JOB HAZARD ANALYSIS	1. JOB TITLE: Rock Work	2. DATE:	NEW X REVISED
INSTRUCTIONS ON REVERSE SIDE	3. TITLE OF WORKER(S): Maintenance Worker Leader, Maintenance Workers, Laborers.	4. NAME OF ORGANIZATION: Rocky Mountain National Park	ANALYSIS BY:
5. LOCATION: RMNP all Trails	6. DEPARTMENT: Maintenance--Trails	10. SUPERVISOR:	REVIEWED BY:
11: REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:	Hard hat (when overhead hazards are present), eye protection, ear protection, respirator (when drilling), long sleeves, long pants, gloves, good boots.		APPROVED BY:

7. SEQUENCE OF BASIC JOB STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED ACTION OR PROCEDURE
Prepare for rockwork—general.	Injuries or property damage resulting from lack of communication or knowledge of project.	**-If at any point, a job is deemed unsafe, workers should feel entitled to stop until the appropriate PPE or equipment is available, or the right conditions exists to make the job safe** -Crew leaders and supervisors will conduct and document weekly safety meetings to discuss safety issues, projects, and other work related topics. -Crew leaders will also conduct, whenever appropriate, 'tailgate' safety meetings with crews to avoid miscommunication, provide project orientation, assign work, etc.
		-Good communication between crewmembers should reinforce individual awareness of real and potential hazards. -Crewmembers often warn each other of presence of hikers with a friendly, "trail," or, "traffic." -Each crewmember should receive training on basic radio procedures, emergency response plans, and SAR operations (see trails handbook).
	Lack of first aid.	-Each crew will be provided at least one first-aid kit and water-filter. -Crewmembers should be familiar with its location and contents at all times. -Basic first aid/CPR training will be available for all crewmembers.
	Injuries from lack of PPE.	-Crew leaders and supervisors are responsible for providing crewmembers with adequate PPE and related training. Refer to block 11.
General rockwork: handle/transport, shape rock, lay rock, crush rock.	Injuries from improper body mechanics,	-Each employee should be provided training on the safe and proper use of the most important, primary tool—their bodies (Strong, Alert, Focused, Energetic, i.e. SAFE training). Proper techniques of stretching, lifting, bending, moving, rolling rocks, tool use, securing good footing, the importance of good nutrition and hydration, etc., should be addressed.
	Improper warm up, incorrect or insufficient stretching.	-Employees will be given time on the job to stretch and warm-up before and during physical activity for a period of time deemed appropriate by the crew leader, or on-site supervisor. -Employees will be encouraged to switch hands often, and vary the types of activities performed to limit exposure to repetitive motion injuries.

Move, handle, transport rock.	Miscommunication, while moving rock.	-Communication methods or jargon should be discussed and agreed upon prior to moving materials. -Transportation methodology should be discussed *before* attempting to move materials. -Instructions should come from one predesignated person while working in teams of two or more.

