



# Job Safety Analysis Manual

Employee Safety And Training Division

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## Introduction

Job-related injuries and fatalities occur every day in the workplace. These injuries often occur because employees have not been trained in the proper job procedures or how to effectively identify hazards in the workplace. An accident prevention method that has been proven effective at identifying workplace hazards and training employees in safer or more efficient work methods is a Job Safety Analysis (JSA) program.

A JSA is defined as a method or process for carefully studying and recording each step of a job, identifying existing and potential job hazards (both safety and health), and determining the best way to perform the job or to reduce or eliminate these hazards.

This manual is intended to assist safety coordinators, supervisors, and employees in the recognition and control of workplace hazards. The appendices include the JSA PPIM, JSA Index, and the completed task or equipment JSAs. The completed JSAs are available in binder and electronic format and are also available in the following location ([\\pdkbdata2k01\data\Highway Administration Safety\Safety\JSA Program](#)).

It is important to note that the JSA program is an ongoing and continual process. The completed JSAs are living documents that require periodic review and updating. Also, the manual contains the JSAs that are completed to date. Many JSAs will be needed to adequately cover the variety of job tasks and operations within PennDOT.

**The main point is that Job Safety Analysis prevents accidents by anticipating and eliminating hazards.**

## Benefits of a Job Safety Analysis (JSA)

There are many advantages and benefits to establishing a JSA program. Establishing proper job procedures is only one of those benefits. Safe and more efficient job procedures can reduce costs resulting from employee absenteeism and workers' compensation and can often lead to increased productivity. Some of the additional benefits of a comprehensive JSA program include the following:

- Eliminates or reduces the potential for injuries.
- Improves safety performance.
- Identifies overlooked or additional hazards.
- Involves numerous employees in the development and review process.
- Provides information to develop effective training programs.
- Provides instruction to new employees on safe work procedures.
- Increases the safety awareness of experienced employees.
- Identifies and reduces wasteful or risky steps/procedures.
- Provides pre-job instruction for new or infrequently performed jobs.
- Allows for the review of job procedures after an accident occurs.
- Assists with compliance of regulatory standards.

## Using the JSA Effectively

When a JSA is distributed, the supervisor's first responsibility is to explain its contents to employees and, if necessary, provide additional employee training. The entire JSA must be reviewed with the affected employees so they become aware of the basic job steps, recognize the hazards associated with the job, and are instructed in the necessary precautions to avoid injury.

The supervisor should observe employees as they perform jobs for which an analysis has been developed. The purpose of these observations is to determine if the employees are following the proper safe job procedures and to provide instruction as necessary. The supervisor should prepare by reviewing the JSA to keep in mind the key points to observe.

Many jobs are done infrequently and on an as-needed basis. Because these jobs are not performed on a regular basis, employees will benefit from pre-job instruction to remind them of the hazards and the necessary precautions. When using a JSA for a particular job, the supervisor should give this instruction at the time the job is assigned.

When an incident results from failure to follow JSA procedures, the facts should be discussed with all employees who participated in that job. The recommended actions or procedures that would have prevented the accident should be emphasized during the review. In addition, close calls or near misses provide an excellent opportunity to discuss the proper job procedures before an injury results from an unsafe condition.

The completed job related JSAs must be reviewed by the applicable employees at least annually. Additional information regarding program responsibilities and utilization requirements is contained in Appendix A - JSA PPIM 12-154.

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Appendix A



**PENNDOT  
PERSONNEL  
INFORMATION  
MEMORANDUM**

<b>PPIM NUMBER:</b>	<b>12-154</b>
<b>ISSUE DATE:</b>	12/17/12
<b>EFFECTIVE DATE:</b>	12/17/12

**SUBJECT:**

Job Safety Analysis

**DISTRIBUTION:**

Executive Committee  
Bureau Directors District Executives  
Assistant District Executives  
District Human Resource Officers County  
Maintenance Managers

**REFERENCES:**

- [Publication 517 – Job Safety Analysis Manual](#)

**BY DIRECTION OF:**

X *Sheri Norris*  
Sheri Norris, Director Bureau of  
Human Resources

Comments and Questions Regarding This PPIM Should Be Directed To:

Name: Employee Safety Division

Phone: 717-787-3460

**Policy**

The Pennsylvania Department of Transportation is committed to enhancing employee safety and health by providing a workplace free from recognized hazards. This policy establishes the processes and procedures to identify hazards and controls through the use of Job Safety Analysis (JSA).

**Purpose**

The purpose of this PPIM is to effectively communicate to all Department employees the definitions, program responsibilities, and requirements of the JSA Program. Job Safety Analysis is an integral and proactive part of a continuous improvement process focused on improving employee safety and health. The completed analyses resulting from this process identify the hazards and the current controls necessary to perform those jobs safely.

**Scope**

This policy applies to all Department employees, including temporary employees, engaged in work identified by this program. All work activities are potentially subject to the JSA process. However, the completed JSA documents are not intended to supersede any established safety policies or other Departmental safe standard operating procedures

**Definitions**

**Control** - A control is a device, procedure, or practice that reduces the likelihood that a hazard will cause harm or that reduces the severity of the harm. Controls include eliminating the hazard, substitution of materials or methods, engineering solutions, administrative procedures (e.g., training), and Personal Protective Equipment (PPE).

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Hazard - A hazard is the potential for harm. In practical terms, a hazard often is associated with a condition or activity that, if left uncontrolled, can result in an injury or illness.

Job Safety Analysis (JSA) - A method or process for carefully studying and recording each step of a job, identifying existing and potential job hazards (both safety and health), and determining the best way to perform the job or to reduce or eliminate these hazards. A JSA is also commonly referred to as a Job Hazard Analysis (JHA).

Operation - A collection of work tasks or jobs.

Risk - Risk is the probability of a hazard resulting in an adverse event, injury, or illness.

Significant - A change in work is significant if additional tasks and/or new hazards have been introduced or additional controls are necessary to control the hazards.

Task - A task is a separate element of work or a specific work assignment. The terms "job" and "task" are commonly used interchangeably.

### **Program Responsibilities**

The most important person in the JSA process is the first line supervisor, who is in constant contact with employees and familiar with the operational hazards in their respective area. Supervisors are in the best position to recognize and correct unsafe acts and conditions as they occur.

All employees are expected to follow the guidelines provided within this document. Supervisors are responsible for ensuring compliance with the policy, including initiating the disciplinary action process when appropriate for employees not following the proper procedures.

#### **A. Bureau of Human Resources (BHR)/Employee Safety Division**

1. Establishes and provides direction to the Districts and Central Office regarding JSA development and assignments.
2. Maintains the JSA policy, publication, and related documents.
3. Provides technical guidance, training, and assistance to the Department.
4. Determines and prioritizes job tasks for JSA development based on accident/injury and hazard analysis.
5. Provides review and approval on JSA job selection, development requests, and completed drafts.
6. Ensures the overall program is evaluated annually for effectiveness and/or updates.
7. Develops and maintains the training curriculums for JSA development groups and general awareness training.

#### **B. District Executive/Bureau Director**

1. Provides leadership in establishing and maintaining this policy and program.
2. Identifies and provides knowledgeable staff for use on JSA development or review teams as needed.
3. Provide resources to the JSA work groups as necessary to carry out their assignments.

#### **C. District Safety Coordinators**

1. Provides technical guidance, training, and assistance at the District and County level.
2. Assists Managers, Supervisors, and employees in the development of JSAs as assigned by the Bureau of Human Resources.
3. Schedules and facilitates the activities and meetings of the JSA development teams as needed to accomplish assignments.
4. Coordinates or provides training to affected employees as outlined in this policy.

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5. Prepares the final draft JSAs for review by the JSA groups and other District/County managers prior to submission to the Employee Safety Division.

#### **D. Managers and Supervisors**

1. Ensures JSAs are reviewed with affected employees at least annually.
2. Ensures employees perform work in accordance with the JSA.
3. Ensures employees are trained to complete their assigned tasks and trained in the tools or equipment to be used in the completion of the task.
4. Utilizes the JSAs as outlined under the Requirements and Utilization section of this policy.
5. Ensures JSA acknowledgement sheets are signed by the affected employees, maintained, and forwarded as appropriate.
6. Considers JSAs when evaluating safety performance during Employee Performance Reviews (EPRs).
7. Review completed/draft JSAs and provides feedback as requested.
8. Ensures that affected employees receive the necessary development or awareness training.
9. Participates on the JSA development teams as requested or assigned

#### **E. Employee**

1. Complies with all Department safety rules and regulations.
2. Reviews all job related JSAs at least annually.
3. Notifies the supervisor regarding any changes in the work process, identified hazards, or controls.
4. Attends all necessary training or instruction.
5. Performs work in accordance with the JSA.

### **Program Management and Procedures**

#### **A. JSA Requirements and Utilization**

Publication (Pub) 517 (JSA manual) is intended to be an integral tool in the performance of the selected jobs or tasks. Due to this importance, Pub 517 (which includes this PPIM and the relevant JSAs) must be maintained at the applicable worksites and/or field operations (e.g. foreman's crew cab, stockpiles, garages, bridge inspection vans, construction offices, etc.)

In addition, all of the applicable JSAs shall be reviewed by the affected employees at least annually. However, managers and supervisors are strongly encouraged to seek additional ways to incorporate the JSAs into their routine activities. Additional opportunities for the utilization of JSAs include, but are not limited to, the following:

1. Initial training or job instruction for new employees.
2. Refresher or awareness training for existing employees.
3. Pre-job instruction for infrequent or non-routine jobs.
4. Pre-job safety talks or meetings.
5. Revisions to a JSA or changes in processes/equipment.
6. Assist with accident investigation or After Action Reviews (AAR).
7. Benchmarking and evaluating employee safety performance.
8. Incorporated into other required equipment or job training.

#### **B. Job Selection**

Ideally, a JSA should be conducted for all jobs in the workplace. In most cases, it is not realistic to quickly develop all of the necessary JSAs. Prioritizing which jobs should be

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analyzed ensures that the most critical jobs are addressed first. Some of the main factors considered when determining the JSA priority for jobs or equipment include:

1. Accident frequency and severity.
2. Accident potential.
3. Newly established jobs or processes.
4. Modified jobs or changes in equipment.
5. Infrequently performed or non-routine jobs.
6. Employee recommendations.

### **C. JSA Development**

The Bureau of Human Resources will establish and provide direction to the Department regarding JSA development and assignments. The basic process to be used for developing JSAs consists of the following:

1. Select/prioritize jobs and communicate JSA assignments.
2. Form JSA teams and select experienced and knowledgeable employees to participate.
3. Provide instruction to the JSA team members on the methods and techniques for developing JSAs.
4. Observe the task and explain the purpose of your observations.
5. Define and record the sequential steps used to complete the job.
6. Review the steps with the observed employees for clarity and agreement.
7. Determine and evaluate the hazards associated with each job step.
8. If needed, observe the task a second time to focus on the potential hazards or conduct additional research.
9. Schedule meetings with the JSA team as necessary to develop the recommended actions and procedures to address each of the identified hazards.
10. Complete the JSA form and review it for completeness and accuracy.
11. Share the findings with knowledgeable employees and managers for feedback and agreement.
12. Provide the completed draft JSA to the Employee Safety Division for final review, approval, and distribution.

Department managers, supervisors, and members of the JSA teams may initiate or recommend the development of additional JSAs. These additions or recommendations should be based on current accidents/injuries, identified hazards, changes in equipment/processes, or gaps in the JSA program. All requests should be initially forwarded to the District Safety Coordinators for consideration and then forwarded to the Employee Safety Division for review and approval.

Contact the District Safety Coordinator or Employee Safety Division if additional assistance is needed or for issues requiring specific safety knowledge, training, or experience.

### **D. JSA Updating and Revisions**

JSAs should be reviewed and updated on a regular basis and at least annually. Input from managers, supervisors, and employees who regularly perform the job is essential for maintaining accurate and effective JSAs. Any revisions or suggestions for improvement should be forwarded to the District Safety Coordinator or Employee Safety Division for consideration.

Additional events that could trigger a review of a JSA include the following:

- After a serious accident, injury, or work-related illness.



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- After a close call or near miss that could have resulted in a serious accident/injury.
- Any significant change to a job or process.
- Significant changes to equipment, materials, or the environment. When equipment is severely damaged.

**Training**

Initial JSA awareness training will be provided to affected employees where identified tasks are covered by a completed analysis. This training is intended to explain the purpose, application, and basic requirements of the program. Retraining may be conducted when warranted by an accident or other evidence identifies an employee's lack of compliance with or understanding of the program.

Employees directly involved in the development of JSAs, as a result of assignments provided by the Bureau of Human Resources, will be provided with initial training that focuses on the JSA development process.

Employee reviews of JSAs should be recorded on the acknowledgement page of the JSA form. These records should be maintained locally by the supervisor with copies forwarded to the District or County office as appropriate.

Course registration in Training Partner is as follows:

78SAFE000010 – Job Safety Analysis Development Training  
78SAFE000015 – Job Safety Analysis Awareness Training

## Completed JSA Index

1. Airless Paint Truck
2. Backhoe - General Operation
3. Backing- General Operation
4. Belt Loader - General Operation
5. Bridge Crane - General Operation
6. Bridge Deck Repair (Small Concrete Repairs) - General Procedures
7. Bridge Inspection - General Operation
8. Bridge Inspection Debris Removal
9. Bridge Replacement - General Procedures
10. Broom/Towable Broom - General Operation
11. Bucket Truck - General Operation
12. Chain Saw - Basic Operation
13. Crack and Joint Sealing- General Procedures
14. Cut-Off Saw - General Operation and Use
15. Dump Truck - General Operation and Use
16. Excavator (Track Hoe) - General Operation
17. Forklift - General Operation
18. Front End Loader – General Operation
19. Garage - General Tire Removal and Installation
20. Grader - General Operation
21. Guide Rail Removal & Installation
22. Hot Pour Mastics – General Procedures
23. Jackhammer - General Operation
24. Line Painting (Long) - General Operation
25. Lowboy – Loading/Unloading and Securing Equipment
26. Oil Distributor – General Operation
27. Patching – General Procedures
28. Paver – General Operation
29. Paving – General Procedures
30. Pipe Flushing – General Procedures
31. Pipe Replacement – General Procedures
32. Post Pounder (Truck Mounted) – General Operation
33. Roller (Ride-On) – General Operation
34. Scaffolding Erecting and Dismantling
35. Shoulder Cutting – General Procedure
36. Sign Installation (Ground Level) – General Operation
37. Skid Steer – General Operation
38. Stone Chipper – General Operation
39. Stone Chipping and Seal Coat – General Procedure
40. Tar Kettle – General Operation (Conveyor and Oven)
41. Welding and Cutting – General Procedure (Gas and Electric)
42. Widener – General Operation
43. Widening – General Procedure
44. Winter Maintenance - Clearing Auger Jams (Plow Operations)
45. Winter Maintenance - Snow Plowing
46. Wood Chipper – Chipping Brush
47. Work Zone Traffic Control - Mobile WZ Setup
48. Work Zone Traffic Control - Stationary WZ Setup

**JOB SAFETY ANALYSIS**

1. Job Operation Airless Paint Truck		2. Job Location Field		
3. Equipment/Tools/Machinery Used Line Painting Truck, Supply Truck, Crash Truck, Crew Cab, Forklift		4. Medical Exams	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
5. Required Training Truck and Loader Certification		Physical Exam Required	<input checked="" type="checkbox"/>	
Safe Driver Training		Respirator Exam Required	<input checked="" type="checkbox"/>	
CDL		6. Inspection Requirements	Frequency	
Forklift Certification		M-614	Daily	
75 Hour Line Painting Certification		Paint Guns/Compressor	Daily	
7. Personal Protective Equipment (X)				
Eyes	Hands and Arms	Feet/Legs	Body / Skin	Respiratory Protection
X Safety Glasses	Gloves	Foot or Leg Guards	Reflective	Half Face Respirator
Chemical Goggles				
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit	Full Face Respirator
Welding Shield				
Other	Heat Resistant	Above the ankle with good tread	Rain Gear	SCBA
Face	Cold Resistant			
Face Shield	Abrasion/Cut Resistant	Heat/Cold Protection	Welding Leathers	Supplied Air
Welding Shield	Protective Work			
Other:	Other:	Chemical Resistance	Body (Whole)	Other:
Head	Hearing Protection			
X Hard Hat	X Earmuffs	Metatarsal Protection	X Radio Headsets	Tick/Insect Spray (as needed)
Other:	X Ear Plugs	Chemical Resistant	X	
8. Reference Manuals				
X Pub 213	X Operators Manual	X Pub 445		
	X Foreman's Manual	X Pub 517		
<b>Prepared By:</b> District 9 JSA Team			<b>Safety Coordinator:</b> Pamela Kane, Lawrence Hann	
<b>Reviewed By:</b> Employee Safety and Training Division			<b>Distribution Date:</b> 2022	

Airless Paint Truck-General

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Conduct Circle of Safety and Pre-trip Inspection (M-614)</p>	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Cut, Puncture, Scrape</p> <p>C. Slip, Trip, Fall- Same level (road surface) or Different Level (equipment)</p>	<p>1) Ensure vehicle is turned off, set brakes and place keys in pocket. 2) Make sure rear wheels are chocked.</p> <p>1) Wear protective work gloves to protect from sharp edges and pinch points.</p> <p>1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment. 5) Maintain good housekeeping. Immediately identify/clean spills and store items properly.</p>
<p>2. Pre-task Safety Brief</p>	<p>A. N/A</p>	<p>1) Employees assigned to this task will attend a pre-task safety brief to review the potential and previously identified hazards associated with the assignment.</p>
<p>3. Load Truck with Materials/Paint</p>	<p>A. Sprain/Strain</p> <p>B. Pinch Points/Crushing Injury</p> <p>C. Vehicle/Equipment- Struck By or Against</p>	<p>1) Use proper lifting techniques when loading or placing paint materials and equipment. Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 2) Get assistance to open totes if needed.</p> <p>1) Wear protective work gloves to protect hands and fingers from sharp edges or pinch points. 2) Maintain firm grip with both hands and keep close to center of gravity to avoid dropping.</p> <p>1) Use a spotter when available as a guide to maneuver load into the truck. 2) Ensure other equipment and personnel are away from the loading area. 3) Maintain proper clearances to avoid hitting the truck or upsetting the load. 4) Refer to Forklift JSA for additional information when utilized.</p>

Airless Paint Truck-General

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Load Truck with Materials/Paint continued	D. Struck by Flying Object E. Noise Hazard	1) Wear safety glasses, hard hat and high visibility PPE. 1) Wear hearing protection (ear plugs or earmuffs).
4. Fueling	A. Chemical (fuel) B. Fire/Explosion	1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 2) Wear safety glasses to protect from incidental contact. 1) No smoking, heat sources, or open flames near fueling area. 2) Keep all ignition sources at least 20 ft away from fueling equipment.
5. Travel To / From Job Site	A. Vehicle Accident- Struck By or Against	1) Refer to Safe Driver Training.
6. Set up Fleet	A. Struck by Vehicle- Traffic B. Slip, Trip, Fall- Same level (road surface) or Different Level (equipment) C. Backing Hazards	1) Utilize defensive driving techniques and wear seat belts at all times. 2) Wear proper communication head gear. 1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering or exiting vehicles or equipment 1) Wearing proper communication head gear. 2) Wear hard hat and high visibility PPE. 3) Utilize backup camera, if equipped. 4) Conduct circle of safety and utilize a spotter when available.
7. Paint Truck Operation	A. Vehicle/Equipment- Struck By or Against B. Communication	1) Turn on warning lights to notify motorists of your presence. 2) Put on high visibility PPE and hard hat before exiting the vehicle. 1) Wear headsets to keep constant communication between driver, foreman and shadow vehicle.
8. Paint Carriage Extended	A. Vehicle/Equipment- Struck By or Against	1) Utilize defensive driving techniques and wear seat belt at all times. 2) Wear proper communication head gear.
9. Spraying of Paint	A. Repetitive Motion/ Sprain or Strain	1) Alternate crew members as needed.

Airless Paint Truck-General

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Reload of Material in the Field	A. Slip, Trip, Fall- Same level (road surface) or Different Level (equipment)	1) Park fleet set brakes and chock wheels. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Maintain good housekeeping. Immediately identify/clean spills and store items properly. 4) Wear safety footwear above the ankle with good tread. 5) Observe path or area from slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
	B. Vehicle/Equipment - Struck By or Against	1) Conduct circle of safety. 2) Pull over to a safe location. 3) Wear hard hat and high visibility PPE.
	C. Pinch points	1) Wear protective work gloves to protect hands and fingers from sharp edges or pinch points.
11. Unload of Material at Stockpile	A. Slip, Trip, Fall- Same level (road surface) or Different Level (equipment)	1) Park fleet set brakes and chock wheels. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Maintain good housekeeping. Immediately identify/clean spills and store items properly.
	B. Back Strain	4) Wear safety footwear above the ankle with good tread. 5) Observe path or area from slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
	C. Struck by Flying Object	1) Get assistance and/or use mechanical lifting devices as appropriate.
	D. Crushing	1) Wear safety glasses, hard hat and high visibility PPE.
	E. Pinch Points	1) Use a spotter when available as a guide to maneuver load into the truck. 2) Ensure other equipment and personnel are away from the loading area. 3) Maintain proper clearances to avoid hitting the truck or upsetting the load. 4) Refer to Forklift JSA for additional information when utilized. 1) Wear protective work gloves to protect hands and fingers from sharp edges or pinch points.

Airless Paint Truck-General

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Backhoe - General Operation		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Backhoe, Attachments, Chains		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	Frequency
Operator Certification		M-614	Daily / Prior to every use
New Equipment Field Training		Preventative Maintenance (PM) Inspection and Service	Every 6 months (Garage)
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet / Legs</b>	
X	Safety Glasses	Protective Sleeves	Leggings / Chaps
	Chemical Goggles	Gloves	Foot or Leg Guards
	Dust Goggles	Chemical Resistant Type:	Reflective Leggings
	Welding Shield	Heat Resistant	Foot Protection
	Other:	Cold Resistant	X Above the ankle boot with good tread
		Abrasion/Cut Resistant	Heat/Cold Protection
	<b>Face</b>	Leather Work	Electrical Protection
	Face Shield	Other:	Chemical Resistance
	Welding Shield		Metatarsal Protection
	Other:		Other:
	<b>Head</b>	<b>Hearing Protection</b>	
X	Hard Hat	X	Ear Muffs
	Bump Cap	X	Ear Plugs
	Other:		Other:
8. Reference Manuals			
X	Pub 213	X	Operators Manual
X	Foreman's Manual	X	Pub 234
			Pub 23 Maintenance Manual
<b>Prepared By:</b> District 1 JSA team		<b>Safety Coordinator:</b> Dominic White	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2 0 2 2	



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Cut, Puncture, Scrape</p> <p>C. Slip, Trip, Fall</p>	<p>1) Ensure vehicle is turned off, keys in pocket.</p> <p>1) Wear leather work gloves to protect from sharp edges and pinch points.</p> <p>1) Wear safety footwear that is above the ankle with good tread.</p> <p>2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.</p> <p>4) Do not jump down or skip steps when entering or exiting vehicles or equipment.</p>
2. Travel To/From Job Site	A. Vehicle/Equipment – Incident	<p>1) Wear seat belt at all times when operating equipment.</p> <p>2) Maintain safe traveling speed according to the road conditions and slow down when turning.</p> <p>3) Know the width of vehicle and buckets.</p> <p>4) Fully raise stabilizers when traveling.</p> <p>5) Secure all safety locks or pins and maintain proper bucket positions.</p> <p>6) Apply minor bucket adjustments to minimize bounce.</p> <p>7) If applicable, disengage from 4-wheel drive when driving to worksite.</p>
3. Pre-Task Safety Brief	A. No Hazard	<p>1) All employees assigned to this task will attend a pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.</p>
4. Enter/Exit the Cab	A. Slip, Trip, Fall	<p>1) Face the equipment at all times when entering and exiting the cab.</p> <p>2) Keep shoes free from mud, ice, snow, or other material that could cause them to slip.</p> <p>3) Maintain three (3) points of contact at all times.</p> <p>4) Do not use the controls as hand holds.</p>
	B. Sprain/Strain	<p>1) Never jump from the cab or off equipment. Always use foot and hand holds while maintaining three (3) points of contact.</p>
	C. Vehicle/Equipment – Struck By or Against	<p>1) Never enter or exit a moving piece of equipment.</p> <p>2) Always shut off the engine, lower attachments, and apply the parking brake before dismounting the machine.</p>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Location / Setup of Backhoe	A. Electrocutation	1) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify your supervisor immediately. 2) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities.
	B. Fire / Explosion	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities.
	C. Environmental (Heat Stress, Frostbite)	1) Make sure you are wearing the proper clothing for the condition. 2) Drink plenty of water.
	D. Vehicle / Equipment - Struck By or Against	1) Lower bucket to the ground before exiting or conducting a walk around inspection. 2) Wear a hard hat and high visibility clothing when walking around the work site. 3) Visually check area for other equipment before walking around the backhoe. 4) Do not park on an incline.
6. Operation of Backhoe	A. Vehicle/Equipment - Struck By or Against	1) Barricade the work area to prevent unauthorized access. 2) Scan the area for workers or equipment before moving the backhoe. 3) Know the swing radius of the arm and bucket and never allow anyone to enter the pivot swing area. 4) Never allow anyone to stand under the bucket or ride on the backhoe.
	B. Slip, Trip, Fall - From Elevation	1) Wear seat belt at all times while in the cab. 2) Never walk or climb on the boom to fix or repair.
	C. Slip, Fall (Equipment)	1) Stay at least two (2) feet away from the edge of slopes, banks, and excavations. 2) Never undercut the machine. 3) Do not overload the capacity of the truck. Refer to operators manual and load chart.
	D. Noise	1) Wear ear plugs or ear muffs at all times when operating the backhoe.
7. Work on a Slope	A. Caught In, Under, Between	1) Make sure all workers are clear of outriggers before placing them on the pad. 2) Use a spotter if you cannot see the outriggers. 3) Coordinate hand signals if you are using a spotter.

Backhoe-General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Work on a Slope Continued	B. Equipment Roll Over - Crushing	1) Inspect ground to ensure it is stable for operations (max. allowable slope, soil conditions, water, slippery surfaces, etc.) to avoid rollover or sliding. 2) Work from a flat surface if available. 3) Travel straight up and down slopes, never across or sideways. 4) Keep loads low while maneuvering. Avoid turning on slopes or with a raised load. 5) Use outriggers for leveling or stabilization. 6) Using outriggers on a slope reduces the capacity of the backhoe.
8. Load Dump Truck or Hauler	A. Struck By – Falling Object  B. Electrocution	1) Make sure truck operator and coworkers are in safe location before dumping material into bed or hauler. 2) Load the truck or hauler from the side or back. Never swing bucket over the cab. 3) Place bucket close to dump location. Never dump from excessive heights. 4) Don't overload bucket capacity. 1) Identify any overhead power lines or other electrical hazards. 2) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately. 3) Contact the utility company when work must take place within the minimum distance.
9. Special Attachments	A. Struck By – Falling Objects	1) Follow manufacturer's directions for proper use. 2) Make sure all pins and pin locks have been securely fastened. 3) Make sure all hoses are securely fastened. 4) Verify attachments work properly prior to operations.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Lift With a Chain	A. Struck By – Flying or Falling Object	<ol style="list-style-type: none"> <li>1) Use chains in good condition and with a sufficient rating for the job.</li> <li>2) Attach chain to designated lift point with shackle.</li> <li>3) Never attach a chain to the bucket teeth. If the bucket does not have a lifting point, weave the chain through the teeth and form a triangle with the chain sling at the opening of the bucket. The tail of the chain should be brought back over the back of the bucket.</li> <li>4) Keep teeth pointed downward at all times.</li> <li>5) Use blocking if there are sharp edges.</li> <li>6) Never lift a load over another worker.</li> <li>7) Make sure employees are clear from load before picking.</li> <li>8) Never pick loads in high winds.</li> <li>9) Slowly move bucket to drop point to avoid swinging of material.</li> <li>10) Stop the engine and place the key in your pocket. Never leave the cab with engine running, if adjustments to chain are needed.</li> </ol>
11. Park Backhoe	A. Struck By – Vehicle	<ol style="list-style-type: none"> <li>1) Park in designated area, not in active work zone.</li> <li>2) Ensure boom is at rest with bucket and body of backhoe resting firmly on the ground before turning off the engine.</li> <li>3) Place controls in neutral and engage parking brake.</li> <li>4) Stop the engine and place the key in your pocket. Never leave the cab with engine running.</li> <li>5) Block wheels if there is any potential for rolling.</li> <li>6) Emergency Stop – Set up flares or cones to warn other operators.</li> </ol>
12. Refuel	A. Chemical (fuel)  B. Fire / Explosion	<ol style="list-style-type: none"> <li>1) Remove cap slowly in case a strong vacuum has been created.</li> <li>2) Fuel can splash out when the cap is released.</li> <li>3) Wear safety glasses to protect from incidental contact.</li> <li>3) Refer to GHS label.</li> <li>1) No smoking, heat sources, or open flames near fueling area.</li> <li>2) Ensure fire extinguisher is nearby during refueling.</li> </ol>

Backhoe-General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Backhoe - General Operation

**JOB SAFETY ANALYSIS**

1. Job Operation Backing - General Operation		2. Job Location Stockpiles and Field (various)	
3. Equipment/Tools/Machinery Used All Vehicles and Equipment		4. Medical Exams	Yes No
5. Required Training Safe Driver training		Physical Exam Required	X
Frequency		Respirator Exam Required	X
Initial		6. Inspection Requirements	Frequency
Initial		M-614	Daily / Prior to each use
Initial		Circle of Safety	Daily / Prior to each use
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	<b>Special Safety Shoes</b>	Rain Gear
Other:	Heat Resistant	X Above the ankle with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Electrical Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Puncture Resistant	Other:
Welding Shield	Leather Work	Toe Protection	<b>Body (Whole)</b>
Other:	Other:	Heat/Cold Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Metatarsal Protection	Personal Flotation Device
X Hard Hat	Ear Muffs	Chemical Resistance	Other: <b>Other</b>
Other:	Ear Plugs	Other:	Keep Work Zone PPE at ready. (hard hat & high visibility apparel)
	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual	X Pub 445M	
Foreman's Manual	Pub 234	X M-614	
<b>Prepared By:</b> Employee Safety and Training Division		<b>Safety Coordinator:</b> Brian Pollick	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614).	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Cut, Puncture, Scrape, or Burn</p> <p>C. Slip, Trip, Fall - Same Level (roadsurface) or Different Level (equipment) Fractures, Contusions, Bruises - Whole Body Sprains, Strains - Upper Body</p> <p>D. Pinch Points/Crushing Injury</p>	<p>1) Ensure vehicle/equipment is turned off and keys are in pocket.</p> <p>1) Wear leather gloves to protect from sharp edges or hot surfaces.</p> <p>1) Look at the surface around the vehicle/equipment and clear debris to prevent trips and falls.</p> <p>2) Wear safety foot wear that is above the ankle with good tread.</p> <p>3) Ensure surface around cab entry is free from surface debris.</p> <p>4) Face the vehicle/equipment and maintain three (3) points of contact when entering and exiting.</p> <p>5) Never jump down or skip steps.</p> <p>1) Secure the hood to prevent it from falling.</p> <p>2) If needed, use recommended bed props/supports to secure the bed in an elevated position.</p>
2. Proper Sight Clearance and Distance	<p>A. Walk around</p> <p>B. Struck by Object</p> <p>C. Vehicle/Equipment Accidents</p>	<p>1) Observe entire area and any obstructions near or in the backing path of your vehicle/equipment.</p> <p>2) Check for any overhead obstructions or low clearances that may cause an issue.</p> <p>1) Adjust mirrors so you can see that maximum amount of area surrounding the vehicle/equipment</p> <p>2) Make sure a small portion of the vehicle/equipment is visible in the mirrors for proper depth perception.</p> <p>3) Use a spotter when available and agree on proper hand signals ahead of time.</p> <p>1) Refer to Safe Driver Training</p>
3. Moving in Reverse	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Finished backing</p>	<p>1) Shift to reverse and listen for backup alarm if equipped.</p> <p>2) Beep the horn to alert anyone in the area and your spotter that you are about to back up.</p> <p>3) Move at a slow and safe pace so you don't move faster than your spotter.</p> <p>4) Check all mirrors periodically for any obstructions that may not be visible by your spotter.</p> <p>5) Be prepared to stop suddenly if needed.</p> <p>1) Take vehicle/equipment out of reverse.</p> <p>2) Beep horn again to alert to your spotter that you are finished.</p> <p>3) Proceed slowly and safely to final destination.</p>

Backing – General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>



**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Belt Loader – General Operation		Stockpiles & Field (Various)	
3. Equipment/Tools/Machinery Used		4. Medical Exams	
Belt Loader		Yes	No
5. Required Training		Physical Exam Required	X
Operator Training – 75 hrs. (Permanent Employee) or 37.5 hrs. (Temporary Employee*)		Respirator Exam Required	X
New Equipment Field Training		6. Inspection Requirements	Frequency
Initial		M-614	Daily / Prior to every use
Initial		Preventative Maintenance (PM) Inspection and Service	Every 6 months (Garage)
7. Personal Protective Equipment (X)			
Eyes	Hands and Arms	Feet/Legs	Body / Skin
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls; Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
Face Shield	Cold Resistant	Heat/Cold Resistance	Welding Leathers
Welding Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Other:	X Leather Work	Chemical Resistance	<b>Body (Whole)</b>
	Other:	Metatarsal Protection	Personal Fall Arrest System
	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual	X Pub 445M	
Foreman's Manual	Pub 234	X Pub 247	
<b>Prepared By:</b> Employee Safety and Training Division		<b>Safety Coordinator:</b> Brian Pollick	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 20 22	

Belt Loader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Cut, Puncture, Scrape B. Vehicle/Equipment – Struck By or Against C. Slip, Trip, Fall	1) Wear protective work gloves to protect from sharp edges and pinch points. 1) Ensure vehicle is turned off, keys in pocket. 1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Pre-Task Safety Brief	A. N/A	1) Employees assigned to this task will attend a pre-task safety brief to review the potential and previously identified hazards associated with the assignment.
3. Raise/Lower Chute, Run Paddles, & Move Belt to Circulate Hydraulics (Cold Weather Operation).	A. Vehicle/Equipment-Struck By or Against	1) Maintain visual contact with spotter and/or ensure operating area is clear of employees.
4. Travel To/From Work Location	A. Slip, Trip, Fall from Elevation B. Vehicle/Equipment – Struck By or Against C. Vehicle/Equipment – Struck By or Against	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment. 1) Wear seat belt at all times when operating equipment. 2) Park/position equipment in a safe location as to not create additional hazards. 1) Know width of vehicle. 2) Apply minor hydraulic adjustments to minimize bounce. 3) If applicable, disengage from 4-wheel drive when driving to worksite. 4) Refer to Lowboy JSA if applicable.

Belt Loader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Inspect Job Site for Potential Hazards and Ensure Traffic Control is in Place	A. Vehicle/Equipment – Struck By or Against	1) Refer to Work Zone Set Up JSA.
	B. Slip, Trip, Fall	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
	C. Struck by Flying, Falling, Sliding Object	1) Wear hard hat.
6. General Belt Loader Operations	A. Vehicle/Equipment – Struck By or Against	1) Ensure area is clear of employees. Utilize barricades and/or signage to establish exclusion zones if necessary. 2) Maintain clean windows and mirrors for operator visibility. 3) Ensure the audible alarms and flashing lights are functioning properly. 4) Perform a visual inspection for hazards and risks before backing up or working in reverse. 5) Communicate with dump truck operators the procedures for starting and stopping. Pinpoint any specific loading instructions to the dump truck operators.
	B. Caught In, Under, Between	1) Visually inspect the ground to ensure it is stable and suitable for operations (maximum allowable slope, soil conditions, water, slippery surfaces, etc.) to avoid rollover or sliding. 2) Do not travel across slopes and only turn the belt loader on level ground where possible. 3) Never allow anyone to stand or go under the chute or a raised attachment. 4) Use all safety measures possible when it is necessary to work or move around the belt loader. 5) Ensure the machine is turned off and wheels chocked any time you have to reach in between mechanical parts or underneath the belt.
	C. Slip, Trip, Fall	1) Never stand/ride on the equipment or on the belt/attachments under any circumstance.
	D. Electrocution	1) Ensure area is clear of overhead electrical lines/hazards.

Belt Loader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
7. Scooping Large/Bulky Loads	A. Vehicle/Equipment – Struck By or Rollover  C. Struck by Flying, Falling, Sliding Object	1) Never exceed the manufacturer’s load capacity to prevent failure or clogging. 2) Move slow while maneuvering into place for large bulk loads. 3) Travel in as straight of a line as possible while extreme side to side motions. 4) Communicate with truck drivers when starting, slowing down, or stopping to avoid material spillage or severe impact from backing truck.  1) Wear hard hat and keep safe distance from operating equipment.
8. Exiting/Entering Cab During Operations	A. Slip, Trip, Fall B. Vehicle/Equipment – Struck By or Against	1) Refer to Step 1. C. when existing and entering loader. 1) Park the machine on level ground, when possible, to avoid roll away. 2) Place transmission controls in neutral, and engage parking brake. 3) Stop the engine and place the key in your pocket. 4) Wear hard hat and high visibility apparel when exiting the belt loader during field operations. 5) Chock wheels if you park on a grade or there is any potential for rolling.  1) Lower all equipment’s attachments to the ground when the loader is not in use or prior to existing. 2) Do not grab or use steering wheel to exit cab.
9. Cleaning Equipment	A. Struck by Flying Object  B. Vehicle/Equipment – Struck By or Against	1) Wear safety glasses or safety goggles to protect eyes from debris. 1) Wear protective work gloves to protect hands from sharp edges and pinch points. 2) Keep firm grip on shovel or digging iron to avoid striking hands against the equipment when cleaning and dislodging dirt.
10. Shut Down Procedure - Let idle for three (3) to five (5) minutes before turning off	A. Slip, Trip, Fall from Elevation  B. Caught In, Under, Between	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering or exiting vehicles or equipment.  1) Ensure attachments are flat on the ground and chute is in its lowest seated position. 2) Set parking brake.

Belt Loader – General Operation

**JSA Acknowledgements**

Print Name	Signature	Date

Belt Loader - General Operation

**JOB SAFETY ANALYSIS**

1. Job Operation Bridge Crane		2. Job Location Field	
3. Equipment/Tools/Machinery Used Under bridge inspection crane or platform		4. Medical Exams	Yes
5. Required Training Crane Certification		Physical Exam Required	No
Fall Protection		Respirator Exam Required	X
CDL		6. Inspection Requirements	Frequency
		M-614	Daily
		Personal Fall Arrest System	Prior to every use / Annual
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistance	<b>Body (Whole)</b>
Other:		Metatarsal Protection	X Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	Ear Muffs		
Other:	Ear Plugs		
	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual	X Pub 445M	
Foreman's Manual	Pub 234		
<b>Prepared By:</b> District 3 JSA Team		<b>Safety Coordinator:</b> Thomas Walker	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against	1) Ensure vehicle is turned off, keys in pocket.
	B. Cut, Puncture, Scrape	1) Wear leather work gloves to protect from sharp edges and pinch points.
	C. Slip, Trip, Fall	1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Pre-task Safety Brief	A. N/A	1) Employees assigned to this task will attend a pre- task safety brief to review the potential and previously identified hazards associated with the assignment. This may include review of the pertinent JSAs, standard operating procedures, hazard controls, and prior bridge inspection reports.
3. Travel To/From Job Site	A. Vehicle/Equipment Accidents	1) Follow accident procedure in Pub 445M
4. Setup Work Location	A. Motor Vehicles – Struck By or Against	1) Turn on warning lights to notify motorists of your presence. 2) Set parking brake of vehicle before exiting the cab. 3) Put on hi-visibility PPE and hard hat before exiting the vehicle. 4) Set cones around truck following the guide for workzone setup. (Refer to Work Zone Traffic Control JSA if applicable)
	B. Slip, Trip, Fall	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting the vehicles or equipment.

Bridge Crane – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Enter/Exit the Bucket	A. Slip, Trip, Fall	<ol style="list-style-type: none"> <li>1) Enter the basket from the bridge deck or support surface.</li> <li>2) Face the basket at all times when entering and exiting.</li> <li>3) Keep shoes free from mud, ice, snow or other material that could cause them to slip.</li> <li>4) Maintain three (3) points of contact at all times. (Two (2) hands and one (1) foot or two (2) feet and one hand)</li> <li>5) Do not use the controls as hand holds.</li> <li>6) Only enter the basket from the bridge if you're 100% tied off at all times (2-legged lanyard).</li> </ol>
	B. Sprain/Strain	<ol style="list-style-type: none"> <li>1) Never jump from the bucket or truck. Always use foot and hand holds and maintain three (3) points of contact.</li> </ol>
	C. Vehicle/Equipment - Struck By or Against	<ol style="list-style-type: none"> <li>1) Never enter or exit a moving truck or bucket.</li> </ol>
6. Operate the Basket	A. Fall From Elevation	<ol style="list-style-type: none"> <li>1) Wear fall protection at all times when in the basket.</li> <li>2) Never leave the floor of the basket or use planks, ladders, or any other devices on the platform for gaining additional height or reach.</li> <li>3) Never exceed the capacity of the basket (tools, workers).</li> <li>4) Never use the basket as a crane.</li> <li>5) Never operate the basket in windy conditions (generally greater than 35 miles per hour mph).</li> <li>6) Never disable or bypass interlocks or safety devices.</li> </ol>
	B. Vehicle/Equipment - Struck By or Against	<ol style="list-style-type: none"> <li>1) Never move the basket into traffic.</li> <li>2) Operate the controls smoothly and evenly. Quick, jerking movements could cause the basket to collide with the bridge or other structure.</li> <li>3) Check the area before moving the basket for other workers, the public, structures, and equipment.</li> <li>4) Keep all body parts inside the basket when in motion.</li> </ol>

Bridge Crane – General Operation



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Operate the Basket Continued	C. Electrocutation	1) Identify any overhead power lines or other electrical hazards. 2) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately. 3) Contact the utility company when work must take place within the minimum distance.
7. Exit Basket to Perform Inspection	D. Drowning  A. Fall From Elevation	1) Personal flotation devices are not needed if the basket operator maintains 100% tie off (2 legged lanyard).  1) Only leave the basket if necessary and no other viable option is available. 2) Maintain 100% tie off (2 legged lanyard). 3) Anchor points outside of basket must be able to support 5,000 lbs. 4) Prepare rescue plan if there is a possibility of a fall.

