

**Department of Human Resources**

Central Employee Services Division
Disability Services Section
500 4th Avenue, Room 500
Seattle, WA 98104
(206) 477-3350
(206) 296-4992 FAX
www.kingcounty.gov

Employee :

Claim # :

JOB ANALYSIS

| | | | |
|-------------------|--|------------------------------------|--|
| Job Title: | Signal and Communication Technician | | |
| Department: | Transit | Division: | Rail |
| DOT Title: | Signal Maintainer | DOT #: | 822.281-026 |
| SVP: | 7 | Requestor: | Jeff Casem |
| Worksite Address: | Light Rail Operation & Maintenance Facility 3407 Airport Way Seattle, WA 98104 | Office Contact Name/ Phone/ Email: | Nick Keolker 206-689-4819 Nick.Keolker-KCRail@soundtransit.org |
| Original Analyst: | Kyle Pletz, BA, BA, VRC, CDMS | | Analysis Date: 5/26/21 |
| Update Analyst: | Kyle Pletz, BA, BA, VRC, CDMS | | Update Date: |

☒ On-Site ☐ Interview ☐ Representative

JOB DUTIES:

This position will perform maintenance on railway signal and communications equipment such as motorized switch machines, vital relays, microprocessor controlled interlockings, programmable logic controllers, fiber optic links, failsafe railroad crossing equipment, stand-alone computers, power supplies and associated 700 MHz and 800 MHz communications equipment and handsets.

ESSENTIAL FUNCTIONS ACCORDING TO THE EMPLOYER:

All King County jobs require ability/essential function to:

- Demonstrate predictable, reliable, and timely attendance.
 - Follow written and verbal directions to complete assigned tasks on schedule.
 - Read, write, and communicate in English & understand basic math.
 - Learn from directions, observations, and mistakes and apply procedures using good judgment.
 - Work independently or as part of a team and interact appropriately with others.
1. Conduct fault diagnosis; inspect, test, modify, maintain and repair railway signal and communications equipment.
 2. Inspect, repair and maintain electrical, electronic, mechanical, and hydraulic equipment including grade crossing mechanisms, switch machines, multiplexers, microprocessor controlled interlockings, vital relays, power supplies, battery systems, audio systems, and other complex machinery and equipment.
 3. Operate common and specialized tools and equipment such as mechanical lift devices, hand tools, and electronic measurement devices.
 4. Access aerial support structures and poles to perform inspections, maintenance and repair tasks.
 5. Determine work priorities for emergency maintenance tasks in the absence of on-site supervision; respond to emergency calls as necessary.
 6. Operate switch machines by hand and by Local Control Panels under revenue and non-revenue conditions.
 7. Plan, schedule, communicate and coordinate activities and work with other trades and sections; assist other trades as necessary.
 8. Operate assigned vehicles including Hi-Rail and Aerial Lift equipment.
 9. Perform snow and ice removal.



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10. Flag trackway to provide safe rail work zones; set up work zone traffic control areas.
11. Record and document maintenance and diagnostic data.
12. Operate switch machines by hand and by Local Control Panels under revenue and non-revenue conditions.
13. Other duties as assigned, related to signal and communications.

EXPERIENCE, QUALIFICATIONS, KNOWLEDGE, SKILLS:

Two years performing journey level work in railway signaling & communications. Additional requirements are:

- Knowledge of the fundamentals of railway signaling and communications.
- Knowledge in analyzing and evaluating malfunctions in electrical and electronic railway equipment and determining repair requirements; skill in performing electronic fabrication and assembly tasks, such as soldering and wire harnessing; skill in problem solving, analyzing, diagnosing and evaluating equipment problems.
- Knowledge of and skill in industrial safety techniques, including experience applying safety techniques while working at railway crossings with train and automobile traffic.
- Knowledge of and skill in maintaining and troubleshooting mechanical and hydraulic equipment.
- Willingness and ability to apply King County's core values around inclusion, equity and social justice as a team member and representative of King County to the public.
- Skill in the application of customer service techniques and principles when dealing with customers in a tactful and diplomatic manner.
- Skill in oral and written communications, including reading, writing and following instructions.
- Skill in preparing written reports, inspection forms for documenting defects and repairs of work orders in designated computer programs; skill in preparing time and material cost estimates; keep accurate records.
- Skill in developing and implementing preventive maintenance and safety inspection procedures.
- Skill in working under established deadlines and time frames.
- Skill in establishing and maintaining cooperative working relationships with a diverse group of individuals.

