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Physical Demands Analysis

Roofer – Mopping Membrane

Prepared for:
Alberta Construction Association

Job Title:	Roofer – Mopping Membrane	Assessment Location:	Edmonton, AB	Data Collection Date:	May 13, 2021
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Completed By:	Joanna Ellingson, BKin	Submitted on:	July 29, 2021
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Disclaimer:	The Physical Demands noted in this report may vary depending on company and location. Please contact the company directly to confirm this physical demands analysis is an accurate representation of the specific job title for the specific location.
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Work Schedule:	Shift Duration: 5 days/week, 8 hours/day Break Schedule: Total of 1 hour break per day / 2-30 minute breaks at 9:00 am and 12:00 pm Shift Rotation: Not applicable On call is required: No Overtime required: Longer shifts may be available depending on work volume and project deadlines
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Education / Experience:	Education required: N/A Hours required for position: N/A Tickets that may be required (not limited to): Fall protection, Construction Safety Training Systems (CSTS) and WHMIS.
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Labour Provider:	N/A
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Job Overview:	As a Mopping Membrane Roofer, the worker is required to complete demolition of the pre-existing roof, lay the Q decking (if not previously installed), drywall/densdeck and vapour barrier, secure the insulation with mopping tar in order to install the roof membrane.		
	% of shift	Job Task	Task Description
	1.0%	Toolbox meeting	<ul style="list-style-type: none">Discuss ongoing and upcoming projects, plans for the day including demolition/installation progress.Discuss safety topics or any safety concerns from the Foreman.
	1.5%	Loading materials/equipment into work truck	<ul style="list-style-type: none">Retrieving all materials and equipment from the shop and loading the work truck.Materials will be dependent on project and site specifications.

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	3.0%	Driving to project site	<ul style="list-style-type: none"> Site location can vary depending on project timelines and site progress. In Edmonton and surrounding area.
	1.5%	Unloading materials/equipment from truck to project site	<ul style="list-style-type: none"> Retrieving all materials and equipment from the work truck and relocating within the site parameters. Includes lifting and carrying tool bags, various tools, screws, ladders, pylons, fall arrest equipment, etc.
	1.0%	Setting up ladders and anchoring fall arrest equipment	<ul style="list-style-type: none"> Securing ladders onto building in order for workers to access the roof. Once ladders are secured, setting fall arrest equipment by anchoring clips and rope onto the roof, ensuring the fall arrest is installed within safety parameters. Installing safety railings on roof. Inspecting and putting on fall arrest harness for all workers working on the roof (as needed).
	1.5%	Loading materials/equipment onto roof	<ul style="list-style-type: none"> Using a manual or mechanical method to transfer materials and equipment onto the roof. Manual method would include the worker using a rope to secure the load at the ground level and the worker on the roof pulling the rope to move the load onto the roof. Mechanical method would include using a scissor lift, EWP, hoist, crane, etc.
	20%	Demolition phase	<ul style="list-style-type: none"> Measure area on the roof to be demolished using the roof cutter (if available). Removing the pre-existing roof membrane, coverboard, insulation, vapour barrier and Q decking by cutting the materials into cubes. Disposing of the previous roof material and using a chute to remove the garbage. This is completed using chain saws, utility knives, shovels, spades, roof cutter, etc.
	10%	Operating the kettle to prepare hot tar for the installation	<ul style="list-style-type: none"> The operator will connect the propane and ensure the chimney lids are open before starting to heat the asphalt. Prepare and feed the asphalt kegs into the kettle and monitor the progress. This includes monitoring the level of asphalt, the temperature in the kettle and when the other roofers require tar to be transported onto the roof. The operator will also open the lids of the kettle and use the screen to pick excess paper. Housekeeping will be required to ensure the kettle does not have excess residue, no tripping hazards are present and the fire extinguisher is there if required. The operator times will be spent approximately 40% feeding and 60% monitoring.