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Bridge Deck Repair (Small Concrete Repairs) - General Procedures		Bridge/Field Locations	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes No
Concrete Saw, Jackhammer, Air Compressor, Torches/Tanks, Misc. Hand Tools, Crew Cab, Dump Truck, Generator		Physical Exam Required	X
5. Required Training		Respirator Exam Required	X (If applicable)
Operator Certification		6. Inspection Requirements	Frequency
Erosion & Sedimentation Control		M-614	Daily
Torch & Tank Set			
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	X Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
X Dust Goggles	X Chemical Resistant Type:	Reflective Leggings	X Coveralls, Body Suit
Welding Shield	Heat Resistant	<i>Foot Protection</i>	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Welding Leathers
X Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	X Other: Neoprene	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Other: <b>Other</b>
X Hard Hat	X Ear Muffs		Personal Flotation Device
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual	X Pub 255 Bridge	X Pub 55, Bridge, Ch. 17
X Foreman's Manual	X Pub 234	X Pub 445M	X Pub 408, section 1040
<b>Prepared By:</b> District 1 JSA Team		<b>Safety Coordinator:</b> Dominic White	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Bridge Deck Repair (Small Concrete Repairs) - General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-Trip Inspection for All Equipment (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket. 2) Place wheel chocks behind back tires.  1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Set Up WZTC	A. Various	1) Refer to WZTC Set Up JSA and Pub 213.
3. Erosion and Sedimentation Controls	A. Slips, Trips and Falls  B. Cuts, Scrapes, Lacerations	1) Continually inspect walking surfaces for tripping hazards and possible changing conditions.  1) Inspect all tools before use for proper operation. 2) Wear proper eye, face, leg, hand, and hearing protection for the task. 3) Refer to the Chain Saw JSA when applicable.
4. Identify/Determine Condition, Type, and Areas to be Repaired	A. Vehicle/Equipment – Struck By or Against	1) Stay within the established work zone. 2) Use a spotter as needed. 3) Identify the types of equipment and their location. 4) Verify that backup alarms are working properly.
5. Cut and Remove Deteriorated Areas	A. Various B. Struck by Flying Object	1) Refer to Cut-Off Saw and Jackhammer JSA as appropriate.  1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection. 2) In addition to eye protection, wear a face shield, if necessary, to protect the face from flying fragments. 3) Wear coveralls or long pants to protect your legs and avoid loose-fitting clothing or anything that could become caught on moving parts. 4) Clear the area to be cut of any loose objects or debris as it may be thrown by the cutting tool. 5) Stay clear and maintain distance if you are not operating the equipment. 6) Ensure the proper/approved blade is installed for the saw and material being cut. 7) Thoroughly inspect the blade for any defects. Cracked or warped blades may shatter/break, causing serious or fatal injury.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Cut and Remove Deteriorated Areas continued	<p>C. Noise</p> <p>D. Cut, Puncture, Scrape</p> <p>E. Sprain/Strain/Overexertion</p> <p>F. Inhalation</p> <p>G. Vehicle/Equipment – Struck By or Against</p>	<p>1) Wear ear plugs or muffs to protect against high noise levels while running equipment.</p> <p>1) Maintain secure footing and balance at all times. Take extra care when working in wet and freezing weather (rain, snow, frost, ice).</p> <p>2) Wear safety footwear that is above the ankle with good tread. Steel-toed safety boots are recommended.</p> <p>3) Wear protective work gloves and operate equipment with both hands, keeping a firm grip on the handles.</p> <p>1) Get assistance with loading, unloading, or moving the equipment as needed.</p> <p>2) Take breaks as needed to prevent getting fatigued and more susceptible to injury.</p> <p>1) Visually monitor dust levels and duration of use. Respirator usage is recommended to reduce potential exposures when cutting bridge surfaces.</p>
6. Clean Dust/Debris From the Area to be Repaired	A. Injection – Compressed Air	<p>1) It is recommended to wear hard toe safety boots or toe caps to provide foot protection.</p> <p>1) Never use compressed air to clean off clothing or point the nozzle at another employee.</p> <p>2) Maintain a good grip on the compressed air nozzle.</p>
7. Drying Damp Areas	B. Foreign Objects – Eyes	<p>1) Dust goggles are required. Keep other co-workers/observers clear while performing the task.</p>
8. Remove/Replace Rebar as Needed	A. Burn or Scald	<p>1) Wear protective work gloves/sleeves.</p>
9. Form Prepped Area	A. Burn or Scald	<p>1) Wear heat resistant gloves.</p>
	B. Struck by Flying, Falling, Sliding Object	<p>1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection.</p>
	A. Struck by Flying, Falling, Sliding Object	<p>1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection.</p> <p>2) Wear hard hat.</p>
	B. Slips, Trips, and Falls	<p>1) Observe path or area for uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>2) Wear safety footwear that is above the ankle with good tread.</p>
	C. Cut, Puncture, Scrape	<p>1) Keep hands clear of moving parts, blades, and pinch points.</p> <p>2) Wear protective work gloves to protect from sharp edges.</p>
	D. Chemical	<p>1) Use in accordance with the precautions listed on the SDS when painting rebar with epoxy and using concrete bonding agent.</p>

Bridge Deck Repair (Small Concrete Repairs) - General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Form Prepped Area continued	E. Overexertion	<ol style="list-style-type: none"> <li>1) Use good body mechanics and lifting techniques.</li> <li>2) Bend at the knees, pull the object close to your body, stand up with object, and do not twist.</li> <li>3) Get assistance as needed.</li> </ol>
10. Pour and Finish Prepped Area with Concrete	A. Foreign Objects – Eyes	<ol style="list-style-type: none"> <li>1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection.</li> </ol>
	B. Slips, Trips, and Falls	<ol style="list-style-type: none"> <li>1) Wear safety footwear that is above the ankle with good tread.</li> <li>2) Observe path or area for uneven/slippery surfaces, obstructions, and other tripping hazards.</li> </ol>
	C. Chemical	<ol style="list-style-type: none"> <li>1) Use chemicals in accordance with the precautions listed on the SDS.</li> <li>2) Refer to the GHS label.</li> <li>3) Wear chemical resistant gloves appropriate for the task.</li> </ol>
11. Clean Up Work Area	A. Vehicle/Equipment – Struck By or Against	<ol style="list-style-type: none"> <li>1) Stay within the established work zone.</li> <li>2) Use a spotter as needed.</li> <li>3) Identify the types of equipment and their location.</li> <li>4) Verify that back up alarms are working.</li> </ol>
	B. Slips, Trips, and Falls	<ol style="list-style-type: none"> <li>1) Wear safety footwear that is above the ankle with good tread.</li> <li>2) Observe path or area for uneven/slippery surfaces, obstructions, and other tripping hazards.</li> <li>3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.</li> <li>4) Do not jump down or skip steps when entering or exiting vehicles or equipment.</li> </ol>
	C. Cut, Puncture, Scrape	<ol style="list-style-type: none"> <li>1) Wear protective work gloves to protect from sharp or rough edges.</li> </ol>
	D. Overexertion	<ol style="list-style-type: none"> <li>1) Use proper lifting techniques. Bend at the knees, pull the object close to your body, stand up with the object, and do not twist.</li> <li>2) Get assistance as needed.</li> </ol>
12. Remove WZTC	A. Various	<ol style="list-style-type: none"> <li>1) Refer to WZTC Set Up JSA and Pub 213.</li> <li>2) Be aware of changing traffic patterns for the traveling public.</li> </ol>

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Bridge Deck Repair (Small Concrete Repairs) - General Procedures

**JOB SAFETY ANALYSIS**

1. Job Operation Bridge Inspection – General Procedures		2. Job Location Field	
3. Equipment/Tools/Machinery Used Vehicles, ladders, hand tools, crane, boat, camera, waders, laptop, power tools, fall protection, and WZTC equipment		4. Medical Exams	Yes No
5. Required Training Ladder		Physical Exam Required	X
Fall Protection		Respirator Exam Required	Frequency
Confined Space Entry		M-614	Daily
		Personal Fall Arrest System	Prior to every use / Annually
		Ladder	Before use
		PPE	Before use
7. Personal Protective Equipment (X)			
X	Safety Glasses	Hands and Arms	Feet/Legs
		Protective Sleeves	Leggings / Chaps
	Chemical Goggles	Gloves	Foot or Leg Guards
	Dust Goggles	Chemical Resistant Type:	Reflective Leggings
	Welding Shield	Heat Resistant	Foot Protection
	Other:	Heat Resistant	Above the ankle boot with good tread
	Face Shield	Cold Resistant	Electrical Protection
	Welding Shield	Abrasion/Cut Resistant	Heat/Cold Protection
	Other:	Leather Work	Metatarsal Protection
	Head	Other:	Chemical Resistance
	Hard Hat	Hearing Protection	Personal Fall Arrest System
	Other:	Ear Muffs	Personal Flotation Device
		Ear Plugs	Other:
		Other: Optional based on task	
8. Reference Manuals			
X	Pub 213	Operators Manual	Pub 238
			Pub 445M
			Pub 100A
<b>Prepared By:</b> District 2 JSA Team		<b>Safety Coordinator:</b> Mark Graham	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Gather Tools for the Job	A. Slip, Trip, Fall	1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
2. Pre-task Safety Brief	A. N/A	1) Employees assigned to this task will attend a pre- task safety brief to review the potential and previously identified hazards associated with the assignment. This may include review of the pertinent JSAs, standard operating procedures, hazard controls, and prior bridge inspection reports.
3. Travel To/From Job Site	A. Vehicle Accidents	1) Refer to Safe Driver Training.
4. Setup Work Location	A. Equipment/Vehicle - Struck By or Against  B. Slip, Trip, Fall	1) Turn on warning lights to notify motorists of your presence. 2) Set parking brake and put on reflective clothing before exiting the vehicle. 3) Ensure proper work zone traffic control set up is in place, if necessary, for the job. 4) Preplan and determine escape route. 5) Refer to Work Zone Traffic Control JSA or Pub 213. 6) Remain behind guide rail/bridge structure whenever possible. 7) Choose alternate worksite if conditions are unsafe.  1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment.
5. General Inspection	A. Slip, Trip, Fall  B. Insect Bites (e.g. - ticks, mosquitoes, flies) or Stings  C. Poison Ivy and Poison Oak  D. Lightning Strikes	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Look for wet surfaces, stones, mud, litter, holes, animal traps, and objects hidden in the weeds. 3) Wear the appropriate footwear for the situation and ensure soles are in good condition to provide traction (lug soles, waders, etc.).  1) Wear insect repellent when appropriate for the conditions. 2) Identify potential for animals or insects. 3) Avoid wasps or hornets nests. 4) Check body carefully for ticks at the end of the day.  1) Wear appropriate clothing and wash clothing following exposure to poisonous plants. 2) Wash all exposed areas with soap and water. Use of barrier cream can reduce the chance of exposure.  1) Do not work during thunder storms.

Bridge Inspection – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
General Inspection continued	E. Sprain, Strain	<ol style="list-style-type: none"> <li>1) Use bag to carry tools.</li> <li>2) Make two trips if necessary.</li> <li>3) Use proper lifting techniques. Bend at the knees, pull the object close to your body, stand up with the object, and do not twist.</li> <li>4) Get Assistance if needed.</li> </ol>
	F. Struck by Flying, Falling, Sliding Object	<ol style="list-style-type: none"> <li>1) Wear hard hat.</li> <li>2) Wear eye protection and gloves when necessary to protect against sharp surfaces and dust/debris.</li> </ol>
	F. Inhalation / Biological	<ol style="list-style-type: none"> <li>1) Wear gloves and a dust mask (non-certified respirator) for nuisance dust as needed.</li> <li>2) Wear a N95 filtering face piece respirator if exposed to bird waste/droppings that may become airborne.</li> </ol>
	G. Drowning	<ol style="list-style-type: none"> <li>1) Avoid entering streams and waterways.</li> <li>2) If you need to enter streams or waterways do not work alone.</li> <li>3) Use of an approved Personal Flotation Device (PFD) may be required based on water depth, flow, obstructions, and other related factors.</li> <li>4) Wear a Personal Flotation Device (PFD) when operating a boat or canoe.</li> <li>5) Follow procedures for working over water.</li> </ol>
6. Working Over Water or From Elevation (six (6) feet or greater)	A. Fall from Elevation/Drowning	<ol style="list-style-type: none"> <li>1) A guardrail must be present on the surface/bridge deck to conduct the inspection.</li> <li>2) Wear a personal fall arrest system and maintain 100% tie off (2 legged lanyard) if guardrails or other acceptable fall protection methods are not utilized.</li> <li>3) Anchor points must be able to support 5,000 lbs.</li> <li>4) If working over water and 100% fall protection cannot be maintained and the danger of drowning exists, employees shall also wear an approved Personal Flotation Device (PFD).</li> <li>5) Prepare rescue plan if there is a possibility of a fall.</li> </ol>
7. Inspect Using a Bridge Crane	A. Various Hazards	<ol style="list-style-type: none"> <li>1) Refer to Bridge Crane JSA</li> </ol>

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Bridge Replacement – General Procedures		Field Bridge Locations	
3. Equipment/Tools/Machinery Used			
Track Hoe, Backhoe, Dump Truck, Concrete Saw, Water Pump, Air Compressor, torch set, and Miscellaneous Hand Tools		4. Medical Exams	
		Physical Exam Required	Yes
		Respirator Exam Required	No
5. Required Training			
Equipment Certifications		Frequency	
Torch and Tanks		Daily	
Erosion & Sedimentation Control		Random	
Safety Training		Daily	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X	Safety Glasses	Protective Sleeves	Leggings / Chaps
	Chemical Goggles	Gloves	Foot or Leg Guards
X	Dust Goggles	Chemical Resistant Type:	Reflective Leggings
	Welding Shield	Heat Resistant	Foot Protection
	Other:		X Above the ankle boot with good tread
	<b>Face</b>	Cold Resistant	Heat/Cold Protection
X	Face Shield	X Abrasion/Cut Resistant	Electrical Protection
	Welding Shield	X Leather Work	Chemical Resistant
	Other:	X Other: Neoprene	Metatarsal Protection
	<b>Head</b>	<b>Hearing Protection</b>	Other: Rubber
X	Hard Hat	X Ear Muffs	
	Bump Cap	X Ear Plugs	
	Other:	Other:	
8. Reference Manuals			
X	Pub 213	X Operators Manual	X Pub 445M
X	Foreman's Manual	X Pub 234	
<b>Prepared By:</b> District 2 JSA Team		<b>Safety Coordinator:</b> Mark Graham	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-Trip Inspection for All Equipment (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket.  1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Set Up Road Closure and Detour	A. Traffic & Various Hazards	1) Refer to Work Zone Traffic Control JSA and Pub 213
3. Assess Work Environment	A. Sun/Heat Exposure B. Physical/Environmental Hazards C. Electrocutation	1) Ensure water is available and provide sunscreen as needed. 1) Check area for potential hazards, identify and correct before the job begins 2) Provide insect spray and poison ivy lotion as needed. 3) Cut back brush and evaluate area for possible animals, insects, and poisonous plants. 4) Verify all applicable environmental permits are addressed and on site. 1) Identify any overhead power lines or other electrical hazards. 2) Stay a minimum of 10 feet away from power lines – if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately. 3) Contact the utility company when work must take place within the minimum distance. 4) Make sure that equipment and power/extension cords needed for the job will be properly installed and grounded.
4. Remove Guidrails & Posts	D. Fire/Explosion	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities. Verify permits are onsite and site is marked as needed.
5. Erosion and Sedimentation Controls	A. Burns/Torches & Various Hazards A. Slips, Trips and Falls B. Cuts, Scrapes, Lacerations	1) Refer to Guide Rail Removal & Installation JSA 1) Continually inspect walking surfaces for tripping hazards and possible changing conditions. 1) Inspect all tools before use for proper operation. 2) Wear proper eye, face, leg, hand, and hearing PPE for the task. Refer to the Chain Saw JSA when applicable

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Remove Old Structure	A. Various B. Vehicle/Equipment - Struck By or Against C. Flying Debris/Dust/Noise	1) Refer to various equipment JSAs as appropriate depending on the job (Excavator, Backhoe, Dump Truck, Concrete Saw, etc.). 1) Identify the location of equipment in operation while performing your task. 2) Maintain communication / signaling and eye contact with operators. 3) Stay clear and maintain distance if you are not operating equipment or involved in the operation. 1) Wear proper eye, face, hand, foot, and hearing PPE for the task.
7. Build Footer Forms	A. Cuts, Scrapes, Lacerations B. Foreign Object - Eye Injuries C. Sprain / Strain - Overexertion	1) Inspect PPE and equipment. Ensure safety guards are in place on saws. 2) Wear leather work gloves and keep hands clear of machinery 1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection. 1) Use proper lifting techniques when working and avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, stand up with the object, and avoid twisting. 3) Get assistance as needed.
8. Prep Existing Area and Dig Footer	A. Slips, Trips, and Falls B. Trench Collapse C. Vehicle/Equipment - Struck By or Against D. Crushing Injury/Suffocation/ Struck by Falling Object	1) Keep the site free of debris and tripping hazards. 1) Use caution when building back the bank area. 2) Keep spoil piles a minimum of two (2) feet from excavation area. 1) Watch for equipment moving overhead and around the worksite.
9. Setting Forms	A. Slips, Trips, and Falls B. Crushing Injury	1) When working in a trench, ensure the proper procedures and protective systems are utilized (sloping/benching, shoring, and/or shielding). 2) Protect all trenches five (5) feet or greater in depth from collapse and falling material with at least one of the methods listed above. 1) Take your time and plan your route when working on uneven ground. 2) Use a spotter to assist with ladder work. 1) Identify location of overhead cranes moving forms into place. 2) Stay clear and maintain distance if you are not operating equipment or involved in the operation.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Pouring Forms/Wings/Headwalls	A. Eye Injury/Splash B. Electrical Shock C. Vehicle/Equipment – Struck By or Against D. Chemical / Burn E. Crushing Injury/Struck By	1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection. 1) Make sure equipment and power/extension cords are properly installed, properly grounded, and not in water. 1) Watch for moving equipment swinging overhead. 2) Use a spotter when available. 1) Avoid contact with wet concrete on skin or absorbed through clothing or boots. 2) Wear rubber gloves and boots as needed to avoid exposures. 1) Ensure proper form bracing to protect against cone blow out.
11. Clearing Stream Bed & Replace Stone	A. Slips, Trips, and Falls B. Falling Debris C. Electrocutation D. Crushing Injury	1) Wear footwear designed and appropriate for use in wet areas. 2) Proceed slowly with deliberate foot placement. 3) Observe path or area for rocks and debris in the stream bed area. 1) Wear hard hat at all times. 1) Operator should use a spotter when available to identify overhead wires and maintain clearances. 1) Use caution when backing 2) Stay clear of moving equipment
12. Place Box Culvert	A. Various B. Crushing / Struck By – Flying, Falling, Rolling Object	1) Refer to lifting section of appropriate equipment JSA (Excavator, Backhoe, etc.). 1) When lifting with equipment, use cables, chains, or straps in good condition and with a sufficient rating for the job. 2) Make sure load is secure when lifting. 3) Never lift a load over another worker. 4) Plan for and identify an escape route. 5) Get assistance with loading, unloading, and placement. 6) Use a spotter. 7) Keep area clear of coworkers not directly involved in the operation. 8) Establish and maintain methods of effective communications.
13. Paint Box Culvert/Install Water-Proof Membrane	A. Inhalation B. Eye Irritation C. Laceration	1) Consult SDS (Safety Data Sheet) and manufacturer’s instructions for proper safety procedures. 2) According to the SDS, wear the appropriate respirator to prevent exposures. 1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection. 1) At minimum, wear leather work gloves when using utility knife. Cut resistant gloves are recommended. 2) Keep hands and figures out of the cutting path.

Bridge Replacement - General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
14. Back Fill	A. Strains & Sprains	1) Use proper body mechanics while using the tamper, raking, and shoveling.
	B. Crushing Injury	1) Be aware of moving equipment and stay away from equipment in motion.
15. Install Pre-Cast Inserts and Tie Rebar for Deck	A. Slips, Trips, and Falls	1) Install rebar mat to prevent tripping hazards.
	B. Lacerations	1) Refer to cut off saw JSA as needed. 3) Wear leather work gloves and keep hands/fingers away from moving machinery.
	C. Strains & Sprains	1) When lifting, bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 2) Get assistance with heavy or awkward loads. 3) Wear knee pads while kneeling and tying rebar.
16. Pour Deck	A. Eye Injury/Concrete Splash	1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection.
	B. Strains & Sprains	1) Wear knee pads.
17. Install and Pour Curb Forms	A. Contusions	1) Use caution when using hand tools.
	B. Eye Injury	2) Inspect tools daily for damage, defects, or signs of wear. 1) Wear properly fitted eye protection (glasses or goggles) with adequate top and side protection.
18. Remove All Forms and Clean Up the Work Area	A. Strains & Sprains	1) Use proper lifting techniques.
	B. Lacerations	1) Wear leather work gloves to protect from sharp edges and pinch points.
	C. Slips, Trips, and Falls	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
	D. Struck by Flying Object – Eye Injury	1) Wear safety glasses to protect eyes from splintering.
	E. Crushing Injury	1) Establish and maintain methods of effective communication between crew members and any contractors who may be on site.
19. Restore Road Surface and Install Guide Rail	A. Various	2) Identify and stay clear of moving vehicles/equipment. 1) Refer to Paving and Guide Rail Installation JSAs.



**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Bridge Replacement - General Procedures

6

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Broom/Towable Broom-General Operation		Field, Stockpile	
3. Equipment/Tools/Machinery Used			
Spider Broom, Dump Truck w/ Towable Broom, Water Truck			
5. Required Training		Frequency	
Spider Broom Certification		Initial	
		Frequency	
		Daily	
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	<i>Foot Protection</i>	Rain Gear
Other:	Cold Resistant	X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Abrasion/Cut Resistant	Heat/Cold Protection	Welding Leathers
Face Shield	Leather Work	Electrical Protection	Other:
Welding Shield	Other:	Chemical Protection	<b>Body (Whole)</b>
Other:		Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	X Tick/Insect Spray (as needed)
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		Personal Flotation Device
Other:	Other:		
8. Reference Manuals			
	X Operators Manual	X Pub 445M	
	Foreman's Manual	Pub 234	
<b>Prepared By:</b> Employee Safety and Training Division		<b>Safety Coordinator:</b> Brian Pollick	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Broom/Towable Broom-General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Pre-trip Inspection/Circle of Safety (M-614)	A. Vehicle/Equipment - Struck By or Against B. Cut, Puncture, Scrape, Burn or Pinch Point C. Slip, Trip or Fall	1) Set parking brake, ensure broom/truck is turned off and place keys in pocket. 2) Place wheel chocks behind back tires (as needed). 1) Wear protective work gloves to protect from sharp edges, pinch points. 2) Secure hood or compartment doors to prevent it from falling. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment. 5) Maintain good housekeeping. Immediately identify/clean spills and store them properly.
2. Pre-task Safety Brief	A. N/A	1) Employees assigned to this task will attend a pre-task safety brief to review the potential and previously identified hazards associated with the assignment.
3. Plan the Route	B. Vehicle Accident – Struck By or Against	1) Ensure there are no obstructions along the route (ground, over-head, width). 2) Establish areas or routes of travel ahead of time to be swept. 3) Establish communication with shadow vehicle operator and discuss scheduled plans ahead of time.
4. Position Vehicle and Hook Towable Broom	A. Vehicle/Equipment – Struck By or Against	1) Wear high visibility PPE and hard hat. 2) Verify or select the most secure/level area and ensure the vehicle is completely off the roadway when connecting. 3) Use a spotter when available to safely guide you. 4) If spotter is used, ensure you agree upon hand signals being used, keep spotter in your line of sight and immediately STOP if you cannot see the spotter. 5) Before exiting the cab, ensure the brake is engaged.
	B. Pinch Points/Caught In or Between	1) Wear protective work gloves to protect hands from sharp edges and pinch points. 2) Keep hands and fingers clear of pinch points when lowering ball onto truck hitch.
	C. Slip, Trip or Fall	1) Maintain three (3) points of contact when entering or exiting the equipment and avoid any obstructions or hazards in the area. 2) Wear safety footwear that is above the ankle with good tread.

Broom/Towable Broom-General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Position Vehicle and Hook Towable Broom continued	D. Vehicle/Equipment- Incident	<ol style="list-style-type: none"> <li>1) Ensure all warning lights are flashing and headlights/parking lights are on for maximum visibility.</li> <li>2) Avoid backing as much as possible. Turn around and sweep location again if possible.</li> <li>3) If dust becomes a visibility hazard, have a water truck spray ahead of sweeping.</li> <li>4) If there is a mechanical problem with broom, move completely off the road before getting out and evaluating.</li> </ol>
5. Broom Operations	A. Overexertion – Sprains/Strains	<ol style="list-style-type: none"> <li>1) If large debris is on the road and needs removed, use proper lifting techniques when moving it (straight back, bend knees, keep object close to body, and lift with legs).</li> <li>2) If a coworker is available, ask for assistance in performing a team lift.</li> </ol>
	B. Pinch Points	<ol style="list-style-type: none"> <li>1) Wear protective work gloves when positioning the moving debris or making adjustments on broom.</li> <li>2) Hands and feet should be positioned clear of the mechanical components at all times.</li> </ol>
	C. Slip, Trip or Fall	<ol style="list-style-type: none"> <li>1) Remove all debris stuck in the bristles and from any places used for foot or hand placement.</li> <li>2) Observe walking path around the broom. Take weather conditions into consideration to avoid slippery surfaces.</li> <li>3) Use three (3) points of contact when entering or exiting equipment.</li> </ol>
6. Position Truck and Un-hook Broom	A. Vehicle/Equipment - Struck By or Against	<ol style="list-style-type: none"> <li>1) Complete a Circle of Safety prior to backing.</li> <li>2) Wear high visibility PPE and hard hat.</li> <li>3) If available, utilize a co-worker as a spotter when backing.</li> <li>4) If spotter is used, ensure you agree upon hand signals being used, keep spotter in your line of sight and immediately STOP if you cannot see the spotter.</li> <li>5) Engage the parking brake prior to exiting the cab.</li> </ol>
	B. Pinch Points/Caught In or Between	<ol style="list-style-type: none"> <li>1) Keep feet clear when lowering jack.</li> <li>2) Wear protective work gloves and avoid all pinch points when raising the broom off of the ball.</li> </ol>
	C. Slip, Trip or Fall	<ol style="list-style-type: none"> <li>1) Use three (3) points of contact when entering or exiting the truck to disconnect the broom.</li> <li>2) Wear safety footwear that is above the ankle with good tread.</li> </ol>

Broom/Towable Broom-General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Broom/Towable Broom-General Operation

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Bucket Truck - General Operation		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	
Bucket Truck, Personal Fall Arrest System		Physical Exam Required	Yes
		Respirator Exam Required	No
			X
5. Required Training		6. Inspection Requirements	
Frequency		Frequency	
Initial / As Needed		Daily / Prior to every use	
Initial		Every 6 months (Garage)	
Bucket Truck Operation		Before use	
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
	Cold Resistant	Heat/Cold Protection	Welding Leathers
<b>Face</b>	Abrasion/Cut Resistant	Electrical Protection	Other:
Face Shield	Leather Work	Chemical Resistance	<b>Body (Whole)</b>
Welding Shield	Other:	Metatarsal Protection	X Personal Fall Arrest System
Other:	<b>Hearing Protection</b>	Other:	Other: <b>Other</b>
<b>Head</b>	Ear Muffs		
X Hard Hat	Ear Plugs		
Bump Cap	Other:		
Other:			
8. Reference Manuals			
X Pub 213	X Operators Manual		
Foreman's Manual	Pub 234		
<b>Prepared By:</b> District 2 JSA Team		<b>Safety Coordinator:</b> Mark Graham	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2 0 2 2	

Bucket Truck - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket. 1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Travel To / From Job Site	A. N/A	1) Refer to Safe Driver Training.
3. Pre-task Safety Brief	A. N/A	1) All employees assigned to this task will attend a pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.
4. Setup Work Location	A. Vehicle/Equipment – Struck By or Against B. Slip, Trip, Fall	1) Turn on warning lights to notify motorists of your presence. 2) Set parking brake of truck before exiting the cab. 3) Put on reflective PPE before exiting the cab of the truck. 4) Set cones around truck following the guide for work zone setup. (Refer to JSA for Work Zone Traffic Control and Pub 213) 5) Chock wheels of truck before performing any work. 1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment.
5. Set Outrigger	C. Electrocution A. Caught In, Under, Between	1) Identify any overhead power lines or other electrical hazards. 2) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately. 3) Contact the utility company when work must take place within the minimum distance. 1) Set a corner of the outrigger pad down on the ground and remove one hand.

Bucket Truck – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Set Outrigger Continued	<p>A. Caught In, Under, Between</p> <p>B. Vehicle/Equipment – Struck By or Against</p>	<p>2) Lower the other side as close the ground and remove other hand.</p> <p>3) Keep feet and hands from under the pad when letting go.</p> <p>4) Make sure all workers are clear of outriggers before placing them on the ground.</p> <p>5) Use a spotter when available if you cannot see the outriggers.</p> <p>6) Do not lift the truck wheels with the outriggers. They are for extra support.</p> <p>1) Do not lower outriggers into traffic.</p> <p>2) Do not operate controls while standing in traffic.</p>
6. Prepare the Boom for Operation	<p>A. Caught In, Under Between</p> <p>B. Vehicle/Equipment – Struck By or Against</p>	<p>1) Do not start engine before unlatching the boom clamp.</p> <p>1) Visually inspect area for people, workers or obstructions before running boom through operational check.</p>
7. Enter / Exit the Bucket	<p>A. Slip, Trip, Fall</p> <p>B. Sprain / Strain</p> <p>C. Vehicle/Equipment – Struck By or Against</p>	<p>1) Face the truck at all times when entering and exiting the bucket.</p> <p>2) Keep shoes free from mud, ice, snow or other material that could cause them to slip.</p> <p>3) Maintain three (3) points of contact at all times. (Two (2) hands and one foot or two (2) feet and one (1) hand)</p> <p>4) Do not use the controls as hand holds.</p> <p>1) Never jump from the bucket or truck. Always use foot and hand holds.</p> <p>1) Never enter or exit a moving truck or bucket.</p>
8. Operate Bucket	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Electrocution</p>	<p>1) Visually inspect area for people, workers or obstructions before operating bucket.</p> <p>2) Raise upper boom first then raise lower boom to avoid hitting the truck.</p> <p>3) Do not allow co-workers around and under the raised bucket.</p> <p>1) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.</p> <p>2) Electrically ground the vehicle (if applicable).</p> <p>3) Keep the insulated part of the booms clean, dry and free of oil or grease.</p> <p>4) Use insulated shields, covers, mats when required.</p> <p>5) Do not operate if the danger of lightning exists.</p> <p>6) Contact the utility company when work must take place within the minimum distance.</p>

Bucket Truck – General Operation



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Operate Bucket Continued	C. Slip, Trip, Fall – From Elevation	<ol style="list-style-type: none"> <li>1) Make sure lanyard is connected to harness and anchor before moving the bucket.</li> <li>2) Never leave the bucket and walk on the boom arm.</li> <li>3) Never stand on the bucket to gain additional height.</li> <li>4) Never use a ladder in the bucket to gain additional height.</li> <li>5) Never attach a wire or rope to the bucket to pull or lift objects.</li> <li>6) Never operate the bucket if wind speeds are greater than 30 miles per hour (mph).</li> <li>7) Do not exceed weight capacity of bucket.</li> <li>8) Never modify any part of the aerial device without manufacturer's permission.</li> <li>9) Never transfer to a work surface or pole from the bucket.</li> </ol>
9. Reposition Vehicle	D. Vehicle/Equipment – Struck By or Against	<ol style="list-style-type: none"> <li>1) Never allow the boom or turntable to enter traffic lanes without proper barricading and proper WZTC setup according to Pub 213.</li> </ol>
	A. Vehicle/Equipment – Struck By or Against B. Slip, Trip, Fall – From Elevation	<ol style="list-style-type: none"> <li>1) Lower and stow the boom in the transport position, secure, if necessary, before moving vehicle.</li> <li>1) If the vehicle is designed to move with employees in the bucket, ensure employees are aware of the move and be in communication with those moving the vehicle.</li> </ol>

Bucket Truck – General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Bucket Truck - General Operation

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location		
Chain Saw - General Operation		Field (various)		
3. Equipment/Tools/Machinery Used				
Chain Saw, Fuel, Bar Oil, File, Wrench, Extra Chain		Yes	No	
			X	
			X	
5. Required Training				
Chain saw operation and maintenance (PowerPoint and/or Training Video)		Frequency		
		Initial / As Needed		
Instructor led hands-on training		Initial / As Needed		
7. Personal Protective Equipment (X)				
Eyes	Hands and Arms	Feet / Legs	Body / Skin	Respiratory Protection
X Safety Glasses	Protective Sleeves	X Leggings / Chaps	X Reflective Apparel	Filtering Face piece
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger	Half Face Respirator
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit	Full Face Respirator
Welding Shield	Heat Resistant	Foot Protection	Rain Gear	PAPR
Other:		X Above the ankle boot with good tread	Rubber Apron	SCBA
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Welding Leathers	Supplied Air
X Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:	Cartridge:
Welding Shield	X Leather Work	Chemical Resistance	<b>Body (Whole)</b>	Other:
X Other: Mesh Face Shield	Other:	Metatarsal Protection	Personal Fall Arrest System	<b>Other</b>
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device	
X Hard Hat	X Ear Muffs			
Bump Cap	X Ear Plugs			
Other:	Other:			
8. Reference Manuals				
X Pub 213	X Operators Manual	X Pub 445M		
X Foreman's Manual	Pub 234	X Pub 247		
<b>Prepared By:</b> District 1 JSA team			<b>Safety Coordinator:</b> Dominic White	
<b>Reviewed By:</b> Employee Safety and Training Division			<b>Distribution Date:</b> 2 0 2 2	

Chain Saw - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Operator Training	A. N/A	1) Review operator's safety manual prior to use. 2) Successful completion of training prior to field operations. 3) Wear all PPE identified on JSA cover page during any hands-on or field instruction.
2. Inspect Saw to Ensure Proper Working Order	A. Cut, Puncture, Scrape  B. Chemicals	1) Wear gloves when the chain condition/sharpness/test saw break. 2) Check for proper bar/chain tension and loose fittings. Adjust as necessary according to the manufacturer's instruction manual. 1) Make sure valves, hoses, and plugs are in good working condition.
3. Sharpening Chain & Fueling	A. Cut, Puncture, Scrape  B. Chemicals  C. Fire/Explosion or Burn	1) Wear leather work gloves and eye protection while sharpening chain or adjusting tension/fittings. 1) Wear leather work gloves and eye protection when fueling. 2) Change clothes or PPE if fuel is spilled on them. 1) Turn off engine and allow it to cool prior to checking or filling fuel/oil. 2) Refuel outdoors and at least 10 feet from an open flame or other ignition sources. 3) Place saw on bare ground when refueling. 4) Clean up spilled fuel immediately, use a funnel when filling. 5) Ensure fuel caps are secure with no leaking.
4. Transporting Saw by Vehicle	A. Chemical or Fire/Explosion  B. Struck by Flying, Falling, Sliding Object  C. Cut, Puncture, Scrape	1) Empty fuel, if necessary, before transport to prevent spills. 2) Turn fuel off and make sure fuel caps are secure to prevent leaking. 1) Secure saw/equipment to minimize shifting. Place in designated area/cabinet away from people. 1) Cover bars during transportation.
5. Conduct Circle of Safety and Travel To/From Work Location	A. Vehicle / Equipment - Struck By or Against  B. Slip, Trip, Fall	1) Wear seat belt and practice safe driving.  1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering and exiting vehicles or equipment.
6. Inspect Job Site for Potential Hazards and Ensure Traffic Control is in Place	A. Vehicle / Equipment - Struck By or Against	1) Refer to Work Zone Traffic Control JSA. 2) Wear high visibility apparel.

Chain Saw - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Inspect Job Site for Potential Hazards and Ensure Traffic Control is in Place Continued	B. Slip, Trip, Fall	1) Observe path or area for slope, uneven / slippery surfaces, obstructions, and other tripping hazards.
	C. Struck by Flying/Falling Object	1) Wear hard hat.
	D. Electrocution	1) Identify any overhead power lines or other electrical hazards. 2) Do not cut trees that are in direct contact with power lines 3) Do not cut or trim trees within 10 feet of power lines. This includes any tools, equipment, ladders, or aerial devices. 4) Contact the utility company when work must take place within the minimum distances.
	A. N/A	1) PPE must be worn at all times by the chain saw operator (safety glasses/mesh face shield, leather work gloves, hard hat, hearing protection, chain saw chaps, slip resistant work boots, and reflective clothing/vest).
8. Starting Procedure	A. Cut, Puncture, Scrape	1) Engage chain brake when starting the saw. 2) Place on ground and at least 10 feet from coworkers. 3) Always maintain secure footing and grip. 4) <b>Never "drop start" a chain saw!</b>
	B. Fire/Explosion	1) Never start saw within 10 feet of the fueling area. 2) Check fuel caps to make sure they are secure and not leaking. 3) Ensure spark plug boot is snug onto the spark plug terminal to prevent arcing.
9. Walking with Chain Saw	A. Cut, Puncture, Scrape	1) Stop chain and engage chain brake when moving short distances. 2) Shut off saw if walking more than 50 feet. 3) Carry saw off to the side in a horizontal and balanced position. 4) Face bar away from body and coworkers. 5) Point bar forward when going downhill and to the rear when going uphill. 6) Maintain minimum of 10 feet between crew members.
	B. Slip, Trip, Fall	1) Plan your route and observe the ground for slope, uneven, or slippery surfaces. 2) Look for brush and hidden tripping hazards such as stumps, roots, rocks, holes, and ditches. 3) Wear safety footwear that is above the ankle with good tread and take short steps.
	C. Burn	1) Keep muffler of chain saw away from body.

Chain Saw - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Chain Saw Operation	A. Noise B. Laceration/Amputation	1) Wear hearing protection (earplugs or earmuffs). <b>Never use a chain saw with one hand or alone!</b> 2) Never operate with a damaged/missing chain catcher or front hand guard. 3) Hold the saw firmly with both hands on the handles. 4) Keep body parts clear of cutting path and stand to the side of the cut. 5) Never operate saw above shoulder/chest level. 6) Keep bar and tip position away from accidental contact or pinching to prevent kickback. 7) Always stop the engine before putting a chain saw down. 8) Ensure co-workers maintain a safe working distance and are never in the general work area of a running saw.
	C. Slip, Trip, Fall	1) Maintain secure footing (shoulder width apart) and balance at all times 2) Clear debris from cutting area. 3) Special care must be taken when working on slopes, uneven ground, in slippery conditions, or in overgrown brush.
	D. Struck by Flying, Falling, Sliding Object	1) Always cut with a properly sharpened chain. 2) Identify escape route prior to cutting. 3) Ensure area is clear of people and hazards (two (2) times tree height). Mark/flag area, if necessary. 4) Never stand on a fallen log while limbing or bucking. 5) Make sure the log will not roll downhill. Stand on uphill side when limbing/bucking. 6) Be extremely cautious if cutting any limbs or logs under tension (spring poles), watch for bar pinch and kick back. 7) Use cutting wedges when necessary.
	E. Overexertion	1) Cut branches and logs into smaller pieces to avoid heavy lifting. 2) Bend at knees, pull the object close to your body, stand up with the object, and do not twist. 3) Use teamwork or equipment to lift heavy loads.

