

CODE OF SAFE PRACTICES



© 2016 California Department of Transportation, All Rights Reserved

State of California Department of Transportation
Division of Construction
September 2017



CODE OF SAFE PRACTICES

State of California Department of Transportation
Division of Construction

Prepared by

Office of Safety, Insurance & Special Projects
1120 N Street, MS 44
Sacramento, CA 95814
(916) 654-4580

September 2017



Cover photo: Interstate 80, Fairfield, CA

© Copyright 2017 California Department of Transportation

All Rights Reserved. (*No part of this manual may be reproduced in any form or by any electronic or mechanical means including information storage and retrieval systems without the permission in writing from the California Department of Transportation.*)

About the CODE OF SAFE PRACTICES

The Code of Safe Practices (COSP) is part of the California Department of Transportation (Caltrans) Injury Illness and Prevention Program (IIPP) and complies with requirements of the California Code of Regulations, Title 8, Section 1509 (8 CCR 1509), "Injury and Illness Prevention Program." The COSP defines standard safety practices for Caltrans staff.

Each Caltrans resident engineer is responsible for verifying that the COSP provides the required safety practices for all activities on their current project.

Caltrans Division of Construction will revise and update the COSP to keep current with new construction activities, methods, and changing construction environments. Employees should forward suggestions for improving the COSP, adding specific construction operation safety protocol, or questions concerning the COSP to the personnel responsible for maintaining the document, which can be found on the Division of Construction website:

<http://www.dot.ca.gov/hq/construc/safety/>

Responsible personnel:

HQ Safety Coordinator
Division of Construction
1120 N Street, MS 44
Sacramento, CA 95814
(916) 654-4580

DISCLAIMER

8 CCR 1509 is specific that each employer prepare a COSP which applies to the employees' operations. This requirement makes the COSP an independent employer responsibility not covered under 8 CCR 336.10, "Determination of Citable Employer," as a multi-employer responsibility. As such, this COSP is applicable solely to Caltrans personnel when they are performing field duties in accordance with their respective job description. It is not for use by any other parties.

This is the most current version of this document and supersedes all previous versions. For ongoing projects, the resident engineer should follow the procedures outlined in Section 2, "General Safety," and include this version of the COSP in the project files.

Table of Contents

SECTION 1 – OBJECTIVE.....	1
SECTION 2 – GENERAL SAFETY	2
2.1 Zero Tolerance for Violence in the Work Place	2
2.2 Accident and Incident Reporting	2
2.3 Personal Protective Equipment	3
2.4 Alert and Distraction-Free.....	3
SECTION 3 – FIELD SAFETY	4
SECTION 4 – EQUIPMENT	5
SECTION 5 – TRAFFIC CONTROL SYSTEMS.....	6
SECTION 6 – HEAT ILLNESS.....	7
6.1 Training	7
6.2 Access to Shade.....	8
6.3 Provisions for Water	8
6.4 Supervisor Procedures	8
SECTION 7 – HAZARDOUS MATERIALS EXPOSURE.....	10
7.1 Hazardous Substances	10
7.2 Hazardous Wastes.....	10
7.3 Hazardous Spills	10
SECTION 8 – VEHICLE OPERATIONS.....	11
8.1 Parking	11
8.2 Flashing Amber Lights	11
8.3 Vehicle Backing	11
8.4 Vehicle Accidents	12
SECTION 9 – FACILITIES	13
SECTION 10 – SPECIAL CONSIDERATIONS	15
<input type="checkbox"/> 10.1 Night Work.....	15
<input type="checkbox"/> 10.2 Excavations	16
<input type="checkbox"/> 10.3 Elevated Work Areas.....	17
<input type="checkbox"/> 10.4 Electrical.....	19

CODE OF SAFE PRACTICES

<input type="checkbox"/>	10.5	Confined or Enclosed Spaces.....	20
<input type="checkbox"/>	10.6	Materials Plant Sites	22
<input type="checkbox"/>	10.7	Field Testing.....	23
<input type="checkbox"/>	10.8	Respirable Crystalline Silica	25
<input type="checkbox"/>	10.9	Lead-Contaminated Soils.....	27
<input type="checkbox"/>	10.10	Yellow Paint Stripe and Markings Removal	28
<input type="checkbox"/>	10.11	Rubberized Hot Mix Asphalt.....	29
<input type="checkbox"/>	10.12	Naturally Occurring Asbestos and Asbestos Abatement.....	30
<input type="checkbox"/>	10.13	Methacrylate, Polyester Concrete, High Friction Surface Treatments, and Multi-Layer Systems Operations	31
		APPENDICES	32
		Appendix 1—Respirators in Caltrans Construction	32
		Appendix 2—Sample Confined Space Entry Checklist (HS-0040).....	34
		Appendix 3—Project Team Acknowledgement and Signature Sheet	36

SECTION 1 – OBJECTIVE

The Division of Construction developed the COSP as part of its safety program to provide a safe working environment for construction personnel. The objective of the COSP is to provide Caltrans construction staff with guidelines and highlight safe practices and procedures for most field-related activities.

The COSP is part of Caltrans' IIPP, which also includes the *Caltrans Safety and Health Manual (Safety Manual)*, portions of the *Construction Manual* and *Standard Specifications*, and contract-specific standard special provisions dealing with safety. In addition to the COSP, the resident engineer should be familiar with the provisions of the California Code of Regulations, Title 8 (CCR Title 8), "Industrial Relations," applicable to the work in order to limit the potential for Caltrans' exposure to California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) multi-employer citations.

The first goal of Caltrans' mission and vision is to "Provide a safe transportation system for workers and users, and promote health through active transportation and reduced pollution in communities." Caltrans construction employees and our contracting partners are part of this strategic mission and vision.

This COSP provides guidance when performing your duties in the field. Always consider your own safety while you are accessing the job site and while observing contractor's operations and make sure to check the safety instructions in the project's COSP.

SECTION 2 – GENERAL SAFETY

The resident engineer should print Sections 1 through 9 of this COSP and check the appropriate boxes on the Table of Contents to indicate which parts of Section 10 are applicable to the project. After checking the applicable boxes, print those parts of Section 10 and Appendices 1 through 3.

When first assigned to a project, employees should read the COSP, and sign and date the signature sheet (Appendix 3), thereby agreeing to follow these guidelines. Employees should also review Chapter 2, “Safety and Traffic,” of the *Construction Manual*. File the resulting document in Category 6 of the project file to comply with Section 5-105A, “Code of Safe Practices,” of the *Construction Manual*.

Resident engineers and construction engineers should review each project for other potential safety issues. If additional safe measures are needed, supervisors should instruct employees or request assistance from district construction safety coordinators to provide instruction on unique safety issues for their projects.

Caltrans field employees assigned to any construction project should comply with the requirements outlined in the Caltrans IIPP, *Safety Manual*, and this COSP.

2.1 Zero Tolerance for Violence in the Work Place

Section 6.02, “Policy Statement,” of the *Safety Manual* states, “It is the policy of Caltrans to promote a safe and healthful work environment and to take appropriate action to protect, as much as possible, its employees and members of the public from prohibited behaviors such as acts of violence, threats, harassment, intimidation, or other abusive conduct which may occur at Caltrans workplaces or during the performance of duties.” Caltrans is committed to working with its employees to maintain a work environment that is free from violence and abusive behavior.

Caltrans has zero tolerance for any acts of violence, threats, harassment, intimidation, or abusive conduct—in any form. It is up to each employee to help make the state workplace a safe place for all. It is expected that each employee will treat all other employees, as well as members of the public, with professionalism, dignity, and respect. Individuals who engage in the prohibited behaviors described in Director’s Policy DP-18-R2, “Workplace Violence Prevention,” may be subject to corrective action under California Government Code, Section 19572.

2.2 Accident and Incident Reporting

Employees are responsible for immediately reporting damage sustained to their assigned state vehicle; accidents or incidents; and unsafe conditions, procedures, or work practices to their resident engineer and supervisor. Personal injuries to employees should be reported in accordance with Chapter 10, “Reporting Personal Injuries and Illnesses,” and vehicle accidents in accordance with Chapter 18, “Motor Vehicle Accidents,” of the *Safety Manual*.

