



***Job Analysis: Millwright (Marine Maintenance) – Port of Seattle
DOT # 638.281-018***

Tasks assigned to Millwrights may include:

- Meet/connect with Crew Chief on a daily basis.
- Read blueprints and/or diagrams to determine the best method for producing a requested item.
- Request parts, supplies, and or materials needed for projects.
- Prepare and or review job hazard analysis for each project. Review job plan. Ensure work is performed in a safe manner.
- Cut required parts and pieces from metal stock. The stock must be moved and maneuvered onto work or cutting tables, and potentially into a metal shear or other cutting apparatus, to cut the necessary pieces. Some metal stock comes in 4'x8' or 4'x12' sheets. A 4'x8' sheet of 1/4 inch thick steel weighs approximately 320 lbs. A 4'x8' sheet of 1 inch thick steel weighs over 1,200 lbs. Some metal stock comes in lengths. A length of steel measuring 4" wide by 1" thick by 20' long weighs approximately 260 lbs. Metal stock may be moved using two workers, a forklift, or an overhead hoist (a special magnet was purchased to assist in moving the metal sheets).
- Bend, shape, and or form metal pieces.
- Tack and/or weld metal components together to fabricate/create parts for machinery or equipment used on Port-owned properties.
- Repair damaged or broken items either in the shop, or on-site at one of the Port properties.
- Respond to emergency repair requests on Port property (work trucks have portable welding machines), or work on-site when the item being modified or repaired cannot be brought back to the shop. When working on-site at a Port property, it may be necessary for a Millwright to obtain a "hot permit," which is essentially used as a tool to alert the Seattle Fire Department to work being done that could have fire-related issues.
- Test constructed items and structures to ensure the items and structures meet the safe load requirements.
- Perform periodic preventative maintenance ("PM") inspections of Port properties to identify potential/necessary repairs. Document needed repairs and create work orders.
- Enter time by work order on a daily basis into job tracking system (Maximo).





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- Enter description of work completed in work log.
- Send and respond to electronic mails.
- Attend periodic meetings during which training is provided and important safety issues are discussed.
- Assist other crafts as requested.
- Potentially supervise apprentices or mentor students.
- Complete all required forms and documents.

Sample Work Tasks

- Gather plates used to cover high voltage tracks that power the cranes used to load and unload container ships. Return to the shop, and remove cracked or damaged hinges. Grind the hinge area smooth and reattach new hinges to the covers. Replace the covers on-site.
- Fabricate bollards/cleats used to tie up vessels ranging from kayaks to cruise ships (the largest cleats may weigh up to 1,200 lbs.).
- Repair or modify the metal walkways used at the marinas to reach the floating docks.

Necessary skills and abilities may include:

- Must have technical knowledge and expertise in metal fabrication, repair, and replacement techniques. Must possess mechanical aptitudes.
- Must have the physical abilities to accomplish all of the tasks assigned to a Millwright. Good eyesight, hand-eye coordination, and manual dexterity.
- Ability to work independently, but also within a team as required.
- Ability to follow directions closely and be detailed oriented while working.
- Having the skills to identify the best way to accomplish a task, and complete the assigned task(s) in a timely and efficient manner. Being able to work in any kind of weather, and potentially from a boat.
- Working knowledge of Windows-based computers and related accessories. Working knowledge of time tracking software, keyboarding and data input skills, and knowledge of electronic mail software.





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Machinery, Tools, Equipment, Personal Protective Equipment:

- Work benches/tables.
- Welding equipment (MIG and stick).
- Portable generators.
- Cutting torches. Propane torches.
- Metal cutting machines and presses (shear).
- Chop and band saws.
- Drill presses.
- Grinders.
- Wrenches, pliers, hammers, and other hand tools.
- Roto-hammer.
- Hardware, including bolts and nuts.
- Burk bars. Pry bars.
- Chains, straps, and ropes.
- Portable chain block hoists and other hoisting devices.
- Hydraulic rams.
- Overhead hoist. Forklift.
- Work trucks with storage boxes and hoists.
- Hand truck. Wheeled carts.
- Racks used to store raw materials.
- Scissor lifts and boom lifts.
- Brooms.
- 2-way radios. Traffic cones.
- Fire extinguishers.
- Work skiffs/boats (14 and 16 foot boats) with outboard engines (larger boat has center console steering).
- Computer, computer accessories, and project management software (Maximo). General office equipment, such as fax machine and telephones. General office supplies, such as pens/pencils, notepads, binders, and copy paper.



