HEALTH AND SAFETY PLAN
FOR

REMEDIAL ACTION PLAN IMPLEMENTATION
CHATSWORTH PARK SOUTH
22360 WEST DEVONSHIRE STREET
CHATSWORTH, CALIFORNIA

Job No.: 29405505.90000
Prepared by: Cynthia Shen
Date: December 2012

HEALTH AND SAFETY PLAN
REMEDIAL ACTION PLAN IMPLEMENTATION
CHATSWORTH PARK SOUTH
22360 WEST DEVONSHIRE STREET
CHATSWORTH, CALIFORNIA

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Preparation Date:	December 4, 2012	
HSP Expires:	December 4, 2013	

APPROVALS

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12/6/12

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12-6-12

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Project Manager:

Tom Dolan (DATE)

This Health and Safety Plan is valid only for this specific project as described in Section 3.0. It is not to be used for other projects or subsequent phases of this project without the written approval of the Regional Health, Safety, and Environment Manager. **A copy of this plan is to be maintained at the site at all times.**

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GLOSSARY OF TERMS, ACRONYMS, AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
analyzer	refers to the field instrument described in Section 6.1
atm	atmosphere
°C	centigrade
Carcinogen	a substance that can cause cancer
cc	cubic centimeter
CGI	Combustible Gas Indicator
CIH	Certified Industrial Hygienist
CNS	Central Nervous System
CSP	Certified Safety Professional
eV	Electron Volts
°F	Fahrenheit
GE&C	General Engineering and Consulting Division
HSR	Health and Safety Representative
HSMS	Health and Safety Program and Management System
HSP	Health and Safety Plan
kg	kilogram
LEL	Lower Explosive Limit
Lpm	liters per minute
MSDS	Material Safety Data Sheet
m	meter
mg	milligram
mg/M^3	milligrams per cubic meter
ml	milliliter
mm	millimeter
ND	not detected
NIOSH	National Institute for Occupational Safety and Health
OBZ	operator's breathing zone
OEL	occupational exposure limit
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	project manager
ppb	parts per billion
ppm	parts per million
REL	Recommended Exposure Limit
RHSEM	Regional Health, Safety, and Environment Manager
SMS	Safety Management Standard
SSO	Site Safety Officer
SSR	Subcontractor's Safety Representative
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
UEL	Upper Explosive Limit
VOC	Volatile Organic Compound

REMEDIAL ACTION PLAN IMPLEMENTATION
CHATSWORTH PARK SOUTH
22360 WEST DEVONSHIRE STREET
CHATSWORTH, CALIFORNIA

1.0 PLAN-AT-A-GLANCE

HSP SUMMARY SHEET

THIS SUMMARY SHEET IS PROVIDED AS A QUICK-REFERENCE/OVERVIEW ONLY. THE REMAINDER OF THIS SITE-SPECIFIC HSP IS INTEGRAL TO THE SAFE CONDUCT OF SITE OPERATIONS AND MUST BE APPLIED IN ITS ENTIRETY.

EMERGENCY INFORMATION

Ambulance -	911
Fire -	911
Police -	911
Health Clinic -	(818) 882-8100 US Health Works Medical Group
Hospital -	(818) 885-8500 Northridge Hospital Medical Center

URS Project Manager:	Tom Dolan	(213) 996-2200 ext 2263
URS HSP Preparer:	Cynthia Shen	(714) 835-6886 ext 2810
URS RHSEM:	Susan Gulbrandsen, CIH	(805) 895-9286 cell
National Response Center		(800) 424-8802

Note that persons without serious or life-threatening injuries should be escorted to an occupational health clinic or urgent care facility instead of a hospital. See Section 12.5

HEALTH CLINIC DIRECTIONS:
To reach the health clinic from the Site, proceed east on West Deconshire Street (1.5 miles). Turn right on De Soto Avenue (go 0.7 mile). The health clinic is located at 9700 De Soto Ave, Chatsworth, CA.

HOSPITAL DIRECTIONS (for emergency only):

To reach the hospital from the Site, go east on West Devonshire Street (1.5 miles). Turn right on De Soto Avenue (go 2.6 miles). Turn left on Roscoe Boulevard (3.1 miles). Arrive at Northridge Hospital Medical Center located at 18300 Roscoe Boulevard, Northridge, CA.

Additional information concerning emergency procedures is located in Section 11.0 and the clinic and hospital route maps a located in Attachment A. A copy of the hospital route map must be readily available in each site vehicle that may be used to transport accident victims to the hospital.

CONSTITUENTS OF POTENTIAL CONCERN

1. Lead and polycyclic aromatic hydrocarbons (PAHs) in soil

Additional information regarding site history, constituents of concern, and scope of work activities is located in sections 2.0 and 5.0.

PROJECT HAZARD ANALYSIS

Task	Chem. Hzds.	Heat Stress	Noise	Slip/Trip/ Fall	Lifting Hzds.	Mech'l. Hzds.	Electro-cution	Explosion	Excav-ation
1. Tree removal	High	Low-Med	Med-High	Med	Med	Med-High	Low	N/A	N/A
2. Rough grade the upper 18-inches of native terrain	High	Low-Med	Med-High	Med	Med	Med-High	Low	N/A	Med
3. Cap installation	Low	Low-Med	Med	Med	Low-Med	Med	Low	N/A	N/A
4. Area E grubbing and vacuuming	High	Low-Med	Med - High	High	Med	Med	Low	N/A	N/A
5. Drainage feature construction	High	Low-Med	Med	High	Med	Med	Low	N/A	N/A

High - Exposure likely more than 50% of the time
Med - Exposure likely 10-50% of the time
Low - Exposure likely less than 10% of the time
n/a – Exposure not anticipated

Additional information concerning Project Hazards and their control can be found in Section 5.0.

TASK	MINIMUM PROTECTIVE CLOTHING/EQUIPMENT REQUIREMENTS
1-5	Steel-toed boots, hard hat, safety glasses, hearing protection, traffic vest, work gloves, nitrile gloves when handling potentially contaminated materials.

PROTECTIVE CLOTHING (First Action Level)

Chemical Protective Clothing
Outer Coveralls: Kleenguard® or Tyvek®‡
Outer Gloves: Nitrile
Inner Gloves: Surgical Nitriles
Chemical protective steel-toed boots or chemical-resistant boot covers over steel-toed boots

‡ Substitute poly-Coated Tyvek® if there is a potential for contact with liquids.

The HSP Preparer has conducted a Hazard Assessment for this project based upon information provided by the Project Manager, in accordance with 8 CCR 3380(f).

For more information on PPE and respiratory protection requirements, see the Action Levels table (Page 4) and Section 7.0.

ENGINEERING CONTROLS TO BE USED (as applicable)

- Natural wind forces to reduce exposure to airborne contaminants
- Forced air ventilation (fans) to reduce potential airborne exposures
- Light colored PPE to reduce solar load for heat stress control
- Dining canopy to provide shaded work/rest area for heat stress control

For more information, see Section 5.0

INSTRUMENTATION TO BE USED

__ HNu PID w/ __ eV probe
__ OVM PID w/ __ eV lamp
__ Photovac Microtip PID w/ __ eV lamp or equivalent instrument
__ MiniRAE PID w/ 10.6 eV lamp or equivalent instrument
__ Combustible Gas/O_2 Indicator
X Miniram Real-time Dust Monitor
__ Other _____

For more information, see Section 6.0

PERSONAL EXPOSURE SAMPLING

__ Will be conducted
_X_ Will be conducted if PID readings require the use of respiratory protection as described in the Action Level Table (page 4) and in Section 6.1.1
__ Is not anticipated

For more information on Monitoring, see Section 6.0

HAZ-COM MATERIALS INVENTORY

- Gasoline (equipment fuel)

Copies of the Material Safety Data Sheets for these chemicals are included in Attachment D.

ACTION LEVELS (for the Dust Monitor)

Reading	Location	Action
<2.0 mg/M^3	Point of Operations/General Work Area	Continue site operations and continue periodic monitoring
2.0 – 5.0 mg/M^3	Worker's Breathing Zone > 5 minutes	Continue site operations and perform continuous monitoring; implement dust control measures wear respiratory protection to continue work
>5.0 mg/M^3	Point of Operations/General Work Area	Shutdown operations, evaluate source, increase dust control measures

For additional information on Action Levels and their implementation, see Sections 6.0 and 7.0

HEALTH AND SAFETY EQUIPMENT LIST

REQ	OPT	
X		URS Safety Management Standards (relevant to project - see next page)
	X	Cal/OSHA “Safety on the Job” Posters
X		Hardhats
X		Safety glasses
X		Safety goggles
X		Ear plugs or muffs
	X	Cotton coveralls
X		Traffic safety vest
X		Tyvek® coveralls
X		Steel-toed boots
X		Work gloves
X		Nitrile outer gloves
X		Surgical nitrile inner gloves
X		Plastic sheeting (visqueen)
	X	55 gallon 17-H drums (for contaminated solids)
	X	55 gallon 17-E drums (for liquids)
	X	Drum liners
X		Barricade tape and barricades
X		Wash tubs, scrub brushes, and decon solution (e.g. Liquinox)
X		Decon solution (i.e., TSP)
	X	Folding chairs
	X	5 or 10 gallon portable eyewash (ANSI-approved)
	X	Respirator sanitizing equipment
X		First Aid kit
X		Infection control kit
X		Drinking water and Gatorade or equivalent
X		Type ABC fire extinguishers
	X	Half-face respirators (NIOSH approved)
	X	Full-face respirators (NIOSH approved)
	X	Respirator cartridges (P100 or combination organic vapor/P100)
	X	Photoionization Detector (PID) w/minimum 10.6 eV lamp and calibration kit
X		Real-time dust monitor
	X	Combustible Gas Indicator and calibration kit
	X	Water trailer or water truck
	X	Compressed gas horn
X		Duct tape
X		Paper towels and hand soap
	X	Spill sorbent
X		Plastic garbage bags
	X	Broom and/or shovel

SAFETY MANAGEMENT STANDARDS REFERENCED BY THIS HSP

SMS	TOPIC	HSP SECTION
5	California Injury and Illness Prevention Program	3.0
46	Subcontractor Health and Safety Requirements	4.1
2	Worker Right-to-Know (Hazard Communication)	5.1.2
18	Heat Stress	5.2.1
26	Noise and Hearing Conservation	5.2.2
69	Manual Materials Handling	5.2.4
19, 56	Heavy Equipment Operations	5.2.5
34	Utility Clearances and Isolation	5.2.6
32	Work Zone Traffic Control	5.2.7
12, 16	Electrical Safety, Hand Tools, and Portable Equipment	5.2.8
64	Hand Safety/Open Blade Prohibition	5.2.9
29	Personal Protective Equipment	7.0
42	Respiratory Protection	8.3/8.9
30	Sanitation	10.1
14	Fire Prevention	12.2
65	Injury Management	12.5
49	Injury / Illness / Incident Reporting & Notifications	12.6/14.0
43	Personal Monitoring (Industrial Hygiene)	6.1.1
72	Behavior Based Safety Observations	13.3
78	Short Service Employees	4.1, 13.1
91	Concrete Operations	
98	Management of Change	3.0

These Safety Management Standards (SMSs) are available on the URS Health and Safety website. Access the website from the SoURSe or through the internet (www.oklink.com/safety).

Copies of the SMSs referenced by this HSP are provided in Attachment E and are to be maintained onsite. Project Managers are responsible to see that other SMSs relevant to field activities but not directly referenced by this HSP are also available onsite.

2.0 FACILITY BACKGROUND/WORK PLAN

The Chatsworth Park South (CPS or the Site) is located at 22360 West Devonshire Street in Chatsworth, California. The CPS recreational facility encompasses approximately 72 acres of hillside terrain in the western portion of the San Fernando Valley. Approximately 21 acres of the Site are developed with recreational facilities including a 10,000-square foot recreational building, tennis courts, a basketball court, picnic areas, children play areas, parking areas, and open space. The facility was closed to public access and use during the spring of 2008. The facility was closed because of hazards associated with lead pellets and sporting clay target debris from a former onsite small arms firing range (SAFR). The facility remains closed pending completion of a remedial action.

In 2010, a Supplemental Site Investigation (SSI) and Preliminary Endangerment Assessment (PEA) were conducted by California Environmental (CE) with oversight by the DTSC. The SSI and PEA were conducted in accordance with a DTSC-approved work plan dated January 2010. Field activities for the SSI and PEA included completion of 42 exploratory borings for soil sampling. A draft SSI/PEA Report was prepared by CE on behalf of the City of LA dated December 15, 2010. The draft SSI/PEA Report also included a Human Health Risk Assessment (HHRA) prepared by Tetra Tech, Inc. and an Ecological Risk Assessment (ERA) prepared by URS Corporation. DTSC approved the SSI/PEA report in a letter dated January 10, 2011.

Based on results of the SSI/PEA, further investigation was recommended to verify the limits of affected area. The additional investigation included a field boundary survey and additional soil borings completed south of the former SAFR.

As discussed above, a portion of the Site was a former SAFR. This use occurred from the early to mid-1950s until sometime in the mid-1960s. The operation of the SAFR resulted in wide surficial spread of lead shot and clay target debris containing elevated polycyclic aromatic hydrocarbons (PAHs). The City of LA acquired the property in 1973 and developed the relatively level portions of the park area with recreational improvements. The development and grading activities occurred during the 1970s and 1980s. The grading activities at the Site were associated with the leveling of the former skeet range area, planting of trees, removal and compaction for development of the existing recreation building, and preparation for a parking area, play areas, a basketball court, and tennis courts. Grading also occurred during placement of the water/oil transmission pipelines. Previous sampling at other SAFRs (Interstate Technology and Regulatory Council [ITRC]) indicates that lead shot and target fragment accumulation under static recreational conditions would typically be limited to the upper several inches of soil. However, grading activities at the Site have distributed the firing range waste products deeper in soil and over portions of the Site which were not a recognized part of the former SAFR.

The SSI and PEA activities identified visible accumulations of lead shot pellets on the hillside area on the north end of the former firing range. Abundant fragments of clay pigeon debris are commonly observed at the surface and in burrowing animal casts scattered throughout the former range area. Offsite accumulations (debris piles) of clay pigeon target fragments were also observed about 100 feet south of the southern property line adjacent to an unimproved roadway. Elevated lead and PAHs were documented throughout areas with visual accumulation of lead shot pellets and clay pigeon debris. Vertical delineation was not conducted. Lead was detected

at a maximum concentration of 9,575 milligrams per kilogram (mg/kg). PAHs were detected at a maximum concentration of 5,730 mg/kg expressed as benzo(a)pyrene equivalent.

The proposed actions at the Site focus on addressing lead and PAH-impacted soil through engineering and institutional controls to reduce the threat to human health and the environment and to provide a permanent solution that reduces the toxicity, and mobility. The DTSC has preliminarily determined that the proposed actions are the preferred removal action remedy in terms of the three technology evaluation criteria: effectiveness, implementability, and cost. The preferred remedy for the Site is containment through surface capping and will include the following remedial actions:

- Grub and remove trees (with the exception of protected and heritage trees as designated by the City of Los Angeles) from the proposed remedial Areas with the exception of Area A (an oak grove) and Area E (a rocky outcrop).
- Rough grade the upper 18-inches of native terrain in all areas (except Areas A and E) to remove existing burrowing animal tunnels and to allow the soil to be compacted.
- Proposed remedial Areas (except Areas A and E) will be capped (1-foot thick) to cover the impacted soil remaining in place.
- Fencing installed around the entirety of Area A (an oak grove) and individual trees retained due to their protected or heritage status.
- Grubbing and vacuuming activities within Area E to remove lead pellets and surficial soil.
- The portion of the Site outside Areas A to N is not proposed for remediation because of steep terrain. These areas will be fenced off to restrict public access. Drainage features will also be implemented along the perimeter of Areas A through N.
- Construction of native tree groves to mitigate tree removal required for remedial implementation.

The 1-foot surface cap will consist of 4 inches of top soil to support turf growth, 8 inches of base to allow drainage, and a layer of hardware cloth to prevent burrowing animals from disturbing the cap. A sprinkler system will be installed on top of the 2-feet layer of imported soil to irrigate the cap's turf layer. As required, provisions will be made to integrate the cap with existing and future Site development

The native tree groves will be constructed by excavating shallow lead- and PAH-impacted soil to a maximum depth of approximately 4 feet bgs within the perimeter of each grove using traditional excavation methods. The impacted soil will be transported to an approved offsite facility for disposal. The tree grove excavation areas will be backfilled with clean import soil (4-feet thick); The groves will be protected from burrowing animals by installing vertical sections of hardware cloth around the perimeter of each grove that ties into the surface cap's underlying horizontal hardware cloth. The surface cap sprinkler system will be extended into the tree groves to supply irrigation water.

3.0 APPLICABILITY

The purpose of this plan, which was developed specifically for operations at the CPS Site in Chatsworth, California, is to assign responsibilities, establish personal protection standards and mandatory safety procedures, and provide for contingencies that may arise while operations are being conducted at the site. This plan complies with, but does not replace, Federal Health and Safety Regulations as set forth in 29 CFR 1910 and 1926 California Health and Safety Regulations as set forth in Title 8, California Code of Regulations, and guidance established by the California Environmental Protection Agency. This plan is to be used by personnel as a supplement to such rules, regulations, and guidance. This health and safety plan is to be augmented by the URS Health and Safety Program and Management System, relevant standards from which are required to be available onsite during all activities.

The provisions of the plan are mandatory for all onsite employees engaged in hazardous material management activities associated with this project which may involve health and safety hazards.

Changing and/or unanticipated site conditions may require modification of this site safety plan in order to maintain a safe and healthful work environment. Any proposed changes to this plan should be reviewed with the URS Regional Health, Safety, and Environment Manager prior to their implementation. If this is not feasible, the site/project manager may modify the plan and record all changes in the field log book; under no circumstances will modifications to this plan conflict with Federal, state, or other governmental health and safety regulations. See also SMS 98, Management of Change.

URS is providing a copy of this Health and Safety Plan to each site subcontractor in order to fulfill its obligation under 8 CCR 5192(b) to inform subcontractors of site hazards.

This Health and Safety Plan is part of URS' Injury and Illness Prevention Program (IIPP), as required by 8 CCR 3203. A copy of URS' written Injury and Illness Prevention Program is located in SMS 5, which is to be available onsite. Each subcontractor retained by URS is to have their own IIPP, as applicable to their operations.

4.0 RESPONSIBILITIES

URS will have site safety and health oversight and coordination responsibilities for personnel; however, each subcontractor is expected to require safe and healthful work performance by each of their employees, subcontractors, or support personnel who may enter the site.

URS will strictly adhere to the provisions of this health and safety plan, along with the applicable regulations issued by governmental entities.

4.1 PROJECT MANAGER (URS)

The Project Manager (PM) shall direct onsite operations. **The PM is also responsible for holding a pre-deployment operational readiness meeting to discuss the scope of work, staffing, equipment, budget, etc.** The PM may delegate all or part of the duties below to a properly qualified URS employee who is designated as the Site Manager. At the site, the PM, assisted by the Site Safety Officer (SSO), has primary responsibility for:

1. Seeing that appropriate personal protective equipment and monitoring equipment is available and properly utilized by all onsite employees.
2. Establishing that personnel are aware of the provisions of this plan, are instructed in the work practices necessary to ensure safety, and are familiar with planned procedures for dealing with emergencies.
3. Establishing that onsite personnel have completed a minimum of 40 hours of health and safety training and have appropriate medical clearance as required by 8 CCR 5192, and have been fit tested for the appropriate respirators. Also ensuring that Short Service Employees (per SMS 78) are mentored for field activities.
4. Verifying that subcontractors (of any tier) retained by URS meet minimum health and safety criteria as described by SMS 46.
5. Seeing that personnel are aware of the potential hazards associated with site operations.
6. Monitoring the safety performance of personnel to see that the required work practices are employed.
7. Correcting work practices or conditions that may result in injury or exposure to hazardous substances.
8. Preparing accident/incident reports for activities (see Section 12.6).
9. Seeing to the completion of Safety Plan Compliance Agreements by personnel (See Attachment B).
10. Halting site operations, if necessary, in the event of an emergency or to correct unsafe work practices.
11. Seeing that utility clearances are obtained prior to the commencement of work (see Section 5.2.8).

12. Seeing that the appropriate SMSs are appended to this HSP and are available on site (see "Plan at a Glance").

13. Reviewing and approving this project HSP.

4.2 SITE SAFETY OFFICER (URS)

The Site Safety Officer's (SSO) duties may be carried out by the PM or other qualified URS site manager. The SSO is responsible for:

1. Implementing project HSPs, and reporting any deviations from the anticipated conditions described in the plan to the PM, and, if necessary, the RHSEM.

2. Determining that monitoring equipment is used properly by personnel and is calibrated in accordance with manufacturer's instructions or other standards, and that results are properly recorded and filed.

3. Checking with the HSR or RHSEM to see that assigned URS personnel have current Fit-For-Duty medical and training authorizations.

4. Assuming other duties as directed by the PM or RHSEM.

5. Coordinating with URS' Medical Surveillance Program Administrator to identify URS personnel onsite for whom special personal protective equipment (PPE), exposure monitoring, or work restrictions may be required.

6. Conducting safety meetings for site personnel in accordance with Section 13, and completing the Site Safety Briefing Form (see Attachment C).

7. Conducting daily site inspections/job safety analyses (JSAs) prior to the start of each shift and documenting on the "Daily Safety Task Analysis Checklist" found in Attachment F.

8. Providing ongoing review of the protection level needs as project work is performed, and informing the PM of the need to upgrade/downgrade protection levels as appropriate.

9. Contacting the RHSEM to perform personal industrial hygiene monitoring for aromatic hydrocarbons if the second action level is reached (>5 part per million [ppm] in the operators breathing zone [OBZ]) as described in the Action Level Table (page 6) and Section 6.1.

10. Seeing that decontamination procedures described in Section 10.0 are followed by personnel.

11. Establishing monitoring of personnel and recording results of exposure evaluations.

12. Halting site operations, if necessary, in the event of an emergency or to correct unsafe work practices.

13. **Maintaining the visitor log.**

4.3 REGIONAL HEALTH, SAFETY, AND ENVIRONMENT MANAGER (URS)

The Regional Health, Safety, and Environment Manager (RHSEM) is responsible for:

1. Determining the need for periodic audits of the operation to evaluate compliance with this plan.
2. Providing health and safety support as requested by the SSO and PM.

4.4 PROJECT PERSONNEL (URS)

Project personnel involved in onsite investigations and operations are responsible for:

1. Taking reasonable precautions to prevent injury to themselves and to their fellow employees.
2. Performing only those tasks that they believe they can do safely, and immediately reporting any accidents and/or unsafe conditions to the SSO or PM.
3. Implementing the procedures set forth in the HSP, and reporting deviations from the procedures described in the Plan to the SSO or PM for action.
4. Notifying the PM and SSO of any special medical problems (i.e., allergies) and seeing that onsite personnel are aware of such problems.
5. Reviewing project HSP and signing Safety Plan Compliance Agreement.

4.5 SUBCONTRACTOR'S SAFETY REPRESENTATIVE

Each subcontractor is requested to designate a Subcontractor's Safety Representative (SSR) who is the subcontractor supervisor. The SSR is responsible for the safe and healthful performance of work by his work force and subcontractors. During the subcontractor's activities onsite, the SSR will perform continuing work area inspections, participate in the development of job safety analyses, and conduct safety meetings and safety orientations for all new employees. The SSR will attend periodic safety meetings with the SSO. The SSR will also investigate accidents and overexposures involving subcontractor personnel.

5.0 JOB HAZARD ANALYSIS

5.1 CHEMICAL HAZARDS

There are two categories of chemical hazards associated with site activities:

- Site Constituents
- Chemicals used to conduct the site work

Site constituents are those which exist at the site and are the cause for conducting site activities. The chemicals that are brought on site in order to conduct the work may be hazardous and subject to regulation under Cal/OSHA's Hazard Communication Standard (8 CCR 5194).

5.1.1 Site Constituents

From an occupational health standpoint, given that any potential exposure to site personnel will be only for a short period of time (intermittent for several days), the levels of contaminants that could be encountered during site activities should not represent a significant concern if the provisions of this HSP are appropriately implemented. However, the site is still under investigation**,** so the potential for exposure to elevated levels of these contaminants may exist. Overviews of the hazards associated with exposure to elevated levels of these contaminants may exist. Overviews of the hazards associated with exposure to the chemicals that may pose a hazard during site activities are presented below in terms of the following types of occupational exposure limits:

PEL - Permissible Exposure Limit (Cal/OSHA Standard)
TLV - Threshold Limit Value (ACGIH Guidance)
REL - Recommended Exposure Limit (NIOSH Guidance)
STEL- Short Term Exposure Limit
C - Ceiling

Cal/OSHA Permissible Exposure Limits (PELs), ACGIH Threshold Limit Values (TLVs), and NIOSH Recommended Exposure Limits (RELs) are time-weighted averages (TWAs) defined as concentrations for a normal 8-hour work day and 40-hour work week to which almost all workers can be repeatedly exposed without suffering adverse health effects

Short Term Exposure Limit (STEL) is defined as the concentration to which workers can be exposed for short time periods without irritation, tissue damage, or narcosis sufficient to likely cause impairment of self-rescue or precipitate accidental injury. The STEL is a 15-minute time-weighted average that should not be exceeded at any time during the workday. STELs are used by OSHA, ACGIH and NIOSH for chemical exposure criteria.

A ceiling value (C) is a concentration that should not be exceeded at any time in any workday. Ceiling limits are used by OSHA, ACGIH and NIOSH for chemical exposure criteria.

Summaries on the potential site constituents of concern follow.

The following compounds are representative of common materials associated with businesses that were either historically and presently located onsite.

Lead

PAHs

5.1.2 Hazard Communication Materials

Materials which are considered hazardous materials under the Cal/OSHA Hazard Communication Standard (8 CCR 5194) may be used during this project. In accordance with the URS Hazard Communication Program, the MSDSs for the hazardous materials listed in Section 1.0 are included in Attachment D. The SSO will make copies of these MSDSs available to any subcontractors (i.e. drillers, excavators) on this project.

URS's written Hazard Communication program is located in SMS 2, a copy of which shall be maintained onsite.

5.2 PHYSICAL HAZARDS

Physical hazards at this work site include:

- Heat stress;
- Noise from the operation of site equipment;
- Slip-trip-fall type of accidents;
- Back injuries due to improper lifting;
- Being caught in or struck by moving equipment or traffic;
- Electrocution or explosion hazards associated with drilling activities such as contact with overhead or underground power lines or pipelines;
- Burn hazards from steam cleaning equipment;
- Hazards from stored energy in equipment;
- Lock-out/tag-out hazards, especially from electrical or pressurized systems.

Hazards from cold stress, confined space entry, trenching/excavation work, poor illumination (night work), and ionizing radiation are not anticipated to be encountered and so are not addressed in this Plan

5.2.1 Heat Stress Recognition and Control

Personnel will be briefed on the signs and symptoms of heat stress, personal risk factors, and appropriate control measures. Control measures include having shaded rest areas readily accessible and at least one quart of water per employee per hour in accordance

with 8 CCR 3395. Heat stress monitoring per SMS 18 shall commence when personnel are wearing PPE, including Tyvek®-type coveralls, and the ambient temperature exceeds 70°F. If standard work garments (cotton coveralls) are worn, monitoring shall commence at 85°F. Additional information regarding URS' approach to Heat Stress is located in SMS 18, a copy of which shall be maintained onsite.

5.2.2 Noise Hazards

Previous surveys indicate that heavy equipment may produce continuous and impact noise at or above the action level of 85 dBA. Such equipment on this project includes the drill rig and the air hammer. All personnel within 25 feet of operating equipment, or near an operation that creates noise levels high enough to impair conversation, shall wear hearing protective devices (either muffs or plugs). All URS personnel are in the URS Hearing Conservation Program and have had baseline and, where appropriate, annual audiograms. Personnel will wash their hands with soap and water prior to inserting earplugs to avoid initiating ear infections. Additional information regarding URS' Hearing Conservation Program is located in SMS 26, a copy of which shall be maintained onsite.

5.2.3 Slip/Trip/Fall Hazards

Workers should exercise caution when walking around the site to avoid fall and trip hazards. If holes or uneven terrain are located in the work area which could cause site personnel to fall or trip, they must be covered, flagged or marked to warn workers. If conditions become slippery, workers should take small steps with their feet pointed slightly outward to decrease the probability of slipping. Gravel or sand should be spread in muddy areas to reduce slipperiness. Workers should watch where they are walking and plan the route to walk in areas of good stability.

5.2.4 Lifting Hazards

The following guidelines will be followed whenever lifting equipment such as portable generators, coolers filled with samples, any other objects that are of odd size or shape, or that weigh over 50 pounds. URS' safe lifting procedures are described in SMS 69, a copy of which is to be available onsite.

- Get help when lifting heavy loads. Portable generators will only be lifted using a two-person lift.
- When moving heavy objects such as drums or containers, use a dolly or other means of assistance.
- Plan the lift. If lifting a heavy object, plan the route and where to place the object. In addition, plan communication signals to be used (i.e., "1, 2, 3, lift," etc.)
- Wear sturdy shoes in good conditions that supply traction when performing lifts.
- Keep your back straight and head aligned during the lift and use your legs to lift the load – do not twist or bend from the waist. Keep the load in front of you – do not lift or carry objects from the side.

- Keeping the heavy part of the load close to your body will help maintain your balance.

5.2.5 Heavy Equipment

Operation of heavy equipment during site activities presents potential physical hazards to personnel. URS' procedures for heavy equipment operations are located in SMS 19, a copy of which is to be maintained onsite.

The following precautions must be observed whenever heavy equipment is in use:

- Personal protective equipment (PPE) such as steel-toed shoes, safety glasses or goggles, and hard hats must be worn whenever such equipment is present.
- Personnel must at all times be aware of the location and operation of heavy equipment, and take precautions to avoid getting the way of its operation. Never assume that the equipment operator sees you; make eye contact and use hand signals to inform the operator of your intent, particularly if you intend to work near or approach the equipment.
- Traffic safety vests **ARE REQUIRED** for personnel working near mobile heavy equipment, such as backhoes and other excavators.
- Never walk directly in back of or to the side of, heavy equipment without the operator's acknowledgment.
- When an equipment operator must operate in tight quarters, the equipment subcontractor should provide a person to assist in guiding the operator's movements.
- Keep all non-essential personnel out of the work area.
- Any heavy equipment that is used in the exclusion zone should remain in that zone until its task is completed. The equipment subcontractor should completely decontaminate such equipment in the designated equipment decontamination area as required prior to moving the equipment outside of the EZ/CRC.

5.2.6 Underground and Aboveground Utilities

The Site Manager is responsible to see that underground utility locations are identified prior to the commencement of any subsurface (> 1 foot) activities. Resources include site plans, utility companies, and regional utility locating services, such as the "811" one-call service. Methodologies to clear subsurface drilling locations include hand augering and air knifing. The proper utility company personnel should certify the deactivation of utilities, and the certification should be retained in the permanent log. URS' procedures for activities proximal to utility locations are located in SMS 34, a copy of which is to be maintained onsite.

Drilling, crane, or similar operations adjacent to overhead lines shall not be initiated until operations are coordinated with the utility officials. Operations adjacent to overhead lines are prohibited unless one of the following conditions is satisfied:

- Power has been shut off and positive means (e.g. lockout/tagout) have been taken to prevent lines from being energized. Wherever possible, the URS SSO will observe power shut off and place a lock and tag on the switch. In all cases utility company personnel shall certify in writing to the Site Manager or SSO the deactivation of overhead utilities, and the certification retained in the project files. The Site Manager or SSO must also attempt to verify power shut off by checking that power is no longer available to the affected building or equipment.
- Equipment, or any part of the equipment, cannot come within the following minimum clearance from energized overhead lines:

Power Lines **Nominal System (kilovolts)**	**Minimum Required Clearance**
600v-50	10 feet
50- 75	11 feet
75-125	13 feet
125-175	15 feet
175-250	17 feet
250-370	21 feet
370-550	27 feet
550-1000	42 feet

5.2.7 Work Area Protection/Crime Prevention

As the project operations may be undertaken near a roadway, in an alley, or within a parking lot, motor vehicles may be a hazard. Consideration should be given to parking a work vehicle within the coned area between the work area and oncoming traffic. URS' procedures for work zone traffic control are located in SMS 32, a copy of which is to be maintained onsite.

Theft and personal assault crimes are a possibility at the site area. Be aware of your surroundings at all times and have means to summon help (cell phones). Also work in pairs at a minimum and avoid attracting attention. Establish as large an "exclusion zone" for the work as possible. If appropriate, arrange for private security services.

5.2.8 Hand Tools and Portable Equipment

Only authorized trained workers will be allowed to use powered hand tools, and only after reviewing the manufacturer's safety procedures. All tools will be inspected by the operator prior to use and defective tools will be removed from service. Guards for moving parts are not to be removed.

Electric-power tools will be double-insulated or grounded. All power tools not plugged directly into a building's fixed electrical system must be plugged into a ground fault circuit interrupter-protected supply (i.e. - an extension cord with a GFCI). Tools shall not be lifted or lowered by their electrical cords.

Pneumatic (air-powered) tools are to be connected to the hose in a manner which prevents accidental disconnecting. Impact tools shall have their attachments secured to

prevent them from accidentally being expelled. Safety features, such as muzzle-to-work contact actuators on nail drivers, shall not be removed or overridden.

Fuel-powered tools shall be stopped while being refueled, serviced, or maintained. Regulations governing the storage and transport of flammable liquids are to be adhered to. If fuel-powered tools are operated indoors or in enclosed spaces, provisions shall be made to prevent the build-up of toxic gases. (See Section 6.2.)

Indoor working conditions may not have enough natural illumination. Portable generators will be used to supplement the area. Some precautions are noted below:

Portable Electric Generator (<5 KW)

- All extension cords which supply power from a portable generator to a piece of equipment or portable power tool are to be equipped with a ground fault circuit interrupter (GFCI).

- Generators are to be off and should be cool prior to refueling.

- All electrical components are to be in sound condition with no exposed parts. Grounding continuity is to be maintained between the generator and the frame.

- Generators are not to be operated within enclosed areas.

- At least one 20-lb. fire extinguisher rated ABC is to be located where gasoline is stored.

See also SMS 12 and 16.

5.2.9 Hand Safety/Open Blade Prohibition

Gloves must resist puncturing and tearing as well as provide the necessary chemical resistance. In many instances, particularly when protecting against concentrated source materials, gloves may have to be layered. In this case, gloves are referred to as “inner” gloves and “outer” gloves. Heavy leather gloves may be worn over chemical protective gloves when doing heavy work which could tear the chemical glove. If they become contaminated, leather gloves should be discarded because leather is difficult to decontaminate.

Open blade tools such as pocket knives, army knives, etc. are not permitted on-site. For cutting tasks, snips or other blade-protected tools must be used instead. Scissors may be used where appropriate. See also SMS 64, Hand Safety.

5.2.10 Lock-Out/Tag-Out

Maintenance activities may exposure personal to stored energy hazards. Consider all wires to be live until locked and tagged out. Personnel are required to lockout and tagout any equipment on which they will be performing any kind of maintenance or work that could result in an injury in the event of an unexpected startup. Expected equipment to which this applied is associated with the groundwater extraction well equipment. "Lockout" involves physically locking out the energy source(s) to a piece of equipment that is going to be worked on. The lockout rule applies to almost every piece of equipment that is to be worked on. The exception to this is cord-and-plug equipment if it is unplugged and the plug is in the control of the worker at all times, and if there are no other sources of energy to the equipment. The types of work activities which could require Lockout/Tagout procedures include installing a piece of equipment, modifying a piece of equipment, and adjusting, maintaining, or servicing a piece of equipment in a manner in which an unexpected movement or startup of the equipment could cause injury. See SMS 23.

The types of energy that may need to be addressed include electrical, hydraulic, pneumatic, and gravitational. Where a piece of equipment has more than a single source or type of energy, each will have to be addressed. **Step-by-step procedures for the equipment are to be incorporated into the JSA and reviewed and discussed with personnel.** Where a confined space entry is involved, the confined space is to be addressed first, then the Lockout provisions should be addressed.

The lockout hardware used is to be durable for the type of use it will receive, identifiable as to its purpose and owner, and individually assigned so that only the worker using the lock has the key. Workers who will be conducting work which will involve Lockout/Tagout procedures are to notify any other workers who may be affected by the Lockout. No worker is to remove the lock of another without taking the necessary precautions and receiving proper authorization.