Machines, Tools, Special Equipment, Personal Protective Equipment Used:

Rake, shove , blower, compressors, boom truck, weed burners, various hand tools, cleaning solutions, spray bottles, vacuum, paper towels, switch, broom, compactor, roto-hammer, demo gun, putty knife, rolling garbage can, utility cart, shovel hoses, light bulbs, pressure washer, Hi-rail vehicle, Rail drill, handsaw, hack saw, various cleaning tools, rags, forklifts, high-lift, brushes, rollers, hand scrapers, hammers, screw drivers, air and electrical tools, drills, chisels, needle gun, grinders, trailer and various County trucks with both manual and automatic transmission. sledge hammer, ballast rake/shovel, power rotary snow broom, grinding tools, exothermic welding equipment, torque wrench, diagnostic rate decoder (DRD), various gauges, multimeter, oscilloscope, hydraulic press, hand and battery operated crimper, specialty software on computer and laptop, soldering equipment, flux solder sucker, Local Control Panel (LCP), hydraulic systems, electric motors, high voltage equipment, powered switch machines, spectrum analyzer, etc.

Hardhat, safety vest, eye protection, safety/hard toe boots, gloves, hearing protection, fall protection, breathing protection.



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PHYSICAL REQUIREMENTS

| Frequency Scale | Strength | Work Pattern | |
|---|---|--|---------------|
| N = Never | <input type="checkbox"/> Sedentary | <input type="checkbox"/> Full-time | |
| S = Seldom (1-10 %, up to 48 min) | <input type="checkbox"/> Light | <input type="checkbox"/> Part-time | |
| O = Occasional (11-33%, 49 min. – 2 hr 40 min) | <input type="checkbox"/> Medium | <input type="checkbox"/> Seasonal | |
| F = Frequent (34-66%, 2 hr 41 min – 5 hr 20 min) | <input checked="" type="checkbox"/> Heavy | 10 | Hours Per Day |
| C = Constant (67-100%, more than 5 hr 20 min) | <input type="checkbox"/> Very Heavy | 4 | Days Per Week |
| | | FLSA Exempt <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | |

Work Pattern (continued)

This is classified as a MEDIUM job by the US Department of Labor but adjusted to HEAVY for this position.

*On a rare occasion the worker may need to work a 12 hour shift.

| Job Demand | Frequency and Weight (lbs) | | | | | Activity Description |
|----------------------------------|----------------------------|--------|------|---|---|---|
| | N | S | O | F | C | |
| Lifting floor – waist | | 21-100 | 1-20 | | | Up to 20 sec./time, 20 min. total with weights of 1-20 lbs. while utilizing hand tools. The employee also lifts 50-100 lbs. when manipulating a rail drill and switch machine parts; loading and unloading equipment from a pickup, such as a snow blower, rail drill, switch plate cover, switch machine parts with the assistance of a coworker. Up to 5-10 min./time, 2.5 hrs. total with 1-20 lbs. while manipulating power tools as well as when using a blower, rail drill, pressure washer, hydraulic press, power cable crimper, various large hand tools, etc. |
| Lifting waist–shoulder | | 21-100 | 1-20 | | | Same as lifting floor to waist. |
| Lifting above shoulder | | 1-5 | | | | Up to 1 min./time, 45 min total while loading and unloading equipment, covering signals, manipulating trash bags, utilizing hand tools and pressure washing. |



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| Job Demand | Frequency and Weight (lbs) | | | | | Activity Description |
|--|----------------------------|-------|------|---|---|--|
| | N | S | O | F | C | |
| Carry (Distance/Surface) | | 51-90 | 1-50 | | | Up to 15 min./time, 1 hr. total with weights of 1-40 lbs. while transporting 1 gallon cans of lubrication, handheld pump sprayer, hand tools and tool bags on uneven ballast (rocks), stairs, sloped surfaces and track components. May carry safety cones. Up to 5 min./time, 20 min total with 60-90 lbs. with rail drill and switch machine parts. |
| Pushing/Pulling (Distance/Surface) | | | 1-50 | | | Up to 10 min./time with a force of up to 50 lbs. for up to 1 hr. total while hand throwing switch machines, using prybars/levers, using power tools, moving rail carts, utilizing rail drill. |