		Transporting hot tar to the roof in order lay insulation and felt membrane	<ul style="list-style-type: none"> When ready to transport the hot tar, the kettle operator will open the lid to feed the hot tar and feed the tar. The roofers will pull the rope until smoke comes out of small chimney on the hi-boy. Once smoke comes, the roofer and kettle operator will communicate to stop the feed of hot tar, wait 1 minute and the roofer will pull the hi-boy to transport the hot tar to the designated area.
19%		Laying Q decking (if not previously installed), drywall/densdeck and vapour barrier	<ul style="list-style-type: none"> Lifting Q decking (if not previously installed), drywall/densdeck from supply storage on the roof and carry the Q decking to the designated installation area. Using screws and plates to secure the drywall/densdeck to the Q decking. Roll adhesive onto drywall/densdeck in preparation for the vapour barrier. Repeating the same process to move the vapour barrier to the designated space, removing the protective sheet to adhere the vapour barrier to the drywall/densdeck.
11.5%		Installing insulation	<ul style="list-style-type: none"> Retrieving insulation pieces from the storage site on the roof, measuring and cutting the insulation required for the desired position. Laying tar using the mop, then lifting and placing insulation to secure onto the vapour barrier. Heavier items will be placed on the insulation in order to ensure the insulation to the roof.
19%		Finishing with mopping the felt membrane and gravel (if requested)	<ul style="list-style-type: none"> Grabbing, lifting and carrying the roof membrane from the storage to the desired area of the roof. Lay tar using the mop and place the felt membrane down. To secure the membrane onto the roof, the roofer will use a broom to secure the strips together.
3.0%		Site cleaning	<ul style="list-style-type: none"> Cleaning site of excess Q decking, densdeck, insulation, membrane and various garbage/materials from site. The crew can use a garbage bin on the roof or use the chute on the roof to dispose of materials and garbage. If hoists or cranes are available, this can also be used to transfer garbage from the roof to the site garbage disposal system.
1.5%		Unloading materials/equipment from roof onto site ground	<ul style="list-style-type: none"> Using a manual or mechanical method to transfer materials and equipment from the roof to the site ground. Manual method would include the worker using a rope to secure the load at the roof level and the worker on the roof lowering the load down to the site ground. Mechanical method would include using a scissor lift, zoom boom, hoist, crane, etc.

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	1.0%	Removing ladders and disassembling fall arrest equipment	<ul style="list-style-type: none"> Disassembling fall arrest equipment by removing clip anchors and rope from the roof. Removing secured ladders from building may be required at the end of the shift. Inspecting fall arrest equipment and safety railings to ensure no safety issues.
	1.5%	Loading materials/equipment from project site to truck	<ul style="list-style-type: none"> Retrieving all materials and equipment from the project site and loading the work truck at the end of the shift. Includes lifting and carrying tool bags, various tools, screws, ladders, pylons, fall arrest equipment, etc.
	3.0%	Drive to the shop	<ul style="list-style-type: none"> Drive from the project site to the shop to unload materials and equipment.
	1.0%	Unloading excess materials and equipment from truck to the shop	<ul style="list-style-type: none"> Retrieving all materials and equipment from the work truck and placing back into the shop. Materials will be dependent on project and site specifications.

Equipment/Tools:	<ul style="list-style-type: none"> Chain saws (12 lbs.) Utility knives (0.5 lbs.) Shovels (6 lbs.) Spades (6 lbs.) Roof cutter Hoist Crane (if available) Kettle Power pack blower (22 lbs.) Drill (2 lbs.) Tape measure Propane tanks Dolly Push brooms (8 lbs.) Tar mop (24 lbs.) Tar ladle Wheelbarrow Ladders (up to 36 ft. – 70 lbs.) Fall arrest equipment (23 lbs.) Safety railings Pylons (12 lbs.)
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Materials:	<ul style="list-style-type: none"> Insulation Felt membrane (100 lbs.) Hot tar
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	<ul style="list-style-type: none"> • Gravel • Drywall/densdeck (57/66 lbs.) • Vapour barrier rolls (80 lbs.) • Q decking
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Exposures / Environment:	<ul style="list-style-type: none"> • Outdoor elements (wind, cold, heat, light rain) • Dust (during demolition) • Asphalt/tar fumes
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Basic Personal Protective Equipment Required:	<ul style="list-style-type: none"> • Hard hat • Steel toed boots • Gloves • Safety vest or high visibility stripes • Long sleeves and pants • Fall arrest equipment
Specialized Personal Protective Equipment Required:	<ul style="list-style-type: none"> • Coveralls for kettle operating • Heat resistance gloves for kettle operating • Face shield for kettle operating