6.0 EXPOSURE MONITORING PLAN

Heat stress, noise, and chemical exposures may be encountered at this site. Heat stress monitoring and prevention is addressed in Section 5.2.1. Noise levels will not be monitored; personnel will wear hearing protection as described in Section 5.2.3.

6.1 CHEMICAL EXPOSURE MONITORING

The field instrumentation described in this health and safety plan has been specifically selected for the contaminants that may be reasonably anticipated to be encountered during this course of this project. Selection factors include anticipated airborne concentrations, potential interference, ionization potentials, instrument sensitivity, and occupational exposure limits. The Action Levels specified in Section 1.0 were established with the expectation that specific instruments will be used. **DO NOT SUBSTITUTE INSTRUMENTS WITHOUT THE CONSENT OF THE HSP PREPARER OR THE RHSEM.**

The monitoring equipment specified in Section 1.0 will be used on a regular basis to evaluate the potential for exposure to airborne contaminants, typically every 5 to 10 minutes. Monitoring will be conducted in the immediate vicinity of the contaminant source point or work area (e.g., at the borehole and cuttings adjacent to the borehole). If readings exceed the first Action Level (5 ppm> 1 minute), monitoring in the operator's breathing zone (OBZ) of the person working nearest the point of operations/contaminant source will start immediately, and site personnel will don protective clothing.

A reading in the OBZ above the second Action Level (5 ppm > 1 minute) will require the use of half-face respirators with appropriate cartridges. An OBZ reading above the third Action Level (25 ppm > 1 minute) will require the use of full-face respirators with appropriate cartridges. If the monitoring instrument reads more than the fourth Action Level (50 ppm > 1 minute), or 100 instantaneously), work will stop, and workers will move upwind while the airborne contaminants dissipate. If elevated levels remain for more than 5 minutes, the source of the airborne contamination will be covered with clean soil, plastic sheeting, or foam, (or controlled in an appropriate manner) and the Regional Health, Safety, and Environment Manager or PM will be contacted for further guidance.

6.1.1 Personal Exposure Monitoring

In accordance with 8 CCR 5192(h), an industrial hygienist will perform quantitative personal monitoring on personnel at greatest risk of exposure (i.e., those working in the exclusion zone). The industrial hygienist will determine who to sample based upon site conditions at the time of the sampling; monitoring will commence when the Second Action Level is exceeded.

Personnel will be monitored for halogenated hydrocarbons and/or aromatic hydrocarbons in accordance with National Institutes for Occupational Safety and Health (NIOSH) Methods 1003 and 1501, respectively. Colorimetric tubes may be used to assist in determining what analyses should be performed. Alternatively, validated passive

samplers may be used if appropriate. A laboratory accredited by the American Industrial Hygiene Association will perform analyses, and results will be reported and records maintained in accordance with OSHA criteria.

URS' procedures for personal monitoring are located in SMS 43, a copy of which is to be maintained onsite.

6.2 BACKGROUND READINGS

All direct-reading instrument readings will be evaluated relative to background reading, not "meter zero". Prior to the start of work at each shift, and whenever there is a significant shift in wind direction, instrument readings will be obtained upwind of the site work zone in order to determine the level of "background" readings from local vehicle traffic, emissions from nearby operations unrelated to the site, etc. Site readings will be evaluated against these background readings (i.e., if an action level is listed as 20 ppm, it is evaluated as 20 ppm above background). The SSO should consult with the RHSEM regarding the potential health hazards associated with background readings above 5 ppm.

6.3 DATA LOGGING

All monitoring data, including background readings, will be logged in the field log book. The results of daily instrument calibrations can either be logged in the field log book. All monitoring instruments will be calibrated in accordance with the manufacturer's instructions prior to the start of each shift. Calibration should also be performed when inconsistent or erratic readings are obtained. **IF AN INSTRUMENT CANNOT BE CALIBRATED TO SPECIFICATION, OR BECOMES OTHERWISE INOPERABLE, ALL INVASIVE SITE WORK (I.E., DRILLING, EXCAVATING) WILL CEASE UNTIL THE INSTRUMENT IS APPROPRIATELY REPAIRED OR REPLACED;** the PM or HSP Preparer should be contacted for further guidance.

6.4 DUST CONTROL

High winds and site operations can cause airborne dust hazards. If site operations generate sustained visible dust, a water mist will be applied to reduce dust generation. If the mist is not effective in reducing dust generation, personnel will don respirators (half-face or full-face as appropriate for analyzer readings) with combination organic vapor-HEPA/P100 cartridges.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The minimum Personal Protective Equipment (PPE) for site personnel includes:

- Hardhat (with orange tape band for SSEs)
- Safety glasses with side shields (or impact resistant goggles)
- Steel-toed boots or Chemical-resistant steel-toed boots
- Ear protection in vicinity of noisy equipment
- Work gloves and/or chemical-resistant gloves
- Traffic safety vest in the vicinity of heavy equipment

As the various monitoring Action Levels are reached, additional PPE is required. Section 1.0 provides the description of the incremental PPE requirements relative to specific Action Levels, as well as the specific kinds of PPE to be use. URS' procedures for use and selection of personal protective equipment are located in SMS 29, a copy of which is to be maintained onsite.

7.1 LIMITATIONS OF PROTECTIVE CLOTHING

The protective equipment ensembles selected for this project are anticipated to provide protection against the types and concentrations of hazardous materials that may potentially be encountered during field operations. However, no protective garment, glove or boot is resistant to all chemicals at any concentration; in fact, chemicals may continue to permeate or degrade a garment even after the source of the contamination is removed.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all personnel:

- When using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift

- Inspect all clothing, gloves and boots both prior to and during use for:

    - Imperfect seams
    - Non-uniform coatings
    - Tears
    - Poorly functioning closures

- Inspect reusable garments, boots and gloves both prior to and during use for:
    - Visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness
    - Cracks or any signs of puncture or abrasion

Any reusable garments exhibiting any such characteristics will be discarded.

7.2 DURATION OF WORK TASKS

The duration of work tasks in which personnel use PPE ensembles that include chemical protective clothing (including uncoated Tyvek®) will be established by the SSO. Variables to be considered include ambient temperature and other weather conditions, the capacity of individual personnel to work in the required level of PPE in heat and cold, and the limitations of specific PPE ensembles. The recommended rest breaks are as follows:

- Fifteen minutes midway between shift startup and lunch
- Lunch break (30-60 minutes)
- Fifteen minutes midway between lunch and shift end

Rest breaks are to be taken in the support zone or other clean area after personnel have completed the decontamination process, including soap and water wash of hands and face.

8.0 RESPIRATORY PROTECTION

8.1 RESPIRATOR SELECTION

Engineering controls and safe work practices (e.g. elimination of the source of contamination, ventilation equipment, working upwind, limiting exposure time, etc). must always be the primary control for air contaminants. Respirators will be used if engineering or work practice controls are not feasible for controlling airborne exposures below acceptable concentrations and as an interim control measure while engineering or work practice controls are implemented.

Once the need for respirators has been established, the respirators will be selected on the basis of the hazards to which the worker is exposed. Only NIOSH-approved respirators will be issued. Selection criteria established in 8 CCR 5144 has been used by the HSP Preparer in determining respirator requirements for this project.

> *CAUTION: Full-face piece or half-face piece air-purifying respirators are not to be used where there is an oxygen deficiency. Only air-supplied respirators with an emergency escape cylinder or self-contained breathing apparatus will be worn when an oxygen deficiency exists.*
>
> *CAUTION: A respirator does not protect against excessive heat or against hazardous substance that can attack the body through the skin.*

The form of the airborne contaminants has been evaluated based upon the suspected contaminants of concern. Evaluation of the concentration of the airborne chemical hazard will be performed using direct reading instruments to determine what type respirator will be used. Airborne readings will be compared to Action Levels in the table in Section 1.0. See action level/respirator requirements in Section 6.1.

8.2 MEDICAL SCREENING

URS project employees are enrolled in the URS Medical Surveillance Program and are medically evaluated in compliance with the requirements of 8 CCR 5144(a)(10). Subcontractor employees will participate in their own employer's medical surveillance program. Employees who are not physically or psychologically capable of wearing respirators are not assigned to this project.

The medical status of each employee is reviewed annually and as may be deemed necessary by the examining physician if the physical status of the employee changes.

8.3 FIT TESTING

A person wearing a respirator must be clean-shaven in the area of the face piece seal. Long hair, sideburns, and skullcaps that extend under the seal are not allowed. Glasses with temple pieces extending under the seal are not allowed for full-face respirators. Persons with facial conditions

that prevent a proper seal are not allowed to wear a respirator until the condition is corrected. Facial conditions that may cause a seal problem include missing dentures, scars, severe acne, etc. Contact lenses can be used with air purifying, but not supplied air respirators.

No individual will enter an area where the use of respiratory protective equipment is required unless the person has been fit tested within the last year. Fit testing will be performed in accordance with accepted fit test procedures defined in SMS 42, a copy of which is maintained at the site.

Records of fit testing will be maintained onsite or by the employee's office and/or corporate medical surveillance program.

Respirator wearers will perform a user seal check each time the respirator is put on. For air purifying respirators, the positive user seal check is performed by first removing the exhalation valve cover, then placing the palm over the respirator exhalation valve and exhaling gently. The respirator mask should puff out without noticeable leakage. The negative user seal check is performed by placing the palms over both of the respirator cartridges, inhaling gently, and holding the breath for 10 seconds. The respirator mask should remain collapsed on the face without noticeable leakage.

8.4 RESPIRATOR USE INSTRUCTIONS

Only those employees who have been properly trained and qualified on the specific type of respirator to be worn may use respirators. No individual will enter an area where the use of respiratory protective equipment is required unless the person has been trained.

All employees whose job assignment requires the use of respirators are given training in accordance with 8 CCR 5144 during initial 40-hour and annual Refresher training for hazardous waste operations.

Hands-on training on inspecting and donning a respirator, including user seal checks, was also provided at the time of fit testing. Retraining is performed annually on each type of respirator worn by the individual. In addition, site-specific respirator training is provided during Site Safety Briefings conducted by the SSO. Training records are kept in the employee's training file.

Particulate respirator cartridges should be changed out when the wearer has difficulty breathing through the cartridges. Chemical gas or vapor respirator cartridges will be ***changed out at least daily.***

The fit of a chemical gas or vapor respirator should be rechecked and the cartridges changed if the wearer detects chemical odor or feels chemical irritation on the skin, both indicators of leakage or cartridge breakthrough. Where available, an ESLI (end-of-service-life indicator) will be used on chemical respirator cartridges. Cartridges will be changed as soon as the ESLI indicates that the cartridge is saturated and no longer effective in absorbing airborne chemicals.

8.5 RESPIRATOR INSPECTION

The user will inspect respirators before and after each day's use.

Inspection procedure, air purifying respirators (full-face piece and half-face piece cartridge respirators):

Examine the face piece for:

- Excessive dirt
- Cracks, tears, holes, or distortion from improper storage
- Inflexibility
- Cracked or badly scratched lenses (full-face only)
- Incorrectly mounted eyeglass lenses or broken or missing mounting clips (full-face only)
- Cracked or broken air purifying element holder, badly worn threads, or missing gaskets

Examine the head straps or head harness for:

- Breaks or cracks
- Broken or malfunctioning buckles
- Excessively worn serration on the headstraps, which may permit slippage
- Loss of elasticity

Examine the inhalation valves (2) and exhalation valve for:

- Foreign material (e.g. hairs, particles, etc.)
- Improper insertion of the valve body in the face piece
- Cracks, tears, or chips in the valve body, particularly in the sealing surface
- Missing or defective exhalation valve covers

Examine the air-purifying cartridge for:

- Missing or worn cartridge holder gasket
- Incorrect cartridge/canister for the hazard
- Incorrect cartridge installation, loose connections, or cross threading in the holder
- Cracks or dents in the outside case or threads of filter or cartridge/canister

8.6 CLEANING OF RESPIRATORS

Respirators assigned and worn by one individual must be dismantled and thoroughly cleaned and disinfected after each day's use. Visitors or multi-assigned respirators must be cleaned and disinfected after each use. A disinfectant spray or wipe is approved as a disinfectant between uses during the day but not for cleaning and sanitizing after each day's use. Care must be taken to prevent damage from rough handling during the cleaning procedure. After cleaning, respirators must be reassembled.

Respirator Cleaning Procedure

Washing: Disassemble and wash with a mild liquid detergent in warm water (not to exceed 110 ºF). A stiff bristle (not wire) brush may be used.

Rinsing: Rinse in clean water (110 ºF maximum) to remove all traces of detergent. This is very important to prevent dermatitis.

Disinfecting: Thoroughly rinse or immerse in a sanitizer provided by the manufacturer. Alternatively, a weak chlorine bleach solution (1 milliliter liquid bleach/liter of water) may be used.

Final Rinsing: Rinse thoroughly in clean water (110 ºF maximum) to remove all traces of disinfectant. This is very important to prevent dermatitis.

Drying: Drain and dry hanging by the straps from racks (take care to prevent damage); or towel drying with clean soft clothes or paper towels.

8.7 MAINTENANCE OF RESPIRATORS

Routine respirator maintenance such as replacing missing valves, gaskets, nosecups etc., must only be performed by URS trained respirator users or a respirator manufacturer's representative. Only approved replacement parts must be used. Substitution of parts from a different brand or type of respirator is generally not possible, invalidates the technical approval of the respirator, and is not permitted. Any respirator suspected of being defective must be removed from service and replaced.

8.8 STORAGE OF RESPIRATORS

When not in use, respirators must be stored to protect them from dust, sunlight, heat, extreme cold, excessive moisture, damaging chemicals, and physical damage. Respirators must be stored in sealable (e.g. Ziploc® or twist-tie) reusable plastic bags between shifts.

The respirator storage environment must be clean, dry, and away from direct sunlight. Onsite cabinets or cases are suggested. Storing bagged respirators in vehicles is discouraged due to the potential for damage from other material or equipment.

8.9 ADDITIONAL INFORMATION

Additional information on URS' Respiratory Protection Program is located in SMS 42, a copy of which is to be available onsite.

9.0 SITE CONTROL

9.1 GENERAL

Barricade tape and/or barricades shall be used to delineate a work zone for safety purposes around the work area. The barriers should be set in a 25-foot radius (as practical) around the work area to provide sufficient maneuvering space for personnel and equipment. A short piece of barricade tape can be affixed to a secure upright (e.g., drill rig mast or vehicle antenna) to serve as a wind direction telltale. A 5-foot opening in the barricades at the support zone (upwind of the work area) will serve as the personnel and equipment entry and exit point. The personnel decontamination station will be established at this point if formal decontamination procedures are required (see Section 9.0). All entry and exit from the work area will be made at this opening in order to control potential sources of contamination and leave contaminated soil and debris in the work area.

At the end of the shift, all boring/sampling holes and excavations must be covered or otherwise secured. All cuttings and decontamination fluids are to be handled in accordance with relevant regulations and instructions from the PM.

The PM or SSO will determine an upwind evacuation area prior to each shift, and all personnel will be notified of its location. A horn or other signaling device will be used to signal an evacuation in the event of an emergency. Three blasts of the horn will be the signal to immediately stop work and proceed to the evacuation area.

The SSO will see that all site visitors sign the visitors' log and that all personnel and site visitors who enter the work area do so only after presenting evidence of both their participation in a medical surveillance program and completion of health and safety training programs that fulfill the requirements of this plan.

The SSO will provide site hazard and emergency action information to all site visitors before they enter the site. This can be done by providing a copy of this HSP to the visitor.

9.2 WORK ZONES

Work zones must be established as described below.

- Exclusion Zone – A 25-foot (as practical) circle around the work area will be defined before work starts. The encircled area will constitute the "Exclusion Zone". This zone is where potentially hazardous contaminants and physical hazards to the workers will be contained. Appropriate personal protection as described in Section 1.0 will be required in this area. Plastic sheeting (visqueen) and/or tarps may be used as necessary to control contaminated materials spilled to the ground during site operations. The size of the Exclusion Zone may be altered to accommodate site conditions and to ensure contaminant containment.

- Contamination Reduction Zone (CRZ) – A corridor leading from the Exclusion Zone will be defined, and will lead from the work area to a break area. All decontamination activities will occur in the CRZ. A waste container will be placed at the end of the corridor so contaminated disposable equipment can be placed inside and covered. Surface/soil contamination in this area should be controlled using plastic sheeting. No personnel or site visitors will be permitted into the Contamination Reduction Zone or Exclusion Zone unless they are in full compliance with the requirements of this Plan.

- Support Zone – A Support Zone, the outermost part of the site, must be defined for each field activity. Support equipment is located in this uncontaminated or clean area. Normal work clothes are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction (upwind of work area), and resources (i.e., roads, shelter, utilities).

10.0 DECONTAMINATION PROCEDURES

If the monitoring instrument readings indicate respirator use (the Second Action Level [5 ppm > one minute]) in the Operator's Breathing Zone, the following steps will be followed whenever personnel leave the exclusion zone/work area:

1. Remove all equipment, sample containers, and notes to the CRZ. Obtain decontamination solutions and decon tools (shovels, auger flights, etc.) by brushing them under a water rinse. A high-pressure steam cleaner may also be used for decon. All waste and spent decon solutions will be properly contained.
2. Scrub boots with a stiff bristle brush and water. Washtubs and chairs will be provided.
3. Remove outer gloves (and boot covers, if used).
4. Remove Tyvek® coverall; discard in provided container.
5. Remove hardhat and eye protection.
6. Remove respirator.
7. Remove inner gloves.
8. Wash hands and face.

The decontamination area will be covered with plastic sheeting, which will be replaced when torn or heavily soiled, and at the end of each shift.

Each worker will be responsible for cleaning, sanitizing and storing their own respirator in accordance with manufacturer's guidance (i.e., washing in warm water and detergent or sanitizing solution, air drying, and storing in a plastic storage bag; see Sections 8.6 - 8.8). Cartridges will be changed in accordance with the procedures described in Section 8.4.

All spent decontamination fluids (rinse waters, etc.) shall be handled as directed by the PM and in accordance with relevant regulations.

10.1 SANITATION

Potable water will be made available at the site, either from a pressurized source or commercially available bottled water. Drinking cups will be supplied so personnel will neither drink directly from the source of water nor have to share drinking cups. Sources of non-potable water shall be clearly labeled as such.

Unless toilet facilities are available onsite or transportation is readily available to transport personnel to nearby (within 5 minutes) toilet facilities, portable toilet facilities, such as chemical toilets, will be provided onsite.

Washing facilities will be provided onsite, and will be located in the decontamination area or the support area. Soap, clean water, wash basins and single-use towels will be available for personnel use.

URS' procedures for site sanitation are located in SMS 30, a copy of which is to be maintained onsite.

10.2 DECONTAMINATION – MEDICAL EMERGENCIES

In the event of physical injury or other serious medical concerns, immediate first aid is to be administered in lieu of further decontamination efforts.

See Emergency Decontamination chart for a decision tree for emergency decontamination.

10.3 DECONTAMINATION OF TOOLS

When all work activities have been completed, contaminated tools used by personnel will be either appropriately decontaminated or properly disposed of as hazardous waste.

It is expected that all tools will be constructed of non-porous, non-absorbent materials. This will aid the decontamination process. Any tool, or part of a tool, which is made of a porous/absorbent material will be discarded and disposed of as a hazardous waste if it cannot be properly decontaminated.

Tools will be placed on a decontamination pad or into a bucket and thoroughly washed using a soap solution and brushing, followed by a fresh water rinse. All visible particles are to be removed before the tool is considered clean.

11.0 SAFE WORK PRACTICES

11.1 GENERAL

1. Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.
2. All personnel will enter designated work areas only through the contamination reduction zone (CRZ). All personnel leaving an exclusion/work zone must exit through the CRZ and pass through the decontamination station as described in Section 10.0.
3. Personnel will wash their hands and face thoroughly with soap and water prior to eating, drinking or smoking.
4. Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling, leaning or sitting on contaminated surfaces. Do not place monitoring equipment on potentially contaminated surfaces (i.e., ground, etc.)
5. All field crew members should make use of their senses to alert them to potentially dangerous situations in which they should not become involved (i.e., presence of strong, irritating or nauseating odors).
6. Only those vehicles and equipment required to complete work tasks should be permitted within the exclusion/work zone (drill rigs, excavators, and similar items). All non-essential vehicles should remain within the support zone.
7. Containers, such as drums, will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.
8. Field survey instruments, such as PIDs, should be covered with plastic or similar covering to minimize the potential for contamination.
9. No matches or lighters will be permitted in the work area/exclusion zone or contamination reduction zone.
10. Contaminated protective equipment, such as respirators, hoses, boots, and disposable protective clothing, will not be removed from the work area/exclusion zone or decontamination area until it has been cleaned, or properly packaged and labeled.
11. Prevent, to the extent possible, spills. In the event that a spill occurs, contain liquid if possible.
12. Prevent splashing of the contaminated materials.
13. Field crewmembers shall be familiar with the physical characteristics of the site operations including:
    - Wind direction in relation to the contaminated area;

- Accessibility to equipment and vehicles;
- Areas of known or suspected contamination;
- Site access; and
- Nearest water sources.

14. The number of personnel and equipment in the exclusion zone should be minimized but only to the extent consistent with workforce requirements of safe site operations.
15. All wastes generated during URS and/or subcontractor activities at the site will be disposed of as directed by the PM.
16. All personal protective equipment will be used as specified and required.
17. The buddy system will be used at all times when performing sampling for hazardous material when the first action level criteria has been exceeded or when working in remote areas.
18. Personnel are to immediately notify the SSO or Site Manager if any indications of potential explosions or unusual conditions are observed.

11.2 SAMPLING PRACTICES

For all sampling activities, the following standard safety procedures shall be employed:

1. All sampling equipment should be cleaned before proceeding to the site.
2. At the sampling site, sampling equipment should be cleaned after each use.
3. Work in "cleaner" areas should be conducted first where practical.
4. All unauthorized personnel will remain outside exclusion zones at all times.

11.3 SAMPLE SHIPMENT/HAZARDOUS MATERIALS SHIPMENT

If samples to be collected during the course of this project fall under the criteria that defines them as hazardous materials under DOT regulations 49 CFR Parts 171-177 (see URS guidelines for determination), then they must be shipped in accordance with those regulations by an individual who is certified as having been Function-Specific trained as required under the DOT regulations.

12.0 EMERGENCY RESPONSE PLAN

It is URS' policy to evacuate personnel from areas involved in hazardous material emergencies and to summon outside assistance from agencies with personnel trained to respond to the specific emergency. This section outlines the procedures to be followed by personnel in the event of a site emergency. These procedures are to be reviewed during the onsite safety briefings conducted by the SSO.

In the event of a fire or medical emergency, the emergency numbers identified in Section 1.0 (page 1) can be called for assistance.

12.1 PLACES OF REFUGE

In the event of a site emergency requiring evacuation, all personnel will evacuate to a pre-designated area located a safe distance from any health or safety hazard (typically the URS site office, unless conditions dictate otherwise) and safely away from the area of influence. The SSO (in cooperation with a facility representative, if available) will designate a primary assembly area prior to the start of work each day. The daily pre-designated assembly area may have to be re-designated by the SSO in the event of an emergency where the area of influence affects the primary assembly area. Once assembled, the SSO shall take a head count. The SSO will evaluate the assembly area to determine if the area is outside the influence of the situation; if not, the SSO will redirect the group to a new assembly area where a new head count will be taken.

During any site evacuation, all employees shall be instructed to observe wind direction indicators. During evacuation, employees will be instructed to travel upwind or crosswind of the area of influence. The SSO will provide specific evacuation instructions, via the site emergency radio if necessary, to site personnel regarding the actual site conditions.

12.2 FIRE

URS' fire prevention procedures are described in SMS 14, a copy of which is to be maintained onsite. To protect against fires, the following special precautions must be taken:

- Before any flame-producing devices, i.e., cutting torches or welding irons, are used in the exclusion zone, the SSO must be contacted. In some cases, the client may require to be contacted as well to determine if a hot work permit is required. A detailed inspection of the work area will be conducted to determine if potential fire sources exist. The fire sources must be removed to at least 35 feet away before work can commence.

- At least one 20-lb. type ABC fire extinguishers must be located at the work area when cutting/welding is being conducted, and a fire watch will be posted.

- Upon completion of the cutting/welding activities the area will be inspected for hot metal, slag, etc. The fire watch will remain on station for at least 15 minutes after the hot work is completed.

Type ABC fire extinguishers will be available onsite to contain and extinguish small fires. The local or facility fire department shall be summoned in the event of any fire onsite.

12.3 COMMUNICATION

A communication network must be set up to alert site personnel of emergencies and to summon outside emergency assistance. Where voice communication is not feasible an alarm system (i.e., sirens, horns, etc.) should be set up to alert employees of emergencies. Radio communication may also be used to communicate with personnel in the exclusion zone. Where phone service is not readily available, radios or portable phones should be used to communicate with outside agencies. Site personnel should be trained on the use of the site emergency communication network. Emergency phone numbers shall be posted at the phone or radio used for outside communication. The SSO is responsible for establishing the communication network prior to the start of work, and for explaining it to all site personnel during the site safety briefing.

In the event of an emergency, personnel will use the following hand signals where voice communications are not feasible:

Signal	Definition
Hands clutching throat	Out of air/can't breathe
Hands on top of head	Need assistance
Thumbs up	OK/I'm alright/I understand
Thumbs down	No/negative
Arms waving upright	Send back support
Grip partner's wrist	Exit area immediately

12.4 EMERGENCY RESPONSE PROCEDURES

12.4.1 Emergency Response Team

The emergency response team will consist of employees who assume the following roles:

- Emergency Care Provider(s)

  Provide first aid/CPR as needed.

- Communicator

  The role of the communicator is to maintain contact with appropriate emergency services, providing as much information as possible, such as the number injured, the type and extent of injuries, and the exact location of the accident scene. The communicator should be located as close to the scene as possible in order to transmit

to the emergency care providers any additional instructions that may be given by emergency services personnel in route.

- Site Supervisor

  The site supervisor (usually the SSO) should survey and assess existing and potential hazards, evacuate personnel as needed, and contain the hazard. Follow up responsibilities include replacing or repairing damaged equipment, documenting the incident, and notifying appropriate personnel/agencies described under incident reporting. It also includes reviewing and revising site safety and contingency plans as necessary.

In the event of an emergency, notify site personnel of the situation. Survey the scene to determine if the situation is safe, to determine what happened, and to search for other victims. The Emergency Response Checklist can be used to help remember the things to do in an emergency.

EMERGENCY RESPONSE CHECKLIST

In an Emergency	Yes	No
Confirm the reported incident		
Evacuate and secure the area		
Render first aid/emergency medical care		
Notify promptly:		
Project Manager		
Fire Department		
Police Department		
Nearest Hospital or Medical Care Facility		
Start Documentation		
If spill or leak occurs:		
Don the proper PPE		
Stop the source		
Contain the spill		
Clean up the spill		
Upon evacuating, take attendance at the assembly area		
Authority given:		
Leave the site		
Restart the operations		
Debrief and document the incident		
A copy of the document submitted to the RHSEM		

12.5 MEDICAL EMERGENCY RESPONSE PLAN

At least one URS employee on site will hold a current certificate in American Red Cross Standard First Aid. This training provides six and one-half hours of Adult CPR and Basic First Aid. If a medical emergency exists, consult the emergency phone number list and request an ambulance immediately. If the injury is beyond first aid, but not particularly serious or life-threatening, the victim should be transported to the nearest occupational health clinic or urgent care facility. See SMS 65 concerning Injury Management. Perform First Aid/CPR as necessary, stabilize the injured, decontaminate if necessary, and extricate only if the environment they are in is dangerous or unsafe and ONLY if the rescuers are appropriately protected for potential hazards they may encounter during the rescue. When emergency services personnel arrive, communicate all first aid activities that have occurred. Transfer responsibility for care of the injured/ill to the emergency services personnel.

The following items and emergency response equipment will be located within easy access at all times:

- First Aid Kit and Infection Control Kit;
- Eyewash – A 15-minute eyewash (required if corrosives are present) or an appropriate amount of portable sterile eyewash bottles will be available onsite for flushing foreign particles or contaminants out of eyes. The SSO will demonstrate the proper operation of the unit(s) prior to the start of work;
- Emergency Phone Numbers List; and
- Portable radios for emergency communications in remote areas.

Drugs, inhalants, or medications shall not be included in the First Aid Kit.

12.6 INCIDENT/NEAR MISS REPORTING

ALL site injuries and illnesses must be reported to the SSO and PM immediately following first-aid treatment. Work is to be stopped until the PM or SSO and RHSEM have determined the cause of the incident and have taken the appropriate action to prevent a reoccurrence. Any injury illness, regardless of severity, is to be reported on the accident report form (see SMS 49-1).

Near misses are unplanned events that could have resulted in injury, property, or equipment damage if there was a change in time or space. Near misses, as well as safety observations, are to be submitted electronically via the URS "Near Miss/Safety Observation" located on the HSE website homepage.

12.7 OPERATION SHUTDOWN

If known or possible hazardous situations are present, or if work tasks are unclear, any project member may request that site operations be temporarily suspended while the underlying hazard is corrected or controlled. All project members are encouraged to exercise "stop work" authority as part of applying principles of the behavior based safety culture. If the situation is related to emissions, during operation shutdown, all personnel will be required to stand upwind to prevent exposure to fugitive emissions. The SSO will have ultimate authority for operations shutdown and restart.

12.8 SPILL OR HAZARDOUS MATERIALS RELEASE

Small spills are immediately reported to the SSO and are dealt with according to the chemical manufacturer's recommended procedures found on the MSDS. Steps will be taken to contain and/or collect small spills for approved storage and disposal.

In the unlikely event of a larger release of hazardous materials as a result of site activities, site personnel will evacuate to the predesignated assembly area. The local Designated Emergency Response Authority (DERA) will be notified by the SSO immediately and appropriate actions will be taken to protect the public health and mitigate the contaminant release. The DERA can be reached through the local police or fire department. The Site Safety Officer or Site Manager will make the following emergency contacts:

URS Project Manager
Tom Dolan (213) 996-2263

Cal OES (if RQ is exceeded or threat of significant release)
(800) 852-7550

13.0 TRAINING, MEDICAL SURVEILLANCE, SITE INSPECTIONS

13.1 TRAINING AND MEDICAL SURVEILLANCE

All site personnel will have met the requirements of 29 CFR 1910.120(e)/8 CCR 5192(e), including:

- Forty (40) hours of initial off-site training or its recognized equivalent
- Eight (8) hours of annual refresher training for all personnel (as required);
- Eight (3) hours of supervisor training for personnel serving as Site Safety Officers
- Three (3) days of work activity under the supervision of a trained and experienced supervisor

All URS site personnel are participating in medical surveillance programs that meet the requirements of 8 CCR 5192(f). Current copies of training certificates and statements of medical program participation for all URS personnel are maintained by the local URS offices. Short service employees (SSEs) will be mentored in the field by experienced personnel for a period of six months unless a variance has been granted by the employee's supervisor (see SMS 78 for additional information). Contractor personnel are to provide evidence of their training and medical clearance to the PM or SSO prior to the start of field operations.

In addition, all site personnel will review this HSP and sign a copy of the Safety Plan Compliance Agreement, which is found in Attachment B. The PM will maintain these agreements at the site, and place them in the project file at the conclusion of the operation.

Prior to the start of operations at the site, the SSO will conduct a site safety briefing, which will include all personnel involved in site operations. At this meeting, the SSO will discuss:

- Contents of this HSP
- Types of hazards at the site and means for minimizing exposure to them
- The type of monitoring that will be performed
- Action levels for upgrade and downgrade of personal protective equipment
- Personal protective equipment that will be used
- URS' Injury and Illness Prevention Program
- Site-specific respiratory protection requirements
- Decontamination protocol
- Site control measures, including safe operating practices and communication
- Location and use of emergency equipment
- Evacuation signals and procedures

All site personnel, including subcontractor personnel, are to attend the briefings and sign the briefing form.

Subsequent site safety briefings will be conducted at least weekly, or whenever there is a change in task or significant change in task location. Briefings will also be conducted whenever new personnel report to the site.

For each briefing, the SSO will complete a Site Safety Briefing form (see Attachment C); these are to be maintained in the project file.

13.2 JOB SAFETY ANALYSIS/SITE INSPECTIONS

The URS Site Manager or Site Safety Officer is to conduct a daily job safety analysis (JSA) prior to the start of each shift and document on the form found in Attachment F. Subcontractors are encouraged to participate in this process, including developing JSAs for their specific operations (such as drill rig operations). Example JSAs are available on the HSE website for a variety of tasks. The purpose of the JSA is to identify the steps in the tasks that will be performed, the respective hazards, and methods to eliminate or control the hazards. The JSA will be updated during the shift if new or different tasks or unanticipated hazards are encountered, or if the control measures are inadequate. The completed forms are to be maintained on site until the completion of the project, at which time they are to be placed in the project files.

13.3 BEHAVIOR-BASED SAFETY OBSERVATIONS

A behavior-based observation is to be made at least once a week. Observations may be made by the SSO, PM, other site employees, or subcontractors. Completed forms are intended to be used to spot trends and serve as an aid for health and safety briefings to communicate positive work practices and areas in need for improvement. Completed observations should be submitted electronically to URS via the "Near Miss/Safety Observation" database located on the HSE website homepage. See SMS 72 for additional information.

14.0 RECORDKEEPING

The PM and SSO are responsible for site recordkeeping. Prior to the start of work, they will review this plan; if there are no changes to be made, they will sign the approval form.

All personnel will review the HSP and sign the Safety Plan Compliance Agreement in Attachment B; copies of these forms will be maintained in the project file as noted in Section 12.

The SSO will conduct a Site Safety Briefing in accordance with Section 13 and have all attendees sign the form in Attachment C; copies will be maintained in the project file.

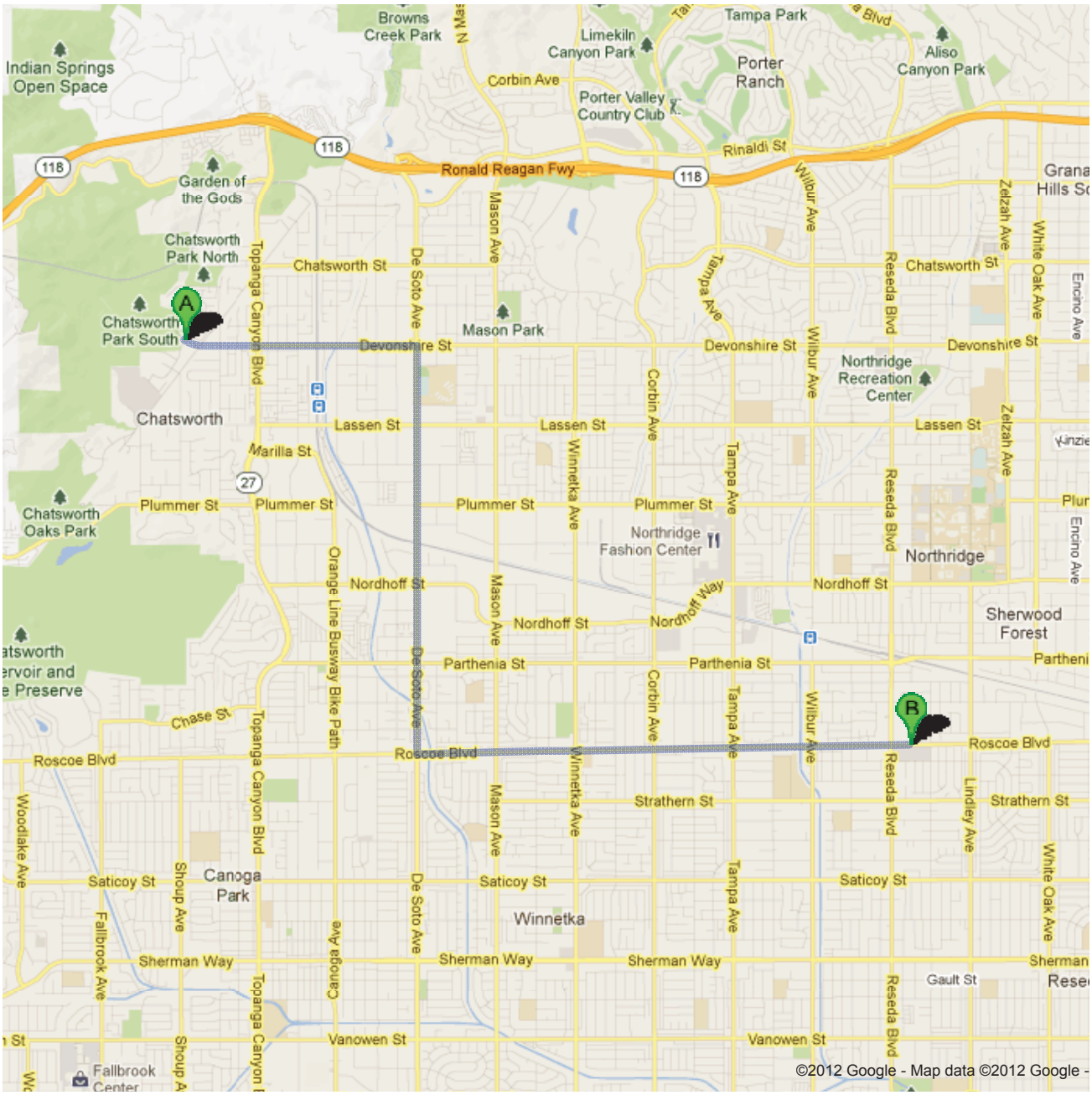
Any incident or exposure incident will be investigated (see SMS 49) will be completed and forwarded to the Office Health and Safety Representative, the RHSEM, and to incidentreport@urscorp.com.