Personal protective equipment: Workers are required to wear a safety vest, approved safety boots, eye and ear protection at all times. Respirators and hard hats are required as necessary. Millwrights may also wear gloves, rain gear, and kneepads.

Welding goggles or a welding hood/mask is required while welding. Fall arrest harnesses are worn when



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working at heights (generally when working at an elevation of 6 feet or more). When working on or within 6 feet of an edge of the water, Millwrights must wear personal flotation devices (“PFDs”).





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Education / Training:

The Millwrights at the Port of Seattle are represented by a Union, and are generally dispatched out of Local 204 (Millwright Local) or Local 2396 (Piledriver Local). Both the Local 204 and Local 2396 are organized under The United Brotherhood of Carpenters.

Millwrights hired by Marine Maintenance are generally Journey-level Millwrights that have completed an apprenticeship through the Union. The Apprenticeship program offered through the Union ensures a pool of educated and well-trained Millwrights, and in most cases, lasts approximately four years before reaching Journeyman status.

Training and or enough hands-on experience with computers to have a working knowledge of Windows-based computers, related accessories, time tracking software, keyboarding, data entry, and electronic mail software.

Per the Dictionary of Occupational Titles (DOT): 638.281-018 Millwright

Specific Vocational Preparation (SVP): 7 (From two to four years)



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COGNITIVE AND BEHAVIORAL ELEMENTS/DEMANDS

The psychological and cognitive demands of this position vary depending on assignments and duties.

Frequency Definitions:		
Continuously = Occurs 66-100% of the time.	Occasionally = Occurs 1-33% of the time	
Frequently = Occurs 33-66% of the time.	Rarely = May occur less than 1% of the time.	
Never = Does not ever occur.		
Comprehension		
Articulating and comprehending information in conversations.		Continuously
Reading, comprehending, and using written materials.		Occasionally
Understanding and solving problems involving math and using the results.		Occasionally
Using technology/instruments/tools & information systems.		Continuously
Working with two and three dimensional formats.		Rarely
Remembering		
Remembering spoken instructions.		Continuously
Remembering written instructions.		Frequently
Remembering visual information.		Continuously
Recalling information incidental to task at hand.		Continuously
Memorizing facts or sequences.		Frequently
Remembering simple instructions.		Continuously
Remembering detailed instructions.		Continuously
Learning & Processing		
Effectively learning and mastering information from classroom training.		Occasionally
Effectively learning and mastering information from on-the-job training.		Continuously
Learning from past directions, observations, and/or mistakes.		Continuously
Using common sense in routine decision making.		Continuously
Recognizing and anticipating potential hazards and taking precautions.		Continuously
Thinking critically and making sound decisions.		Occasionally
Integrating ideas and data for complex decisions.		Occasionally
Determining and following precise sequences.		Frequently
Coordinating and compiling data and information.		Occasionally
Analyzing, synthesizing data and information.		Rarely
Tasking and Planning		
Performing repetitive or short-cycle work.		Continuously
Working under specific instructions.		Continuously
Completing complex tasks.		Occasionally
Directing, controlling, or planning for others as necessary for basic tasks.		Rarely
Directing, controlling, or planning for others as necessary for complex tasks.		Rarely
Multi-tasking.		Continuously
Planning, prioritizing, and structuring daily activities.		Rarely



