Key

Never (0%)	Rarely (1 – 10%)	Occasionally (11 - 33%)	Frequently (34 – 66%)	Continuously (67 – 100%)
Not at all (0%)	0-24 min./day 0-5 reps/ in 8 hour day	25 min. to 2.5 hours/day 6-100 reps in 8 hour day	2.51 to 5 hours/day 101-300 reps in 8 hour day	5.01 hours and over 301 to 500 + reps in 8 hr. day

Site: Ramsey County						Location: Arden Hills
Posture, Movement:	Never (0%)	Rarely (1 – 10%)	Occasionally (11 - 33%)	Frequently (34 – 66%)	Continuously (67 – 100%)	Comments
Sitting			x -summer	X	X	Driving trucks (tandem single axel, 18 wheeler, pickup), heavy equipment operation (i.e.: bobcat, asphalt roller, skid loader), etc..
Standing			X			On even and uneven ground/surfaces to dig trenches, direct traffic, flagging, paving and repairing road surfaces, etc..
Walking			X			On even ground/surfaces and uneven ground/surfaces. To operate push and walk behind mowers, for grade marking, to load/unload equipment or materials, patching potholes & crack sealing, etc..
Bending / Stooping			X	X		Shoveling/digging, loading/unloading, to do chain saw work, crack sealing/ pothole patching, mowing, landscaping, tree trimming, placing retaining block, curb work, etc..
Twisting			X	X		Shoveling/digging, loading/unloading, to do chain saw work, crack sealing/ pothole patching, mowing, landscaping, tree trimming, placing retaining block, washing station, etc..
Low Level Position (kneel/squat/1/2 kneel/ crouching)			X			Laying sod, landscaping, concrete work (troweling cement), patching and pipe work, culvert work to work with paver block, to get in and out of bobcat, washing station work, landscaping, curb work, etc..
Crawling		X				LP4, inspect confined spaces, guard rail repair, for curb and sidewalk work, to trowel cement, etc..
Climb (stairs/ladder)			X			To get in and out of trucks/ heavy equipment. There are ladders on the sides of trucks/equipment as well as 2-4 steps to get inside to drive equipment/truck, etc..
Balancing			X	X		On even and uneven surfaces/ground, on trailers. On moving equipment such as asphalt roller/curbing machine. To perform safety harness work, etc..



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Job Task Analysis – Physical Demand Checklist Continued

Posture, Movement:	Never (0%)	Rarely (1 – 10%)	Occasionally (11 - 33%)	Frequently (34 – 66%)	Continuously (67 – 100%)	Comments
Reach – forward					X	Tool use (i.e.: chain /concrete/ chop saw), asphalt router, to drive/steer/operate machines & trucks. Washing truck/heavy equipment, troweling concrete, raking concrete/asphalt, minor maintenance duties on vehicles/ equipment, flagging & hand signals, etc...
Reach – over shoulder level		X	X			Marking lines, operation of truck/controls, tree trimming, shovel full of asphalt from truck back, climbing in/out of trucks, sledge hammer work, hand signals, etc.
Reach – low level			X	X		Smaller tool use, hand tools, shovels, cleaning gutters/ culverts, storm sewer work, drainage ditch maintenance, curb work, landscaping, clearing brush, etc..
Reach – behind/across		X				Lever operation (bobcat), to steer asphalt roller, application of seat belts, flagging, troweling concrete, etc..
Lateral/Side Bend of Trunk			X	X		Driving and operating truck/plows (especially during snowfall) and heavy equipment (asphalt roller, sweeper), tree trimming, etc..
Push / Pull			X	X		Hydraulic lever operation, stick shift, Jet truck, tail gate, moving ramps on trailers, pry bar use, driving, steering, opening closing doors, lawn mower & weed whip pull start, raking/shoveling sand/ dirt/rock, rakes, trowels, shovel full of asphalt from truck back, brooms, brush/tree limbs, etc..