All instrument readings and calibrations, PPE use and changes, health and safety-related issues, and deviations from or problems with this HSP will be recorded in the field log.

ATTACHMENT A

HOSPITAL AND OCCUPATIONAL CLINIC ROUTE MAPS

Directions to Northridge Hospital Medical Center
18300 Roscoe Boulevard, Northridge, CA 91328
7.2 mi – about **17 mins**
Main: 818-885-8500
24 hr ER: 818-885-5396



22360 W Devonshire St, Los Angeles, CA 91311

1.	Head **southeast** on **W Devonshire St**	go 335 ft total 335 ft
2.	Keep left at the fork About 4 mins	go 1.4 mi total 1.5 mi
3.	Turn right onto **De Soto Ave** About 5 mins	go 2.6 mi total 4.1 mi
4.	Turn left onto **Roscoe Blvd** Destination will be on the right About 8 mins	go 3.1 mi total 7.2 mi

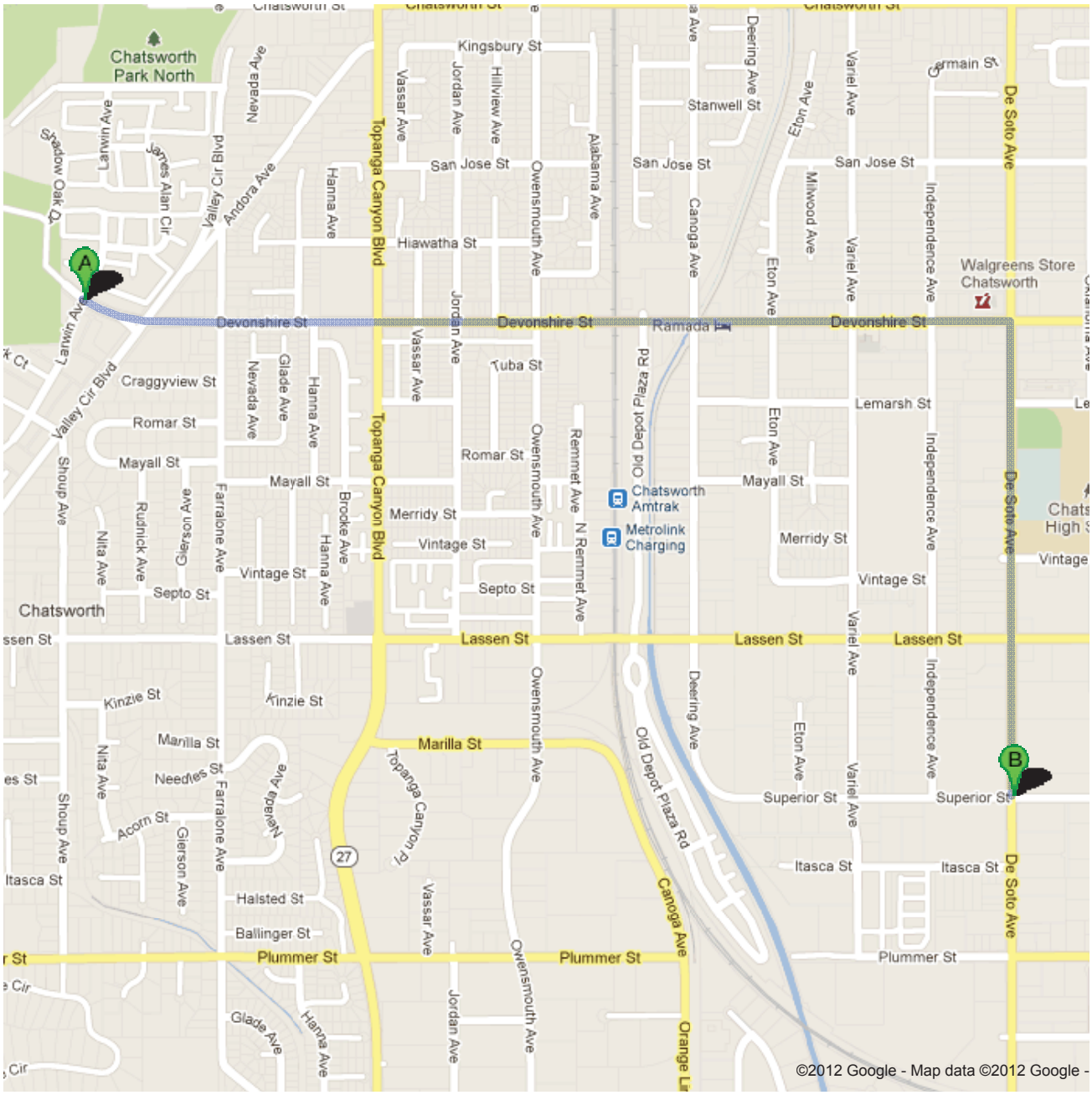
Northridge Hospital Medical Center
18300 Roscoe Boulevard, Northridge, CA 91328

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2012 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Directions to 9700 De Soto Ave, Chatsworth, CA 91311
2.2 mi – about **6 mins**
Workers Comp: 24 hours per day and 7 days per week
Urgent Care Center: 7am to 7pm
Phone: 818-882-8100



22360 W Devonshire St, Los Angeles, CA 91311

1.	Head **southeast** on **W Devonshire St**	go 335 ft total 335 ft
2.	Keep left at the fork About 4 mins	go 1.4 mi total 1.5 mi
3.	Turn right onto **De Soto Ave** Destination will be on the left About 2 mins	go 0.7 mi total 2.2 mi

9700 De Soto Ave, Chatsworth, CA 91311

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2012 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

ATTACHMENT B

SAFETY PLAN COMPLIANCE AGREEMENT

ATTACHMENT B

MEDICAL EMERGENCY CONTACT SHEET AND
SAFETY PLAN COMPLIANCE AGREEMENT FOR
REMEDIAL ACTION PLAN IMPLEMENTATION
CHATSWORTH PARK SOUTH
CHATSWORTH, CALIFORNIA

I, _____, have received a copy of the Health and Safety Plan for this Project. I have reviewed the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the health and safety requirements specified in the plan.

SIGNED: _____ _____
Signature Date

Firm: _____

This brief Medical Emergency Contact Sheet will be kept in the Support Zone during site operations. It is in no way a substitute for medical surveillance program requirements. This data sheet will accompany injured personnel when medical assistance or transport to hospital facilities is necessary.

Emergency Contact: _____ Phone #:_____

Relationship: _____

Do you wear contact lenses? _____

ATTACHMENT C

SITE SAFETY BRIEFING FORM

SITE SAFETY BRIEFING FORM

I have read the Health and Safety Plan for the project and I understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the health and safety requirements specified in the Plan.

	Name	Signature
URS Site Manager		
URS Site Safety Officer		
URS Site Personnel		

SAFETY ISSUES

	DISCUSSED	
	Yes	No
Protective Clothing/Equipment	___	___
Chemical and Physical Hazards	___	___
Control Methods	___	___
Air Monitoring Action Levels and Requirements	___	___
Nearest Phone	___	___
Hospital Name/Address/Directions	___	___

Meeting conducted by: _____ Date: _____

Attendees' Names (print)	**Signatures**

ATTACHMENT D

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Chevron Regular Unleaded Gasoline

MSDS: 2655
Revision #: 34 **Revision Date:** 3/31/2003

Click here to search the product data sheet database

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

CHEVRON REGULAR UNLEADED GASOLINE

Product Number(s): CPS201000 [See Section 16 for Additional Product Numbers]
Synonyms: Calco Regular Unleaded Gasoline

Company Identification
Chevron Products Company
Marketing, MSDS Coordinator
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS applies to: Federal Reformulated Gasoline, California Reformulated Gasoline, Wintertime Oxygenated Gasoline, Low RVP Gasoline and Conventional Gasoline.

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT

Gasoline	86290-81-5	100 %volume
Benzene	71-43-2	0.1 - 4.9 %volume
Ethyl benzene	100-41-4	0.1 - 3 %volume
Naphthalene	91-20-3	0.1 - 2 %volume
Ethanol	64-17-5	0 - 10 %volume
Methyl tert-butyl ether (MTBE)	1634-04-4	0 - 15 %volume
Tertiary amyl methyl ether (TAME)	994-05-8	0 - 17 %volume
Ethyl tert-butyl ether (ETBE)	637-92-3	0 - 18 %volume

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

SECTION 3 HAZARDS IDENTIFICATION

****

EMERGENCY OVERVIEW

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- VAPOR HARMFUL
- CAUSES SKIN IRRITATION
- CAUSES EYE IRRITATION
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN
- TOXIC TO AQUATIC ORGANISMS

****

IMMEDIATE HEALTH EFFECTS

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:
Reproduction and Birth Defects: This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.
Cancer: Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Risk depends on duration and level of exposure. See Section 11 for additional information.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Flammable liquid.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Tagliabue Closed Cup) < -45 °C (< -49 °F)
Autoignition: > 280 °C (> 536 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: 1.4 Upper: 7.6

EXTINGUISHING MEDIA: Dry Chemical, CO2, AFFF Foam or alcohol resistant foam if >15% volume polar solvents (oxygenates).

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be

evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Never siphon gasoline by mouth.
Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Do not store in open or unlabeled containers. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Unusual Handling Hazards: WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'. Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

General Storage Information: DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.
Respiratory Protection: Determine if airborne concentrations are below the recommended exposure limits. If not, wear an approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors.
When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling	Notation
Benzene	ACGIH_TLV	.5 ppm	2.5 ppm		Skin A1
Benzene	OSHA_PEL	1 ppm	5 ppm		
Benzene	OSHA_Z2	10 ppm		25 ppm	
Ethanol	ACGIH_TLV	1000 ppm			A4
Ethanol	OSHA_PEL	1000 ppm			
Ethyl benzene	ACGIH_TLV	100 ppm	125 ppm		A3
Ethyl benzene	OSHA_PEL	100 ppm	125 ppm		
Ethyl tert-butyl ether (ETBE)	ACGIH_TLV	5 ppm			
Gasoline	ACGIH_TLV	300 ppm	500 ppm		A3
Gasoline	OSHA_PEL	300 ppm	500 ppm		

Methyl tert-butyl ether (MTBE)	ACGIH_TLV	50 ppm			A3
Naphthalene	ACGIH_TLV	10 ppm	15 ppm		Skin A4
Naphthalene	OSHA_PEL	10 ppm	15 ppm		
Tertiary amyl methyl ether (TAME)	CHEVRON		50 ppm		

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow
Physical State: Liquid
Odor: Petroleum odor
pH: NA
Vapor Pressure: 5 psi - 15 psi (Typical) @ 37.8°C (100°F)
Vapor Density (Air = 1): 3 - 4 (Typical)
Boiling Point: 37.8°C (100°F) - 204.4°C (400°F) (Typical)
Solubility: Insoluble in water; miscible with most organic solvents.
Freezing Point: NA
Melting Point: NA
Specific Gravity: 0.7 g/ml - 0.8 g/ml @ 15.6°C (60.1°F)
Viscosity: <1 SUS @ 37.8 °C (100°F)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 0/110.
Skin Irritation: For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.
Skin Sensitization: This material did not cause sensitization reactions in a Modified Buehler guinea pig test.
Acute Dermal Toxicity: 24 hour(s) LD50: >3.75g/kg (rabbit).
Acute Oral Toxicity: LD50: >5 ml/kg (rat)
Acute Inhalation Toxicity: 4 hour(s) LD50: >2000ppm (rat).

ADDITIONAL TOXICOLOGY INFORMATION:
Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both

safety and heath hazards. When vapor exposures are low, or short duration and infrequent, such as during refuelling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2, 8 and 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).

NEUROTOXICITY: Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments. In an inhalation study, groups of 6 Fischer rats (3 male. 3 female) were exposed to 2056 ppm of wholy vaporized unleaded gasoline for 6 hours perday, 5 day per week for up to 18 months. Histopathology of the peripheral nervous system and spinal cord revealed no distal axonal neuropthy of the type associated with e xposure to n-hexane even though gasoline contained 1.9% n-hexane. The authors concluded that gasoline treatment may have amplified the incidence and prominence of some naturally occurring age-related (subclinical) in the nervous system. BIRTH DEFECTS AND REPRODUCTIVE TOXICITY: An inhalation study with rats exposed to 0, 400 and 1600 ppm of wholly vaporized unleaded gasoline, 6 hours per day on day 6 through 16 of gestation, showed no teratogenic effects nor indication of toxicity to either the mother or the fetus. Another inhalation study in rats exposed to 3000, 6000, or 9000 ppm of gasoline vapor, 6 hours per day on day 6 through 20 of gestation, also showed no teratogenic effects nor indications of toxicity to either the mother or the fetus.

CHRONIC TOXICITY/CANCER: Wholly vaporized unleaded gasoline was used in a 3 month inhalation study. Groups of 40 rats (20 males, 20 female) and 8 squirrel monkeys (4 male, 4 female) were exposed 6 hours per day and 5 days per week for 13 weeks to 384 or 1552 ppm gasoline. One group of each species served as unexposed controls. The initial conclusion of this study was that inhalation of gasoline at airborne concentrations of up to 1522 ppm caused no toxicity in rats or monkeys. However, further histopathological examination of male rat kidneys on the highest dose group revealed an increased incidence and severity of regenerative epithelium and dilated tubules containing proteinaceous deposits. Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice. The mechanism of this response is still being investigated but it is thought to be an epigenetic process unique to the female mouse.

This exposure also caused kidney damage and eventually kidney cancer in male rats. No other animal model studied has shown these adverse kidney effects and there is no physiological reason to believe that they would occur in man. EPA has concluded that mechanism by which wholly vaporzied unleaded gasoline causes kidney damage is unque to the male rat. The effects in that species (kidney damage and cancer) should not be used in human risk assesment. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have ocurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall class ification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene and 1, 3-butadiene. The actual evidence for carcinogenicity in humans was considered inadequate.

MUTAGENICITY: Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chomosomal aberrations in their bone marrow cells. EPIDEMIOLOGY: To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indic ated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between

mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

The 96 hour(s) LC50 for rainbow trout (Oncorhynchus mykiss) is 2.7 mg/l.
The 48 hour(s) LC50 for water flea (Daphnia magna) is 3.0 mg/l.
The 96 hour(s) LC50 for sheepshead minnow (Cyprinodon variegatus) is 8.3 mg/l.
The 96 hour(s) LC50 for mysid shrimp (Mysidopsis bahia) is 1.8 mg/l.
This material is expected to be toxic to aquatic organisms. Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

ENVIRONMENTAL FATE

This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Name: GASOLINE

DOT Hazard Class: 3 (Flammable Liquid)
DOT Identification Number: UN1203
DOT Packing Group: II

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:
1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

4_I1=IARC Group 1	15=SARA Section 313
4_I2A=IARC Group 2A	16=CA Proposition 65
4_I2B=IARC Group 2B	17=MA RTK
05=NTP Carcinogen	18=NJ RTK
06=OSHA Carcinogen	19=DOT Marine Pollutant
09=TSCA 12(b)	20=PA RTK

The following components of this material are found on the regulatory lists indicated.

Benzene	15, 16, 17, 18, 20, 4_I1, 5, 6
Ethanol	17, 18, 20
Ethyl benzene	15, 17, 18, 20, 4_I2B
Gasoline	17, 18, 20
Methyl tert-butyl ether (MTBE)	15, 17, 18, 20, 9
Naphthalene	15, 16, 17, 18, 20, 4_I2B
Tertiary amyl methyl ether (TAME)	9

CERCLA REPORTABLE QUANTITIES(RQ)/SARA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ

Benzene	10 lbs	None	186 lbs
Ethanol	100 lbs	None	1961 lbs
Ethyl benzene	1000 lbs	None	34964 lbs
Methyl tert-butyl ether (MTBE)	1000 lbs	None	7513 lbs
Naphthalene	100 lbs	None	4000 lbs

CHEMICAL INVENTORIES:
CANADA: All the components of this material are on the Canadian DSL or have been notified under the New Substance Notification Regulations, but have not yet been published in the Canada Gazette.
UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

WHMIS CLASSIFICATION:
Class B, Division 2: Flammable Liquids
Class D, Division 2, Subdivision A: Very Toxic Material - Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material - Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

Additional Product Number(s): CPS201023, CPS201054, CPS201055, CPS201075, CPS201090, CPS201105, CPS201106, CPS201120, CPS201121, CPS201122, CPS201126, CPS201128, CPS201131, CPS201136, CPS201141, CPS201142, CPS201148, CPS201153, CPS201158, CPS201161, CPS201162, CPS201168, CPS201181, CPS201185, CPS201186, CPS201188, CPS201216, CPS201217, CPS201218, CPS201236, CPS201237, CPS201238, CPS201266, CPS201267, CPS201268, CPS201277, CPS201278, CPS201279, CPS201286, CPS201287, CPS201289, CPS201296, CPS201297, CPS201298, CPS201849, CPS201850, CPS201855, CPS201856, CPS201857, CPS204000, CPS204001, CPS204002, CPS204003, CPS204010, CPS204011, CPS204022, CPS204023, CPS204046, CPS204047, CPS204070, CPS204071, CPS204088, CPS204089, CPS204104, CPS204105, CPS204116, CPS204117, CPS204140, CPS204141, CPS204164, CPS204165, CPS204188, CPS204189, CPS204200, CPS204201, CPS204212, CPS204213, CPS204224, CPS204225, CPS204248, CPS204249, CPS204272, CPS204273, CPS204290, CPS204291, CPS204322, CPS204323, CPS2043 24, CPS204350, CPS204352, CPS204354, CPS204356, CPS204358, CPS204359, CPS204364, CPS204365, CPS204370, CPS204371, CPS204376, CPS204377, CPS204382, CPS204383, CPS204388, CPS204389, CPS204394, CPS204395, CPS204400, CPS204401, CPS204406, CPS204407, CPS204412, CPS204413, CPS204418, CPS204419, CPS204424, CPS204425, CPS204430, CPS204431, CPS204436, CPS204437, CPS204442, CPS204446, CPS204450, CPS204454, CPS204458, CPS204462, CPS204466, CPS204467, CPS204484, CPS204485, CPS204502, CPS204503, CPS204520, CPS204521, CPS204538, CPS204539, CPS204556, CPS204557, CPS204574, CPS204575, CPS204592, CPS204593, CPS204610, CPS204611, CPS204628, CPS204629, CPS204646, CPS204647, CPS204664,

CPS204665, CPS204682, CPS204690, CPS204691, CPS204696, CPS204697, CPS204702, CPS204703, CPS204708, CPS204709, CPS204721, CPS204722, CPS204727, CPS204728, CPS241765

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: Section 1 (Product Codes). This Material Safety Data Sheet has been prepared using the ProSteward MSDS system.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	-	Threshold Limit Value	TWA	-	Time Weighted Average
STEL	-	Short-term Exposure Limit	PEL	-	Permissible Exposure Limit
			CAS	-	Chemical Abstract Service Number
NDA	-	No Data Available	NA	-	Not Applicable
<=	-	Less Than or Equal To	>=	-	Greater Than or Equal To

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

123455-22 DIESEL #2, ON-ROAD (LOW SULFUR)
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: DIESEL #2, ON-ROAD (LOW SULFUR)
SUPPLIER: EXXONMOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037
24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296
Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 613-228-1467
MSDS Internet Website: http://emmsds.ihssolutions.com/

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: HYDROCARBONS AND ADDITIVES
GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
DIESEL FUEL (68334-30-5)	100
COMPONENT(S) OF PRODUCT INGREDIENTS INCLUDE:	
NAPHTHALENE (91-20-3)	0.5
ETHYL BENZENE (100-41-4)	0.5

NOTE: Composition may contain up to 0.5% performance additive.
See Section 8 for exposure limits (if applicable).

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3. HAZARDS IDENTIFICATION

This product is considered hazardous according to regulatory guidelines (See Section 15).
EMERGENCY OVERVIEW: Clear (May Be Dyed) Liquid. Material is combustible. Liquid can release vapors that readily form flammable mixtures at or above the flash point. Product can accumulate a static charge which may cause a fire or explosion. DOT ERG No. : 128
POTENTIAL HEALTH EFFECTS: Respiratory irritation, headache, dizziness, nausea, loss of consciousness, and in cases of extreme exposure, possibly death. Diesel exhaust may cause lung cancer. Prolonged, repeated skin contact may result in skin irritation or more serious skin disorders. Low viscosity material-if swallowed may enter the lungs and cause lung damage. Note: This product contains polycyclic aromatic hydrocarbons, some of which have been reported to cause skin cancer in test animals and in humans

under conditions of poor personal hygiene and prolonged repeated contact.
POTENTIAL ENVIRONMENTAL EFFECTS: Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.
For further health effects/toxicological data, see Section 11.

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4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Remove contaminated clothing. Dry wipe exposed skin and cleanse yourself with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. (See Section 16 - Injection Injury)
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.
INGESTION: Seek immediate medical attention. Do not induce vomiting.
NOTE TO PHYSICIANS: Material if aspirated into the lungs may cause chemical pneumonitis. PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE: Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

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5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective, but water should be used to keep fire-exposed containers cool. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Material is combustible. Liquid can release vapors that readily form flammable mixtures at or above the flash point. Product can accumulate a static charge which may cause a fire or explosion.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): > 55(131) (ASTM D-93).
Flammable Limits (approx.% vol.in air) - LEL: 0.6%, UEL: 7.0%
NFPA HAZARD ID: Health: 1, Flammability: 2, Reactivity: 0

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6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free

number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Eliminate sources of ignition. Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Eliminate sources of ignition and warn other ships in the vicinity to stay clear. Notify port and other relevant authorities. Confine with booms if skimming equipment is avaliable to recover the spill. Otherwise disperse in unconfined waters, if permitted by local authorities and environmental agencies. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

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7. HANDLING AND STORAGE

HANDLING: Keep product away from high energy ignition sources, heat, sparks, pilot lights, static electricity, and open flame. Harmful in contact with or if absorbed through the skin. Avoid inhalation of vapors or mists. Use in well ventilated area away from all ignition sources. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Store in a cool area. Avoid sparking conditions. Ground and bond all transfer equipment.

SPECIAL PRECAUTIONS: To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Use the correct grounding procedures. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:
ExxonMobil recommends an 8-hour time-weighted average (TWA) exposure of 500 mg/m3 total vapor (approx. 100 ppm) or 5 mg/m3 stable aerosols.

Substance Name (CAS-No.)	Source	---TWA--- ppm	mg/m3	----STEL--- ppm	mg/m3	NOTE
NAPHTHALENE (91-20-3)						
	OSHA	10	50	15	75	
	ACGIH	10	52	15	79	
ETHYL BENZENE (100-41-4)						
	OSHA	100	435	125	545	
	ACGIH	100	434	125	543	

NOTE: Limits shown for guidance only. Follow applicable regulations.
VENTILATION: Use in well ventilated area with local exhaust ventilation. Ventilation equipment must be explosion proof. Use away from all ignition sources.
RESPIRATORY PROTECTION: Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-contained breathing apparatus may be required for use in confined or enclosed spaces.
EYE PROTECTION: If splash with liquid is possible, chemical type goggles should be worn.
SKIN PROTECTION: Impervious gloves must be worn. If contact is likely oil impervious clothing must be worn. Good personal hygiene practices should always be followed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.
APPEARANCE: Liquid
COLOR: Clear (May Be Dyed)
ODOR: Hydrocarbon
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 149(300)
MELTING POINT C(F): NA
FLASH POINT C(F): > 55(131) (ASTM D-93)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: 0.5
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.82-0.87
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: > 1.0
VISCOSITY AT 100 C, cSt: NE
POUR POINT C(F): < -7(20)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): NA
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Halogens, strong acids, alkalies, and oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

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11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

Repeated dermal application of middle distillates, heating oils and diesel oils to rabbits for 2-4 weeks at up to 1 gm/kg resulted in strong to severe skin irritation with some weight loss at the higher dose. Toxic effects ranging from weight loss to mortality was observed in rabbits treated repeatedly with very high doses (6 gm/kg) of these oils. Repeated inhalation exposure of middle distillate and diesel vapor and aerosol to rats for 2-4 weeks at up to 6 mg/l resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and some reduction in lung function.

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

Diesel fuel vapors were tested in an inhalation teratology (developmental toxicity) study in rats and when only minimal maternal toxicity was observed, no fetotoxic or developmental effects were observed. A developmental toxicity study of dermally applied middle distillates did indicate fetotoxicity (reduced litter size, litter weight, increased resorptions) at doses that also caused significant maternal toxicity.

---CHRONIC TOXICOLOGY (SUMMARY)---

Diesel fuel, heating oil and middle distillates have been shown to be carcinogenic in lifetime mouse skin painting bioassays. While in some cases, the tumor incidence is low in the test populations and possibly associated with skin irritation, concurrent evidence from short-term predicative tests (Modified Ames) does indicate some level of mutagenic activity associated with levels of

polycylic aromatic compounds in certain test samples.

---SENSITIZATION (SUMMARY)---

Middle distillate oils were not skin sensitizers when tested in a Modified Buehler Guinea Pig Sensitization Assay.

---OTHER TOXICOLOGY DATA---

Overexposure to diesel exhaust fumes may result in eye irritation, headaches, nausea, and respiratory irritation. Animal studies involving lifetime exposure to high levels of diesel exhaust have produced variable results, with some studies indicating a potential for lung cancer. Limited evidence from epidemiological studies suggest an association between long-term occupational exposure to diesel engine emissions and lung cancer. Diesel engine exhaust typically consists of gases and particulates, including carbon dioxide, carbon monoxide, nitrogen compounds, oxides of sulfur, and hydrocarbons. Diesel exhaust composition will vary with fuel, engine type, load cycle, engine maintenance, tuning and exhaust gas treatment. Use of adequate ventilation and/or respiratory protection in the presence of diesel exhaust is recommended to minimize exposures. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative substances.

ECOTOXICITY: Based on test results for similar products, this substance may be toxic to aquatic organisms such as algae and daphnia (EL50/ IrL50 =1-10 mg/L). This substance has also been shown to be toxic to specific fish species (LL50 = 1-10 mg/L for rainbow trout, Atlantic silverside).

MOBILITY: Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant.

PERSISTENCE AND DEGRADABILITY: The majority of the components in this product would be expected to be inherently biodegradable. The consitituents of diesel fuels/heating oil which are volatilized will photodegrade in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning for fuel value in compliance with applicable laws and regulations.

RCRA INFORMATION: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).

FLASH: > 55(131) C(F)

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14. TRANSPORT INFORMATION

NOTE:The flash point of this material is > 131F. Regulatory classifications vary as follows:
DOT: Flammable Liquid OR Combustible Liquid - (49CFR 173.120(b)(2))
OSHA: Combustible Liquid
IATA/IMO: Flammable Liquid
USA DOT:

SHIPPING NAME:	Diesel Fuel
HAZARD CLASS & DIV:	COMBUSTIBLE LIQUID
ID NUMBER:	NA1993
ERG NUMBER:	128
PACKING GROUP:	PG III
STCC:	NE
DANGEROUS WHEN WET:	No
POISON:	No
LABEL(s):	NA
PLACARD(s):	Combustible
PRODUCT RQ:	NA
MARPOL III STATUS:	NA

RID/ADR:

HAZARD CLASS:	3
PACKING GROUP:	III
LABEL:	3
DANGER NUMBER:	30
UN NUMBER:	1202
SHIPPING NAME:	Gas Oil
REMARKS:	NA

IMO:

HAZARD CLASS & DIV:	3
UN NUMBER:	1202
PACKING GROUP:	PG III
SHIPPING NAME:	Gas Oil
LABEL(s):	Flammable Liquid
MARPOL III STATUS:	NA

ICAO/IATA:

HAZARD CLASS & DIV:	3
ID/UN Number:	1202
PACKING GROUP:	PG III
SHIPPING NAME:	Gas Oil
SUBSIDIARY RISK:	NA
LABEL(s):	Flammable Liquid

STATIC ACCUMULATOR (50 picosiemens or less): YES

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.
EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.
Symbol: Xn N Harmful, Dangerous for the environment.
Risk Phrase(s): R40-65-66-51/53.
Limited evidence of a carcinogenic effect. Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or

cracking. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): S24-2-36/37-62.
Avoid contact with skin. Keep out of the reach of children. Wear suitable protective clothing and gloves. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Contains: Gas oil - unspecified.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".
SARA (311/312) REPORTABLE HAZARD CATEGORIES:
FIRE CHRONIC ACUTE
This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
ETHYL BENZENE(COMPONENT ANALYSIS)	100-41-4	0.5%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
NAPHTHALENE (COMPONENT ANALYSIS) (0.50%)	91-20-3	16, 22
ETHYL BENZENE (COMPONENT ANALYSIS)	100-41-4	1, 8, 24
DIESEL OIL..C9-20	68334-30-5	21, 26

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

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16. OTHER INFORMATION

USE: DIESEL FUEL
NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.
Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.
Precautionary Label Text:
CONTAINS DIESEL OIL.. C9-20
WARNING!
COMBUSTIBLE LIQUID AND VAPOR. RESPIRATORY IRRITATION, HEADACHE, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME

EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.
MAY CAUSE SKIN CANCER ON PROLONGED, REPEATED SKIN CONTACT. ANIMAL SKIN ABSORPTION STUDIES RESULTED IN INCREASED MORTALITY, EFFECTS ON BODY WEIGHT, THE IMMUNE SYSTEM AND THE UNBORN CHILD. PROLONGED, REPEATED SKIN CONTACT MAY CAUSE IRRITATION. DIESEL EXHAUST MAY CAUSE LUNG CANCER.
Keep away from heat and flame. Avoid prolonged or repeated overexposure by skin contact or inhalation. Use with adequate ventilation. Keep container closed. Keep out of reach of children.
FIRST AID: If inhaled, remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. In case of contact, remove contaminated clothing. Dry wipe the exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself and others. Wear impervious gloves. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a physician.
This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

****
For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: C, TRN: 123455-22, CMCS97: EMGF22, REQ: PS+C, SAFE USE: C
EHS Approval Date: 22JUL2002
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Legally required information is given in accordance with applicable Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending any license under valid patents. Appropiate warnings and safe handling procedures should be providedto handlers and users. Use or re-transmission of the information contained herein in any other format than the format as presented is strictly prohibited. ExxonMobil neither represents nor warrants that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.
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ALCONOX

MATERIAL SAFETY DATA SHEET

Section 1 – PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ALCONOX

GENERAL USE: Detergent Cleaner
PRODUCT DESCRIPTION: White granular powder mixture, practically odorless

MANUFACTURERS NAME: Alconox, Inc	DATE PREPARED: October 8, 2003	Page 1 of 4
STREET ADDRESS: 30 Glenn St. Suite 309	TELEPHONE NUMBER FOR INFORMATION ++914-948-4040	
CITY, STATE, ZIP, COUNTRY White Plains, NY 10603 USA	EMERGENCY TELEPHONE NUMBER CHEM-TEL (800) 255-3924 Outside USA ++813-248-0573	
DISTRIBUTOR NAME: same unless filled in		
STREET ADDRESS:	TELEPHONE NUMBER FOR INFORMATION	
CITY, STATE, ZIP, COUNTRY	EMERGENCY TELEPHONE NUMBER	

SECTION 2 – HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	CAS #	% By Wt	OSHA PEL		ACGIH TWA		SARA TITLE III	RQ LBS.
			ppm	mg/m^3	ppm	mg/m^3		
Sodium phosphate, tribasic (a)	7758-29-40	10-30	N/E					5000
Sodium carbonate (nuisance dust)	497-19-8	7-13		15				
Sodium dodecylbenzene sulfonate (a)	25155-30-0	10-30	N/E					1000
Tetrasodium phosphate	7722-88-5	10-30		5				
(a) see Section 15			N/E not established					

SECTION 3 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Granular powder, airborne dust particles are harmful and irritating to respiratory tract. Contact with eyes and skin may cause irritation. Hazard symbols for this product XI,XN.

POTENTIAL HEALTH EFFECTS

INHALATION: Breathing airborne particles or dust from mixing, spraying, sanding, grinding, etc., may cause irritation to the respiratory tract

SKIN: : None expected, however, prolonged contact may cause irritation

EYES: Contact with eyes may cause irritation

INGESTION: May cause gastric distress, stomach pains, vomiting and diarrhea

CARCINOGENICITY NTP? No IARC (MONOGRAPHS)? No OSHA REGULATED? No

MATERIAL SAFETY DATA SHEET

SECTION 4 – FIRST AID MEASURES

INHALATION: Remove affected person to fresh air; if symptoms persist seek medical attention

SKIN: Remove contaminated clothing; wash affected area with soap and water; launder contaminated clothing before reuse; if irritation persists seek medical attention

EYES: Remove contact lenses. Flush eyes with clear running water for 15 minutes while holding eyelids open; if irritation persists, seek medical attention

INGESTION: Give two glasses of water for dilution; DO NOT induce vomiting

SECTION 5 – FIRE FIGHTING MEASURES

FLASH POINT (METHOD USED) Non-flammable	FLAMMABLE LIMITS LEL: NOT APPLICABLE UEL: NOT APPLICABLE	
	AUTOIGNITION TEMPERATURE: Not Determined	NFPA CLASS: none

GENERAL HAZARDS: Product is not considered flammable or combustible. Products of combustion include compounds of carbon, hydrogen and oxygen, including carbon monoxide.

EXTINGUISHING MEDIA: Carbon dioxide, water, water fog, dry chemical, chemical foam

FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS; NONE

HAZARDOUS COMBUSTION PRODUCTS: Smoke, fumes, oxides of carbon

SECTION 6 – ENVIRONMENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Confine and segregate product for reuse; place material into approved containers for disposal; for spills in excess of allowable limits (RQ) notify the National Response Center @ (800) 424-8802; refer to CERCLA 40 CFT 302 for detailed instructions

SECTION 7 – HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Keep container closed when not in use; protect containers from abuse; store containers in cool, dry area. Keep this and other chemicals out of reach of children.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

The use of local exhaust ventilation and airborne particle collection is recommended. No other special controls are indicated.

PERSONAL PROTECTION

RESPIRATORY PROTECTION (SPECIFY TYPE): NIOSH approved respirator designed to remove airborne particulate present in excess of maximum allowable concentrations due to operations such as mixing, spraying, sanding, buffing, etc. Refer to 29 CFR 1910 134 or European Standard EN 149 for regulations.

PROTECTIVE GLOVES: Neoprene or rubber gloves

EYE PROTECTION: Safety goggles with side shields

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Safety eyebath nearby

WORK/HYGENIC PRACTICES: Practice safe workplace habits. Minimize body contact with this, as well as all chemicals in general

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: ALCONOX
October 8, 2003

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

VAPOR PRESSURE (MM Hg) Not Applicable	VAPOR DENSITY (AIR = 1) Not Applicable
SPECIFIC GRAVITY (WATER = 1) 0.85-1.10	EVAPORATION RATE (WATER = 1) Not Applicable
SOLUBILITY IN WATER Complete to > 10% w/w	FREEZING POINT Not Applicable
pH: 9.5 (1% aqueous solution)	PHYSICAL STATE: Granular Powder
BOILING POINT Not Applicable	APPEARANCE AND ODOR White granular powder, practically odorless
VISCOSITY Not Applicable	VOLATILE ORGANIC COMPOUNDS (VOC) None

SECTION 10 – STABILITY AND REACTIVITY

STABILITY UNSTABLE STABLE XXX	CONDITIONS TO AVOID Store in a cool dry area

INCOMPATABILITY (Materials to Avoid)
Strong oxidizers, strong acids

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Decomposition will no occur if handled and stored properly. In case of fire, oxides of carbon, hydrocarbons, fumes, and smoke may be produced.