Chain Saw - General Operation

JSA Acknowledgements

Print Name	Signature	Date

Chain Saw - General Operation

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Crack and Joint Sealing – Rotate worker tasks at least daily or as needed		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes No
Dump Truck, Tar Kettle, Hose/Wand, Air Compressor/Wand, Squeegee, Router, Crew Cab, Crash Truck, Fork Lift, Arrow Board, Stop/Slow Paddles		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training	Frequency	Frequency	
Hot Work Material	Initial	Daily	
Kettle Operations	Initial	Prior to use	
Personal Protective Equipment	Initial	Prior to use	
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	X Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Filtering Face piece
X Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Half Face Respirator
Welding Shield	X Heat Resistant	Foot Protection	Full Face Respirator
Other:		X Above the ankle boot with good tread	PAPR
<b>Face</b>		Heat/Cold Protection	SCBA
X Face Shield	Cold Resistant	Electrical Protection	Supplied Air
Welding Shield	Abrasion/Cut Resistant	Chemical Resistance	Cartridge:
Other:	X Leather Work	Metatarsal Protection	Other:
<b>Head</b>	X Other: With Gauntlets	Other:	<b>Other</b>
X Hard Hat	<b>Hearing Protection</b>	Personal Fall Arrest System	
Bump Cap	X Ear Muffs	Personal Flotation Device	
X Other: Nomex hood	X Ear Plugs		
	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual	X SDS Sheets	
X Foreman's Manual	Pub 445M		
<b>Prepared By:</b> District 3 JSA Team		<b>Safety Coordinator:</b> Thomas Walker	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment - Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall - Same Level (roadsurface) or Different Level (equipment)	1) Ensure dump truck is turned off and keys are in pocket. Ensure tailgate of truck is secure prior to operation. 1) Look at the surface around the dump truck and clear debris to prevent trips and falls. 1) Wear safety footwear that is above the ankle with good tread. 2) Ensure surface around cab entry is free from surface debris. 3) Face the dump truck and maintain three (3) points of contact when entering or exiting the vehicle or equipment. 4) Never jump or skip steps.
2. Pre-heat Tar Kettle/Hose and Material	A. N/A	1) Refer to Tar Kettle JSA
3. Load Truck with Material/Blocks	A. Sprain/Strain B. Pinch points/Crushing Injury	1) Use proper lifting techniques when loading or placing blocks, Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. Get assistance as needed. 1) Wear leather work gloves to protect hands and fingers from pinching between or under blocks. 2) Maintain firm grip with both hands and keep blocks close to center of gravity to avoid dropping.
4. Set Up Work Zone 5. Drink Water Prior to Starting JobTask 6. Router Transverse Cracks as Needed (Non-routine task typically performed on road surfaces > 5 years old)	C. Vehicle/Equipment - Struck By or Against D. Burns - Hands, Body Parts (Approx. 350 degree operating temperature) A. N/A A. Heat Exhaustion A. Noise B. Struck By - Debris	1) Use a spotter when available as a guide to maneuver load into the truck. 2) Ensure other equipment and personnel are away from the loading area. 3) Maintain proper clearances to avoid hitting the truck or upsetting the load. 1) At a minimum, you must wear leather gloves with gauntlets (Nomex strongly recommended), Nomex hood, coveralls or welding apron, long sleeves, safety glasses or goggles, and face shield. 1) Refer to Work Zone Set Up JSA 1) Hydrate frequently throughout the day to prevent symptoms of heat exhaustion. 1) Wear ear plugs or ear muffs during this task. 1) Wear safety glasses, safety goggles, face shield, leather gloves and long sleeves (or protective arm/coverings) while performing this task.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Router Transverse Cracks Continued	C. Contact with – Equipment	1) Inspect the router prior to use. 2) Ensure guards are in place and the equipment/power cord is in good working condition.
	D. Vehicle/Equipment - Struck By or Against	1) Use a spotter while routing and stay within the work zone.
	E. Sprain/Strains	1) Alternate workers as needed to avoid overexertion and injury.
7. Clean Cracks	A. Injection – Compressed Air	1) Maintain a good grip on the compressed air nozzle. 2) Never use compressed air to clean off clothing or point the nozzle at yourself or other employee.
	B. Slip, Trip, Fall – Same Level	1) Wear safety footwear that is above the ankle with good tread. 2) Look for changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.
	C. Crushing Injury – Dump Truck	1) Maintain good communication with dump truck operator during the task. 2) Predetermine methods or signals to communicate with the driver.
	D. Noise	1) Wear ear plugs or ear muffs during this task.
	E. Foreign Objects – Eyes	1) Dust goggles are required. 2) Keep other co-workers/observers clear while performing the task.
	F. Struck by – Traffic	1) Keep body within the work zone and be aware of passing traffic.
	G. Hand fatigue – Trigger	1) Whenever possible, stretch hands outward to maintain blood flow and reduce cramping. 2) Rotate workers if needed.
8. Apply Material	A. Sprains and Strains – Upper body	1) Avoid bending at waist and keep your back as straight as possible. If possible, change posture occasionally to prevent static positioning.
	B. Burns – Hands, Body Parts (Approx. 350 degree operating temperature)	1) At a minimum, you must wear leather gloves with gauntlets (Nomex strongly recommended), Nomex hood, coveralls or welding apron, long sleeves, safety glasses or goggles, and face shield.
	C. Vehicle/Equipment - Struck By or Against	1) Keep body within the work zone and be aware of passing traffic. Wear proper PPE (hardhat and high visibility apparel).
	D. Slip, Trip, Fall – Same Level	1) Wear safety footwear that is above the ankle with good tread. 2) Continue to evaluate road surface as you cleanout the cracks.
	E. Hand fatigue – Trigger	1) Whenever possible, stretch hands outward to maintain blood flow and reduce cramping.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Squeegee Material	<p>A. Slip, Trip, Fall – Same level</p> <p>B. Sprains and Strains – Upper body</p> <p>C. Burns – Hands, Body Parts (Approx. 350 degree operating temperature)</p> <p>D. Hand Fatigue</p> <p>E. Vehicle/Equipment - Struck By or Against</p>	<p>1) Wear leather work shoes and continue to evaluate road surface as you perform the task.</p> <p>1) Keep your back as straight as possible while applying material. If possible, change your posture occasionally to prevent static positioning.</p> <p>1) At a minimum, you must wear safety glasses, faceshield, long sleeved shirt, long pants and leather gloves with gauntlets.</p> <p>1) Whenever possible, stretch hands outward to maintain blood flow and reduce cramping. 2) Alternate workers as needed.</p> <p>1) Keep body within the work zone and be aware of oncoming traffic. 2) Use a spotter when available and/or shadow vehicle.</p>
10. Apply De-tac as Needed	<p>A. Sprains and Strains – Upper Body</p> <p>B. Slip, Trip, Fall – Same level</p> <p>C. Struck by – Traffic</p>	<p>1) Keep your back as straight as possible while applying material. 2) If possible, change your posture occasionally to prevent static positioning.</p> <p>1) Wear leather work shoes and continue to evaluate road surface as you perform the task.</p> <p>1) Keep body within the work zone and be aware of oncoming traffic.</p>

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Crack and Joint Sealing – General Procedures

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Cut-Off Saw - General Operation		Field (Various)	
3. Equipment/Tools/Machinery Used			
Cut-Off Saw, Fuel, Wrench, Extra Saw Blade		4. Medical Exams	Yes No
		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training			
Frequency		Frequency	
Instructor led hands-on training		Prior to every use	
		Annual / Seasonal service inspection	
		At least annually or as needed based on operation	
		Concrete/Asphalt	
		Before using.	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X	Safety Glasses	Protective Sleeves	Leggings / Chaps
	Chemical Goggles	Gloves	Foot or Leg Guards
	Dust Goggles	Chemical Resistant Type:	Reflective Leggings
	Welding Shield	Heat Resistant	Foot Protection
	Other:		X Above the ankle boot with good tread
	<b>Face</b>	Cold Resistant	Heat/Cold Protection
X	Face Shield	Abrasion/Cut Resistant	Electrical Protection
	Welding Shield	X Leather Work	Chemical Resistance
	Other:	Other:	Metatarsal Protection
	<b>Head</b>	<b>Hearing Protection</b>	Other:
X	Hard Hat	X Ear Muffs	
	Bump Cap	X Ear Plugs	
	Other:	Other:	
8. Reference Manuals			
	Pub 213	X Operators Manual	X Pub 445M
	Foreman's Manual	Pub 234	X Pub 247
<b>Prepared By:</b> Employee Safety and Training Division		<b>Safety Coordinator:</b> Brian Pollick	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Cut-Off Saw – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Operator Training	A. N/A	1) Review operator's safety manual prior to use. 2) Successful completion of training prior to field operations. 3) Wear all PPE identified on JSA cover page during any hands-on or field instruction.
2. Inspect Saw to Ensure Proper Working Order	A. Cut, Puncture, Scrape  B. Chemicals	1) Wear gloves when inspecting the saw condition/blade condition/blade tightness. 2) Check for proper operation and any loose bolts or adjustments. Adjust as necessary according to the manufacturer's instruction manual. 1) Make sure valves, hoses, and plugs are in good working condition.
3. Securing/Replacing Blade	A. Cut, Puncture, Scrape B. Chemicals C. Fire/Explosion or Burn	1) Wear protective work gloves and eye protection while replacing/tightening saw blade. 1) Wear protective work gloves and eye protection when fueling. 2) Change clothes or PPE if fuel is spilled on them. 1) Turn off engine and allow it to cool prior to checking or filling fuel/oil. 2) Refuel outdoors and at least 10 feet from an open flame or other ignition sources. 3) Place saw on bare ground when refueling. 4) Clean up spilled fuel immediately, use a funnel when filling. 5) Ensure fuel caps are secure with no leaking.
4. Transporting Saw by Vehicle	A. Chemical or Fire/Explosion	1) Empty fuel, if necessary, before transport to prevent spills. 2) Turn fuel off and make sure fuel caps are secure to prevent leaking.
5. Conduct Circle of Safety and Travel To/From Work Location	B. Struck by Flying, Falling, Sliding Object C. Cut, Puncture, Scrape	1) Secure saw/equipment to minimize shifting. Place in designated area/cabinet away from people. 1) Cover blades if possible, during transportation.
6. Inspect Job Site for Potential Hazards and Ensure Traffic Control is in Place	A. Vehicle/Equipment – Struck By or Against B. Slip, Trip, Fall	1) Wear seatbelt and practice safe driving. 1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering and exiting vehicles or equipment. 1) Refer to Work Zone Traffic Control JSA. 2) Wear high visibility apparel.

Cut-Off Saw – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Inspect Job Site Continued	B. Slip, Trip, Fall C. Struck by Flying/Falling Object D. Electrocutation	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 1) Wear hard hat. 1) Identify any overhead power lines or other electrical hazards. 2) Do not cut any surface that is near or in direct contact with power lines.
7. Don/Wear Identified PPE	A. N/A	1) PPE must be worn at all times by the saw operator (safety glasses/face shield, protective work gloves, hard hat, hearing protection, work boots above the ankle with good tread, and reflective clothing/vest).
8. Starting Procedure	A. Cut, Puncture, Scrape B. Fire/Explosion	1) Hold firmly when starting the saw. 2) Place on ground and at least 10 feet from coworkers. 3) Always maintain secure footing and grip. 4) Never "drop start" a cut-off saw! 1) Never start saw within 10 feet of the fueling area. 2) Check fuel caps to make sure they are secure and not leaking. 3) Ensure spark plug boot is snug onto the spark plug terminal to prevent arcing.
9. Walking with Cut-Off Saw	A. Cut, Puncture, Scrape B. Slip, Trip, Fall	1) Keep saw pointed away from body when moving short distances. 2) Shut off saw if walking more than 50 feet. 3) Carry saw off to the side in a horizontal and balanced position. Face blade away from body and coworkers. 4) Point blade forward when going downhill and to the rear when going uphill. 5) Maintain minimum of 10 feet between crew members. 1) Plan your route and observe the ground for slope, uneven, or slippery surfaces. 2) Look for hidden tripping hazards along the way. 3) Wear safety footwear that is above the ankle with good tread and take short steps.
	C. Burn	1) Keep muffler of cut-off saw away from body

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Cut-Off Saw Operation	A. Noise B. Laceration/Amputation	<ol style="list-style-type: none"> <li>1) Wear hearing protection (earplugs or earmuffs).</li> <li>1) <b>Never use a cut-off saw with one hand or alone!</b></li> <li>2) Never operate with a damaged/missing blade or front blade guard.</li> <li>3) Hold the saw firmly with both hands on the handles.</li> <li>4) Keep body parts clear of cutting path and stand to the side of the cut.</li> <li>5) Never operate saw above shoulder/chest level.</li> <li>6) Keep blade and tip position away from accidental contact or pinching to prevent kickback.</li> <li>7) Always stop the engine before putting a saw down.</li> <li>8) Ensure co-workers maintain a safe working distance and are never in the general work area of a running saw.</li> </ol>
	C. Slip, Trip, Fall	<ol style="list-style-type: none"> <li>1) Maintain secure footing and balance at all times – shoulder width apart.</li> <li>2) Clear debris from cutting area.</li> <li>3) Special care must be taken when working on slopes, uneven ground, or in slippery conditions.</li> </ol>
	D. Struck by Flying, Falling, Sliding Object	<ol style="list-style-type: none"> <li>1) Always cut with the proper type of blade.</li> <li>2) Identify escape route prior to cutting.</li> <li>3) Ensure area is clear of people and hazards. Mark/flag area, if necessary.</li> <li>4) Make sure people in the area are aware you are cutting before you begin.</li> <li>5) Be extremely cautious of binding or kick-back.</li> </ol>
	E. Overexertion	<ol style="list-style-type: none"> <li>1) Cut asphalt, metal, or concrete into smaller pieces to avoid heavy lifting.</li> <li>2) Bend at knees, pull the object close to your body, stand up with the object, and do not twist.</li> <li>3) Use teamwork or equipment to lift heavy loads.</li> </ol>

Cut-Off Saw – General Operation



JSA Acknowledgements

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation Dump Truck – General Operation and Use		2. Job Location Stockpiles and Field (various)	
3. Equipment/Tools/Machinery Used Dump Truck		4. Medical Exams Physical Exam Required	Yes
		Respirator Exam Required	No X
5. Required Training Operator Training – 75 hrs. (Permanent Employee) or 37.5 hrs. (Temporary Employee)		6. Inspection Requirements	Frequency Daily / Prior to each use
New Equipment Field Training			Every 6 months (Garage)
Safe Driver			
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Electrical Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Heat/Cold Protection	Other:
Welding Shield	X Leather Work	Metatarsal Protection	<b>Body (Whole)</b>
Other:	Other:	Chemical Resistance	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Other:
X Hard Hat	Ear Muffs		Other: <b>Other</b>
Other:	Ear Plugs		
	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual	X Pub 445M	X Pub 235 (O1)
Foreman's Manual	Pub 234	X M-614	X CDL Manual
<b>Prepared By:</b> District 6 JSA Team		<b>Safety Coordinator:</b> Ken Whitton	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Dump Truck – General Operation and Use

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614).	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Cut, Puncture, Scrape, or Burn</p> <p>C. Slip, Trip, Fall - Same Level (roadsurface) or Different Level (equipment) Fractures, Contusions, Bruises - Whole Body Sprains, Strains - Upper Body</p> <p>D. Pinch Points/Crushing Injury</p>	<p>1) Ensure dump truck is turned off and keys are in pocket.</p> <p>1) Wear leather gloves to protect from sharp edges or hot surfaces.</p> <p>1) Look at the surface around the dump truck and clear debris to prevent trips and falls.</p> <p>2) Wear safety foot wear that is above the ankle with good tread.</p> <p>3) Ensure surface around cab entry is free from surface debris.</p> <p>4) Face the dump truck and maintain three (3) points of contact when entering or exiting the vehicle or equipment.</p> <p>5) Never jump down or skip steps.</p> <p>1) Secure the hood to prevent it from falling.</p> <p>2) If needed, use recommended bed props/supports to secure the bed in an elevated position.</p>
2. Travel to and From Job Site	A. Slip, Trip, Fall	<p>1) Face the dump truck and maintain three (3) points of contact when entering or exiting the vehicle.</p> <p>2) Never jump down or skip steps.</p> <p>3) Use proper hand holds and steps. Look for bent or broken steps.</p> <p>4) Ensure shoes or tread are not caught in the steps before continuing to climb.</p> <p>5) Remove buildup of snow, ice, or mud from steps.</p>
3. Arrive at Site to Collect Materials for Transport	<p>B. Struck by Flying Object</p> <p>C. Vehicle Accidents</p> <p>A. Vehicle Accidents</p> <p>B. Overhead Obstruction/ Electrocutation</p>	<p>1) Make sure objects are secured and place any loose or heavy items in the proper storage area.</p> <p>1) Refer to Driving JSA</p> <p>1) Slow down upon arrival to collection site and observe other vehicles and/or pedestrians in the area.</p> <p>2) If backing into the load site is required, confirm the location of other equipment or personnel.</p> <p>3) Use a spotter every time one is available.</p> <p>4) If a spotter is not available, get out of the truck and ensure the area is clear prior to dumping.</p> <p>1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained.</p> <p>2) Evaluate the area when entering a new dumping location to ensure you will not come into contact with overhead electrical lines or other hazards as you position for the load.</p> <p>3) Stay a minimum of 10 feet away from power lines-if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.</p> <p>4) Contact the utility company when work must take place within the minimum distance.</p>

Dump Truck – General Operation and Use

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Arrive at Site to Collect Materials for Transport continued	C. Vehicle Accident – Instability – Load	<ol style="list-style-type: none"> <li>1) Position the truck for side loading and set the parking brake.</li> <li>2) Confirm the material has been properly loaded (distributed evenly, not overloaded) prior to leaving the site.</li> <li>3) Confirm that the tailgate is secure.</li> </ol>
4. Travel Back to Job Site for Unloading	A. Vehicle Accident	<ol style="list-style-type: none"> <li>1) Maintain awareness of the relationship between increased braking distance as the dump load weight increases.</li> <li>2) Ensure proper air pressure is maintained for the brakes.</li> <li>3) Allow for additional stopping distance when road surfaces are wet.</li> <li>4) Wear your seat belt.</li> <li>5) Do not use any communication devices while driving.</li> </ol>
5. Unload Material	A. Striking Others	<ol style="list-style-type: none"> <li>1) Always use a spotter when available when positioning vehicle for dumping or spreading.</li> <li>2) Ensure you have a clear understanding of signals and a clear view of the spotter.</li> <li>3) If a spotter is not available, get out of the truck and ensure the area is clear prior to dumping.</li> <li>4) Check for traffic prior to exiting the vehicle.</li> </ol>
	B. Tip Over – Uneven Surfaces	<ol style="list-style-type: none"> <li>1) The truck should be positioned on an even surface for dumping.</li> <li>2) If required to dump on a slope, place the truck so that it faces up or faces down the slope.</li> <li>3) Be aware of wet loads that may create an unsafe condition while unloading the material.</li> <li>4) Ensure the parking brake has been set and the tailgate is in the open position.</li> </ol>
	C. Overhead Obstruction / Electrocutation	<ol style="list-style-type: none"> <li>1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained.</li> <li>2) Evaluate the area when entering a new dumping location to ensure you will not come into contact with overhead electrical lines or other hazards as you position for the load.</li> <li>3) Stay a minimum of 10 feet away from power lines-if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.</li> <li>4) Contact the utility company when work must take place within the minimum distance.</li> </ol>
6. Troubleshoot Problems with Bed Operation	A. Crushing Injury	<ol style="list-style-type: none"> <li>1) Never work under a raised bed unless it is adequately supported by the recommended safety devices/props.</li> <li>2) Do not rely on the hydraulic system to hold the bed in the up position.</li> <li>3) Report issues to your supervisors for additional direction or repair.</li> </ol>

Dump Truck – General Operation and Use

**JSA Acknowledgements**

Print Name	Signature	Date

Dump Truck – General Operation and Use

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Excavator (Track Hoe) – General Operation		Field	
3. Equipment/Tools/Machinery Used			
Excavator		4. Medical Exams	Yes
		Physical Exam Required	No
		Respirator Exam Required	X
		Respirator Exam Required	X
5. Required Training			
Excavator Certification		Frequency	Frequency
		Initial	Daily
6. Inspection Requirements			
M-614		Daily	
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield		Foot Protection	Rain Gear
Other:	Heat Resistant	X Above the ankle with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual		
Foreman's Manual	Pub 234		
<b>Prepared By:</b> District 4 JSA team		<b>Safety Coordinator:</b> Wayne Wolfe	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Excavator (Track Hoe) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket.  1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety shoes that are above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Travel To / From Job Site	A. Vehicle/Equipment Accident	1) Wear seat belt at all times when operating equipment and utilize defensive driving techniques. 2) Maintain safe traveling speed according to the road conditions and slow down when turning. 3) Refer to Low Boy JSA
3. Perform Pre-Work and On-Site Job Assessments	A. Fire/Explosion  B. Crushing Injury/Suffocation/Struck by Falling Object  C. Electrocution	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities and verify the site is marked as needed. 1) Determine the depth of the excavation and if any workers will need to enter the excavation. 2) Determine if protective measures or systems (sloping/benching, shoring, and/or shielding) will be needed for trench safety based on depth. 3) Protective systems may be needed at depths between four (4) and five (5) feet and are required at five (5) feet.  1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained. 2) Identify any overhead power lines or other electrical hazards. 3) Stay a minimum of 10 feet away from power lines-if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately. 4) Contact the utility company when work must take place within the minimum distance.
4. Ensure Traffic Control in Place as Necessary	D. Sliding, Fall, Rollover - Equipment  E. Vehicle/Object - Struck By or Against  A. Vehicle/Equipment – Struck By or Against	1) Observe area for ground/soil conditions, slope, uneven/slippery surfaces, obstructions, and other hazards. 1) Wear hard hat and high visibility apparel at all times when outside of crew cab at the jobsite. 1) Refer to Work Zone Traffic Control JSA and Pub 213

Excavator (Track Hoe) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Enter/Exit the Cab	<p>A. Slip, Trip, Fall</p> <p>B. Sprain/Strain</p> <p>C. Vehicle/Equipment – Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Keep shoes free from mud, ice, snow, or other material that could cause them to slip.</li> <li>2) Face the equipment and maintain three (3) points of contact when entering and exiting the cab.</li> <li>1) Never jump off the equipment. Always use foot and hand holds.</li> <li>1) Park the machine on level ground.</li> <li>2) Never enter or exit a moving piece of equipment.</li> <li>3) Lower the bucket to the ground, put controls in neutral, and apply the parking brake before leaving the cab.</li> <li>4) Stop the engine and place the key in your pocket.</li> <li>5) Wear hard hat and high visibility apparel when exiting equipment at the jobsite.</li> </ol>
6. General Excavator Operation	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Slip, Trip, Fall - From Elevation</p> <p>C. Sliding, Fall, Rollover - Equipment</p> <p>D. Struck By Falling Object/Crushing</p> <p>E. Electrocutation</p>	<ol style="list-style-type: none"> <li>1) Barricade the work area and/or use signage to prevent unauthorized access and establish exclusion zones if necessary.</li> <li>2) Know the swing radius of the arm and counter weight. Never allow anyone to enter the swing area and ensure proper clearances from objects.</li> <li>3) Scan the area for workers or equipment before moving the track hoe.</li> <li>4) Maintain clean windows and mirrors for visibility.</li> <li>5) Always work facing the equipment. Maintain visual contact with the operator.</li> <li>1) Wear seat belt at all times while in the cab.</li> <li>2) Never walk or climb on the boom, stick, or bucket to fix/repair.</li> <li>1) Visually inspect the ground to ensure it is stable to support the machine and suitable for operations (maximum allowable slope, soil conditions, water, slippery surfaces, etc.) to avoid rollover or sliding.</li> <li>2) Stay at least 2 feet away from the edge of slopes, banks, and excavations.</li> <li>3) Never undercut the machine.</li> <li>4) Do not overload the capacity of the machine. Refer to operators manual and load chart.</li> <li>1) Never allow anyone to stand under the bucket or ride on the equipment.</li> <li>1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained.</li> <li>2) Identify any overhead power lines or other electrical hazards.</li> <li>3) Stay a minimum of 10 feet away from power lines-if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.</li> <li>4) Contact the utility company when work must take place within the minimum distance.</li> </ol>

Excavator (Track Hoe) – General Operation



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
7. Work on a Slope	A. Equipment Roll Over - Crushing	<ol style="list-style-type: none"> <li>1) Work from a flat surface if available.</li> <li>2) Travel straight up and down slopes, avoid going across or sideways.</li> <li>3) Keep loads low while maneuvering. Avoid turning on slopes or with a raised load.</li> </ol>
8. Load Dump Truck or Hauler	<p>A. Struck By – Falling Object</p> <p>B. Electrocutation</p>	<ol style="list-style-type: none"> <li>1) Make sure truck operator and coworkers are in safe location before dumping material into bed or hauler.</li> <li>2) Load the truck or hauler from the side or back.</li> <li>3) Never swing bucket over the cab.</li> <li>4) Place bucket close to dump location. Never dump from excessive heights.</li> <li>1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained.</li> <li>2) Identify any overhead power lines or other electrical hazards.</li> <li>3) Stay a minimum of 10 feet away from power lines-if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.</li> <li>4) Contact the utility company when work must take place within the minimum distance.</li> </ol>
9. Special Attachments	A. Struck By – Falling Objects	<ol style="list-style-type: none"> <li>1) Follow manufacturer’s directions for proper use.</li> <li>2) Make sure all pins and locks are securely fastened.</li> <li>3) Make sure all hoses are securely fastened.</li> </ol>
10. Lifting With a Chain/Sling	A. Struck By – Flying or Falling Object	<ol style="list-style-type: none"> <li>1) Use approved chains, slings, and lifting hardware in good condition and with a sufficient load rating.</li> <li>2) Attach chain to designated lift point (lifting eyes) with a load rated shackle.</li> <li>3) Never make a lift with a chain or sling attached solely to the bucket teeth, lifting arms, or hydraulic lift cylinders.</li> <li>4) If no lifting point, weave the chain through the teeth and form a triangle with the chain sling at the opening of the bucket. The tail of the chain should be brought back over the backside of the bucket.</li> <li>5) Keep teeth pointed downward at all times.</li> <li>6) Use blocking or some other form of protection to prevent chain damage/failure where it bends over sharp edges.</li> <li>7) Never lift a load over another worker.</li> </ol>

Excavator (Track Hoe) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Lifting With a Chain/Sling continued	B. Vehicle/Equipment - Struck By or Against/Tip Over	<ol style="list-style-type: none"> <li>1) Never exceed the manufacturer's load or lifting capacity. Refer to the owner's manual and lifting carts.</li> <li>2) When the radius or distance of the load increases from the excavator, the excavator's leverage and lifting capacity decreases.</li> <li>3) Always move at the slowest speed when traveling with a suspended load.</li> <li>4) Keep loads as low to the ground as possible when traveling to maintain control of the load.</li> <li>5) Slowly move bucket to drop point to avoid swinging of material.</li> <li>6) Never pick up loads in high winds.</li> </ol>
11. Refuel	A. Chemical (fuel)	<ol style="list-style-type: none"> <li>1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released.</li> <li>2) Wear safety glasses to protect from incidental contact.</li> <li>3) Do not top-off the tank.</li> </ol>
	B. Fire/Explosion	<ol style="list-style-type: none"> <li>1) Shut off the engine.</li> <li>2) No smoking, heat sources, or open flames near fueling area.</li> <li>3) Ensure fire extinguisher is nearby during refueling.</li> </ol>

Excavator (Track Hoe) – General Operation

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

<b>1. Job Operation</b>		<b>2. Job Location</b>	
Forklift - General Operation		Garage, Stockpile	
<b>3. Equipment/Tools/Machinery Used</b>			
Forklift, Attachments		Physical Exam Required	Yes
Respirator Exam Required		Respirator Exam Required	No
Frequency		Frequency	X
Initial / 3 Year Evaluation		Daily / Before use	
<b>5. Required Training</b>			
Forklift (Classroom / Hands-On)		M-614	
<b>7. Personal Protective Equipment (X)</b>			
<b>Eyes</b>		<b>Feet/Legs</b>	
X	Safety Glasses	Leggings / Chaps	<b>Body / Skin</b>
X	Chemical Goggles	Foot or Leg Guards	Reflective Apparel
	Dust Goggles	Reflective Leggings	Reflective Face piece
	Welding Shield	Foot Protection	Half Face Respirator
	Other:	X Above the ankle boot with good tread	Full Face Respirator
	<b>Face</b>	Heat/Cold Protection	PAPR
X	Face Shield	Electrical Protection	SCBA
	Welding Shield	Chemical Resistance	Supplied Air
	Other:	Metatarsal Protection	Cartridge:
	<b>Head</b>	Other:	Other:
X	Hard Hat	<b>Hearing Protection</b>	<b>Other</b>
	Bump Cap	Ear Muffs	X Approved basket /work platform (optional)
	Other:	Ear Plugs	
		Other:	
<b>8. Reference Manuals</b>			
	Pub 213		
	Foreman's Manual		
	Operators Manual		
	Pub 234		
<b>Prepared By:</b> District 4 JSA Team		<b>Safety Coordinator:</b> Wayne Wolfe	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Untrained Operator/ Various Hazards	1) Ensure the operator receives training on the proper operation of the equipment.
	B. Defective Equipment - Various Hazards	1) Do not operate an unsafe forklift at any time. Report any broken, missing, or defective equipment to the designated person or supervisor. 2) Modifications and use of such equipment are not allowed without expressed written approval from the manufacturer or authorized representative.
	C. Vehicle/Equipment - Struck By or Against	1) Ensure vehicle is turned off, keys in pocket.
	D. Cut, Puncture, Scrape	1) Wear leather work gloves to protect from sharp edges and pinch points.
	E. Slip, Trip, Fall	1) Observe path and area around the machine for obstructions, clutter, uneven/slippery surfaces, and other tripping hazards.
2. Getting On/Off Equipment	A. Slip, Trip, Fall	1) Wear safety footwear that is above the ankle with good tread. 2) Keep hands, shoes, and controls as clean and dry as possible to minimize the risk of slips and falls. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting . 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
3. General Operation / Driving	A. Tip Over/Crushing Injury	1) Wear your seatbelt at all times when on the truck. 2) Avoid making jerky starts and sudden stops. Never use reverse in order to brake. 3) Slow down when turning and do not turn on inclines. 4) Identify and stay well back from open edges such as ramps and loading docks. 5) Keep all body parts inside the frame of the fork lift at all times. 6) If the truck tips, hug the steering wheel and do not jump. 7) Keep loads as low to the ground as possible when traveling maintain control of the load.
	B. Vehicle/Equipment - Struck By or Against	1) Operate at a safe speed with regard to traffic conditions. 2) Scan the area for coworkers and people entering the work area. 3) Slow down or stop and sound your horn at doorways, corners, intersections, and places with limited view. 4) Never drive toward any person who is in front of a fixed object or wall.
Forklift - General Operation		

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>4. Loading / Unloading</p>	<p>A. Struck by Flying or Falling Object /Crushing Injury</p>	<ol style="list-style-type: none"> <li>1) Never lift forks or loads near people or over the top of them.</li> <li>2) No person is permitted to stand or walk under elevated forks.</li> <li>3) Wear a hard hat if the forklift is not equipped with overhead protection.</li> <li>4) Spread forks as wide as possible for transporting the load.</li> <li>5) Position the forks so that the distance from the front wheels to the load's center of gravity is minimized, and the heaviest portion is closest to the mast.</li> <li>6) Ensure the forks are inserted into the base of the load as far as possible.</li> <li>7) Keep the load level or tilted back towards the mast in preparation for traveling.</li> </ol>
	<p>B. Equipment - Struck Against</p>	<ol style="list-style-type: none"> <li>1) Check overhead clearances and for other obstructions before raising or lowering a load.</li> <li>2) Make sure the load is square and as close as possible to the drop point before raising the forks.</li> </ol>
	<p>C. Tip Over/Crushing Injury</p>	<ol style="list-style-type: none"> <li>1) Don't overload the machine at any time. Check the capacity of the truck and the weight of the load before lifting.</li> <li>2) Never counterweight a forklift to increase its lifting capacity.</li> <li>3) When unloading trucks or trailers, the brakes on that vehicle must be set (locked) and the wheels chocked.</li> </ol>
<p>5. Moving Loads</p>	<p>A. Tip Over/Crushing Injury</p>	<ol style="list-style-type: none"> <li>1) Secure the load before traveling. Never move a load unless it is completely stable.</li> <li>2) Lower the load 4"-6" from the ground before traveling or turning.</li> <li>3) Drive up and down inclines with the load on the uphill side.</li> </ol>
	<p>B. Vehicle/Equipment - Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Travel in reverse if vision is blocked by the load. Use a spotter if necessary.</li> <li>2) Travel with load as low as possible to avoid striking building structures and overhead objects.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Lifting People	A. Slip, Trip, Fall – From Elevation	<ol style="list-style-type: none"> <li>1) Never allow passengers or riders anywhere on the truck.</li> <li>2) Never raise a person on the forks or a pallet. Only an approved basket designed and marked for this purpose can be used.</li> <li>3) Ensure approved basket is securely attached to the forks.</li> <li>4) Never travel with a person in the basket, they may only be used to raise and lower a person.</li> <li>5) Passengers should never leave the floor of the basket or use the railing system to gain additional reach or height.</li> <li>6) If it is necessary to leave the basket to gain access to an elevated work surface, a personal fall arrest system and 100% tie off to an approved anchor point outside the basket is usually required.</li> </ol>
7. Park and Shut Down Equipment	A. Vehicle/Equipment - Struck By or Against or Crushing Injury	<ol style="list-style-type: none"> <li>1) Never leave the truck until the lifting mechanism is lowered, controls are in neutral, and brakes are set.</li> <li>2) Park in the designated area when not in use.</li> <li>3) Always administer the emergency brake.</li> <li>4) Turn off the truck if you move beyond the immediate work area or the truck is not visible.</li> <li>5) Remove keys and place in pocket.</li> <li>6) A forklift may not be left on an incline unless it is safely parked and the wheels are blocked.</li> </ol>
8. Refuel/Charge Forklift	B. Fire/Emergency or Slip, Trip, Fall  A. Inhalation/Toxic Gases  B. Chemical/Fire/Explosion	<ol style="list-style-type: none"> <li>1) Place forks in the lowest position possible with the forks tips down flat on the surface.</li> <li>2) Never park in areas that will block exits, stairways, fire extinguishers, or other emergency equipment.</li> <li>1) Make sure there is appropriate ventilation when operating a LPG, gasoline or diesel fueled trucks to reduce the buildup of carbon monoxide.</li> <li>1) Fueling and/or charging operations should be conducted in the designated location.</li> <li>2) Wear a face shield, goggles, apron, and rubber gloves servicing batteries.</li> <li>3) Ensure the charging area has adequate ventilation to control the accumulation of combustible gases.</li> <li>4) Keep open flames away from the battery and refueling/charging area.</li> </ol>
Forklift – General Operation	C. Temperature Extreme - Freeze	<ol style="list-style-type: none"> <li>1) Wear leather or thermal gloves and safety glasses when changing tanks on LPG powered forklifts.</li> </ol>

JSA Acknowledgements

Print Name	Signature	Date



**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Front End Loader – General Operation		Stockpiles & Field (various)	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Loader, Front Bucket, Hook, Fork, Shovel, Digging Iron		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	
Operator Training – 75 hrs. (Permanent Employee) or 37.5 hrs. (Temporary Employee*)		Frequency	Daily / Prior to every use
New Equipment Field Training		Initial	Every 6 months (Garage)
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold Resistance	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistance	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual	Pub 445M	
	Pub 234	Pub 247	
<b>Prepared By:</b> District 4 JSA Team		<b>Safety Coordinator:</b> Wayne Wolfe	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Cut, Puncture, Scrape	1) Wear leather work gloves to protect from sharp edges and pinch points.
	B. Vehicle/Equipment – Struck By or Against	1) Ensure vehicle is turned off, keys in pocket.
	C. Slip, Trip, Fall	1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Raise Boom & Curl Bucket to Circulate Hydraulics (Cold Weather Operation).	A. Vehicle/Equipment – Struck By or Against	1) Maintain visual contact with spotter and/or ensure operating area is clear of employees.
3. Attach Special Equipment (e.g. hooks or forks) as Necessary	A. Sprain/Strain or Overexertion	1) Avoid manually moving or lifting unit attachments. 2) If necessary, use proper lifting techniques and get assistance 3) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist.
	B. Vehicle/Equipment – Struck By or Caught Between	1) Maintain visual contact with spotter and/or ensure operating area is clear of employees. 2) Ensure the unit/attachment is fully engaged and secure. 3) Shut off the loader or hydraulics to prevent accidental movement of the attachments when a spotter is helping to secure them. 4) Keep hands clear of attachment pinch point areas if manual positioning or securing is necessary.
4. Travel To/From Work Location	A. Slip, Trip, Fall from Elevation	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	B. Vehicle/Equipment – Struck By or Against	1) Wear seat belt at all times when operating equipment. 2) Park/position equipment in a safe location as to not create additional hazards.
	C. Vehicle/Equipment – Struck by or Against	1) Know width of vehicle and bucket. 2) Maintain proper bucket position – minimum of one (1) foot off ground and curled all the way back. 3) Apply minor bucket adjustments to minimize bounce. 3) If applicable, disengage from 4-wheel drive when driving to worksite.

Front End Loader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Inspect Job Site for Potential Hazards and Ensure Traffic Controls in Place	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Slip, Trip, Fall</p> <p>C. Struck by Flying, Falling, Sliding Object</p>	<p>1) Refer to Work Zone Set Up JSA.</p> <p>1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>1) Wear hard hat.</p>
6. General Loader Operations	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Caught In, Under, Between</p>	<p>1) Ensure area is clear of employees. Utilize barricades and/or signage to establish exclusion zones if necessary.</p> <p>2) Maintain clean windows and mirrors for operator visibility.</p> <p>3) Ensure the audible alarms and flashing lights are functioning properly.</p> <p>4) Perform a visual inspection for hazards and risks before backing up or working in reverse.</p> <p>1) Visually inspect the ground to ensure it is stable and suitable for operations (maximum allowable slope, soil conditions, water, slippery surfaces, etc.) to avoid rollover or sliding.</p> <p>2) Do not travel across slopes and only turn the loader on level ground where possible.</p> <p>3) Never allow anyone to stand or go under a raised bucket or other attachment.</p> <p>4) Use the lift arm supports provided or recommended by the manufacturer when it is necessary to work or move around the loader with the bucket/attachment in a raised position.</p> <p>5) Ensure the lock bar is in place any time you have to enter the articulation point.</p>
7. Moving or Raising Loads	<p>C. Slip, Trip, Fall</p> <p>D. Electrocutation</p> <p>A. Vehicle/Equipment – Struck By or Rollover</p>	<p>1) Never stand/ride on the equipment or inside the bucket/ attachments under any circumstance.</p> <p>1) Ensure area is clear of overhead electrical lines/hazards.</p> <p>1) Never exceed the manufacturer's load capacity to prevent failure or rollover.</p> <p>2) Keep loads low while maneuvering (at least one (1) foot or as needed for minimum clearance).</p> <p>3) Travel straight up and down with the load or heavy end of the machine pointed uphill.</p> <p>4) Maneuver to truck then raise load, come in straight and avoid angles/turning.</p>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Moving or Raising Loads continued	C. Struck by Flying, Falling, Sliding Object	1) Wear hard hat and keep safe distance from operating equipment.
8. Exiting/Entering Cab During Operations	A. Slip, Trip, Fall B. Vehicle/Equipment – Struck By or Against	1) Refer to Step 1.C. when existing and entering loader. 1) Park the machine on level ground, when possible, to avoid roll away. 2) Place transmission controls in neutral, move FNR lever to neutral, and engage parking brake. 3) Stop the engine and place the key in your pocket. 4) Wear hard hat and high visibility apparel when exiting the loader during field operations. 5) Block wheels if you park on a grade or there is any potential for rolling.
9. Cleaning Equipment	C. Caught In/Under/Between	1) Lower all equipment to the ground when the loader is not in use or prior to existing. 2) Do not grab or use steering wheel to exit cab to avoid being struck or crushed due to the articulation of the bucket/support arms.
	A. Struck by Flying Object	1) Wear safety glasses or safety goggles to protect eyes from debris.
	B. Vehicle/Equipment – Struck by or Against	1) Wear leather work gloves to protect hands. 2) Keep firm grip on shovel or digging iron to avoid striking hands against the equipment when cleaning and dislodging dirt.
10. Shut Down Procedure - Let idle for three (3) to five (5) minutes before turning off	A. Slip, Trip, Fall from Elevation	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	B. Caught In, Under, Between	1) Ensure bucket is flat on ground. 2) Set parking brake. 3) Rotate steering back & forth to depressurize articulation. (Select Models)

Front End Loader – General Operation

JSA Acknowledgements

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

<b>1. Job Operation</b>		<b>2. Job Location</b>	
Garage Tire Removal and Installation - General		Garage and Field	
<b>3. Equipment/Tools/Machinery Used</b>			
Wheel Chocks, Jack, Jack Safety Stand, Air Supply, Air Impact, Wheel Buddy, Supply Socket, Torque Wrench		Yes	No
<b>4. Medical Exams</b>			X
Physical Exam Required			
Respirator Exam Required			X
<b>5. Required Training</b>			
Frequency		Frequency	
Initial and as needed due to injury, change in equipment, etc.		Before Each Use	
		Before Each Use	
		Before Each Use	
<b>7. Personal Protective Equipment (X)</b>			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Electrical Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Chemical Resistance	Other:
Welding Shield	X Leather Work	Metatarsal Protection	<b>Body (Whole)</b>
Other:	Other:	Other:	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>		Personal Flotation Device
Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
<b>8. Reference Manuals</b>			
X Pub 177	X Pub 247		
<b>Prepared By:</b> District 6 JSA Team		<b>Safety Coordinator:</b> Ken Whitton	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Garage - Tire Removal and Installation - General

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Remove Keys from Vehicle	A. Struck By/Caught In/Contact With	1) Keys must be removed and placed in your pocket while performing maintenance.
2. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment - Struck By or Against B. Slip, Trip, Fall	1) Ensure vehicle is turned off, the parking brake is set, the wheels are chocked, and keys are in your pocket. 1) Wear safety footwear that is above the ankle with good tread. 2) Ensure surface around equipment is free of debris, tools, hoses, cords, and other tripping hazards. 3) Face equipment and maintain three (3) points of contact when entering or exiting equipment. 4) Never jump down or skip steps.
3. Gather Tools and Equipment to Complete the Task	A. Cut, Puncture, Scrape	1) Wear protective work gloves while gathering tools and equipment. 2) Inspect all equipment and tools for weight capacities and damage. 3) Complete lock out/tag out procedures on damaged tools or equipment, to remove from service, and report.
4. Place Jack on Factory Approved Vehicle/Equipment Jacking Point	A. Vehicle/Equipment - Struck By or Against	1) Ensure that jack surface is even for stable support. If the tire must be changed out on a job site, a stable support should be available for use to place under the jack.
5. Jack the Vehicle and Install Safety Stands	A. Sprains/Strains	1) When jacking up the vehicle, bend at the knees and keep your back straight. If the jack does not operate smoothly, it should be replaced. 2) Install the safety stands in the factory approved locations.
	B. Struck By/Caught Under or Between- Vehicle and Floor Surface	1) Stay clear of the vehicle while jacking and carefully observe the stability of the vehicle. Leave the jack in place (if possible) or relocate to another approved point as a backup.
	C. Struck By/Caught Under or Between - Vehicle and Safety Stands	1) Make sure jack stands are level and secure. 2) While lowering the vehicle, keep body parts clear of the point of vehicle contact with the safety stands. 3) Nudge the vehicle to ensure that it will remain stable while performing your job task.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Remove Lug Nuts	A. Noise B. Struck By - Tools or Materials	1) Wear hearing protection (plugs or muffs) while operating pneumatic equipment. 1) Ensure that your safety glasses with side protection are worn.
7. Remove the Tire/Wheel	A. Sprains/Strains - Whole Body B. Slip, Trip, Fall - Same Level C. Contusions, Bruises - Hands D. Severe Injury - Whole Body	1) Lift with your legs, keep your back straight and keep the load close to your body while positioning the tire/wheel on the dolly. 2) Use the wheel dolly to support and carry the wheel. 1) Ensure that your work area around the dolly is clear of cords, tools, and other tripping hazards. 1) Watch hand placement while positioning the tire/wheel on the dolly. 1) Follow injury procedure in Pub 445M
8. Inspect the Studs and Hub	A. Slip, Trip, Fall - Same Level B. Contusions, Bruises - Head	1) Ensure that your work area is clear of cords, tools, and other tripping hazards. 1) Take your time while performing the inspection and observe for potential overhead hazards.
9. Install New Tire/Wheel	A. Sprains/Strains - Whole Body B. Slip, Trip, Fall - Same Level C. Contusions, Bruises - Hands	1) Load new tire/wheel onto the dolly. 2) Lift with your legs, keep your back straight, and keep the load close to your body while positioning the tire/wheel on the dolly. 1) Ensure that your work area is clear of cords, tools, and other tripping hazards. 1) Watch hand placement while positioning the new tire/wheel.
10. Install Lugs	A. Sprains/Strains - Upper Body B. Struck By - Tools or Materials	1) Ensure lugs are installed according to manufacturer's specifications. 2) Maintain proper footing and positioning to allow for torque. 1) Ensure that your safety glasses with side shields are worn.
11. Jack the Vehicle Up	A. Sprains/Strains - Whole Body	1) When jacking up the vehicle, bend at the knees and keep your back straight. 2) If the jack does not operate smoothly, it should be replaced.