2.3 Personal Protective Equipment

Chapter 12, “Personal Protective Equipment,” of the *Safety Manual* discusses personal protective equipment (PPE) requirements:

- All employees should wear a white hard hat with a Caltrans decal.
- All employees should wear a minimum of American National Standard Institute (ANSI) 107-2010 Class 2 garments during daytime hours and should wear ANSI 107-2010 Class 3 garments during hours of darkness when performing duties outside their vehicles within the state right-of-way. (Note: ANSI 107-2004 garments are also compliant during daytime hours or hours of darkness.)
- All employees should wear ANSI Z87.1-rated eye protection when working within the state right-of-way.
- Additional safety equipment, such as gloves, face protection, hearing protection, and rain gear should be used or worn when dictated by the situation as described in the *Safety Manual*, or as ordered by the supervisor. All equipment must be in compliance with CCR Title 8 requirements.
- Employees should wear clothing and footwear appropriate for the job to be performed and not shoes with soft, thin, or badly worn soles.
- Employees should follow the respirator guidelines in Chapter 15, “Respiratory Protection Program,” of the *Safety Manual*.

By law, all employees must wear seat belts and harness devices when operating state, state-leased, or private vehicles while performing state business in accordance with Chapter 17, “Guidelines for Safety Motor Vehicle Operation,” of the *Safety Manual*. Passengers must also wear such devices.

2.4 Alert and Distraction-Free

Employees should not drive or report to work if their abilities are impaired by fatigue, alcohol, prescription or nonprescription drugs, illness, or other causes that might expose themselves and others to injury.

In active work zones, employees should not use personally owned communication devices including, but not limited to, cell phones, bluetooth devices, or entertainment devices. Employees may use a communication device for business purposes in a work zone at a location where their safety or the safety of other workers and the traveling public will not be compromised.

SECTION 3 – FIELD SAFETY

Each construction field office should hold tailgate safety meetings at least every 10 working days to discuss potential hazards or other safety concerns with the job. The meetings should be documented and the meeting minutes posted in a conspicuous place at the field office in accordance with Chapter 2, “Safety Meetings,” of the *Safety Manual*.

Section 5-1.01, “General,” of the *Standard Specifications* requires that the contractor provide the inspector safe access at all times during construction. If a contractor’s practice does not comply with contractual requirements or CCR Title 8 and you are not being provided safe access to perform your job duties, follow the procedures in Section 2-103, “Managing Safety Hazards,” of the *Construction Manual*. Remember to always remove yourself from the hazardous area promptly. Then, consider starting a documentation trail to show lack of safe access and requests to the contractor to provide safe access to our employees. Include these items in the documentation trail:

- Identified improper practices based on contractual requirements or CCR Title 8 reference.
- Documented conversations with a contractor foreman or superintendent requesting immediate correction of the safety deficiency or, as necessary, provision of a timeline for correction and potential consequences for failure to abate the deficiency.
- How and when the safety deficiency was abated.
- If the contractor fails to abate the deficiency within a reasonable time frame, inform the resident engineer of the actions taken, and follow up with the appropriate contractor’s representative to request abatement.
- If the safety deficiency is not abated in a timely manner based on the resident engineer’s request, or if the safety deficiency is repeated later, the resident engineer should write a letter to the contractor detailing the safety deficiency event with a timeline for correction and potential consequences for failure to correct the deficiency. All available contractual resources should be considered, including potentially stopping the operation, shutting down the job, removing personnel, and requesting Cal/OSHA enforcement visit the job site after consultation with the construction manager and the district construction safety coordinator in accordance with Section 2-103A, “Imminent Hazards,” of the *Construction Manual*.

Employees should minimize their exposure to hazards and stay away from work areas when their presence is not required.

Employees should face oncoming traffic unless they have a clear reason for doing otherwise and should be alert to contractor equipment in the work zone.

When inspecting or sampling in isolated areas, employees should notify their supervisors or resident engineers of their location and time of return. It is desirable that each employee is accompanied by another, if available. (known as the buddy system).

Employees should not assist contractors in performing any contract task except for resetting of cones or barricades when it is safe to do so and necessary for access.

SECTION 4 – EQUIPMENT

Work around construction equipment requires special precautions. Your priority is to observe the operation and determine if you have safe access to perform your job duties:

- Before entering a work area, determine movement patterns of the contractor's equipment.
- The contractor should confirm that the equipment has back-up alarms, guards, lighting, and other safety features installed as required by CCR Title 8. Notify the contractor if they are using equipment not in compliance and ask that the operation be stopped until equipment is repaired and brought into compliance.
- Employees should listen for automatic backup alarms for mandated equipment—or verify appropriate administrative controls are in place where backward movement would constitute a hazard to employees—in the work area as required by 8 CCR 1592, “Warning Methods.” If you note noncompliance follow the procedures outlined in Section 3, “Field Safety,” of this COSP.
- Employees should not enter into areas potentially in a blind spot of the equipment operator. Employees should follow these rules around the work area:
 1. Never assume that an equipment operator can see you.
 2. Establish eye contact with the operator and use hand signals to show your intentions.
 3. Do not proceed until the equipment operator signals to you that it is safe.
 4. Face moving equipment unless there is clear reason for doing otherwise.
 5. Do not ride on or operate any contractor's equipment.

Exceptions:

- 1. You may cross a paving operation by walking across the screed.
- 2. You may ride in a contractor work truck if the vehicle complies with state law for seating and safety belts for the driver, passengers, and occupants.
- Always position yourself away from the path of overhead operations, paying special attention to crane operations. Avoid walking or standing under overhead operations, crane booms, suspended loads, or the fall path of a snapped cable.
- Stay clear of pile driving operations. Pieces of broken piles or hammers can fly throughout the area causing injury.

SECTION 5 – TRAFFIC CONTROL SYSTEMS

Construction personnel should exercise care whenever working in the roadway environment including doing preconstruction surveys, working within or outside of contractor-established traffic control, or doing post-construction surveys.

- When entering or leaving a work area adjacent to public traffic, use appropriate traffic signals and proceed with the normal traffic flow.
- Face traffic unless there is clear reason for doing otherwise. Plan in advance an escape route in case an errant vehicle enters the work area. Use another employee as a lookout, if someone is available.
- Plan work in advance to keep employee exposure to public traffic to a minimum.
- Where workers are engaged in construction activities, park vehicles in the shoulder or closed lanes of travel between oncoming traffic and the work location to provide barrier protection.
- When required to cross traffic lanes on foot, provide enough time to walk across the lanes safely.
- Employees should stay in their vehicles while in a lane closure unless inspection duties require otherwise.
- Employees should not work in or within 6 feet of the traveled way without proper signage or a lane closure.

Exceptions:

Within 6 feet from the traveled way, brief operations may be conducted without using a lane closure or signage, if the following conditions are met:

1. Parking or working is limited to no more than 20 minutes.
2. Traffic volume is light.
3. Sight distance is at least 500 feet in each direction. If not, the resident engineer should work with the contractor to provide safe access for employees to work inside a lane closure.
4. Employees feel it is safe to do so. If they do not feel safe or the above provisions cannot be met, they should speak with their resident engineer or supervisor and ask to work behind a contractor-established lane closure.

SECTION 6 – HEAT ILLNESS

Heat illness prevention is a requirement of 8 CCR 3395, “Heat Illness Prevention in Outdoor Places of Employment.” All employees should review Chapter 23, “Heat Illness Prevention Program,” of the *Safety Manual* to better understand Caltrans’ program requirements to meet 8 CCR 3395.

Employees need to pay special attention to Sections 23.04, “Caltrans Heat Illness Prevention Plan,” and 23.06, “Types of Heat Illness/Symptoms and First Aid,” of the *Safety Manual*, respectively.

6.1 Training

All employees must receive heat illness prevention training before being assigned to a field location. The training is to be documented in the employee’s training record. Supervisors are responsible for confirming that their employees are trained in accordance with Chapter 23 of the *Safety Manual*.