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Use Appropriate Behavior for Professional Work Environment	
Receiving criticism and accepting limits appropriately.	Frequently
Maintaining emotional control and organization under increased stress.	Continuously
Maintaining socially appropriate affect, temperament, and behavior.	Continuously
Monitoring own quality of performance and altering behaviors to correct mistakes or improve outcome.	Continuously
Working independently and/or unsupervised.	Continuously
Adapting to frequent interruptions, changes in priorities, or changes in work location.	Frequently
Responding effectively to emergency situations.	Rarely

Frequency Designations: Required Beneficial Not Necessary	
Maintaining Attendance and An Assigned Work Schedule	
Maintaining predictable and reliable attendance each work shift.	Beneficial
Being punctual.	Beneficial
Taking rest periods at set times or only at times determined by breaks in job responsibilities.	Not Necessary
Adjusting to a flexible schedule of work days and or shifts.	Beneficial



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PHYSICAL DEMANDS

N/A: Not Applicable

S: Seldom (1-10% of the time)

O: Occasional (10-30% of the time)

STRENGTH: Sedentary Light

F: Frequent (30%-70% of the time)

C: Constant (Over 70% of the time)

WNL: Within Normal Limits (talking, hearing, etc.)

Medium Heavy Very Heavy

Frequency

Comments

Sitting	S	Driving to job sites, attending meetings, or for short periods of time while working in the field.
Standing	F	Interchange with walking. A majority of the work completed by Millwrights is performed while standing (although frequency will depend on assigned tasks). Work tables and other work surfaces are generally 34 inches high. Standing may also include standing in a boat while working.
Walking	F	Interchange with standing. Frequency will depend on assigned tasks. Walking between work areas, gathering parts and pieces to fabricate or install, and carrying metal to machines to cut pieces to size. Walking may be over concrete, asphalt, or grating, or over uneven or slippery surfaces (including dirt, mud, and wet wooden docks).
Lifting (up to 50 pounds)	F	Lifting welding guns (with attached wires/hoses/accessories), cutting torches, hand tools, smaller parts and components, and bolts and nuts.
Lifting (50 to 100 pounds)	O	Lifting metal stock for cutting, medium sized parts and components, and portable welding machines (est. 90 pounds).
Lifting (100 to 150 pounds)	S	Lifting large sheets of metal stock, and long pieces of metal stock. Heavy items are generally lifted by two workers, a forklift, or a hoist.
Carrying (up to 50 pounds)	F	Carrying welding guns (with attached wires/hoses/accessories), cutting torches, hand tools, smaller parts and components, and bolts and nuts.
Carrying (50 to 100 pounds)	O	Carrying metal stock for cutting, medium sized parts and components, and portable welding machines (est. 90 pounds). When in the field, work trucks are parked as close to a work site as possible. Heavier items would be moved using an overhead hoist, hand truck, wheeled cart or work table, or forklift.
Pushing/Pulling (Up to est. 50 lbs. of force).	F	Positioning metal stock on shear, saw, or other metal cutting machine, using wrenches to tighten or loosen bolts/nuts, using a drill press to drill holes in parts, and using a hammer, maul, or sledgehammer.
Pushing/Pulling (est. 50 pounds to 100 lbs. of force).	S	Positioning larger pieces of metal stock on shear, saw, or other metal cutting machine, or maneuvering heavy and/or large assemblies on work tables or ground.
Climbing Stairs/Ladders	O	Workers may encounter stairs in the shop facilities, when working in the field, climbing in/out of a forklift, and in/out of the back of a work truck. Millwrights climb ladders as needed (ladders can range from stepstools to extension ladders to fixed ladders attached to the Port's container cranes – 50 ft. in the air).
Working at Heights/ Balancing	O	Frequency depends on assigned tasks. Climbing ladders, working from a manlift, working high on cranes used to load and unload container ships, or standing on staging constructed under a dock. May also work while standing in a boat, which can take a significant amount of balancing.