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Jack the Vehicle Up continued	B. Struck By/Caught Under or Between – Vehicle and Floor Surface C. Struck By/Caught Under or Between – Vehicle and Jack Stands	1) Stay clear of the vehicle while jacking and carefully observe the stability of the vehicle. 1) While raising the vehicle, keep body parts clear of the point of vehicle contact with the safety stands.
12. Remove Safety Stands	A. Sprains/Strains – Lower Back B. Struck Against – Head C. Struck By/Caught Under or Between – Vehicle and Floor Surface	1) Bend at the knees and keep your back straight while removing the safety stands. 1) Take your time while removing the stands and observe for potential overhead hazards. 1) Observe the stability of the vehicle prior to removing the safety stands. Stay focused on the task.
13. Lower the Vehicle to the Floor	A. Struck By/Caught Under or Between – Vehicle and Floor Surface	1) Ensure that there are no other coworkers, tools, or equipment in the immediate area prior to lowering the vehicle. 2) Keep all body parts clear of the floor surface and slowly lower the vehicle.
14. Remove Wheel Chocks	A. Sprains/Strains – Lower Back	1) Bend at the knees and keep your back straight while removing wheel chocks.
15. Clean Up Work Area	A. Slip, Trip, Fall – Same Level	1) Inspect tools and equipment and ensure they are stored properly. 2) Properly clean up any oil spills that occurred during maintenance.

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Garage – Tire Removal and Installation – General

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Grader - General Operation		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Grader		Physical Exam Required	No
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	Frequency
Operator Certification		M-614	Daily
New Equipment Field Training		Preventative Maintenance (PM) Inspection and Service	Every 6 months (Garage)
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Metatarsal Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Heat/Cold Protection	Other:
Welding Shield	X Leather Work	Electrical Protection	<b>Body (Whole)</b>
Other:	Other:	Chemical Resistance	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual		
Foreman's Manual	Pub 234		
<b>Prepared By:</b> District 6 JSA Team		<b>Safety Coordinator:</b> Ken Whitton	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Grader - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against	1) Ensure vehicle is turned off, keys in pocket.
	B. Cut, Puncture, Scrape	1) Wear leather work gloves to protect from sharp edges and pinch points.
	C. Slip, Trip, Fall	1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	D. Chemical/Cut or Puncture	1) Never use your hands to check hydraulic lines. 2) Use a piece of sturdy cardboard or wood when searching for hydraulic leaks. 3) Wear safety glasses or goggles and leather gloves.
	E. Burn	1) Make sure engine is cool before checking items in engine compartment.
	A. Chemical (fuel)	1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 2) Wear safety glasses to protect from incidental contact.
	B. Fire/Explosion	1) No smoking, open flames, cell phone use, or other ignition sources near the fueling area.
	A. Vehicle/Equipment – Accident	1) Keep the windows, mirrors, and lights clean to maintain good visibility. 2) Wear seat belt at all times when operating equipment. 3) Do not let anyone ride along (inside or outside). 4) Maintain safe traveling speed according to the road conditions and slowdown in congested areas. 5) Know the width, height, and weight of the vehicle and maintain proper clearances.
3. Travel To/From Job Site	B. Struck Against – Objects	1) Keep blade raised when traveling to the jobsite/work location. 2) Turn blade so no part extends into traffic when traveling to jobsite/work location.

Grader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
4. Pre-task Safety Brief	A. N/A	1) All employees assigned to this task will attend a pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.
5. Location/Setup of Grader	A. Electrocutation	1) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately. 2) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities.
	B. Fire/Explosion	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities.
	C. Environmental (Heat Stress, Frostbite)	1) Make sure you are wearing the proper PPE and clothing for the conditions. 2) Drink plenty of water.
	D. Vehicle/Equipment – Struck By or Against	1) Wear high visibility PPE and clothing when walking around the worksite. 2) Visually check area for other equipment before walking around equipment. 3) Do not park on an incline.
	E. Struck Against – Objects	1) Keep blade as low as possible but still able to clear objects when traveling on the jobsite.
6. Enter/Exit the Grader	A. Slip, Trip, Fall	1) Face the equipment at all times when entering and exiting the cab. 2) Keep shoes free from mud, ice, snow, or other material that could cause them to slip. 3) Always maintain three points of contact. (Two (2) hands and one (1) foot or two (2) feet and one hand.) 4) Do not use the controls as hand holds.
	B. Sprain/Strain	1) Never jump from the cab or off equipment. Always use foot and hand holds while maintaining three (3) points of contact. 2) Never use the blade as a step to get in or out of the grader.
	C. Vehicle/Equipment – Struck By or Against	1) Never enter or exit a moving piece of equipment.

Grader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>7. Operate Grader</p>	<p>A. Slip, Trip, Fall – From Grader</p>	<ol style="list-style-type: none"> <li>1) Always secure seatbelt properly before operating grader.</li> <li>2) Never allow riders on the grader for any reason (both inside and outside).</li> </ol>
	<p>B. Vehicle/Equipment – Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Do not operate grader until work zone is properly set up (Refer to Work Zone Set Up JSA).</li> <li>2) Do not drive grader outside of designated work zone.</li> <li>3) Use flaggers or other traffic control devices when moving grader from one side of the street to the other.</li> </ol>
	<p>C. Electrocutation</p>	<ol style="list-style-type: none"> <li>1) When cutting or scraping, always look for guide wires, markings, posts or other electrical hazards along the work area.</li> </ol>
	<p>D. Struck Against – Person</p>	<ol style="list-style-type: none"> <li>1) Travel forward as much as possible. Only back up when necessary.</li> <li>2) Always look in the direction of travel before reversing to ensure no one has entered your intended path of travel.</li> <li>3) Always use a spotter if available when backing up to ensure area is clear.</li> <li>4) Coordinate hand signals when you are using a spotter.</li> <li>5) Do not drive the grader towards a person standing in the path of travel.</li> <li>6) Never use the grader as a towing device to pull objects or other vehicles.</li> </ol>
	<p>E. Struck By – Flying Object</p>	<ol style="list-style-type: none"> <li>1) Never use the blade point to remove rocks or other hard objects.</li> <li>2) Do not use the grader blade to lift objects out of the ground.</li> </ol>
	<p>F. Caught In, Under, Between</p>	<ol style="list-style-type: none"> <li>1) Drive up and down the slope. Only use side slope travel if there is no alternative.</li> <li>2) Avoid blade down pressure when working on slopes or hills.</li> <li>3) Stay clear of drop offs or edges that could cause the grader to fall into or tip.</li> <li>4) Do not dig deeper than the machine will allow.</li> <li>5) Only cross rough terrain if there is no alternative. Use a reduced gear and slower speed.</li> </ol>

Grader – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Engine Shutdown/Parking	A. Fire  B. Vehicle/Equipment – Struck By or Against	1) Follow shut down procedures. Improper shutdown can cause a compartment fire. 2) Turbo chargers require three(3) – five (5) minutes to cool down. 1) Ground the blade when the grader is unattended. Shift blade to center and lock it when parking. 2) Select a safe parking location and remove ignition key when leaving grader.
9. Snow/Ice Removal	A. Struck By – Damaged Equipment (Cold Weather Startup)  B. Struck Against – Object	1) Let the grader warm up five (5) minutes if temperature is below 32 Degrees Fahrenheit before operating grader. 2) Cycle cylinders travel distance until full stroke isreached. 3) Avoid sudden operation of controls until the grader has warmed up. 1) Check operation of wipers and defroster before operating. 2) Keep windshield free of ice and snow. Stop and clear if necessary.

Grader – General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Grader – General Operation



**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Guiderail Removal & Installation – General Procedures		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Crew Cab, Post Pounder, Supply Truck, Crash Truck, Waste Truck, Air Compressor, Pneumatic Air Tools, Torch Set, Gas Powered Cut-off Saw, Hand Tools		Physical Exam Required	No
		Respirator Exam Required	X
5. Required Training		Frequency	
Post Pounder Certification	Initial	Daily	
Torch Training	Initial & Annual Review		
Truck & Loader Certification	Initial		
Oxygen/Acetylene	Initial & Annual Review		
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X Safety Glasses	Protective Sleeves	Leggings / Chaps	<b>Body / Skin</b>
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Apparel
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Reflective Vest/Flagger
Welding Shield		Foot Protection	Coveralls, Body Suit
X Other: Cutting Goggles	X Heat Resistant	X Above the ankle boot with good tread	Rain Gear
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Rubber Apron
X Face Shield	X Abrasion/Cut Resistant	Electrical Protection	Welding Leathers
Welding Shield	X Leather Work	Chemical Resistant	Other:
Other:	Other:	Metatarsal Protection	<b>Body (Whole)</b>
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Fall Arrest System
X Hard Hat	X Ear Muffs		Personal Flotation Device
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual		
X Foreman's Manual	X Pub 234		
<b>Prepared By:</b> District 3 JSA Team		<b>Safety Coordinator:</b> Thomas Walker	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Guiderail – Removal and Installation – General

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection All Equipment (M-614)	A. Vehicle/Equipment – Struck By or Against	1) Ensure vehicle is turned off, keys in pocket.
	B. Cut, Puncture, Scrape	1) Wear leather work gloves to protect from sharp edges and pinch points.
	C. Slip, Trip, Fall	1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Load/Unload Supplies	A. Cut/Laceration, Puncture, Scrape	1) At minimum, wear leather work gloves to protect from sharp edges and pinch points. Cut resistant gloves are recommended when handling guide rail material.
	B. Slips, Trips, Falls	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering or exiting vehicles or equipment. 3) Observe path or area for uneven/slippery surfaces, obstructions, and other tripping hazards. 4) Maintain good housekeeping and ensure items are neatly and properly stored.
	C. Sprain/Strain	1) Use proper lifting techniques when loading supplies into the trucks. Avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting. 3) Get assistance as needed.
	D. Stuck By Falling/Sliding Object	1) Take your time and stay focused on the task. 2) Ensure loads are properly secured. 3) Maintain firm grip with both hands and keep close to center of gravity to avoid dropping.
	E. Vehicle/Equipment - Struck By or Against	1) Use a spotter as a guide to maneuver loads into the truck. 2) Ensure other equipment and personnel are away from the loading area. 3) Maintain proper clearances to avoid hitting the truck or upsetting the load. 4) Make certain back up alarms are working properly. 5) If utilized, refer to Forklift or Front End Loader JSA.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
3. Travel to Work Site	A. Vehicle Accident – Struck By or Against	1) Refer to Safe Driver Training
4. Set-up Work Zone	A. Various	1) Utilize Publication 213 to determine the type of highway and setup configuration. 2) Refer to WZTC Set Up JSA
5. Remove Existing Guide Rail	A. Various	1) Refer to Welding/Cutting or Gas-Powered Cut-Off Saw or Pneumatic Air Tools JSAs for additional information as needed.
	B. Burn or Scald	1) Wear leather gloves, apron, and jacket.
	A. Weld flash	1) Make sure the welding helmet face shield has the proper shading for the task and is down before beginning any welding.
	C. Inhalation	1) Respirator usage is recommended to reduce potential exposures. 2) Keep head away from the smoke plume and stand upwind from any torch cutting.
	D. Caught In, Under, or Between	1) Stay focused on the task and be alert to what other coworkers are doing. 2) Keep body parts clear of pinch points. 3) Leave one bolt attached to support panels for safety.
	E. Cut/Laceration, Puncture, Scrape	1) At minimum, wear leather work gloves to protect from sharp edges and pinch points. Cut resistant gloves are recommended when handling guiderail material.
	F. Sprain/Strain - Overexertion	1) Use proper lifting techniques when working and avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting. 3) Get assistance as needed.
	G. Slip, Trips, Falls	1) Observe path or work area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
	H. Struck by Flying, Falling, Sliding Object	1) Watch for overhead objects/hazards and use a spotter as needed. 2) Wear hard hat and safety glasses or goggles.
	I. Vehicle/Equipment—Struck By or Against	1) Stay within the established work zone. 2) Wear high visibility PPE and apparel. 3) Make certain back up alarms are working properly. 4) Identify equipment locations and use a spotter as needed.
	J. Poisonous Plants	1) Identify potential poisonous plants prior to initiating work. 2) Wear long sleeves and gloves. Use skin barrier lotion as needed. 3) Remove vegetation and apply herbicide treatment as needed.
	K. Animal/Insect Bite	1) Identify potential for animals/insects. 2) Wear proper clothing and use insect repellent as needed.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Layout/Marking Ground	A. Slips, Trips, Falls	1) Observe path or work area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment
7. Laying Out Posts	A. Sprain/Strain - Overexertion	1) Use proper lifting techniques when working and avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting. 3) Get assistance as needed.
8. Line Up Post Pounder	B. Cut/Laceration, Puncture, Scrape A. Vehicle/Equipment--Struck By or Against B. Overhead Obstacles/Electrocution	1) Wear leather or cut resistant gloves when handling posts. 1) Use a spotter when available to align post pounder and coordinate hand signals. 2) Visually check area for other equipment and coworkers to ensure it is clear. 1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained. 2) Identify any overhead power lines or other electrical hazards. 3) Stay a minimum of 10 feet away from power lines if the work area contains any power lines(downed or otherwise), do not work in the area and notify the manager immediately. 4) Contact the utility company when work must take place within the minimum distance.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Latch Posts in Pounder/Pounding	A. Various	1) Refer to Post Pounder JSA.
10. Lay out Panels	A. Sprain/Strain - Overexertion	1) Use proper lifting techniques when working and avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting. 3) Get assistance as needed.
	B. Cut/Laceration, Puncture, Scrape	1) Wear leather or cut resistant gloves when handling panels.
11. Line Up/Install/Tighten Bolts	A. Cut/Laceration, Puncture, Scrape	1) Wear leather or cut resistant gloves when handling guide rail material.
	B. Slips, Trips, Falls	1) Observe the work area for slope, uneven/slippery surfaces, and other tripping hazards. 2) Clear path or work area of any obstructions or debris.
	C. Sprain/Strain - Overexertion	1) Use proper lifting techniques and avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed.
	D. Noise	1) Wear hearing protection (ear plugs or muffs) when using or in proximity to the pneumatic air tools / air compressor.
	E. Struck By Flying Object	1) Wear safety glasses.

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Hot Pour Mastics – General Procedure		Field	
3. Equipment/Tools/Machinery Used			
Dump Truck, Tar Kettle, Hose/Wand, Air Compressor/Wand, Squeegee, Router, Crew Cab, Drag Box (Asphalt Spreader)		4. Medical Exams	Yes
		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training			
Hot Work Material		Frequency	Daily
Kettle Operations		Initial	Prior to use
Personal Protective Equipment		Initial	Prior to use
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X	Safety Glasses	X	Leggings / Chaps
	Chemical Goggles		Foot or Leg Guards
X	Dust Goggles		Reflective Leggings
	Welding Shield		Foot Protection
	Other:	X	Above the ankle boot with good tread
<b>Face</b>			Heat/Cold Protection
X	Face Shield		Electrical Protection
	Welding Shield		Chemical Resistance
	Other:	X	Metatarsal Protection
<b>Head</b>		<b>Hearing Protection</b>	
X	Hard Hat	X	Ear Muffs
	Bump Cap	X	Ear Plugs
X	Other: Nomex hood		Other:
8. Reference Manuals			
X	Pub 213	X	Operators Manual
X	Foreman's Manual	X	Pub 445M
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinators:</b> Dennis J. McArdle, ASC	
<b>Reviewed By:</b> Employee Safety Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Conduct Circle of Safety and Pre-trip Inspection (M-614)</p>	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Cut, Puncture, Scrape</p> <p>C. Slip, Trip, Fall – Same Level (roadsurface) or Different Level (equipment)</p>	<p>1) Ensure equipment is turned off and keys are in pocket.</p> <p>2) Ensure tailgate of truck is secure prior to operation.</p> <p>3) All employees should be wearing high visibility safety apparel and hard hat due to close proximity of moving vehicles.</p> <p>1) Look at the surface around the equipment and clear debris to prevent trips and falls.</p> <p>1) Wear safety footwear that is above the ankle with good tread.</p> <p>2) Ensure surface around cab entry is free from surface debris.</p> <p>3) Face the equipment and maintain three (3) points of contact when entering or exiting the truck.</p> <p>4) Never jump or skip steps.</p>
<p>2. Pre-task Safety Brief</p>	<p>A. N/A</p>	<p>1) Employees assigned to this task will attend a pre-task safety brief to review the potential and previously identified hazards associated with the work activities.</p>
<p>3. Tar Kettle/Alternative Tar Kettle Transport</p>	<p>A. Damage to the Machine</p> <p>B. Sprain/Strain</p> <p>C. Burns– Hands, Body Parts</p> <p>D. Vehicle/Equipment - Struck By or Against</p>	<p>1) Load blocks of material according to manufacturer’s recommendations.</p> <p>2) Before starting machine, be certain paddle is off.</p> <p>3) Warm temperatures to manufactures specifications for transfer oil and application material.</p> <p>1) Use proper lifting techniques when loading or placing blocks. Bend at the knees, pull the object close to your body, stand up with the object, and do not twist.</p> <p>2) Get assistance as needed.</p> <p>1) At a minimum, you must wear safety glasses, face shield, long sleeved shirt, long pants, and leather gloves with gauntlets that extend above the wrist. Employees have the option to utilize additional PPE such as the Nomex hood and leather apron. (See Hot Mastics - PPE Chart)</p> <p>1) Use a spotter when available as a guide to maneuver load into the truck.</p> <p>2) Ensure other equipment and personnel are away from the loading area.</p> <p>3) Maintain proper clearances to avoid hitting the truck or upsetting the load.</p> <p>4) All employees should be wearing high visibility safety apparel and hardhat due to close proximity of moving vehicles.</p>

Hot Pour Mastics – General Procedure



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
3. Tar Kettle/Alternative Tar Kettle Transport continued	E. Slip, Trip, Fall – Same Level	1) Wear safety footwear that is above the ankle with good tread. 2) Continue to evaluate road surface as you clean out the cracks.
4. Set Up Work Zone	A. N/A	1) Refer to Work Zone Set Up JSA.
5. Properly Hydrate	A. Heat Exhaustion	1) Hydrate frequently throughout the day to prevent symptoms of heat exhaustion.
6. Air Compressor	A. Eye injury	1) Wear safety goggles and face shield to avoid eye injury.
7. Propane Torch	A. Burns– Hands, Body Parts	1) At a minimum, you must wear safety glasses, face shield, long sleeved shirt, long pants, and leather gloves with gauntlets that extend above the wrist. 2) Employees have the option to utilize additional PPE such as the Nomex hood and leather apron. (See Hot Mastics- PPE Chart)
8. Clean Cracks	A. Injection – Compressed Air	1) Maintain a good grip on the compressed air nozzle. 2) Never use compressed air to clean off clothing or point the nozzle at yourself or another employee.
	B. Slip, Trip, Fall – Same Level	1) Wear safety footwear above the ankle with good tread. 2) Look for changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.
	C. Crushing Injury – Dump Truck	1) Maintain good communication with equipment operator during the task. 2) Predetermine methods or signals to communicate with the driver.
	D. Noise	1) Wear ear plugs or earmuffs during this task.
	E. Foreign Objects – Eyes	1) Dust goggles are required. 2) Keep other co-workers/observers clear while performing the task.
	F. Vehicle/Equipment - Struck By or Against	1) Keep body within the work zone and be aware of passing traffic. 2) All employees should be wearing high visibility safety apparel and hardhat due to close proximity of moving vehicles.
	G. Hand Fatigue	1) Whenever possible, stretch hands outward to maintain blood flow and reduce cramping. 2) Alternate crew members as needed.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Filling Drag Box (Asphalt Spreader)	A. Vehicle/Equipment - Struck By or Against	1) Keep body within the work zone and be aware of passing traffic. 2) All employees should be wearing high visibility safety apparel and hardhat due to close proximity of moving vehicles.
	B. Burns – Hands, Body Parts	1) At a minimum, you must wear safety glasses, face shield, long sleeved shirt, long pants, and leather gloves with gauntlets that extend above the wrist. Employees have the option to utilize additional PPE such as the Nomex hood and leather apron. (See Hot Mastics- PPE Chart)
	C. Slip, Trip, Fall – Same Level	1) Wear safety footwear above the ankle with good tread. 2) Look for changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.
	D. Repetitive Motion/Sprain or Strain	1) Alternate crew members as needed.
	A. N/A	1) Refer to Tar Kettle JSA for additional information.
10. Applying Material	A. Sprains and Strains	1) Use proper lifting techniques when loading or placing materials. Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 2) Get assistance as needed.
	B. Burns – Hands, Body Parts	1) At a minimum, you must wear safety glasses, face shield, long sleeved shirt, long pants, and leather gloves with gauntlets that extend above the wrist. Employees have the option to utilize additional PPE such as the Nomex hood and leather apron. (See Hot Mastics- PPE Chart)
	C. Vehicle/Equipment - Struck By or Against	1) Keep body within the work zone and be aware of passing traffic. 2) All employees should be wearing high visibility safety apparel and hardhat due to close proximity of moving vehicles.
	D. Slip, Trip, Fall – Same Level	1) Wear safety footwear above the ankle with good tread. 2) Look for changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.
	E. Hand Fatigue	1) Whenever possible, stretch hands outward to maintain blood flow and reduce cramping. 2) Alternate crew members as needed.

Hot Pour Mastics – General Procedure

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
11. Squeegee Material (as needed)	A. Slip, Trip, Fall – Same level	1) Wear safety footwear above the ankle with good tread. 2) Look for changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.
	B. Sprains and Strains	1) Use proper lifting techniques when loading or placing materials. Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 2) Get assistance as needed.
	C. Burns – Hands, Body Parts	1) At a minimum, you must wear safety glasses, face shield, long sleeved shirt, long pants, and leather gloves with gauntlets that extend above the wrist. 2) Employees have the option to utilize additional PPE such as the Nomex hood and leather apron. (See Hot Mastics-PPE Chart)
	D. Hand Fatigue	1) Whenever possible, stretch hands outward to maintain blood flow and reduce cramping. 2) Alternate crew members as needed.
	F. Vehicle/Equipment - Struck By or Against	1) Keep body within the work zone and be aware of passing traffic. 2) All employees should be wearing high visibility safety apparel and hardhat due to close proximity of moving vehicles.
	12. Apply De-tac (as needed)	A. Sprains and Strains
B. Slip, Trip, Fall – Same level		1) Wear safety footwear above the ankle with good tread. 2) Look for changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.
C. Vehicle/Equipment - Struck By or Against		1) Keep body within the work zone and be aware of passing traffic. 2) All employees should be wearing high visibility safety apparel and hard hat due to close proximity of moving vehicles.

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation Jackhammer- General Operation		2. Job Location Field	
3. Equipment/Tools/Machinery Used Jackhammer, Air Compressor		4. Medical Exams	Yes No
5. Required Training New Equipment Field Training		Physical Exam Required	X
Frequency Initial		Respirator Exam Required	X
		6. Inspection Requirements	Frequency
		M-614	Daily
		Preventative Maintenance (PM) Inspection and Service	Every 6 months (Garage)
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
X Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	<i>Foot Protection</i>	Rain Gear
Other:		X Above the ankle with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	X Metatarsal Protection	Welding Leathers
X Face Shield	Abrasion/Cut Resistant	Heat/Cold Protection	Other:
Welding Shield	X Leather Work	Electrical Protection	<b>Body (Whole)</b>
Other:	Other:	Chemical Resistance	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	<b>Other</b>
X Hard Hat	X Ear Muffs		Personal Flotation Device
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual		
Foreman's Manual	X Pub 445M		
<b>Prepared By:</b> Employee Safety and Training Division		<b>Safety Coordinator:</b> Brian Pollick	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket. 1) Wear protective work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	D. Chemical/Cut or Puncture	1) Never use your hands to check hydraulic lines. 2) Use a piece of sturdy cardboard or wood when searching for hydraulic leaks. 3) Wear safety glasses or goggles and protective work gloves.
	E. Burn	1) Make sure engine is cool before checking items in engine compartment.
2. Pre-task Safety Brief	A. N/A	1) Employees assigned to this task will attend a pre- task safety brief to review the potential and previously identified hazards associated with the assignment.
3. Fueling	A. Chemical (fuel)	1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released.
	B. Fire/Explosion	2) Wear safety glasses to protect from incidental contact. 1) No smoking, open flames, cell phone use, or other ignition sources near the fueling area.

Jack Hammer – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
4. Travel To / From Job Site	A. Vehicle/Equipment – Accident	<ol style="list-style-type: none"> <li>1) Keep the windows, mirrors, and lights clean to maintain good visibility.</li> <li>2) Wear seat belt at all times when operating equipment.</li> <li>3) Maintain safe traveling speed according to the road conditions</li> <li>4) Maintain slow speeds in congested areas.</li> <li>5) Know the width of vehicle and maintain proper clearances.</li> <li>6) Inspect all connections, chains, and hitch securement before traveling.</li> <li>7) Refer to Lowboy JSA for trailering information.</li> </ol>
	B. Struck Against – Objects	<ol style="list-style-type: none"> <li>1) Periodically look at your side view mirrors to monitor the condition of the compressor.</li> <li>2) Avoid backing if possible.</li> <li>3) If backing is required use a spotter when available.</li> </ol>
5. Location/Setup of Compressor	A. Fire/Explosion	<ol style="list-style-type: none"> <li>1) Keep machine away from open source of flame.</li> <li>2) Do not use compressor if there is any fuel spillage.</li> </ol>
	B. Environmental (Heat Stress, Frostbite)	<ol style="list-style-type: none"> <li>1) Make sure you are wearing the proper clothing for the conditions.</li> <li>2) Drink plenty of water.</li> </ol>
	C. Vehicle/Equipment – Struck By or Against	<ol style="list-style-type: none"> <li>1) Wear high visibility PPE and hard hat when walking around the worksite.</li> <li>2) Visually check area for other equipment before walking around equipment.</li> <li>3) Do not park on an incline.</li> </ol>
	D. Struck Against – Objects	<ol style="list-style-type: none"> <li>1) Wear high visibility PPE and hard hat when walking around the worksite.</li> <li>2) Wear safety glasses when testing air pressure and hooking jackhammer to the air hose.</li> </ol>
	E. Slip, Trip, Fall	<ol style="list-style-type: none"> <li>1) Face the equipment at all times when entering and exiting the cab.</li> <li>2) Keep shoes free from mud, ice, snow, or other material that could cause them to slip.</li> <li>3) Maintain three (3) points of contact at all times. (Two (2) hands and one (1) foot or two (2) feet and one hand.)</li> </ol>

Jack Hammer – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Hooking up Jackhammer	A. Sprain/Strain	1) Never jump from the cab or off equipment. Always use foot and hand holds. 2) Use proper body ergonomics when opening compressor doors, and pulling air hose from reel.
	B. Struck By/Against – Objects	1) Make sure compressor is turned off, and air hose has no air pressure supplied. 2) Wear protective work gloves to protect sharp edges and pinch points. 3) Wear safety glasses/goggles to avoid any dirt and debris from entering eyes.
	A. Slip, Trip, Fall	1) Wear safety footwear above the ankle with good tread. 2) Be aware of tripping hazards and maintain proper footing at all times. 3) Be aware of air hose at all times and avoid walking over it if possible.
	B. Struck By – Vehicle	1) Do not operate compressor or jackhammer until work zone is properly set up (Refer to Work Zone Set Up JSA). 2) Wear high visibility PPE and hard hat when walking around the worksite. 3) Use a spotter when available to watch for possible hazards that may occur.
	C. Overexertion/Sprains or Strains	1) Use proper techniques when lifting jackhammer. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed.
7. Operate Jackhammer	D. Struck Against – Person	1) Travel forward with the compressor as much as possible. Only back up when necessary. 2) Always look in the direction of travel before reversing to ensure no one has entered your intended path of travel. 3) Use a spotter when backing up to ensure area is clear when available. 4) Coordinate hand signals if you are using a spotter.
	E. Struck By – Flying Object	1) Avoid having bystanders near a working jackhammer. 2) Keep a firm grip and maintain control at all times to avoid slipping off work surface.

Jack Hammer – General Operation



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Engine Shutdown/Parking	A. Fire B. Vehicle/Equipment - Struck By or Against	1) Follow shutdown procedures. Improper shutdown can cause a compartment fire. 1) Keep everyone clear of the air hose when reeling it in. 2) Open air release valve to eliminate compressed air from hose before removing rom jackhammer.
9. Snow/Ice Removal	A. Struck By - Damaged Equipment (Cold Weather Startup)	1) Let the compressor warm up five (5) minutes if temperature is below 32 Degrees Fahrenheit before operating. 2) Avoid sudden operation of controls until the compressor has warmed up.

Jack Hammer - General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Line Painting (Long) – General Procedures		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	
Supply Truck, Line Paint Truck, Crew Cab, Crash Truck		Physical Exam Required	Yes
		Respirator Exam Required	No
			X
5. Required Training		6. Inspection Requirements	
Truck and Loader Certification	Frequency	Frequency	
	Initial	Daily	
Line Painting Training – 75 Hours Certification (on job)	Initial	Initial/Before Use/Yearly	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X Safety Glasses	Protective Sleeves	Leggings / Chaps	<b>Body / Skin</b>
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Apparel
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Reflective Vest/Flagger
Welding Shield		Foot Protection	Coveralls, Body Suit
Other:	Heat Resistant	X Above the ankle boot with good tread	Rain Gear
	Cold Resistant	Heat/Cold Protection	Rubber Apron
<b>Face</b>	Abrasion/Cut Resistant	Electrical Protection	Welding Leathers
Face Shield	Leather Work	Chemical Resistant	Other:
Welding Shield	Other:	Metatarsal Protection	<b>Body (Whole)</b>
Other:	<b>Hearing Protection</b>	Other:	Personal Fall Arrest System
X Hard Hat	X Ear Muffs		X Tick/Insect Spray
Bump Cap	X Ear Plugs		Personal Flotation Device
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual	X Pub 445M	
X Foreman's Manual	X Pub 234		
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Dennis J. McArdle, A.S.C	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection for Equipment (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut/Puncture/Scrape C. Slip, Trip, or Fall	1) Ensure vehicle is turned off. Set brakes and place key in pocket. 2) Place wheel chocks behind back tires. 1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment. 5) Maintain good housekeeping. Immediately identify/clean spills. 6) Store all materials properly.
2. Loading Material	A. Crushing B. Noise Hazard C. Struck By Flying Object D. Pinch Points E. Sprain/Strain/Overexertion	1) Utilize mechanical devices and ladders/platforms when applicable. Refer to specific equipment JSA as appropriate. 1) Wear hearing protection (ear plugs or ear muffs) 1) Wear safety glasses and hard hat 1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Utilize mechanical devices and ladders/platforms when applicable. Refer to specific equipment JSA as appropriate. 2) Get assistance as needed. 3) Use proper lifting techniques when loading material into trucks. 4) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist.
3. Fueling	A. Chemical (fuel) B. Fire/Explosion	1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 2) Wear safety glasses and leather work gloves to protect from incidental contact. 1) No smoking, heat sources, or open flames near fueling area. 2) Keep all ignition sources at least 20 feet away when fueling equipment.
4. Travel to/from Job Site	A. Various	1) Refer to Safe Driver Training.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Set Up Fleet	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Slip/Trip/Fall Different Level</p> <p>C. Backing Hazards</p> <p>D. Overhead Hazards</p>	<p>1) Refer to Work Zone Traffic Control JSA and reference Pub 213 for additional information.</p> <p>2) Turn on warning lights to notify motorists.</p> <p>3) Put on reflective clothing and PPE before exiting cab of truck.</p> <p>4) Utilize defensive driving techniques and wear seatbelt at all times.</p> <p>5) Wear proper communication head gear.</p> <p>1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment.</p> <p>2) Do not jump down or skip steps when entering or exiting vehicles or equipment.</p> <p>1) Wear proper communication head gear.</p> <p>2) Utilize automatic back-up camera.</p> <p>3) Conduct circle of safety and utilize a spotter as needed.</p> <p>4) Spotter shall wear hard hat and appropriate safety apparel.</p> <p>1) Look ahead for low hanging wires or limbs.</p> <p>2) Communicate the hazard to the rest of the crew.</p> <p>3) Avoid striking the object.</p>
6. Paint Carriage Extended	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Side Hazards</p>	<p>1) Utilize defensive driving techniques and wear seat belt at all times.</p> <p>2) Wear proper communication head gear.</p> <p>3) Turn on warning lights to notify motorists.</p> <p>1) Be aware of all clearances.</p> <p>2) Identify hazards (parked cars, trees, poles).</p> <p>3) Communicate observations to the rest of the crew.</p>
7. Spraying of Paint	<p>A. Repetitive Motion/Sprain or Stain</p> <p>B. Noise</p>	<p>1) Alternate crew members as needed.</p> <p>1) Use hearing protection (ear plugs or ear muffs).</p>
8. Reload of Material in the Field	<p>A. Slip, Trip or Fall</p> <p>B. Vehicle/Equipment - Struck By or Against</p> <p>C. Pinch Points</p> <p>D. Noise Hazard</p>	<p>1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment.</p> <p>3) Do not jump down or skip steps when entering or exiting vehicles or equipment.</p> <p>1) Conduct circle of safety.</p> <p>2) Pull over to safe location.</p> <p>3) Wear PPE and reflective apparel.</p> <p>1) Wear leather work gloves to protect from sharp edges and pinch points.</p> <p>1) Wear hearing protection (ear plugs or muffs).</p>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure	
Reload of Material in the Field continued	E. Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed. 4) Rotate work duties when possible.	
	F. Poisonous Plants	1) Identify potential poisonous plants. 2) Wear gloves and long sleeves if needed. 3) Use skin barrier lotion if appropriate.	
	G. Animal/Insect Bite	1) Identify potential for animals/insects. 2) Use insect repellent as needed. 3) Wear long sleeves.	
	9. Unload of Material at Stockpile	A. Slip, Trip, or Fall – Different Level	1) Park fleet, set brake, and remove ignition key. Operator to keep in keys in pocket. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment. 3) Place wheel chocks behind back tires.
		B. Slip, Trip or Fall	1) Maintain good housekeeping. Immediately identify/clean up spills. 2) Store materials properly. 3) Wear safety footwear that is above the ankle with good tread. 4) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
		C. Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed. 4) Rotate work duties when possible.
	D. Struck By Flying or Falling Object	1) Wear PPE and leather gloves. 2) Wear safety glasses or safety goggles. 3) Wear safety footwear that is above the ankle with good tread. 4) Be alert of fellow workers. 5) Observe and be aware of all clearances.	
E. Crushing	1) Utilize mechanical devices when applicable. Refer to specific equipment JSA as appropriate. 2) Wear leather work gloves to protect from sharp edges and pinch points. 3) Wear safety footwear that is above the ankle with good tread.		
F. Pinch Points	1) Wear leather work gloves to protect from sharp edges and pinch points. 2) Be aware of all clearances.		