Supervisors and employees should be aware of the health risks associated with working and performing work activities in environments that may contribute to heat illness. Knowing what factors can increase risk will enable you to take steps to reduce problems while working in the heat. The following are steps that supervisors and employees can take to help prevent heat stress:

- Discuss the increased risks when working in high heat exposure areas such as exposure to radiant heat from mechanical sources or on hot days.
- Drink plenty of water—***I quart per hour.*** Thirst is not a good indicator of how much water the body needs. Drink more water or other fluids than needed to satisfy thirst. It is best to regularly replenish the water lost from sweating by drinking small amounts frequently throughout the work shift.
- Take preventive recovery periods. Depending on conditions, (for example, air temperature, sun exposure, physical exertion) more recovery periods may be needed. A preventive recovery period means taking time to recover from working in the heat in order to prevent heat illness. This period will be no less than 5 minutes. If *not in* the right-of-way, use available or provided shade for recovery. If *in* the right-of-way, your vehicle can be your shade and relocating to a cooler location should also be considered.
- Wear PPE to guard against heat exposure. When possible, wear comfortable, loose, lightweight clothing that allows body heat to be released. Cover your head.
- Acclimatize to hot work. This usually requires several days working in the heat for short periods, gradually increasing work time and intensity. Consider alternative work schedules (work earlier or later) to avoid the times when heat is most severe. Regardless of physical condition, employees need to acclimatize appropriately for their work conditions.
- Eat light meals. It is better to eat light during the workday when exposed to heat because hot, heavy meals add heat to the body and divert blood to the digestive system.
- Avoid drinks with alcohol, caffeine, and large amounts of sugar as these can contribute to dehydration. Remember that personal risk factors such as acclimatization, age, and health affect

CODE OF SAFE PRACTICES

the body's water retention and physiological responses to heat. Follow the doctor's or pharmacist's instructions regarding medications taken, including any for using the medicines in heat or sun intensive environments.

- Know the symptoms and first aid for stages of heat illness.

6.2 Access to Shade

As a construction employee, you have been or will be assigned a state vehicle. This vehicle with the air conditioner running is your area for shade.

6.3 Provisions for Water

Potable drinking water is available at all resident engineer offices and at all state maintenance facilities. It is your responsibility to obtain a sufficient amount of water (1 quart per hour) for the entire shift.

Water coolers and cups are available through the state warehouse.

2-gallon cooler:

Item Number	Name	Unit	Description
7240 0065 2	CAN	EA	WATER COOLER CAN 2 GALLON, PLASTIC W/FLUSH MOUNTED SPIGOT

5-gallon cooler:

Item Number	Name	Unit	Description
7240 0075 3	CAN	EA	WATER COOLER CAN 5 GALLON, PLASTIC W/FLUSH MOUNTED SPIGOT

Paper drinking cup:

Item Number	Name	Unit	Description
7350 0010 9	CUP	TU	PAPER DRINKING CUP, 3.5 OZ

6.4 Supervisor Procedures

The supervisor (per the footnote to Section 2.02, "Policy Statement" of the *Safety Manual*, this includes the construction engineer and resident engineer) needs to ensure compliance with the Heat Illness Prevention Program. Supervisors need to consider having documentation on file, as part of tailgate safety meetings or the resident engineer's daily diary that addresses key elements of 8 CCR 3395. These include:

Responsible person in charge—If multiple inspectors are assigned to an operation, designate one person as the responsible person to remind employees to drink small quantities of water, even if not thirsty, increase the number of water and rest breaks, observe them for alertness and signs of symptoms of heat illness, and increase communication with employees. If working alone, the employee should confirm that their supervisor is aware of their working conditions and are

responsible for having the items listed in Section 6.3, “Provisions for Water,” of this COSP.

Temperature check—Check the forecasted temperature prior to start of each day’s operations. If temperatures are expected to exceed 95 degrees Fahrenheit, inform the responsible person in charge to closely monitor other Caltrans staff as described above and in Section 23.04, “Caltrans Heat Illness Prevention Plan,” of the *Safety Manual*.

Water supply—Inform employees where they may obtain water and discuss procedures for refilling their water supplies during the shift, as necessary.

Acclimatization—Supervisors must allow time for new employees brought on during the season to acclimatize to working in the outdoor environment. Pay special attention to employees: when there are increases in temperatures; who move from an office environment to the field during the season; or to employees who may have been working in mountainous or coastal areas who are temporarily or permanently reassigned to work in valley or inland areas.

Emergency response—Confirm employees know who to call in case of emergency. Account for personnel on the call list that are not available to answer the phone (on vacation or working an alternate shift). There may be areas in the region that lack cell phone reception. Identify the closest location where cell phone service, roadside assistance telephone, or the nearest business phone is available to use in case of emergency. When notified by an employee that they may be suffering from a heat-related illness, maintain communication with the employee. If symptoms do not dissipate, respond or assign another employee to respond to the affected individual’s location to obtain medical assistance or provide assistance, as necessary. If inspectors are working by themselves and the contractor is present, coordinate with the contractor to provide assistance to our staff in an emergency. If necessary, implement emergency procedures as described in Section 23.06, “Types of Heat Illness/Symptoms and First Aid,” of the *Safety Manual* and below, and call 911.

Emergency procedures—Call 911 and confirm employees know how to call 911. Confirm employees know how to direct emergency services to their project location. Use the project description as listed on the contract plans title sheet as a basis for project location. For projects with multiple locations, additional description may be necessary for each location. The location should reference the route number, distance, and direction from the nearest cross street, interchange, or landmark feature (Highway 101 in Mendocino County, 2.5 miles north of Redwood Valley Drive). Do not use post miles for location as emergency responders are not always familiar with county post mile numberings. If the location is inaccessible, plan ahead on how employees will be transported to a point where they can be reached by emergency medical service personnel if necessary. Options include ensuring a vehicle is available to transport the affected person to a predetermined location that is accessible to emergency medical service personnel.

SECTION 7 – HAZARDOUS MATERIALS EXPOSURE

Construction projects use many different materials, either individually or in combination, to meet contract requirements. Employees encounter different conditions on construction sites because of environmental conditions, such as wind velocity or direction, and wet conditions that may affect how hazardous materials disperse. The contractor may be using known or unknown materials that require special handling if the material spills. The contractor is responsible for responding to these spills based on direction provided by the product safety data sheets and established requirements of the approved water pollution control plan (WPCP) or stormwater pollution prevention plan (SWPPP).

Do not handle or transport hazardous substances under the contractor's control unless you have been specially trained to handle or transport hazardous materials (such as a materials tester) and your duties require it.

7.1 Hazardous Substances

Chapter 16, “Hazardous Materials Communications Program,” of the *Safety Manual* discusses Caltrans policy on hazardous substances and requires that a copy of the chapter be posted at the field office.

The contractor should provide the resident engineer with a list of hazardous substances present at the project site, maintain safety data sheets, and make them readily accessible to employees. Product names provided should match products in use in the field. If there is a discrepancy, ask the contractor to obtain and provide the resident engineer with the appropriate safety data sheets.

District offices should provide employees with the general information and training on hazardous substances to comply with the Caltrans Hazardous Materials Communication Program. Training should be provided for specific hazardous materials the employee may be exposed to on the job site.

7.2 Hazardous Wastes

When unknown and potentially hazardous wastes are discovered, the employee should remove themselves from the area and inform the resident engineer and contractor of the unknown or potential hazardous waste. The employee should not reenter the area until the waste is identified and the issue is resolved.

7.3 Hazardous Spills

If employees identify a known hazardous spill they should remove themselves to a safe distance, make the necessary phone calls and wait for emergency responders to arrive, then follow their direction. Employees should inform the traffic management center, district dispatch, or the radio room (after-hours California Highway Patrol) of any potential hazardous spill and should not undertake exploratory work. The resident engineer should review the WPCP or SWPPP and provide hazardous spill emergency numbers to all field staff.

SECTION 8 – VEHICLE OPERATIONS

Employees should review Chapter 17, “Motor Vehicle Safety,” of the *Safety Manual* prior to operating a state vehicle. Drive vehicles defensively. The vehicle operator is responsible for the proper care and maintenance of assigned equipment and should not operate an unsafe vehicle.