HAZARDOUS POLYMERIZATION MAY OCCUR WILL NOT OCCUR XXX	CONDITIONS TO AVOID None

SECTION 11 – TOXICOLOGICAL INFORMATION

Hazardous Ingredients	%	CAS #	LD50 of Ingredient (Species and Route)	LC50 of Ingredient (Species and Route)
Sodium phosphate, tribasic (a)	10-30	7758-29-4	3100 mg/kg oral –rat	Not established
Sodium carbonate (Nuisance Dust)	7-13	497-19-8	4020 mg/kg	1200 mg/m3/2H
Sodium dodecylbenzene sulfonate (a)	10-30	25155-30-0	Not Established	Not Established
Tetrasodium phosphate	10-30	7722-88-5	Not Established	Not established
Mixture as a whole	100%	various	>5.0 g/kg oral-rat	

SECTION 12 – ECOLOGICAL INFORMATION

No data are available on the adverse effects of this material on the environment. Neither COD nor BOD data are available. Based on the chemical composition of their product it is assumed that the mixture can be treated in an acclimatized biological waste treatment plant system in limited quantities. However treatment should be evaluated and approved for each specific biological system. None of the ingredients in this mixture are classified as a Marine Pollutant.

SECTION 13 – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: Dispose of in accordance with Local, State , and Federal regulations. Do not flush to waterway. Refer to “40 CFR Protection of Environment Parts 260 – 299” for disposal regulations in the US. Consult your Local, State, and Federal Environmental Protection Agency before disposing of any chemicals.

SECTION 14 – TRANSPORT INFORMATION

PROPER SHIPPING NAME: Not Regulated	IATA HAZARD CLASS / Pack Group: None
HAZARD CLASS / Pack Group: None / None	IMDG HAZARD CLASS: None
REFERENCE: Not Applicable	RID/ADR Dangerous Goods Code: None
IDENTIFICATION NUMBER: None	Canadian TDG Class / Division: None
LABEL: None Required	HAZARD SYMBOLS: None

Note: Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 – 177, IMDG, IATA, EC, Canadian TDG, and United Nations TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging and materials and methods of shipping.

MATERIAL SAFETY DATA SHEET

SECTION 15 – REGULATORY INFORMATION

TSCA (Toxic Substances Control Act):
Components of this product are listed on the TSCA inventory

SARA TITLE III (Superfund Amendments and Reauthorization Act)
311/312 Hazard Categories
Acute Health

313 Reportable Ingredients
None

CERCLA (Comprehensive Response Compensation and Liability Act)
(a) The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) has notification requirements for releases or spills to the environment of the Reportable Quantity (RQ for this mixture = 6,000 lbs) or greater amounts, according to 40 CFR 302

CPR (Canadian Controlled Products Regulations)
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled products Regulations

EINECS (European Inventory of Existing Commercial Chemical Substances)
Components of this product are on the European Inventory of Existing Commercial Chemical substances

AICS (Australian Inventory of Chemical Substances)
Components of this product are on the Australian Inventory of Chemical substances

EC Risk Phrases
R20 Harmful by Inhalation
R36 Irritating to eyes
R37 Irritating to respiratory system
R38 Irritating to skin

EC Safety Phrases
S8 Keep container dry
S22 Do not breath dust
S24 Avoid contact with skin
S25 Avoid contact with eyes

SECTION 16 – OTHER INFORMATION

No Specific Notes

HMIS HAZARD RATINGS	HEALTH	1	0= insignificant	3= high
	FLAMMABILITY	0	1= slight	4= extreme
	REACTIVITY	0	2= moderate	
	PERSONAL PROTECTIVE EQUIPMENT	B	Safety Glasses, Gloves	

REVISION SUMMARY — This MSDS has been revised in the following sections:
No revisions available

MSDS prepared by manufacturer

The information contained herein is believed to be accurate but is not warranted to be so. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed.

Material Safety Data Sheet

24 Hour Assistance:
1-847-367-7700
Rust-Oleum Corp.
www.rustoleum.com

1. Identification

Product Name: PRO LSPR 12PK MARK FLUOR RED-OR CONT PK

Revision Date: 6/11/2012

Identification Number: P2558852

Product Use/Class: Marking Paint/Aerosols

Supplier:
Rust-Oleum Corporation
11 Hawthorn Parkway
Vernon Hills, IL 60061
USA

Manufacturer:
Rust-Oleum Corporation
11 Hawthorn Parkway
Vernon Hills, IL 60061
USA

Preparer: Regulatory Department

2. Hazard Identification

EMERGENCY OVERVIEW: Harmful if swallowed. Extremely flammable liquid and vapor. Vapors may cause flash fire or explosion. Harmful if inhaled. May affect the brain or nervous system causing dizziness, headache or nausea. Contents Under Pressure.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Causes eye irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: Substance may cause slight skin irritation. Prolonged or repeated contact may cause skin irritation.

EFFECTS OF OVEREXPOSURE - INHALATION: Harmful if inhaled. High gas, vapor, mist or dust concentrations may be harmful if inhaled. Avoid breathing vapors or mists. High vapor concentrations are irritating to the eyes, nose, throat and lungs.

EFFECTS OF OVEREXPOSURE - INGESTION: Substance may be harmful if swallowed. Aspiration hazard if swallowed; can enter lungs and cause damage.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: Overexposure to xylene in laboratory animals has been associated with liver abnormalities, kidney, lung, spleen, eye and blood damage as well as reproductive disorders. Effects in humans, due to chronic overexposure, have included liver, cardiac abnormalities and nervous system damage. IARC lists Ethylbenzene as a possible human carcinogen (group 2B). Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage.

PRIMARY ROUTE(S) OF ENTRY: Eye Contact, Ingestion, Inhalation, Skin Absorption, Skin Contact

3. Composition/Information On Ingredients

Chemical Name	CAS-No.	Weight % Less Than	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING
Liquefied Petroleum Gas	68476-86-8	30.0	N.E.	N.E.	N.E.	N.E.
Aliphatic Hydrocarbon	64742-89-8	20.0	100 ppm	N.E.	100 ppm	N.E.
Limestone	1317-65-3	20.0	10 mg/m3 [Total Dust]	N.E.	5 mg/m3 [Respirable]	N.E.
Talc	14807-96-6	10.0	2 mg/m3	N.E.	0.1 mg/m3 [Respirable]	N.E.
Acetone	67-64-1	10.0	500 ppm	750 ppm	1000 ppm	N.E.
n-Butyl Acetate	123-86-4	5.0	150 ppm	200 ppm	150 ppm	N.E.
Hydrotreated Light Distillate	64742-47-8	5.0	200 mg/m3	N.E.	N.E.	N.E.

Naphtha, Petroleum, Hydrotreated Light	64742-49-0	5.0	200 mg/m3	N.E.	N.E.	N.E.
Xylene	1330-20-7	5.0	100 ppm	150 ppm	100 ppm	N.E.
Stoddard Solvents	8052-41-3	5.0	100 ppm	N.E.	500 ppm	N.E.
Ethylbenzene	100-41-4	1.0	20 ppm	125 ppm	100 ppm	N.E.

4. First-aid Measures

FIRST AID - EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes holding eyelids open. Get medical attention. Do NOT allow rubbing of eyes or keeping eyes closed.

FIRST AID - SKIN CONTACT: Wash with soap and water. Get medical attention if irritation develops or persists.

FIRST AID - INHALATION: If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical assistance immediately.

FIRST AID - INGESTION: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. Get immediate medical attention.

5. Fire-fighting Measures

Flash Point, °F -156 (Setaflash)

EXTINGUISHING MEDIA: Alcohol Foam, Carbon Dioxide, Dry Chemical, Water Fog

UNUSUAL FIRE AND EXPLOSION HAZARDS: FLASH POINT IS LESS THAN 20 °. F. - EXTREMELY FLAMMABLE LIQUID AND VAPOR! Water spray may be ineffective. Closed containers may explode when exposed to extreme heat. Vapors may form explosive mixtures with air. Vapors can travel to a source of ignition and flash back. Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Perforation of the pressurized container may cause bursting of the can.

SPECIAL FIREFIGHTING PROCEDURES: Evacuate area and fight fire from a safe distance.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Remove all sources of ignition, ventilate area and remove with inert absorbent and non-sparking tools. Dispose of according to local, state (provincial) and federal regulations. Do not incinerate closed containers.

7. Handling and Storage

HANDLING: Wash thoroughly after handling. Wash hands before eating. Use only in a well-ventilated area. Follow all MSDS/label precautions even after container is emptied because it may retain product residues. Avoid breathing vapor or mist.

STORAGE: Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Do not store above 120 ° F. Store large quantities in buildings designed and protected for storage of NFPA Class I flammable liquids. Contents under pressure. Do not expose to heat or store above 120 ° F.

8. Exposure Controls/Personal Protection

ENGINEERING CONTROLS: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof ventilation equipment. Prevent build-up of vapors by opening all doors and windows to achieve cross-ventilation.

RESPIRATORY PROTECTION: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or in any other circumstances where air purifying respirators may not provide adequate protection.

SKIN PROTECTION: Use impervious gloves to prevent skin contact and absorption of this material through the skin. Nitrile or Neoprene gloves may afford adequate skin protection.

EYE PROTECTION: Use safety eyewear designed to protect against splash of liquids.

OTHER PROTECTIVE EQUIPMENT: Refer to safety supervisor or industrial hygienist for further information regarding personal protective equipment and its application.

HYGIENIC PRACTICES: Wash thoroughly with soap and water before eating, drinking or smoking.

9. Physical and Chemical Properties

Vapor Density	Heavier than Air	**Odor:**	Solvent Like
Appearance:	Aerosolized Mist	**Evaporation Rate:**	Faster than Ether
Solubility in Water:	Slight	**Freeze Point:**	N.D.
Specific Gravity:	0.868	**pH:**	N.A.
Physical State:	Liquid		

(See section 16 for abbreviation legend)

10. Stability and Reactivity

CONDITIONS TO AVOID: Avoid temperatures above 120 ° F. Avoid all possible sources of ignition.

INCOMPATIBILITY: Incompatible with strong oxidizing agents, strong acids and strong alkalies.

HAZARDOUS DECOMPOSITION: By open flame, carbon monoxide and carbon dioxide. When heated to decomposition, it emits acrid smoke and irritating fumes.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

11. Toxicological Information

Chemical Name	LD50	LC50
Liquefied Petroleum Gas	N.E.	N.E.
Aliphatic Hydrocarbon	>5000 mg/kg (Rat, Oral)	N.E.
Limestone	>5000 mg/kg (Rat, Oral)	N.E.
Talc	N.E.	TCLo: 11 mg/m3 (Inhalation)
Acetone	5800 mg/kg (Rat)	50100 mg/m3 (Rat, 8Hr)
n-Butyl Acetate	13100 mg/kg (Rat, Oral)	2000 ppm (Rat, Inhalation, 4 Hr)
Hydrotreated Light Distillate	>3160 mg/kg (Skin)	N.E.
Naphtha, Petroleum, Hydrotreated Light	N.E.	N.E.
Xylene	4300 mg/kg (Rat, Oral)	5000 ppm (Rat, Inhalation, 4Hr)

Stoddard Solvents	>5000 mg/kg (Rat, Oral)	N.E.
Ethylbenzene	3500 mg/kg (Rat, Oral)	N.E.

12. Ecological Information

ECOLOGICAL INFORMATION: Product is a mixture of listed components.

13. Disposal Information

DISPOSAL INFORMATION: Dispose of material in accordance to local, state and federal regulations and ordinances. Do not allow to enter storm drains or sewer systems.

14. Transport Information

	Domestic (USDOT)	International (IMDG)	Air (IATA)
Proper Shipping Name:	Consumer Commodity	Aerosols	Aerosols
Hazard Class:	ORM-D	2.1	2.1
UN Number:	N.A.	UN1950	UN1950
Packing Group:	N.A.	N.A.	N.A.
Limited Quantity:	No	Yes	Yes

15. Regulatory Information

U.S. Federal Regulations:

CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA ' Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Fire Hazard, Pressure Hazard, Acute Health Hazard, Chronic Health Hazard

SARA SECTION 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

No Sara 313 components exist in this product.

TOXIC SUBSTANCES CONTROL ACT:

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

No TSCA 12(b)components exist in this product.

International Regulations:

CANADIAN WHMIS:

This MSDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

Canadian WHMIS Class: AB5 D2A

16. Other Information

HMIS Ratings:

Health:	2*	**Flammability:**	4	**Physical Hazard:**	0	**Personal Protection:**	X

NFPA Ratings:

Health:	2	**Flammability:**	4	**Instability**	0

VOLATILE ORGANIC COMPOUNDS, g/L: 522

REASON FOR REVISION: Regulatory Update

Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

Rust-Oleum Corporation believes, to the best of its knowledge, information and belief, the information contained herein to be accurate and reliable as of the date of this material safety data sheet. However, because the conditions of handling, use, and storage of these materials are beyond our control, we assume no responsibility or liability for personal injury or property damage incurred by the use of these materials. Rust-Oleum Corporation makes no warranty, expressed or implied, regarding the accuracy or reliability of the data or results obtained from their use. All materials may present unknown hazards and should be used with caution. The information and recommendations in this material safety data sheet are offered for the users' consideration and examination. It is the responsibility of the user to determine the final suitability of this information and to comply with all applicable international, federal, state, and local laws and regulations.

QUIKRETE®
CEMENT & CONCRETE PRODUCTS™

Portland Cement Based Concrete Products

MATERIAL SAFETY DATA SHEET
(Complies with OSHA 29 CFR 1910.1200)

SECTION I: PRODUCT IDENTIFICATION

The QUIKRETE® Companies
One Securities Centre
3490 Piedmont Road, Suite 1300
Atlanta, GA 30329

Emergency Telephone Number
(770) 216-9580

Information Telephone Number
(770) 216-9580

MSDS J1
Revision: Feb-09

QUIKRETE® Product Name	Code #
CONCRETE MIX	1101
FENCE POST MIX	1005
FIBER-REINFORCED CONCRETE MIX	1006
CRACK RESISTANT CONCRETE MIX	1006-80
QUIKRETE 5000 CONCRETE MIX	1007
LIGHTWEIGHT CONCRETE MIX	1008
HANDICRETE CONCRETE MIX	1141
B-CRETE	1101-81
PRO-FINISH QUIKRETE 5000	1007-85
BASIC CONCRETE MIX	1015
RIP RAP	1129
ALL-STAR CONCRETE MIX	1122
RIP RAP SCRIM	1134-80
FIBER REINFORCED DECK MIX	1250-80
PRO-FINISH CRACK RESISTANT CONCRETE MIX	1006-68
COUNTERTOP MIX	1106-80
RITEMIX CONCRETE	1171-60
GREEN CONCRETE MIX	1101-63

Product Use: Portland cement-based, aggregated products for general construction

SECTION II - HAZARD IDENTIFICATION

Route(s) of Entry: Inhalation, Skin, Ingestion
Acute Exposure: Product becomes 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. Toxic effects noted in animals include, for acute exposures, alveolar damage with pulmonary edema.
Chronic Exposure: Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis.

Carcinogenicity: Since Portland cement and blended cements are manufactured from raw materials mined from the earth (limestone, marl, sand, shale, etc.) and process heat is provided by burning fossil fuels, trace, but detectable, amounts of naturally occurring, and possibly harmful, elements may be found during chemical analysis. Under ASTM standards, Portland cement may contain 0.75 % insoluble residue. A fraction of these residues may be free crystalline silica. Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs and possibly cancer. There is evidence that exposure to respirable silica or the disease silicosis is associated with an increased incidence of Scleroderma, tuberculosis and kidney disorders.

Carcinogenicity Listings:		
	NTP:	Known carcinogen
	OSHA:	Not listed as a carcinogen
	IARC Monographs:	Group 1 Carcinogen
	California Proposition 65:	Known carcinogen

NTP: The National Toxicology Program, in its "Ninth Report on Carcinogens" (released May 15, 2000) concluded that "Respirable crystalline silica (RCS), primarily quartz dusts occurring in industrial and occupational settings, is *known to be a human carcinogen*, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to RCS and increased lung cancer rates in workers exposed to crystalline silica dust (reviewed in IAC, 1997; Brown *et al*., 1997; Hind *et al*., 1997)

IARC: The International Agency for Research on Cancer ("IARC") concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz or cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is *carcinogenic to humans (*Group 1)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances or studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates." (1997)

Signs and Symptoms of Exposure: Symptoms of excessive exposure to the dust include shortness of breath and reduced pulmonary function. Excessive exposure to skin and eyes especially when mixed with water can cause caustic burns as severe as third degree.

Medical Conditions Generally Aggravated by Exposure: Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure. Exposure to crystalline silica or the disease silicosis is associated with increased incidence of scleroderma, Tuberculosis and possibly increased incidence of kidney lesions.

Chronic Exposure: Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis. (May contain trace (<0.05 %) amounts of chromium salts or compounds including hexavalent chromium, or other metals found to be hazardous or toxic in some chemical forms. These metals are mostly present as trace substitutions within the principal minerals)

Medical Conditions Generally Aggravated by Exposure: Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure.

SECTION III - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components	CAS No.	PEL (OSHA) mg/M^3	TLV (ACGIH) mg/M^3
Portland Cement	65997-15-1	5	5
Lime	01305-62-0	5	5
Silica Sand, crystalline	14808-60-7	$\frac{10}{\%SiO_2+2}$	0.05 (respirable)
May contain one or more of the following ingredients:			
Amorphous Silica (From fly Ash)	07631-86-9	$\frac{80}{\%SiO_2+2}$	10
Alumina (From Fly Ash)	01344-28-1	5	5
Limestone Dust	01317-65-3	5	5
Calcium Sulfate	10101-41-4 or 13397-24-5	5	5

Other Limits: National Institute for Occupational Safety and Health (NIOSH). Recommended standard maximum permissible concentration=0.05 mg/M^3 (respirable free silica) as determined by a full-shift sample up to 10-hour working day, 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica.

SECTION IV – First Aid Measures

Eyes: Immediately flush eye thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.
Skin: Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation or inflammation develops or persists. Seek immediate medical treatment in the event of burns.
Inhalation: Remove person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Seek medical help if coughing and other symptoms do not subside. Inhalations of large amounts of Portland cement require immediate medical attention.
Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

SECTION V - FIRE AND EXPLOSION HAZARD DATA

Flammability: Noncombustible and not explosive.
Auto-ignition Temperature: Not Applicable
Flash Points: Not Applicable

SECTION VI – ACCIDENTAL RELEASE MEASURES

If spilled, use dustless methods (vacuum) and place into covered container for disposal (if not contaminated or wet). Use adequate ventilation to keep exposure to airborne contaminants below the exposure limit.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND STORAGE

Do not allow water to contact the product until time of use. DO NOT BREATHE DUST. In dusty environments, the use of an OSHA, MSHA or NIOSH approved respirator and tight fitting goggles is recommended.

SECTION VIII – EXPOSURE CONTROL MEASURES

Engineering Controls: Local exhaust can be used, if necessary, to control airborne dust levels.

Personal Protection: The use of barrier creams or impervious gloves, boots and clothing to protect the skin from contact is recommended. Following work, workers should shower with soap and water. Precautions must be observed because burns occur with little warning -- little heat is sensed.

WARN EMPLOYEES AND/OR CUSTOMERS OF THE HAZARDS AND REQUIRED OSHA PRECAUTIONS ASSOCIATED WITH THE USE OF THIS PRODUCT.

Exposure Limits: Consult local authorities for acceptable exposure limits

SECTION IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Appearance: Gray to gray-brown colored powder; Some products contain coarse aggregates.

Specific Gravity:	2.6 to 3.15	**Melting Point:**	>2700°F
Boiling Point:	>2700°F	**Vapor Pressure:**	Not Available
Vapor Density:	Not Available	**Evaporation Rate:**	Not Available
Solubility in Water:	Slight	**Odor:**	Not Available

SECTION X - REACTIVITY DATA

Stability: Stable.
Incompatibility (Materials to Avoid): Contact of silica with powerful oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, or oxygen difluoride may cause fires
Hazardous Decomposition or By-products: Silica will dissolve in Hydrofluoric Acid and produce a corrosive gas – silicon tetrafluoride.
Hazardous Polymerization: Will Not Occur.
Condition to Avoid: Keep dry until used to preserve product utility.

SECTION XI – TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, Ingestion
Toxicity to Animals:
LD50: Not Available
LC50: Not Available
Chronic Effects on Humans: Conditions aggravated by exposure include eye disease, skin disorders and Chronic Respiratory conditions.
Special Remarks on Toxicity: Not Available

SECTION XII – ECOLOGICAL INFORMATION

Ecotoxicity: Not Available
BOD5 and COD: Not Available
Products of Biodegradation: Not available
Toxicity of the Products of Biodegradation: Not available
Special Remarks on the Products of Biodegradation: Not available

SECTION XIII – DISPOSAL CONSIDERATIONS

Waste Disposal Method: The packaging and material may be land filled; however, material should be covered to minimize generation of airborne dust. This product is not classified as a hazardous waste under the authority of the RCRA (40CFR 261) or CERCLA (40CFR 117&302).

SECTION XIV – TRANSPORT INFORMATION

Not hazardous under U.S. DOT and TDG regulations.

SECTION XV – OTHER REGULATORY INFORMATION

US OSHA 29CFR 1910.1200: Considered hazardous under this regulation and should be included in the employers' hazard communication program
SARA (Title III) Sections 311 & 312: Qualifies as a hazardous substance with delayed health effects
SARA (Title III) Section 313: Not subject to reporting requirements
TSCA (May 1997): Some substances are on the TSCA inventory list
Federal Hazardous Substances Act: Is a hazardous substance subject to statues promulgated under the subject act
Canadian Environmental Protection Act: Not listed
Canadian WHMIS Classification: Considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class D2A, E- Corrosive Material) and subject to the requirements of Health Canada's Workplace Hazardous Material Information (WHMIS). This product has been classified according to the hazard criteria of the Controlled Products Regulation (CPR). This document complies with the WHMIS requirements of the Hazardous Products Act (HPA) and the CPR.

SECTION XVI – OTHER INFORMATION

HMIS-III:

Health –
0 = No significant health risk
1 = Irritation or minor reversible injury possible
2 = Temporary or minor injury possible
3 = Major injury possible unless prompt action is taken
4 = Life threatening, major or permanent damage possible

Flammability-
0 = Material will not burn
1 = Material must be preheated before ignition will occur
2 = Material must be exposed to high temperatures before ignition
3 = Material capable of ignition under normal temperatures
4 = Flammable gases or very volatile liquids; may ignite spontaneously

Physical Hazard-
0 = Material is normally stable, even under fire conditions

1 = Material normally stable but may become unstable at high temps
2 = Materials that are unstable and may undergo react at room temp
3 = Materials that may form explosive mixtures with water
4 = Materials that are readily capable of explosive water reaction

Abbreviations:

ACGIH	American Conference of Government Industrial Hygienists
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CPR	Controlled Products Regulations (Canada)
DOT	Department of Transportation
IARC	International Agency for Research
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TWA	Time-weighted Average
WHMIS	Workplace Hazardous Material Information System

Revision #07-01, supersedes all previous revisions
Created: 10/25/2006
Last Updated: February 25, 2009

NOTE: The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to silica contained in our products.

PURPLE PRIMER FOR CPVC/PVC PIPE,019 CEZ-12

Product and Company Identification
Composition/Information on Ingredients
Hazards Identification
First Aid Measures
Fire Fighting Measures
Accidental Release Measures
Handling and Storage
Exposure Controls/Personal Protection
Physical and Chemical Properties
Stability and Reactivity
Toxicological Information
Ecological Information
Disposal Considerations
Transport Information
Regulatory Information
Other Information / Hazmat Info / Hazcom Label

MSDS Safety Information

FSC:	8010
MSDS Date:	04/12/1995
MSDS Num:	CFYKT
Submitter:	D DG
LIIN:	00D007137
Tech Review:	01/22/1998
Status CD:	C
MFN:	01
Article:	N
Kit Part:	N
Responsible Party	51947
Name:	HARVEY WILLIAM H CO
Address:	4350 LAFAYETTE AVE
City:	OMAHA
State:	NE
Zip:	68131-1026
Country:	US
Info Phone Number	402-553-0479 / FAX 402-553-4826
Emergency Phone Number	402-553-0479/800-424-9300(CHEMTREC)
Preparer's Name:	UNKNOWN
Proprietary Ind:	N
Review Ind:	Y
Published:	Y
Special Project CD:	N

Cage:	98354
Address:	12 HOWLAND ROAD
Box:	N/K
City:	FAIRHAVEN
State:	MA
Zip:	02719
Country:	US
Phone:	508-996-6721; 508-758-4408

Cage:	51947
Address:	4334 SOUTH 67TH ST
City:	OMAHA
State:	NE
Zip:	68117-1019
Country:	US
Phone:	800-228-9681

Ingredients

Cas:	109-99-9
Code:	M
RTECS #:	LU5950000
Code:	M
Environmental Wt:	
Other REC Limits:	NONE RECOMMENDED
OSHA PEL:	200 PPM
Code:	M
Code:	
Code:	M
Code:	
Ozone Depleting Chemical:	N

Cas:	78-93-3
Code:	M
RTECS #:	EL6475000
Code:	M
Environmental Wt:	
Other REC Limits:	NONE RECOMMENDED

OSHA PEL:	200 PPM
Code:	M
Code:	
Code:	M
Code:	
Ozone Depleting Chemical:	N

Cas:	108-94-1
Code:	M
RTECS #:	GW1050000
Code:	M
Environmental Wt:	
Other REC Limits:	NONE RECOMMENDED
OSHA PEL:	S, 50 PPM
Code:	M
Code:	
Code:	M
Code:	
Ozone Depleting Chemical:	N

Health Hazards Data

LD50 LC50 Mixture	LD50 (ORAL, RAT) IS UNKNOWN.
Route Of Entry Inds - Inhalation:	YES
Skin:	NO
Ingestion:	NO
Carcinogenicity Inds - NTP:	NO
IARC:	NO
OSHA:	NO
Health Hazards Acute And Chronic	TARGET ORGANS:EYE, SKIN, CNS, LIVER, KIDNEY, RESPIRATORY TRACT. ACUTE- CAUSES SEVERE EYE IRRITATION. CAUSES MODERATE SKIN IRRITATION. INHALATION CAN CAUSE NOSE & THROAT IRRITATION, CNS EFFECTS. MODERATELY TOXIC BY INGESTION. CHRONIC- CAUSED LIVER ABNORMAITIES & KIDNEY DAMAGE IN LABORATORY ANIMALS.
Explanation Of	NONE

Carcinogenicity	
Signs And Symptions Of Overexposure	SEVERE IRRITATION, NAUSEA, HEADACHE, VOMITING, DIARRHEA, TEARING, DIFFICULT BREATHING, DRY SKIN, BLURRED VISION, ITCHING, INCOORDINATION, DIZZINESS, DROWSINESS
Medical Cond Aggravated By Exposure	PERSONS WITH PRE-EXISTING SKIN DISORDERS, EYE PROBLEMS OR IMPAIRED LIVER, KIDNEY, CNS OR RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS PRODUCT.

First Aid

GET MEDICAL ATTENTION IF SYMPTOMS PERSIST. EYES:IMMEDIATELY FLUSH WITH WATER FOR 15 MINUTES. HOLD EYELIDS OPEN. SKIN:WASH WITH SOAP & WATER. INHALED:MOVE TO FRESH AIR. PROVIDE CPR/OXYGEN IF NEEDED. ORAL:IF CONSCIOUS, DRINK WATER. CALL PHYSI CIAN. AVOID ACOHOL BEVERAGES. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

Spill Release Procedures

WEAR PROTECTIVE EQUIPMENT. ELIMINATE IGNITION SOURCES. VENTILATE AREA. PICK UP SPILL WITH NON-FLAMMABLE ABSORBENT MATERIAL SUCH AS SAND. PLACE IN CONTAINER FOR DISPOSAL. PREVENT LIQUID FROM ENTERING SEWERS, WATERWAYS. DO NOT CONTAMINATE ENV IRONMENT.

Neutralizing Agent	NOT RELEVANT

Waste Disposal Methods

Handling and Storage Precautions

Other Precautions	AVOID BREATHING VAPORS. DO NOT GET IN EYES, ON SKIN ORON CLOTHING. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING.REMOVE CONTAMINATED CLOTHING PROMPTLY. LAUNDER BEFORE REUSE. KEEP OUT OFREACH OF CHILDREN. DO NOT INGEST.

Fire and Explosion Hazard Information

Flash Point Method:	N/P
Flash Point:	
Flash Point Text:	5F,-15C
Autoignition Temp:	
Autoignition Temp Text:	N/K
Lower Limits:	1.1
Upper Limits:	11.8
Extinguishing Media	SMALL FIRE:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY, FOAM. LARGE:CALL FIRE DEPARTMENT.
Fire Fighting Procedures	WEAR PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. PREVENT RUN-OFF TO ENTER SEWERS/WATERWAYS.
Unusual Fire/Explosion Hazard	VAPOR IS FLAMMABLE AND CAN TRAVEL CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK. CONTAINERS MAY RUPTURE DUE TO VAPOR PRESSURE BUILDUP.

Control Measures

Ventilation	MECHANICAL (GENERAL AND/OR LOCAL EXHAUST, EXPLOSION-PROOF) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).
Protective Gloves	NITRILES, PVC
Eye Protection	SAFETY GLASSES/CHEMICAL SPLASH GOGGLES
Other Protective Equipment	SAFETY SHOWER AND EYE WASH FOUNTAIN SHOULD BE LOCATED NEARBY.

	WEAR APPROPRIATE PROTECTIVE CLOTHING FOR RISK OF EXPOSURE.
Work Hygienic Practices	OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES.
Supplemental Safety and Health	N/P

Physical/Chemical Properties

HCC:	F3
NRC/State LIC No:	NOT RELEVANT
Net Prop WT For Ammo:	N/R
Boiling Point:	
B.P. Text:	146F,63C

Reactivity Data

Stability Indicator:	YES
Stability Condition To Avoid:	EXCESSIVE HEAT, OPEN FLAMES, SPARKS
Materials To Avoid:	STRONG OXIDIZING AGENTS, STRONG ACIDS, STRONG ALKALIS, CHLORINATED INORGANICS, COPPER AND COPPER ALLOYS
Hazardous Decomposition Products:	CARBON MONOXIDE, CARBON DIOXIDE, HYDROCHLORIC ACID, CHLORINE
Hazardous Polymerization Indicator:	YES

Toxicological Information

Toxicological Information: N/P

Ecological Information

Ecological: N/P

MSDS Transport Information

Transport Information: N/P

Regulatory Information

Sara Title III Information: N/P

Federal Regulatory Information: N/P

State Regulatory Information: N/P

Other Information

Other Information: N/P

HMIS Transportation Information

Responsible Party Cage:	51947
Trans ID NO:	6928
Product Name:	PURPLE PRIMER FOR CPVC/PVC PIPE,019 CEZ-12
MSDS Prepared Date:	04/12/1995
Review Date:	01/22/1998
MFN:	1
Submitter:	D DG
Status CD:	C
Tech Entry NOS Shipping Nm:	METHYL ETHYL KETONE, CYCLOHEXANONE, TETRAHYDROFURAN
Radioactivity:	NOT RELEVANT
Form:	
Net Explosive Weight:	N/R
Coast Guard AMMO Code:	N/R
Magnetism:	N/P
Net Unit Weight:	1.7 LBS
AF MMAC Code:	
DOD Exemption NUM:	NOT RELEVANT
Multiple KIT Number:	0
Kit IND:	N

Kit Part IND:	N
Review IND:	Y
Unit Of Issue:	NK
Container QTY:	N/K
Type Of Container:	N/K
Additional Data:	DOT PROPER SHIPPING NAME: CONSUMER COMMODITY, ORM-D, IMO CLASS 3.2, PER MSDS. LIMITED QUANTITY BY DOT: EXEMPT FROM LABELLING AND PLACARDING UNLESS OFFERED BY AIR (49 CFR 173.150).

Detail DOT Information

DOT PSN Code:	GJJ
Symbols:	
DOT Proper Shipping Name:	FLAMMABLE LIQUIDS, N.O.S.
DOT PSN Modifier:	
Hazard Class:	3
UN ID Num:	UN1993
DOT Packaging Group:	II
Label:	FLAMMABLE LIQUID
Special Provision:	T8,T31
Packaging Exception:	
Non Bulk Pack:	202
Bulk Pack:	242
Max Qty Pass:	5L
Max Qty Cargo:	60 L
Vessel Stow Req:	B
Water/Ship/Other Req:	

Detail IMO Information

IMO PSN Code:	HIN
IMO Proper Shipping Name:	FLAMMABLE LIQUID, N.O.S. o
IMO PSN Modifier:	
IMDG Page Number:	3230
UN Number:	1993

UN Hazard Class:	3.2
IMO Packaging Group:	I/II
Subsidiary Risk Label:	-
EMS Number:	3-07
MED First Aid Guide NUM:	T

Detail IATA Information

IATA PSN Code:	MBV
IATA UN ID NUM:	1993
IATA Proper Shipping Name:	FLAMMABLE LIQUID, N.O.S. *
IATA PSN Modifier:	
IATA UN Class:	3
Subsidiary Risk Class:	
IATA Label:	FLAMMABLE LIQUID
UN Packing Group:	II
Packing Note Passenger:	305
Max Quant Pass:	5L
Max Quant Cargo:	60L
Packaging Note Cargo:	307
Exceptions:	

Detail AFI Information

AFI PSN Code:	MBV
AFI Symbols:	*
AFI Proper Shipping Name:	FLAMMABLE LIQUIDS, N.O.S.
AFI PSN Modifier:	
AFI Hazard Class:	3
AFI UN ID NUM:	UN1993
Special Provisions:	P5
Back Pack Reference:	A7.3

HMIS HAZCOM Label

Product Name:	**PURPLE PRIMER FOR CPVC/PVC PIPE,019 CEZ-12**

Cage:	51947
Assigned IND:	N
Company Name:	WILLIAM H HARVEY CO
Street:	4334 SOUTH 67TH ST
PO Box:	
City:	OMAHA
State:	NE
Zipcode:	68117-1019
Country:	US
Health Emergency Phone:	402-553-0479/800-424-9300(CHEMTREC)
Label Required IND:	Y
Date Of Label Review:	01/22/1998
Status Code:	C
MFG Label NO:	UNKNOWN
Label Date:	01/22/1998
Year Procured:	N/K
Origination Code:	F
Chronic Hazard IND:	N/P
Eye Protection IND:	YES
Skin Protection IND:	YES
Signal Word:	DANGER
Respiratory Protection IND:	N/P
Health Hazard:	Moderate
Contact Hazard:	Moderate
Fire Hazard:	Severe
Reactivity Hazard:	None

This information is derived from the Hazardous Material Information System which is utilized by the U.S. Department of Defense. IntraWEB, LLC and its Distributors in no manner whatsoever, expressly or implied warrants, states, or intends said information to have any application use or viability by or to any person or persons. Any person utilizing this information should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

IPS
WELD-ON

MATERIAL SAFETY DATA SHEET

Date Revised: APR 1992
Supersedes: NOV 1991

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. IPS Corporation urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on this sheet.

SECTION I

MANUFACTURER'S NAME
IPS Corporation

ADDRESS
17109 S. Main St., P.O. Box 379, Gardena, CA 90248

Transportation Emergencies:
CHEMTREC: (800) 424-9300
Medical Emergencies: (213) 222-3212
(L.A. Poison Center 24 Hour No.)
Business: (213) 321-6515

CHEMICAL NAME and FAMILY
PVC /CPVC Primer
Mixture of Organic Solvents

TRADE NAME
WELD-ON P-70 Primer for PVC and CPVC Plastic Pipe

FORMULA: Proprietary

SECTION II - HAZARDOUS INGREDIENTS

None of the ingredients below are listed as carcinogens by IARC, NTP or OSHA	CAS#	APPROX. %	ACGIH-TLV	ACGIH-STEL	OSHA-PEL	OSHA-STEL
Tetrahydrofuran (THF)	109-99-9	45 - 55	200 PPM	250 PPM	200 PPM	250 PPM
Methyl Ethyl Ketone (MEK)	78-93-3	47*	200 PPM	300 PPM	200 PPM	300 PPM
Cyclohexanone	108-94-1	5 - 15	25 PPM Skin		25 PPM Skin	

*Title III Section 313 Supplier Notification: This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.