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Line Painting (Long) - General Procedures

**JOB SAFETY ANALYSIS**

<b>1. Job Operation</b>		<b>2. Job Location</b>	
Lowboy - Loading/Unloading and Securing Equipment		Field, Stockpile	
<b>3. Equipment/Tools/Machinery Used</b>			
Tractor Trailer, Lowboy, Chains, Binders, Straps, Various Types of Equipment to Transport			
<b>5. Required Training</b>		<b>6. Inspection Requirements</b>	
Load Securement		Frequency	
Tractor Trailer Certification		Daily	
CDL Class A License		Initial/Before Use/Yearly	
Incidental Use Certification			
<b>7. Personal Protective Equipment (X)</b>			
<b>Eyes</b>		<b>Feet/Legs</b>	
Safety Glasses		Leggings / Chaps	
Chemical Goggles		Foot or Leg Guards	
Dust Goggles		Reflective Leggings	
Welding Shield		Foot Protection	
Other:		X Above the ankle boot with good tread	
<b>Face</b>		Heat/Cold Protection	
Face Shield		Electrical Protection	
Welding Shield		Chemical Protection	
Other:		Metatarsal Protection	
<b>Head</b>		<b>Hearing Protection</b>	
X Hard Hat		X Ear Muffs	
Bump Cap		X Ear Plugs	
Other:		Other:	
<b>8. Reference Manuals</b>			
X Pub 213		X Operators Manual	
Foreman's Manual		X Pub 234	
		X Pub 445M	
		X Pub 235	
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Dennis J. McArdle, A.S.C.	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Lowboy - Loading/Unloading and Securing Equipment



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Pre-trip Inspection/Circle of Safety (M-614)</p>	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Cut, Puncture, Scrape, Burn or Pinch Point</p> <p>C. Slip, Trip or Fall</p>	<p>1) Set parking brake, ensure truck is turned off and place keys in pocket. 2) Place wheel chocks behind back tires (as needed).</p> <p>1) Wear leather work gloves to protect from sharp edges, pinch points, or hot surfaces. 2) Secure hood to prevent it from falling.</p> <p>1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment. 5) Maintain good housekeeping. Immediately identify/clean spills and store them properly.</p>
<p>2. Plan the Route/Move</p>	<p>A. Vehicle Accident – Struck By or Against</p>	<p>1) Ensure there are no obstructions along the route (ground, over-head, width). 2) Plan your route of travel ahead of time. 3) Obtain the necessary permits for weight and height limits (if applicable). 4) Ensure the work-zone setup is in place prior to arriving at the jobsite (if applicable). Adjust the setup based on weather conditions and visibility. 5) The foreman or designee should also ensure the equipment is properly staged for pickup by placing the unit(s) in an appropriate area where the lowboy can be placed on level ground and clear of roadway. 6) Re-familiarize yourself with the equipment operations or use a certified operator to load the equipment if needed.</p>
<p>3. Position Vehicle and Un-Hook Trailer</p>	<p>A. Vehicle/Equipment – Struck By or Against</p>	<p>1) Wear high visibility PPE and hard hat. For night- time operations, the addition of reflective leggings/chaps and/or ANSI Class 3 garment ( vest, sweatshirt, or jacket) is required. 2) Verify or select the most secure/level pick-up/drop-off location and ensure the vehicle is completely off the roadway (if possible). 3) Verify adequate clearance (overall operating area) for the pick-up/drop-off location. 4) Activate flashing or revolving amber warning light(s) on lowboy. 5) Maintain two 10-foot travel lanes in each direction. Use flashing beacon if done in 15 minutes or less. If longer than 15 minutes, a flagger and additional signage are needed. 6) If spotter is used, ensure you agree upon hand signals being used, keep spotter in your line of sight and immediately <b>STOP</b> if you cannot see the spotter. 7) Before exiting the cab, ensure the brake is engaged. 8) Place wheel chocks behind back tires of the tractor.</p>

Lowboy – Loading/Unloading and Securing Equipment

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Position Vehicle and Un-Hook Trailer continued  4. Prepare Trailer to Load Equipment (Chains and Binders)	B. Vehicle/Equipment - Struck By or Against	<ol style="list-style-type: none"> <li>1) Keep feet clear and out from under the trailer when lowering the deck.</li> <li>2) Wear leather work gloves.</li> <li>3) Keep hands and fingers clear of pinch points when lowering the deck and engage the safety locks.</li> </ol>
	C. Slip, Trip or Fall	<ol style="list-style-type: none"> <li>1) Maintain three (3) points of contact when climbing on the trailer to release the safety pin.</li> <li>2) Wear safety footwear that is above the ankle with good tread.</li> </ol>
	A. Vehicle/Equipment- Incident	<ol style="list-style-type: none"> <li>1) Verify the weight of the equipment being transported to select the proper number and capacity of the chains/binders.</li> </ol>
	B. Overexertion – Sprains/Strains	<ol style="list-style-type: none"> <li>1) Use proper lifting techniques when lowering or lifting ramps or wide load planks (straight back, bend knees, and lift with legs).</li> <li>2) If a coworker is available, ask for assistance in performing a team lift.</li> </ol>
	C. Pinch Points	<ol style="list-style-type: none"> <li>1) Wear leather gloves when positioning the binders/chains and ramps.</li> <li>2) Feet should be positioned clear of the ramps when lowering.</li> </ol>
5. Check and Prepare the Equipment to Load	D. Slip, Trip or Fall	<ol style="list-style-type: none"> <li>1) Remove all debris or oils on the deck.</li> <li>2) Observe walking path on and around the trailer.</li> <li>3) Take weather conditions into consideration and any openings created by removing the wide load planks.</li> <li>4) Properly store all cords and hoses.</li> </ol>
	A. Vehicle/Equipment Accident	<ol style="list-style-type: none"> <li>1) Conduct a Circle of Safety around the equipment.</li> <li>2) Perform a general vehicle/equipment inspection. Check the brakes, fluids, tires, and steering wheel.</li> <li>3) Check and remove any loose objects or debris from the equipment (stones, material, tools, auxiliary).</li> </ol>
	B. Slip, Trip, or Fall	<ol style="list-style-type: none"> <li>1) Maintain three (3) points of contact when entering or exiting equipment.</li> </ol>
	C. Poisonous Plants	<ol style="list-style-type: none"> <li>1) Identify potential poisonous plants as you conduct your circle of safety.</li> <li>2) Wear gloves and long sleeves if needed.</li> <li>3) Use skin barrier lotion if appropriate.</li> </ol>
	D. Animal/Insect Bite	<ol style="list-style-type: none"> <li>1) Identify potential for animals/insects hiding under or by parked equipment.</li> <li>2) Use insect repellent as needed.</li> <li>3) Consider wearing long sleeves if equipment is parked in or next to tall grass.</li> </ol>
	E. Overhead	<ol style="list-style-type: none"> <li>1) Plan your route of travel looking for overhead wires and tree limbs.</li> <li>2) Avoid striking the object.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Load/Unload Equipment	<p>A. Rollover/Crushing</p> <p>B. Vehicle/Equipment Struck by or Against</p> <p>C. Caught In, Under, or Between</p> <p>D. Fall from Elevation</p>	<p>1) Keep equipment properly centered on the trailer.                  2) Use a spotter if available to properly align equipment.                  3) Keep attachments low to deck (backhoe, loader, track hoes, etc.).                  4) Use wide load planks as required.                  5) Use a controlled speed to avoid spinning or sliding.                  6) Wear seat belts on all equipment with enclosed cabs and ROPS (Rollover Protective Structures).</p> <p>1) Watch for obstructions, coworkers, vehicles/equipment, and pedestrians. Keep the working area clear.                  2) Maintain communication and visual contact with the spotter (if applicable).</p> <p>1) Keep the engine running and properly set parking brake. (wet line)                  2) When lowering attachments ensure all personnel are clear.</p> <p>1) Maintain three (3) points of contact when entering or exiting and face equipment.                  2) Identify footing placement and hand holds prior to entering and exiting equipment.                  3) Never jump off equipment or skip steps.                  4) No loose-fitting clothing or safety apparel should be worn to avoid getting caught on the equipment when entering or exiting. Vest fronts should be secured, and coat zippered.</p>
7. Secure/Unsecure Equipment	<p>A. Pinch Points/Crushing Injury</p> <p>B. Overexertion</p> <p>C. Slip, Trip or Fall</p> <p>D. Vehicle Incident</p>	<p>1) Secure tie-down chains or straps and articulation bar lock.                  2) Wear leather gloves when chaining equipment and pinning articulated equipment.                  3) Keeps hands and feet clear of any tight areas.                  4) Carefully disengage chain straps/articulation bar lock.</p> <p>1) Maintain good posture and minimize bending, crawling, leaning, and overreaching while positioning chains.                  2) If available, ask a co-worker for assistance.</p> <p>1) Maintain three (3) points of contact by properly positioning chains prior to entering or exiting vehicles or equipment.                  2) Observe walking path for obstructions or obstacles when attaching chains and climbing on deck.</p> <p>1) Inspect binders and chains.                  2) Follow Federal Motor Carrier Regulations to ensure proper securement requirements for the various types of equipment.</p>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Re-hook Trailer and Prepare for Transport	A. Vehicle/Equipment - Struck by or Against  B. Pinch Points/Caught In or Between  C. Slip, Trip or Fall	1) Complete a Circle of Safety prior to backing. 2) If available, utilize a co-worker as a spotter when backing. 3) Engage the parking brake prior to exiting the cab. 4) Ensure air lines and electrical cords are hooked up and secured.  1) Keep feet clear when raising desk in case of improper coupling and deck disengages/falls. 2) Watch fingers and hands pinch points when raising deck and engaging safety locks. 3) Wear leather work gloves.
	D. Vehicle/Equipment Accident	1) Use three (3) points of contact when entering or exiting the trailer to engage the safety pin. 2) Wear safety footwear that is above the ankle with good tread.  1) Obtain permits as needed (lights and signs). 2) Plan your route of travel ahead of time. 3) Verify height and width of trailer. 4) Verify securement of equipment and conduct a circle of safety. 5) Wear your seat belt.
9. Transport Equipment	A. Vehicle/Equipment Accident	1) Allow for extra clearances when turning and maintain a controlled speed. 2) Verify bridge clearances (height and width) before proceeding through. 3) Allow for extended braking distances due to the additional weight of the load. 4) Wear your seat belt.
10. Position Vehicle and Un-Hook Trailer	A. Position Vehicle and Un-Hook Trailer	1) Wear high visibility PPE and hard hat. For night-time operations, the addition of reflective leggings/chaps and/or ANSI Class 3 garment (vest, sweatshirt, or jacket) is required. 2) Verify or select the most secure/level pick-up/drop-off location and ensure the vehicle is completely off the roadway (if possible). 3) Verify adequate clearance (overall operating area) for the pick-up/drop-off location. 4) Activate flashing or revolving amber warning light(s) on lowboy. 5) Maintain two 10-foot travel lanes in each direction. Use flashing beacon if done in 15 minutes or less. If longer than 15 minutes, a flagger and additional signage are needed. 6) If spotter is used, ensure you agree upon hand signals being used, keep spotter in your line of sight and immediately STOP if you cannot see the spotter. 7) Keep the engine running and properly set parking brake.
11. Unload Equipment	A. Refer to Step 6	
12. Re-Hook Trailer and Prepare for Transport	A. Refer to Step 8	

JSA Acknowledgements

Print Name	Signature	Date

Lowboy - Loading/Unloading and Securing Equipment

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Oil Distributor – General Operation		Various	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Oil Distributor		Physical Exam Required	X (certain types of oil)
		Respirator Exam Required	
5. Required Training		6. Inspection Requirements	Frequency
Operator Certification		M-614	Daily
Safe Driver Training		Drive Unit	Semiannual
		Tanker Unit	Annual
		State Inspection	Every 6 months
		Preventative Maintenance	Every 90 days
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	X Protective Sleeves	Leggings / Chaps	X Reflective Apparel
X Chemical Goggles	Gloves	Foot or Leg Guards	X Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	X Coveralls, Body Suit
Welding Shield		<i>Foot Protection</i>	Rain Gear
Other:	X Heat Resistant	X Above the ankle boot with good tread	Rubber Apron
	Cold Resistant	Heat/Cold Protection	Welding Leathers
<b>Face</b>		Electrical Protection	Other:
X Face Shield	Abrasion/Cut Resistant	Chemical Resistance	<b>Body (Whole)</b>
Welding Shield	Leather Work	Metatarsal Protection	Personal Fall Arrest System
Other:	Other:	Other:	Personal Flotation Device
	<b>Hearing Protection</b>	Other:	
X Hard Hat	X Ear Muffs		X Spill kit
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual	X SDS	X Pub 372
X Foreman's Manual	X Pub 370	X Placard for hot oil	
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Dennis J. McArdle, A.S.C.	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2 0 2 2	

Oil Distributor – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-Trip Inspection (M-614)	A. Vehicle/Equipment - Struck By or Against B. Slip, Trip, Fall - Same Level (roadsurface) or Different Level (equipment)	1) Ensure truck is turned off and keys are in pocket. 2) Wear safety footwear that is above the ankle with good tread. 3) Ensure surface around cab entry is free from surface debris. 4) Face the cab and maintain three (3) points of contact when entering or exiting vehicle or equipment. 5) Never jump or skip steps when entering or exiting.
2. Travel to Site to Fill Distributor	A. N/A	1) Refer to Safe Driver Training.
3. Arrive at Worksite	A. Vehicle Accidents	1) Slow down upon arrival to the site and observe other vehicles and/or pedestrians in the area. 2) Request a spotter when available to back the truck up to the tank. If no one is available, get out and confirm the location of the truck and the distance required to fill the tank. Ensure the area is clear of personnel.
4. Prepare to Transfer Oil from Supply Tanker to Oil Distributor	A. Burns - Hot Oil / Splash Hazard B. Slip, Trip, Fall - Same Level	1) Don your protective gear to include safety glasses/goggles, face shield, gloves (leather at minimum), and protective sleeves. 2) Observe walking surface and clear any debris around your working area.
5. Remove Cap from Supply Tanker and Connect Hose from Supply Tanker to Distributor	A. Burns - Contact With - Hot Oil	1) When removing caps and opening / closing valves always stand to the side.
6. Open Hatch on Top of Supply Tanker	A. Slip, Trip, Fall - Different Level	1) Ensure that your work boots are free of oil, grease, and debris. Wipe off, if necessary, prior to climbing ladder. 2) Inspect ladder for defects and oil/grease prior to ascending ladder. 3) Maintain three (3) points of contact at all times.
	B. Burns - Hot Oil (pressure in tanker)	1) Continue to wear all protective gear identified in Step 4.A.1).
	C. Sprains/Strains - Upper Body	1) Open the hatch with a fluid motion. 2) If the hatch is difficult to open, report the condition to your supervisor for repair.
7. Open the Supply Tanker Valve and Fill Distributor	A. Burns - Hot Oil	1) Always stand to the side of the valve when opening.

Oil Distributor - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Close Valve on Supply Tanker and Remove Hose	A. Sprains/Strains – Upper Body B. Burns – Hot Oil	1) Bend at the knees to close the valve and do not over tighten. 2) Ask for assistance with lifting and holding the hose if needed. 1) Hold the hose in a vertical position until all of the residual oil in the hose has completely drained into the distributor.
9. Remove Hose from Distributor and Cap	A. Burns – Hot Oil	1) Handle hose carefully. Residual oil could still be in the hose.
10. Close Hatch on Supply Tanker	A. Slip, Trip, Fall – Different Level B. Sprains / Strains – Upper Body	1) Ensure that your work boots are free of oil, grease, and debris. Wipe off, if necessary, prior to climbing ladder. 2) Inspect ladder for defects and oil / grease prior to ascending ladder. Maintain three (3) points of contact at all times. 1) Close the hatch with a fluid motion and maintain three (3) points of contact at all times.
11. Return to Work Site and Operate Oil Distributor (Refer to Stone Chipping / Seal Coat Operation JSA for additional information)	A. Vehicle Accidents B. Vehicle / Equipment – Struck By or Against	1) Refer to Safe Driver Training. 1) Always stay within the established work zone. 2) Always identify the placement of other equipment and personnel. Maintain the appropriate distances at all times. 3) Use a spotter if vision is obstructed or as needed to ensure the area is clear. 4) Coordinate hand signals when you are using a spotter.

Oil Distributor – General Operation





**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Patching – General Procedures		Field	
3. Equipment/Tools/Machinery Used			
Crew Cab, Dump Truck, Compactor or Roller, Concrete Saw, Jack Hammer, Air Compressor, Hand Tools (Shovels, Lutes, Chalk Line, Brooms or Keel)			
5. Required Training		Frequency	
Equipment Certification		Initial	
		Frequency	
		Daily	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X	Safety Glasses	Leggings / Chaps	<b>Body / Skin</b>
	Chemical Goggles	X	Reflective Apparel
X	Dust Goggles	X	Reflective Vest/Flagger
	Welding Shield	Foot or Leg Guards	Coveralls, Body Suit
	Other:	Reflective Leggings	Rain Gear
		Foot Protection	Rubber Apron
		X	Welding Leathers
		Above the ankle boot with good tread	Other:
		Metatarsal Protection	Cartridge:
X	Face Shield	Heat/Cold Protection	Other:
	Welding Shield	Electrical Protection	<b>Body (Whole)</b>
	Other:	Chemical Resistant	Personal Fall Arrest System
		Other:	X Tick/Insect Spray (as needed)
		<b>Hearing Protection</b>	Personal Flotation Device
X	Hard Hat	X	Ear Muffs
	Bump Cap		Ear Plugs
	Other:		Other:
8. Reference Manuals			
X	Pub 213	X	Operators Manual
X	Foreman's Manual	X	Pub 445M
			Pub 234
<b>Prepared By:</b> District 8 JSA Team		<b>Safety Coordinator:</b> Ron Wylie	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614) for All Equipment	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall – Same or Different Level	1) Ensure vehicle is turned off and keys are in pocket. 1) Wear leather work gloves to protect against sharp edges and pinch points. 1) Wear safety footwear above the ankle with good tread. Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Pre-task Safety Brief	A. N/A	1) Employees assigned to this task will attend a pre-task safety brief to review the potential and previously identified hazards associated with the assignment.
3. Travel To and From the Job Site	A. Various	1) Refer to Safe Driving Manual.
4. Inspect Job Site for Potential Hazards and Ensure Traffic Control is in Place	A. Vehicle Hazards/Various B. Slip, Trip, Fall C. Struck by Flying/Falling Object D. Fire / Explosion	1) Refer to WZTC JSA. 1) Observe path or area for slope, uneven / slippery surfaces, obstructions, and other tripping hazards. 1) Wear high visibility PPE and hard hat. 1) If base repair operations are being completed, call 8-1-1 (PA One Call) to avoid utility interactions and verify the site is marked as needed.
5. Marking Pavement	A. Vehicle/Equipment - Struck By or Against B. Slips/Trips/Falls C. Repetitive Motion-Bending	1) Stay within established work zone. 2) Use spotters when available and stay alert to approaching traffic. 1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 1) Use stand-up paint applicator to avoid bending at the waist. 2) Use good body mechanics by bending at the knees and keeping the lower back straight. 3) Rotate workers as needed.
6. Cutting/Breaking Pavement – Concrete Saw or Jack Hammer	A. Various	1) Refer to Concrete/Cut-Off Saw or Jack Hammer JSAs as appropriate.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Cutting/Breaking Pavement - Concrete Saw or Jack Hammer continued	B. Struck by Flying Object	1) Use face shield and eye protection (glasses or goggles). 2) Stay clear and maintain distance if you are not operating the equipment. 3) Use a filtering face piece or dust mask to prevent inhaling airborne particles.
	C. Crushing/Puncture/Cuts	1) Wear hard toe safety boots or toe caps to provide foot protection. 2) Wear protective work gloves to protect from sharp edges and pinch points.
	D. Noise	1) Wear hearing protection (ear plugs or muffs). 2) Stay clear and maintain distance if you are not operating the equipment.
	A. Struck by Flying Object	1) Use face shield and eye protection (glasses or goggles). 2) Never use compressed air to clean yourself off or coworkers. 3) Use a filtering face piece or dust mask to prevent inhaling airborne particles.
7. Removing Debris - Air Compressor or Hand Tools	B. Cut/Puncture/Scrape	1) Wear protective work gloves to protect from sharp edges and pinch points.
	C. Noise	1) Wear hearing protection (ear plugs or muffs). 2) Stay clear and maintain distance if you are not operating the equipment.
	A. Chemical Hazards	1) Reference applicable Safety Data Sheets (SDS) 2) Wear safety glasses or goggles and protective work gloves.
8. Applying Tack Coat	A. Sprains/Strains	1) Avoid bending at waist and keep your back as straight as possible. 2) If possible, change posture occasionally. 3) Use proper lifting techniques and don't overload your shovel with material. 4) Stay as close to the target area as possible. 5) Rotate work duties when possible.
	B. Burns	1) Wear protective work gloves at minimum. Recommend use of heat resistant gloves (Nomex). 2) Wear safety glasses or goggles. 3) Wear long sleeve shirts (recommended).
9. Applying Material		

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Applying Material continued	<p>C. Chemical Hazards</p> <p>D. Slips/Trips/Falls</p>	<p>1) Reference applicable Safety Data Sheets (SDS).</p> <p>2) Wear safety glasses or goggles and protective work gloves.</p> <p>1) Wear safety footwear above the ankle with good tread and continue to evaluate road surface for tripping hazards as you apply material.</p>
10. Compaction - Roller or Tamper (Mechanical or Hand)	<p>A. Various</p> <p>B. Vehicle / Equipment - Struck by or Against</p> <p>C. Pinch Points/Crushing Injuries</p>	<p>1) Refer to Roller or Mechanical Tamper JSA as appropriate.</p> <p>1) Keep body within the work zone and be aware of passing traffic.</p> <p>2) Wear High visibility PPE and hard hat.</p> <p>3) Use a spotter if needed and ensure communication/hand signals are understood.</p> <p>4) Be aware of equipment location.</p> <p>1) Be alert to fellow workers.</p> <p>2) Make certain back up alarm is working properly.</p> <p>3) Be aware of all clearances.</p>
11. Sealing	A. Chemical Hazards	<p>1) Reference applicable Safety Data Sheets (SDS).</p> <p>2) Wear protective work gloves, face shield, and safety glasses or goggles.</p>
12. Shut Down the Job	A. Vehicle / Equipment - Struck by or Against	<p>1) Refer to WZTC JSA.</p> <p>2) Use proper tear down of WZTC for traffic control.</p> <p>3) Use crew cab as shadow truck.</p> <p>4) Secure tools and equipment.</p>

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location		
Paver – General Operation		Field		
3. Equipment/Tools/Machinery Used				
Shovel, Lute, Long handled scraper, Temperature Gauge, Depth Gauge				
5. Required Training		Frequency		
Paver Certification		Initial		
NECPT		Biannual		
Hot Oil Safety		Annual		
6. Inspection Requirements				
M-614		Daily		
7. Personal Protective Equipment (X)				
Eyes	Hands and Arms	Feet/Legs	Body / Skin	Respiratory Protection
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel	Filtering Face piece
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger	Half Face Respirator
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit	Full Face Respirator
Welding Shield	Heat Resistant	Foot Protection	Rain Gear	PAPR
Other:		X Above the ankle boot with good tread	Rubber Apron	SCBA
<b>Face</b>	Cold Resistant	Metatarsal Protection	Welding Leathers	Supplied Air
Face Shield	Abrasion/Cut Resistant	Heat/Cold Protection	Other:	Cartridge:
Welding Shield	X Leather Work	Electrical Protection	<b>Body (Whole)</b>	Other:
Other:	Other:	Chemical Resistant	Personal Fall Arrest System	X Tick/Inset spray (as needed)
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device	
X Hard Hat	Ear Muffs			
Bump Cap	Ear Plugs			
Other:	Other:			
8. Reference Manuals				
X Pub 213	X Operators Manual	X Pub 445M		
X Forman's Manual	X Pub 234			
<b>Prepared By:</b> District 8 JSA Team			<b>Safety Coordinator:</b> Ron Wylie	
<b>Reviewed By:</b> Employee Safety and Training Division			<b>Distribution Date:</b> 2022	

Paver – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614) of Equipment	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle/equipment is turned off, keys in pocket.  1) Wear protective work gloves to protect from sharp edges and pinch points.
2. Pre-task Safety Briefing	D. Burn A. N/A	1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.  1) Make sure engine is cool before checking items in engine compartment.
3. Fueling	A. Chemical (fuel) B. Fire / Explosion	1) Employees assigned to this task will attend a pre-safety brief to review the potential and previously identified hazards associated with the assignment.  1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 2) Wear safety glasses or goggles to protect from incidental contact.
4. Start the Paver	A. Damage to Equipment	1) No smoking, heat sources, or open flames near fueling area. 2) Keep all ignition sources at least 20 feet away when fueling equipment.  1) Check hopper, belts, auger, and vibrations. 2) If equipment requires attention, contact the mechanic.
5. Light Burner on Paver	A. Burns B. Fumes	1) Wear protective work gloves. 2) Wear safety glasses or goggles. 3) Follow manufacturer specification for lighting.  1) Be cautious of your positioning to be away from the fumes when heating the burner. 2) Keep head to the side and stay upwind of the fumes.
6. Establish Width and Depth of the Paver	A. N/A B. Burns	1) Set width and depth according to the manufacturer's instructions.  1) Wear protective work gloves and keep body clear of hot surfaces.

Paver – General Operation



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
7. Paver Operations	A. Vehicle/Equipment – Struck By or Against	<ol style="list-style-type: none"> <li>1) Maintain communications and identify the location of moving equipment.</li> <li>2) Stay within established work zone.</li> <li>3) Keep riders off of the equipment (other than the operators) while moving or during operations.</li> <li>4) Visually check area for other equipment and coworker before moving equipment.</li> <li>5) Use a spotter when available to ensure the area is clear.</li> <li>6) Maintain spacing between other equipment and personnel.</li> <li>7) Always wear high visibility PPE and hard hat.</li> </ol>
	B. Crushing Injury	<ol style="list-style-type: none"> <li>1) Employees should never be in the area between the machine and dump truck.</li> <li>2) Verify trucks hauling asphalt to the paver have properly working back up alarms.</li> <li>3) Operator and spotter need to maintain visual contact at all times when aligning truck and paver.</li> <li>4) Coordinate hand signals with the operator and ensure the area is clear.</li> </ol>
	C. Slips/Trips/Falls	<ol style="list-style-type: none"> <li>1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.</li> <li>2) Do not jump down or skip steps when entering or exiting vehicles or equipment.</li> </ol>
	D. Falls/Burns	<ol style="list-style-type: none"> <li>1) Stay focused on the task and use caution when getting on/off the back of the paver to avoid falling backwards into the hot material.</li> <li>2) Wear safety footwear above the ankle with good tread and protective work gloves.</li> <li>3) Maintain three (3) points of contact when entering or exiting.</li> <li>4) Ensure first aid kit is on site.</li> </ol>
	E. Heat Stress	<ol style="list-style-type: none"> <li>1) Ensure adequate water supply is on site.</li> <li>2) Monitor employees for heat related illness.</li> </ol>
8. End of the Day/Clean Equipment	A. Cut, Puncture, Scrape, or Burns	<ol style="list-style-type: none"> <li>1) Wear protective work gloves to protect from sharp edges, pinch points, and hot surfaces.</li> </ol>
	B. Struck by Flying Object	<ol style="list-style-type: none"> <li>1) Wear safety glasses or goggles to protect from material getting into eyes.</li> </ol>
	C. Slips, Trips, Falls	<ol style="list-style-type: none"> <li>1) Observe path or area for tripping hazards. Face equipment and maintain three (3) points of contact when entering or exiting.</li> </ol>

Paver – General Operation

JSA Acknowledgements

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Paving – General Procedures		Field	
3. Equipment/Tools/Machinery Used			
Roller, Oil Distributor, Paver, Skid Steer, Dump Truck, Water Truck, Fuel Truck, & Various Hand Tools			
5. Required Training		Frequency	
NECPT		Initial & Recertification (Pub 351)	
Paver Certification		Initial	
Roller Certification		Initial	
Skid Steer Certification		Initial	
Oil Distributor Certification		Initial	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X Safety Glasses	Protective Sleeves	Leggings / Chaps	<b>Body / Skin</b>
Chemical Goggles	Gloves	Foot or Leg Guards	X Reflective Apparel
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Reflective Vest/Flagger
Welding Shield		Foot Protection	Coveralls, Body Suit
Other:	X Heat Resistant	X Above the ankle boot with good tread	Rain Gear
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Rubber Apron
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Welding Leathers
Welding Shield	X Leather Work	Chemical Resistant	Other:
Other:	X Other: Rubber	Metatarsal Protection	<b>Body (Whole)</b>
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Fall Arrest System
X Hard Hat	X Ear Muffs		X Bug Spray
Bump Cap	X Ear Plugs		X Personal Flotation Device
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual	X SDS Sheets	X Pub 351
X Forman's Manual	X Pub 243	X Pub 445M	
<b>Prepared By:</b> District 8 JSA Team		<b>Safety Coordinator:</b> Ron Wylie	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614) of Equipment	A. Vehicle/Equipment - Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle/equipment is turned off, keys in pocket.
		1) Wear leather work gloves to protect from sharp edges and pinch points.
		1) Wear safety footwear above the ankle with good tread.
		2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.
		3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.
		4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	D. Burn	1) Make sure engine is cool before checking items in engine compartment.
2. Pre-task safety Brief	A. N/A	1) Employees assigned to this task will attend a pre-task safety brief to review the potential and previously identified hazards associated with the assignment.
3. Travel to Work Site	A. Vehicle / Equipment - Struck By or Against	1) Refer to Safe Driver Training.
		2) Refer to Lowboy JSA.
		3) Utilize defensive driving techniques.
		1) Review the route or use a spotter ahead of the equipment.
	B. Overhead Clearances/Oversize Equipment	2) Notify the equipment transporter of any issues.
4. Inspect Job Site for Potential Hazards and Ensure Traffic Controls in Place	A. Vehicle Hazards / Various	1) Refer to WZTC JSA
	B. Slip, Trip, Fall	1) Observe path or area for slope, uneven / slippery surfaces, obstructions, and other tripping hazards.
	C. Struck by Flying, Falling, Sliding Object	1) Wear hard hat.
	D. Chemical	1) Ensure all safety data sheets are available onsite for potential exposures to chemicals during operations.
5. Light Burner on Paver	A. Various	1) Refer to Paver JSA
6. Filler Roller with Water	A. Slips/Trips/Falls	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.
		2) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	B. Pinch Points	1) Wear protective work gloves to protect from sharp edges and pinch points.
	C. Backing	1) Utilize a spotter for proper backing and coordinate signals with the operator.
7. Oil Distributor Preparation	A. Various	1) Refer to Oil Distributor JSA

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Prepare Road Surface	A. Flying debris B. Vehicle/Equipment - Struck By or Against	1) Wear appropriate PPE (safety glasses, gloves, high-visibility PPE, and hard hat). 1) Utilize flaggers w/ proper PPE, attire & communications.
9. Place Center Line Markings	A. Vehicle/Equipment - Struck By or Against B. Sprains & Strains	1) Stay within work zone. 2) Maintain proper communications. 1) Utilize proper lifting techniques and body mechanics/position. 2) Perform pre-operation stretching and preparation.
10. Oil Distributor Begins Application of Tack Oil	A. Various B. Burn/Scald	1) Refer to Oil Distributor JSA. 1) Keep all ground personnel a minimum of 300' from distributor during spray application.
11. Position Paver	C. Vehicle/Equipment - Struck By or Against A. Vehicle/Equipment - Struck By or Against B. Pinch Points C. Fumes	1) Watch for obstructions (personnel, vehicles, debris). 1) Use spotter when backing and coordinate signals. 2) Check that back-up alarms are functioning properly. 3) Stay within the established work zone. 1) Ensure body parts do not come into contact with the cribbing underneath. 1) Keep upwind of the fumes.
12. Back Dump Truck into the Paver and Dump Asphalt into Hopper	A. Various B. Vehicle/Equipment - Struck By or Crushing Injury C. Pinch Points D. Slip, Trip, Fall E. Burns	1) Refer to Dump Truck or Paver JSA. 1) Employees should never be in the area between the machine and dump truck. 3) Utilize a spotter for backing and for identifying overhead obstructions. 4) Operator and spotter need to maintain visual contact at all times when aligning truck and chipper. 5) Coordinate hand signals with the operator and ensure the area is clear. 1) Keep clear of equipment do not try to free the equipment while it is running. 1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering or exiting vehicles or equipment. 1) Stay clear of equipment and hot surfaces. 2) Wear protective work gloves to protect from sharp edges and pinch points.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
13. Begin Paving Operation	A. Various	1) Refer to Paver JSA
14. Roller Compaction	A. Various	1) Refer to Roller JSA
15. Place Temporary Traffic Lane Markings	A. Vehicle/Equipment - Struck By or Against	1) Stay within work zone and utilize a spotter as needed. 2) Wear high visibility apparel and face traffic.
16. Operation Shut-Down	B. Strains/Sprains	1) Do not bend at the waist and rotate workers as needed or possible.
	A. Vehicle/Equipment - Struck By or Against	1) Maintain proper WZTC set up and stay within the established work zone.
	B. Slips, Trips, Falls	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	C. Burns	1) Wear leather work gloves to avoid potential hot spots on the equipment.
	D. Sprains/Strains	1) Don't overload your shovel. 2) When shoveling material, try to stay as close to the target area as possible.
	E. Chemical	1) Do not use diesel fuel to clean equipment.

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Pipe Flushing - General Procedure		Field	
3. Equipment/Tools/Machinery Used			
Dump Truck, Backhoe, Trailer Jetter (Pipe Flusher), and Shovels		4. Medical Exams	Yes
		Physical Exam Required	No
		Respirator Exam Required	X
5. Required Training			
Pipe Flusher Equipment Training	Frequency	Frequency	
	Initial	Daily	
Backhoe Equipment Training	Initial		
Dump Truck Equipment Training	Initial		
PPE, Bloodborne Pathogens	Initial		
Appendix D of OSHA Regulation - Voluntary Use of Filtering Face Piece	Initial		
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	X Protective Sleeves	Leggings / Chaps	X Reflective Apparel
X Chemical Goggles	Gloves	Foot or Leg Guards	X Reflective Vest/Flagger
	Chemical Resistant Type:	Reflective Leggings	X Coveralls, Body Suit
	Heat Resistant	Foot Protection	X Rain Gear
		X Above the ankle boot with good tread	Rubber Apron
	Cold Resistant	Metatarsal Protection	Welding Leathers
X Face Shield	Abrasion/Cut Resistant	X Slip Resistant	Other:
X Welding Shield	X Leather Work	Heat/Cold Protection	<b>Body (Whole)</b>
	Other: Disposable	Electrical Protection	Personal Fall Arrest System
	<b>Hearing Protection</b>	Chemical Resistance	Personal Flotation Device
	X Ear Muffs	Other: Rubber Boots	X Portable water tank
	X Ear Plugs		X Soap
	Other:		X Wet Wipes
8. Reference Manuals			
X Pub 213	X Operators Manual	X Pub 23 Maintenance Manual	
X Foreman's Manual	X Pub 234		
<b>Prepared By:</b> District 9 JSA Team		<b>Safety Coordinator:</b> Pam Kane	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Conduct Circle of Safety and Pre-trip Inspection (M-614) for Equipment</p>	<p>A. Vehicle/Equipment – Struck By or Against                      B. Cut, Puncture, Scrape                      C. Slip, Trip, Fall – Same or Different Level</p>	<p>1) Ensure vehicle is turned off and keys are in your pocket, the parking brake is set and the wheels are chocked.                      1) Wear leather work gloves to protect against sharp edges and pinch points.                      1) Wear safety footwear that is above the ankle with good tread.                      2) Observe path or area for slope, uneven/slippy surfaces, obstructions, and other tripping hazards.                      3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting the vehicle.                      4) Do not jump down or skip steps when entering or exiting vehicles or equipment.</p>
<p>2. Travel To/From Job Site</p>	<p>A. Vehicle/Equipment Accident</p>	<p>1) Wear Seat Belt at all times when operating vehicles and equipment.                      2) Maintain a safe traveling speed according to the road conditions and slow down when turning.                      3) Know your vehicle's height, weight and width and maintain proper clearances.                      4) Ensure trailers are secured to the hitch, the chains are crossed and the hitch is secured.</p>
<p>3. Set Up Work Location</p>	<p>A. Vehicle/Equipment – Struck by or Against                      B. Strain-Sprain</p>	<p>1) Turn on warning lights to notify motorists of your presence.                      2) Set parking brake of truck before exiting the cab.                      3) Put on reflective clothing and PPE before exiting the cab of the truck.                      4) Set cones around truck following the JSA for workzone set up.                      5) Chock behind the back wheels of truck if not parked on a level surface before performing any work.                      6) Utilize PUB 213 to determine the type of highway and setup configuration.                      7) Set arrow panel to the direction you want traffic to flow.                      1) Use proper lifting techniques when unloading devices from trucks.                      2) Turn with your feet, not your waist if placing devices with a cone platform.                      3) Adjust the side rail of the cone setting platform as needed to effectively place devices.                      4) Avoid bending at the waist and rotate workers as needed.</p>

Pipe Flushing – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Set Up Work Location continued	C. Slip, Trip, Fall - From Elevation	<ol style="list-style-type: none"> <li>1) Use proper lifting techniques when unloading devices and signs from trucks.</li> <li>2) Turn with your feet, not your waist if placing devices with a cone platform.</li> <li>3) Adjust the side rail of the cone setting platform as needed to effectively place devices.</li> <li>4) Avoid bending at the waist and rotate workers as needed.</li> <li>5) Stay within the railing system of the cone setting platform and only adjust the side rails as needed to effectively place devices</li> <li>6) Use three (3) points of contact.</li> </ol>
	D. Slip, Trip, Fall - Same Level	<ol style="list-style-type: none"> <li>1) Wear safety footwear that is above the ankle with good tread.</li> <li>2) Take short steps to identify potential tripping hazards such as stumps, roots, rocks, holes and ditches hidden in the brush.</li> <li>3) Watch where you're walking - use three points of contact when possible.</li> <li>4) Plan your route and observe the ground for uneven surfaces and debris.</li> </ol>
4. Clear and Remove Vegetation, Brush, and Debris from the Pipe Using Shovels	A. Slip, Trip, Fall - Same Level	<ol style="list-style-type: none"> <li>1) Wear safety footwear that is above the ankle with good tread.</li> <li>2) Plan your route and observe the ground for slope and uneven/slippery surfaces.</li> <li>3) Look for tripping hazards such as stumps, roots, rocks, holes, and ditches hidden by brush.</li> </ol>
	B. Bacteria - Storm Runoff and Potential Waste Water	<ol style="list-style-type: none"> <li>1) Wear waterproof gloves - cover all wounds and sores with waterproof dressings to protect from potential contamination.</li> <li>2) Wear rubber boots or rubber boot covers to protect your feet from water.</li> <li>3) Remove wet or contaminated boots before entering the crew cab.</li> <li>4) Wash hands with soap and water after completing this task.</li> </ol>
	C. Sprains and Strains - Whole Body	<ol style="list-style-type: none"> <li>1) Do not overload your shovel with debris.</li> <li>2) Stay as close to the target as possible when offloading debris from the shovel. If necessary, take a step and off load vs. throwing.</li> </ol>
	D. Cuts, Punctures and Scrapes -Vegetation	<ol style="list-style-type: none"> <li>1) Long pants and long sleeves or protective arm covers should be used during this task.</li> </ol>
	E. Insect Bites, Animal Bites, Snake Bites, Poisonous Plants	<ol style="list-style-type: none"> <li>1) Wear Proper PPE - Long Pants, Boots above the ankle. Long sleeved shirt recommended.</li> <li>2) If in high or thick brush, tuck pant legs into boots.</li> <li>3) Use insect repellent on pant legs and shirt sleeves.</li> <li>4) Ensure the first aid kits if close by and stocked.</li> <li>5) If you suffer insect allergies - be sure you have your medication with you and nearby.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Clear and Remove Vegetation, Brush, and Debris from the Pipe Using Shovels continued	<p>F. Heat Stress</p> <p>G. Sunburn</p> <p>H. Crushing Injury – Contact with Backhoe or Dump Truck</p>	<p>1) Drink plenty of cool water throughout the day.</p> <p>2) Once you're thirsty – you are already dehydrated – drink water prior to starting the work day.</p> <p>3) If you or a co-worker are experiencing heat stress, get out of the sun. Go to a cool or shady place – sit down in the air-conditioned vehicle.</p> <p>4) Apply cool compresses to the head and neck.</p> <p>5) Call 911.</p> <p>1) Apply sunscreen periodically throughout the day. SPF 50 or greater is recommended.</p> <p>2) Wear light clothing with long sleeves to prevent sunburn.</p> <p>1) You must remain aware of the location of equipment in operation while performing your task.</p> <p>2) Maintain communication/signaling and eye contact with equipment/dump truck operators.</p> <p>3) Use a spotter when available.</p>
5. Clear and Remove Vegetation, Brush, and Soil Using a Backhoe	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Crushing / Rollover</p>	<p>1) Refer to Backhoe JSA</p>
6. Position the Dump Truck to Receive Soil and Debris	<p>A. Vehicle/Equipment – Struck By or Against</p>	<p>1) Refer to Dump Truck JSA</p>
7. Prepare the Pipe Flusher (Trailer Jetter) for Flushing Task	<p>A. Cut or puncture</p> <p>B. High Pressure/Struck by Flying Object</p> <p>C. Slip/Trip/Fall – Same Elevation</p>	<p>1) Wear proper PPE – Leather gloves and long pants. Long sleeved shirt recommended.</p> <p>1) Make sure the water pressure is turned off when starting the machine and remains off until the hose is in proper position.</p> <p>1) Wear safety footwear that is above the ankle with good tread.</p> <p>2) Take short steps to identify potential tripping hazards such as stumps, roots, rocks, holes and ditches hidden in the brush.</p> <p>3) Watch where you're walking – use three points of contact when possible.</p> <p>4) Plan your route and observe the ground for uneven surfaces and debris.</p>
8. Position Hose into the Pipe and Perform Flushing Task	<p>A. Contact with High Pressure – Approx.1500 psi</p> <p>B. Struck By - Hose</p>	<p>1) Hold hose with both hands when performing this task.</p> <p>2) Wear proper PPE – with goggles/safety glasses and a face shield.</p> <p>3) Never point the hose in the direction of a co-worker or other object.</p> <p>1) Hold hose with both hands when performing this task.</p> <p>2) Wear proper PPE – with goggles/safety glasses and a face shield.</p> <p>3) Use additional help holding/pulling the hose based on terrain.</p>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Position Hose into the Pipe and Perform Flushing Task continued	<p>C. High Noise Levels – Trailer Jetter (Pipe Flusher), Flushing Task</p> <p>D. Bacteria – Storm Runoff and Potential Waste Water</p>	<ol style="list-style-type: none"> <li>1) The operator of the trailer jetter and the pipe flusher (hose) must wear hearing protection during periods of flushing and operating the pump.</li> <li>2) Ensure your hands are clean prior to inserting ear plugs.</li> </ol>
	<p>E. Contact With – Waste Water and Debris in Adjacent Storm Drain</p> <p>F. Incidental Contact with Overspray – Waste Water</p>	<ol style="list-style-type: none"> <li>1) Cover all open wounds and sores with waterproof dressings to protect from potential contamination.</li> <li>2) Wear rubber boots or disposable boot coverings to protect your feet from the water. Boots and boot covers shall be washed and sanitized at the end of the task.</li> <li>3) Hip waders may be necessary based on the site.</li> <li>4) Remove contaminated boots before entering the crew cab at the end of the day.</li> <li>5) Wear a Tyvek or similar coverall with hood to protect clothing and skin. Wear a reflective vest over the coverall.</li> <li>6) Wear goggles/safety glasses and face shield to protect against contact to eyes and face.</li> <li>7) A filtering face piece (N95) may be used on a voluntary basis for additional protection against aerosolized bacteria that may contact the nose or mouth.</li> <li>8) Wear disposable coverings over work gloves or rubber gloves that can be cleaned and sanitized or disposed of at the end of the shift.</li> <li>9) Wash hands thoroughly with soap and water after the task is completed.</li> </ol>
9. Clean Up Site	<p>A. Slips, Trips, Falls – Same elevation</p> <p>B. Contact With – Bacteria from Job Task</p>	<ol style="list-style-type: none"> <li>1) If monitoring of the adjacent storm drain is required, stay clear of the drain opening while the flushing is occurring.</li> <li>1) All employees not involved in this phase of the task must stay upwind to prevent potential exposure to overspray.</li> <li>1) Communicate with co-workers that the hose is being retracted.</li> <li>2) Wear Boots with good tread that fit above the ankle.</li> <li>3) Take short steps to identify potential tripping hazards such as stumps, roots, rocks, holes and ditches hidden in the brush.</li> <li>4) Watch where you're walking – use three points of contact when possible.</li> <li>5) Plan your route and observe the ground for uneven surfaces and debris.</li> </ol> <ol style="list-style-type: none"> <li>1) Pick up and clean all potentially contaminated tools.</li> <li>2) Use backhoe/grade-all to pick-up all excess debris at site.</li> <li>3) Wash all potentially contaminated vehicles and equipment.</li> </ol>