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Job Task Analysis – Physical Demand Checklist Continued

Lifting: & Carrying	Never	Rarely	Occasionally	Frequently	Continuously	Comments
Up to 10 pounds				X		Materials, rakes, hand tools, power tools, cones, lubricant/solvent containers, etc.
11 – 24 pounds			X	X		Sledge hammer, water hose, grass seed, chipping hammer, weighted shovels, road barricades, etc.
25 – 34 pounds			X			Concrete work (demo/repair), sand bags, etc.
35 – 50 pounds		X	X			Concrete work (demo/repair), sand bags, water and other liquids in 5 gal. bucket, boxes of rubber, cement bags, etc..
51 – 74 pounds		X				Catch basin materials, jack hammer/bit, various posts, etc..
75 –100 pounds		X				Bag of Spec mix (80 lbs.), retaining/cement block (75-82 lbs.), manhole cover (2 person lift encouraged), several cement rings, etc..
Over 100 pounds		X				Construction materials such as chunks of concrete, asphalt, fallen trees, Manhole covers/lids, etc.. Coworker or mechanical assistance encouraged.



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Physical Demand Checklist – Head & Neck - Upper & Lower Extremities

Repetitive use of Arms/hands/fingers	Never	Rarely	Occasionally	Frequently	Continuously	Comments
Bend/Twist/Rotate arm/wrist/ forearm				X		Driving, steering and operating trucks or heavy equipment. Loading/unloading, shoveling, tamping, handling hoses, hand & power tools, shifting levers or operation controls (joystick type), shovels/rakes, flagging/hand signals, etc..
Elbow Flex/Ext Right:				X	X	Same as above
Left:				X	X	Same as above
Simple grasping: Right					X	Truck/snowplow controls are right hand operated. Radio operation. Handling light objects, flagging, etc..
Left:			X	X		Same as above
Firm grasping: Right:			X			Forceful hand/power tool use, shoveling, loading equipment (tie downs), mowers, skid loaders, small equipment use (i.e.: tampers, tree trimmers, weed whips) and sledge hammering, jack hammering, handling heavy objects, etc..
Left:			X			Same as above
Fine hand work: Right:		X				Writing in daily log, hand radio use (both of these with the dominant hand), manipulating hardware, controls/switches, etc..
Left:		X				See above
<u>Pinch (see below)</u>						
Lateral Right:		X	X			Writing and radio use, key use, manipulating hardware, etc.. – depends on hand dominance
Left:		X	X			Writing and radio use, manipulating hardware, etc.. – depends on hand dominance
3- point Right:		X				Same as above
Left:		X				Same as above
2-point Right:		X				Same as above
Left:		X				Same as above
Other/Comments: Frequent vibration exposure through driving and operating truck/heavy equipment. Finger/thumb use for power controls on tools & equipment, etc..						
Repetitive use of the <i>feet</i> (ex., using foot controls)						
Right	Yes		Frequently – Driving trucks/plows. Equipment operation-bobcat.			
Left	Yes		Rarely			
Both	Yes		Rarely- clutch operation (left foot) of Tandem 70 trucks			
<i>Posture of the head and neck:</i>						
Static position	Yes		Sweeper operation, other equipment operation as needed.			
Frequent Flexing	Yes		Digging, controls			
Occasional/Rare Extension	Yes		Controls, observing heavy equipment in surroundings to signal to operator, etc..			
Frequent rotating (right/left)	Yes		Driving and equipment operation (checking mirrors and peripheral road conditions) - Needed especially for plowing/asphalt/ sweeper/skid steering, flagging/hand signals, etc..			
Frequent side bending (right/left)	Yes		Driving and equipment operation (checking mirrors and peripheral road conditions) - Needed especially for plowing/asphalt/ sweeper/skid steering, etc..			



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Job Task Analysis - Environmental Exposure Checklist

Environmental Exposures		Comments:
Working around moving machinery	Yes	Trucks, construction areas/ road traffic
Working at heights	Yes	Rare-vertical ladder on Oil Distributor truck, bucket truck are examples.
Congested area	Yes	Work is outside
Working outside	Yes	50% = New employee - 10 yr. employee 30-50% = 10-20 year employees 0-10% = 20+ year employee (they mostly drive trucks or vehicles).
Inadequate lighting (task)	Yes	Snowplowing (nighttime and poor driving visibility conditions).
Glare	Yes	Sunny weather, driving
Exposure to heat and humidity	Yes	See working outside
Exposure to cold	Yes	See working outside
Using powered equipment	Yes	Jack hammering, trenching, tampers, weed whips, tree trimmers, mowers, etc..
Vibration	Yes	Jack hammering, chipping tools, tampers, driving and steering truck, etc..
Slippery surfaces	Yes	Ground/weather/rain, snow and ice, oil, climbing on equipment, etc..
Chemical exposure: (specify)		
Inhalation	Yes	Gasoline, diesel, oils, biodiesel additive, cleaning chemicals (orange citrus cleaner), degreasers, lubricants, silica dusts, and asphalt fumes etc..
Ingestion	Yes	
Skin contact	Yes	
Noise- interfering w/ communication	Yes	Plowing, trenching, blowing, bobcat operation, tamping, jack hammering, etc.
Radiation (ionizing/non-ionizing)	No	
Hazardous waste/agents	Yes	Roadside clean up – exposures vary greatly
Airborne infectious agents	No	
Blood and/or bodily fluids	Yes	Rare – ex: assisting co-worker with blood while providing first aid
Risk - physical violence/aggression	Yes	Rare - traffic situations- road rage from motorists