SHIPPING INFORMATION
DOT Hazard Class: Flammable Liquid
DOT Shipping Name: Flammable Liquid, N.O.S.
(Tetrahydrofuran, Methyl Ethyl Ketone)
Identification Number: UN 1993

SPECIAL HAZARD DESIGNATIONS

	HMIS	NFPA	HAZARD RATING
HEALTH	2	2	0 - MINIMAL
FLAMMABILITY:	3	3	1 - SLIGHT
REACTIVITY:	0	1	2 - MODERATE
PROTECTIVE EQUIPMENT:	H		3 - SERIOUS
			4 - SEVERE

SECTION III - PHYSICAL DATA

APPEARANCE	ODOR	BOILING POINT (°F/°C)
Purple or Clear, thin liquid	Ethereal	151°F Based on first boiling component: THF
SPECIFIC GRAVITY @ 73 +/- 2°F Typical 0.870 +/- 0.040	VAPOR PRESSURE (mm Hg.) 143 mm Hg. Based on first boiling component, THF @ 20°C	PERCENT VOLATILE BY VOLUME (%) 100%
VAPOR DENSITY (Air = 1) 2.49	EVAPORATION RATE (BUAC = 1) > 1.0	SOLUBILITY IN WATER Completely soluble in water

VOC STATEMENT: This cement contains 850 grams of VOC per liter as manufactured. More than 60 percent of the VOC acts as a reactive diluent and remains in the joint.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE LIMITS (Percent by Volume)	LEL	UEL
6°F T.C.C. Based on THF		2.0	11.8

FIRE EXTINGUISHING MEDIA
Ansul "Purple K" potassium bicarbonate dry chemical, carbon dioxide, National Aer-O-Foam universal alcohol resistant foam, water spray.

SPECIAL FIRE FIGHTING PROCEDURES
Evacuate enclosed areas, stay upwind. Close or confined quarters require self-contained breathing apparatus, positive pressure hose masks or airline masks. Use water spray to cool containers, to flush spills from source of ignition and to disperse vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source of ignition.

IPS
WELD-ON

MATERIAL SAFETY DATA SHEET

Date Revised: DEC 1993

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SECTION I

MANUFACTURER'S NAME
IPS Corporation

ADDRESS
17109 S. Main St., P.O. Box 379, Gardena, CA 90248

Transportation Emergencies:
CHEMTREC: (800) 424-9300
Medical Emergencies: (213) 222-3212
(L.A. Poison Center 24 Hour No.)
Business: (310) 366-3300

CHEMICAL NAME and FAMILY
Solvent Cement for PVC Plastic Pipe
Mixture of PVC Resin and Organic Solvents

TRADE NAME
WELD-ON 2711 PVC Pipe Cement

FORMULA: Proprietary

SECTION II - HAZARDOUS INGREDIENTS

None of the ingredients below are listed as carcinogens by IARC, NTP or OSHA	CAS #	APPROX. %	ACGIH-TLV	ACGIH-STEL	OSHA-PEL	OSHA-STEL
Polyvinyl Chloride Resin (PVC)	NON/HAZ		N/A		N/A	
Tetrahydrofuran (THF)	109-99-9		200 PPM	250 PPM	200 PPM	250 PPM
Methyl Ethyl Ketone (MEK)	78-93-3	17*	200 PPM	300 PPM	200 PPM	300 PPM
Cyclohexanone	108-94-1		25 PPM Skin		25 PPM Skin	
N-Methylpyrrolidone	872-50-4		N/E		N/E	

*Title III Section 313 Supplier Notification: This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.

SHIPPING INFORMATION

DOT Shipping Name: Adhesive
DOT Hazard Class: 3
Identification Number: UN 1133
Packaging Group: II
Label Required: Flammable Liquid

SPECIAL HAZARD DESIGNATIONS

	HMIS	NFPA	HAZARD RATING
HEALTH:	2	2	0 - MINIMAL
FLAMMABILITY:	3	3	1 - SLIGHT
REACTIVITY:	0	1	2 - MODERATE
PROTECTIVE EQUIPMENT:	H		3 - SERIOUS
			4 - SEVERE

SECTION III - PHYSICAL DATA

APPEARANCE
Gray, medium syrupy liquid

ODOR
Ethereal

BOILING POINT (°F/°C)
151°F Based on first boiling component: THF

SPECIFIC GRAVITY @ 73 +/- 2°F
Typical 0.985 +/- 0.040

VAPOR PRESSURE (mm Hg)
143 mm H. Based on first boiling component, THF @ 20°C

PERCENT VOLATILE BY VOLUME (%)
Approx: 65 - 75%

VAPOR DENSITY (Air = 1)
2.49

EVAPORATION RATE (BUAC = 1)
> 1.0

SOLUBILITY IN WATER
Solvent portion completely soluble in water. Resin portion separates out.

VOC STATEMENT: VOC as manufactured: 695 Grams/Liter. Maximum VOC emission per SCAQMD Rule 1168, Test Method 316A: 450 Grams/Liter.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
6°F T.C.C. Based on THF

FLAMMABLE LIMITS (Percent by Volume)	LEL	UEL
	2.0	11.8

FIRE EXTINGUISHING MEDIA
Ansul "Purple K" potassium bicarbonate dry chemical, carbon dioxide, National Aer-O-Foam universal alcohol resistant foam, water spray.

SPECIAL FIRE FIGHTING PROCEDURES
Evacuate enclosed areas, stay upwind. Close or confined quarters require self-contained breathing apparatus, positive pressure hose masks or airline masks. Use water spray to cool containers, to flush spills from source of ignition and to disperse vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source of ignition.

IPS
WELD-ON

MATERIAL SAFETY DATA SHEET

Date Revised: DEC 1993
Supersedes:

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. IPS Corporation urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on this sheet.

SECTION I

MANUFACTURER'S NAME
IPS Corporation

ADDRESS
17109 S. Main St., P.O. Box 379, Gardena, CA 90248

Transportation Emergencies:
CHEMTREC: (800) 424-9300
Medical Emergencies: (213) 222-3212
(L.A. Poison Center 24 Hour No.)
Business: (310) 366-3300

CHEMICAL NAME and FAMILY
Solvent cement for PVC Plastic Pipe
Mixture of PVC Resin and Organic Solvents

TRADE NAME
WELD-ON 2705 PVC Pipe Cement

FORMULA: Proprietary

SECTION II - HAZARDOUS INGREDIENTS

None of the ingredients below are listed as carcinogens by IARC, NTP or OSHA	CAS#	APPROX. %	ACGIH-TLV	ACGIH-STEL	OSHA-PEL	OSHA-STEL
Polyvinyl Chloride Resin (PVC)	NON HAZ		N/A		N/A	
Tetrahydrofuran (THF)	109-99-9		200 PPM	250 PPM	200 PPM	250 PPM
Methyl Ethyl Ketone (MEk)	78-93-3	20*	200 PPM	300 PPM	200 PPM	300 PPM
Cyclohexanone	108-94-1		25 PPM Skin		25 PPM Skin	

*Title III Section 313 Supplier Notification: This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.

SHIPPING INFORMATION
DOT Shipping Name: Adhesive
DOT Hazard Class: 3
Identification Number: UN 1133
Packaging Group: II
Label Required: Flammable Liquid

SPECIAL HAZARD DESIGNATIONS

	HMIS	NFPA
HEALTH	2	2
FLAMMABILITY:	3	3
REACTIVITY:	0	1
PROTECTIVE EQUIPMENT:	H	

HAZARD RATING
0 - MINIMAL
1 - SLIGHT
2 - MODERATE
3 - SERIOUS
4 - SEVERE

SECTION III - PHYSICAL DATA

APPEARANCE	ODOR	BOILING POINT (°F/°C°)
Clear, white or gray medium syrupy liquid	Ethereal	151°F Based on first boiling component: THF
SPECIFIC GRAVITY @ 73 +/- 2°F Typical 0.976 +/- 0.040	VAPOR PRESSURE (mm Hg.) 143 mm Hg. Based on first boiling component, THF @ 20°C	PERCENT VOLATILE BY VOLUME (%) Approx: 70 - 80%
VAPOR DENSITY (Air = 1) 2.49	EVAPORATION RATE (BUAC = 1) > 1.0	SOLUBILITY IN WATER Solvent portion completely soluble in water Resin precipitates.

VOC STATEMENT: VOC as manufactured: 730 Grams/Liter. Maximum VOC emission per SCAQMD Rule 1168, Test Method 316A: 450 Grams/Liter.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE LIMITS (Percent by Volume)	LEL	UEL
6°F T.C.C. based on THF		2	11.8

FIRE EXTINGUISHING MEDIA
Ansul "Purple K" potassium bicarbonate dry chemical, carbon dioxide, National Aer-O-Foam universal alcohol resistant foam, water spray.

SPECIAL FIRE FIGHTING PROCEDURES
Evacuate enclosed areas, stay upwind. Close or confined quarters require self-contained breathing apparatus, positive pressure hose masks or airline masks. Use water spray to cool containers, to flush spills from source of ignition and to disperse vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source of ignition.

Material Safety Data Sheet

An RPM Company

24 Hour Emergency Phone Numbers:
Medical/Poison Control:
In U.S.: Call 1-800-222-1222
Outside U.S.: Call your local poison control center
Transportation/National Response Center:
1-800-535-5053
1-352-323-3500

NOTE: The National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

IMPORTANT: Provide this information to employees, customers, and users of this product. Read this MSDS before handling or disposing of this product. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard. All abbreviated terms used in this MSDS are further described in Section 16.

Section 1 - Chemical Product / Company Information

This Material Safety Data Sheet is available in Canadian French and Hispanic American Spanish upon request.
On peut demader cette fiche signalétique (MSDS) a la langue francaise-canadienne.
Los Datos de Serguridad del Producto pueden obtenerse en Espanol si lo riquiere.

Product Name:	DAP Alex Painters Acrylic Latex Caulk - All Colors	**Revision Date:**	04/01/2008
Product UPC Number:	070798180659	**Supersedes:**	10/29/2004
Product Use/Class:	Latex Caulk	**MSDS Number:**	00010011001
Manufacturer:	**DAP Inc.** **2400 Boston Street Suite 200** **Baltimore, MD 21224-4723** **888-327-8477 (non-emergency matters)**		

Section 2 - Hazards Identification

Emergency Overview: A colored paste product with a very slight ammonia odor. WARNING! May cause eye, skin, nose, throat and respiratory tract irritation. May cause eye or skin irritation. Harmful if swallowed or absorbed through the skin. This product contains ethylene glycol.

Refer to other MSDS sections for other detailed information.

Effects Of Overexposure - Eye Contact: May cause eye irritation.

Effects Of Overexposure - Skin Contact: May cause skin irritation. Harmful if absorbed through the skin.

Effects Of Overexposure - Inhalation: Harmful if inhaled. Inhalation of high concentrations may cause headache, nausea, and dizziness. Inhalation may cause irritation to the respiratory tract (nose, mouth, mucous membranes). Inhalation may cause mild irritation to the respiratory tract (nose, mouth, mucous membranes).

Effects Of Overexposure - Ingestion: Ingestion of ethylene glycol can cause gastrointestinal irritation, nausea, vomiting, diarrhea and if ingested in sufficient quantities, death. Harmful or fatal if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. If ingested, may cause vomiting, diarrhea, and depressed respiration. Ingestion may result in obstruction when material hardens.

Effects Of Overexposure - Chronic Hazards: Repeated or prolonged exposure may cause respiratory system damage.

Prolonged and repeated skin contact may cause irritation and possibly dermatitis.

The International Agency for Research on Cancer (IARC) has determined that crystalline silica in the form of quartz or cristobalite that is inhaled from occupational sources is carcinogenic to humans (Group 1- carcinogenic to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program (NTP) classifies respirable crystalline silica as "known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (Group A2).
Breathing dust containing respirable crystalline silica may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects: Excessive inhalation of respirable dust can cause pneumoconiosis, a respiratory disease, which can result in delayed, progressive, disabling and sometimes fatal lung injury. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. Smoking exacerbates this disease. Individuals with pneumoconiosis are predisposed to develop tuberculosis. There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) and kidney disease. Prolonged, repeated, or high exposures may cause weakness and depression of the central nervous system. Overexposure may cause kidney, cardiovascular, skin and liver damage.

Formaldehyde vapor is a known animal carcinogen according to OSHA and NTP and is considered possibly carcinogenic to humans by inhalation. The International Agency for Research on Cancer considers formaldehyde to be a human carcinogen.

A mixture of diisodecyl phthalate and diisononyl phthalate has been tested in a two-generation toxicity study in laboratory animals. No effects on reproductive parameters were seen. However, a small but statistically significant increase in early offspring mortality was seen at high oral doses. The significance of this to humans is uncertain.

The mixture of phthalate esters contained within this product has been shown to cause developmental effects at high doses in laboratory animals when administered orally by gavage in a developmental study and developmental and fertility effects when administered at high doses by feed in a two-generation reproduction study. The potential risk from occupational and consumer exposure is considered to be very low, based on limited relevance of the rodent findings to humans and the large safety margins between exposure and the effect levels.

Ethylene Glycol may cause kidney and liver damage upon prolonged and repeated overexposures. Studies have shown that repeated inhalation of ethylene glycol has produced adverse cardiovascular changes in laboratory animals. Ethylene glycol has been shown to cause birth defects in laboratory animals.

Primary Route(s) Of Entry: Skin Contact, Inhalation, Eye Contact

Medical Conditions which May be Aggravated by Exposure: None known.

Carcinogenicity:

CAS No.	Chemical Name	ACGIH	OSHA	IARC	NTP
14808-60-7	Silica, crystalline	Suspected human carcinogen.	Not Listed.	Human carcinogen.	Known carcinogen.
13463-67-7	Titanium dioxide	Not Listed.	Not Listed.	Possible carcinogen.	Not Listed.
50-00-0	Formaldehyde	Suspected human carcinogen.	Potential cancer hazard.	Human carcinogen.	Anticipated carcinogen.

Section 3 - Composition / Information On Ingredients

Chemical Name	CASRN	Wt%
Limestone	1317-65-3	40-70
Branched and linear phthalates	Proprietary	1-5
Stoddard solvent	8052-41-3	0.5-1.5
Ethylene glycol	107-21-1	0.1-1.0
Silica, crystalline	14808-60-7	0.1-1.0
Titanium dioxide	13463-67-7	0.1-1.0
Ammonia	7664-41-7	0.1-1.0
Formaldehyde	50-00-0	<0.009

Section 4 - First Aid Measures

First Aid - Eye Contact: In case of contact, immediately flush eyes with large quantities of water for at least 15 minutes until irritation subsides. Get medical attention immediately.

First Aid - Skin Contact: Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical aid if symptoms persist. If skin irritation persists, call a physician. Remove and wash contaminated clothing. In case of contact, immediately flush skin with plenty of water while removing contaminated clothing and shoes.

First Aid - Inhalation: If inhaled, remove to fresh air. If breathing is difficult, leave the area to obtain fresh air. If continued breathing difficulty is experienced, get medical attention immediately.

First Aid - Ingestion: If swallowed, DO NOT INDUCE VOMITING. Get medical attention immediately. If ingested, drink 2 glasses of water. Immediately see a physician. Never give anything by mouth to an unconscious person.

Note to Physician: None.

COMMENTS: If over-exposure occurs, call your poison control center at 1-800-222-1222.

Section 5 - Fire Fighting Measures

Extinguishing Media: Carbon Dioxide, Dry Chemical, Foam, Water Fog

Unusual Fire And Explosion Hazards: No special protective measures against fire required.

Special Firefighting Procedures: Wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear. Use water spray to cool exposed surfaces.

Section 6 - Accidental Release Measures

Steps To Be Taken If Material Is Released Or Spilled: Wear proper protective equipment as specified in Section 8. Use absorbent material or scrape up dried material and place in container.

Section 7 - Handling And Storage

Handling: KEEP OUT OF REACH OF CHILDREN! DO NOT TAKE INTERNALLY. Avoid breathing vapor and contact with eyes, skin and clothing. Use only with adequate ventilation. Open all windows and doors or use other means to ensure cross-ventilation and fresh air entry during application and drying. Odor is not an adequate warning for hazardous conditions. Wash thoroughly after handling.

Storage: Do not store at temperatures above 120 degrees F. Store containers away from excessive heat and freezing. Close container after each use. Store away from caustics and oxidizers.

Section 8 - Exposure Controls / Personal Protection

Chemical Name	CASRN	ACGIH TWA	ACGIH STEL	ACGIH CEIL	OSHA TWA	OSHA STEL	OSHA CEIL	Skin
Limestone	1317-65-3	10 MGM3	N.E.	N.E.	5 MGM3 (respirable fraction)	N.E.	N.E.	No
Branched and linear phthalates	Proprietary	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	No
Stoddard solvent	8052-41-3	100 PPM	N.E.	N.E.	500 PPM	N.E.	N.E.	No
Ethylene glycol	107-21-1	N.E.	N.E.	100 MGM3	N.E.	N.E.	N.E.	No
Silica, crystalline	14808-60-7	0.05 MGM3	N.E.	N.E.	10/(%SiO2 + 2) MGM3	N.E.	N.E.	No
Titanium dioxide	13463-67-7	10 MGM3	N.E.	N.E.	15 MGM3	N.E.	N.E.	No
Ammonia	7664-41-7	25 PPM	35 PPM	N.E.	50 PPM	N.E.	N.E.	No

Formaldehyde	50-00-0	N.E.	N.E.	0.3 PPM	0.75 PPM	2 PPM	N.E.	No

Exposure Notes:

14808-60-7 The 2002 ACGIH Threshold Limit Values for Chemical Substances and Physical Agents lists the median Respirable Particulate Mass (RPM) point for crystalline silica at 4.0 microns in terms of the particle's aerodynamic diameter.

The TLVs for crystalline silica represent the respirable fraction.

OSHA PEL TWA for Quartz is calculated using the following formula: 10 mg/m3/(% SiO2 + 2). Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size selector with the following characteristics.

..... Aerodynamic diameter (unit density sphere)	Percent passing selector
2	90
2.5	75
3.5	50
5.0	25
10	0

50-00-0 Formaldehyde is a specially regulated substance for which an OSHA chemical-specific exposure standard exits. Detailed information regarding this substance may be found in 29 CFR 1910.1048. Medical surveillance information regarding this substance may be found in Appendix C to 29 CFR 1910.1048.

Precautionary Measures: Contact lenses pose a special hazard; soft lenses may absorb and all lenses concentrate irritants.

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Ensure adequate ventilation, especially in confined areas. Local ventilation of emission sources may be necessary to maintain ambient concentrations below recommended exposure limits.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment. A NIOSH-approved air purifying respirator with an organic vapor cartridge or canister may be necessary under certain circumstances where airborne concentrations are expected to exceed exposure limits. A respiratory protection program that meets the OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/m3) as determined by a full shift sample up to 10-hour work shift.

Skin Protection: Rubber gloves. Natural rubber, butyl rubber and polyvinyl chloride gloves are not suitable protection against the phthalates contained within this product; neoprene is recommended.

Eye Protection: Goggles or safety glasses with side shields.

Other protective equipment: Not required under normal use.

Hygienic Practices: Wash hands before breaks and at the end of workday. Remove and wash contaminated clothing before re-use.

Important: Listed Permissible Exposure Levels (PEL) are from the U.S. Dept. of Labor OSHA Final Rule Limits (CFR 29 1910.1000); these limits may vary between states.

Note: An employee's skin exposure to substances having a "YES" in the "SKIN" column in the table above shall be prevented or reduced to the extent necessary under the circumstances through the use of gloves, coveralls, goggles or other appropriate personal protective equipment, engineering controls or work practices.

Section 9 - Physical And Chemical Properties

Boiling Range:	Not Established	**Vapor Density:**	Heavier Than Air
Odor:	Very Slight Ammonia	**Odor Threshold:**	Not Established
Color:	Colored	**Evaporation Rate:**	Slower Than n-Butyl Acetate
Solubility in H2O:	Not Established	**Specific Gravity:**	1.6
Freeze Point:	Not Established	**pH:**	Between 7.0 and 12.0
Vapor Pressure:	Not Established	**Viscosity:**	Not Established
Physical State:	Paste	**Flammability:**	Non-Flammable
Flash Point, F:	Greater than 200 degrees Fahrenheit	**Method:**	(Seta Closed Cup)
Lower Explosive Limit, %:	Not Established	**Upper Explosive Limit, %:**	Not Established

When reported, vapor pressure of this product has been calculated theoretically based on its constituent makeup and has not been determined experimentally.

(See section 16 for abbreviation legend)

Section 10 - Stability And Reactivity

Conditions To Avoid: Excessive heat and freezing.

Incompatibility: Incompatible with strong bases and oxidizing agents.

Hazardous Decomposition Products: Normal decomposition products, i.e., COx, NOx.

Hazardous Polymerization: Hazardous polymerization will not occur under normal conditions.

Stability: Stable under recommended storage conditions.

Section 11 - Toxicological Information

Product LD50: Not Established **Product LC50:** Not Established

CASRN	Chemical Name	LD50	LC50
107-21-1	Ethylene glycol	Rat:4700 mg/kg	Rat:10876 mg/kg
7664-41-7	Ammonia	----------	Rat:2000 ppm/4H
50-00-0	Formaldehyde	----------	Rat:203 mg/m3

Significant Data with Possible Relevance to Humans: This product contains trace amounts of free formaldehyde. OSHA and NTP identify formaldehyde as a potential carcinogen. IARC identifies formaldehyde as a human carcinogen. Formaldehyde has been shown to cause mutations in a variety of in-vitro test systems, the significance of which to humans is unknown. There should be minimal risk when used with ventilation adequate to keep the atmospheric concentration of formaldehyde below the recommended exposure limits.
Maintain adequate ventilation to prevent exposure above current OSHA / ACGIH exposure limits. Workplace monitoring of the air to define formaldehyde exposure levels may be necessary.
In a two-year inhalation study, rats showed carcinogenic effects in the respiratory system at 15 ppm of formaldehyde.

Section 12 - Ecological Information

Ecological Information: Ecological injuries are not known or expected under normal use.

Section 13 - Disposal Information

Disposal Information: Dispose of material in accordance with all federal, state and local regulations. State and Local regulations/restrictions are complex and may differ from Federal regulations. Responsibility for proper waste disposal is with the owner of the waste.

EPA Waste Code if Discarded (40 CFR Section 261): None

Section 14 - Transportation Information

DOT Proper Shipping Name:	Not Regulated	**Packing Group:**	N.A.
DOT Technical Name:	N.A.	**Hazard Subclass:**	N.A.
DOT Hazard Class:	N.A.	**DOT UN/NA Number:**	N.A.

Note: The shipping information provided is applicable for domestic ground transport only. Different categorization may apply if shipped via other modes of transportation and/or to non-domestic destinations.

Section 15 - Regulatory Information

CERCLA - SARA Hazard Category:

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Immediate Health Hazard, Chronic Health Hazard

SARA Section 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

None

Toxic Substances Control Act:

All ingredients in this product are either on TSCA inventory list, or otherwise exempt.

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

None

New Jersey Right-to-Know:

The following materials are non-hazardous, but are among the top five components in this product:

Chemical Name	CAS Number
Water	7732-18-5
Non-Hazardous Polymer	Proprietary
Acrylic polymer	Proprietary

Pennsylvania Right-to-Know:

The following non-hazardous ingredients are present in the product at greater than 3%:

Chemical Name	CAS Number
Water	7732-18-5
Non-Hazardous Polymer	Proprietary
Acrylic polymer	Proprietary

California Proposition 65:

WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Section 16 - Other Information

HMIS Ratings:			
Health: 1	Flammability: 1	Reactivity: 0	Personal Protection: X

Volatile Organic Compounds (VOC), less water less exempts: g/L: 56.0 lb/gal: 0.5 wt:wt%: 2.5

Volatile Organic Compounds (VOC), less water less exempts, less LVP-VOCs: wt:wt%: 0.9

REASON FOR REVISION: Periodic Update

Legend:

N.A. – Not Applicable	ACGIH – American Conference of Governmental Industrial Hygienists
N.E. – Not Established	SARA – Superfund Amendments and Reauthorization Act of 1986
N.D. – Not Determined	NJRTK – New Jersey Right-to-Know Law
VOC – Volatile Organic Compound	OSHA – Occupational Safety and Health Administration
PEL – Permissible Exposure Limit	HMIS – Hazardous Materials Identification System
TLV – Threshold Limit Value	NTP – National Toxicology Program
CEIL – Ceiling Exposure Limit	STEL – Short Term Exposure Limit
LD50 – Lethal Dose 50	LC50 – Lethal Concentration 50
F – Degree Fahrenheit	MSDS – Material Safety Data Sheet
C – Degree Celsius	CASRN – The Chemical Abstracts Service Registry Number

DAP believes the data and statements contained herein are accurate as of the date hereof. They are offered in good faith as typical values and not as a product specification. **NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE WITH REGARD TO THE INFORMATION HEREIN PROVIDED OR THE PRODUCT TO WHICH THE INFORMATION REFERS.** Since this document is intended only as a guide to the appropriate use and precautionary handling of the referenced product by a properly trained person, it is therefore the responsibility of the user to (i) review the recommendations with due consideration for the specific context of the intended use and (ii) determine if they are appropriate.

<End of MSDS>

ATTACHMENT E

SAFETY MANAGEMENT STANDARDS

URS SAFETY MANAGEMENT STANDARD

Hazard Communication (Worker Right-to-Know)

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

This standard is not applicable to chemical laboratory operations that are covered under 29 Code of Federal Regulations (CFR) 1910.1450 (Occupational Exposure to Chemicals in Laboratories).

2. Purpose and Scope

The purpose of this Hazard Communication standard (also know as worker right-to-know program) is to provide URS personnel with information and training about safety and health hazards associated with the chemicals they may encounter in the workplace. This procedure describes how chemical safety hazards are communicated to URS personnel and how information is to be provided to employees of other companies working at the location. The requirements include steps to acquire this information, maintain the information, and train personnel in the hazard communication program.

3. Implementation

Implementation of this standard is the responsibility of the URS manager who directs activities at the facility, site, or project location. For office locations and large projects, this program may be incorporated into the general site orientation and training program or administered by project management.

Note: Manufacturers are permitted to ship chemicals under existing classification systems until December of 2015. As such, many of the requirements listed here may be gradually phased in by the manufacturers until that time. Where noted within the SMS, deviations from the existing procedure are allowed until December 2015 or until otherwise noted by URS.

4. Requirements

A. Hazardous Material Inventory

Maintain a hazardous material inventory that lists all of the hazardous materials used at each workplace (i.e., office, field location). Use chemical identifiers consistent with and referenced on the applicable safety data sheet (SDS). (Note that the terms material safety data sheet (MSDS) and SDS may be used interchangeably until December 2015.)

B. Site-Specific Written Program

A site-specific written program may be prepared as a stand-alone document or included within a site-specific health and safety plan. The program must cover hazardous materials in all physical forms (liquids, solids, gases, vapors, fumes, and mists), regardless of whether they are "contained."

C. Safety Data Sheets (SDSs)

1. The safety representative will obtain an SDS for each chemical before it is used. SDSs will generally be received by the person ordering the product. SDSs for products frequently used should be kept on file because additional copies may not be included in repeat shipments.

2. The safety representative will review each SDS when it is received to evaluate whether the information is complete and to determine whether existing protective measures are adequate.

3. Each office or project location will assign a responsible person or department to maintain a collection of all applicable and relevant SDSs in an area that is accessible by all employees at all times. An electronic database is an acceptable method of maintaining the SDSs.

4. The assigned person or department will replace SDSs when updated sheets are received and will communicate any significant changes to those who work with the chemical.

5. SDSs are required for all hazardous materials brought on site by project personnel.

6. General consumer products to be used for their specific purpose, as well as food, drugs, cosmetics, and tobacco products brought into the workplace for employee consumption, are exempt, as are supplies in the first aid kit, such as isopropyl alcohol and antibacterial wipes.

7. Subcontractors bringing hazardous materials onto a site or project must submit SDSs to the safety representative. The safety representative may restrict the use of certain hazardous materials on a site or project due to occupational health risk, hazardous

physical properties of the material, or potential employee sensitivity to odor or irritating properties of the material.

D. Labels

Unless each container has appropriate labeling, label all chemical containers with the following information:

1. Product identifiers (codes or product names matching those on the SDS).

2. Signal word (key words used to emphasize hazards and indicate the relative severity of the hazard).

3. Appropriate hazard statements (standard phrases assigned to a hazard class and category which describe the nature of the hazard).

4. Pictograms (graphic elements intended to convey specific information about the hazard).

5. Precautionary statements (supplement the hazard statements by briefly providing measures to be taken to minimize or prevent adverse effects from the hazard).

6. Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

Labels on incoming containers of hazardous materials will not be removed or defaced.

Labels are also required when a hazardous substance is transferred from a primary container to a secondary container. Labels on secondary containers must indicate the product identifier, as well as words, pictures, or symbols, or combination thereof, which will provide general information about the hazards of the chemical, including the physical and health hazards.

Note that until December 2015, manufacturers will be in a transitional period as they gradually meet the requirements of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). As such, the labels on incoming containers from the manufacturer are only required to indicate product names and identities of the hazardous chemicals, appropriate hazard warnings, and the name and address of the manufacturer, importer, or other responsible party, rather than the items

listed above in D.1 through D.6. Labels may incorporate words, pictures, symbols, or combinations thereof to ensure the appropriate information is provided to the end user. Examples of acceptable labeling systems include the National Fire Protection Association (NFPA) Diamond, the Hazardous Materials Identification System (HMIS), the Chemical Hazard Identification and Training (CHIT) system, or similar.

E. Hazardous Non-routine Tasks

Periodically, employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, each employee must be provided with information about hazards to which they may be exposed, as follows:

1. Specific chemical and physical hazards.

2. Protective/safety measures that must be taken.

3. Measures that have been taken to lessen the hazards, including ventilation, respirators, presence of another employee, and emergency procedures.

F. Informing Contractors/Subcontractors

Provide other contractors/subcontractors working in the same area with the following information on chemicals used by or provided to URS personnel:

1. Identification of hazardous chemicals to which they may be exposed while on the jobsite.

2. Precautionary measures the contractors/subcontractors need to take to protect their employees during both normal operating conditions and foreseeable emergencies.

3. Location of SDSs.

4. Applicable labeling systems in use in the workplace.

G. Training

1. Provide training to all employees who have the potential to be exposed to hazardous materials, on the following schedule:

    a. At the time of the initial task assignment,

b. Whenever new chemicals are introduced into the workplace, or

c. More frequently where required by site-specific conditions or client-specific requirements.

2. This training will include the following:

   a. Applicable regulatory requirements.

   b. Any operations in the work area where hazardous chemicals are present.

   c. Location of the program, inventory, and SDS.

   d. Site-specific chemicals used and their hazards (chemical, physical, and health), including:

      1. General characteristics of chemicals

      2. Signs and symptoms of exposure

   e. How to detect the presence or release of chemicals including the location, types, and usage of any portable and fixed monitoring or detection equipment and their associated alarms, where applicable.

   f. Safe work practices and methods employees can take to protect themselves from chemical hazards, including work practices, emergency procedures, and the use of personal protective equipment.

   g. How to read an SDS.

   h. Site- or project-specific information on hazard warnings and labels in use at the location, if applicable.

   i. Site-specific evacuation and rescue procedures in the event of chemical release, including the location of staging areas and personnel accounting procedures.

3. Document the training.

4. Arrange provisions for training in the language of the user. International Chemical Safety Cards (see Section 6, ILO) may be

used in conjunction with SDS information to provide non–English-language information. SDSs are required to be on site, but there is no requirement for the SDSs to be in a language other than English.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Hazardous Material Inventory.

B. SDSs.

C. Training records.

D. Contractor/Subcontractor notifications.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) General Industry Standards – Hazard Communication – 29 Code of Federal Regulations (CFR) 1910.1200

B. U.S. OSHA Construction Standards – Hazard Communication – 29 CFR 1926.59

C. Mine Safety and Health Administration – Hazard Communication – 30 CFR 47

D. OSHA Administration Technical Links – http://www.osha.gov/dsg/hazcom/index.html

E. International Labour Organization (ILO) – International Chemical Safety Cards (information about 1613 chemicals in 18 languages). http://www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm

F. Agency for Toxic Substances and Disease Registry (ATSDR) – Tox FAQs and Tox FAQs en Espanol, 2003. http://www.atsdr.cdc.gov/toxfaqs/index.asp

G. United Nations – Globally Harmonized System of Classification and Labeling of Chemicals (GHS). http://www.unece.org/trans/danger/publi/ghs/ghs_rev04/04files_e.html

7. Supplemental Information

A. Hazard Communication Program – Template

B. Hazard Communication Employee Training Program

HAZARD COMMUNICATION PROGRAM

Table of Contents

A. Purpose
B. Identification of Hazardous Substances
C. Container Labeling
D. Safety Data Sheets (SDS)
E. Employee Training and Information
F. Non-Routine Task Training
G. Access to Information by Other Employees

Appendices

I. Hazard Communication Checklist
II. Potentially Hazardous Substances
III. List of Jobsite Hazardous Substances
IV. Sample Letter to Suppliers to Obtain SDS

A. PURPOSE

A-1 To protect the health and safety of our employees, URS Corporation has developed this Hazard Communication program.

1. As an organization we intend to provide information about chemical hazards and other hazardous substances, and the control of hazards via our comprehensive Hazard Communication Program, which includes container labeling, Safety Data Sheets (SDS), and training.

2. This written Hazard Communication Program applies to all operations that MAY expose employees to hazardous substances because of normal work conditions (including non-routine tasks) or as the result of a reasonably foreseeable emergency.

3. This written Hazard Communication Program is available, upon request, to employees, their designated representatives and to appropriate representatives of state and/or federal safety and health agencies.

A-2 Scope

This program is part of URS Corporation's comprehensive health and safety program and shall be applied in conjunction with that overall program.

A-3 Responsibilities

1. The Project Manager is responsible for implementing and ensuring compliance with this written hazard communication program. The Hazard Communication checklist found in Appendix I is provided to assist the Project Manager in carrying out this responsibility.

2. The designated Project Safety Representative is responsible for coordinating and administering the program, in developing and assisting in the presentation of training materials and in providing technical assistance to project supervision.

3. Each Project Supervisor shall become familiar with the hazard communication procedures and shall supervise the application of these procedures to tasks for which they are responsible.

4. The Safety Manager is the designated safety professional for the project or office location and is responsible for providing technical assistance to the Project Supervisor or Safety Representative to implement the hazard communication program.

B. IDENTIFICATION OF HAZARDOUS SUBSTANCES

B-1 "Hazardous Substances" are materials or mixtures that are or have physical or health hazards (See Appendix II for examples of potentially hazardous materials).

B-2 "Exposure" is any situation arising from work conditions where an employee may ingest, inhale, absorb or otherwise come in contact with a hazardous substance.

B-3 An inventory of all hazardous substances to which employees may be exposed on this jobsite, as well as an accompanying SDS, shall be maintained in the project office (see Appendix III).

C. CONTAINER LABELING

C-1 When hazardous substances are received, the Project Safety Representative shall examine the containers to determine if the labels provide the following information (primary containers):

1. A product identifier;
2. Signal words;
3. Appropriate hazard statements;
4. Pictograms;
5. Precautionary statements; and
3. The name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

C-2 When hazardous substances are transferred into portable or secondary containers, the responsible Project Supervisor shall ensure that these containers are labeled with an extra copy of the manufacturer's label or with a printed label that includes the information above.

EXCEPTION: When an employee transfers a hazardous substance into a portable container for his/her own immediate use, the portable container need not be labeled.

C-3 Each Project Supervisor shall ensure that the labels on containers of hazardous substances are not removed or defaced, unless the containers are immediately relabeled with the information in C-1 above. The labels shall be written legibly in English. However, for non-English speaking employees information may be presented in their native language as well.

C-4 Containers without complete labels or with defaced labels will not be used on the job.

C-5 The Project Supervisor or Safety Representative shall review the jobsite labeling procedure at least quarterly and update as required.