**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Pipe Replacement - General Procedures		Field	
3. Equipment/Tools/Machinery Used			
Excavator (Backhoe, Track hoe, or Gradall), Dump truck, Vacuum (water Pump) Excavator, Trailer Jetter/Pipe Flusher, Gas Powered Cut-off saw, 2 pcs. Of Compaction Equipment (mechanical tamper), Rakes, Shovels, Transit or a Lock Level			
5. Required Training		Frequency	
Equipment Certifications		Initial	
Grade Set Training		initial	
Trench and Excavation training		Initial	
6. Inspection Requirements			
614M		Daily	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X Safety Glasses		Leggings / Chaps	
Chemical Goggles		Foot or Leg Guards	
X Dust Goggles		Reflective Leggings	
Welding Shield		Foot protection	
Other:		X Above the ankle boot with good tread	
<b>Face</b>		Metatarsal Protection	
X Face Shield - Plastic		Heat/Cold Protection	
Welding Shield		Electrical Protection	
Other:		Chemical Resistance	
<b>Head</b>		Other:	
X Hard Hat		Hearing Protection	
Bump Cap		Ear Muffs	
Other:		Ear Plugs	
8. Reference Manuals		Other:	
X Pub 213		x Pub 247	
X Operator's Manual		x Pub 234	
X Foreman's Manual		x Pub 247	
<b>Prepared By:</b> District 9 JSA Team		<b>Safety Coordinator:</b> Pam Kane	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Pipe Replacement - General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Call 811 (PA One Call) and mark the road.	A. Fire/Explosion B. Electrocutation	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities and verify the site is marked as needed. Call before you dig at least three (3) days in advance.
2. Conduct Circle of Safety and Pre-trip Inspection of all Equipment. (M-614)	A. Vehicle/Equipment Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, the parking park is set, the wheels are chocked, and the keys are in your pocket. 1) Wear leather work gloves to protect hands from sharp edges and pinch points. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven or slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down off skip steps when entering or exiting vehicles and equipment.
3. Travel to and from work site	A. Vehicle or Equipment Accident	1) Refer to Safe Driving training for additional information. 2) Wear Seat Belt at all times. Every trip – every time. 3) Maintain safe traveling speeds according to the road conditions and slow down when turning. 4) Know height, width, and weight of machinery.
4. Set up Work Zone Traffic Control	A. Vehicle/Equipment Struck By or Against B. Pedestrian Struck By	1) Refer to WZTC Set-up JSA. 2) Utilize Publication 213 to determine the type of highway and traffic control set-up configuration.
5. Clear and Remove Vegetation, Brush, and Debris from the Pipe Using Shovels and Rakes as Needed.	A. Slip, Trip, Fall Same Level B. Strains and Sprains – Whole Body C. Cuts, Punctures and Scrapes - Vegetation D. Insect Bites, Animal Bites, Snake Bites and Poisonous Plants E. Heat Stress	1) Wear safety footwear that is above the ankle with good tread and take shot steps. 2) Plan your route and observe the ground for slope and uneven or slippery surfaces. 3) Look for tripping hazards such as stumps, rocks, roots, holes, and ditches hidden by the brush. 1) Do not overload the shovel with debris. 2) Stay as close to the target as possible when throwing debris. 1) Proper PPE should be worn during this task including gloves and long-sleeved shirt. 1) Ensure the first aid kit is close by and available. 2) Use insect repellent before and during the operation to repel insects. 3) Check yourself for ticks at breaks. 1) Drink plenty of water. 2) Take breaks. 3) Review signs and symptoms of heat stress. 4) Observe co-workers throughout the day to assist in heat related illness.
Pipe Replacement – General Procedures		

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Dismantle and Remove Existing Guiderail as Needed	<p>F. Crushing Injury – Contact with the backhoe or dump truck</p> <p>A. Cuts/lacerations, Puncture, Scrape</p> <p>B. Pinch Points - Caught In, Under, Between</p> <p>C. Burn or Scald</p> <p>D. Weld Flash</p> <p>E. Strain/Sprain – Over Exertion</p> <p>G. Slips, trips and Falls</p> <p>H. Struck by Flying, Falling, Sliding Object</p> <p>I. Vehicle/Equipment – Struck-by or Against</p> <p>J. Poisonous Plants – Animal Insect Bites</p>	<p>1) Do not become distracted. Stay aware of the location of equipment at all times during the operation and while you are performing your tasks.</p> <p>2) Maintain visual communication with the equipment operators. Remember – if you can't see them – they can't see you.</p> <p>1) Stay focused on the task and be alert to what other coworkers activity.</p> <p>2) Keep body parts clear of pinch points.</p> <p>3) Leave one bolt attached to support panels for safety.</p> <p>1) Stay focused on the task and be alert to what other coworkers activity.</p> <p>2) Keep body parts clear of pinch points.</p> <p>3) Leave one bolt attached to support panels for safety.</p> <p>1) Wear leather gloves, apron, and jacket.</p> <p>1) Make sure the welding helmet face shield has the proper shading for the task and is down before beginning any welding.</p> <p>1) Use proper lifting techniques when working and avoid bending at the waist.</p> <p>2) Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting.</p> <p>3) Get assistance as needed.</p> <p>1) Observe path or work area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>1) Watch for overhead objects/hazards and use as potter as needed.</p> <p>2) Wear hard hat and safety glasses or goggles.</p> <p>1) Stay within the established work zone.</p> <p>2) Wear high visibility PPE and apparel.</p> <p>3) Make certain back up alarms are working properly.</p> <p>4) Identify equipment locations and use a spotter as needed.</p> <p>1) Identify potential poisonous plants prior to initiating work.</p> <p>2) Wear long sleeves and gloves. Use skin barrier lotion as needed.</p> <p>3) Remove vegetation and apply herbicide treatment as needed.</p>
7. Flush Pipe or Clean Head Wall as Needed	<p>A. Contact with high pressure – Approx. 1500 psi</p> <p>B. Struck-by hose</p>	<p>1) Hold hose with both hands when performing this task.</p> <p>2) Wear proper PPE – with goggles/safety glasses and a face shield.</p> <p>3) Never point the hose in the direction of a co-worker or other object.</p> <p>1) Hold hose with both hands when performing this task.</p> <p>2) Wear proper PPE – with goggles/safety glasses and a face shield.</p> <p>3) Use additional help holding/pulling the hose based on terrain.</p>



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
	C. High Noise Levels – Trailer Jetter (Pipe Flusher), flushing task	1) The operator of the trailer jetter and the pipe flusher (hose) must wear hearing protection during periods of flushing and operating the pump. Ensure your hands are clean prior to inserting ear plugs.
	D. Bacteria – Storm runoff and potential waste water	1) Cover all open wounds and sores with waterproof dressings to protect from potential contamination. 2) Wear rubber boots or disposable boot coverings to protect your feet from the water. Boots and boot covers shall be washed and sanitized at the end of the task. 3) Hip waders may be necessary based on the site. 4) Remove contaminated boots before entering the crew cab at the end of the day. 5) Wear a Tyvek or similar coverall with hood to protect clothing and skin. Wear a reflective vestover the coverall. 6) Wear goggles/safety glasses and face shield to protect against contact to eyes and face. 7) A filtering face piece (N95) may be used on a voluntary basis for additional protection against aerosolized bacteria that may contact the nose or mouth. 8) Wear disposable coverings over work gloves or rubber gloves that can be cleaned and sanitized or disposed of at the end of the shift. 9) Wash hands thoroughly with soap and water after the task is completed.
8. Load/Unload Pipe	E. Contact with waste water and debris in adjacent storm drain	1) If monitoring of the adjacent storm drain is required, stay clear of the drain opening while the flushing is occurring.
	A. Various – Rollover/Crushing, Vehicle/Equipment Struck-By or Against, Caught-in/Under/Between	1) Refer to Low-boy JSA for additional information.
	B. Slip, Trip, Falls from Elevation	1) Wear safety footwear that is above the ankle with good tread. 2) Face the vehicle/equipment and maintain three (3) points of contact when mounting or dismounting equipment. 3) Do not jump down or skip steps when mounting or dismounting equipment. 4) Get assistance loading or unloading pipes.
	C. Cut, Puncture, Scrape	1) Wear leather work gloves to provide added hand protection.
	D. Strain/Sprain - Overexertion	1) Use proper lifting techniques and avoid bending at the waist. 2) Bend at knees, pull the object close to your body, stand up with the object, and avoid twisting while lifting. 3) Get assistance as needed. 4) Use equipment for lifting and loading/unloading pipe.

Pipe Replacement – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
	E. Struck-by Flying, Falling, Rolling object	<ol style="list-style-type: none"> <li>1) When using equipment to lift: Use cables, chains, or straps in good condition and with a sufficient rating for the job.</li> <li>2) Make sure the load is secure before lifting.</li> <li>3) Never lift a load over another worker.</li> <li>4) Plan for and identify an escape route.</li> <li>5) Get assistance with loading/unloading pipe and use a spotter.</li> <li>6) Chock/block pipe to prevent rolling when loaded or unloaded.</li> <li>7) Keep the unloading area clear of co-workers. Ensure pipe does not fall, bounce or roll onto other workers.</li> </ol>
9. Cut Pavement	<p>A. Respirable Crystalline Silica Dust</p> <p>B. Struck-by Flying Object</p>	<ol style="list-style-type: none"> <li>1) Cut pavement using a water delivery system for dust suppression.</li> <li>2) Use a ventilation system in equipment for dust filtration.</li> <li>3) Use a vacuum system for dust collection to minimize or eliminate exposure.</li> <li>4) Monitor dust levels and duration of use. If a water or vacuum system is not available, a respirator will be necessary to continue work.</li> <li>5) Control dust for passing traffic.</li> </ol> <ol style="list-style-type: none"> <li>1) Use face shield and properly fitted eye protection (glasses or goggles) with adequate top and side protection.</li> <li>2) Wear coveralls or long pants to protect your legs and avoid loose-fitting clothing or anything that could become caught on moving parts.</li> <li>3) Clear the area to be cut of any loose objects or debris that could be thrown by the cutting tool.</li> <li>4) Stay away and maintain the distance if you are not operating the equipment.</li> <li>5) Ensure the proper/approved blade is installed for the saw and material being cut.</li> <li>6) Thoroughly inspect the blade for any defects. Please note: Cracked or warped blades can shatter or break and will cause serious or fatal injury.</li> </ol>
	C. Cut, Puncture, Scrape	<ol style="list-style-type: none"> <li>1) Maintain secure footing and balance at all times. Take extra care when working in wet or freezing weather (rain, snow, frost etc.)</li> <li>2) Wear safety footwear that is above the ankle with good tread.</li> <li>3) Wear leather work gloves to protect your hands from sharp edges and pinch points.</li> <li>4) Operate the cut-off saw using both hands at all times. Keep a firm grip on the front and rear handles while in operation.</li> </ol>
	D. Strain/Sprain/Overexertion	<ol style="list-style-type: none"> <li>1) Get assistance when loading or unloading the cut-off saw/self-propelled concrete saw.</li> <li>2) Take frequent breaks while operating the cut-off saw to prevent fatigue and injury.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>10. Excavate/Remove Old Pipe</p>	<p>A. Equipment Rollover, Slide, Fall</p>	<ol style="list-style-type: none"> <li>1) Visually inspect the ground to ensure it is stable enough to support the machine and suitable for operations. Take into consideration the maximum allowable slope, soil conditions, water intake, slippery conditions, etc.) to avoid rollover or sliding.</li> <li>2) Stay at least 2-feet away from the edge of slopes, banks, and excavations.</li> <li>3) Never undercut the machine.</li> <li>4) Do not overload the capacity of the machine. Refer to the operator's manual and load chart for the machine.</li> </ol>
	<p>B. Vehicle/Equipment – Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Know where all personnel are at all times</li> <li>2) Use a spotter when available and coordinate hand signals or other methods of communication prior to work.</li> <li>3) Stay in the view of operators at all times – if you can't see them – they can't see you.</li> </ol>
	<p>C. Struck by Falling Object</p>	<ol style="list-style-type: none"> <li>1) Stay clear of operation while material is being excavated.</li> <li>2) When using equipment to lift, ensure all cables, chains and straps are in good operational condition and have a sufficient rating for the job.</li> </ol>
	<p>D. Underground/Overhead Hazards – Electrocutation/Explosion</p>	<ol style="list-style-type: none"> <li>1) Verify the information given by PA One Call before digging.</li> <li>2) Inspect and evaluate the area for overhead and underground hazards to include privately installed utilities or pipes installed by a property owner that may not be covered by the PA One Call System.</li> <li>3) Utilize a spotter as needed to assist with maintaining proper clearances.</li> </ol>
<p>11. Replace Pipe</p>	<p>A. Slip/Trip/Fall – Same Level</p>	<ol style="list-style-type: none"> <li>1) Observe path or area for slope, uneven/slippery conditions, obstructions, and ground conditions as well as other tripping hazards.</li> <li>2) Do not jump down into excavations. Proceed slowly and plan your foot and hand placement carefully when entering or exiting.</li> </ol>
	<p>B. Caught In/Under/Between</p>	<ol style="list-style-type: none"> <li>1) Watch body/limb placement around pipes and equipment.</li> </ol>
	<p>C. Strain/Sprain</p>	<ol style="list-style-type: none"> <li>1) Use proper equipment to lift/set pipe. Ensure cables, chains, or straps are in good condition and have a sufficient rating for the job.</li> <li>2) Refer to item 7D above for manual lifting precautions.</li> </ol>
	<p>D. Exposure to Falling Loads</p>	<ol style="list-style-type: none"> <li>1) Employees are not allowed in the excavation while heavy equipment is digging.</li> <li>2) Employees shall not work under loads being lifted or moved by heavy equipment used for digging or lifting.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
12. Setting New Pipe/Working in Trench	A. Slip/Trip/Fall from Elevation	<ol style="list-style-type: none"> <li>1) For excavations of 4-feet or deeper, stairways, ramps or ladders will be used as a safe means of access and egress.</li> <li>2) When setting ladders in trenches, employees shall not have to travel more than 25 feet in lateral direction to reach a ladder, stair way or ramp or other means designed by a registered professional engineer.</li> <li>3) If a ladder is used, it shall be secured and extend three (3) feet above the landing.</li> <li>4) All ladders should comply with Protocol 14 – portable ladder safety.</li> </ol>
	B. Suffocation from Collapse	<ol style="list-style-type: none"> <li>1) Excavations greater than five (5) feet in depth or if instability is noticed in trenches less than five (5) feet shall use a method to protect employees from collapse (trench box, sloping).</li> <li>2) Only trench boxes designed or certified by a Registered Professional Engineer shall be used.</li> <li>3) Trench shields/boxes shall not have any lateral movement when installed.</li> <li>4) The excavated area between the outside of the trench box and the face of the trench shall be as small as possible.</li> <li>5) All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 ½ : 1 for Type C soil.</li> <li>6) Spoil piles should be stored a minimum of two feet from the sides of the excavation and not block the safe means of egress or access.</li> </ol>
	C. Crushing/Struck-By Falling Object – Exposure to Falling Loads	<ol style="list-style-type: none"> <li>1) Do not allow employees to work in an excavation under raised loads or equipment.</li> <li>2) Keep mobile equipment the required distance from excavation openings and use barricades or other means when necessary.</li> </ol>
	D. Suffocation from Hazardous Atmosphere	<ol style="list-style-type: none"> <li>1) Ensure hazardous atmospheres are not present or allowed to accumulate in excavations such as oxygen deficiency or flammable gases.</li> <li>2) Testing shall be done daily by a certified competent person before employees enter a trench where trenches are greater than four feet and have the potential for toxic substances or hazardous atmospheres.</li> <li>3) Refer to Protocol 7 – Confined Space Entry – Section 11 Atmospheric Monitoring</li> </ol>
	E. Suffocation by Drowning/Collapse	<ol style="list-style-type: none"> <li>1) Do not allow water to accumulate within the excavation.</li> <li>2) Employees shall not enter or work in excavations with standing water or in which water is accumulating unless adequate protection is provided.</li> <li>3) Water removal equipment must be used and monitored by a competent person.</li> <li>4) During rainstorms or water intrusions employees shall exit the excavation or trench immediately</li> </ol>

Pipe Replacement – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
13. Back Fill	<p>A. Struck by Material/Falling Objects</p> <p>B. Tip-Over – Uneven Surfaces</p> <p>C. Overhead Obstruction/ Electrocution</p> <p>D. Noise</p> <p>A. Various</p>	<p>5) The excavation shall be carefully inspected daily by a competent person and after each rainstorm or water intrusion and before employees are permitted to re-enter the excavation or trench.</p> <p>6) Protective measures such as diversion ditches and dikes shall be used to limit surface runoff water from entering the excavation or trench.</p> <p>1) When available, always use a spotter when positioning vehicle for dumping or spreading.</p> <p>2) Ensure you have a clear understanding of signals and a clear view of the spotter.</p> <p>3) If a spotter is unavailable, get out of truck and ensure the area is clear prior to dumping.</p> <p>4) Do not allow employees to work in an excavation under raised loads or equipment.</p> <p>1) The truck should be positioned on an even surface for dumping.</p> <p>2) If required to dump on a slope, place the truck so that it faces up or faces down the slope.</p> <p>3) Be aware of wet loads that may create an unsafe condition while unloading the material.</p> <p>4) Ensure the parking brake has been set and the tailgate is in the open position.</p> <p>1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained.</p> <p>2) Evaluate the area when entering a new dumping location to ensure you will not come in contact with overhead electrical lines while you position the truck to dump the load.</p> <p>3) Verify the truck bed is lowered after material is dumped and prior to leaving the site.</p> <p>1) Wear ear plugs or earmuffs to protect against high noise levels from compaction equipment.</p> <p>1) Refer to Paver – General Operation JSA for additional information.</p>
14. Restore Road Surface	A. Various	1) Refer to Paver – General Operation JSA for additional information.

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Post Pounder (Truck Mounted) – General Operation		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Pounder, Hand Tools, Level, Plates		Physical Exam Required	No
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	
Certification		Pre-trip	Daily
		Suspension Cable	Daily
		All Tools	Daily
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X	Safety Glasses	Protective Sleeves	Leggings / Chaps
	Chemical Goggles	Gloves	Foot or Leg Guards
	Dust Goggles	Chemical Resistant Type:	Reflective Leggings
	Welding Shield	Heat Resistant	Foot Protection
	Other:	X	Above the ankle boot with good tread
<b>Face</b>		<b>Body / Skin</b>	
	Face Shield	Cold Resistant	Heat/Cold Protection
	Welding Shield	X	Abrasion/Cut Resistant
	Other:		Leather Work
<b>Head</b>		<b>Body (Whole)</b>	
	Hard Hat	X	Chemical Resistant
	Bump Cap		Metatarsal Protection
	Other:		Other:
<b>Hearing Protection</b>		Personal Fall Arrest System	
X	Ear Muffs		Personal Flotation Device
	Ear Plugs		
	Other:		
8. Reference Manuals			
X	Pub 213	X	Operators Manual
X	Foreman's Manual	X	Pub 234
<b>Prepared By:</b> District 9 JSA Team		<b>Safety Coordinator:</b> Pam Kane	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Post Pounder (Truck Mounted) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Ensure PA One Call was Done a Minimum of Three (3) Days Prior to Operating this Machinery	A. Utility Line (water, electric, gas, phone, etc.) damage	1) Ensure the work site is the same as the proposed work site that has been called into PA One Call. 2) Look for the PA One Call paint lines in the area where the post pounder will be used. 3) If you see no One Call paint lines, stop, and call the supervisor. 4) Compare surrounding area to proposed work site.
2. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By/Pinch Points  B. Cut, Puncture, Scrape  C. Slip, Trip, Fall	1) Ensure vehicle is turned off, the parking brake is set, the wheels are chocked, and the keys are in your pocket.  1) Wear leather work gloves to protect from sharp edges and pinch points. 2) Check the boom cable to ensure there are no breaks or tears. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
3. Transport to Work Site	A. Vehicle/Equipment – Struck By or Against  B. Electrocution  C. Overhead Obstructions	1) Refer to Safe Driver Training. 2) Utilize defensive driving techniques. 3) Wear seat belt at all times. 4) Do not use a cell phone while driving. 5) Ensure boom is in proper position and locked in transport.  1) Identify and avoid any low hanging wires. 2) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the supervisor immediately. 3) Contact the utility company when work must take place within the minimum distance.  1) Scan the area (bridges, trees, etc.) and ensure proper clearances are maintained. 2) Prior to operation – trim or remove any low hanging tress or tree limbs.
4. Work Site Inspection	A. Fire/Explosion  B. Electrocution  C. Overhead Obstructions	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities. 2) Compare surrounding area to proposed work site. 1) Identify and avoid any low hanging wires. 2) Stay a minimum of 10 feet away from power lines –if the work area contains any power lines (downed or otherwise), do not work in the area and notify the supervisor immediately.  1) Trim/remove low hanging tree limbs.

Post Pounder (Truck Mounted) – General Operation



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Preparing Post Pounder for Operation	A. Caught In, Under, Between	1) Wear leather work gloves to protect from sharp edges and pinch points.
	A. Caught In, Under, Between	1) Be alert to fellow workers. 2) Be aware of all clearances. (above, behind and side to side) 3) Keep hands and feet clear of pinch points. 4) When available use a spotter when backing up vehicles or equipment.
	B. Cut, Puncture, Scrape	1) Wear leather work gloves to protect from sharp edges and pinch points, especially when handling guide rail material. 2) Keep clear of pinch points.
	C. Noise	1) Operator- wear hearing protection (ear plugs or muffs). 2) Other workers- wear earmuffs or ear plugs when in proximity of this vehicle.
	D. Struck by Flying, Falling, Sliding Object	1) Be aware and cautious of flying/falling objects. 2) Wear all required PPE, including hard hat and safety glasses. 3) Other worker - Wear hard hat and safety glasses when in proximity of this vehicle.
	E. Slip, Trip, Fall	1) Operator - Use three points of contact when entering/exiting onto this equipment. Face the equipment when entering/exiting. 2) Operator and other workers - Observe your path for obstacles such as rocks, air hoses or other materials that can cause a tripping hazard. 3) Observe the path for slope, slippery or uneven surfaces and obstructions that cause a tripping hazard. 4) Do not skip steps when entering/exiting onto this equipment and never jump off this equipment.
6. Post Pounder Operation	F. Suspension Lock	1) Ensure suspension lock is engaged and the foot on the boom is stationary.
	A. Vehicle/Equipment Struck By or Against	1) Identify equipment locations and use a spotter when available. 2) Stay within the established work zone. 3) Wear high visibility material. 4) Make sure back-up alarms are functioning properly.
	B. Struck by Flying, Falling, Sliding Object	1) Watch for flying/falling objects. 2) Wear a hard hat and safety glasses. 3) Watch overhead objects/hazards and use a spotter when needed.
	C. Slip, Trip, Fall	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 3) Do not jump down or skip steps when entering or exiting vehicles or equipment. 4) Contact the utility company when work must take place within the minimum distance.
D. Noise		1) Operator - Wear earmuffs or ear plugs. 2) Other workers - wear earmuffs or ear plugs when in close proximity of this equipment.

Post Pounder (Truck Mounted) - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
7. Job Shut Down	A. Caught In, Under, Between  B. Cut/Lacerations, Puncture, Scrape  C. Slip, Trip, Fall from Elevation  D. Overexertion	1) Know where other workers are and use a spotter, if available and when possible. 2) Be sure suspension lock is engaged and boom foot is stationary and locked. 3) Be aware of all clearances (above, behind and side to side).  1) Wear leather work gloves to protect from sharp edges and pinch points.  1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not skip steps when entering/exiting this equipment and never jump off this equipment.  1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed.
8. Fueling Equipment	A. Gasoline or Diesel	1) No topping off the tank. 2) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 3) Wear safety glasses or goggles when filling the tank to protect from incidental contact. 4) Keep face away when fueling.
9. Post Operation Inspection	B. Fire/Explosion  A. Vehicle/Equipment – Struck By/ Pinch Points  B. Cut, Puncture, Scrape  C. Slip, Trip, Fall	1) No smoking, heat sources, or open flames near fueling area. 2) Ensure fire extinguisher is nearby during refueling. 3) Ensure engine is shut off prior to fueling.  1) Ensure vehicle is turned off, keys in pocket.  1) Wear leather work gloves to protect from sharp edges and pinch points.  1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation Roller (Ride-on) – General Operation		2. Job Location Field	
3. Equipment/Tools/Machinery Used Rubber Tire Roller, Metal Drum Roller		4. Medical Exams	Yes No
5. Required Training Roller Certification		Physical Exam Required	
Frequency Initial		Respirator Exam Required	
		6. Inspection Requirements	Frequency Daily
		M-614	
		Preventative Maintenance (PM)	60 to 90 days
7. Personal Protective Equipment (X)			
Eyes	Hands and Arms	Feet/Legs	Body / Skin
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:	Heat Resistant	X Above the ankle boot with good tread	Rubber Apron
	Cold Resistant	Heat/Cold Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
	<b>Hearing Protection</b>	Other:	Other: <b>Other</b>
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		Personal Flotation Device
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual	X PUB 445M	X PUB 23 Maintenance M
X Foreman's Manual	Pub 234	X PUB 235	Manual
<b>Prepared By:</b> District 6 JSA Team		<b>Safety Coordinator:</b> Tom Schmidt	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Roller (Ride-on) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against/Pinch Points B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket. 2) Secure hood and compartment covers. 1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear that is above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Fueling	A. Vehicle/Equipment – Struck By or Against B. Chemical (fuel) C. Fire/Explosion	1) Shut off engine, set parking brake, and place the transmission in neutral or park (as applicable). 1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 2) Wear safety glasses to protect from incidental contact. 1) No smoking near heat sources, or open flames near fueling area. 2) Ensure fire extinguisher is nearby during refueling.
3. Secure Roller for Transport and Offload at Job Site	A. Various B. Pinch Points/Crushing Injury C. Crushing/Pinch Points/Runaway Roller	1) Refer to Lowboy JSA. 1) Secure tie-down chain or straps and articulation bar lock. 2) Wear leather work gloves to protect from sharp edges and pinch points. 3) Keep hands and feet clear of any tight areas. 4) Secure Roller in a park position. 1) Carefully disengage chain straps/articulation bar lock.
4. Mount / Dismount Roller	A. Slip, Trip, Fall B. Sprain/Strain C. Vehicle/Equipment - Struck by or Against	1) Face the roller all times when getting on or off the equipment. 2) Maintain three points of contact at all times. 3) Do not use the controls as hand holds. 4) Look at the surface around the equipment and clear debris to prevent trips and falls. 1) Never jump off the equipment. Always use foot and hand holds. 1) Start the unit only when seated in the operator's position. 2) Never enter or exit a moving piece of equipment. 3) Always shut off the engine and apply the parking brake before dismounting the machine. 4) Always look around your work area for traffic and equipment prior to starting the task.

Roller (Ride-on) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Operate roller	A. Rollover/Crushing Injury	<ol style="list-style-type: none"> <li>1) Check area for slippery conditions and the stability of the soil/area being compacted. Avoid soft/unstable edges where the ground could give way under the roller.</li> <li>2) Operate the roller on level ground as much as possible. Ensure the roller is not operated on grades steeper than those specified by the manufacturer.</li> <li>3) Use machinery equipped with rollover protective structures (ROPS) and seatbelts. Do not remove these safety devices and ensure their use.</li> <li>4) Contact the manufacturer or equipment dealer to determine whether approved retrofit ROPS and seatbelts are available for rollers without these safety features.</li> <li>5) Replace seatbelts if they are damaged, worn, or too small.</li> <li>6) Wear the seat belt at all times and do not jump from the equipment in the event of a rollover.</li> <li>7) Keep knees and elbows close to the body, hold on firmly to the steering wheel, and lean away from the impact to avoid being crushed by machine or ROPS.</li> </ol>
	B. Vehicle/Equipment - Struck By or Against	<ol style="list-style-type: none"> <li>1) Before operating the roller or changing the direction of travel, make sure that personnel and obstacles are free from the roller's path. Serious injury or death can result.</li> <li>2) Use spotters or barriers where necessary. Be aware of equipment blind spots.</li> <li>3) Confirm communication signals to be used between equipment operators and workers on foot.</li> <li>4) Make sure of shifting position forward/reverse prior to moving equipment.</li> <li>5) Stay within the established work zone.</li> <li>6) Do not ride equipment or allow passengers on rollers.</li> <li>7) Ensure back up alarms are functioning properly.</li> <li>8) Whenever possible, stop the unit on a stable, level, and hard surface. If on an incline, secure the parking brake and stop the engine; then chock both the front and rear drums/wheels securely.</li> </ol>
	C. Caught In or Between	<ol style="list-style-type: none"> <li>1) Stay clear of turning/articulating points of the machine as these areas are pinch points. Never place yourself or allow coworkers to stand near the machine while the engine is running.</li> <li>2) Keep other personnel away from equipment while in operation.</li> <li>3) Maintain safe distance between vehicles and keep employees from entering these areas.</li> </ol>
	D. Noise Hazard	<ol style="list-style-type: none"> <li>1) Wear hearing protection (ear plugs or muffs) as appropriate.</li> <li>2) Stay clear of equipment if not operating it to reduce noise exposure.</li> </ol>
	E. Sprains / Strains	<ol style="list-style-type: none"> <li>1) Maintain proper posture and a straight back when using/driving a roller.</li> </ol>

Roller (Ride-on) – General Operation

**JSA Acknowledgements**

Print Name	Signature	Date

Roller (Ride-on) - General Operation

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Scaffold Erecting and Dismantling		Field, Stockpile, Garage Locations	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes No
Scaffolding		Physical Exam Required	
		Respirator Exam Required	
5. Required Training		6. Inspection Requirements	Frequency
Scaffold Training		Initial	Daily
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Metatarsal Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Heat/Cold Protection	Other:
Welding Shield	X Leather Work	Electrical Protection	<b>Body (Whole)</b>
Other:	Other:	Chemical Resistance	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Other:
X Hard Hat	Ear Muffs		Personal Flotation Device
Bump Cap	Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X Pub 445M	Operators Manual		
	Pub 234		
<b>Prepared By:</b> Employee Safety and Training Division		<b>Safety Coordinator:</b> Brian Pollick	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Initial Inspection	A. Structure B. Bracing C. Strains and Sprains/Pinch Points	1) Inspect frame for any damage, crimping, or other major hazards. 1) Inspect for damage, loose bolts, or other major hazards. 1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Wear protective work gloves to protect from sharp edges and pinch points.
2. Pre-task Safety Brief	A. N/A	1) All employees assigned to this task will attend a pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.
3. Location/Setup of Scaffolding	A. Strains and Sprains/Pinch Points  B. Overexertion  C. Lifting	1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Wear protective work gloves to protect from sharp edges and pinch points.  1) When lifting components, bend at the knees, pull the object close to your body, stand up with object, and do not twist. 2) Get assistance as needed.  1) When adding more sections of scaffolding on top of another, lift frames and bracing up with a rope. 2) Get assistance to hand up sections or tie rope to before lifting to eliminate the need up climbing up and down constantly.
4. Climbing	A. Strains and Sprains/Pinch Points  B. Fall from Elevation	1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Wear protective work gloves to protect from sharp edges and pinch points. 4) Maintain three (3) points of contact at all times when entering and exiting.  1) A guardrail must be present on the top of the scaffolding. 2) Wear a personal fall arrest system and maintain 100% tie off (2-legged lanyard) if guardrails or other acceptable fall protection methods are not utilized. 3) Anchor points must be able to support 5,000 lbs. per person attached. 4) Prepare rescue plan if there is a possibility of a fall.

Scaffold Erecting and Dismantling

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
5. Dismantling	A. Strains and Sprains/Pinch Points	1) Wear safety footwear above the ankle boot with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Wear protective work gloves to protect from sharp edges and pinch points.
	B. Overexertion	1) When lifting components, bend at the knees, pull the object close to your body, stand up with object, and do not twist. 2) Get assistance as needed.
	C. Lowering	1) When removing sections of scaffolding from each other, lower frames and bracing down with a rope. 2) Get assistance to hand down sections or tie rope to before lowering to eliminate the need up climbing up and down constantly.

Scaffold Erecting and Dismantling

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Scaffold Erecting and Dismantling

**JOB SAFETY ANALYSIS**

<b>1. Job Operation</b>		<b>2. Job Location</b>	
Shoulder Cutting – General Procedures		Stockpile and State Highway	
<b>3. Equipment/Tools/Machinery Used</b>			
Crew Cab, Grader, Belt Loader, Broom, Roller, Dump Trucks, Water Truck, Hand Tools (Brooms/Shovels), Shadow Vehicle		4. Medical Exams	
5. Required Training		Physical Exam Required	
Truck & Loader Certification/Spider Broom		Respirator Exam Required	
Grader Certification/Backhoe		6. Inspection Requirements	
Belt Loader Certification		Frequency	
Roller Certification/Skid Steer		Daily	
<b>7. Personal Protective Equipment (X)</b>			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:	Heat Resistant	X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	X Other: Nuisance Dust Mask
<b>Head</b>	<b>Hearing Protection</b>	X Slip Resistant	Personal Fall Arrest System
X Hard Hat	X Ear Muffs	Other:	Personal Flotation Device
Bump Cap	X Ear Plugs		
Other:	Other:		
<b>8. Reference Manuals</b>			
X Pub 213	Operators Manual	X Pub 445	
X Foreman's Manual	Pub 234	X Pub 445M	
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Dennis McArdle	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Shoulder Cutting – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Conduct Circle of Safety and Pre-trip Inspection of Equipment (M-614)</p>	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Cut, Puncture, Scrape</p> <p>C. Slip, Trip, Fall</p>	<p>1) Park fleet, set brakes, and use wheel chocks as needed.</p> <p>2) Ensure vehicle is turned off, keys in pocket.</p> <p>3) Use bed props when needed to access pinch points or crushing areas.</p> <p>1) Wear leather work gloves to protect from sharp edges and pinch points.</p> <p>1) Wear safety footwear above the ankle with good tread.</p> <p>2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.</p> <p>4) Do not jump down or skip steps when entering or exiting vehicles or equipment.</p> <p>5) Utilize a ladder as needed. Refer to Ladder JSA.</p>
<p>2. Fueling</p>	<p>D. Chemical/Cut or Puncture</p> <p>E. Burn</p> <p>A. Chemical (fuel)</p>	<p>1) Never use your hands to check hydraulic lines.</p> <p>2) Use a piece of sturdy cardboard or wood when searching for hydraulic leaks.</p> <p>3) Wear safety glasses or goggles and leather gloves.</p> <p>1) Make sure engine is cool before checking items in engine compartment.</p> <p>1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released.</p> <p>2) Wear safety glasses and rubber gloves to protect from incidental contact</p> <p>3) Never leave fuel pump/truck unattended while fueling.</p> <p>4) Refer to Safety Data Sheet (SDS)</p>
<p>3. Travel To/From Job Site</p>	<p>B. Fire/Explosion</p> <p>A. Vehicle/Equipment – Accident</p> <p>B. Struck By or Against – Objects</p>	<p>1) No smoking, open flames, cell phone use, or other ignition sources near the fueling area.</p> <p>1) Refer to Lowboy, or Equipment Specific JSAs as applicable.</p> <p>2) Keep the windows, mirrors, and lights clean to maintain good visibility.</p> <p>3) Wear seat belt at all times when operating equipment.</p> <p>4) Maintain safe traveling speed according to the road conditions and slowdown in congested areas.</p> <p>5) Know the height, weight, and width of the vehicle and maintain proper clearances.</p> <p>1) Keep blades, buckets, or attachments in the proper position when traveling to the jobsite/work location.</p> <p>2) Make sure objects are secure and place any loose or heavy items in the proper storage area.</p>

Shoulder Cutting – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>4. Inspect Job Site for Potential Hazards and Ensure Traffic Control is in Place</p>	<p>A. Vehicle/Equipment – Struck By or Against</p> <p>B. Slip, Trip, Fall</p> <p>C. Struck by Flying, Falling, Sliding Object</p>	<p>1) Refer to Work Zone Set Up JSA and Pub 213.                      2) Refer to Flagging JSA or PUB 234.                      3) Conduct a pre-task safety brief or talk regarding the potential hazards and controls for those hazards.                      4) Ensure flaggers are appropriately positioned.                      5) Maintain effective radio communications. Test radios, check batteries, use pilot truck as necessary to control traffic.                      6) Evaluate the need for a dedicated safety spotter to watch backing maneuvers.</p> <p>1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>1) Wear hard hat.</p>
<p>5. Position Fleet and Personnel for Operation</p>	<p>A. Slip, Trip, Fall - Elevation</p> <p>B. Vehicle/Equipment – Struck By or Against</p>	<p>1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.                      2) Do not jump down or skip steps when entering or exiting the vehicles or equipment.</p> <p>1) Wear high visibility apparel at all times when walking around the worksite.                      2) Visually check area for other equipment and coworkers before moving equipment or walking around the worksite.                      3) Use a spotter if vision is obstructed when backing up to ensure area is clear.                      4) Coordinate hand signals if you are using a spotter.</p>
<p>6. Grade Shoulder Operation</p>	<p>A. Various</p> <p>B. Vehicle/Equipment – Struck By or Against</p> <p>C. Noise</p>	<p>1) Refer to Grader JSA.</p> <p>1) Use flaggers or other traffic control devices when moving equipment from one side of the street to the other or through intersections.                      2) Move as a unit and maintain spacing between other equipment and personnel. Be prepared for grader to pause or stop during the operation.                      3) Maintain effective radio communications or utilize spotters as needed.                      4) Use spotters as needed to check for manholes, utility shut offs, fixed objects, and other possible obstructions. Spotter shall be ahead of the grader at least 25 feet in front.                      5) Confirm with the operator that he/she is aware of your position and the task you are about to complete.                      6) No additional riders shall be on any part of the grader when it is moving. Only the operator will be in the cab.</p> <p>1) Wear ear plugs or earmuffs when consistently working around the grader during operation.</p>

Shoulder Cutting – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Grade Shoulder Operation continued	D. Inhalation/Eye Injury	1) Wear safety glasses or dust goggles as needed. 2) Utilize a water truck to control dust as needed. 3) Wear a non-certified nuisance dust mask or maintain distance from equipment to avoid dust as needed.
7. Load Material Operation	A. Various B. Slip, Trip, Fall	1) Refer to Belt Loader or Dump Truck JSA. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Avoid walking on or over the graded soil/material.
	C. Struck by Equipment/Crushing Injury	1) Maintain communication between truck driver and belt loader operator. 2) Maintain visual contact with the spotter/operators. 3) Employees should never be in the area between the belt loader and dump truck.
	D. Overhead Obstacles/Electrocution	1) Identify any overhead power lines or other electrical hazards. 2) Maintain clearances and use a spotter if needed. If a spotter is being used, ensure you are clear on communication signals between the operator and spotter beforehand. 3) Alert the operator in advance if overhead wires or obstructions may interfere with the operation. Maintain focus on the task.
	E. Struck by Flying, Falling, Sliding Object	1) Wear hard hat and safety glasses when working near the belt loader. 2) Do not walk alongside the belt loader while trucks are being loaded. 3) Do not overload trucks beyond their hauling capacities.
	F. Noise	1) Wear ear plugs or ear muffs when in the area of the belt loader during operation.
8. Broom Operation	A. Various B. Inhalation / Eye Injury	1) Refer to Broom/Towable Broom JSA. 2) Wear safety glasses or dust goggles as needed. 3) Utilize a water truck to control dust as needed. 4) Wear a non-certified nuisance dust mask or maintain distance from equipment to avoid dust as needed.
9. Roller Operation	A. Various B. Vehicle/Equipment – Struck By or Against/Crushing Injury/Rollover	1) Refer to Roller JSA. 2) Maintain spacing between other equipment and personnel. Stay focused on task and be prepared to pause or stop during the operation. 3) Know the grade and other equipment limitations to avoid rollover situations.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Grader Spotter (if used)	<p>A. Slip/Trip/Fall</p> <p>B. Vehicle/Equipment – Struck By or Against/Crushing Injury</p>	<p>1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</p> <p>2) Wear safety footwear above the ankle with good tread.</p> <p>1) Wear proper PPE, including hard hat and reflective apparel at all times in the work area.</p> <p>2) Utilize spotters as needed. Coordinate signals with the operators.</p> <p>3) Never ride on equipment and maintain safe distance from moving equipment. At least 25 feet in front of the grader when it is moving forward.</p> <p>4) Confirm with the operator that he/she is aware of your position and the task you are about to complete.</p> <p>5) Maintain visual contact with the operators.</p> <p>6) Employees should never be in the area between the belt load and the dump truck.</p>
	C. Eye Hazards and Noise	<p>1) Wear safety glasses or dust goggles as needed.</p> <p>2) Wear ear plugs or earmuffs when working near equipment.</p>
	D. Sprains/Strains	<p>1) Use proper lifting techniques and ask for assistance if needed. Avoid twisting.</p> <p>2) Use mechanical devices if available.</p> <p>3) Don't overload your shovel with dirt/material.</p> <p>4) When throwing or moving material, try to stay as close to the target area as possible.</p>
	E. Cuts, Blisters – Hands	<p>1) Use protective work gloves while shoveling or using a broom.</p>
11. Dump Material	A. Various	<p>1) Refer to Dump Truck JSA.</p>



**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Sign Installation (Ground Level) – General Procedures		Field (Various)	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Crew Cab, Hand Tools (sledgehammer, wrenches, sockets, level, saw), Ladder, Pulver, Chains, Drill, Pry Bar, Post Hole Digger		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	Frequency
PPE		M-614	Daily
Ladder		Ladder	Daily / Yearly
		Tools	Daily / Yearly
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:	X Above the ankle boot with good tread	X	Rubber Apron
<b>Face</b>	X Cold Resistant	Heat/Cold Protection	Welding Leathers
X Face Shield	X Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistance	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X Pub 213	X Operators Manual	X Pub 46	X Pub 09 (MUTCD)
X Foreman's Manual	X Pub 236	X Pub 111	X Pub 445M
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Dennis J. McArdle, A.S.C	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Receive/Store Signs	A. Sprains/Strains/Overexertion	1) Use proper lifting techniques and avoid bending at the waist. 2) Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting. 3) Use team lifting for large/odd shape signs.
	B. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points.
	C. Struck by Flying/Falling/Sliding Objects	1) Wear hard hat. 2) Wear safety glasses. 3) Wear safety footwear that is above the ankle with good tread.
2. Review Work Location	A. Underground or Overhead Hazards/Electrocution	1) Call 811 (PA One Call) before digging to avoid hitting underground utilities. 2) Stay a minimum of 10 feet away from power lines – if the work area contains any power lines (downed or otherwise), DO NOT work in the area and notify your supervisor immediately. 3) Complete preliminary checks prior to operating equipment.
	B. Slip, Trip, Fall Same Level	1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 2) Wear slip resistant footwear with good tread.
	C. Vehicle/Equipment – Struck By or Against	1) Refer to Work Zone Traffic Control JSA. 2) Wear proper PPE and high visibility apparel. 3) Use a spotter.
	D. Poisonous Plants	1) Identify potential poisonous plants. 2) Wear gloves and long sleeves if needed. 3) Use skin barrier lotion if appropriate.
	E. Animal/Insect Bite	1) Identify potential for animals/insects. 2) Use insect repellent as needed.
3. Load Truck/Proceed to Location	A. Sprains/Strains/Overexertion	1) Use good body mechanics and proper lifting techniques 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Pre-assemble large/odd shape signs before loading. 6) Rotate work duties when possible.
	B. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points.
	C. Struck by Flying/Falling/Sliding Objects	1) Wear proper PPE, including hard hat, leather gloves, and safety glasses or goggles.
	D. Vehicle Accidents	1) Refer to Safe Driver Training.