Do not transport hazardous materials in state vehicles unless specifically authorized. Fuel should be carried only in approved fuel containers.

8.1 Parking

- Park vehicles in accordance with legal requirements for parking on public streets and highways.
- Stay at least 25 feet clear of the tracks when parking within railroad rights-of-way.
- Where workers are engaged in construction activities, park vehicles in the shoulder or closed lanes of travel between oncoming traffic and the work location to provide barrier protection.
- Avoid parking behind or in the operating area of the contractor’s equipment.

8.2 Flashing Amber Lights

Amber warning lights are discussed in Section 17.13, “Amber Warning Lights,” of the *Safety Manual*. Flashing amber lights include such devices as flashing incandescence, flashing LED, rotating beacons, and light bars.

- General use—When the vehicle is equipped with an amber light, follow these guidelines:

Lights ON:

1. Entering or leaving a closure with the appropriate turn signal.
2. Moving at slow speed in or near traffic.
3. When using a vehicle as a barrier to protect workers.

Lights OFF:

1. When parked in a closure (emergency flashers may be used).
 2. Operating in normal traffic.
 3. When no danger to employees or motorists exists.
- Night use—Use discretion so you do not blind or distract traffic needlessly.

8.3 Vehicle Backing

Employees should review and follow Section 17.10, “Vehicle Backing Policy,” of the *Safety Manual*.

8.4 Vehicle Accidents

If an employee is involved in a vehicle accident with a state, leased, or privately owned vehicle used for state business, the employee must complete Form 270, “Vehicle Accident Report,” scan it, email it, and mail it to the district safety office within 48 hours. Follow all other accident reporting procedures documented in Section 18.03, “Motor Vehicle Accident Reporting and Forms,” of the *Safety Manual*.

SECTION 9 – FACILITIES

Refer to Chapter 5, “Office and Field Safety,” of the *Safety Manual* for information on office work. Consider field construction facilities as including field construction offices, resident engineer offices, field labs, and adjacent areas used by Caltrans.

- Each facility should post emergency telephone numbers and services in a conspicuous place.
- Arrange field construction facilities, furniture, and supplies safely for easy entrance and exit.
- Store or dispose of hazardous flammable substances properly.
- Employees should take responsibility for immediately reporting unsafe conditions, procedures, or work practices to their supervisors for corrective action.
- Employees should be aware of the location of fire extinguishers and first aid kits.
- Avoid leaving boxes, books, miscellaneous equipment, and so forth in aisles since they can cause employees to fall and injure themselves. Avoid leaving heavy objects on cabinets, bookshelves, and windowsills. In case of an earthquake, these objects can become airborne and cause injury.
- Keep aisles clear of stacked materials and equipment. Maintain a minimum 24-inch width around office furniture and minimum 44-inch width in hallways for walking. Be familiar with walkways and use care. Slow down at hallway intersections, especially when carrying hot beverages.
- Be familiar with the location of emergency action plan exits and escape routes to use in case of fire or earthquake.
- Maintain electrical cords in good condition. Avoid laying electrical cords where they can tangle with chair legs or create a tripping hazard. If possible, reroute cords to avoid crossing pathways. If necessary, provide additional electrical outlets.
- Use proper lifting and bending techniques for objects you can safely handle. If an object looks too bulky or heavy to lift—**get help**.
- Use care in opening top drawers of file cabinets, so they do not topple on you or other employees. Avoid leaving drawers open when not in use, even for brief periods of time, since open drawers create possible hazards for other employees. Secure cabinets taller than 5 feet to the wall or floor to keep them from falling.
- Provide an ergonomic workstation and use proper body posture to minimize musculoskeletal and visual problems. Refer to Chapter 7, “Ergonomics,” of the *Safety Manual*.
- Employees should not move any furniture or equipment. If it needs to be moved, contact the facilities coordinator to arrange for movers.

CODE OF SAFE PRACTICES

- Store office supplies in areas set aside for that purpose and not where they can contribute to injury. Do not store materials on top of bookshelves or file cabinets or in walkways, hallways, or stairwells.
- Do not attempt to reach high shelves without a proper ladder or step stool. Avoid awkward reaches.
- Smoking is prohibited in all state facilities, including vehicles, stairwells, and restrooms. Smoking is allowed only in designated areas outside the building.
- It is illegal for any employee or member of the public to bring a firearm or weapon into a state facility or vehicle. Immediately report violations to your supervisor. Refer to Chapter 8, “General Health, Medical and Safety,” of the *Safety Manual*.
- All employees should use a sign-out board that provides location and approximate return time information for the office to contact them in the event of an emergency.
- Employees should take care while operating and using office equipment to allow its future availability for all employees. Specific pieces of equipment are listed below:
 1. Desktop computer—Plug computers into an approved surge protector, and turn them off at the end of every day. Use proper ergonomics to eliminate eye strain and body aches.
 2. Alarm system—Be aware of proper operation, memorize passwords, and know emergency numbers to call during a false alarm.
 3. Copier, printer, and fax machine—Only authorized personnel should attempt to maintain and repair the equipment. Avoid hazards associated with loading paper by following the sections on “Lifting,” and “Material/Office Supply Storage,” of the *Code of Safe Work Practices*. Avoid contact with toner and ink.
 4. Paper cutter—Take extra precautions while using the paper cutter because of associated risk. Verify that the device, especially the spring-balanced cutting arm, is in proper working order before using. Make sure the cutting arm is locked and in a closed position after use and during storage.
 5. Coffee pot—at the end of the workday, be sure the coffee pot has been turned off to avoid unit overheating and potential damage, possibly resulting in a fire hazard.

SECTION 10 – SPECIAL CONSIDERATIONS

10.1 Night Work

Work during hours of darkness creates special hazards because of the lack of light for visibility.

- In addition to other required PPE discussed previously, employees must wear ANSI 107-2010 Class 3 (ANSI 107-2004 garments are also compliant) garments at night.
- Employees must always work in lighted areas to comply with Section 7-1.02K(6)(a), “General,” of the *Standard Specifications* and 8 CCR 1523, “Illumination.” The minimum acceptable lighting is 10 foot-candles. Section 5-1.01, “General,” of the *Standard Specifications* requires the contractor to provide employees with safe access to inspect the job.
- If employees believe the contractor is not providing sufficient light for their operations, they should notify the contractor that they will not be performing inspection duties until they have confirmation of compliance with 8 CCR 1523. If the contractor can’t confirm CCR Title 8 compliance, employees should call the construction safety coordinator and ask for a safety review. If the field office has a light meter, employees should use it to check for compliance with 8 CCR 1523.

10.2 Excavations

Excavations are defined in 8 CCR 1540, “Excavations,” as any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Employees should not enter an excavation unless it is necessary to perform their work.

- Employees who need to enter an excavation should first determine that it is safe to do so.
- Employees should verify that required protection against ground movement and the prescribed access is in place. If the excavation is 5 feet or deeper, employees should review the excavation safety plan that the contractor prepared and resident engineer authorized, as required by Section 7-1.02K(6)(b), “Excavation Safety,” of the *Standard Specifications* and verify that the contractor is following the excavation safety plan.
- Employees should verify that excavated material spoils piles are placed at least 2 feet from the edge of the excavation.
- Employees should be aware that an excavation can become subject to the requirements for a confined space.
- Employees should be aware that changed soil conditions may require modifications to shoring or sloping systems, including excavations less than 5 feet deep.
- Employees should know they may encounter hazardous waste during excavation processes. If they observe suspect material, they should inform the contractor, remove themselves from the area and follow Section 7, “Hazardous Materials Exposure,” of this COSP.
- Employees should be provided with adequate protection by the contractor delineating the perimeter of the excavation when the contractor is not conducting operations at the location. Delineation can be provided in a number of ways, including using plating to cover the excavation or establishing a perimeter with tape line delineators.