NOC STRENGTH LEVEL KEY	
Strength Level	Definition
Limited (Lim)	Up to 5 kg (11 pounds)
Light (L)	5 kg to 10 kg (11 – 22 pounds)
Medium (M)	10 kg to 20 kg (22 – 44 pounds)
Heavy (H)	Greater than 20 kg (44 pounds plus)

**Strength Level Key based on the National Occupational Classification*

FREQUENCY KEY		
Frequency	% of Workday	Hours – Based on 8 hour Workday
Not Required (N/R)	0%	0
Rarely (R)	1 – 5%	<25 min/day
Occasionally (O)	6 – 33%	25 min to 2 hours 40 min/day
Frequently (F)	34 – 66%	2 hours 41 min to 5 hours 17 min/day
Constantly (C)	67 – 100%	5 hours 18 min to 8 hours/day

**Frequency Key based on WCB Alberta Recommendations*

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Job Demand	Frequency / NOC Strength Level					Details/ Measurements
	N/R	R	O	F	C	
Material Handling:p to						
Floor to Waist Level Lifting			H	M		Lifting materials and equipment including: q decking (as necessary), insulation, drywall/densdeck (57/66 lbs.), asphalt kegs (50 lbs.), felt membrane (100 lbs.), ladders (up to 70 lbs. – rare), chainsaws (12 lbs.), powerpack blower (22 lbs.), tar mop (24 lbs.) and tar ladle, fall arrest equipment (23 lbs.), tool bag (26 lbs.), push brooms (8 lbs.), various tools, garbage on site, etc. when loading/unloading truck, project site, during site clean up, and while on the roof during demolition and roof installation.
Knee to Waist Level Lifting			H			Lifting materials and equipment including: q decking (as necessary), insulation, drywall/densdeck (57/66 lbs.), asphalt kegs (50 lbs.), felt membrane (100 lbs.), ladders (up to 70 lbs. – rare), chainsaws (12 lbs.), powerpack blower (22 lbs.), tar mop (24 lbs.) and tar ladle, fall arrest equipment (23 lbs.), tool bag (26 lbs.), push brooms (8 lbs.), various tools, garbage on site, etc. when loading/unloading truck, project site, during site clean up, and while on the roof during demolition and roof installation.
Waist to Waist Level Lifting			H	M		Lifting materials and equipment including: q decking (as necessary), insulation, drywall/densdeck (57/66 lbs.), asphalt kegs (50 lbs.), felt membrane (100 lbs.), ladders (up to 70 lbs. – rare), chainsaws (12 lbs.), powerpack blower (22 lbs.), tar mop (24 lbs.) and tar ladle, fall arrest equipment (23 lbs.), tool bag (26 lbs.), push brooms (8 lbs.), various tools, garbage on site, etc. when loading/unloading truck, project site, during site clean up, and while on the roof during demolition and roof installation.