| Physical Demands | Frequency | | | | | Activity Description |
|-------------------------|-----------|---|---|---|----|--|
| | N | S | O | F | C | |
| Sitting | | | | | X* | On an automobile seat for up to 1 hr./time, 7 hrs. total while driving to/from various work sites as well as when operating a boom truck or forklift, soldering, welding, and performing signal system repair/maintenance. *The employee can also sit for up to 10 hrs. in a shift while performing snow detail or contractor support on a rare occasion. |
| Standing | | | | | X | On ballast, carpeted, asphalt, concrete, grass, vegetation, inclines, side hills, linoleum, frozen and uneven surfaces for up to 1 hr./time, 7 hrs. total while roadway and trackway flagging, pressure washing, using rail drill, spotting for confined space entry and working on structures. |
| Walking | | | | | X | On ballast, dense vegetation, gravel/rocks, carpeted, asphalt, concrete, grass, vegetation, frozen surfaces, inclines, side hills, linoleum and uneven surfaces for up to 2-5 hrs./ time, 7.5 hrs. total while performing track maintenance and signal maintenance, vacuuming, sweeping, etc. Performs switch inspections weekly and walking track circuit inspections annually on side hill ballast rock. |
| Perform Work on Ladders | | | | X | | Up to 10 min./time, 4 hrs. total while utilizing a ladder to change signal bulbs, performing inspections, checking junction boxes, pressure washing signal houses annually, climbing in/out of truck; traversing thick vegetation, track structures, etc. |
| Climbing | | | | X | | Up to 10 min./time, 4 hrs. total while utilizing a ladder to change signal bulbs, performing inspections, checking junction boxes, pressure washing signal houses annually, climbing in/out of truck; traversing thick vegetation, track structures, etc. |



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|-------------------------|-----------|---|---|---|---|---|
| | N | S | O | F | C | |
| Balancing | | | | | X | Up to 4 hrs./time, 7.5 hrs. while continuously traversing track ballast, side hill and inclines; also, working on steep inclines, traversing wet or slick surfaces and performing signal maintenance duties on uneven ground. |
| Stooping / Bending | | | X | | | on flat carpeted and linoleum surfaces for up to 1-2 minutes at a time for up to 30 minutes total in a shift when retrieving supplies from low shelves or cabinets, adding paper to the copy machine, searching through low file drawers and filing. Bending/stooping may be reduced by alternating with squatting or kneeling. |
| Twisting at Neck | | | | X | | Up to 30 sec./time, 4 hrs./total while moving tools over tracks, performing signal maintenance and traversing for maintenance, repairs and cleaning. Track and road flagging. |
| Twisting at Waist | | | | X | | Up to 30 sec./time, 4 hrs./total while moving tools over tracks, performing signal maintenance and traversing for maintenance, repairs and cleaning. Track and road flagging. |
| Squatting / Kneeling | | | | X | | Up to 10 min./time, 4 hrs. total while performing signal repair; performing equipment maintenance, performing shunt testing loading/unloading trucks, using a blower, confined space spotting, etc. |
| Crawling | | X | | | | Up to 1 min./time, up to 10 min. total while performing signal inspections. |
| Reach waist to shoulder | | | | | X | Up to 1 hr./time, 8 hrs. total while operating equipment, performing signal maintenance duties, utilizing hand tools and meters, cleaning, shoveling, sweeping, driving, unpacking supplies, etc. |
| Reach above shoulder | | | | | | Up to 1 min./ time, 30 min. total while changing signal bulbs, loading/unloading trucks, unpacking supplies, loading/unloading tools and equipment, painting and pressure washing. |
| Reach below waist | | | | | | Up to 1 hr./time, 5 hrs. total while operating equipment, replacing filters, performing signal maintenance duties, utilizing hand tools and meters, cleaning, shoveling, sweeping, driving, unpacking supplies, etc. |
| Keyboarding | | X | | | | Up to 5 min./time, 30 min total while ordering parts and performing research. |
| Wrist Flexion/Extension | | | X | | | Up to 5 min, 1 hr. total while utilizing hand tools, power tools, meters, switch brooms, shoveling, switch lube sprayer, etc. |