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Bending at Waist	F	Entering/exiting vehicle, fabricating, repairing and/or installing items below waist level. Performing assessments and inspections. Gathering materials and supplies.
Bending Neck	C	Within normal limits.
Twisting at Waist	F	Positioning metal stock for cutting, welding and grinding parts, maneuvering into and out of tight work areas, positioning and installing parts, driving forklift, and gathering supplies.
Crouching/Kneeling	O	Working below waist level. NOTE: Workers may wear kneepads while working.
Crawling	S	Limited. NOTE: Workers may wear kneepads while working.
Stooping	O	Entering/exiting truck or vehicle, entering/exiting back of truck, and maneuvering into and out of tight work areas.
Reaching	F	Cutting parts from sheets or metal stock, welding on larger assemblies, removing and placing assemblies on site, using overhead hoists or manual winches, climbing ladders, and gathering supplies and materials. NOTE: Efforts are made to position work between knee and shoulder level, however Millwrights need to be able to work at levels from the floor to over the shoulder heights.
Driving	O	Driving work trucks and forklifts.
Foot Controls	O	Driving work trucks, forklifts, and using foot safety switches on metal fabrication tools and man lifts.
Repetitive Motion	S-O	Millwrights may be tasked with cutting or stamping parts out of metal stock, punching or drilling holes in metal pieces (typically with a drill press), grinding metal parts, or welding a series of similar parts/pieces which may increase the level of repetitive motion experienced by a Millwright.
Handling/Grasping	C	30 % Pinch Grasp 70 % Whole Hand Grasp
Fine Finger Manipulation	F	Adjusting control knobs on welding machine and cutting torch, guiding welding gun and cutting torch, using wrenches, triggers on power tools, keys to start truck and forklift, gathering and fastening bolts and nuts, and operating two-way radio.
Keyboarding	S	Entering time in time tracking system, and receiving/sending emails.
Talking	O	Communicating with supervisors and other co-workers.
Hearing	C	Communicating with supervisors and other co-workers. Listening for hazards.
Seeing	C	Visual abilities would be considered important in this position.
Writing	S	Documenting completed tasks and inspections, and marking measurements.
Normal Job Site Hazards	F	Smoke, fumes, dust, hot welding wire, burns from torches/fire, sparks, carrying heavy objects, working at heights (ladders, man lifts, or catwalks), falling objects, striking head on overhead objects, working near moving vehicles, slippery walking surfaces, sharp tools, noise, odors, vibrations, and potentially capsizing while working in a boat.
Expected Environmental Conditions	C	Work may be performed inside a shop environment, immediately outside the shop in a covered area, or outside completely exposed to the weather. Worker may be exposed to noisy environments, dust, and fumes.



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The above job analysis represents the requirements of a specific job based on personal observations, discussions with employer representatives, and/or workers. 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 when reporting physical demand frequencies.

Analysis was done on the job site? Yes No

Job Analysis Reviewed By:	Corbin Purnhagen
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Completed by Vocational Provider Brice York, B.A., CDMS

Date February 5, 2019 Signature of Vocational Provider 



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FOR PHYSICIAN'S/EVALUATOR'S USE ONLY

- The injured worker can perform the physical activities described in the job analysis and can return to work on _____
- The injured worker can perform the physical activities described in the job analysis on a part-time basis for _____ hours per day. The worker can be expected to progress to regular duties in _____ weeks/months.
- The injured worker can perform the described job, but only with the modifications/restrictions in the attached report and/or listed below. These modifications/restrictions are (check one):
 - Temporary for _____ weeks _____ months
 - Permanent
- The injured worker cannot perform the physical activities described in the job analysis based on the physical limitations in the attached report and/or listed below. These limitations are (check one):
 - Temporary for _____ weeks _____ months
 - Permanent

COMMENTS:

Date _____ Physician's/Evaluator's Signature _____

Physician's/Evaluator's Name Printed _____

PLEASE RETURN COMPLETED FORM VIA FACSIMILE TO:

Port of Seattle Employee Health & Safety Department at (206) 787-3406