Sensory Demands (Check all that apply)

Hearing Speech Near vision Far vision Color vision Spatial perception
 Tactile Smell Taste

* Must be able to smell burning wires in mechanical overheat situation.

Additional Comments:

The physical and environmental demands of this job position were reviewed by these individuals for accuracy. It is recommended that at least two employees who perform the job and a supervisor (per facility) review this document. This document was reviewed by:

Name & Title	Date
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

**Photos: Heavy Equipment Operator 1- Highway Maintenance Labor – Highway Maintenance Crew Leader
RAMSEY CTY PUBLIC WORKS (updated 8/16/22)**

VARIOUS EQUIPMENT DRIVEN, MOVED, IN AND OUT OF, LOADED, UNLOADED FOR JOB.



Dump truck has plow attachment for winter.



Oil distributor truck. Note vertical ladder climb.



Water truck.



Trailer (flat bed). Loading equipment on and off.



Driving forklift.

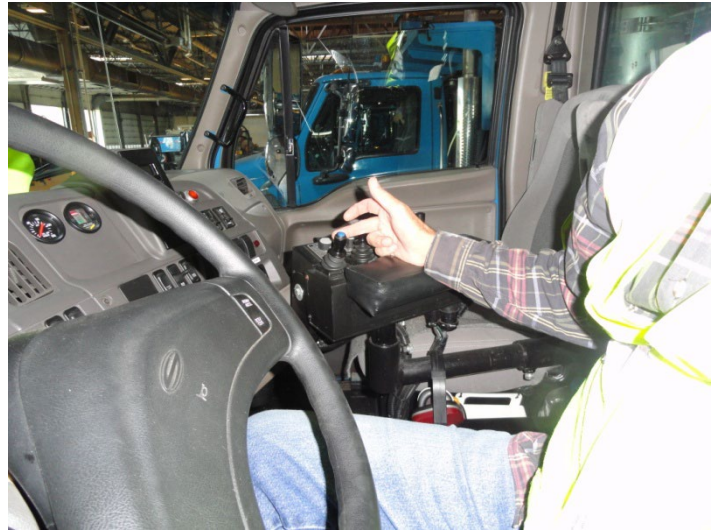


Asphalt roller.

**Photos: Heavy Equipment Operator 1- Highway Maintenance Labor – Highway Maintenance Crew Leader
RAMSEY CTY PUBLIC WORKS (updated 8/16/22)**



Driving – frequent/constant levels (3-8 hours/day).



Hand operation of the control mechanism for dump box and snow plowing.



Climbing in/out of truck or heavy equipment/truck to drive.



Climb onto or off equipment for supplies, tools, etc. Steps from 11"-24" off ground.

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RAMSEY CTY PUBLIC WORKS (updated 8/16/22)**



Tools: Shovels, wheel barrels, buckets for gravel, rock or dirt.



Example of climbing on and in truck to locate supplies or tools needed for the job.



Occasional/frequent standing on even/uneven surfaces.



Ratcheting tie downs (grip/bend) to transport heavy equipment.



Bobcat operation and direction of crew lead at jobsite.



Loading/unloading, steering climbing with heavy equipment.

**Photos: Heavy Equipment Operator 1- Highway Maintenance Labor – Highway Maintenance Crew Leader
RAMSEY CTY PUBLIC WORKS (updated 8/16/22)**



Hoses for vacuum excavator machine (used with gas/utility).



Example of trenching forward bent, twist, grip and push/pull to insert/remove equipment.