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| | N | S | O | F | C | |
| Handle/Grasp | | | | | X | Up to 1 hr./time, 9 hrs. total while utilizing hand tools, power tools, meters, switch brooms, shoveling, switch lube sprayer, etc. Also utilizes handling when driving. |
| Forceful Grasp | | | X | | | Up to 5-10 min./time, 2.5 hrs. total with 1-20 lbs. while manipulating power tools and various signal parts; using a rail drill, pressure washer, hydraulic press, power cable crimper, various large hand tools, etc. |
| Fine Finger Manipulation | | | | X | | Up to 1 hr./time, 6 hrs. total while operating radio, computer, hand tools, power tools, forklift, loaders, etc. |
| Hand Controls | | | | X | | Up to 1 hr./time, 6 hrs. total while operating radio, computer, meters, testing equipment, hand tools, power tools, forklift, etc. |
| Foot Controls | | | | | X | Up to 1 hr./time, 9 hrs. total while driving to and from various work sites as well as when operating various trucks, forklift, and high rail equipment. |
| Repetitive Motion | | | X | | | Body Part: Hands Cycles/hr: 200+ |
| Vibratory Tasks – High | X | | | | | |
| Vibratory Tasks – Low | | | X | | | Up to 30 min./time, 2 hrs. total while using impact drivers, rail drill, hammers/striking tools, blower, etc. |
| Talking | | | | X | | Up to 5 min./time, 6 hrs. total while conversing with coworkers and supervisors (in person and on radio) to ensure that all tasks and duties are completed as well as when attending meetings. Performs signal inspections and confined space work with coworkers which requires constant communication. |
| Hearing | | | | | X | Must be able to hear at all times due to continuously working in an environment with moving machines and trains. |
| Visual – Near Acuity | | | | X | | Working on signal equipment. |
| Visual – Far Acuity | | | | | X | Must be able to identify multiple hazards at all times, such as moving trains, equipment and machinery. Must be able to interpret/process speeds of trains and equipment. Performs visual inspections of tracks and signal equipment. |
| Visual – Depth Perception | | | | | X | Must be able to identify multiple hazards at all times, such as moving trains, equipment and machinery. Must be able to interpret/process speeds of trains and equipment. Performs visual inspections of tracks and signal equipment. |
| Visual – Color Discrimination | | | | X | | Identifies colors of signals. |
| Visual – Accommodation | | | | | X | Must be able to identify multiple hazards at all times, such as moving trains, equipment and machinery. Must be able to interpret/process speeds of trains and equipment. Performs visual inspections of tracks and signal equipment. |



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| Physical Demands | Frequency | | | | | Activity Description |
|---------------------------------------|---|---|---|---|---|---|
| | N | S | O | F | C | |
| Visual – Field of Vision | | | | | X | Must be able to identify multiple hazards at all times, such as moving trains, equipment and machinery. Must be able to interpret/process speeds of trains and equipment. Performs visual inspections of tracks and signal equipment. |
| Exposure to Weather | | | | | X | Work is performed outside on rail tracks. |
| Extreme Cold | | X | | | | Work is performed outside on rail tracks. |
| Extreme Hot | | | | X | | Work is performed outside on rail tracks. There is also exposure to hot equipment such as exhaust pipes. May be near to welding. |
| Wet and / or Humidity | | | | X | | Work is performed outside on rail tracks. |
| Proximity to Moving Mechanical Parts | | | | | X | Work is performed on active rail track. Also works around heavy machinery. |
| Exposure to Explosives | | X | | | | Very rare, but small charges for exothermic welding can be used. |
| Atmospheric Conditions | | | | X | | Work is performed outside on rail tracks with passing trains that kick up dust. |
| Exposed Heights | | | | X | | Aerial rail tracks. |
| Exposure to Electricity | | | | X | | Working on electrical signal equipment. |
| Exposure to Toxic / Caustic Chemicals | | X | | | | |
| Exposure to Radiation | X | | | | | |
| Noise Intensity | <input type="checkbox"/> Very Quiet <input type="checkbox"/> Quiet <input checked="" type="checkbox"/> Moderate <input checked="" type="checkbox"/> Loud <input type="checkbox"/> Very Loud | | | | | |
| Other: | | | | | | |

Analyst's Comments:



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Possible Employer Modifications:

Update Comments (*if applicable*):

Note: The information for this job analysis was gathered by either on-site observation, interview and / or is representative of the labor market as indicated on page one. Additional data may have been obtained from standardized industry resources such as the DOT, GOE, COJ, OOH, WOIS and O-NET. On occasion, practicality and feasibility prevent the direct observation and/or gathering of objective, quantifiable data. For this reason, a “best estimate” may have been used.

Analyst:

Kyle Pletz, BA, BA, VRC, CDMS

Vocational Consultant

Date

Update (if applicable):

Vocational Consultant

Date

Employer Verification:

Name

Date

Employee Verification: (optional)

Name

Date



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MEDICAL PROVIDER:

- ☐ I agree that the employee can perform the physical activities described in this job analysis and can return to work. Date employee is released to return to work if different from today's date: _____
- ☐ I agree the employee can perform the described job but only with modifications (describe in comments section). Modifications are needed on a ☐ permanent basis or ☐ temporary basis.
- ☐ The employee **temporarily** cannot perform this job based on the following physical limitations:

Anticipated release date: _____

Treatment plan: _____

- ☐ The employee is **permanently** restricted from performing the physical activities described in this job analysis based on the following physical limitations (state objective medical findings):

Comments:

Signature

Date

Print Name

- ☐ Attending Physician ☐ Consulting Physician ☐ Pain Program Physician
- ☐ IME Physican ☐ PCE Therapist ☐ OT / PT Therapist ☐ PEP Physician