10.3 Elevated Work Areas

In accordance with Section 12.16, “Fall Protection” of the *Safety Manual* and 8 CCR 1670, “Personal Fall Arrest Systems, Personal Fall Restraint Systems and Positioning Devices,” an elevated work area is an open-side end of all scaffolds, runways, ramps, elevated platforms, thrust-outs, surfaces, wall openings, bridge decks, or other elevations 7.5 feet or more above the ground, floor, or level underneath, or other sloped surfaces steeper than 40 degrees.

There are two distinct elevated work area exposures possible for employees:

- Work on a contract with contractor-installed fall protection systems—The contractor is required to provide safe access to our employees in accordance with Section 5-1.01, “General,” of the *Standard Specifications*.
- All other work—This might include pre- or post-construction project review, respectively or work on bridge decks with railings that don’t meet 8 CCR 1620, “Design and Construction of Railings,” standards discussed below.

Follow these work practices in elevated work areas for safety:

- Before employees enter an elevated work area, they should determine that proper worker protection is in place or readily available for use. This protection includes hand railings and walkways. If hand railings are used for fall protection, they must have a top rail between 42 and 45 inches measured from the top surface of the rail to the floor, platform, runway, or ramp and a mid-rail halfway between the top rail and floor, platform, runway, or ramp in accordance with 8 CCR 1620. If there is not an established fall protection system in place, then employees should not enter that area and must complete Fall Protection training as discussed below.
- Each employee should use proper safety equipment and look for openings, loose covers, or other unguarded areas. Address safety deficiencies as described in Section 2, “General Safety,” of this COSP.
- Contractors must provide standard fall protection (standard guardrail, catch platforms, safety nets) and use it on open sides and ends of elevated work areas.
- Before employees enter work areas where no fixed standard protection is applied, they should have the concurrence of the resident engineer or structures representative and meet the following requirements:
 1. Employee has successfully completed a Fall Protection (LMS 100320) course.
 2. Employee has a fall protection harness and shock-absorbing lanyard that is the proper length for the work. This equipment must pass an inspection performed prior to each use and have a documented inspection by a competent person for fall protection at least twice a year.
- Employees should be aware that elevated work areas may encompass deep or enclosed spaces that may meet requirements for confined space entry.

CODE OF SAFE PRACTICES

- Employees should not work or pass below elevated work areas where protection from falling objects has not been provided.

Follow these practices for all other work:

- A Fall Protection Plan should be implemented by the supervisor.
- All employees who might be exposed to fall hazards are required to attend a General Fall Protection Awareness training course (LMS course code to be determined). This training is for those employees who are not required to attend Fall Protection training (LMS 100320), which is required for those employees that need to wear fall protection harnesses to perform their jobs.
- Employees should not approach to within 6 feet of railings not in compliance with 8 CCR 1620, “Design and Construction of Railings,” on elevated structures. In accordance with 8 CCR 1671.2, “Controlled Access Zones and Safety Monitoring Systems,” if work within 6 feet of railings is of short duration (nonrepetitive) and limited exposure, work may proceed provided adequate risk control is recognized. A spotter should be used if possible.

10.4 Electrical

- Before beginning any wiring inspection, employees should follow appropriate lockout or tag-out procedures. Employees should verify that the contractor has completed work on the circuit and that the circuit is de-energized. Remember, all electrical equipment must be treated as energized until tested or otherwise proved de-energized.
- Most equipment with exposed metal surfaces is required to be grounded. Request that the contractor remove from service equipment that has damaged or removed grounding prongs that could expose our employees to harm.
- Conductors or equipment should not be located in damp or wet conditions; exposed to gases, fumes, vapors, and liquids with a deteriorating effect; or exposed to excessive temperatures unless approved for that purpose. If you observe this, remove yourself from that area and inform the contractor of the need for correction.
- Flexible cords should be protected from accidental damage. Verify cords are not placed at points where they can be pinched or damaged by closing a door or window edge. They should be protected from abrasion by adjacent materials. Any flexible cord where the outer sheath is damaged such that the conductor wiring is visible should be referenced to the contractor for removal from service.
- If a generator is used to power a temporary office, it must be grounded according to the Electrical Safety Orders in 8 CCR 2395.1–2395.114.1, or manufacturer instructions.

10.5 Confined or Enclosed Spaces

10.5.1 Definitions

Chapter 14, “Confined Spaces,” of the *Safety Manual* provides detailed information about confined spaces. CCR Title 8 designates two distinct types of confined spaces. Confined spaces in construction are discussed in 8 CCR Article 37, “Confined Spaces in Construction,” encompassing Sections 1950-1962, respectively, and permit-required confined spaces are discussed in 8 CCR 5157, “Permit-Required Confined Spaces,” and 8 CCR 5158, “Other Confined Space Operations,” discusses other confined space operations.

A confined space is a location that meets the following definitions:

- An employee can physically enter and perform assigned work.
- Access is limited or has restricted means of entry or exit.
- It is not designed for continuous employee occupancy.

NOTE: Contractors use a different rule for confined space entry as detailed in 8 CCR Article 37. Their rule has only two provisions: (1) existing ventilation is not sufficient to remove dangerous air contamination, or oxygen enrichment or deficiency, and (2) ready access or exit for the removal of a suddenly disabled employee is difficult because of the size and location of the opening. Caltrans employees must follow the provisions of Chapter 14 of the *Safety Manual* and this COSP.

- Confined spaces include such structures or facilities as tanks, bridge cells, shafts, pits, bins, tubes, pipelines, deep trenches, tunnels, vaults, vats, pump houses or compartments, sewage lift stations, culverts, coffer dams, or elevator pits. Employees must not enter any contractor’s designated permit-required confined space. If the contractor has such a work location and inspection is required, immediately contact the resident engineer and the construction safety coordinator to request assistance. No employee must enter or remain in a confined space or an area otherwise known to be deficient in oxygen and containing harmful amounts of dusts, gases, or other substances.

10.5.2 Permit-Required Confined Space Entry Procedures

- Employees must not enter permit-required confined spaces at any time.

10.5.3 Non-Permit-Required Confined Space Entry Procedures

- Employees can enter a non-permit-required confined space work area if they have done all of the following:
 1. Attended a confined space course.
 2. Reviewed the procedures in Chapter 14 of the *Safety Manual*.
 3. Filled out the appropriate forms before entering.
 4. Obtained calibrated atmospheric testing equipment and the training to use it.

Employees must follow confined space entry procedures to identify if the work location is a confined space:

- Immediately before entry, verify radio communications with the radio dispatcher, resident engineer office, or California Highway Patrol for possible emergency rescue.
- Review emergency and rescue procedures. Post at each worksite the name of and way to contact the rescue response agency.
- To the extent feasible, the space must be emptied and flushed or otherwise purged of flammable, injurious, or incapacitating substances.
- Verify that the space has continuous natural or mechanical ventilation.
- Test the air with an appropriate device to determine whether dangerous air contamination, oxygen deficiency, and explosive hazard exist.
- Maintain a written record of the testing results at the worksite. Hazardous atmosphere is defined as an oxygen level below 19.5 percent by volume or a combustible gas content of greater than 10 percent lower explosive level (LEL); carbon monoxide greater than 25 parts per million (ppm); or hydrogen sulfide greater than 10 ppm.

If the space atmosphere tests hazardous—Stop! Do not enter! Post a “Danger—DO NOT ENTER” sign.

- Maintain a log at the worksite for recording:
 1. Name of person entering enclosed space.
 2. Name of standby person.
 3. Date and time of each entry and exit.
 4. Initial percentage of oxygen.
 5. Initial percentage of LEL value.
 6. Periodic meter readings or notation of the use of continuous monitoring equipment.
- Verify that suitable lighting is provided in the work area.
- At least one standby person must remain outside the enclosed space with an effective means of communicating with anyone in the enclosed space and with the radio dispatcher, resident engineer office, or California Highway Patrol.
- Conduct testing of the atmosphere with sufficient frequency to verify that dangerous air contamination and oxygen deficiency do not develop during the performance of an operation.

If the atmosphere becomes hazardous, everyone must vacate the closed space immediately. Do not re-enter!

Notify the radio dispatcher, resident engineer office, or California Highway Patrol upon exiting the enclosed space.