Sign Installation (Ground Level) – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
4. Set Up Work Location and Traffic Control	A. Vehicle/Equipment – Struck By or Against	1) Refer to Work Zone Traffic Control JSA and reference Pub 213 for additional information. 2) Turn on warning lights to notify motorists. 3) Put on reflective clothing and hard hat before exiting cab of truck. 4) Set cones around truck following the guide for Work Zone set up.
5. Remove Existing Sing/Anchor	A. Sprains/Strains/Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Rotate work duties when possible.
	B. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points. 2) Be aware of all clearances.
	C. Struck By Flying Objects	1) Wear hard hat, face shield, and safety glasses or goggles. 2) Wear safety footwear above the ankle with good tread.
	D. Poisonous Plants	1) Identify potential poisonous plants. 2) Wear gloves and long sleeves if needed. 3) Use skin barrier lotion if appropriate.
	E. Animal/Insect Bite	1) Identify potential for animals/insects. 2) Use rake or shovel to check ground area for hiding animals. 3) Use insect repellent as needed.
6. Install New Anchors/Sleeves	A. Sprains/Strains/Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Rotate work duties when possible.
	B. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points. 2) Be aware of all clearances.
	C. Struck By Flying Objects	1) Wear hard hat and leather gloves. 2) Wear face shield and safety glasses. 3) Wear safety footwear above the ankle with good tread. 4) Be alert of fellow workers. 5) Observe and be aware of all clearances.
	D. Noise	1) Use hearing protection (ear plugs or muffs). 2) Stay clear of the work area if you are not operating the equipment.
7. Install Sign to Post	A. Slip, Trip, Fall from Elevation	1) Refer to Ladder JSA, 2) Make sure ladder/step is on level ground. 3) Follow safety instructions/labels on the ladder.

Sign Installation (Ground Level) – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
		4) Maintain three points of contact. 5) Use a spotter to help stabilize the ladder.
	B. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points. 2) Be aware of all clearances.
	C. Sprains/Strains/Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Rotate work duties when possible.
	D. Struck by Flying Objects or Caught In, Under, or Between	1) Wear hard hat and leather gloves. 2) Wear face shield and safety glasses. 3) Wear safety footwear above the ankle with good tread. 4) Be alert of fellow workers. 5) Observe and be aware of all clearances.
8. Install Post to Anchor	A. Slip, Trip or Fall from Elevation	1) Make sure ladder/step is on level ground. 2) Follow safety instructions/labels on the ladder. 3) Maintain three points of contact. 4) Use a spotter to help stabilize the ladder.
	B. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points. 2) Be aware of all clearances.
	C. Struck by Flying Objects or Caught In, Under, or Between	1) Wear hard hat and leather gloves. 2) Wear face shield and safety glasses. 3) Wear safety footwear above the ankle with good tread. 4) Be alert of fellow workers. 5) Observe and be aware of all clearances.
	D. Sprains/Strains/Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Rotate work duties when possible.
9. Clean Up and Leave Site	A. Struck By Flying or Falling Object	1) Wear hard hat and leather work gloves. 2) Wear face shield and safety glasses. 3) Wear work boots. 4) Be alert of fellow workers. 5) Observe and be aware of all clearances.
	B. Vehicle/Equipment – Struck By or Against	1) Refer to Work Zone Traffic Control JSA. 2) Wear high visibility apparel

Sign Installation (Ground Level) – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
	C. Sprains/Strains/Overexertion	3) Use spotter. 4) Stay within established work zone. 1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Rotate work duties when possible. 6) Cut large post into smaller pieces for carrying and storage.
	D. Poisonous Plants	1) Identify potential poisonous plants. 2) Wear gloves and long sleeves if needed. 3) Use skin barrier lotion if appropriate.
	E. Animal/Insect Bite	1) Identify potential for animals/insects. 2) Use rake or shovel to check ground area for hiding animals. 3) Use insect repellent as needed.
	A. Cut/Puncture/Scrape	1) Wear leather/cut resistant gloves to protect from sharp edges and pinch points. 2) Be aware of all clearances.
	B. Sprains/Strains/Overexertion	1) Use good body mechanics and proper lifting techniques. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Use proper footing. 4) Use team lifting for larger/odd shape signs. 5) Rotate work duties when possible.
10. Unload Scrap		

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Sign Installation (Ground Level) - General Procedures

**JOB SAFETY ANALYSIS**

1. Job Operation Skid Steer - General Operation		2. Job Location Stockpile / Field	
3. Equipment/Tools/Machinery Used Skid Steer		4. Medical Exams Physical Exam Required	Yes
5. Required Training Skid Steer		Respirator Exam Required	No X
Frequency Initial Certification		6. Inspection Requirements M-614	Yes X
		Preventative Maintenance (PM) Inspection and Service	Frequency Daily / Prior to every use Every 6 months (Garage)
7. Personal Protective Equipment (X)			
Eyes	Hands and Arms	Feet/Legs	Body / Skin
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Earmuffs		
Other:	X Ear Plugs		
	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual		
Foreman's Manual	Pub 234		
<b>Prepared By:</b> District 11 JSA Team		<b>Safety Coordinator:</b> Richard Falvo	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Skid Steer - General Procedures



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket.  1) Wear leather work gloves to protect from sharp edges and pinch points.  1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Pre-task Safety Brief	A. No Hazard	1) All employees assigned to this task will attend a pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.
3. Task Preparation	A. Electrocution or Fire/Explosion	1) Call 8-1-1 (PA One Call) before digging to avoid hitting underground utilities.
	B. Environmental (Heat Stress, Frostbite)	1) Make sure you are wearing the proper clothing for the condition. 2) Drink plenty of water.
4. Secure Skid Steer for Transport	A. Various Hazards	1) Refer to Lowboy JSA.
5. Travel to/from Job Site	A. Vehicle Accidents	1) Refer to Safe Driver Training.
6. Offload Skid Steer at Jobsite	A. Various Hazards	1) Refer to Lowboy JSA.
7. Enter/Exit the Operator's Compartment	A. Slip, Trip, Fall	1) Face the equipment at all times when entering and exiting the operator's compartment. 2) Keep shoes free from mud, ice, snow or other material that could cause them to slip. 3) Maintain three (3) points of contact at all times. (two (2) hands and one (1) foot or two (2) feet and one (1) hand.) 4) Do not use the controls as hand holds.

Skid Steer – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Enter / Exit the Operator's Compartment Continued	<p>B. Sprain/Strain</p> <p>C. Vehicle/Equipment - Struck By or Against</p>	<p>1) Never jump from the operator's compartment or off equipment. 2) Always use foot and hand holds.</p> <p>1) Never enter or exit a moving piece of equipment. 2) Make sure bucket is lowered before exiting the cab. 3) Wear high visibility apparel and visually check area for other equipment before walking around the jobsite. 4) Avoid parking on inclines and chock wheels if necessary.</p>
8. Operation of Skid Steer	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Slip, Trip, Fall - From Elevation</p> <p>C. Noise</p> <p>D. Stuck By - Sliding/Falling Equipment</p> <p>E. Equipment Roll Over/Crushing Injury</p>	<p>1) Barricade the work area to prevent unauthorized access. 2) Scan the area for workers or equipment before moving the skid steer. 3) Never allow workers to ride anywhere on the equipment. 4) Never block vision with the bucket while traveling. 5) Keep operator's compartment clear of objects to avoid distractions.</p> <p>1) Wear seat belt at all times while in the operator's compartment. 2) Make sure restraint bar is lowered and secured. 3) Never stand in the bucket or on forks.</p> <p>1) Wear hearing protection at all times when operating the skid steer.</p> <p>1) Stay away from the edge of slopes, banks, excavations. 2) Do not overload the capacity of the bucket.</p> <p>1) Travel with the load as close to the ground as possible to maintain stability and control. 2) Drive around rocks, ditches, curbs, etc. Do not travel directly over them. 3) Before operating on a job site look for ruts, holes, drop-offs, hidden obstacles, slick spots, soft soil, or deep mud. 4) If traveling up or down a hill with load, keep load pointing uphill. 5) If traveling up or down hill empty, keep bucket downhill. 6) Travel straight up and down inclines, avoid going sideways or across.</p>

Skid Steer - General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Load Truck or Hauler	<p>A. Struck By – Falling Object</p> <p>B. Electrocution</p>	<p>1) Make sure truck operator is in safe location before dumping material into bed or hauler.</p> <p>2) Load the truck or hauler from the side or back. Never lift the bucket over the operator's compartment.</p> <p>3) Place bucket as close to dump location prior to lifting.</p> <p>1) Identify and overhead power lines or other electrical hazards.</p> <p>2) Stay a minimum of 10 feet away from power lines –If the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.</p> <p>3) Contact the utility company when work must take place within the minimum distance.</p>
10. Special Attachments	A. Struck By – Flying or Falling Objects	<p>1) Follow manufacturer's directions for proper use.</p> <p>2) Make sure all pins and pin locks have been securely fastened.</p> <p>3) Make sure all hoses are securely fastened.</p>
11. Park Skid Steer	A. Vehicle/Equipment - Struck By or Against	<p>1) Park in designated area.</p> <p>2) Do not park on inclines, chock wheels if needed.</p> <p>3) Emergency Stop – Set up flares or cones to warn other operators.</p> <p>4) Never leave the operator's compartment with engine running.</p> <p>5) Move foot pedal controls until both lock.</p> <p>6) Move hydraulic controls to neutral.</p>
12. Refuel	B. Struck Against	1) Make sure lift arms and attachment are fully on the ground.
	A. Chemical (fuel)	<p>1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released.</p> <p>2) Wear safety glasses or goggles to protect from incidental contact.</p>
	B. Fire/Explosion	<p>1) No smoking, heat sources, or open flames near fueling area.</p> <p>2) Keep all ignition sources at least 20ft away when fueling equipment.</p>

**JSA Acknowledgements**

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location			
Stone Chipper – General Operation		Stockpiles & Field (various)			
3. Equipment/Tools/Machinery Used		4. Medical Exams		Yes	No
Stone Chipper		Physical Exam Required			X
		Respirator Exam Required			X
5. Required Training		6. Inspection Requirements			
Frequency		Frequency			
Initial Certification		Daily/Prior to every use			
Stone Chipper Certification		Preventive Maintenance (PM) Inspection and Service			
		Every 6 month (Garage)			
7. Personal Protective Equipment (X)					
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>	<b>Respiratory Protection</b>	
X Safety Glasses	X Protective Sleeves	Leggings / Chaps	X Reflective Apparel		Filtering Face Piece
	Gloves	Foot or Leg Guards	Reflective Vest/Flagger		Half Face Respirator
	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit		Full Face Respirator
		Foot Protection	Rain Gear		PAPR
	Heat Resistant	X Above the ankle boot with good tread	Rubber Apron		SCBA
	Cold Resistant	Heat/Cold Protection	Welding Leathers		Supplied Air
X Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:		Cartridge:
	X Leather Work	Chemical Resistance	<b>Body (Whole)</b>		Other:
	Other:	Metatarsal Protection	Personal Fall Arrest System		<b>Other</b>
	<b>Hearing Protection</b>	Other:	Personal Flotation Device		
X Hard Hat	X Ear Muffs				
	X Ear Plugs				
	Other:				
8. Reference Manuals					
	X Operators Manual	X Pub 235			
X Foreman's Manual	Pub 234	X Pub 445M (MESH)			
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Bernadette Taylor			
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022			

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Conduct Circle of Safety and Pre-trip Inspection (M-614)</p>	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Cut, Puncture, Scrape</p> <p>C. Slip, Trip, Fall - Same Level (Road Surface) or Different Level (Equipment)</p>	<p>1) Ensure stone chipper is turned off and keys are in pocket.</p> <p>2) Wear leather work gloves for protection against sharp edges, blades, etc.</p> <p>1) Look at the road surface around the stone chipper and clear debris to prevent trips and falls.</p> <p>2) Look at the equipment surface and clear equipment, etc. from the walking surface to prevent trips and falls.</p>
<p>2. Travel to/from Job Site</p>	<p>A. Vehicle Accidents</p>	<p>1) Refer to Safe Driver Training</p>
<p>3. Set Up Work Location</p>	<p>A. Vehicle/Equipment - Struck By or Against</p>	<p>1) Refer to the Work Zone Traffic Control and Stone Chipping/Seal Coat JSAs.</p>
<p>4. Prepare Stone Chipper for Operation</p>	<p>A. Caught In / Caught Between</p>	<p>1) Ensure all guarding is secure. Clear all employees away from moving parts of the stone chipper before starting the engine.</p>
<p>5. Mount/Dismount Stone Chipper</p>	<p>A. Slip, Trip, Fall - Same Level (Road Surface) or Different Level (Equipment)</p>	<p>1) Wear safety footwear that is above the ankle with good tread.</p> <p>2) Look at the surface around the stone chipper and clear debris to prevent trips and falls.</p> <p>3) Face the stone chipper and maintain three (3) points of contact when entering or exiting the equipment.</p> <p>4) Never jump or skip steps when entering or exiting.</p> <p>5) Always look around your work area for traffic and equipment prior to starting the task.</p>
<p>6. Operate Stone Chipper (Refer to Stone Chipping/Seal Coat Operation JSA for additional information)</p>	<p>A. Vehicle/Equipment - Struck By or Against</p> <p>B. Contact Stress/Strains - Upper Body</p>	<p>1) Visually inspect the work area for co-workers, obstructions, and overhead wires/tree limbs. Make sure there is clear communication with co-workers while operating the stone chipper.</p> <p>1) While driving the chipper it is necessary to lean to the right for visibility. Consider removable padding to provide arm protection for operators that choose to lean on the railing.</p>
<p>7. Provide Support to Stone Chipper Operator</p>	<p>A. Falls - Same Level</p> <p>B. Falls - Different Level</p>	<p>1) When the operator is signaled to move the equipment, ensure that one hand is gripping the railing.</p> <p>2) Maintain your balance by keeping your feet slightly spread apart.</p> <p>1) Never walk around on the stone chipper while it is operating unless absolutely necessary.</p> <p>2) Stay away from rail openings at all times. Ensure chains are secured across the openings.</p> <p>3) Do not sit on the rails at any time.</p>

Stone Chipper - General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure	
Provide Support to Stone Chipper Operator Continued	C. Caught In – Moving Belt	1) The front point person of the stone chipper must maintain a grip on the guard rail while the equipment is in operation and the belt is moving. 2) The rear point person must not approach this area while the equipment is in operation. 3) Ensure the floor area of the chipper is clear of tools and debris.	
	D. Grab Pole (front of stone chipper) / Cut, Lacerations	1) Wear protective work gloves.	
	E. Contact Stress (Grab Pole)	1) Wear protective work gloves 2) Job rotation (rotate employees as needed)	
	F. Electrocution – Contact with Electrical Wires	1) Assign spotter to alert the operator in advance if overhead wires, tree limbs, bridges, or other hazards may interfere with the operation. Maintain focus on the task.	
	G. Heat Stress	1) Drink plenty of water. Once you are thirsty you are already becoming dehydrated. 2) Review tip sheet on the signs and symptoms of heat stress. Observe co-workers throughout the day to assist in prevention. 3) Ensure adequate water supply is on site. 4) Give heat stress safety talk including signs and symptoms. 5) Be aware of heat of equipment. 6) Provide cool down periods if necessary.	
	8. Retrieve Shovel and Shovel Stone from the Rear of Stone Chipper as Needed	A. Slip, Trip, and Fall – Different Level	1) Face the stone chipper while dismounting and maintain three (3) points of contact. 2) Ask your co-worker to hand you the shovel once you are on the ground. 3) Never jump or skip steps while entering or exiting the machine.
		B. Crushing – Whole Body	1) Confirm with operator that he/she is aware of the shoveling task you are about to complete.
C. Sprains, Strains – Upper body (reaching over shoulder height)		2) Always stand to the side of the equipment while shoveling. 1) Don't overload your shovel with stone. 2) Don't twist your body when throwing stone. 3) When throwing the stone, try to stay as close to the target area as possible.	
D. Slip, Trip, Fall – Same Level		1) Visually inspect the work area for trip and fall hazards to include litter, branches, and uneven surfaces. 2) Periodically wipe the bottom of your shoes to reduce the buildup of oils and stone.	
E. Cuts, Blisters – Hands		1) Use protective work gloves while shoveling stone.	

Stone Chipper – General Operation

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Stone Chipper - General Operation



**JOB SAFETY ANALYSIS**

<b>1. Job Operation</b>		<b>2. Job Location</b>	
Stone Chipping and Seal Coat – General Procedures		Field	
<b>3. Equipment/Tools/Machinery Used</b>			
Power Broom, Oil Distributor, Stone Chipper, Dump Trucks, Rubber Tire Rollers, Loader, Pilot Truck, Crew cab, Small Hand Tools			
<b>4. Required Training</b>		<b>5. Inspection Requirements</b>	
Frequency		Frequency	
Oil Distributor Operator - Liquid Asphalt Training		Equipment Calibration (Oil Distributor, Stone Chipper, Rubber Tire Roller)	
Yearly		Calibrate in accordance with Appendix B of Chapter 7 of Pub 23	
Foreman required BOMO Training – Seal Coat Operations		Oil and Stone Applications (yield verifications)	
Every Two Years		Twice daily/ or until desired application is achieved.	
Operator Certifications for specialized equipment			
Initial certification per Pub 235			
<b>7. Personal Protective Equipment (X)</b>			
<b>Eyes</b>		<b>Feet/Legs</b>	
Protective Sleeves		Leggings / Chaps	
Gloves		Foot or Leg Guards	
Chemical Resistant Type:		Reflective Leggings	
Heat Resistant		Foot Protection	
Cold Resistant		X Above the ankle boot with good tread	
Abrasion/Cut Resistant		Heat/Cold Protection	
Leather Work		Electrical Protection	
Other: Rubber-Heat Resistant		Chemical Resistance	
<b>Hearing Protection</b>		Metatarsal Protection	
X Ear Muffs		Other:	
X Ear Plugs			
Other:			
<b>8. Reference Manuals</b>			
X Pub 213		X Pub 235	
X Operator's Manual		X Pub 23	
X Foreman's Manual		X BOMO QA Seal COAT	
X Pub 234		X Pub 445M	
<b>Prepared By:</b> District 5 JSA Team			
<b>Reviewed By:</b> Employee Safety and Training Division			
<b>Safety Coordinator:</b> Bernadette Taylor			
<b>Distribution Date:</b> 2022			

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Various	1) Refer to equipment specific JSA's
2. Load Hand Tools on the Stone Chipper and Yield Test Equipment	A. Slip, Trip and Fall	1) Wear safety footwear that is above the ankle with good tread. 2) Face the stone chipper and maintain three (3) points of contact when entering or exiting the equipment. 3) Never jump or skip steps when entering or exiting.
3. Travel to and from Job Site	B. Cut, Puncture, Scrape	1) Wear leather work gloves for protection against sharp edges, blades, etc.
4. Setup Work Location and Traffic Control	A. Vehicle Accidents A. Vehicle/Equipment - Struck By or Against	1) Refer to Safe Driver Training 2) Refer to Work Zone Traffic Control JSA and reference Pub 213 for additional information. 3) Turn on warning lights to notify motorists of your presence. 4) Put on reflective clothing, PPE, and hard hat before exiting cab of the truck. 5) Set cones around the truck following the guide for work zone set up. 6) Ensure radios are operating properly and spare batteries are available.
5. Remove Debris from Roadway	B. Chemical/Burn or Scald	1) Ensure all Safety Data Sheets (SDS) are available onsite for potential exposure to chemicals during operations. 2) Discuss burn care first aid daily during safety talks or pre-work meetings.
6. Deploy Flagging Personnel/Pilot Vehicle	A. Various B. Struck by Flying or Falling Object	1) Refer to Mobile/Towable Broom JSA 2) Wear hard hat, leather work gloves, and safety glasses. 3) Keep distance from broom and other equipment to create.
7. Place Oil Distributor at the Lead Position in the Operation	A. Various	1) Refer to Work Zone Traffic Control JSA. 2) Preplan escape route. 3) Pilot vehicle eliminates travel lane confusion (head on collisions). 4) Designated vehicle to escort traffic through work zone. Install "FOLLOW ME" sign on rear of vehicle.
8. Position Dump Truck, Stone Chipper, and Rollers on Roadway	A. Various	1) Refer to Oil Distributor JSA. 2) Refer to Dump Truck, Stone Chipper, and Roller JSAs.
9. Attached Truck Hooks to Chipper and Charge with First Load of Aggregate	A. Fall/Whiplash	1) Keep workers off the equipment (other than operators) until it is properly attached. 2) Wear seat belt at all times. 3) Use trained and experienced drivers.

Stone Chipping and Seal Coat - General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
	B. Crushing Injury	1) Employees should never be in the area between the machine and dump truck. 2) Operator and spotter need to maintain visual contact at all times when aligning truck and chipper. 3) Coordinate hand signals with the operator and ensure the area is clear.
C. Vehicle/Equipment – Struck Against or Sprain/Strain		1) Keep chute door clean and use proper tool for clearing jams.
10. Oil Distributor Operator Begins Required Spray Application	A. Various	1) Refer to Oil Distributor JSA.
B. Burn/Scald		1) Keep all ground personnel a minimum of 300' from distributor during spray application.
C. Vehicle/Equipment – Struck By or Against		1) Watch for obstructions (personnel, vehicles, debris).
A. Various		1) Refer to Stone Chipper, Dump Truck, or Roller JSA for equipment specific information.
B. Overhead Obstructions/Electrocution		1) Use spotter to watch for obstructions and signal driver. 2) Scan the area (bridges, wires, trees, etc.) and ensure proper clearances are maintained. 3) Identify any overhead power lines or other electrical hazards. 4) Stay a minimum of 10 feet away from power lines if the work area contains any power lines (downed or otherwise), do not work in the area and notify your supervisor immediately.
C. Sudden Stops/Falls/Equipment – Struck By or Against		1) Maintain safe distance between vehicles and keep employees from entering these areas. 2) Use spotter to signal driver. 3) Maintain good flagger to flagger communication.
D. Vehicle Traffic – Struck By or Against		1) Work within the established work zone setup. 2) Use a pilot vehicle to guide traffic. 3) Maintain good flagger communication.
12. Conduct Yield Test on Aggregate/Oil Application Rates	A. Slip, Trip and Fall – From Elevation	1) Ensure that your work boots are free of oil, grease, and debris. Wipe off, if necessary, prior to climbing. 2) Face equipment and maintain three (3) points of contact at all times when entering or exiting. 3) Never jump or skip steps when entering or exiting.
B. Vehicle/Equipment – Struck By or Against		1) Communication between all equipment operators and crew members must be precise and clear.
C. Burn/Scald		1) Wear gloves and safety glasses or goggles.
D. Sprain/Strain		1) Lift with your legs, not your back. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed.

Stone Chipping and Seal Coat – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
13. Release Empty Truck and Replace with Full One	A. Whiplash or Falling  B. Crushing Injury  C. Vehicle Accident – Collisions	1) Keep workers off the equipment (other than operators) until it is properly attached. 2) Use handrails and wear seat belt at all times. 3) Use spotter to communicate between operator and driver.  1) Employees should never be in the area between the machine and dump truck. 1) Use radio communication between drivers and flaggers.
14. Broom the Accumulated loose Aggregate from the Untreated Lane onto the Treated Lane	A. Various  B. Struck by Flying or Falling Object	1) Refer to Mobile/Towable Broom JSA.  1) Wear hard hat, leather work gloves, and safety glasses. 2) Keep distance from broom and other equipment to create separation and avoid dust.
15. Reposition Equipment and Continue Operation	A. Repetitive Motion/Fatigue  B. Heat Stress	1) Rotate worker tasks when possible.  1) Ensure adequate water supply is on site. 2) Give heat stress safety talk including signs and symptoms. 3) Be aware of heat of equipment. 4) Provide cool down periods if necessary. 5) Observe co-worker throughout the day for signs of heat stress. 6) Ensure A/C is functioning in trucks used in the operation.

<b>Date</b>	<b>Signature</b>	<b>Print Name</b>

**JOB SAFETY ANALYSIS**

<b>1. Job Operation</b>		<b>2. Job Location</b>	
Tar Kettle – General operation (conveyor & oven)		Various	
<b>3. Equipment/Tools/Machinery Used</b>			
Tar Kettle – Craftco Series II E-Z 1500		4. Medical Exams	
		Physical Exam Required	
		Respirator Exam Required	
		Yes	
		No	
		X	
		X	
<b>5. Required Training</b>			
Loading Procedures		Frequency	
Personal Protective Equipment		Prior to Use	
Hot Oil		Semi-annual	
Tar Kettle Operations			
<b>7. Personal Protective Equipment (X)</b>			
<b>Eyes</b>		<b>Feet / Legs</b>	
X Safety Glasses		Leggings / Chaps	
X Chemical Goggles		Foot or Leg Guards	
Dust Goggles		Reflective Leggings	
Welding Shield		Foot Protection	
Other: X Heat Resistant		X Above the ankle boot with good tread	
<b>Face</b>		Heat/Cold Protection	
X Face Shield		Electrical Protection	
Welding Shield		Chemical Resistant	
Other: X Leather Work		Metatarsal Protection	
<b>Head</b>		Other:	
X Hard Hat		<b>Hearing Protection</b>	
Bump Cap		Ear Muffs	
Other:		Ear Plugs	
		Other:	
<b>8. Reference Manuals</b>			
X Pub 213		X Operators Manual	
Foreman's Manual		Pub 234	
<b>Prepared By:</b> District 5 JSA Team		<b>Safety Coordinator:</b> Bernadette Taylor	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Connect Kettle to Vehicle	A. Slips/Trips/Falls – Same Level B. Vehicle/Equipment - Struck by Vehicle or Equipment / Pinch Points	1) Wear leather work shoes with good traction. 2) Clear any debris around attachment area. 1) Always use a spotter when available while connecting the kettle to the truck. 2) Operator and spotter to maintain visual contact at all times when aligning truck and kettle. 3) Wear leather work gloves and keep hands clear of pinch points when securing pintle hook or hitch. 4) Ensure safety chains are secure.
2. Preheat Kettle and Hose	A. N/A	1) Set to proper temperature. Refer to the manufacturer's specifications.
3. Load Kettle / Conveyor with Blocks  (Refer to additional Tar Kettle JSAs for manual loading, lighting, and starting procedures.)	A. Sprains and Strains – Whole body B. Slip, Trip, Fall - Elevation C. Sprains and Strains – Upper Body (approximately 36 pounds per block)	1) Face the dump truck and use three (3) points of contact when entering or exiting the truck. 2) Never jump down or skip steps. 1) Load the conveyor with the appropriate number of blocks to fill the kettle. Load a few at a time and permit the blocks to melt. Never load all of the blocks at one time. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed. 4) Hold the blocks close to your body while lifting and placing on the conveyor. 5) Never load the conveyor while the vehicle is in motion.
4. Heat Material and Check Kettle as Needed	A. Inhalation of Vapors B. Burns	1) Keep head to the side when you open the lid. Let vapors escape prior to looking inside. 2) Wear safety glasses/goggles, face shield, and leather gloves.
5. Apply/Spray Material	A. Various Hazards	1) Refer to Crack and Joint Sealing JSA for additional operational and PPE requirements.

Tar Kettle – General operation (conveyor & oven)

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>



**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Welding and Cutting – General Procedures (Gas and Electric)		Garage, Maintenance Shops, Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes No
Arc Welder, MIG Welder, Gas Welder, Tig Welder, Forge, Cranes/Overhead hoists, Angle Grinder, Hammer, Chisel, Wire Brush		Physical Exam Required	X
5. Required Training		Respirator Exam Required	X
Welding Certification		6. Inspection Requirements	Frequency
Respirator		Equipment Inspection	Before each use
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	X Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
X Welding Shield	X Heat Resistant	Foot Protection	Rain Gear
Other:		X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	Cold Resistant	Heat/Cold Protection	Welding Leathers
X Face Shield	X Abrasion/Cut Resistant	Electrical Protection	Other:
X Welding Shield	Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	X Wear hard hat and vest if required to weld in a workzone.
Hard Hat	X Earmuffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
Pub 213	X Operators Manual		
Foreman's Manual	Pub 234		
<b>Prepared By:</b> District 4 JSA Team		<b>Safety Coordinator:</b> Jake Hoinowski	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Welding and Cutting – General Procedures (Gas and Electric)

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614) if Going to a Field Location	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall	1) Ensure vehicle is turned off, keys in pocket. 1) Wear leather work gloves to protect from sharp edges and pinch points. 1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Travel To/From Job Site	A. Various Hazards B. Flying Object/Vehicle Accident	1) Refer to Safe Driver Training. 1) Remove gauges from cylinders and install protective caps if transporting by vehicle. 2) Secure cylinder from accidental movement.
3. Pre-task Safety Brief	A. No Hazard	1) All employees assigned to this task will attend pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.
<b>General Requirements</b>		
4. Prepare Welding Area	A. Slip, Trip, Fall B. Weld Flash C. Strain/Sprain D. Struck By Falling Object E. Burn F. Cuts/Scrapes	1) Make sure floor is clear of tripping hazards. 2) Make sure floor is dry and adequate traction is provided. 1) Erect welding curtain to protect bystanders from weld flash. 2) Make sure welding helmet fits securely. 3) Inspect welding helmet for cracks. 4) Make sure the proper filter shade is selected for the task. 1) If bench-top welding, place material to be welded in the area and use clamps for support if needed. 2) Use assisted lifting devices or team lifts for large objects. 1) Inspect overhead hoist or other mechanical lifting devices before lifting material. 1) Inspect PPE for holes or damage. 2) Do not touch parts that have recently been welded. 3) Use a tool to handle recently welded parts. 1) Wear cut resistant gloves to handle sharp materials.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
4. Prepare Welding Area continued	G. Fire/Explosion	<ol style="list-style-type: none"> <li>1) Make sure all flammable material is at a minimum of 35 feet away from the welding area.</li> <li>2) Inspect tanks, hoses, and fittings for damage and secure connections.</li> <li>3) Do not weld on pressurized objects.</li> <li>4) Do not weld on objects that contained or contain a flammable material.</li> <li>5) Use a fire watch for at least 20 minutes after welding has been completed.</li> </ol>
5. Prepare or Cut Material With Grinder	A. Struck By flying Object	<ol style="list-style-type: none"> <li>1) Inspect grinding wheel for damage.</li> <li>2) Make sure guard is in place before cutting.</li> <li>3) Wear safety glasses and a face shield to protect from flying chips.</li> </ol>
6. Welding or Cutting	B. Noise	<ol style="list-style-type: none"> <li>1) Wearing hearing protection (ear plugs, earmuffs).</li> </ol>
	A. Burn	<ol style="list-style-type: none"> <li>1) Wear leather gloves, apron, and jacket.</li> <li>2) Recommend using earmuffs, Nomex hood, or another means to cover and protect the ears/ear canal from falling slag when working under equipment.</li> </ol>
	B. Weld flash	<ol style="list-style-type: none"> <li>1) Make sure the welding helmet face shield has the proper shading for the task and is down before beginning any welding.</li> </ol>
7. Chip/Grind Excess Weld Slag	C. Inhalation	<ol style="list-style-type: none"> <li>1) Utilize general mechanical ventilation for the area.</li> <li>2) Adjust local exhaust ventilation (LEV) unit as close as possible to the work zone to capture fume plume (visible smoke).</li> <li>3) If LEV is not available a respirator may be required. Refer to your supervisor/safety coordinator for respirator requirements.</li> <li>4) Even if not required through the use of LEV, respirator usage is recommended to reduce potential exposures.</li> </ol>
	A. Noise	<ol style="list-style-type: none"> <li>1) Wearing hearing protection (ear plugs, earmuffs).</li> </ol>
	B. Electrical Shock	<ol style="list-style-type: none"> <li>1) Inspect grinder cords for frays and deterioration.</li> </ol>
	C. Struck By	<ol style="list-style-type: none"> <li>1) Wear safety glasses and a face shield to protect from flying chips.</li> <li>2) Keep hands and fingers away from strike point.</li> <li>3) Inspect grinding wheel for damage.</li> <li>4) Make sure guard is in place before cutting.</li> </ol>
8. Clean Up	A. Cuts/Burns	<ol style="list-style-type: none"> <li>1) Clean any chips or excess metal around the area.</li> </ol>
	B. Slip, Trip, Fall	<ol style="list-style-type: none"> <li>1) Be mindful of cords, wires and other hazards that may present a fall in the area.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<b>Electric Welding</b> 9. Prepare Welding Area	A. Burn/Electrical Shock	1) Ensure all surfaces in the immediate welding area are dry. 2) Inspect welding gloves for holes and dryness. 3) Make sure equipment is properly grounded. 4) Inspect welding leads for damaged insulation and exposed conductors. 5) Make sure power is off before dragging leads to the work location.
10. Turn On Welding Machine	A. Burn/Electrical Shock	1) Make sure leads are connected properly to the welding machine. <ul style="list-style-type: none"> <li>• Male portion to machine</li> <li>• Female is energized portion</li> </ul> 2) Make sure the leads are not tied in knots.
11. Weld/Cut	A. Burn/Electrical Shock	1) Remove stub ends immediately after welding. 2) Turn off power when not in use. 3) Do not drape cable over any part of the body. 4) In awkward positions (truck cab) use DC constant voltage wire welder or DC manual stick welder.
<b>Gas Welding</b> 12. Turn on Cylinders/Set Gauges.	A. Strain/Sprain B. Struck By or Caught Between C. Fire/Explosion	1) Use cart to move gas cylinders. 1) Do not try and catch a cylinder if it falls. 2) Crack valve slowly and listen for leaks. 3) Turn off cylinder if you smell or hear gas. 1) Set acetylene gauge to below 15 PSI. Any PSI setting above 15 PSI is unstable.
13. Use Striker to Light Torch	A. Burn B. Fire/Explosion	1) Wear protective clothing (cotton welding jacket, apron, gloves, and work boots). 1) Turn off cylinder if you smell or hear gas.
14. Weld or Cut Material	A. Explosion	1) Do not drape lines over gas cylinder. 2) Stop welding if you smell gas or hear a leak.
15. Turn Off Cylinders/Set Gauges	A. Caught Between B. Fire/Explosion	1) Use cart to move gas cylinders. 2) Do not try and catch a cylinder if it falls. 1) Keep PPE on until all pressure has been safely released from the hoses. 2) Replace regulator with protective cap.

Welding and Cutting – General Procedures (Gas and Electric)

<b>Print Name</b>	<b>JSA Acknowledgements Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Widener (self-propelled) – General Operation		Various	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Widener		Physical Exam Required	No
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	Frequency
Operator Certification		M-614	Daily; Prior to Use
		Preventative Maintenance	Based on Fuel Consumption
		Seasonal	Between Winter / Summer Season
7. Personal Protective Equipment (X)			
X	Safety Glasses	Protective Sleeves	Respiratory Protection
		Gloves	
	Dust Goggles	Chemical Resistant Type:	Full Face Respirator
	Welding Shield	Heat Resistant	PAPR
	Other:		SCBA
	Face Shield	Cold Resistant	Full Face Respirator
	Welding Shield	Abrasion/Cut Resistant	Cartridge:
	Other:	Leather Work	Other:
	Head	Other:	Other
X	Hard Hat	Hearing Protection	Personal Fall Arrest System
	Bump Cap	Earmuffs	Personal Flotation Device
	Other:	Ear Plugs	
		Other:	
8. Reference Manuals			
	Pub 213	X Operators Manual	
	Foreman's Manual	Pub 234	
<b>Prepared By:</b> District 4 JSA Team		<b>Safety Coordinator:</b> Jake Hoinowski	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Widener (self-propelled) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment - Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall – Same Level (Road Surface) or Different Level (Equipment)	1) Ensure widener is turned off and keys are in pocket. 1) Look at the surface around the widener and clear debris to prevent trips and falls. 1) Wear safety footwear above the ankle with good tread. 2) Ensure surface around entry is free from surface debris. 3) Face the widener and maintain three (3) points of contact when entering or exiting the equipment. 4) Never jump or skip steps when entering or exiting.
2. Travel To/From Job Site	A. Vehicle Accidents	1) Refer to Safe Driving Manual
3. Set Up Work Location	A. Vehicle/Equipment - Struck By or Against	1) Refer to the Work Zone Traffic Control and Widening JSAs.
4. Fueling	A. Chemical (fuel)	1) Remove cap slowly in case a strong vacuum has been created. Fuel can splash out when the cap is released. 2) Wear safety glasses or goggles to protect from incidental contact.
5. Check Belts for Threading/Splicing and Proper Movement	B. Fire / Explosion	1) No smoking, heat sources, or open flames near fueling area. 2) Keep all ignition sources at least 20 feet away when fueling equipment.
6. Mount/Dismount Widener	A. Caught In/Under/Between - Belts	1) Keep hands clear of any moving parts. If close up inspection is required turn off engine, remove keys, and put in pocket prior to inspection.
7. Operate the Widener	A. Slip, Trip, Fall – Different Level	1) Wear safety footwear above the ankle with good tread. 2) Look at the area around the widener for tripping hazards and clear any debris to prevent trips and falls. 3) Face the widener and maintain three (3) points of contact when entering or exiting the equipment. Never jump or skip steps. 4) Always look around your work area for traffic prior to starting the task.
	A. Caught In / Contact With – Moving Parts	1) Clear all personnel from equipment prior to starting the engine. 2) Stay clear of moving belts while equipment is in operation.

Widener (self-propelled) – General Operation

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Operate the Widener continued	B. Tip Over	1) Avoid conditions which could lead to a tip over. Observe work area and identify any unsafe slopes, hills, or ditches prior to starting the task.
	C. Contact With Wires – Electrocutation	1) If a spotter is being used, ensure you are clear on communication signals. 2) Identify any overhead power lines or other electrical hazards. 3) Stay a minimum of 10 feet away from power lines-If the work area contains any power lines (downed or otherwise), do not work in the area and notify the manager immediately.
	D. Crushing Injury	1) Employees should never be in the area between the machine and dump truck.
	E. Contact With – Equipment	1) Stay seated during operation. If available, the seatbelt must be worn.
	F. Heat Stress	1) Drink plenty of water throughout the shift. Once you are thirsty you are already becoming dehydrated. 2) Review the signs and symptoms of heat stress. Observe coworkers throughout the day to assist in prevention.
	G. Insect Bites	1) Ensure insect repellent is available for use. 2) Ensure you have the proper medication if you are allergic. It is recommended to notify your supervisor and coworkers of your allergy in the event of an emergency.
	H. Contact With – Road Traffic	1) Always look both ways when getting on or off of the widener.
8. Park Widener During Breaks or End of Shift	A. Vehicle/Equipment - Struck By or Against	1) Park on a level surface. 2) Lower the machine until the cutter is resting on the ground. 3) Place controls in neutral, apply the parking brake, and stop the engine. 4) Remove key and place in pocket prior to exiting. 5) Chock the wheels, if necessary, to park on an incline.