D. SAFETY DATA SHEETS (SDS)

D-1 Safety Data Sheets (SDSs) are documents that supply information about a particular hazardous substance or mixture. Manufacturers are required to provide SDSs when the hazardous substances are sold to distributors or purchasers. In most cases, SDSs are sent to the purchaser of the project (e.g., the procurement department or Project Supervisor), not the safety department.

D-2 The Safety Manager / Project Safety Representative or Project Supervisor in coordination with the purchasing agent or project business manager, will be responsible for obtaining and maintaining the master sets of SDSs and other information on all hazardous substances used (see sample letter in Appendix IV).

D-3 The Project Safety Representative will review SDSs for completeness. If an SDS is missing or obviously incomplete, a new SDS will be requested from the manufacturer. In some cases, SDSs may be obtained on-line through the manufacturer's web site. The Project Safety Representative should review products for highly toxic or dangerous constituents prior to use and consult with the Safety Manager for any items considered hazardous or toxic.

D-4 SDSs are available to all employees in their work area for review during each work shift. If SDSs are not available or new hazardous substance(s) in use do not have SDSs, contact the Project Safety Representative immediately. Additional information such as chemical safety cards and the NIOSH Pocket Guide to Chemical Hazards may be used for additional information.

D-5 Project Supervisors shall be alert to other employees (such as subcontractors) whose work on the jobsite may expose employees to additional hazardous substances. When it appears such exposure will occur, SDSs for the substances must be obtained.

D-6 When doing renovation or remodeling work, the Project Supervisor shall coordinate SDSs of hazardous materials used by contractors. Contractors bringing hazardous materials on to a site or project must submit SDSs to the Project Supervisor. The Project Supervisor should consult wit the Safety Manager if there are any questions regarding hazardous constituents of products.

E. EMPLOYEE TRAINING AND INFORMATION

E-1 Initial Orientation

Before starting work, each new employee must attend a health and safety orientation. URS Corporation's on-line training program on Hazard Communication may be used as a component of the initial training but employees still require site specific information on hazards of chemicals in use, site specific spill and emergency procedures, and site specific labeling systems as described below.

E-2 Training shall be provided before employees are assigned duties that may cause exposure to hazardous substances. Training shall also be given when new hazardous substances are introduced into the work area or when an SDS is changed. In general, this training shall include:

1. Information on which hazardous substances are in the work area.
2. How to read and interpret information on SDSs and labels.
3. Any physical or health hazards associated with the use of a hazardous substance or mixture being used in the work area.
4. Proper precautions for handling hazardous substances, including specific procedures the company has implemented to protect workers from exposure such as personal protective equipment and work practices.
5. Proper procedures for reporting of releases or threatened releases of hazardous substances.
6. Emergency procedures for spills, fires, disposal and first aid.
7. The methods and observations that can be used to detect the presence of a hazardous substance in the work place (odor, visual appearance or monitoring).
8. The right of employees, their physicians or their collective bargaining agents to receive information on hazardous substances to which they may be exposed.
9. The right against discharge or discrimination due to an employee's exercise of the rights afforded by law.
10. The details of this written Hazard Communication Program; the availability and location of this written Hazard Communication Program and of SDSs or other information.

E-3 Hazard communication training must be documented.

E-4 Additional training shall be provided as needed during the weekly safety and health training ("toolbox") meetings in order to emphasize the safe handling, use and storage of onsite hazardous substances.

F. NON-ROUTINE TASK TRAINING

F-1 When employees are assigned to a non-routine task that may expose them to a hazardous substance for which they have not been trained, they shall be trained in the manner required by Section E.

F-2 Some examples of non-routine tasks are:

- Confined space entry.
- Tank cleaning.
- Repair of pipes or tanks containing hazardous substances.

Prior to starting work on such projects, each affected employee will be given information about the hazardous substances he or she may encounter during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps the jobsite is using to reduce the hazards, including ventilation, respirators, presence of another employee and emergency procedures including site specific warnings, evacuation routes, and assembly points.

G. ACCESS TO INFORMATION BY OTHER EMPLOYERS

G-1 It is the responsibility of the Project Safety Representative or Project Supervisor to provide contractors and subcontractors with information about hazardous chemicals their employees may be exposed to on a jobsite and suggested precautions for the contractor's employees to follow to avoid exposure to hazardous conditions.

G-2 Contractors and subcontractors on the job site with potential exposure or risk will be contacted before work is started, to gather and distribute information concerning any chemical hazard that they may bring or be exposed to, in areas that are under URS Corporation control.

APPENDIX I

HAZARD COMMUNICATION CHECKLIST

_____1. Have we prepared a list of all the hazardous substances in our workplace?

_____2. Are we prepared to update our hazardous substance list?

_____3. Have we obtained or developed a safety data sheet for each hazardous substance we use?

_____4. Have we developed a system to ensure that all incoming hazardous substances are checked for proper labels and data sheets?

_____5. Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous substances?

_____6. Are our employees aware of the specific information and training requirements of the Hazard Communication Standard?

_____7. Are our employees familiar with the different types of chemicals and the hazards associated with them?

_____8. Have our employees been informed of the hazards associated with performing non-routine tasks?

_____9. Do our employees understand how to detect the presence or release of hazardous substances in the workplace?

_____10. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous substances in their work area?

_____11. Does our training program provide information on appropriate first aid, emergency procedures and the likely symptoms of overexposure?

_____12. Does our training program include an explanation of labels and warnings that are used in each work area?

_____13. Does the training describe where to obtain safety data sheets and how employees may use them?

_____14. Have we worked out a system to ensure that new employees are trained before beginning work?

_____15. Have we developed a system to identify new hazardous substances before they are introduced into a work area?

_____16. Do we have a system for informing employees when we learn of new hazards associated with a chemical we use?

_____17. Have the employees been advised of the consequences for failure to follow established procedures?

_____18. Do we have a system to ensure subcontractors are sharing information with one another, concerning the hazardous substances they have brought to the site?

APPENDIX II

EXAMPLES OF POTENTIALLY HAZARDOUS MATERIALS THAT MAY BE FOUND ON URS CORPORATION CONSTRUCTION/GENERAL INDUSTRY PROJECTS

Acetone
Acetylene gas
Adhesives
Aluminum etching agent
Ammonia
Anti-freeze
Arsenic compounds
Asbestos
Asphalt (Petroleum) fumes
Battery Fluids
Benzene (and derivatives)
Bleaching agents
Carbon black
Carbon monoxide (in cylinders)
Caulking, sealant agents
Caustic soda (sodium hydroxide)
Chromate salts
Chromium
Cleaners
Cleaning agents
Coal tar pitch
Coal tar epoxy
Coatings
Cobalt
Concrete curing compounds
Creosol
Cutting oil (oil mist)
De-emulsifier for oil
Diesel gas, diesel oil
Drywall
Dusts (brick, cement block)
Enamel
Etching agents
Ethyl alcohol
Fiberglass, mineral wool
Foam insulation
Freon 20, R20 (and others)
Gasoline (petrol, ethyl)
Glues
Graphite
Greases
Helium (in cylinders)
Hydraulic brake fluid
Hydrochloric acid
Hydrogen (in cylinders)
Inks
Insulations
Iron
Kerosene
Lead
Lime (calcium oxide)
Limestone
Lubricating oils
Lye (sodium hydroxide, potassium hydroxide)
Magnesium
Metals (aluminum, nickel, copper, zinc, cadmium, iron, etc.)
Methanol (methyl alcohol)
Methyl ethyl ketone (2-butanone)
Motor oil additives
Muriatic acid (hydrochloric acid)
Naptha (coal tar)
Nitroglycerin
Oxalic acid
Ozone
Paint remover
Paint stripper
Paints/lacquers
Particle board
Pentachlorophenol
Pesticides
Photographic developers and fixers
Photogravure ink (copy machine)
Plastics
Polishes for metal floors
Propanol
Putty Resins, epoxy/synthetics
Sealers
Shellac
Solder, flux (zinc chloride, fluorides, etc.)
Solder, soft (lead, tin)
Solvents
Sulfuric acid
Thinner, paint/lacquer
Tin
Transite
Turpentine, gum spirit, oil of turpentine
Varnishes
Waterproofing agents
Waxes
Welding Rods
Wood alcohol (methanol)
Wood preservative
Xylene
Zinc

APPENDIX III

LIST OF PROJECT SPECIFIC HAZARDOUS SUBSTANCES

On the following page(s) is a current list of the specific hazardous substances, along with the manufacturer's product identifier, known to be present at this jobsite.

This list uses the product identifier referenced on the SDS. Specific information on each substance may be found on the SDSs located in the project office.

APPENDIX IV

(PROJECT LETTERHEAD)

Date

Product Manufacturer's (Importer/Distributer/Responsible Party) Name
Product Manufacturer's (Importer/Distributer/Responsible Party) Address

Subject: Safety Data Sheet Requisition

Dear Manufacturer (Importer/Distributer/Responsible Party):

Please provide the following safety data sheet(s):

_____

_____

_____

_____

Thank you for your support and assistance in this matter.

Sincerely,

Requestor's Name
Requestor's Address

This document presents information that can be used for hazard communication training.

This information has been developed based on groups (types) of hazardous substance(s) used and the common hazards associated with them.

For specific hazard information on each brand of material the Safety Data Sheets (SDS) must be reviewed.

OVERVIEW OF THE HAZARD COMMUNICATION REGULATION

The Hazard Communication Regulation is intended to ensure that both employers and employees are aware of the dangers associated with hazardous substances in their workplaces. The following information is a review of the specific requirements of a hazard communication program, including container labeling, SDS and training.

WRITTEN HAZARD COMMUNICATION PROGRAM

We have a written program that outlines how we will provide information and control your exposure to hazardous substances. This plan is available for your review during our training and at the project office for review during your work shift.

HAZARDOUS SUBSTANCES USED IN OUR WORKPLACE

On this job, we use a variety of products. Many of these products contain one or more hazardous substances. Let's review the hazardous substance inventory in your work area.

READING LABELS AND SDS

LABELS: A product label on both the original and secondary containers should be reviewed prior to working with the material. Each label will have several important pieces of information you should be familiar with:

1. Product identifier (codes or product names matching those on the SDS).
2. Signal word (key words used to emphasize hazards and indicate the relative severity of the hazard).
3. Appropriate hazard statements (standard phrases assigned to a hazard class and category which describe the nature of the hazard).
4. Pictograms (graphic elements intended to convey specific information about the hazard).
5. Precautionary statements (supplement the hazard statements by briefly providing measures to be taken to minimize or prevent adverse effects from the hazard).

6. Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

The label should act as a visual reminder of the information we have presented in this training session and of the information found in more detail on the SDS. It is essential for your safety that you read the label only use the hazardous substance(s) within the guidelines prescribed. Questions concerning the label should be directed to your supervisor/foreman.

SAFETY DATA SHEETS (SDS): The SDS is the primary means we will use to convey the necessary information about the hazards of the substances we use. The manufacturers and importers are responsible for providing us with the SDS. The manufacturer must provide us with adequate information to use the substance safely.

PHYSICAL AND HEALTH HAZARDS OF THE HAZARDOUS SUBSTANCE(S) USED

Employees are to be trained specifically about the hazards of the substances in their work areas. This may be done by specific hazardous substances or by categories of hazards, but in any case, the employee is to be aware that information is available on the specific hazards of individual hazardous substances through SDSs.

Employees may be trained using the common type or generic chemical group or by reviewing the specific SDS as long as the training includes the following information:

1. Measures to protect employee from the hazards (i.e., work practices, engineering controls and the use of personal protective equipment).
2. The physical and health hazards of the hazardous substances.
3. Detection of release of the substance; emergency and first aid procedures.

EXAMPLE OF GENERAL HAZARDOUS SUBSTANCE GROUP TYPE TRAINING

Product/Chemical Group: Hydrocarbon Solvents.

Health Effects – Effect of Overexposure: High concentrations of solvent vapors are irritating to the eyes, nose, throat and lungs, may cause headaches and dizziness and sleepiness. Even higher levels may cause unconsciousness and may have other brain and central nervous system effects.

Prolonged or repeated liquid contact with the skin may cause defatting of the skin, leading to dryness, possible irritation and dermatitis (reddening and inflamed skin). Some solvents are absorbed right through the skin and the health effects are just as if the solvent vapor was inhaled.

Each organic solvent's possible long term health effects will vary; however, prolonged solvent exposures are related to possible liver, kidney and central

nervous system and brain damage (Note: The variety of solvent types should be reviewed).

Physical Hazards: Hydrocarbon solvents are flammable and combustible and represent fire and explosion hazards if the materials are not handled correctly. Hydrocarbon solvents are generally stable and will not react violently with water. Review the SDS section on Physical and Chemical Properties. Most solvents will vaporize rapidly and become airborne.

Detection of Release: Odor – Solvent vapor may produce an odor or cause your nose or eyes to be irritated, but do not depend on odor to warn you. Odor thresholds (lowest level that can be detected) for most solvents vary widely from person to person. Also, some solvents produce "olfactory fatigue" - the rapid loss of ability to smell the odor. However, odor can warn you of exposure to some solvents (confirm this with industrial hygiene monitoring).

Appearance – Most solvent vapors are invisible so do not rely on appearance to warn you for exposure.

Instrumentation – A variety of industrial hygiene instruments can be used to measure employee exposure. This equipment should be operated only are qualified personnel.

Emergency Response – For Flammable Solvents: If the material is spilled or leaks, shut-off and eliminate all sources of ignition. Recover the free product by adding absorbents to the spill. Minimize breathing vapors and skin contact. Ventilate the area by opening windows and doors. Follow the established hazardous waste disposal procedures.

Exposure Control: Protective Equipment, Engineering Controls and Proper Work Practices:

- Protective Equipment – Use chemical-resistant gloves, aprons or clothing if prolonged or repeated skin contact may occur. Use splash goggles and face shield when eye or face contact may occur. Use approved respiratory protective equipment as established by our Safety Program (Note: If needed, a review of the respiratory protective program may be appropriate).
- Engineering Controls/Work Practices – Ventilation is to be used when it is necessary to prevent build-up of vapors from both a health or fire and explosion concern. Keep containers closed when not in use. Do not handle or store near heat or sources of ignition or strong oxidants. No smoking, burning or welding is permitted near the flammable vapors. Use the bonding and/or grounding system when transferring materials. Most solvents will vaporize rapidly and become airborne.

APPROPRIATE EMERGENCY AND FIRST AID PROCEDURES

Eye contact – If splashed into the eyes, flush with water for 15 minutes or until irritation subsides. If irritation continues, call a physician.

Skin contact – In case of skin contact, remove any contaminated clothing and wash skin thoroughly with water and soap.

Inhalation – If overcome by vapors, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation.

Ingestion – If ingested, DO NOT induce vomiting, call emergency medical aid immediately.

HAZARD COMMUNICATION TRAINING

Date: _____

I have received hazard communication training as described in the URS Corporation Hazard Communication Program.

Employee Name (Print)	Employee Signature	Employee Number

I hereby certify that the above named employees have been provided with hazard communication training.

Supervisor/Instructor's Name _____ Supervisor/Instructor's Signature _____

HAZARDOUS PROPERTIES OF CHEMICALS TRAINING

Chemicals are a part of every aspect of our lives. A minute does not go by that we do not use something that contains chemicals, or chemicals were used in the manufacturing process. The chemicals you use in the work place only present potential health and physical hazards when they are mishandled, improperly used, incompatible mixtures combined, improperly stored or labeled.

Depending upon the chemical and the level of exposure, health hazards can vary from minor skin irritations to serious chemical burns, nerve damage, different forms of cancer and even death. Physical damage may include fires, explosions, property and environmental damage.

Hazard awareness is recognizing and understanding the potential injuries and illnesses or physical damage the chemicals can cause. The communication of this information is essential for your being aware of, understanding and respecting the potential hazards. This knowledge is important for the decisions you make concerning how you use the chemicals and the safe work practices you follow.

Remedial action response personnel may be exposed to a number of substances that are hazardous because of their properties. These properties can be summarized into three broad categories:

a. Physical/chemical
b. Biological
c. Radiological

It should be noted that many hazards may be present at any one time. It is important to understand the fundamentals of each of these properties and their relationships so that effective safety practices may be employed to reduce the risk to the public and remedial response personnel. Some hazards that may be encountered at this work site are toxic substances, flammable materials, explosive materials, corrosive materials, biological agents, excessive noise, heat or cold stress, oxygen deficient work areas, and radioactive materials.

PHYSICAL/CHEMICAL PROPERTIES

Physical hazards. Chemical compounds possess inherent properties, which determine the type and degree of the hazard they represent. Evaluating risks of an incident depends on understanding these properties and their relationship to the environment.

a. Solubility. The ability of a solid, liquid, gas or vapor to dissolve in a solvent is solubility. An insoluble substance can be physically mixed or blended in a

solvent for a short time but is unchanged when it finally separates. The solubility of a material is important when determining its reactivity, dispersion, mitigation and treatment.

b. Density. The density of a substance is its mass per unit volume, commonly expressed in g/cc.

c. Specific gravity. Specific gravity is the ratio of the density of a substance to the density of water. If the specific gravity of a substance is greater than 1 it will sink in water. The substance will float in water if its specific gravity is less than 1.

d. Vapor density. The vapor density is the density of a gas compared to the density of air. If the density of a gas is greater than that of air then the gas will tend to pocket and settle into the lowest points. If the vapor density is close to air or lower than air then the gas will disperse. If the vapor or gas displaces oxygen in the low spots then it can become an asphyxiant problem. If the gas or vapor is an explosive, when it pockets it will become an explosive hazard.

e. Flashpoint. If the ambient temperature in relation to the material of concern is right, then it may give off enough vapor at its surface to allow ignition by an open flame or spark. The minimum temperature at which a substance produces sufficient flammable vapors to ignite is its flashpoint. If the vapor does ignite, combustion can continue as long as the temperature remains at or above the flashpoint. The relative flammability of a substance is based on its flashpoint. An accepted relation between the two is:

Highly flammable:	Flashpoint <100°F
Moderately flammable:	Flashpoint >100°F & <200°F
Relatively inflammable:	Flashpoint >200°F

f. Chemical Hazards. Hazardous conditions that may exist because of the chemical nature of substances may be summarized as fire hazards, explosive hazards, corrosive hazards, and chemical reactivity.

Fire Hazards

a. Combustibility: Combustibility is the ability of a material to act as a fuel, that is, to burn. Materials that can be readily ignited and sustain a fire are considered to be combustible, while those that cannot are called noncombustible. Three elements are required for combustion to occur: fuel, oxygen, and heat. The concentration of the fuel and the oxygen must be high enough to allow ignition and maintain the burning process. Combustion is a chemical reaction that requires heat to proceed. Heat is supplied by the

ignition source and is maintained by the combustion, or it must be supplied from an external source. The relationship of these three fire components can form a triangle. If one leg of the triangle is removed, then the fire can be extinguished. For example, water applied to a fire removes the heat, thereby extinguishing the fire. When a material generates enough heat by itself to self-ignite and combust, spontaneous combustion occurs, either as a fire or explosion (e.g., diesel greater than 140 degrees Fahrenheit is combustible.)

b. Flammability: Flammability is the ability of a material (liquid or gas) to generate a sufficient concentration of combustible vapors under normal conditions to be ignited and produce a flame. It is necessary to have a proper fuel-to-oxygen (oxygen) ratio (% fuel in air) to allow combustion. A flammable material is considered highly combustible if it can burn at ambient temperatures. However, a combustible material is not necessarily flammable because it may not be easily ignited or the ignition maintained. Pyrophoric materials will ignite at room temperature in the presence of a gas or vapor or when a slight friction or shock is applied.

The substances listed below are easily ignited (pyrophorics), require little oxygen to support combustion, have low flammability limits and explosive limits and a wide flammable and explosive range.

Flammable liquids	**Flammable solids**
Aldehydes	Phosphorus
Ketones	Magnesium Dust
Amines	Zirconium Dust
Ethers	Titanium Dust
Aliphatic Hydrocarbons	Aluminum Dust
Aromatic Hydrocarbons	Zinc Dust
Alcohols	
Nitroaliphatics	

Water Reactive Flammable Solids	**Pyrophoric Liquids**
Potassium	Organometallic compounds
Sodium	Dimethyl Zinc
Lithium	Tributyl Aluminum

Some of the hazards related to fires and explosions can cause physical destruction due to shock waves, heat, and flying objects. Secondary fires can be created as well as other flammable conditions. Toxic or corrosive compounds may also be released to the surrounding environment as well.

Explosives

An explosive is a substance, which undergoes a very rapid chemical transformation producing large amounts of gases and heat. The gases

produced, for example, nitrogen, oxygen, carbon monoxide, carbon dioxide, and steam, due to the heat produced, rapidly expand to velocities exceeding the speed of sound. This creates both a shockwave (high pressure front) and noise. The main categories of explosives are listed below.

High or detonating – produces a shock wave followed by combustion.

Primary high explosive – detonation occurs in a short time. Examples: lead azide, mercury fulminate, and lead styphnate.

Secondary high explosive – needs a booster to detonate. Examples: Tetryl, cyclonite, dynamite and TNT

Low or deflagrating – Explosive rate very fast. Combustion followed by a shock wave. Examples: smokeless powder, magnesium, and molotov cocktail.

Corrosive Hazards

Corrosion is a process of material degradation. Upon contact, a corrosive material may destroy body tissues, metals, plastics, and other materials. Corrosivity is the ability of material to increase the hydrogen ion concentration of a material or to transfer electron pairs of or from itself or another material. A corrosive material is a reactive compound or element that produces a destructive chemical charge in the material it is acting on. Common corrosives are:

Halogens	**Acids**	**Bases (Caustics)**
Bromine	Acetic acid	Potassium Hydroxide
Chlorine	Hydrochloric acid	Sodium Hydroxide
Fluorine	Hydrofluoric acid	
Iodine	Nitric acid	
	Sulfuric acid	

Skin irritation and burns are typical results when the body contacts an acidic or basic corrosive material.

The measure of an acid or a base is the pH scale. The pH scale ranges from 0 to 14 with a pH <7 being acidic and a pH>7 being basic. The lower the pH of the acid the more acidic is the material, and the higher the pH of the base the more basic the material. A pH of 7 is considered neutral.

Chemical Reactivity

a. Reactivity hazards. A reactive material is one that undergoes a chemical reaction under specified conditions. Generally, the term “reactive hazard” is used to refer to a substance that undergoes a violent or abnormal reaction in

the presence of water or under normal ambient atmospheric conditions. Among this type of hazard are the pyrophoric liquids that will ignite in air at or below normal room temperature in the absence of added heat, shock, or friction, and the water-reactive flammable solids that will spontaneously combust upon contact with water.

The most common reactive mixture in construction is found in gas welding or brazing. Acetylene gas mixes with oxygen to provide an extremely powerful reaction in the form of a very intense flame.

b. Compatibility. If two or more hazardous materials remain in contact indefinitely without reaction, they are compatible. Incompatibility, however, does not necessarily indicate a hazard. For example, acids and bases (both corrosive) react to form salts and water, which may not be corrosive.

The compatibility of materials must be determined before the materials are used or stored. Some examples of incompatibilities are sulfuric acid and plastics (toxic gas or vapor is produced), acids and metal (flammable gas or vapor is produced), chlorine and ammonia (chlorine gas is created, toxic gas). There are many other incompatibilities that may be found. Check to make sure that the materials used for a project are compatible.

All of the hazards listed above will be found on the safety data sheet (SDS). The SDS is a short technical report that provides you with the known hazards of a specific material. The SDS explains how to properly use the material, handle any problems related to the material and how to store the material. Know what the SDS says for the materials that you work with.

All materials should have a label on them. This is the first and easiest place to look to see if a material is hazardous. Labels should tell you any precautions that must be taken when handling the material. Read the label on the materials that you use and abide with the cautions and warnings. If a material is not properly labeled, notify your supervisor so that the problem is corrected.

BIOLOGICAL HAZARDS

Biological agents are living organisms that can cause sickness or death to exposed individuals. Biological hazards can cause infection or disease to persons who are exposed.

Biological hazards may involve plants or animals including microorganisms. Biological hazards, such as disease causing agents, may be present at a hazardous waste site or involved in a spill. Like chemical hazards, they can be dispersed throughout the environment via wind and water.

Many biological agents require a carrier to inoculate a person. For instance, rabid rodents at a landfill may be a biological hazard. Deer carry ticks may have Rocky Mountain Spotted fever; prairie dogs will not.

The same personnel protective requirements for a response to a chemical hazard apply to biological hazards. Body coverings and respiratory protective equipment might have to be utilized. Especially important is the need to maintain personnel cleanliness. Before eating, drinking or smoking residual contamination should be washed off.

BIOHAZARDS

Biohazard training will be provided to employees as per the blood borne pathogen program (SMS 051).

HAZARDOUS MATERIAL PROTECTION

The routes of exposure for hazardous materials include the following:

- Inhalation – Breathing contaminated air (e.g., welding fumes.)
- Skin Absorption – Contact with harmful liquids, gases, solids or contaminated clothing, equipment, medications, cosmetics, etc. A good example is solvents. Materials can also enter through an open wound.
- Ingestion – Eating or drinking contaminated foods, water or medications. (Remember food and cigarettes can become contaminated by your unwashed hands, gloves, equipment. Good hygiene practices are very important.)
- Injection – A contaminated material can be injected into some part of the body.

Protection from potentially hazardous materials includes the following:

- Use good personal hygiene. This is the simplest control measure to chemical hazards.
- Know what protective equipment is required for the specific job you are doing. Ask your supervisor what risks you might encounter and what hazardous substances you are working with.
- Know what potential explosive and or flammable conditions may exist with the job you are doing.
- Have all confined spaces checked for explosives, hydrogen sulfide, carbon monoxide, and oxygen deficiency. Know what hazards are involved with confined spaces.
- Know where emergency equipment is located and how to use it. For example, know where the nearest fire extinguisher is from your work area.

- Know the standard operating procedures for rescue and emergency situations.
- Know the proper method for decontamination when working with hazardous materials.
- Use the buddy system when at all possible. Keep communication lines open when working with hazardous materials.
- Stay out of contaminated areas if you are not properly trained, equipped, or authorized to enter. Do not take chances with life-threatening materials or situations.

PERSONAL PROTECTIVE EQUIPMENT

Different types of protective equipment will be required depending on the substances to be handled, the existing conditions, and the particular situation. Personal protective equipment includes a variety of special suits, hard hats, goggles, face shields, aprons, boots, gloves, and respirators. Each is designed to protect you from certain hazards. It is important for you to know the advantages and disadvantages of all the equipment you may use or need. Use all equipment as instructed and follow all written procedures for the specific equipment.

STANDARD OPERATING PROCEDURES FOR EMERGENCY SITUATIONS

Standard operating procedures exist for any unexpected event such as an accident, fire, explosion, etc.

If you know or suspect that you have been contaminated with a hazardous substance, **TELL YOUR SUPERVISOR**. You should know the general symptoms of over-exposure to toxic substances. These include:

- Irritation of skin, eyes, nose, throat, or respiratory tract
- Changes in complexion or skin discoloration
- Headache
- Difficulty in breathing
- Nausea
- Dizziness or light-headedness
- Excessive salivation (drooling)
- Lack of coordination
- Blurred vision
- Cramps and/or diarrhea
- Changes in behavior patterns

You should know the location of emergency eyewash and shower facilities.

Before you enter, and periodically while you are working in confined spaces such as tanks, crawl spaces, ditches, etc., the air in the space should be tested by a qualified individual for oxygen content, explosive levels, toxic gases, and other hazardous materials.

Understand the site emergency response procedures and know the locations of response equipment before the need arises. If you must rescue someone, use proper precautions and protective equipment. **DO NOT BECOME A CASUALTY YOURSELF**. Move the affected person from the hazardous exposure if possible. Get help and follow emergency rescue procedures.

For spills and leaks of hazardous materials limit the leak or spill as quickly as possible. Small spills should be cleaned up immediately. If a valve must be closed to prevent a spill from continuing then do so. If the spill is large, or your skin, eyes or clothing are contaminated, leave the work area immediately. Wash eyes, skin, and clothes off with lots of water to remove the material. Get to fresh air. Notify your foreman or supervisor as soon as it is safe for you to do so. Unless you have special training and the proper protective equipment, do not try to clean up large spills yourself.

If a corrosive material is splashed in your eyes or on your skin and clothes, deal with it immediately. Wash the affected area with plenty of water (at least 15 minutes with a continuous stream). Remove any contaminated clothing. Get to fresh air if you feel burning in the nose, throat or lungs. Do not vomit if you have swallowed a corrosive material. Drink large quantities of water to dilute the material, and seek immediate medical attention.

EXAMPLES OF HAZARDOUS MATERIALS POSSIBLY FOUND ON SITE

SOLVENTS

Solvents are among the most common toxic materials in the workplace. Many processes, mixing and cleaning, use or give off solvent vapors. They are also used as thinners in paints and adhesives. Solvents vary in their toxicity from practically non-toxic materials such as the alcohols, ketones, halogenated solvents, to the very toxic such as dimethyl acetamide, methyl acrylate and other materials. Some solvents are also flammable or reactive.

Solvents can cause irritations to the eyes and skin when in high concentrations. Most will dissolve the protective layer of oils on the skin and leave it looking white in the small cracks. They should never be used to clean the skin; if there is a problem with contamination, some form of glove or barrier cream should be used to protect the skin. The early signs of overexposure often include headaches, dizziness, nausea and other related symptoms.

METALS AND SOLID PARTICULATES

Examples: Babbitt metal, cadmium, galvanized metal, lead, manganese, nickel, zinc

Metals and other particulate solids can be toxic and are usually given off when welding or grinding. Some, like gypsum dust are only nuisance dusts, while others, like zinc fume from welding cause flu-like symptoms. Others, like asbestos have been linked to cancer and other chronic diseases. Dusts can irritate the skin and be ingested with food, drinks or smoking materials if they aren't washed off the hands and removed from clothing. They may also be carried home to family members and cause problems there if they are not washed off before leaving the work area.

When the welding, brazing, grinding or cutting of metal is performed, care should be taken to avoid breathing the fumes or dusts. Local exhaust ventilation should be used to reduce your exposure. If fumes and dust cannot be controlled with exhaust ventilation, appropriate approved respirators should be used. Approved safety goggles and gloves should be worn when working with metals. Gloves may be necessary to prevent skin sensitization and dermatitis.

ACIDS

Examples of acids found on URS Corporation sites are sulfuric acid (used in water treatment plants and found in batteries), hydrochloric acid, and nitric acid. Acids are considered corrosives and cause material degradation. Acids destroy tissues, metals and other materials. Acids can cause skin irritations in the form of rashes or other types of dermatitis, and more severe problems such as skin or eye burns. When working with acids proper eye and face protection should be worn as well as hand protection.

LUBRICANTS, COOLANTS AND MACHINE OILS

Lubricants, coolants and machine oils are common in construction sites. There are three types: petroleum based (straight oils), water based, and synthetic fluids that contain no oils. Many cutting oils contain additives to inhibit corrosion, prevent bacterial growth and permit high temperature operation. The fumes and mist from cutting operations can be irritating to the eyes and lungs. Skin exposure can result in acne-like conditions and can cause other problems. Avoid breathing mist and fumes and use gloves and aprons to minimize contact with materials.

GASES

Examples: Acetylene, ammonia, carbon dioxide, carbon monoxide, freon, oxygen, hydrogen, liquefied petroleum gas, propane

Gases present a range of problems. Some, like nitrogen, are simple asphyxiates. They prevent the body from getting enough oxygen by displacing it from the air stream. Some are chemically hazardous, like carbon monoxide, or nitrous oxide, which cause poisoning of the body systems. Some are very toxic, like arsine and phosphine. Some are very reactive and should be dealt with in very careful manners. Other gases, like hydrogen, oxygen and acetylene are explosives and must be treated with great care. Chains and stands should secure all compressed gas cylinders at all times, and only the proper fittings should be used. Liquefied and petroleum gases are extremely flammable and considered simple asphyxiates.

PLASTICS, EPOXIES AND POLYMERS

Plastics, epoxies and polymers are a growing group of industrial chemicals. Materials such as polystyrene, polypropylene, acrylates, vinyl, and polyurethane are but a few. Although most of these materials are not toxic in their final form, where they are being molded, extruded, laid up, there can be significant hazards. When burned, these materials can be very hazardous.

CLEANERS

Cleaners contain acid, alkalis, aromatics, surfactants, petroleum products, ammonia and hypochlorite. Because of these ingredients these materials are considered to be irritants, and can be harmful to you if swallowed or inhaled. Many may cause eye, nose, throat, and skin and lung irritation. Some cleaners are flammable and burn easily. Others may be caustic or corrosive and cause severe skin burns. Because many cleaners used in the job area are consumer products commonly found in our homes, you may underestimate the hazard they pose. Protect yourself from these hazards by reading the labels and following the recommended precautions. Wear gloves and eye protection. Avoid inhaling the vapors and mists. Wash your hands and face thoroughly before eating, drinking or smoking.

Specific emergency procedures for each chemical will be detailed on that cleaner's safety data sheet. In general, if a cleaning chemical gets into your eyes, flush the eyes with clean running water for at least 15 minutes, then seek medical attention. If the chemical gets on your skin, wash the area of contact and seek medical attention.

Do not mix two cleaning chemicals together, unless specifically told to do so by your supervisor. For example, the dangerous gas, chlorine, will be created if you mix bleach and ammonia or bleach and drain cleaner together.

Examples: Abrasive cleaners, bleach, drain cleaner, general purpose cleaning spray, germicide, and glass cleaner, metal cleaner, rug and upholstery cleaners, stain remover.

FUELS

Examples: Diesel oil, gasoline, propane, kerosene

The primary hazard posed by fuels is obviously, fire. Fuels are either flammable or combustible. Whether flammable (a material which is easily ignited and burns with extreme rapidity) or combustible (a material capable of fueling a fire), they should be handled with care.

Proper storage and transport of fuels in approved, self-closing, safety containers is extremely important and should be strictly adhered to at all times. When filling portable containers with flammable materials they should be properly grounded and bonded to the container to prevent ignition from static electricity.

Store gasoline in containers marked “gasoline”. Store kerosene in containers marked “kerosene”. Never use kerosene containers for the transport or storage of gasoline.

Excessive skin contact with fuels can result in dermatitis. Some petroleum products have been shown to cause skin tumors. Inhalation of fuel vapors over a long period of time can cause central nervous system depression, and may aggravate any existing respiratory problems that may exist. Ingestion of fuels can cause poisoning. Do not induce vomiting. If fuels get in your eyes, rinse with clean water for at least 15 minutes and seek medical attention.

LABELING

Proper labeling of all chemical containers is another excellent control measure to chemical hazards. Container labels give a code or name identifying the chemical in the container, the name, address, and telephone number of the manufacturer, importer, or distributor; and symbols, signal words, and hazard statements that warn you of possible dangers. Read the label on all materials with which you work.

Examples of signal words and hazard statements:

- Danger, fatal if swallowed
- Danger, toxic if swallowed
- Warning, may be harmful if swallowed

Labels and their warnings should be taken seriously since they provide you with the first clue to the hazards posed to your health and safety. They also give information on personal protective equipment required, emergency response and first-aid steps in case of an exposure, proper procedures in case of a spill and emergency phone numbers.

SDS

Safety data sheets, if read and followed, are a powerful means of controlling chemical exposures. Chemical manufacturers are required to provide SDSs for the chemicals they produce or import. The purpose of the SDS is to communicate information on the recommended safe use and handling procedures for that chemical.

All SDS must provide certain categories of information about the chemical substance or mixture:

- Identification of the substance or mixture and of the supplier
- Hazards identification
- Composition/information on ingredients
- First aid measures
- Firefighting measures
- Accidental release measures
- Handling and storage
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal considerations
- Transport information
- Regulatory information
- Other information including information on preparation and revision of the SDS

HAZARD COMMUNICATION TRAINING QUESTIONS

NAME: _____ LOCATION: _____

1. Container labels must:
   A. Give directions to the manufacturing plant.
   B. Give price of the product.
   C. Notify the user of the physical and health hazards.
   D. Provide translation in Spanish.

2. What is an SDS?
   A. Main Statistical Data Service.
   B. Safety Data Sheet.
   C. New accident reporting system.
   D. Both A and C.

3. What are the requirements of the Hazard Communication Standard?
   A. Chemical inventories.
   B. Container labeling.
   C. Negotiations for purchase price of chemicals.
   D. SDSs.
   E. Employee Training.
   F. All of the above except C.