Waist to Chest Level Lifting		H	L			Transporting materials and equipment including: q decking (as necessary), insulation, drywall densdeck (57/66 lbs.), asphalt kegs (50 lbs.), felt membrane (100 lbs.), ladders (up to 70 lbs.), fall arrest equipment (23 lbs.), pylons (12 lbs.), tool bag (26 lbs.), various tools, garbage on site, etc. when loading/unloading truck onto project site and vice versa, during site clean up.
Waist to Shoulder Level Lifting		H	L			Transporting materials and equipment including: q decking (as necessary), insulation, drywall densdeck (57/66 lbs.), ladders (up to 70 lbs.), fall arrest equipment (23 lbs.), pylons (12 lbs.), tool bag (26 lbs.), various tools, garbage on site, etc. when loading/unloading truck onto project site and vice versa, during site clean up.
Waist to Overhead Level Lifting		H	L			Transporting equipment including: ladders (up to 70 lbs.), fall arrest equipment (23 lbs.), various tools, garbage on site, etc. when loading/unloading truck onto project site and vice versa, during site clean up.
Front Carry			H	L		Carrying materials and equipment including: membrane (100 lbs.), insulation, asphalt kegs (50 lbs.), and drywall/densdeck (57/66 lbs.), tar ladle, tool bag (26 lbs.), garbage throughout the site and on the roof.
Right / Left-handed Carry (Dominant Hand)		M	L			Carrying various materials and equipment including: insulation, tool bag (26 lbs.), tar ladle, fall arrest equipment (23 lbs.), chainsaw (12 lbs.), push brooms (8 lbs.), spades and shovels (6 lbs.), etc. throughout site and on the roof.
Shoulder Carry		H				Carrying various materials and equipment including: q decking (as necessary), insulation, drywall densdeck (57/66 lbs.), felt membrane (100 lbs.), ladders (up to 70 lbs.), garbage throughout the site and on the roof.
Static Pushing/Pulling (Force)			M			Finishing stages of repositioning/laying vapour barrier, insulation, drywall/densdeck and Q decking, removing previous roofing from Q decking, pushing drill into drywall/densdeck (35.5 lbs.).

Dynamic Pushing/Pulling (Force)			H			Pushing/pulling ladder onto work truck (36.0 lbs./52.0 lbs.), operating roof cutter, operating controls on hoist, garbage on site, securing tar onto felt membrane, pushing hi-boy (67.5 lbs.), pushing wheelbarrow with gravel (69.5 lbs.), using spades and shovels on the roof to move gravel, guiding bin when using hoisting/craning, etc.
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*Equipment and materials including ladders and roof materials can be carried by 2 workers due to the weight and size of the object being carried.

Job Demand	Frequency					Details/Measurements
	N/R	R	O	F	C	
Upper Extremity Work:						
Hand Gripping					X	Handling materials and equipment while loading/unloading truck, at the shop and on site, moving materials onto/from the roof using hoist/crane/rope method, gripping steering wheel while driving, during roof demolition, preparing and installing Q decking (as necessary), drywall/densdeck, vapour barrier, insulation, felt membrane, operating kettle, transporting hi-boy and wheelbarrow, moving gravel, installing fall arrest equipment, safety railings and ladders, using various tools, removing garbage and site clean up, etc.
Pinch Gripping				X		Using screws and drill to install drywall/densdeck, removing cover from asphalt kegs, operating kettle and hi-boy, etc.
Upper Extremity Coordination					X	Handling materials and equipment while loading/unloading truck, at the shop and on site, moving materials onto/from the roof using hoist/crane/rope method, gripping steering wheel while driving, during roof demolition, preparing and installing Q decking (as necessary), drywall/densdeck, vapour barrier, insulation, felt membrane, using screws and drill during installation, removing cover of asphalt kegs, operating kettle and hi-boy, transporting hi-boy and wheelbarrow, installing fall arrest equipment, safety railings and ladders, using various tools, removing garbage and site clean up, etc.

Reaching Forward					X	Loading/unloading materials and equipment from work truck, drilling drywall/densdeck to install onto Q decking, reaching across the body to move tar mop and spade/shovel, removing garbage using the chute, operating powerpack blower, kettle and roof cutter, securing or adjusting drywall/densdeck, insulation, vapour barrier, felt membrane, etc.
Overhead Shoulder Level Reaching			X			Assisting/controlling materials and equipment while using manual (rope) or mechanical method for transfer onto/off the roof, operating kettle and hi-boy, setting up/securing ladder, pushing ladder onto work truck rack, removing garbage from site as necessary, etc.
Below Shoulder Level Reaching					X	Loading/unloading materials onto/from work truck, site, roof, during roof demolition and installation, installing fall arrest and safety railings, site clean up, driving to/from site.
Throwing		X				Dropping excess materials into site garbage bin (if no access to chute).