Widener (self-propelled) – General Operation





**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Widening – General Procedures		Field	
3. Equipment/Tools/Machinery Used			
Widener, Dump Trucks, Milling Machine, Skid Steer, Broom, Shovels, Hand Tools, Roller, Water Truck, Tacking Equipment		4. Medical Exams	
		Physical Exam Required	Yes
		Respirator Exam Required	X (certain oils)
5. Required Training		6. Inspection Requirements	
Oil Distributor, Milling Machine, Dump Truck, Roller	Frequency	Frequency	
	Initial certification	Semi annual	
Hot oil training	Annually	Annually	
Flagger training	Annually	Daily	
Work Zone	Annually		
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
X Safety Glasses	Protective Sleeves	Leggings / Chaps	<b>Body / Skin</b>
X Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Apparel
Dust Goggles	X Chemical Resistant	Reflective Leggings	Reflective Vest/Flagger
Welding Shield	Type:	Foot Protection	Coveralls, Body Suit
Other:	X Heat Resistant	X Above the ankle boot with good tread	Rain Gear
			Rubber Apron
<b>Face</b>			Welding Leathers
Face Shield	Cold Resistant	Heat/Cold Protection	Other:
Welding Shield	Abrasion/Cut Resistant	Electrical Protection	Supplied Air
Other:	X Leather Work	Chemical Resistant	Cartridge:
		Metatarsal Protection	Other:
<b>Head</b>		Other:	<b>Respiratory Protection</b>
X Hard Hat	X Ear Muffs		Filtering Face piece
Bump Cap	X Ear Plugs		Half Face Respirator
Other:			Full Face Respirator
			PAPR
			SCBA
8. Reference Manuals			
X Pub 213	X Operators Manual	X SDS	
X Foreman's Manual	X Pub 234		
<b>Prepared By:</b> District 4 JSA Team		<b>Safety Coordinator:</b> Jake Hoinowski	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Widening – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety and Pre-Trip Inspection (M-614) for All Equipment	A. Vehicle/Equipment – Struck By or Against B. Cut, Puncture, Scrape C. Slip, Trip, Fall – Same or Different Level	1) Ensure vehicle is turned off and keys are in your pocket. 1) Wear leather work gloves to protect against sharp edges and pinch points. 1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Do not jump down or skip steps when entering or exiting vehicles or equipment.
2. Travel to and from Job Site	A. Vehicle Accidents	1) Refer to Safe Driving Training
3. Set up Work Location (Refer to Work Zone Traffic Control JSA)	A. Vehicle/Equipment – Struck By or Against	1) Turn on warning lights to notify motorists of your presence. 2) Set parking brake of truck before exiting the cab. 3) Put on reflective clothing before exiting the cab of the truck. 4) Set cones around truck following the guide for workzone set up. 5) Chock wheels of truck if not parked on a level surface before performing any work.
4. Mill Surface	A. Vehicle/Equipment – Struck By or Against	1) Stay within established work zone. 2) Check to make sure that back up alarms are still functioning properly. 3) Continue to identify equipment locations and use spotters as necessary.
	B. Noise	1) Use ear plugs or earmuffs when working on or near loud equipment.
	C. Struck By Flying or Falling Object	1) Wear eye protection (safety glasses or goggles) to protect against potential eye hazards.
	D. Slip, Trip, Fall	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Watch for and identify uneven road or ground surfaces/edges.
5. Sweep Clean Milled Surface	A. Vehicle/Equipment – Struck By or Against	1) Stay within established work zone.
	B. Noise	2) Continue to identify equipment locations and use spotters as necessary.
	C. Struck By Flying or Falling Object	1) Use ear plugs or earmuffs when working on or near loud equipment.
	D. Slip, Trip, Fall	1) Wear eye protection (safety glasses or goggles) to protect against potential eye hazards. 1) Wear safety footwear above the ankle with good tread. 2) Watch for and identify uneven road or ground surfaces/edges.

Widening – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Apply Tack Oil (Refer to Oil Distributer JSA if applicable)	A. Chemicals  B. Overexertion / Repetitive Motion	1) Refer to the SDS (Safety Data Sheet) of the products in use for any specific PPE requirements. 2) Wear appropriate chemical resistant protective gloves. 1) Rotate employees as needed and use proper lifting techniques. 2) Bend at the knees, pull the object close to the body, stand up with the object, and do not twist. 3) Get assistance as needed
7. Dump Material Into the Widener and Fill in the Milled Area	A. Various Hazards  B. Burn or scald  C. Noise	1) Refer to the Widener JSA. 2) Refer to Dump Truck JSA. 1) Use of heat resistant gloves when dealing with hot material. 2) Wear safety goggles to protect against potential eye hazards 1) Use ear plugs or earmuffs when working on or near loud equipment.
8. Laboring	A. Caught In, Under, Between  B. Vehicle/ Equipment – Struck By or Against  C. Slip, Trip, Fall  D. Burn or scald  E. Noise  F. Struck by Flying or Fall Object	1) Be alert to fellow workers. 2) Be aware of all clearances. 3) Keep clear of pinch points. 4) Wear leather work gloves to protect against sharp edges and pinch points. 1) Work within the established work zone. 2) Identify location of equipment and stay clear of moving equipment. 3) Use spotters when available and ensure signals are understood between the spotter and equipment operator. 1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 1) Use of heat resistant gloves when dealing with hot material.
9. Compact Material	A. Various Hazards	1) Use ear plugs or earmuffs when working near loud equipment. 1) Wear eye protection (safety glasses or goggles) to protect against potential eye hazards and dust. 2) Keep distance from broom and other equipment to create separation and avoid dust. 1) Refer to Roller JSA

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
10. Post Operation Procedure (Cleaning and Equipment Inspection)	A. Struck by Flying Object	1) Wear safety glasses when cleaning equipment.
	B. Vehicle/Equipment – Struck By or Against	1) Wear leather work gloves to protect against sharp edges and pinch points. 2) Keep firm grip on shovel, digging iron, or other hand tools to avoid striking hands against the equipment when cleaning and dislodging dirt.
	C. Slip, Trip, Fall from Elevation	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 2) Do not jump down or skip steps when entering or exiting vehicles or equipment.
	D. Caught In, Under, Between	1) Set parking brake and place ignition key in pocket.
	E. Equipment Damage	1) Identify and report any damaged or defective equipment. 2) Refer to specific equipment JSAs as needed.

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location			
Winter Maintenance - Clearing Auger Jams (Plow Operator)		Highway/ Local Roads / Stockpile			
3. Equipment/Tools/Machinery Used		4. Medical Exams		Yes	
Dump Truck, Auger/Spreader, Flashlight, Wooden Stick/Handle, Shovel		Physical Exam Required		X	
		Respirator Exam Required		X	
5. Required Training		6. Inspection Requirements		Frequency	
Dump Truck Certification		M-614		Daily	
Snow Academy					
7. Personal Protective Equipment (X)					
<b>Eyes</b>		<b>Hands and Arms</b>		<b>Feet/Legs</b>	
X	Safety Glasses		Protective Sleeves		Leggings / Chaps
	Chemical Goggles		Gloves	X	Reflective Apparel
	Dust Goggles		Chemical Resistant Type:		Reflective Vest/Flagger
	Welding Shield		Heat Resistant		Coveralls, Body Suit
	Other:				Rain Gear
					Rubber Apron
	<b>Face</b>	X	Cold Resistant		Welding Leathers
	Face Shield		Abrasion/Cut Resistant		Other:
	Welding Shield	X	Leather Work		<b>Body (Whole)</b>
	Other:				Personal Fall Arrest System
					Personal Flotation Device
	<b>Head</b>				Other:
X	Hard Hat				Other:
	Bump Cap				
	Other:				
8. Reference Manuals					
	Pub 213		Operators Manual		
	Foreman's Manual		Pub 234		
<b>Prepared By:</b> District 12 JSA Team		<b>Safety Coordinator:</b> Dennis Myers			
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022			

Winter Maintenance - Clearing Auger Jams (Plow Operator)

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Verify Reason for Feeder Fault	A. Various	1) Operate spreader on manual mode (if available) to rule out the possibility of an auger jam.
2. Park and Secure Truck	A. Vehicle/Equipment - Struck By or Against	1) Determine the safest location to pull off of the roadway. 2) Crossovers, exit ramps, pull-offs, or stockpiles are the preferred locations if available. 3) Contact the foreman or alternate to inform them of the issue. Get assistance if possible or if you feel it's needed. 4) Maintain communication and set times for follow-up calls. 5) Put truck in park or neutral and set the brake. Chock the wheels if needed or on an incline/slope.
3. Exit Truck and Visually Inspect the Auger/Spreader  (Visual Inspection ONLY!)	A. Caught In/Amputations/Crushing  B. Vehicle/Equipment - Struck By or Against  C. Slip, Trip, Fall	1) Perform a visual inspection only to check for any loose connections. 2) Keep hands, body, and clothing away from the auger at all times.  1) Wear hard hat and high visibility apparel (minimum of ANSI Class 2 required). 2) Check mirrors and look for traffic before opening the door and when returning to the cab.  1) Face the truck and maintain three (3) points of contact. 2) Never jump or skip steps when entering or exiting. 3) Observe the area around the cab and truck for snow, ice, and debris. 4) Wear safety footwear above the ankle with good tread. 5) Ensure boots are not caught in the steps before entering or exiting.
4. Shut Down the Truck Engine	A. Vehicle/Equipment - Struck By or Against	1) Shut engine down, but turn the key to the run position to keep the electrical system on. 2) The lights, wipers, and radio should be operational when along the roadside and exposed to moving vehicles/equipment. 3) Chock the wheels any time when working directly behind the truck.
5. Disconnect the Hydraulic Lockout System (If Equipped).	B. Caught In - Crushing or Amputation/Struck by Object  C. Slip, Trip, Fall	1) Operate all hydraulic control functions (Blast button, bed lift, plow, wing plow etc.) to clear any residual hydraulic pressure). 2) Notify others, if present, that you are going to hit the blast button. 3) If at a stockpile or not exposed to moving vehicles/equipment, remove key and place in your pocket.  1) Face the truck and maintain 3 points of contact when entering and exiting. 2) Use proper hand holds and steps. Look for damaged steps. 3) Remove buildup of snow, ice, or mud from boots and steps.
	A. Laceration, Sprain/Strain	1) Wear gloves to protect from sharp edges and pinch points.
	B. Chemical Exposure	1) Wear safety glasses or goggles to protect eyes.

Winter Maintenance - Clearing Auger Jams (Plow Operator)



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Drop the Top/Bottom Pans and Inspect Auger	A. Sprains/Strains B. Struck Against - Rough/Sharp Object or Surface C. Chemical	1) Drop top pan first to possibly avoid excess material being deposited. 2) Use both hands to release pins and drop pan slowly. 1) Wear leather work gloves when releasing pins and lower bottom pan to avoid sharp edges and pinch points. 1) Keep lower body clear of material falling from the bottom pan. 2) Avoid contact with material on unprotected skin.
7. Clear Material and Jam	A. Caught In - Crushing or Amputation/Struck by Object	1) <b>NEVER place hands or other body parts into the auger for any reason.</b> 2) Keep loose articles/clothing and gloves away from the auger as they can become entangled and be drawn into the auger. 3) Be aware of residual hydraulic pressure. The auger may turn several times once a jam is cleared. 4) Use a piece of wood or other object that will break if the auger moves. Ensure it is of sufficient length to keep your hands and body away from the auger. 5) Work from right to left when clearing the pan or auger and stay ahead of the stick or handle. 6) Get assistance if the jam cannot be safely cleared without difficulty. If needed, drive to a stockpile and unload material at the direction of the supervisor.
8. Reassemble the Pans, Spreader, and Hydraulic Lockout System	A. Sprains/Strains B. Caught In, Between, Pinch Points	1) Use proper lifting techniques when raising bottom pan and spreader. 2) Use both hands when lifting to set pins. 3) Get assistance with lifting the spreader box and setting the pins if possible. 1) Wear leather work gloves to avoid sharp edges and pinch points when securing pins, pans and connections.

Winter Maintenance - Clearing Auger Jams (Plow Operator)

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Clean Dropped Material	A. Vehicle Accident  B. Slip, Trip, Fall  C. Sprains/Strains	1) Ensure dropped material does not pose a hazard to the motoring public. 2) Make arrangements for a loader to clean up large amounts of material if needed.  1) Observe area around the tailgate, truck, and walking path for snow, ice, or other tripping hazards.  1) Don't overload your shovel with material. 2) Avoid bending at waist and keep your back as straight as possible. 3) When throwing the material, try to stay as close to the target area as possible.
10. Start Truck and Continue on Route or Transport to Stockpile for Assistance	A. Caught In - Crushing or Amputation/Struck by Object	1) Only at this point should the unit be started to confirm the jam has been cleared. 2) Before attempting to correct the jam a second time, all the above steps must be repeated as hydraulic pressure may have been created by restarting the truck.

Winter Maintenance - Clearing Auger Jams (Plow Operator)

**JSA Acknowledgements**

<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Winter Maintenance (Snow Plowing) – General Procedures		Field	
3. Equipment/Tools/Machinery Used			
Dump Truck, Plow, Plow Blade(s)		Medical Exams	Yes
		Physical Exam Required	X
		Respirator Exam Required	X
5. Required Training			
Operator Training – 75 hrs. (Permanent Employee) or 37.5 hrs. (Temporary Employee)		Frequency	Daily
Snow Academy			Before, During, and Throughout Shift
Conduct dry runs			
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	Reflective Leggings	Coveralls, Body Suit
Welding Shield		Foot Protection	Rain Gear
Other:	Heat Resistant	X Above the ankle boot with good tread	Rubber Apron
<b>Face</b>	X Cold Resistant	Heat/Cold Protection	Welding Leathers
Face Shield	Abrasion/Cut Resistant	Electrical Protection	Other:
Welding Shield	X Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Other:	Other:	Metatarsal Protection	Personal Fall Arrest System
<b>Head</b>	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	Earmuffs		
Bump Cap	Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X PUB 445	PUB 213 Operators Manual	X PUB 235 Operators Training	X PUB 23 Maintenance Manual
X OTJ Book			X PUB 113 Foreman Manual
<b>Prepared By:</b> District 12 JSA Team		<b>Safety Coordinator:</b> Dennis Myers	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Winter Maintenance (Snow Plowing) – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Dress Appropriately for Cold Weather	A. Contact – temperature extremes /frost bite	1) Wear appropriate winter clothing and accessories to protect against cold temperature and wind.
2. Conduct Circle of Safety and Pre-trip Inspection (M-614)	A. Vehicle/Equipment - Struck By or Against	1) Ensure dump truck is turned off and keys are in pocket.
	B. Cut, Puncture, Scrape, or Burn	1) Wear leather gloves to protect from sharp edges or pinch points.
	C. Pinch points/amputations	1) Keep all extremities away from tailgate latches, auger, plow blades, and truck bed.
	D. Slip, Trip, Fall	1) Look at the surface around the dump truck and clear debris to prevent trips and falls. 2) Wear safety footwear above the ankle with good tread. 3) Ensure surface around cab entry is free from surface debris. 4) Face the dump truck and maintain three (3) points of contact when entering or exiting vehicles or equipment. 5) Never jump down or skip steps when entering or exiting vehicles or equipment.
3. Getting in/out of truck	A. Slip, Trip, Fall	1) Face the dump truck and maintain three (3) points of contact when entering or exiting vehicles or equipment. 2) Never jump down or skip steps. 3) Use proper hand holds and steps. Look for bent or broken steps. 4) Ensure shoes or tread are not caught in the steps before entering or exiting vehicles or equipment. 5) Remove buildup of snow, ice, or mud from steps.
4. Plow mounting	A. Various Hazards	1) Inspect plow, plow frame, plow blades, and other parts to ensure nothing is damaged or inoperable. 2) Immediately report and damages or excessive wear to your supervisor.
	B. Crushing/amputation, lacerations, contusions	1) Keep extremities (feet, hands, fingers) clear of plow blade. 2) Do not place hands between objects/pinch points. 3) Keep feet away from under plow frame and blade. 4) Wear leather work gloves to avoid sharp edges or pinch points.
	C. Sprain / Strain	1) Use proper lifting device or get assistance when manual lifting or moving is required. 2) Use blocking to position the plow at the proper mounting height.
5. Load Winter Material in Truck Bed	A. Various Hazards	1) Refer to Front End Loader JSA for additional information.
	B. Struck by – Flying/Falling Object	1) Load materials only to the designed capacity or fill line. 2) Be cautious of the terrain, slope, and traction issues. 3) Maintain proper bucket clearance when loading.
	C. Vehicle - Struck by or Against/Rollover	1) Do not allow anyone in the loading/working area when filling the truck bed with material.

Winter Maintenance (Snow Plowing) – General Procedures

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Fill Salt Brine Tank	A. Contact – Chemical/Splash	1) Wear gloves and safety glasses or goggles to protect from any eye hazards.
7. Perform Snow Plow Operations	A. Vehicle Accidents	1) Refer to Safe Driving Manual. 2) Keep windows, mirrors, windshield wipers, and lights free of ice, snow, and condensation to maintain visibility.
	B. Vehicle Accidents/Equipment Damage	1) Ensure the plow is correctly mounted. Use plow balance when removing snow from the roadway. 2) Avoid over excessive wear to plow blades or shoes. Check condition of plow blade and shoes. 3) Check plow for cracked/broken welds.
	C. Vehicle – Struck Against (Fixed Objects and Overhead Obstructions) and Electrocutation	1) Operate truck with bed down, slow down. Vertical hazards with low bridges, underpasses, tree limbs, wires, utility poles, guy wires, bridges, and vehicles. 2) Be aware of expansion joints, manholes, guidetrails, mailboxes and pedestrians. 3) Conduct a dry run before winter operations start. Take new employees on dry runs no matter what time of the year they start.
8. Clear Auger Jams	D. Rollover	1) Maintain safe operating speed and clearances. Be cautious of sharp curves and slow down.
	A. Various – Amputation, Struck By Vehicle, Etc.	1) Refer to Clearing Auger Jams JSA for additional information.
9. Unload Material and Clean Out Truck Bed	A. Various Hazards	1) Refer to Dump Truck JSA for additional information.
	B. Rollover	1) Always keep the dump truck on a level surface.
	C. Caught In or Between/Amputations	1) Keep extremities (hands, fingers) away from auger and tailgate any time the engine is running. 2) Ensure the auger is properly shielded. 3) Turn off truck and put keys in pocket. 4) Cut out/release hydraulic pressure. 5) Don't wear loose clothing. 6) Only use break away tools like a wooden stick to clean out an auger or clear a jam. 7) Never insert hands into the spreader hopper. 8) Wear leather work gloves to avoid sharp edges or pinch points.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>10. Park truck and block the plow</p>	<p>A. Vehicle / Equipment – Struck Against (Fixed Objects)</p> <p>B. Crushing/amputation, lacerations, contusions</p> <p>C. Overexertion</p>	<p>1) Be cautious of approach to parking spot and maintain proper clearances from buildings, vehicles, and equipment.</p> <p>1) Keep all extremities (feet, hands, fingers) clear of plow blade.</p> <p>2) Do not place hands between objects/pinch points.</p> <p>3) Keep feet away from under plow frame and blade.</p> <p>4) Wear leather work gloves to avoid sharp edges or pinch points.</p> <p>1) Use proper lifting device or get assistance when manual lifting or moving is required.</p> <p>2) Use blocking to position the plow at the proper mounting height.</p> <p>3) Keep feet away from under plow frame and blade.</p>





**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Wood Chipper – Chipping Brush		Field (Various Locations)	
3. Equipment/Tools/Machinery Used			
Wood Chipper, Dump Truck, Wooden Push Paddle			
5. Required Training		Frequency	
Dump Truck Operator Training – 75 hrs. (Permanent Employee) or 37.5 hrs. (Temporary Employee)		Initial	
Chipper Operator Training		Initial and as needed	
Equipment/Operator Manual		Prior to use or as needed	
6. Inspection Requirements			
M-614		Daily	
7. Personal Protective Equipment (X)			
<b>Eyes</b>		<b>Feet/Legs</b>	
<b>Hands and Arms</b>		<b>Body / Skin</b>	
<b>Respiratory Protection</b>		<b>Respiratory Protection</b>	
X	Safety Glasses	Protective Sleeves	Leggings / Chaps
	Chemical Goggles	Gloves	Foot or Leg Guards
X	Dust Goggles	Chemical Resistant Type:	Reflective Leggings
	Welding Shield	Heat Resistant	Foot Protection
	Other:	X	Above the ankle boot with good tread
	<b>Face</b>	Cold Resistant	Heat/Cold Protection
	Face Shield	Abrasion/Cut Resistant	Electrical Protection
	Welding Shield	X	Leather Work
	Other:	X	Other: Non-Gauntlet
	<b>Head</b>	<b>Hearing Protection</b>	Metatarsal Protection
X	Hard Hat	X	Ear Muffs
	Bump Cap	X	Ear Plugs
8. Reference Manuals			
	Pub 213	Operators Manual	X
	Foreman's Manual	Pub 234	Pub 247
<b>Prepared By:</b> District 12 JSA Team		<b>Safety Coordinator:</b> Dennis Myers	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Wood Chipper – Chipping Brush

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
<p>1. Conduct Circle of Safety and Pre-trip Inspection (M-614) for Truck and Chipper</p>	<p>A. Slip, Trip, Fall</p>	<p>1) Wear safety footwear above the ankle with good tread.                      2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.                      3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.                      4) Do not jump down or skip steps when entering or exiting vehicles or equipment.</p>
<p>2. Perform Daily Maintenance Check</p>	<p>B. Vehicle/Equipment – Struck By or Against                      A. N/A</p>	<p>1) Keep vehicle/equipment key in pocket.                      1) Check all fluids.                      2) Grease all fittings.                      3) Remove lock-out pins.</p>
<p>3. Attach Chipper to Truck Including Safety Chains and Lights</p>	<p>A. Vehicle/Equipment – Struck By or Against</p>	<p>1) Operator and spotter to maintain visual contact at all times when aligning truck and chipper.                      2) Ensure safety chains are secure and adjusted proper length.</p>
<p>4. Position Chute and Feed Tray in Travel Position</p>	<p>B. Caught In, Under, Between                      A. Slip, Trip, Fall</p>	<p>1) Wear leather work gloves and keep hands clear of pinch points when securing pintle hook or hitch.                      1) Clean off chipper, remove any slipping hazards.                      2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.                      3) Do not jump off or skip steps.</p>
<p>5. Travel to Work Location</p>	<p>B. Overexertion                      C. Caught In, Under, Between</p>	<p>1) Use proper lifting techniques when securing the feed tray.                      1) Wear leather work gloves and keep hands clear of sharp edges or pinch points when adjusting chute or closing feed tray.</p>
<p>6. Inspect Job Site for Potential Hazards. Ensure Traffic Control is in Place as Needed</p>	<p>A. Vehicle/Equipment – Struck By or Against                      A. Vehicle/Equipment – Struck By or Against                      B. Slip, Trip, Fall                      C. Struck by Falling Object</p>	<p>1) Ensure lights are working and hitch/safety chains are secure.                      2) Wear seatbelt and be a defensive driver.                      3) Maintain slower speed to ensure trailer control.                      1) Wear high visibility apparel.                      2) Refer to Work Zone Traffic Control JSA.</p>
<p>7. Position Equipment/Chute and Start/Engage Chipper</p>	<p>A. Slip, Trip, Fall                      B. Vehicle/Equipment – Struck By or Against                      C. Caught In, Under, Between</p>	<p>1) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.                      1) Wear hard hat.                      1) Face vehicle/equipment and maintain three (3) points of contact when climbing.                      2) Do not jump off or skip steps if climbing chipper.                      1) Chock trailer wheels to prevent the detached chipper from rolling or sliding.                      2) Ensure the area and equipment is clear of coworkers before starting up and moving chute.                      1) Wear leather work gloves and keep hands clear of pinch points when adjusting chute or opening feed tray.                      2) Ensure all coworkers are clear of the machine before starting and engaging the chipper.</p>

Wood Chipper – Chipping Brush

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Feed Brush Into Chipper	A. Noise B. Caught In, Under, Between	1) Wear hearing protection (ear plugs or earmuffs). 1) Do not operate unless properly trained on using equipment. 2) Never Operate Alone! Make sure a coworker is present to assist in the event of an emergency. 3) Ensure reverse and emergency stop controls are functioning properly prior to operation. 4) Never put hands, kick brush, or bend over into the feed area of the hopper for any reason! 5) Always feed chipper from the side and be in position to operate emergency controls! 6) Lay short pieces on top of longer pieces or use a wooden push paddle. 7) To avoid getting entangled, cut vines into four (4) to five (5) foot pieces and lay on top of longer material or use a wooden push paddle. 8) Never wrestle or force brush into the chipper. 9) No loose fitting clothing. Tuck in shirt or ensure break away vest is closed and fitted properly. 10) Wear non-gauntlet gloves with tight, narrow cuffs.
	C. Struck by Flying, Falling, Sliding Object	1) Wear safety glasses or goggles and all previously identified protective apparel. 2) Stand to the side of the feeder tray to avoid being struck by brush kicking to the left or right. 3) Only one person should be designated to feed the wood chipper. All others should stay clear of the machine and the branches being fed into it.
	D. Slip, Trip, Fall	1) Ensure brush is stacked at least five (5) feet behind the feeder with the cut end facing the chipper. 2) Ensure feeder area is clear of debris and tripping hazards. 3) Maintain feed tray/table at least two (2) feet above the ground.
	E. Overexertion	1) Use proper lifting techniques and avoid excessive loads when feeding chipper.
	F. Cut, Puncture, Scrape	1) Wear long sleeves and non-gauntlet leather work gloves.
	G. Poisonous Plants	1) Wear long sleeves and non-gauntlet leather work gloves. 2) Use proper skin barrier lotion (optional).

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Unclog Chipper	A. Cut, Puncture, Scrape	<ol style="list-style-type: none"> <li>1) Disengage clutch and let idle.</li> <li>2) Turn machine off and remove key.</li> <li>3) Place lock-out pins in vertical disc and drum feed slots.</li> <li>4) Wear gloves and avoid cutting knives.</li> <li>5) Use wooden paddle to clear material from chipper housing or discharge chute.</li> </ol>
	B. Vehicle/Equipment – Struck By	<ol style="list-style-type: none"> <li>1) Close and secure chipper hood prior to starting to prevent it from flying open.</li> </ol>
	C. Slip, Trip, Fall	<ol style="list-style-type: none"> <li>1) Clean off chipper, remove any slipping hazards.</li> <li>2) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting.</li> <li>3) Do not jump off or skip steps.</li> </ol>

Wood Chipper – Chipping Brush



**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Work Zone Traffic Control – Mobile WZ Setup		Freeways, Expressways, and Conventional Highways	
3. Equipment/Tools/Machinery Used		4. Medical Exams	
Maintenance and Protection of Traffic Devices and Various Fleet Equipment		Physical Exam Required	Yes
		Respirator Exam Required	No
5. Required Training		6. Inspection Requirements	
Flagger Training	Frequency	FM inspects WZ sign condition	Frequency
Foreman's Academy	Every 3 years	FM inspects cone condition	Daily
Defensive Driving	Initial	FM inspects safety attire for all personnel	Daily
Publication 213	Every 2 years		
Acting Foreman Training	Initial		
Every 2 years			
7. Personal Protective Equipment (X)			
<b>Eyes</b>	<b>Hands and Arms</b>	<b>Feet/Legs</b>	<b>Body / Skin</b>
X Safety Glasses	Protective Sleeves	Leggings / Chaps	X Reflective Apparel
Chemical Goggles	Gloves	Foot or Leg Guards	X Reflective Vest/Flagger
Dust Goggles	Chemical Resistant Type:	X Reflective Chaps/Pants	Coveralls, Body Suit
Welding Shield	Heat Resistant	Foot Protection	Rain Gear
Other:	Heat Resistant	X Above the ankle boot with good tread	Rubber Apron
	Cold Resistant	Heat/Cold Protection	Welding Leathers
<b>Face</b>	Abrasion/Cut Resistant	Electrical Protection	Other:
Face Shield	Leather Work	Chemical Resistant	<b>Body (Whole)</b>
Welding Shield	Other:	Metatarsal Protection	Personal Fall Arrest System
Other:	<b>Hearing Protection</b>	Other:	Personal Flotation Device
X Hard Hat	X Ear Muffs		
Bump Cap	X Ear Plugs		
Other:	Other:		
8. Reference Manuals			
X PUB 213	X Operators Manual	X PUB 517	
X Foreman's Manual	X PUB 234		
<b>Prepared By:</b> District 6 JSA Team		<b>Safety Coordinator:</b> Thomas Schmidt	
<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2 0 2 2	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure	
<p>1. Pre Work Inspection</p>	<p>A. Vehicle/Equipment - Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Drive through work site to visually identify potential hazards and identify appropriate PATA 600 or 300 series (Usually performed by the foreman prior to the start of any maintenance work).</li> <li>2) Wear seat belt at all times when operating vehicles or equipment.</li> <li>3) Keep vehicle on shoulder.</li> <li>4) Use appropriate lighting for visibility.</li> <li>5) Identify equipment staging areas.</li> </ol>	
	<p>B. Employee Struck by Motorist</p>	<ol style="list-style-type: none"> <li>1) Exit vehicle on the protected side (Passenger).</li> <li>2) Wear proper high visibility apparel and hard hat.</li> <li>3) Use a spotter to watch for traffic when available.</li> <li>4) Locate and mark sign locations &amp; limits of workzone.</li> <li>5) Identify nearest medical facility for emergency care.</li> </ol>	
	<p>C. Struck By or Against/Electrocution</p>	<ol style="list-style-type: none"> <li>1) Identify and plan operations around trees, powerlines, and permanent structures that have low overhead clearances.</li> <li>2) Coordinate with Railroad and District Office when work zone intersects railroad tracks.</li> </ol>	
	<p>D. Environmental - Low Visibility</p>	<ol style="list-style-type: none"> <li>1) Wear proper high visibility apparel and hard hat.</li> <li>2) Use flares, lighting pucks, or lighting stations as necessary.</li> </ol>	
	<p>E. Slip, Trip, Fall</p>	<ol style="list-style-type: none"> <li>1) Keep work areas clear of debris and other tripping hazards.</li> <li>2) Observe work area for uneven surfaces and loose gravel.</li> <li>3) Wear safety footwear above the ankle work with good tread.</li> </ol>	
	<p>2. Perform 614 and Air-Brake Test</p>	<p>A. Vehicle/Equipment - Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) When operator is not in the vehicle, ensure equipment is turned off and keys are with the operator.</li> </ol>
		<p>B. Cut, Puncture, Scrape</p>	<ol style="list-style-type: none"> <li>1) Wear leather work gloves to protect from sharp edges and pinch points.</li> </ol>
		<p>C. Slip, Trip, Fall</p>	<ol style="list-style-type: none"> <li>1) Wear safety footwear above the ankle work with good tread.</li> <li>2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards.</li> <li>3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting vehicles or equipment.</li> <li>4) Do not jump down or skip steps when entering or exiting vehicles or equipment.</li> </ol>
	<p>3. Inventory and Load Equipment</p>	<p>A. Sprain/Strain/Overexertion</p>	<ol style="list-style-type: none"> <li>1) Use proper lifting techniques and properly secure equipment for transport.</li> <li>2) Seek assistance when necessary.</li> </ol>
		<p>B. Slip, Trip, Fall</p>	<ol style="list-style-type: none"> <li>1) Keep work areas clear of debris and other tripping hazards.</li> <li>2) Observe work area for uneven surfaces and loose gravel.</li> </ol>
<p>C. Cut/Puncture, Pinch Points</p>		<ol style="list-style-type: none"> <li>1) Wear gloves to prevent cuts, puncture wounds, and protect against pinch points.</li> <li>2) Check stands and make sure they are working properly.</li> </ol>	

Work Zone Traffic Control – Mobile WZ Setup

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
4. Safety Talk	A. N/A	1) All employees assigned to this task will attend pre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and controls.
5. Travel to Work Zone	A. Slip, Trip, Fall B. Vehicle/Equipment - Struck By or Against	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting the vehicle. 1) Wear seat belt at all times when operating vehicles and equipment. 2) Use appropriate lighting for visibility. 3) Avoid low lying trees/wires and low clearance heights on permanent structures. 4) Avoid and/or remove obstructions in the roadway or shoulder.
6. Set Up Work Zone	A. Vehicle/Equipment - Struck By or Against B. Employee Struck By Operator, Motorist, or Object	1) Wear seat belt at all times when operating equipment. 2) Ensure proper placement of and set up of work zone signs. 3) Ensure proper placement of equipment. Once safety devices are in place, introduce equipment into the work zone in the appropriate order.
		1) Stay clear and maintain distance if you are not operating equipment. 2) Avoid walking within operator's blind spots. 3) Get operator's attention before approaching equipment. 4) Establish a means of communication/hand signals prior to work. 5) Stay within the established work zone. 6) When shadow vehicles are being used, they should reduce speed when approaching curves or uneven roadways that restrict sight distances. 7) Reposition signs, flaggers, devices, and equipment as needed. 8) Assign a work zone observer to inspect the work zone integrity every half hour. 9) Wear proper high visibility apparel and hard hat at all times.
	C. Low/Poor Visibility	1) Use appropriate lighting sources for visibility as needed. 2) Maintain minimum sight distances according to Pub 213.
	D. Slip, Trip, Fall	1) Keep work areas clear of debris, obstructions, and other tripping hazards. 2) Observe path or area for slope, uneven terrain, and slippery surfaces. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting. 4) Wear safety footwear above the ankle work with good tread.
	E. Cut, Puncture, Pinch Points	1) Wear work gloves to prevent cuts or puncture wounds and to protect against pinch points.
	F. Overexertion	1) Use proper lifting techniques: Bend at the knees, pull the object close to your body, stand up with the object, and avoid twisting movements 2) Seek assistance when necessary. 3) Drink water to avoid dehydration.

Work Zone Traffic Control – Mobile WZ Setup



Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
7. Placement of Flaggers	A. Employee Struck By Vehicle	<ol style="list-style-type: none"> <li>1) When required, introduce flaggers to the work zone where a good line of sight is established (Do not place flaggers below the crest of hills or around bends in the road).</li> <li>2) Flaggers must verify the operation of radio devices and maintain communications with other flaggers.</li> <li>3) Establish clear escape routes for flaggers.</li> <li>4) Flaggers must face and maintain awareness to all oncoming traffic.</li> <li>5) For mobile operations on conventional highways, flaggers can continuously move if there is proper sight distance. If there is not proper sight distance, the appropriate flagger relocation option shall be utilized (See notes for PATA 302A in PUB 213).</li> </ol>
	B. Environmental- Heat or Cold	<ol style="list-style-type: none"> <li>1) Foreman must check on flaggers to provide relief and water breaks. Employees are just as susceptible to becoming dehydrated in cold weather as they are in hot conditions.</li> <li>2) Dress according to hot and humid weather conditions (Full length trousers, appropriate footwear and a light-weight, light-colored, cotton or cotton-blend shirt is recommended when working in intense sun and extreme heat).</li> <li>3) Dress according to cold weather conditions (Full length trousers, appropriate footwear, recommend wearing multiple loose layers of clothing, thermal or insulated undergarments and gloves).</li> </ol>
	C. Insect bites	<ol style="list-style-type: none"> <li>1) Apply bug repellent when necessary.</li> <li>2) Notify foreman of any allergic reactions.</li> </ol>
8. Work Zone Removal	A. Vehicle/Equipment – Struck By	<ol style="list-style-type: none"> <li>1) Use appropriate lighting for visibility.</li> <li>2) Ensure use of seat belts.</li> <li>3) Non-essential equipment leaves work zone.</li> </ol>
	B. Slip, Trip, Fall	<ol style="list-style-type: none"> <li>1) Ensure work zone is clear and cleaned before removing and loading devices.</li> <li>2) Use three (3) points of contact when entering or exiting the vehicle.</li> <li>3) Identify changes in the road surface such as grates, curbs, manhole covers, uneven surfaces, slopes, and loose gravel.</li> </ol>
	C. Overexertion	<ol style="list-style-type: none"> <li>1) Seek assistance when loading equipment for storage as needed. Use proper lifting techniques.</li> <li>2) Drink water to avoid dehydration.</li> </ol>
	D. Employee Struck by Operator, Motorist, or Object	<ol style="list-style-type: none"> <li>1) Wear proper PPE (high visibility apparel and hardhat).</li> <li>2) Avoid walking within operator's blind spots.</li> <li>3) Stay clear and maintain distance if you are not operating the equipment.</li> <li>4) Remove work zone safety devices and signs in reverse order.</li> </ol>

Work Zone Traffic Control – Mobile WZ Setup

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
9. Travel to Yard	A. Slip, Trip, Fall B. Vehicle/Equipment - Struck By or Against	1) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting any part of the vehicle. 1) Use appropriate lighting for visibility. 2) Wear seat belt at all times when operating equipment. 3) Identify low lying trees/wires. 4) Identify and remove obstructions in the roadway or shoulder. 5) Identify clearance heights on permanent structures.
10. Unload and Inventory	A. Overexertion	1) Use proper lifting techniques. 2) Seek assistance when necessary.
	B. Slip, Trip, Fall	1) Maintain good housekeeping. 2) Observe area for uneven surfaces and other tripping hazards.
	C. Cut, Puncture, Pinch Points	1) Wear leather work gloves to prevent cuts, puncture wounds, and protect against pinch points. 2) Inspect signs for visibility and damage. 3) Check stands ensure they are working properly.

Print Name	Signature	Date

**JOB SAFETY ANALYSIS**

1. Job Operation		2. Job Location	
Work Zone Traffic Control – Stationary WZ Set Up / Removal		Field	
3. Equipment/Tools/Machinery Used		4. Medical Exams	Yes
Traffic Control Devices, Crew Cab, Cone Setting Platform		Physical Exam Required	No
		Respirator Exam Required	X
5. Required Training		6. Inspection Requirements	Frequency
Flagger Training		FM inspects WZ sign condition	Daily
BOMO Power Points (job specific)		FM inspects cone condition	Daily
Foremen Academy (position specific)		FM inspects safety attire for all personnel	Daily
7. Personal Protective Equipment (X)			
<b>Eyes</b>	Safety Glasses	Protective Sleeves	<b>Feet/Legs</b>
	Chemical Goggles	Gloves	
<b>Face</b>	Dust Goggles	Chemical Resistant Type:	Foot or Leg Guards
	Welding Shield	Heat Resistant	X Reflective Leggings
<b>Head</b>	Other:		Foot Protection
			X Above the ankle boot with good tread
<b>Hearing Protection</b>	Face Shield	Cold Resistant	Heat/Cold Protection
	Welding Shield	Abrasion/Cut Resistant	Electrical Protection
<b>Body / Skin</b>	Other:	Leather Work	Chemical Resistant
		Other:	Metatarsal Protection
<b>Respiratory Protection</b>	X Hard Hat	Earmuffs	Other:
	Bump Cap	Ear Plugs	Personal Fall Arrest System
<b>Other</b>	Other:	Other:	Personal Flotation Device
8. Reference Manuals			
X Pub 213	X PUB 445	X PUB 517	
		X Pub 234	
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<b>Reviewed By:</b> Employee Safety and Training Division		<b>Distribution Date:</b> 2022	

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
1. Conduct Circle of Safety	A. Slip, Trip, Fall	1) Wear safety footwear above the ankle with good tread. 2) Observe path or area for slope, uneven/slippery surfaces, obstructions, and other tripping hazards. 3) Face vehicle/equipment and maintain three (3) points of contact when entering or exiting a vehicle or equipment. 4) Do not jump down or skip steps when entering or exiting a vehicle or equipment.
2. Travel To / From Job Site		1) Refer to Safe Driver Training.
3. Pre Task Safety Brief	A. No Hazard	1) All employees assigned to this task will attend apre-task safety brief, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards. 1) Review PUB 213 prior to setting up work zone.
4. Load equipment on truck	A. Strain, Sprain	1) Use proper lifting techniques when loading device sand signs into trucks. 2) Bend at the knees, pull the object close to your body, stand up with the object, and do not twist. 3) Get assistance as needed.
5. Arrive at site.	A. Vehicle Accidents	1) Slow down upon arrival to the site and observe other vehicles and/or pedestrians in the area.
6. Set up work zone (Shoulder Closure)	A. Vehicle/Equipment - Struck By or Against	1) Utilize Publication 213 to determine the type of highway and setup configuration. 2) Try to schedule work during low traffic volume times. 3) Set arrow panel to caution motorists. 4) Park arrow panel truck 30 – 50 feet behind where you would like to start the work zone. 5) Set up shadow vehicle with rear-mounted impact attenuator (if applicable to the setup configuration). 6) Set up devices and signs according to Publication 213, General Note - Number 18.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
6. Set up work zone Shoulder Closure continued	<p>B. Strain, Sprain</p> <p>C. Slip, Trip, Fall – From Elevation</p>	<ol style="list-style-type: none"> <li>1) Use proper lifting techniques when unloading devices and signs from truck.</li> <li>2) Adjust the side rail of the cone setting platform as needed to effectively place devices. Avoid bending at the waist and rotate workers as needed.</li> <li>3) Turn with your feet, not your waist if placing devices with a cone setting platform.</li> <li>1) Stay within the railing system of the cone setting platform and only adjust the side railing as needed to effectively place devices.</li> </ol>
7. Set up work zone (Lane Closure)	<p>A. Vehicle/Equipment - Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Utilize Publication 213 to determine the type of highway and setup configuration.</li> <li>2) Try to schedule work during low traffic volume times.</li> <li>3) Set arrow panel to directional arrow you want traffic to flow.</li> <li>4) Park arrow panel truck 30 – 50 feet behind where you would like to start the work zone.</li> <li>5) Set up shadow vehicle with rear-mounted impact attenuator (if applicable to the setup configuration).</li> <li>6) Set up devices and signs according to Publication 213, General Notes - Number 18.</li> </ol>
8. Removal of Work Zone	<p>B. Strain, Sprain</p> <p>C. Slip, Trip, Fall – From Elevation</p> <p>A. Vehicle/Equipment - Struck By or Against</p>	<ol style="list-style-type: none"> <li>1) Use proper lifting techniques when unloading devices and signs from truck.</li> <li>2) Turn with your feet, not your waist if placing devices with a cone setting platform.</li> <li>3) Adjust the side rail of the cone setting platform as needed to effectively place devices. Avoid bending at the waist and rotate workers as needed.</li> <li>1) Stay within the railing system of the cone setting platform and only adjust the side railing as needed to effectively place devices.</li> <li>1) Reference Pub 213 (General Notes - Number 18).</li> <li>2) Remove devices and signs, in reverse order as they were installed (opposite the flow of traffic).</li> <li>3) Remove shadow vehicle with rear-mounted impact attenuator (if applicable to the setup configuration).</li> <li>4) Turn off arrow panel vehicle.</li> </ol>

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
8. Removal of Work Zone	A. Vehicle/Equipment - Struck By or Against  B. Strain, Sprain	1) Reference Pub 213 (General Notes - Number 18). 2) Remove devices and signs, in reverse order as they were installed (opposite the flow of traffic). 3) Remove shadow vehicle with rear-mounted impact attenuator (if applicable to the setup configuration). 4) Turn off arrow panel vehicle. 1) Use proper lifting techniques when loading devices and signs on truck. 2) Turn with your feet, not your waist if picking up devices with a cone setting platform.
9. Use of Flagger in Work Zone	A. N/A	1) Refer to PUB 234 and PUB 213 for use of flagger.

Work Zone Traffic Control – Stationary WZ Set Up / Removal