4. What is one way to determine if a chemical has been spilled or released in your work area?
   A. When you smell something out of the ordinary.
   B. By reading the SDS and being knowledgeable of the chemical appearance and odor.
   C. Call somebody.
   D. Both A & B.

5. How can you protect yourself from chemical exposures?
   A. Personal protective equipment and proper work practices.
   B. Stay upwind of vapors and gases.
   C. Use proper ventilation.
   D. All of the above.

6. What are the main examples of chemicals found on site?
   A. Solvent, fuel, metals, lubricants, gases.
   B. Toxic, flammable, corrosive, reactive, pressurized.
   C. Physical properties and health effects.
   D. The good, the bad and the ugly.

7. New and transferred employees must be trained on the hazards of their new work area.
   A. True
   B. False

8. An SDS provides what?
   A. Supervisor guide to acid unloading.
   B. Engineering data.
   C. Health, safety and first-aid information.
   D. Chemical process checklist.

9. Where is your site-specific Hazard Communication program located?
   A. Accident Prevention Manual.
   B. Employee Handbook.
   C. Budget Manual.
   D. SDS Book.

10. A new chemical used in your area is always considered a new hazard.
    A. True
    B. False

11. If an SDS is not available for the chemical you are using, you should?
    A. Notify your supervisor.
    B. Call the manufacturer.
    C. Contact the Safety Department.
    D. Nothing, most chemicals are safe.
    E. Both A & C.

12. Labeling systems use words, graphics, geometric shapes, and colors to warn you of any possible danger to your health and safety, and to tell you about safe work practices you need to follow when handling chemicals.
    A. True
    B. False

13. A flammable liquid is a liquid with a flashpoint:
    A. Of 2,000 degrees Fahrenheit
    B. Below 200 degrees Fahrenheit
    C. At freezing
    D. All of the above

14. Which Signal Word represents the most serious hazard?
    A. Caution
    B. Warning
    C. Danger
    D. Beware

15. Chemicals can enter the body through:
    A. Breathing them in
    B. Contact with body openings
    C. Both A and B
    D. None of the Above

16. If you are not familiar with a chemical, you should check the Safety Data Sheets.
    A. True
    B. False

17. A primary/original container label for a chemical must include:
    A. A code or name identifying the chemical
    B. The chemical manufacturers or importer's name, address, and telephone number
    C. Warnings of its hazardous content
    D. All of the above

18. A container label should be checked only if you do not know the contents of the container.
    A. True
    B. False

19. If a label is torn or missing, you should report it right away to the proper personnel at your facility.
    A. True
    B. False

20. The Hazard Communication Standard is also referred to as the Right to Know Standard.
    A. True
    B. False

21. A Safety Data Sheet is required for all hazardous materials in your facility.
    A. True
    B. False

22. Safe work practices require a complete understanding and respect for the potential hazards.
    A. True
    B. False

23. The written emergency response plan contains the procedures to take in the event of an emergency.
    A. True
    B. False

HAZARD COMMUNICATION TRAINING QUESTIONS
ANSWER SHEET

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   - A. Give directions to the manufacturing plant.
   - B. Give price of the product.
   - **C. Notify the user of the physical and health hazards.**
   - D. Provide translation in Spanish.

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   - **F. All of the above except C.**

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   - A. When you smell something out of the ordinary.
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   - C. Call somebody.
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   B. False

13. A flammable liquid is a liquid with a flashpoint:
   A. Of 2,000 degrees Fahrenheit
   B. Below 200 degrees Fahrenheit
   C. At freezing
   D. All of the above

14. Which Signal Word represents the most serious hazard?
   A. Caution (note not a signal word for HAZCOM but is used by EPA)
   B. Warning
   C. Danger
   D. Beware (note not a signal word for HAZCOM)

15. Chemicals can enter the body through:
   A. Breathing them in
   B. Contact with body openings
   C. Both A and B
   D. None of the Above

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17. A primary/original container label for a chemical must include:
    A. A code or name identifying the chemical
    B. The chemical manufacturers or importer's name, address, and telephone number
    C. Warnings of its hazardous content
    D. All of the above

18. A container label should be checked only if you do not know the contents of the container.
    A. True
    B. False

19. If a label is torn or missing, you should report it right away to the proper personnel at your facility.
    A. True
    B. False

20. The Hazard Communication Standard is also referred to as the Right to Know Standard.
    A. True
    B. False

21. A Safety Data Sheet is required for all hazardous materials in your facility.
    A. True
    B. False

22. Safe work practices require a complete understanding and respect for the potential hazards.
    A. True
    B. False

23. The written emergency response plan contains the procedures to take in the event of an emergency.
    A. True
    B. False

URS **SAFETY MANAGEMENT STANDARD**

Injury and Illness Prevention Program (California)

1. Applicability

This standard applies to the operations of URS Corporation, its subsidiary companies, and its offices and field operations located in the State of California. These facilities are required to comply with the State regulations regarding an effective Injury and Illness Prevention Program (IIPP).

2. Purpose and Scope

The purpose of the IIPP is to minimize the incidence and severity of workplace injuries and illnesses. This standard complies with California Code of Regulations (CCR) Title 8, Sections 1509 and 3203. This IIPP compliments URS' behavior-based safety culture.

3. Implementation

Implementation of this standard is the responsibility of the manager directing activities of the affected facility, site, or project location. Each office or facility impacted by this standard must designate a local Health, Safety, and Environment (HSE) representative to serve as the responsible person for the IIPP. Additionally, IIPP administrators for this program who can provide guidance regarding this program include:

Mark Litzinger (Infrastructure & Environment; 206-438-2199)

Jeffrey Treffinger (Federal Services; 301-944-3257)

Brad Giles (Energy & Construction; 208-386-7899)

4. Requirements

A. Program Implementation. In addition to designating a person responsible for local IIPP implementation, management must ensure that the following 6 (six) elements described in paragraphs B. through G. are adequately addressed.

B. Communication

Occupational health and safety issues and programs will be communicated in a manner that is readily understood by all employees. A HSE newsletter is periodically distributed electronically employees. Additionally, each office will:

1. Verify that all new employees complete New Employee Safety Orientation within 1 week of starting work (see SMS 025 – New Employee Health and Safety Orientation). New employees should meet with the HSE Manager/Representative (or his/her designee) when possible.

2. Require that job-specific health and safety training courses are provided to employees in a timely manner.

3. Verify that employees have access to the URS HSE Program and Management System on the URS intranet site.

4. Establish an office-wide communication system for health and safety information. The communication system must allow all workers to inform management of health and safety issues without fear of reprisal. The precise method of communication may vary with the needs of the office or work site; communication may consist of one or more of the following elements:

    a. An office health and safety committee. The committee should meet at regular intervals (e.g., once per month, but not less than quarterly). The committee membership must represent labor and management and should consist of the office manager and/or line managers, the local HSE representative, and employees from operations and administrative functions. Employees can inform any committee member of alleged hazardous conditions. Committee meetings may be conducted as part of other currently established meetings (such as routine line manager meetings). Each meeting must be documented and communicated to office employees.

    b. An employee suggestion box. Office management is responsible for responding to suggestions in a timely manner. The system must allow for employees to provide suggestions anonymously if they choose to do so.

    c. An office-wide newsletter. The newsletter should be published at regular intervals, and include information such as program updates, training schedules, health and safety tips, etc.

d. A HSE bulletin board. For large locations or offices with multiple floors, several bulletin boards should be utilized. Bulletin boards are centralized locations for posting office health and safety committee business, training schedules, HSE policy updates, and other topical/seasonal information.

5. Conduct regular field briefings and job safety analysis (JSA)/job hazard analysis (JHA) reviews for all employees on a project.

6. Encourage employees to identify health and safety issues as they are observed by immediately reporting the issues to a supervisor/line management. Inform employees that they may communicate health and safety concerns anonymously without fear of reprisal. Anonymous reporting methods include, but are not limited to, suggestion box, submission to a health and safety committee member, or contact to the Division, Regional, or Business HSE Manager or Director.

C. Compliance

All employees are responsible for complying with safe and healthful work practices. Methods of ensuring compliance include:

1. Informing employees of the provisions of the IIPP.

2. Encouraging employees to apply the principles of “4sight” and emphasizing that everyone has stop work authority if known or suspected hazards are present or if tasks are unclear.

3. Evaluating the safety performance of all employees during performance evaluations and by periodic behavior-based safety observations (see SMS 072, Behavior Based Safety).

4. Recognizing employees that perform safe and healthful work practices via personal evaluation, or awards that may be connected to a specific project or location initiative, or other URS recognition programs.

5. Providing an anti-reprisal policy for employees reporting safety and health concerns.

6. Providing training or mentoring to employees whose safety performance is deficient.

7. Disciplining employees for failure to comply with safe and healthful work practices.

D. Hazard Assessment

1. For each field project, develop a written Health and Safety Plan (HASP) or Safe Work Plan (SWP) incorporating this standard and relevant SMSs and inspection protocols. Each of these documents contains a hazard assessment section and receives appropriate review prior to implementation. Before hazards can be controlled, they must be identified. Identification of hazards is an important step in controlling or eliminating the hazards. Hazard evaluation is the process of examining human, situational, and environmental factors in order to anticipate possible failures during completion of project work tasks.

   SMS 086, Managing Health, Safety, and Environment-Related Risks, describes risk management strategies, including event probability/severity ranking, the principles of 4sight, and JSAs. SMS 098, Management of Change, addresses protection of employees from hazards due to changes in the working environment.

2. Conduct periodic hazard assessments in accordance with the procedures outlined in SMS 068 – Health, Safety and Environment Compliance Assurance.

3. Conduct hazard assessments:

   a. Initially, as a new project or office is established.

   b. When new substances, processes, procedures, or equipment that present potential new hazards are introduced into the workplace. Contact the local URS HSE Representative/Manager if you are not certain that an assessment should be initiated.

   c. When new, previously unidentified hazards are recognized, either through an employee report or a workplace inspection.

   d. In conjunction with an incident investigation.

   e. When workplace conditions warrant an assessment.

f. As directed by the Division, Regional, or Business HSE Manager or Director, or as required by contractual requirements.

E. Incident Investigations

1. Encourage employees to immediately report any incidents, near misses, unsafe acts or conditions, or risky behaviors by fellow employees. Incidents will be defined as fatalities, injuries, illnesses, property damage events, fires, flashes, explosions, and environmental releases or as described by SMS 049.

2. Conduct investigations of incidents, near misses, unsafe acts or conditions, or risky behaviors in accordance with SMS 049 – Injury/Illness/Incident Reporting and Notifications or as be required per contractual requirements. Investigation procedures will include:

   a. Interviewing injured workers and witnesses;

   b. Examining the workplace for factors associated with the incident;

   c. Determining the cause of the incident;

   d. Taking corrective action to prevent the incident from recurring; and

   e. Recording the findings and actions taken.

3. For incidents that meet the criteria of “significant”, the procedures of SMS 066, Incident Investigation, will be followed

F. Hazard Correction

1. Encourage employees to report any work conditions, practices, or procedures that could pose potential workplace hazards. Unsafe acts or unsafe conditions should be reported to the local operational level for resolution.

2. Require that unsafe work conditions, practices, or procedures are corrected in a timely manner, based on the severity of the hazards.

3. Hazards discovered during a formal audit (SMS 068) or client audit protocol must be abated in accordance with the timetable provided in the audit report.

4. Correct imminent hazards either:

    a. Immediately; or

    b. If immediate correction cannot be accomplished without endangering employees and/or property, remove employees from the hazard area until the hazard can be safely abated.

5. Document hazard corrections to the project or office safety file.

G. Training and Instruction

Provide training:

1. On the IIPP when the IIPP is first established or undergoes significant revision. Training can be accomplished by URS online module for this purpose or equivalent live instruction.

2. To all new employees.

3. To employees with new job assignments for which training has not been previously accomplished.

4. Whenever new substances, processes, procedures, or equipment are introduced to the workplace and may represent a new hazard not addressed by previous training.

5. To employees whose project roles require regular refresher training.

6. To supervisory employees to familiarize them with the safety and health hazards to which workers under their supervision may be exposed.

7. Specific to an employee's job assignment as required by Cal-OSHA. (Contact your local HSE Representative or Regional HSE Manager for guidance.)

8. As indicated per the requirements of SMS 055, Health, Safety, and Environment Training.

H. Program Evaluation

Evaluate and document the IIPP for each location on an annual basis using the checklist in Attachment 005-1 – IIPP Evaluation Checklist.

5. Documentation Summary

A. Maintain the following documentation in the office safety file:

1. Employee training records
2. Office hazard assessments and corrective actions
3. Incident reports and records
4. Communication records (i.e., Safety Committee notes, employee suggestions and resolutions, newsletters, etc.)
5. A copy of this Program

B. Maintain the following documentation in the project safety file:

1. Copies of employee training certificates
2. Safe Work Plan or Health and Safety Plan
3. Job Safety Analyses
4. Completed inspections/check sheets per applicable SMSs
5. Incident reports and records

6. Resources

A. Cal/OSHA Standard – Injury and Illness Prevention Program – 8 CCR 3203

B. SMS 025 – New Employee Health and Safety Orientation

C. SMS 049 – Injury / Illness / Incident Reporting and Notifications

D. SMS 055 – Health, Safety, and Environment

E. SMS 066 – Incident Investigation

F. SMS 068 – Health, Safety, and Environment Compliance Assurance

G. SMS 072 – Behavior Based Safety

H. SMS 086 – Managing Health, Safety, and Environment-Related Risks

I. SMS 098 – Management of Change

J. Attachment 005-1NA – IIPP Evaluation Checklist

7. Supplemental Information

A. Model Injury and Illness Prevention Program for High-Hazard Employers

The model Injury and Illness Prevention Program (IIPP) on the following pages has been prepared for use by employers in industries which have been determined by Cal/OSHA to be high hazard. URS offices are not required to use this model; however, it does provide the essential framework required for an IIPP.

MODEL
INJURY AND ILLNESS PREVENTION PROGRAM
FOR
HIGH HAZARD EMPLOYERS

ABOUT THIS MODEL PROGRAM

Every California employer must establish, implement and maintain a written Injury and Illness Prevention (IIP) Program and a copy must be maintained at each workplace or at a central worksite if the employer has non-fixed worksites. The requirements for establishing, implementing and maintaining an effective written injury and illness prevention program are contained in Title 8 of the California Code of Regulations, Section 3203 (T8 CCR 3203) and consist of the following eight elements:

- **Responsibility**
- **Compliance**
- **Communication**
- **Hazard Assessment**
- **Accident/Exposure Investigation**
- **Hazard Correction**
- **Training and Instruction**
- **Recordkeeping**

This model program has been prepared for use by employers in industries, which have been determined by Cal/OSHA to be high hazard. You are not required to use this program. This model program was written for a broad spectrum of employers and it may not match your establishment's exact needs. However, it does provide the essential framework required for an Injury and Illness Prevention Program.

Proper use of this model program requires the IIP Program administrator of your establishment to carefully review the requirements for each of the eight IIP Program elements found in this model program, fill in the appropriate blank spaces and check those items that are applicable to your workplace. The recordkeeping section requires that the IIP Program administrator select and implement the category appropriate for your establishment. Sample forms for hazard assessment and correction, accident/exposure investigation, and worker training and instruction are provided with this model program.

This model program must be maintained by the employer in order to be effective.

INJURY AND ILLNESS PREVENTION PROGRAM

RESPONSIBILITY

The Injury and Illness Prevention Program (IIP Program) administrator,

_____
Program Administrator
has the authority and responsibility for implementing the provisions of this program for

_____.
Establishment Name

All managers and supervisors are responsible for implementing and maintaining the IIP Program in their work areas and for answering worker questions about the IIP Program. A copy of this IIP Program is available from each manager and supervisor.

COMPLIANCE

Management is responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly.

All employees are responsible for using safe work practices, for following all directives, policies and procedures, and for assisting in maintaining a safe work environment.

Our system of ensuring that all workers comply with the rules and maintain a safe work environment include:

1. **Informing workers of the provisions of our IIP Program;**
2. **Evaluating the safety performance of all workers;**
3. **Recognizing employees who perform safe and healthful work practices;**
4. **Providing training to workers whose safety performance is deficient;**
5. **Disciplining workers for failure to comply with safe and healthful work practices; and**
6. **The following practices:** _____

_____

_____

COMMUNICATION

We recognize that open, two-way communication between management and staff on health and safety issues is essential to an injury-free, productive workplace. The following system of communication is designed to facilitate a continuous flow of safety and health information between management and staff in a form that is readily understandable and consists of one or more of the following checked items:

☐ **New worker orientation including a discussion of safety and health policies and procedures.**

☐ **Review of our IIP Program.**

☐ **Workplace safety and health training programs.**

☐ **Regularly scheduled safety meetings.**

☐ **Effective communication of safety and health concerns between workers and supervisors, including translation where appropriate.**

☐ **Posted or distributed safety information.**

☐ **A system for workers to anonymously inform management about workplace hazards.**

☐ **Our establishment has less than ten employees and communicates with and instructs employees orally about general safe work practices and with respect to hazards unique to each employee's job assignment.**

☐ **A labor/management safety and health committee that meets regularly, prepares written records of the safety and health committees meetings, reviews results of the periodic scheduled inspections, reviews investigations of accidents and exposures and makes suggestions to management for the prevention of future incidents, reviews investigations of alleged hazardous conditions, and submits recommendations to assist in the evaluation of employee safety suggestion.**

☐ **Other:** _____

_____

_____

_____

HAZARD ASSESSMENT

Periodic inspections to identify and evaluate workplace hazards shall be performed by the following competent observer(s) in the following areas of our workplace:

Competent Observer	Area

Periodic inspections are performed according to the following schedule:

1. _____;
   Frequency (Daily, weekly, monthly, etc.)
2. **When we initially established our IIP Program;**
3. **When new substances, processes, procedures or equipment which present potential new hazards are introduced into our workplace;**
4. **When new, previously unidentified hazards are recognized;**
5. **When occupational injuries and illnesses occur;**
6. **When we hire and/or reassign permanent or intermittent workers to processes, operations, or tasks for which a hazard evaluation has not been previously conducted; and**
7. **Whenever workplace conditions warrant an inspection.**

Periodic inspections consist of identification and evaluation of workplace hazards utilizing applicable sections of the attached Hazard Assessment Checklist and any other effective methods to identify and evaluate workplace hazards.

ACCIDENT/EXPOSURE INVESTIGATIONS

Procedures for investigating workplace accidents and hazardous substance exposures include:

1. **Visiting the accident scene as soon as possible;**
2. **Interviewing injured workers and witnesses;**
3. **Examining the workplace for factors associated with the accident/exposure;**
4. **Determining the cause of the accident/exposure;**
5. **Taking corrective action to prevent the accident/exposure from reoccurring; and**
6. **Recording the findings and corrective actions taken.**

HAZARD CORRECTION

Unsafe or unhealthy work conditions, practices or procedures shall be corrected in a timely manner based on the severity of the hazards. Hazards shall be corrected according to the following procedures:

1. **When observed or discovered;**

2. **When an imminent hazard exists which cannot be immediately abated without endangering employee(s) and/or property, we will remove all exposed workers from the area except those necessary to correct the existing condition. Workers necessary to correct the hazardous condition shall be provided with the necessary protection; and**

3. **All such actions taken and dates they are completed shall be documented on the appropriate forms.**

TRAINING AND INSTRUCTION

All workers, including managers and supervisors, shall have training and instruction on general and job-specific safety and health practices. Training and instruction shall be provided as follows:

1. **When the IIP Program is first established;**

2. **To all new workers, except for construction workers who are provided training through a Cal/OSHA approved construction industry occupational safety and health training program;**

3. **To all workers given new job assignments for which training has not previously provided;**

4. **Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;**

5. **Whenever the employer is made aware of a new or previously unrecognized hazard;**

6. **To supervisors to familiarize them with the safety and health hazards to which workers under their immediate direction and control may be exposed; and**

7. **To all workers with respect to hazards specific to each employee's job assignment.**

Workplace safety and health practices for all industries include, but are not limited to, the following:

1. **Explanation of the employer's IIP Program, emergency action plan and fire prevention plan, and measures for reporting any unsafe conditions, work practices, injuries and when additional instruction is needed.**

2. **Use of appropriate clothing, including gloves, footwear, and personal protective equipment.**

3. **Information about chemical hazards to which employees could be exposed and other hazard communication program information.**

4. **Availability of toilet, hand-washing and drinking water facilities.**

5. **Provisions for medical services and first aid including emergency procedures.**

In addition, we provide specific instructions to all workers regarding hazards unique to their job assignment, to the extent that such information was not already covered in other training.

RECORDKEEPING

We have checked one of the following categories as our recordkeeping policy.

☐ **Category 1. Our establishment is on a designated high hazard industry list. We have taken the following steps to implement and maintain our IIP Program:**

1. **Records of hazard assessment inspections, including the person(s) or persons conducting the inspection, the unsafe conditions and work practices that have been identified and the action taken to correct the identified unsafe conditions and work practices, are recorded on a hazard assessment and correction form; and**

2. **Documentation of safety and health training for each worker, including the worker's name or other identifier, training dates, type(s) of training, and training providers are recorded on a worker training and instruction form. We also include the records relating to worker training provided by a construction industry occupational safety and health program approved by Cal/OSHA.**

Inspection records and training documentation will be maintained according to the following checked schedule:

☐ **For one year, except for training records of employees who have worked for less than one year which are provided to the worker upon termination of employment; or**

☐ **Since we have less than ten workers, including managers and supervisors, we maintain inspection records only until the hazard is corrected and only maintain a log of instructions to workers with respect to worker job assignments when they are first hired or assigned new duties.**

☐ **Category 2. We are a local governmental entity (any county, city, or district, and any public or quasi-public corporation or public agency therein) and we are not required to keep written records of the steps taken to implement and maintain our IIP Program.**

LIST OF TRAINING SUBJECTS

We train our workers about the following checked training subjects:

- ☐ **The employer's Code of Safe Practices.**
- ☐ **Confined spaces.**
- ☐ **Safe practices for operating any agricultural equipment.**
- ☐ **Good housekeeping, fire prevention, safe practices for operating any construction equipment.**
- ☐ **Safe procedures for cleaning, repairing, servicing and adjusting equipment and machinery.**
- ☐ **Safe access to working areas.**
- ☐ **Protection from falls.**
- ☐ **Electrical hazards, including working around high voltage lines.**
- ☐ **Crane operations.**
- ☐ **Trenching and excavation work.**
- ☐ **Proper use of powered tools.**
- ☐ **Guarding of belts and pulleys, gears and sprockets, and conveyor nip points.**
- ☐ **Machine, machine parts, and prime movers guarding.**
- ☐ **Lock-out/tag-out procedures.**
- ☐ **Materials handling.**
- ☐ **Chainsaw and other power tool operation.**
- ☐ **Tree falling/bucking procedures and precautions, including procedures for recognizing and working with hazard trees, snags, lodged trees, and unsafe weather conditions.**
- ☐ **Yarding operations, including skidding, running lines, unstable logs, rigging and communication.**
- ☐ **Landing and loading areas, including release of rigging, landing layout, moving vehicles and equipment, and log truck locating, loading and wrapping.**
- ☐ **Fall protection from elevated locations.**
- ☐ **Use of elevated platforms, including condors and scissor lifts.**
- ☐ **Safe use of explosives.**
- ☐ **Driver safety.**
- ☐ **Slips, falls, and back injuries.**
- ☐ **Ergonomic hazards, including proper lifting techniques and working on ladders or in a stooped posture for prolonged periods at one time.**
- ☐ **Personal protective equipment.**
- ☐ **Respiratory Equipment.**
- ☐ **Hazardous chemical exposures.**
- ☐ **Hazard communication.**
- ☐ **Physical hazards, such as heat/cold stress, noise, and ionizing and non-ionizing radiation.**
- ☐ **Laboratory safety.**
- ☐ **Bloodborne pathogens and other biological hazards.**
- ☐ **Other job-specific hazards, such as** _____

_____

_____

_____

HAZARD ASSESSMENT AND CORRECTION RECORD

Date of Inspection: **Person Conducting Inspection:**

Unsafe Condition or Work Practice:

Corrective Action Taken:

Date of Inspection: **Person Conducting Inspection:**

Unsafe Condition or Work Practice:

Corrective Action Taken:

Date of Inspection: **Person Conducting Inspection:**

Unsafe Condition or Work Practice:

Corrective Action Taken:

Cal/OSHA Consultation Programs

Toll-free number: 1-800-963-9424 • Internet: www.dir.ca.gov

On-site Assistance Program Area Offices

Northern California
2424 Arden Way, Suite 410
Sacramento, CA 95825
(916) 263-0704

Central Valley
1901 North Gateway Blvd., Suite 102
Fresno, CA 93727
(559) 454-1295

San Francisco Bay Area
1515 Clay Street, Suite 1103
Oakland, CA 94612
(510) 622-2891

San Bernardino
464 West 4th Street, Suite 339
San Bernardino, CA 92401
(909) 383-4567

San Fernando Valley
6150 Van Nuys Blvd., Suite 307
Van Nuys, CA 91401
(818) 901-5754

Los Angeles/Orange
10350 Heritage Park Drive, Suite 201
Santa Fe Springs, CA 90670
(562) 944-9366

San Diego
7575 Metropolitan Dr. suite 204
San Diego, CA 92108
(619) 767-2060

Your call will in no way trigger an inspection by Cal/OSHA enforcement.

- **Voluntary Protection Program**
  San Francisco, CA 94142
  (415) 703-5272

- **Research and Education Unit**
  Sacramento, CA 95825
  (916) 574-2528

DIR
CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS

URS SAFETY MANAGEMENT STANDARD

Electrical Safety

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies for those projects where electricity is used, electrical systems are installed or maintained, or live electrical circuits are accessed. For work in close proximity to overhead or underground utilities, see SMS 034 – Utility Clearances and Isolation.

2. Purpose and Scope

The purpose of this standard is to describe requirements for working on electrical circuits and to reduce worker risk from electrical hazards. The primary hazards related to electricity are shock, burns, arc-blast, fire, and explosions.

Work on live electrical circuits presents hazards of injury due to electrocution and arc flash exposure. Electrocution is a function of voltage (the energy potential) and amps (the amount of energy absorbed through the circuit). The human body can absorb 3 amps with survivable damage to the tissue. At 5 amps, tissue death is nearly immediate. Electrocution may occur with voltage of less than 50 volts. Below that level, electrocution may not cause death. However, even 0.1 amp across the heart (or across the chest or arms, which correlates to current across the heart) can interfere with the heart's function. Individuals who are electrocuted across the chest may be injured in such a way as to stop the heart's function, or stop respiration. If not immediately treated; the heart of an electrocution victim can fail. Electrocution at higher voltages may cause tissue damage or burns. In either mode of electrocution, injury is nearly instantaneous, and death is a frequent outcome.

Arc-flash injury is a result of exposure to the radiation emitted from an electrical spark. An arc flash is typically a very short-duration event (on the order of microseconds), but the heat generated may be four times as hot as the surface of the sun. The radiation emitted by arc flash will cause instant tissue damage. If the eyes are unprotected, the radiation will cause instant blindness.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Any work performed on live electrical systems of 50 volts or more must be done by a qualified licensed or journeyman electrician or HVAC mechanics. Other personnel who may be exposed to electrical hazards must be trained in and be familiar with safe working practices.

B. Arc-flash protection protocols (see Section L) must be in place any time electricians are working on or near live circuits of 50 volts or more.

C. Personnel must follow established lockout/tagout procedures when performing work on electrical equipment or machinery unless power must be applied for the purpose of adjustment or electrical trouble-shooting. Refer to SMS 023 – Lockout and Tagout Safety.

1. Consider all electrical systems as live until verified as de-energized and grounded.

2. Do not work on or in close proximity to electrical circuits unless the circuit is de-energized, grounded, or guarded.

D. General Safe Work Practices

1. Use rated-load switches or circuit breakers to disconnect electric power and lighting circuits. Non-electrical workers may reset a tripped single-pole convenience outlet or lighting circuit breaker *one time*, provided it is not located in a designated emergency panel, and when, based on their knowledge, it is safe to do so. If the circuit breaker trips again, contact a supervisor to authorize and initiate the next appropriate course of action. Other types of circuit breakers may only be reset by personnel with training and knowledge of the affected systems.

2. Strictly prohibit use of pocket knives and standard box cutters – use wire strippers and cable strippers to strip wire and cable, including high-voltage cable.

3. Equipment must meet the requirements of the National Fire Protection Association (NFPA) and/or National Electric Code (NEC) for these locations, if electrical equipment is used near sources of flammable vapors, such as those identified in Class 1, Division 1 or Class 1, Division 2.

4. Guard and secure lamps and fixtures to preclude injury. Open fluorescent fixtures must have wire guards, lenses, tube guards and

locks, or safety sockets that require force in the horizontal axis to remove the lamp.

5. Protect lamps for general illumination from inadvertent contact or breakage either with a suitable guard or by separation of at least 7 feet from normal working surfaces.

6. Double-insulated portable electric hand tools shall be inspected prior to use for any damage or defects and tagged out of service if the protection is compromised by damage or excessive wear. Double-insulated tools must be marked (usually with standard double-insulated mark on casing).

7. Use low voltage battery powered tools when feasible and practical.

8. Unplug portable electrical hand tools when not in use.

9. Do not use electrical cords to raise or lower equipment.

10. Do not use equipment with frayed cords or three-wire cord ends that have had the grounding prong removed.

11. Use the proper power receptacle for each application. Do not manipulate the cord-end prongs to fit the wrong receptacle.

12. Avoid the use of temporary wiring. Employ appropriate ground-fault circuit interrupters with any temporary wiring, including extension cords used for portable electrical equipment and tools.

13. Do not use extension cords in place of permanent wiring (affixed to structure, run-around poles, under doors, through holes in walls or structure, etc.).

14. Always plug high-current–draw items such as coffee pots, refrigerators, microwaves, toaster ovens, and toasters directly into an approved outlet, never into extension cords or power strips.

15. Plug power strips (surge protectors) directly into an approved outlet, not into other power strips or into extension cords. Only use surge protectors listed by a nationally or internationally recognized testing laboratory. Do not plug loads into these devices that exceed the maximum recommended by the manufacturer.

16. Inspect extension cords and cords on electrical equipment before each use. Take equipment or extension cords with damaged wiring or missing plug prongs out of service until the damage is repaired.

17. Electrical safety interlocks may be defeated only by trained and qualified personnel, and then only temporarily, when directed to do so by an approved procedure or work practice, while working on the equipment. Return the interlock to its operable condition as soon as possible.

18. De-energize circuits immediately if an electrical shock victim is still in contact with electrical energy. If not possible to de-energize the circuit, only trained and qualified employees may attempt to remove the victim. Note: Electrical shocks are medically serious regardless of the voltage. Even if the victim shows no apparent signs of injury, they must be seen by a qualified health care professional.

19. Avoid installing conductors in or removing conductors from raceways containing energized or potentially energized conductors, as a general rule, because of the possibility of conductor damage. If this type of work is unavoidable, identify and lock out/tag circuits, or the task will be considered energized work, and an Energized Work Permit (Attachment 012-1) must be secured.

20. Personnel must remain alert at all times when working near exposed electrical parts or in situations where electrical hazards may exist. Personnel must never reach blindly into areas that may contain live circuits. Personnel must not be permitted to work in areas containing electrical hazards if alertness is recognizably impaired due to illness, fatigue, or other reasons.

21. Employees must not enter an area containing exposed electrical circuits unless adequate illumination is provided. When the illumination or obstructions affect visibility and the employee might contact the exposed circuits or equipment, employee will not perform the task.

22. Do not perform tasks within the Limited Approach Boundary of energized electrical components if lack of illumination or obstructions precludes observation of the work to be performed.

23. Handle conductive materials and equipment in contact with an employee's body carefully so they do not come into contact with

exposed conductors. Conductive material and equipment include, but are not limited to ducts, pipes, tubes, conductive hoses or ropes, metal-lined rules and scales, and steel tapes or chains.

24. Use protective shields, barriers, or insulating materials to protect workers from exposed energized parts that might be inadvertently contacted, or where dangerous electric heating or arcing is likely to occur.

25. Take precautions when work is performed in a confined or enclosed space, such as a manhole or vault, to avoid contact with the energized part. Special training in confined spaces and a confined space entry permit must be obtained before entry.

26. Housekeeping and custodial duties will not be performed adjacent to energized parts where such parts present an electrical contact hazard. Cleaning materials such as water, steam, conductive cleaning fluid, steel wool, metalized cloth, or silicon carbide will not be used in the proximity of energized parts.

27. Workers will not wear conductive apparel (e.g., watches, rings, bracelets, key chains, necklaces, metalized aprons, cloth with conductive thread, metal head gear, wire/metal-rimmed glasses, etc.).

28. Report to supervisor potential electrical hazards or unexpected occurrences during electrical renovation or construction.

29. Do not use equipment that does not meet the requirements of this standard.

E. Hazardous Locations

1. Determine whether electrical equipment and wiring will be installed in locations where any of the following may be present: flammable vapors, liquids, or gases; combustible dusts or fibers; or a concentration or quantity of flammable or combustible material. See Supplemental Information A – Hazardous Locations, for definitions of hazardous locations.

2. Use protective barriers or insulating materials if electrical systems in a confined space cannot be de-energized.

3. If an employee must handle long dimensional conductive objects (e.g., ducts and pipes) in areas with exposed energized systems,

attempts will be made to de-energize the systems. If the systems cannot be de-energized, site procedures will be developed (e.g., use of insulation, guarding, and material handling techniques) which will minimize the hazard.

F. Circuit Interrupters and Grounding

1. Ground-Fault Circuit Interrupters (GFCI)

   a. Provide GFCI protection in wet or extremely damp areas.

   b. Employ GFCI to protect personnel when using portable electric tools and portable electric equipment, including portable lights.

   c. Locate GFCI protection between extension cords and the electrical outlets into which they are plugged.

   d. Provide GFCI for all 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites.

   e. Provide GFCI for all 120-volt, single-phase, 15- and 20-ampere receptacle outlets within garages, bathrooms, kitchens, and shops.

   f. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5 kilowatts, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with GFCI.

   g. Test portable GFCI devices by pushing the test button on the device before each use. Permanently mounted GFCI will be tested monthly by pressing the test button.

2. Grounding

   Effectively ground all wiring, electrical circuits, and equipment, except portable tools and appliances protected by an Underwriter's Laboratory (UL)-approved system of double insulation. Note that an equipment conductor grounding program that meets regulatory requirements can be used in lieu of GFCIs. Examples of equipment requiring grounding include:

   a. Portable and vehicle- or trailer-mounted generators.

b. Electrically powered arc welders.

c. Switches.

d. Motor-controller cases.

e. Fuse boxes.

f. Distribution cabinets.

g. Frames.

h. Non–current-carrying rails used for travel, and motors of electrically operated cranes.

i. Electric elevators.

j. Metal frames of non-electric elevators to which electric conductors are attached.

3. Assured Grounding

   Whenever possible, use GFCI instead of assured grounding. Assured grounding programs must be approved by the Regional HSE Manager or HSE Director. Develop a site-specific assured grounding program. Supplemental Information C – Assured Grounding Guidelines, may be used to develop a site-specific program.

G. Circuits

1. Require that there are no missing blanks.

2. Close doors to circuit and fuse boxes when not in use.

3. Label every circuit located on a circuit breaker/fuse box, and/or motor-control center (MCC).

H. Temporary Wiring, Electrical Tools, and Extension Cords

1. Require that temporary wiring is installed and used in accordance with regulatory requirements; specifically:

   a. Guard, bury, or isolate temporary wiring by elevation to prevent accidental contact by workers and equipment.

b. Require that vertical clearance above walkways is not less than 10 feet (3 meters) from circuits carrying 600 volts or less.

c. Support all exposed temporary wiring on insulators.

d. Protect temporary wiring from accidental damage.

e. Guard live parts of wiring.

f. Mark temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment to indicate the maximum operating voltage.

2. Require that lighting strings are installed and used in accordance with regulatory requirements; specifically:

a. Provide adequate light throughout the building and in all work areas throughout the project, particularly passageways and stairways, and wherever necessary to avoid a hazard due to lack of light. Consideration should be given to the selection and placement of lights that will provide minimum glare, eliminate harsh shadows, and provide adequate illumination to work efficiently and safely. Ensure lighting is available at all times when employees are in the work area.

b. Use nonconductive lamp sockets and connections permanently molded to the conductor insulation.

c. Require that lighting strings have lamp guards, except where the construction of the reflector is such that the bulb is deeply recessed.

d. Promptly replace all broken or defective bulbs. Exposed empty light sockets are prohibited.

e. Protect all lights used for illumination from accidental contact or breakage.

f. Ground metal-case sockets.