10.6 Materials Plant Sites

The materials plant site has its own potentially hazardous conditions common to this type of operation. The plant inspector will normally be the only state representative at the plant. When entering the two types of plant sites—job site and commercial, employees must do the following:

- Comply with plant training requirements. Plants may have specific onsite training requirements in order to comply with the Federal Mine Safety and Health Administration and CCR Title 8 requirements.
- Onsite use of the hard hat, ANSI 107-2010 compliant garments, and safety glasses is required at all times except when inside office areas. Some areas require the use of hearing protection.
- When entering or driving within the facility, be aware of access roads and their direction of travel.
- Report your presence to the plant operator before you enter the plant. Familiarize yourself with the plant operating procedures by reading the contractor's plant COSP before beginning work, and follow the rules.
- Do not enter an unsafe work area. Specific work areas requiring inspection should have safe access and comply with CCR Title 8 requirements at all times. Be alert for overhead wires, tripping hazards, floor openings, and loose material on stairways or walkways. Look for exposed electrical sources.
- Avoid work areas where your presence is not required. Do not walk behind equipment, and look before moving into "blind" areas.
- Be particularly aware of the following conditions:
 1. Conveyors that start and stop without notice.
 2. Hot asphalt lines and hot aggregate.
 3. Flammable fuel storage tanks and lines.
 4. Revolving and reciprocating parts, including chains and pulleys that should be guarded at all times.
 5. Restricted areas during time of plant operation.
 6. Loud-sounding horns, which signal that the plant is about to begin operations.
 7. Equipment backing operations.
 8. Noise, dust, and no smoking areas (flammable materials hazards).

10.7 Field Testing

10.7.1 Testing Portland Cement Products

Portland cement-based concrete products become alkaline when exposed to moisture. Exposure can dry the skin, cause alkali burns, and affect the mucous membranes. Dust can irritate the eyes and upper respiratory system. Excessive exposure to skin and eyes, especially when the concrete products are mixed with water, can cause caustic burns as severe as third degree. Prior to handling concrete samples and in accordance with Section 5-1.01, "General," of the *Standard Specifications*, confirm that the contractor provides facilities necessary for the inspection. This includes an ANSI Z358.1-compliant eyewash station, in compliance with 8 CCR 5162, "Emergency Eyewash and Shower Equipment"; and a hand washing station with soap, water, and paper towels, in accordance with 8 CCR 1527, "Washing Facilities, Food Handling, and Temporary Sleeping Quarters." Based on information in a generic portland cement-based concrete product safety data sheet, be prepared for the following first aid measures if exposed:

- Eyes: Immediately flush eyes thoroughly with water. Continue flushing eyes for at least 15 minutes, including under lids, to remove all particles. Call a physician immediately.
- Skin: Wash skin with cool water and pH-neutral soap or mild detergent. Seek medical treatment if irritation or inflammation develops or persists. Seek immediate medical treatment for burns.

10.7.2 Testing With Nuclear Gauges

The field lab has unique conditions that require special attention for radioactive sources. Only trained personnel may use specialized equipment.

- Operators of radioactive sources must work within all safety regulations.
- Operators must get training in the proper use, transportation, and storage of nuclear gauge devices.
- Operators must wear film badges when operating gauges or if within 10 feet of the gauges. Instruct all other persons to keep away.
- Use the three-lock system on transportation and storage of devices. Keep transportation or shipping papers within reach of vehicle operators.
- This job often requires the lifting of heavy objects. Use proper lifting methods by balancing the load and lifting with the legs. Do not risk back injury. If necessary, get help.
- Do not, under any circumstances, attempt to repair, modify, or open the nuclear sealed source.
- Operators must notify radiation safety officers and their supervisors in the event of an accident with the gauge.
- In case of a vehicle accident with a vehicle transporting a nuclear gauge, the following emergency procedures must be implemented by the employee:

CODE OF SAFE PRACTICES

1. Move the vehicle off the traveled way to the nearest onsite parking area. The vehicle must not be moved again until a radiation survey has been conducted, if deemed necessary, by responsible authorities.
2. Move a safe distance from the vehicle and call the 24-hour emergency contact number listed on the shipping papers. Be sure to state that a nuclear gauge is involved. Be prepared to provide the emergency contact with your location. The location should reference the route number, distance, and direction from the nearest cross street, interchange, or landmark feature (Highway 101 in Mendocino County, 2.5 miles north of Redwood Valley Drive). Do not use post miles for location as emergency responders are not always familiar with county post mile numberings.
3. Review the “Contact in Case of Nuclear Incident” in the nuclear gauge binder and call the district radiation safety officer or alternates, if necessary.

10.8 Respirable Crystalline Silica

10.8.1 Background

8 CCR 1532.3, “Respirable Crystalline Silica,” takes effect on September 23, 2017 and supersedes requirements listed in 8 CCR 1530.1, “Control of Employee Exposures from Dust-Generating Operations Conducted on Concrete or Masonry Materials.” The exposure standards have been significantly lowered from a Permissible Exposure Limit of 100 µg/m³ to 50 µg/m³, and an Action Level requiring medical surveillance of 25 µg/m³ has been added to the law. This will impact contractor operations and requires Caltrans to implement procedures to protect our employees from potential silica dust exposure.

According to the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA):

Crystalline silica is an important industrial material found abundantly in the earth’s crust. Quartz, the most common form of silica, is a component of sand, stone, rock, concrete, brick, block, and mortar. Materials containing quartz are found in a wide variety of workplaces.

Silica dust is hazardous when very small (respirable) particles are inhaled. These respirable dust particles can penetrate deep into the lungs and cause disabling and sometimes fatal lung diseases, including silicosis and lung cancer, as well as kidney disease.

Occupational exposure to respirable crystalline silica occurs when cutting, sawing, drilling, and crushing of portland cement concrete (PCC), brick, ceramic tiles, rock, and stone products. Occupational exposure also occurs in operations that process or use large quantities of sand, such as foundries and the glass, pottery and concrete products industries. OSHA estimates that more than 2.3 million workers in the United States are potentially exposed to dust containing crystalline silica with nearly 90 percent of those workers employed in the construction industry.

There are many contractor operations which could create exposure to silica dust. These include operations such as:

- Bridge demolition—grinding on PCC, both hand and machine
- Sawcutting—horizontal/downward drilling on PCC
- Use of powder-actuated tools (Hilti Guns)
- Jackhammering or chipping of PCC—sandblasting
- Masonry work—PCC/Asphalt production
- Various materials testing methods in our district and field materials labs
- Sweeping after PCC or asphalt grinding operations

10.8.2 Employee Exposure Procedures

Employees should limit their exposure to contractor operations with the potential to create silica dust by staying upwind at least 50 feet from the operations until the operations with the potential for creating silica dust are stopped and any visible dust has settled as much as environmental conditions allow. Inspection of these activities should be limited to times when the potential for silica dust exposure is minimized to the maximum extent practicable.

10.8.3 Respiratory Protection

Employees should not be performing any tasks on the contract that create silica dust. As such, respirator wear will be optional for the employee. If an employee wants to wear a particulate filtering face piece respirator (or dust mask), they will need to comply with *Safety Manual* Chapter 15, Appendix B, “Caltrans Guidelines for Dust Masks.”

Additionally, in accordance with 8 CCR 1532.3, “Respirable Crystalline Silica,” the dust mask must meet High Efficiency Particulate Air (HEPA) requirements of having a filter that is 99.97 percent efficient in removing particles as small as 0.3 micrometers in diameter and, therefore, a N100 dust mask is required.

10.8.4 Special Procedures for Materials Testers Working in District or Field Labs

This COSP only applies to field construction personnel. District or field lab staff performing operations which could create silica dust in either district or field labs should refer to the *Laboratory Safety Manual* for specific procedures required for compliance with 8 CCR 1532.3, “Respirable Crystalline Silica.”

10.9 Lead-Contaminated Soils

Lead enters the body through inhalation or ingestion of lead-containing materials and is not readily absorbed through the skin. The primary concern is exposure through ingestion of contaminated soil. Another concern is that shoes or clothing contaminated with lead-containing soils will enter vehicles, offices, or homes, and provide a source for lead contamination and exposure to others.