Job Demand	Frequency					Details/Measurements
	N/R	R	O	F	C	
Positional Work:						
Trunk Flexion (Bending)				X		During installation of fall arrest equipment and safety railings, guiding hoist, demolition, preparation and installation of roofing materials/membranes, during site clean up.
Trunk Rotation (Twisting)				X		Checking progress of roof demolition and installation, while using tar mop and push broom, kettle and hi-boy, power pack blower, during site clean up, loading and unloading materials and equipment from work truck.
Kneeling			X			During installation of felt membrane on parapet, fall arrest equipment and safety railings, demolition, preparation and installation of roofing membranes, during site clean up.
Crawling			X			During installation of vapour barrier and drywall/densdeck (securing to Q decking), felt membrane on parapet.
Crouching	X					Not required.

Squatting			X			During installation of fall arrest equipment and safety railings, demolition, preparation and installation of roofing materials/membranes on parapets, during site clean up.
Neck Flexion					X	Loading/unloading materials and equipment, during installation of fall arrest equipment and safety railings, demolition of previous roof, installation of Q decking (as necessary), drywall/densdeck, vapour barrier, insulation and felt membrane, operating roof cutter, kettle and hi-boy, transporting wheelbarrow, power pack blower, tar mop, site clean up, checking surroundings.
Neck Extension			X			Using manual (rope) or mechanical (hoist/crane) method to load/unload materials and equipment on roof (ground position), reviewing site from ground level, loading/unloading materials and equipment onto/from truck, checking surroundings.
Neck Rotation				X		While loading/unloading materials and equipment, during installation of fall arrest equipment and safety railings, demolition of previous roof, installation of Q decking (as necessary), drywall/densdeck, vapour barrier, insulation and felt membrane, transporting hi-boy and wheelbarrow, operating roof cutter and kettle, power pack blower, tar mop, site clean up, checking surroundings.

Job Demand	Frequency					Details/Measurements
	N/R	R	O	F	C	
Static Work:						
Sitting		X				Driving to and from site, during breaks.
Static Standing			X			During tool box meeting, reviewing site, hazard and fall arrest protection plan.
Balancing				X		While on roof, during demolition and installation, ladder climbing, accessing the roof, walking on site.

Job Demand	Frequency					Details/Measurements
	N/R	R	O	F	C	
Ambulation:						
Walking: Level Surfaces				X		Depending on composition of site (ground and roof).

Walking: Uneven Surfaces				X		Depending on composition of site (ground and roof).
Walking: Slopes			X			Dependent on site (ground and roof).
Jumping	X					Not required.
Running	X					Not required.

Job Demand	Frequency					Details/Measurements
	N/R	R	O	F	C	
Climbing:						
Stairs		X				Gain access to various levels (depending on site).
Ladder			X			To access various levels of the roof/site building.
Other		X				Climbing onto equipment (EWP, scissor lift), scaffolding equipment.

PHOTOS OF TASKS AND WORK ENVIRONMENT

Figure 1: Lifting the asphalt keg in order to feed the kettle.



Figure 2: Placing the asphalt keg into the kettle.



Figure 3: Roofer operating hi-boy in preparation to transport tar.



Figure 4: Using the tar mop in order to install felt membrane.



Figure 5: Securing the felt membrane by pushing/pulling a push broom.



Figure 6: Securing the gravel to the membrane using a tar ladle and spades/shovels.



If you have any questions, and/or would like to discuss this assessment and report further, I can be reached at (780) 429-4761.

Sincerely,



Joanna Ellingson, BKin
Kinesiologist

SITE SPECIFIC JOB DEMAND ADDITIONS:

Job Demand	Frequency					Details/Measurements
	N/R	R	O	F	C	
Site Specific Job Demand:						
Roping materials/equipment			X			To load/unload materials onto the roof at site when a hoist is not available.

Validation Agreement

Job Title:	Roofer – Adhesive Membrane
Data Collection Date:	April 21, 2021

We the undersigned have reviewed the Physical Demands Analysis for this position and agree that the physical demands documented in this report are representative of the true demands of the tasks associated with the job title as assessed on the date listed above.

Completed by:	Joanna Ellingson, BKin Kinesiologist	Lifemark Clinician Name and Credentials
Approved by:		Management Representative
Approved by:		Worker Representative
Approved by:		Labour Provider Representative