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	Excessive strain, lack of personnel.	-The appropriate number of workers should be used to move materials. This decision may vary between individuals or determined by the on-site supervisor. If inadequate personnel is available refrain from activities.
	Injuries from tools or equipment.	-Each employee will be provided training on the safe and proper use and maintenance of tools and equipment used in rockwork. -All tools should be inspected regularly to ensure their safe condition. Any unsafe, defective, or ill-maintained tools should be fixed, red-flagged, tagged, rotated out of service, or discarded.
	Loss of control of material, such as on steep slopes.	-Trail workers need to stay aware of their surroundings, the location of other crewmembers and other trail users while moving materials. -Post lookouts or guards when loss of control is possible. -When moving rocks or applying leverage, workers need to position themselves in such a way to minimize their exposure. -Consider using chock stones to facilitate partial lifts. -Consider the use of a "belay" system to ensure safe materials movement.
Rockwork: lay rock, shape rock, and crush rock.	Injuries from tools or equipment.	-The right tool for the job should always be used to decrease the chances of injury to an employee, or damage to a tool through improper use. -Tools and equipment, when not in use, should be kept in an orderly manner a safe distance away from the work area or the public. -Tools should never be leaned against trees or rocks, always laid down flat, and in such a way to minimize exposure to sharp edges. -All protective covers, scabbards, and shields should be in place whenever such tools are not actively being used. -Logic dictates that if proper body mechanics are employed while using any tool, proper tool use should follow.
	Injuries from rock bars.	-Workers should never straddle, sit or stand on rock bars. -Exercise caution when crisscrossing rock bars. -Be prepared for sudden or unexpected loss of bite or slippage—use chocks. -Experience shows that as the angle between the ground and the rock bar approach's 90 degrees, the purchase becomes less secure. -Communicate with coworkers.
	Foot injuries.	-Workers need to maintain constant awareness of their feet in relation to objects being moved and avoid placing them under materials.
Rockwork: lay rock, shape rock, and crush rock.	Finger and/or hand injuries.	-It is recommended that workers use **either** rock bars **or** hand lifting techniques to minimize the potential for injuries to hands. -If hands are absolutely necessary in the presence of rock bars, extreme

		caution and 100% communication with other workers should follow.
	Injuries caused by shaping or splitting rock, or repetitive motion injuries.	-Chisels and wedges should be frequently ground or filed so that no "mushroom" or burrs develop. -All personnel in close proximity to shaping or splitting operations need to be in full PPE. -In case of a partial miss or deflection, workers need to give a 5 to 10 foot safety circle around anyone driving wedges or shaping rock. -Consider use of the special driver bit in jackhammer mode to reduce potential hazards when driving wedges using a hammer. -Employees will be encouraged to switch hands often, and vary the types of activities performed to limit exposure to repetitive motion injuries.

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Quarrying, cutting, or splitting rock.	Cuts or scrapes, from rock and freshly cut edges.	-Freshly cut stone is extremely sharp, and workers need to exercise caution while handling or moving this material. -Clear work area often to reduce the chance of tripping or falling.
Drilling rock.	Hazardous material (respirable silica)	Refer to JHA—Rock Drill Use and Maintenance.
Moving rock with griphoists and/or highlines.	Overhead hazards, improper use resulting in damage to property, injury or death.	Refer to JHA—Griphoist and Highline Use and Maintenance.
Moving rock with equipment—Bobcat, loader, hand cart/dolly, wheelbarrow.	Personal injury or property damage.	Refer to JHA—Equipment Use and Maintenance.

JSA Instructions

The JSA shall identify the location of the work project or activity, the name of employee(s) writing the JSA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory

Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

a. Research past accidents/incidents.
b. Research the Health and Safety Code or other appropriate literature.
c. Discuss the work project/activity with participants
d. Observe the work project/activity
e. A combination of the above

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment and furniture.
b. Substitution. For example, switching to high flash point, non-toxic solvents.
c. Administrative Controls. For example, limiting exposure by reducing the work schedule.
d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills, portable water pumps)
e. A combination of the above.

Block 10: The JSA must be reviewed and approved by a supervisor.

Block 11: List all recommended and required PPE relevant for job/activity.

Emergency Evacuation Instructions

Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the work site.

Be prepared to provide the following information:

a. Nature of the accident or injury (avoid using victim's name).
b. Type of assistance needed, if any (ground, air or water evacuation).
c. Location of accident or injury, best access route into the work site (road name/number), identifiable ground/air landmarks.
d. Radio frequency(s).
e. Contact person.
f. Local hazards to ground vehicles or aviation.
g. Weather conditions (wind speed & direction, visibility, temp).
h. Topography.
i. Number of person(s) to be transported
j. Estimated weight of passengers for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JSA and Emergency Evacuation Procedures Acknowledgement

As supervisor I acknowledge that the following employees have participated in the development of this JSA, accompanying evacuation procedures and have also been briefed on the provisions thereof:

Supervisor's Signature: _____