Recent testing of soils along some urban freeways has revealed that the soils contain low levels (< 3000 ppm) of lead. An evaluation of the soil contamination levels and expected dust levels indicates that exposure to airborne lead should be well below the Cal/OSHA permissible exposure limit (average of 50 micrograms of lead per cubic meter of air for 8 hours).

Eating, drinking, or smoking with hands or faces contaminated with lead-containing materials is the usual way that ingestion occurs. If you eat food, drink, or use cigarettes, chewing tobacco, or makeup with lead-contaminated soils in them or handle these items with soil-contaminated hands or utensils, you could ingest lead.

Lead exposure can cause serious short- and long-term health effects, including damage to the nervous and blood-forming systems, kidneys, reproductive system, and digestive system. Young children absorb lead much easier than adults and can suffer additional severe and delayed effects, including slow learning and behavioral problems from exposure.

Once in the body, lead is a potent systemic poison that serves no useful function. Some leads are quickly filtered out and excreted, but some remain in the blood and other tissues, often for a long time.

Job sites with elevated lead levels should adopt the following work practices to minimize the potential for contamination and ingestion of lead-contaminated soils:

- The contractor should be minimizing visible dust in accordance with their authorized Lead Compliance Plan (LCP). Employees should stay upwind at least 50 feet away from any operations where high levels of lead were identified in the contract and dust is visible. Inform the contractor of the need to comply with the provisions of their authorized LCP if visible dust is observed.
- Minimize contamination of personal clothing and footwear. Stay clear of operations that generate dust. If contamination cannot be avoided, use protective or disposable clothing and footwear to keep personal clothes clean. So contamination will not spread, store or dispose of used protective clothing by leaving it at the job site or placing it in a plastic bag. Clean your shoes before leaving the job site. If contaminated clothing should be laundered, wash it separately.
- Prevent soil ingestion by not eating, drinking, or smoking near work operations. Wash your hands and face before eating, drinking, or smoking. Clean your hands, clothing, and shoes before entering vehicles or buildings. Store food and water to avoid exposure to dust.

10.10 Yellow Paint Stripe and Markings Removal

Yellow traffic paint, thermoplastic stripe, and permanent marking tape previously used high levels of lead chromate pigments to achieve their yellow color. White markings do not contain lead. Although some of the new yellow paints do not contain lead, all older yellow paints do. When the markings are removed by grinding, scraping, burning, abrasive blasting, or other mechanical methods, the dust created can contain lead.

To minimize the potential for lead exposure, when removing yellow traffic paint marking or stripe by grinding, scraping, burning, abrasive blasting, or other mechanical methods, job sites will adopt the same work practices as those outlined for lead-contaminated soils in the previous section.

10.11 Rubberized Hot Mix Asphalt

10.11.1 Background

Rubberized hot mix asphalt (RHMA) is composed of petroleum asphalt, ground tire, natural rubbers, and aggregate. In the creation of RHMA, the asphalt and rubber are mixed and heated until the rubber swells and blends with the asphalt. The mixture is applied to the heated aggregate to create RHMA. Diluent or extender oils are sometimes added to the rubber-asphalt mixture to lower viscosity and improve aggregate coverage. Materials temperature is important at all stages. Caltrans specifications require a rubber-asphalt reaction temperature between 375 degrees Fahrenheit and 425 degrees Fahrenheit for at least 45 minutes before application to the aggregate. The aggregate is heated to 325 degrees Fahrenheit before mixing. RHMA cannot be heated above 325 degrees Fahrenheit.

RHMA is sticky and requires care in handling. Because of the rubber content, many not familiar with RHMA assume it is too cold and apply heat. This action causes the rubber-asphalt to break down and creates excessive emissions and smoke. Typically, if the RHMA is smoking and stinking, it is too hot. Caltrans specifications call for a maximum windrow and mat temperature of 325 degrees Fahrenheit.

Caltrans collected extensive industrial hygiene air-monitoring data during paving operations using RHMA. Materials monitored included asphalt, volatile organic compounds, polynuclear aromatic hydrocarbons, and cyclohexane extractable particulates. Results showed paving worker exposures to be low for all materials and well below established Cal/OSHA limits for materials with a limit. Unfortunately, local incidents of nausea, irritated throat, headache, and irritation continued to occur on isolated RHMA paving jobs. Most of these incidents have been accompanied by reports of excessive smoke and RHMA temperatures in excess of 325 degrees Fahrenheit.

10.11.2 Handling Procedure

Before starting paving work involving RHMA, follow these rules to work with and inspect RHMA paving jobs:

- Minimize personal contact with RHMA and RHMA smoke. Stay upwind and out of the smoke if possible. If irritation or other symptoms occur, move farther away from the smoke. Wear a half-face cartridge respirator with P-100 (HEPA) or Organic Vapor combination cartridges (magenta and black). Respirator use must comply with Chapter 15, “Respiratory Protection Program,” of the *Safety Manual*, which requires a medical exam, training, fit testing, clean-shaven wearers, and National Institute for Occupational Safety and Health-approved equipment and documentation before respirators are issued or worn. Contact the local district safety officer or construction safety coordinator for assistance.
- Use personal protective equipment to minimize contamination of clothing and skin. Wear coveralls if necessary, and wear gloves if handling RHMA. Remove contamination from shoes and clothing when leaving the site and before entering vehicles or offices.
- Prevent ingestion; do not eat, drink, or smoke near the paver. Wash hands before eating, drinking, smoking, and entering vehicles or offices.

10.12 Naturally Occurring Asbestos and Asbestos Abatement

10.12.1 Background

You may encounter asbestos at a construction site in the following areas or during the following operations:

- Excavations where asbestos-bearing rock outcroppings are at or near the surface.
- Demolition, salvage, alteration, repair, or maintenance of structures where asbestos is present, primarily in sheet rock and mastics.
- Transportation, disposal, storage, and containment involving naturally occurring asbestos or materials containing asbestos, such as bridge shims.
- Pipe and boiler insulation.
- Insulators of electrical conductors, plaster, cement, drywall, and taping compounds.

10.12.2 Employee Procedures

Naturally Occurring Asbestos (NOA) or Demolition of Portland Cement Concrete

The contract will identify areas with NOA present. Demolition of portland cement concrete can cause asbestos fibers embedded in the concrete to become airborne. Employees should minimize their exposure to these areas until there is either no visible dust or when the contractor has completed work to a degree to allow inspection with minimal potential exposure.

10.12.3 Other Asbestos Exposure

For structures-related work, either on bridges or in structures where the contract has identified asbestos containing materials, employees must not approach the work area or enter the containment area until the contractor informs the employee that the work is completed and the area is cleaned and ready for inspection.

10.12.4 Biological Contaminants

Chapter 22, “Disease Protection,” of the Safety Manual discusses Caltrans’ policy on how to reduce risks of contracting a disease through exposure to bodily fluids and environmental conditions. If there is a potential exposure to Valley Fever, supervisors should inform employees about the risk and provide NIOSH-approved respirator protection with particulate filters rated as N99 and follow the protection program described in 8 CCR 5144, “Respiratory Protection.”

10.13 Methacrylate, Polyester Concrete, High Friction Surface Treatments, and Multi-Layer Systems Operations

10.13.1 Background

Working around methacrylate sealers, polyester concrete, high friction surface treatments, and multi-layer systems requires special precautions.

These operations typically involve the use of styrene-based products, cobalt products, and methyl ethyl ketone peroxide (MEKP is an organic peroxide).

Respirator use is recommended when using methacrylate products and is required for use with polyester concrete in accordance with Section 15.12, “Recommended Respirators,” of the *Safety Manual*.

High friction surface treatments and multi-layer system overlays can use the same styrene-containing binder resins as polyester concrete and the potential exposure for our personnel is similar. Polyester concrete respirator requirements should be followed.

Training in accordance with Chapter 15, “Respiratory Protection Program,” of the *Safety Manual* in proper respirator use, a medical evaluation, and respirator fit testing is required prior to respirator use. Personnel must not use a respirator until the above requirements are fulfilled and must stay at least 50 feet away and upwind from these operations.

10.13.2 Handling procedures

Employees must not handle these materials and must stay well away from the contractor’s mixing operations.

Incorrect mixing of the products for methacrylate will result in a flash fire.

Before starting work involving any of the products discussed in Section 10.13.1, “Background,” of this COSP, read and follow these rules to work near and inspect these products:

- Review project specifications and note allowable application temperatures.
- Review the safety data sheets for the products involved.
- Minimize personal contact and exposure with these products and associated vapors. Wear a respirator as required and stay upwind if possible.
- Use PPE to minimize contact with or exposure to these products and to minimize contamination of clothing, skin, or eyes.
- Prevent ingestion of these products by using good personal hygiene. Do not eat, drink, or smoke near these products.

APPENDICES

Appendix 1—Respirators in Caltrans Construction

Employees must comply with Section 15.12, “Recommended Respirators,” of the *Safety Manual* for the following operations:

Asbestos—Asbestos removal or disturbance requires special training and equipment. A specific work plan or COSP is required, and the plan will indicate what type of respirator is required. Dust masks may not be used for asbestos protection.

Asphalt paving—Respirator use is not required, but a cartridge respirator with organic vapor (black) or organic vapor-P100 combination cartridges will provide adequate protection from the offensive odors and fumes. Dust masks may not be used.

Galvanized metals—Welding or cutting on galvanized metals can release toxic fumes. Follow the appropriate COSP. Use a cartridge respirator with N or P100 filters if welding or cutting for more than 30 minutes continuously. For less than 30 minutes, no respirator is required, but an N95 dust mask may be used.

High friction surface treatments (HFST)—Employees working with or around (within 50 feet) HFST construction projects need to wear cartridge respirators with organic vapor (black) or organic vapor-P100 combination cartridges. Dust masks may not be used.

Lead—Respirator selection for operations that disturb lead-containing paints or materials will follow the lead compliance plan for that particular operation. Any operation that disturbs lead-containing materials requires special lead training and protective equipment. Dust masks may not be used for protection from lead.

Methacrylate road or bridge sealers—Respirator use is not required, but a cartridge respirator with organic vapor (black) or organic vapor-P100 combination cartridges may be used. These materials sometimes have an offensive odor. Dust masks may not be used.

Multi-layer system (MLS or MLS+)—Employees working with or around (within 50 feet) MLS or MLS+ construction projects need to wear cartridge respirators with organic vapor (black) or organic vapor-P100 combination cartridges. Dust masks may not be used.

Pesticides—Cartridge respirator with P100-organic vapor cartridges is required. Dust masks cannot be used for pesticides. Follow the pest control advisor’s use recommendations—a respirator is required for mixing or loading loose (not packaged) powders.

Polyester concrete—Employees working with or around (within 50 feet) polyester concrete construction projects need to wear cartridge respirators with organic vapor (black) or organic vapor-P100 combination cartridges. Dust masks may not be used.

CODE OF SAFE PRACTICES

Spray painting—Respirator use is required for solvent-based paints but not for latex-based paints. Use a cartridge respirator with P100-organic vapor cartridges. Dust masks are not appropriate for spray painting.

Treated wood—Respirator use is not required during sawing and drilling on treated wood, but a cartridge respirator with N or P100 cartridges may be worn. An N95 dust mask may also be worn.

CODE OF SAFE PRACTICES

Appendix 2—Sample Confined Space Entry Checklist (HS-0040) (page 1 of 2)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
CONFINED SPACE ENTRY CHECKLIST
HS-0040 (REV. 5/2013)

FORM FOR ONE SHIFT ONLY. NEW FORM MUST
BE COMPLETED FOR EACH SUBSEQUENT SHIFT.

Page 1 of 2

This form must be readily available at the confined space while the work is in progress. After work is completed, give to your supervisor for retention.

DESCRIBE WORK TO BE DONE

DATE	TIME	FROM	TO
LOCATION OF CONFINED SPACE		<input type="checkbox"/> Pumping Plant <input type="checkbox"/> Culvert <input type="checkbox"/> Bridge Cell <input type="checkbox"/> Other	

LOCATION OF WORK WITHIN CONFINED SPACE (DRAW SKETCH BELOW, ESTIMATE AND SHOW DISTANCE AND DIRECTION FROM WORK ACCESS)

NOTE: If more space is needed use back of form.

CHECKLIST BELOW MUST BE COMPLETED BEFORE ENTRY

NOTE: THE RESPONSIBLE PERSON IN CHARGE INITIALS ITEMS 1-4 AND 6-8. ENTER SPACE ONLY AFTER THE PROCEDURES LISTED BELOW HAVE BEEN COMPLETED.

INITIAL

1. Review Code of Safe Practices for entry and work in confined spaces.
2. Review emergency/rescue procedures and list contact information.
3. Notify nearest Traffic Management Center or Responsible Person and list contact information.
4. Complete at least 2 tests of atmospheric conditions in the confined space using a four gas meter. Additional testing may be necessary depending on the depth and configuration of the space.
5. Testing of atmosphere conditions -- pre-entry

SIGNATURE OF TESTER	TIME	LOCATION OF SAMPLED AIR	METER READING				
			OXYGEN (%)	COMBUSTIBLES (%Lower Explosive Limit - LEL)	CARBON MONOXIDE	HYDROGEN SULFIDE	OTHER
PRINT NAME							
SIGNATURE							

NOTE: If more lines are needed use back of form.

6. Suitable lighting provided in work area.
7. Effective means of providing continuous communication between the attendant and entrants.
8. Assure that atmosphere will be tested during work within confined space. NOTE: If atmosphere becomes hazardous, all workers shall STOP WORK and LEAVE CONFINED SPACE IMMEDIATELY - DO NOT RE-ENTER; contact Responsible Person in Charge.

AUTHORIZED PERSONS

	PRINT NAME	INITIAL	PRINT NAME	INITIAL
RESPONSIBLE PERSON IN CHARGE				
ATTENDANT				
ALTERNATE ATTENDANT				
ENTRANTS				

I have determined that the above procedures have been completed and it is safe to enter and work in this confined space.

RESPONSIBLE PERSON IN CHARGE SIGNATURE

DATE

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For information, call (916) 654-6410, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

CODE OF SAFE PRACTICES

Appendix 2—Sample Confined Space Entry Checklist (HS-0040) (page 2 of 2)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

CONFINED SPACE ENTRY CHECKLIST

HS-0040 (REV. 5/2013)

Page 2 of 2

LOCATION OF WORK WITHIN CONFINED SPACE (DRAW SKETCH BELOW. ESTIMATE AND SHOW DISTANCE AND DIRECTION FROM WORK ACCESS) (CONTINUED)

10. The following table summarizes the results of the study. The first column lists the variables, the second column lists the sample size, and the third column lists the estimated effect sizes.

Note: any new hazards or changes that need to be added to the confined space Index Form sent to Safety Officer for change to the Index

Form sent to Safety Officer for change to the Index

TESTING OF ATMOSPHERE CONDITIONS – PRE ENTRY (CONTINUER)

FOR ONGOING TESTING DURING OCCUPATION OF ENCLOSED SPACE

TESTING OF ATMOSPHERE CONDITIONS – POST ENTRY

ACCEPTABLE ENTRY CONDITIONS (atmospheric)

ACCEPTABLE ENTRY CONDITIONS (atmospheric oxygen level) 19.5% - 23.5%

Oxygen level 19.5% - 23%
Combustible Gas / Vapor < 10% LEL

Combustible Gas / Vapor < 10% LFL
Carbon Monoxide < 25 ppm

Carbon Monoxide ≤ 25 ppm
Hydrogen Sulfide ≤ 10 ppm

CODE OF SAFE PRACTICES

Appendix 3—Project Team Acknowledgement and Signature Sheet

The following employees have read, understood, and will abide by the Division of Construction *Code of Safe Practices* for the project:

DISTRICT - EA: _____

Construction Engineer/Senior Resident Engineer

Print Name _____

Signature _____

Project Resident Engineer

Print Name _____

Signature _____

PRINT FULL NAME, SIGN, AND DATE

Inspectors _____