3. Require that extension cords are installed and used in accordance with regulatory requirements, specifically:

a. Use only 3-wire grounded-type extension cords designated for hard service or extra hard service and listed by UL.

b. Check cords for damage before use and daily thereafter.

c. Do not exceed the rated load.

d. Use extension cords of adequate length. "Daisy chaining" of cords is prohibited unless specifically allowed by the cord manufacturer.

e. Do not use spliced cords.

f. Destroy and discard worn, damaged or frayed cords and cords with the ground prong removed or rendered ineffective shall be removed from service for repair and retesting.

g. Cord set repairs shall be performed by a qualified electrician using only UL-listed attachment plugs and receptacle ends of equal service rating. The repaired cord set shall be tested using a three prong circuit tester, a tension tester and an ohm meter prior to being returned to service.

h. Do not fasten extension cords with staples, hang them using non-metallic insulating hangers such as zip-ties.

i. Do not wrap cords or cables around any conductive materials.

j. Protect electrical cords and trailing cables from damage that could create a hazard to employees or other persons in the area.

4. Inspect portable electric tools brought onto the site to ensure that they are in good condition. Inspect portable cord- and plug-connected equipment for external defects and evidence of possible internal damage before use on any shift.

I. Work On or Near Energized Hazards

1. Two qualified personnel and an Energized Work Permit (Attachment 012-1) must be present for work on or near energized hazards, except for authorized troubleshooting with approved testing equipment or verifying de-energization during lockout/tagout.

a. Work is considered to be “on or near” whenever any of the following conditions occur:

   i. Any part of the body, regardless of the level of PPE protection, enters or is inadvertently placed within the Restricted Approach Boundary, based on the maximum potential voltage involved.

   ii. Any tool or piece of equipment (insulated or not) enters or is inadvertently placed within the Restricted Approach Boundary, based on the maximum potential voltage involved.

b. If URS retains a subcontractor to perform work on live electrical systems, the subcontractor will advise URS (or URS’ client) of:

   i. Any unique hazards presented by the contract employer’s work.

   ii. Any unanticipated hazards found during the contract employer’s work that the host employer did not mention.

   iii. The measures the contractor took to correct any hazards reported by URS to prevent such violation from recurring in the future.

2. Obtain an Energized Work Permit (Attachment 012-1) for all work, even non-electrical work, within the restricted approach boundary.

   a. Work “on or near” live equipment as defined above is permitted only when it is impossible to shut off the equipment or circuits; or when de-energizing the equipment would introduce additional or increased hazards; or is infeasible due to equipment design or operational limitations. Examples of situations that would meet the requirements of “increased or additional hazards” include interruption of life safety equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination from a large area.

   b. Retain a copy of the Energized Work Permit both at the work site until work is completed in the office/project file. The Energized Work Permit provides documentation of the

justification for working the circuit or equipment energized; identifies the specific personnel who are to perform the work and the specific PPE requirements for the task; defines the scope of the task; and details additional special protective and work practices required to protect both the workers and other personnel in the area. The permit must be authorized by a member of management.

c. ANSI-approved voltage-rated tools must be used any time the plane of the cabinet, vault, box, or opening is breached if *all* exposed live components of 50 volts or greater in a cabinet, vault, box, or other piece of electrical equipment are not completely de-energized through lockout/tagout.

d. Full PPE must be worn, based on maximum potential voltages as defined in Section 3 below, as well as the use of ANSI-approved and voltage-rated tools, which are rated for maximum voltages, that may be encountered during metering, even though metering during authorized troubleshooting is not considered “working on or near.”

3. Approach Boundaries for Live Parts

The approach boundaries listed below will be used to define Energized Work Permit requirements, tool and equipment requirements, and PPE requirements by employees:

a. Flash Protection Boundary: Workers within this boundary must use arc-flash protection for all parts of the body when work is being performed that could lead to an arc flash. Arc-flash protection boundaries are presented in the table below. Flash-protection boundaries at voltages above 600 volts will be calculated following NFPA 70E on a case-by-case basis using the formula found in NFPA 70E, paragraph 130.3 (A), or applying the maximum level of protection recommended in Table 130.7(C)(9)(a), based on the work being performed.

b. Limited Approach Boundary: The limited approach boundary establishes an area around exposed energized hazards of 50 volts or greater where unqualified employees must be escorted and directly supervised by a qualified employee. Use insulated, voltage-rated, ANSI-approved tools based on the maximum voltage within this boundary. Limited

approach boundaries are presented in the table below (refer to NFPA 70E for higher voltages).

c. Restricted Approach Boundary: The restricted approach boundary establishes an area around exposed energized hazards of 50 volts or greater where unqualified employees are prohibited, and insulated tools and full PPE are required, based on the maximum voltage. A worker is considered to be working "near" energized systems when any part of the body or tool could approach an energized component closer than the distances discussed below. An Energized Work Permit is always required in these cases, except during troubleshooting with approved testing equipment. Restricted approach boundaries are presented in the table below (refer to NFPA 70E for higher voltages).

d. Prohibited Approach Boundary: The prohibited approach boundary establishes an area around exposed energized hazards of 50 volts or greater where approach within the boundary is considered "working on" an energized system. A worker is considered to be "working on" energized systems when any part of the body or tool could approach an energized component closer than the distances discussed below. Unqualified workers are prohibited, and full PPE is required, based on the maximum voltage. An Energized Work Permit is always required in these cases, except during troubleshooting with approved testing equipment. Prohibited approach boundaries are presented in the table below (refer to NFPA 70E for higher voltages).

Nominal System Voltage Range, Phase to Phase[1]	Flash Protection Boundary	Limited Approach Boundary	Restricted Approach Boundary	Prohibited Approach Boundary
Less than 50 volts	Not Specified	Not Specified	Not Specified	Not Specified
50 volts – 240 volts	4 ft / 1.22 m	3 ft, 6 in / 1.1 m	Avoid Contact	Avoid Contact
240 volts – 300 volts	4 ft / 1.22 m	3 ft, 6 in / 1.1 m	Avoid Contact	Avoid Contact
301 volts – 500 volts	4 ft / 1.22 m	3 ft, 6 in / 1.1 m	1 ft / 0.3 m	1 in / .03 m
501 volts – 599 volts	4 ft / 1.22 m	3 ft, 6 in / 1.1 m	1 ft / 0.3 m	1 in / .03 m

Nominal System Voltage Range, Phase to Phase[1]	Flash Protection Boundary	Limited Approach Boundary	Restricted Approach Boundary	Prohibited Approach Boundary
600 volts	4 ft / 1.22 m	3 ft, 6 in / 1.1 m	1 ft / 0.3 m	1 in / .03 m
601 volts – 750 volts	CN	3 ft, 6 in / 1.1 m	1 ft / 0.3 m	1 in / .03 m
751 volts – 1 kV	CN	5 ft / 1.5 m	2 ft, 2 in / 0.67 m	7 in / 0.12 m
1.1 kV – 7.5 kV	CN	5 ft / 1.5 m	2 ft, 2 in / 0.67 m	7 in / 0.12 m
7.51 kV – 15 kV	CN	5 ft / 1.5 m	2 ft, 2 in / 0.67 m	7 in / 0.12 m
15.1 kV – 17 kV	CN	6 ft / 1.83 m	2 ft, 7 in / 0.82 m	10 in / 0.25 m
17.1 kV – 26.5 kV	CN	6 ft / 1.83 m	2 ft, 7 in / 0.82 m	10 in / 0.25 m
26.51 kV – 36 kV	CN	6 ft / 1.83 m	2 ft, 7 in / 0.82 m	10 in / 0.25 m
36.1 kV – 46 kV	CN	6 ft / 1.83 m	2 ft, 9 in / 0.88 m	1 ft, 5 in / 0.46 m

[1] For single-phase systems, select the range that is equal to the system's maximum phase-to-ground voltage multiplied by 1.732.

CN = Calculation Needed. See NFPA 70E, Annex D – Incident Energy and Flash Protection Boundary Calculation Methods; and choose the appropriate method out of the 5 listed. These calculations must be used only under qualified engineering supervision.

4. Establishing an Electrically Safe Work Condition

   a. Establish an electrically safe work condition before performing work (other than authorized metering as a part of troubleshooting) within the Limited Approach Boundary of exposed electrical hazards.

   b. Performing complete lockout/tagout of all electrical potentials of 50 volts or greater within the cabinet, vault, box, or work area is considered establishing an electrically safe work condition, as long as the lockout/tagout process accomplishes all of the following:

      i. Provides a documented hazard evaluation at the site, including the identification of the person in charge of the lockout/tagout.

      ii. Identifies every source of electrical energy of 50 volts or greater remaining inside the cabinet, vault, and

box, and completely eliminates them through lockout/tagout.

iii. Tests every phase conductor or circuit part with an approved meter (phase-to-phase and phase-to-ground) to verify they are de-energized (meter will be checked before and after each test to confirm it is operating properly).

iv. Applies ground-connecting devices to any part or circuit where there is a possibility of induced voltages or stored electrical energy, including grounding-out of capacitors or similar devices that may hold stored energy.

c. If both locks and tags cannot be installed, employ a second alternative method such as removal of a fuse in addition to a tag. Consider all circuits and equipment energized until an electrically safe work condition has been established and verified.

d. Follow these work practices if an electrically safe work condition as described above has not been established:

i. If the Restricted and/or Prohibited Approach Boundary may be breached, an Energized Work Permit will be secured, and work practices will comply with those required for “working on or near” energized hazards

ii. If the Limited Approach Boundary may be breached, a qualified person must be present and directly supervise the work.

iii. If the Arc-Flash Boundary may be breached and any work is performed that has the possibility of causing an arc flash, all personnel within the flash boundary will be protected with appropriate levels of arc-flash protection.

5. Insulated Tools and Equipment

a. Use ANSI-approved insulated tools and/or handling equipment when working near exposed energized conductors or circuit parts. Protect the insulating materials

on these items during storage or transportation. Use fuse-handling equipment capable of withstanding the circuit voltage when removing or installing fuses from an energized fuse terminal. Allow *only* nonconductive ropes and hand lines near exposed parts.

b. Inspect insulated tools and equipment prior to each use. Include an examination for damage to the insulation or damage that may limit the tool from performing its intended function, or which could increase the potential for an incident. Immediately remove any defective tools and equipment from service.

c. Use insulated tools and insulated equipment when:

    i. Breaking the plane (or opening) of an electrical fixture (cabinet, vault, panel, etc.) where any live voltage of 50 volts or greater remains (including metering for troubleshooting). Cabinet will be considered as containing live voltage until all sources of 50 volts or greater have been completely de-energized through lockout/tagout, and confirmed to be de-energized through metering.

    ii. Any part of the body or a tool or piece of equipment may cross the Limited Approach Boundary for the maximum voltage present.

    iii. All tools used in either case above will be voltage-rated, ANSI-approved tools rated to the maximum voltage hazard present.

d. Insulated tools and equipment will also comply with the following:

    i. Grounding and testing devices will be stored in a clean, dry area and properly inspected and tested before each use.

    ii. Use fuse or fuse-holding equipment to remove or install a fuse if the fuse terminals are energized. Fuse or fuse holder will be rated and insulated for the circuit voltage.

iii. Ropes or hand lines used near exposed live parts operating at 50 volts or greater will be non-conductive.

iv. Fiberglass-reinforced plastic rod and tube tools used for live line work will meet the requirements of ASTM F 711.

v. Portable ladders will have non-conductive side rails. Metal ladders are prohibited in areas where electrical hazards exist.

6. Personal Protective Equipment Requirements

a. Protective equipment requirements outlined in the table below are mandatory when any part of the body or a tool or piece of equipment may be placed within the Restricted-Approach Boundary (Section 1):

i. All personnel must wear the required PPE as outlined in this section until all energy sources of 50 volts or greater within the Restricted Approach Boundary have been completely eliminated through lockout/tagout, and de-energization has been confirmed through metering. The ratings in this section of cal/cm^2 represent arc-flash protection ratings. If protective equipment is not marked with these ratings, it does not meet the requirements of NFPA 70E, and will not be used. Exceptions to these requirements are limited to those specifically addressed under each type of protective equipment.

ii. Maintain protective equipment in a safe, reliable condition, and visually inspect before each use. Gloves shall be leak tested before use. Store protective equipment in a manner to prevent physical damage, and damage from moisture, dust, or other deteriorating agents.

iii. Do not use arc-flash clothing that is contaminated with grease, oil, or flammable liquids or combustible materials or is damaged to an extent where the protective qualities are impaired. Store arc-flash clothing to avoid physical damage; damage from

moisture, dust, or other deteriorating agents; and contamination from flammable or combustible material. Clean following the manufacturer's instructions to avoid loss of protection. If necessary, make repairs using the same flame-retardant materials used in the original garment.

iv. When body protection is required, use all-cotton underclothing (never nylon, polyester or rayon) that contains no metal.

v. Trim, name tags, or logos affixed to flame-retardant clothing must also be flame-retardant rated.

vi. Hairnets and/or beard nets must be of non-melting, flame-resistant design.

vii. Wear Class E hardhats rated for electrical protection when inside any substation or other power transmission and distribution equipment area. Inspect hardhats before use.

Voltage	Required PPE
Less than 50	Eye/Face: ANSI approved safety glasses (non-metallic) with side shields or goggles Body: Long sleeve cotton shirt and cotton pants Hand: Leather gloves Foot: Leather, EH rated footwear Head/Ears: Hard hat, hearing protection (ear canal inserts)
50 to 240 volts	Eye/Face: ANSI approved safety glasses (non-metallic) with side shields or goggles and Arc-Flash Face Shield *or* Arc-Flash Suit Hood (4 cal/cm^2) Body: Flame Retardant long sleeve shirt/pants or coverall (4 cal/cm^2) Hand: EH gloves (Class 00 with leather protectors) Foot: EH rated footwear Head/Ears: Class E Hard hat, hearing protection (ear canal inserts)

Voltage	Required PPE
Above 240 to 480 volts	Eye/Face: ANSI approved safety glasses (non-metallic) with side shields or goggles and Arc-Flash Face Shield and Sock Hood (8 cal/cm^2) *or* Arc-Flash Suit Hood (8 cal/cm^2) Body: Flame Retardant long sleeve shirt pants or coverall (8 cal/cm^2) Hand: EH gloves (Class 00 with leather protectors) Foot: EH rated footwear Head/Ears: Class E Hard hat, hearing protection (ear canal inserts)
480 to 600 volts	Eye/Face: ANSI approved safety glasses (non-metallic) with side shields or goggles and Arc-Flash Suit Hood (8 cal/cm^2) Body: Flame-Retardant long sleeve shirt pants or coverall (8 cal/cm^2) Hand: EH gloves (Class 0 or higher with leather protectors) Foot: EH rated footwear (carbon fiber recommended) Head/Ears: Class E Hard hat, hearing protection (ear canal inserts)
600 volts or above	Eye/Face: ANSI approved safety glasses (non-metallic) with side shields or goggles and Arc-Flash Suit Hood (25 cal/cm^2) Body: 2 Layer Flame-Retardant long sleeve shirt pants or coverall (25 cal/cm^2) Hand: EH gloves (Class 0 or higher with leather protectors) Foot: EH rated footwear (carbon fiber recommended) Head/Ears: Class E Hard hat, hearing protection (ear canal inserts)

7. Hazard Alerting/Control Requirements

   a. Employ special precautions to warn employees of unusual electrical hazards until they are corrected or eliminated. For example, if breakers or breaker blanks are found missing inside a breaker panel, a warning sign will be placed on the panel door that limits access to qualified electricians only until the electrical hazard is returned to compliance with the electrical code.

   b. Use barricades in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas containing live parts. Make barricades of non-conductive design and place so as to prevent access to the Limited Approach Boundary by non-qualified personnel (10 feet for

exposed movable conductors, and 3½ feet for non-movable conductors up to 750 volts).

c. Do not leave exposed energized components unattended and/or unprotected. If signs or barricades cannot assure warning and protection from electrical hazards, station an attendant to warn and protect personnel. Attendants will remain in the area as long as there is the potential for personnel to be exposed to the electrical hazards. Their primary duty is to keep unqualified personnel outside a work area where the unqualified employee might be exposed to the electrical hazard; which at an absolute minimum, is outside the Limited Approach Boundary.

d. Employ additional alerting methods such as signs, barricades, or attendants where work is performed on equipment that is de-energized and placed in an electrically safe condition in a work area with *other* energized equipment that is similar in size, shape, and construction, to prevent employees from entering look-alike equipment.

B. Electrical Protective Equipment Requirements

1. Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following requirements:

   a. Produce blankets, gloves, and sleeves by a seamless process.

   b. Mark each item clearly with its Class number.

   c. Markings must be non-conductive and not impair the insulating qualities of the equipment.

   d. Confine markings on gloves to the cuff-portion of the glove.

2. Equipment must also meet the specifications contained in the governing ASTM standard outlined in the following table.

Item	Standard
Insulating matting	ASTM D 178-93 (or D 178-88)
Insulating blankets	ASTM D 1048-93 (or D 1048-88a)
Insulating covers	ASTM D 1049-93 (or D 1049-88)

Insulating line hose	ASTM D 105-90
Insulating sleeves	ASTM D 1051-87

3. Do not use insulating equipment with any of the following defects:

    a. Holes, tears, punctures, or cuts.

    b. Embedded foreign objects.

    c. Texture changes, swelling, softening, hardening, or becoming sticky or inelastic.

    d. Any other defect that may damage insulating properties.

4. Clean insulating equipment as needed to remove foreign substances, and store in a location and manner that protects it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions. A thorough visual examination by the worker is always required immediately before each use.

5. Inspect and test rubber insulating equipment as outlined in the following table.

Item	Inspection	Testing by Qualified Agency	Governing Standard for Test Voltage
Rubber insulating line hose	Before each use	Upon indication that the insulating value is suspect	ASTM F 478
Rubber insulating covers	Before each use	Upon indication that the insulating value is suspect	ASTM F 478
Rubber insulating blankets	Before each use	Before first issue and every 12 months thereafter	ASTM F 479
Rubber insulating gloves	Before each use	Before first issue and every 6 months thereafter	ASTM F 496
Rubber insulating sleeves	Before each use	Before first issue and every 12 months thereafter	ASTM F 496

NOTE: In the case of blankets, gloves, and sleeves, if the equipment has been electrically tested but not issued for service, it may not be placed into service unless it has been electrically tested within the past 12 months. In all cases, a process or procedure will be deployed that assures identification and confirmation of inspection currentness for individual pieces of equipment by both the worker and an inspecting/auditing agency.

C. Warning Sign and Marking Requirements

1. A summary of the warning signs and marking requirements for electrical systems and areas contained in industry standards is provided in the table below. Projects must comply with these requirements or provide alternate and equally effective warnings for the Company personnel.

Warning Signs and Markings	
Condition	**Requirements**
Entrance to rooms or other guarded locations containing exposed live parts (600 volts nominal or less).	Post conspicuous warning sign forbidding unqualified persons from entering.
Entrance to buildings, rooms, or enclosures containing exposed live parts (over 600 volts nominal).	Post warning sign reading ***Danger-High Voltage – Keep Out*** or similar language. Entrance must remain locked.
All electrical equipment.	Mark equipment with the manufacturer's name, trademark, or other marking indicating the organization responsible for the product. Additional requirements for marking voltage, current, wattage, or other ratings maybe specified by the NEC.
Disconnection of power sources (including circuit breakers).	Mark each disconnection required for motors, appliances, and each service feeder or branch circuit at the point where it originates to indicate its purpose, unless located and arranged so that the purpose is evident.
Circuit breakers or fuses applied in compliance with Series Combination Ratings.	Mark equipment enclosure to indicate the equipment has been applied with Series Combination Rating. Markings must state ***Caution–Series Rated System Amps Available: Identified Replacement Component Required***.
Exposed live parts of transformers.	Mark with operating voltage.
Fused cutouts not interlocked with the switch to prevent opening of the cutouts under load.	Post conspicuous sign at the cutouts reading ***Warning – Do Not Open Under Load***.
More than one switch is installed with interconnected load terminals to provide for alternate connection to different supply conductors.	Post conspicuous sign reading ***Warning – Switch May be Energized by Backfeed*** **at each switch**.
Fuses potentially energized by backfeed.	Post sign on enclosure door reading ***Warning – Fuses May Be Energized By Backfeed*****.**

D. Power Transmission/Distribution Requirements

1. Develop additional location-specific written procedures that cover site-specific systems and define work practices that meet the spirit and intent of 29 Code of Federal Regulation (CFR) 1910.269 for locations that perform work on power transmission and distributions systems. This Safety Management Standard does not cover all of the work practices necessary to protect personnel in these highly unique and hazardous work conditions.

E. Training

1. Train affected personnel, both those qualified to perform electrical work and those not qualified who may still work on or near energized systems, in the safe work practices outlined in this section on an annual basis. Training may be at different levels for qualified and unqualified, but must be sufficient to afford the electrical safe work practices and hazard recognition knowledge required to safely perform their respective tasks. Training will also cover how a GFCI operates, hazards associated with portable electric power extension cord use, and when GFCI use is required. Affected personnel will also be instructed on how to inspect the specialized PPE required for electrical work prior to being placed in a position where this PPE is required. All personnel will receive training on electrical hazards as part of the job orientation which shall qualify as documentation for unqualified workers. Qualified workers will receive additional training specific to the job and hazards as required.

2. Document all training. Train affected personnel either as “qualified” or “unqualified,” with qualified being at a level sufficient to afford protection during actual electrical work.

3. Qualified personnel are personnel who have also been trained, at a minimum, in the following:

    a. The skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment.

    b. The skills and techniques necessary to determine the nominal voltage of exposed live parts.

    c. Clearance distances for working near live circuits or equipment.

d. The decision-making process necessary to determine the degree and extent of the hazard, and the PPE and job planning necessary to perform the task safely.

4. Personnel who perform work on electrical circuits must also meet the following minimum requirements:

   a. Have experience servicing the electrical components of the equipment they are assigned to service.

   b. Have experience working on energized electric circuit parts or equipment.

   c. Meet any governing statute or regulatory requirement, host nation, or customer requirement for special certifications or licenses.

5. Personnel who work on power transmission/distribution systems must have additional training and experience that meets or exceeds the spirit and intent outlined in 29 CFR 1910.269. This includes the requirement to identify hazardous tasks not routinely performed, and establish procedures to ensure personnel have performed these tasks within the past 12 months, or that they are re-trained or supervised before performing them. These additional requirements are mandatory before exposure to the hazards. This additional training must be documented.

F. Job Briefings

1. Before starting each job, the employee in charge will conduct a job briefing with other personnel involved. The briefing will cover such subjects as a pre-job hazard review associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements. Use Supplemental Information B – PPE, Tools, and Equipment, as a guide for proper PPE, as applicable. Use SMS 086 NA procedures and appropriate forms in Supplemental Information for conducting Job Safety Analysis or Job Hazard Analysis for each job.

2. If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing will be conducted before the start of the first job of the day or shift. Conduct additional job briefings if significant changes might affect the safety of employees during the course of the work. A brief

discussion will be satisfactory if the work involved is routine, and if the employee, by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job. A more extensive discussion must be conducted if:

a. The work is complicated or particularly hazardous; or

b. The employee cannot be expected to recognize and avoid the hazards involved in the job.

G. Inspect the job site periodically using Attachment 012-2 NA – Electrical Hazard Checklist, to evaluate compliance with this standard.

5. Documentation Summary

The following information will be maintained in the project file:

A. A copy of license for licensed/journeyman electrician for project (as necessary).

B. Completed audits of electrical hazards.

C. Documented communications between URS, contractors, licensed/journeyman electricians, or others.

D. Records of all pertinent electrical work performed on a project, including as-built design updates.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard – General Industry Electrical Safety – 29 CFR 1910, Subpart S

B. U.S. OSHA Standard – Construction Electrical Safety – 29 CFR 1926, Subpart K

C. U.S. OSHA Standard – Design Safety Standards for Electrical Systems – 29 CFR 1910, Subpart S

D. American National Standards Institute/Institute of Electrical and Electronics Engineers – National Electrical Safety Code (NESC), ANSI/IEEE C2-2002

E. National Fire Protection Association, National Electric Code, NFPA-70

F. SMS 023 – Lockout and Tagout Safety

G. SMS 034 – Utility Clearances and Isolation

H. SMS 086 – Managing Health, Safety and Environment Related Risks

I. Attachment 012-1 NA – Energized Work Permit

J. Attachment 012-2 NA – Electrical Hazard Checklist

7. Supplemental Information

A. Hazardous Locations

B. PPE, Tools, and Equipment Needed During Electrical Work

C. Assured Grounding Guidelines

URS	Health, Safety, and Environment **ENERGIZED WORK PERMIT**	Attachment 012-1 NA Issue Date: June 1999 Revision 5: January 2011

INSTRUCTIONS: An Energized Work Permit is required for any work within the Restricted Approach Boundary (1 foot for 50 to 750 volts; 2 feet, 2 inches for 751 to 15kV; see NFPA 70E for higher voltages). An energized electrical work permit is not required under the following two conditions:

1) Work is limited to metering as a part of troubleshooting and the maximum voltage is less than 600 volts; or
2) All potential sources of electrical energy of 50 volts or greater are completely eliminated within the cabinet, vault, or panel through lockout/tagout.

TO BE COMPLETED BY THE PERMIT REQUESTER			
Project/Site Name:		Work Location:	
Description of circuit/equipment:			
Description of work to be done:			
Justification of why circuit/equipment cannot be de-energized, or the work be deferred until scheduled outage:			
Requestor Name:		Requestor Title:	
Requestor Signature:		Date:	

TO BE COMPLETED BY THE ELECTRICAL QUALIFIED PERSONS DOING THE WORK		
1 – Maximum voltage of energized components:		
2 – Required PPE (check range based on maximum voltage)		
☐	50 to 240 volts	• Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Face Shield *or* Arc-Flash Suit Hood (4 cal/cm^2) • Body: Flame-Retardant long-sleeved shirt/pants or coverall (4 cal/cm^2) • Hand: EH gloves (Class 00 with leather protectors) • Foot: EH-rated footwear • Head/Ears: Class E hard hat, hearing protection (ear canal inserts) • Tools: ANSI-approved, voltage-rated
☐	Above 240 to 480 volts	• Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Face Shield and Sock Hood (8 cal/cm^2) *or* Arc-Flash Suit Hood (8 cal/cm^2) • Body: Flame-Retardant long-sleeved shirt/pants or coverall (8 cal/cm^2) • Hand: EH gloves (Class 00 with leather protectors) • Foot: EH-rated footwear • Head/Ears: Class E Hard hat, hearing protection (ear canal inserts • Tools: ANSI-approved, voltage-rated
☐	480 to 600 volts	• Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Suit Hood (8 cal/cm^2) • Body: Flame-Retardant long-sleeved shirt/pants or coverall (8 cal/cm^2) • Hand: EH gloves (Class 0 or higher with leather protectors) • Foot: EH-rated footwear (carbon fiber recommended) • Head/Ears: Class E Hard hat, hearing protection (ear canal inserts) • Tools: ANSI-approved, voltage-rated

☐	600 volts and above	• Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Suit Hood (25 cal/cm^2) • Body: 2-Layer Flame-Retardant long-sleeved shirt/pants or coverall (25 cal/cm^2) • Hand: EH gloves (Class 0 with leather protectors) • Foot: EH-rated footwear (carbon fiber recommended) • Head/Ears: Class E Hard hat, hearing protection (ear canal inserts) • Tools: ANSI-approved, voltage-rated

3 – Description of job procedure to be used in performing the work:

4 – Description of safe work practices to be employed:

5 – Method to be employed to restrict access of unqualified persons from the work area:

ELECTRICAL QUALIFIED PERSONS CERTIFICATION

I/we agree to, and certify the following:

- Work on energized circuits and components will be limited to conditions outlined on this permit.
- Required ANSI-certified tools and equipment are available and will be used.
- Required PPE is available and will be used/worn.
- A pre-task briefing has been held that included all personnel involved with this work.
- An on-site hazard assessment has been/will be conducted before work is started.
- Work described on this permit can be done safely.
- If conditions or work requirements change, or hazards not previously identified are encountered, work will stop until a new permit is issued or the new hazards have been eliminated.

Electrically Qualified Persons:

Print Name	Signature	Date

APPROVAL TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED

Project/Site Manager:	Date:
HSE Manager/Representative:	Date:
Date & Time Permit Valid:	Date &Time Permit Expires:

URS	Health, Safety and Environment **ELECTRICAL HAZARD CHECKLIST**	Attachment 012-2 NA Issue Date: June 1999 Revision 5: January 2011

Location Inspected: _____ **Job No.:** _____

Date Inspected: _____ **Name of Inspector:** _____

Check Yes, No, or NA for Not Applicable. If a comment is required, circle the number, and see Page 3.

Electrical Equipment Markings

1.	Disconnecting switches and circuit breakers are labeled to indicate their use or equipment served.	☐ Yes	☐ No	☐ NA
2.	The necessary voltage, wattage, or current ratings are labeled.	☐ Yes	☐ No	☐ NA
3.	Circuit breakers clearly indicate whether they are in the “on” or “off” position.	☐ Yes	☐ No	☐ NA
4.	Markings for arc flash hazards per NFPA 70E are on each panel or distribution box.	☐ Yes	☐ No	☐ NA

Electrical Grounding

5.	Extension cords used have a grounding conductor (third plug).	☐ Yes	☐ No	☐ NA
6.	Ground-fault circuit interrupters are installed as required.	☐ Yes	☐ No	☐ NA
7.	Portable electrical tools and equipment are of the double-insulated type.	☐ Yes	☐ No	☐ NA
8.	Ground-fault circuit interrupters open the circuit on a ground current of 5 milliamperes or greater, and are equipped with an integral push-button test circuit.	☐ Yes	☐ No	☐ NA
9.	Ground-fault circuit interrupters are installed in accordance with the manufacturer’s instructions.	☐ Yes	☐ No	☐ NA
10.	Ground-fault circuit interrupters are tested prior to initial use, and periodically thereafter.	☐ Yes	☐ No	☐ NA
11.	Grounding rods are at least 5/8-inch- (0.625-centimeter)-diameter steel or iron rods, ½-inch- (1.27-centimeter)-diameter copper-clad steel, or ¾-inch-(1.9-centimeter)-diameter galvanized pipe.	☐ Yes	☐ No	☐ NA
12.	Grounding rods are in 8-foot (2.5-meter) lengths and driven to full depth.	☐ Yes	☐ No	☐ NA
13.	The paths from circuits, equipment, structures, and conduits or enclosures to ground are:			
	• Permanent and continuous.	☐ Yes	☐ No	☐ NA
	• Have ample carrying capacity for the current likely to be imposed on them.	☐ Yes	☐ No	☐ NA
	• Have resistance sufficiently low to permit current flow to operate circuit breakers and similar overcurrent devices on the circuit.	☐ Yes	☐ No	☐ NA
14.	Driven ground-rod electrodes have a resistance to ground not exceeding 25 ohms.	☐ Yes	☐ No	☐ NA
15.	Upon installation of the driven ground-rod electrode, the resistance was tested and recorded.	☐ Yes	☐ No	☐ NA
16.	Conductors, used for bonding and grounding circuits, are of sufficient size to carry the anticipated current.	☐ Yes	☐ No	☐ NA
17.	Grounds are not removed until all work is complete.	☐ Yes	☐ No	☐ NA

Electrical Guarding

18.	Switches, receptacles, etc., are provided with tight-fitting covers or plates.	☐ Yes	☐ No	☐ NA
19.	All energized parts of electrical circuits and equipment are guarded against accidental contact by approved cabinets or enclosure.	☐ Yes	☐ No	☐ NA
20.	All unused openings (including conduit knockouts) in electrical enclosures and fittings are enclosed with appropriate covers, plugs, or plates.	☐ Yes	☐ No	☐ NA
21.	Ground-fault circuit interrupters are installed on each temporary 15- or 20-ampere, 120-volt AC circuit at locations where construction, demolition, modifications, alterations, or excavations are being performed.	☐ Yes	☐ No	☐ NA
22.	Electrical switches and breakers (rated 440 volts or greater) are provided with a means for locking them out in the OFF position.	☐ Yes	☐ No	☐ NA

Electrical Systems

23.	Circuit breakers accessible to personnel are protected from physical damage, and located away from ignitable material.	☐ Yes	☐ No	☐ NA
24.	Weatherproof cabinets or enclosures are used when switches, circuit breakers, fuse panels, and motor controllers are in a wet or outside location.	☐ Yes	☐ No	☐ NA
25.	A readily accessible, manually operated switch is provided for each incoming service or supply circuit rated less than 5 kilovolts.	☐ Yes	☐ No	☐ NA
26.	Electrical raceways and enclosures are securely fastened in place.	☐ Yes	☐ No	☐ NA
27.	Overcurrent protection is provided for fuses or circuit breakers for each feeder and branch circuit.	☐ Yes	☐ No	☐ NA
28.	Insulting fuse tongs or extractors are used when removing fuses from circuits rated 50 to 600 volts.	☐ Yes	☐ No	☐ NA
29.	Fuse cabinets have close-fitting doors that can be locked.	☐ Yes	☐ No	☐ NA

Extension Cords

30.	Clamps or other securing means are provided on flexible cords or cables at plug receptacles, tools, equipment, etc., and the cord jackets are securely held in place.	☐ Yes	☐ No	☐ NA
31.	Flexible cords and cables are free of splices and taps.	☐ Yes	☐ No	☐ NA
32.	Only 3-wire grounded-type extension cords, designated for hard or extra-hard service, are used.	☐ Yes	☐ No	☐ NA
33.	Extension cords are listed by Underwriters Laboratories, Inc.	☐ Yes	☐ No	☐ NA
34.	Extension cords are checked for damage before use.	☐ Yes	☐ No	☐ NA
35.	The rated load on extension cords is not exceeded.	☐ Yes	☐ No	☐ NA
36.	Extension cords are not fastened with staples, hung by nails, or suspended by wire.	☐ Yes	☐ No	☐ NA

Temporary Wiring

37.	Temporary wiring is guarded, buried, or isolated by elevation to prevent accidental contact by workers and equipment.	☐ Yes	☐ No	☐ NA
38.	A vertical clearance above walkways for temporary wiring is not less than 10 feet (3 meters) from circuits carrying 600 volts or less.	☐ Yes	☐ No	☐ NA
39.	All exposed temporary wiring is supported on insulators.	☐ Yes	☐ No	☐ NA
40.	Temporary wiring is protected from accidental damage.	☐ Yes	☐ No	☐ NA

41.	Nonconductive lamp sockets and connections are permanently molded to the conductor insulation on lighting strings.	☐ Yes	☐ No	☐ NA
42.	Lighting strings have lamp guards.	☐ Yes	☐ No	☐ NA
43.	Broken or defective bulbs are replaced promptly.	☐ Yes	☐ No	☐ NA
44.	Lights are protected from accidental contact or breakage.	☐ Yes	☐ No	☐ NA
45.	Wiring installed in conduit is equipped with bushings at outlets and terminals.	☐ Yes	☐ No	☐ NA
46.	Receptacles are of the grounding type, and electrically connected to the equipment-grounding conductor.	☐ Yes	☐ No	☐ NA

Worker Practices

47.	Personnel performing electrical repairs are properly trained and qualified.	☐ Yes	☐ No	☐ NA
48.	Workers de-energize, ground, or guard electrical circuits before working in close proximity to them.	☐ Yes	☐ No	☐ NA
49.	Workers consider all electrical systems as live until verified de-energized and grounded.	☐ Yes	☐ No	☐ NA
50.	Proper lockout/tag-out procedures are used for de-energizing electric circuits.	☐ Yes	☐ No	☐ NA
51.	Arc flash protection protocols are in place for work on circuits of 50 volts or higher.	☐ Yes	☐ No	☐ NA

Equipment

52.	Only fiberglass or wood ladders are used when working near electrical hazards.	☐ Yes	☐ No	☐ NA
53.	Insulation mats are placed on floors and on frames of equipment when working on energized equipment.	☐ Yes	☐ No	☐ NA
54.	Only voltage-rated tools are used on or near live circuits. Voltage rating is appropriate for the work being performed.	☐ Yes	☐ No	☐ NA

Personal Protective Equipment

55.	Rubber matting, blankets, insulated sleeves, and rubber gloves are inspected before use.	☐ Yes	☐ No	☐ NA
56.	Workers use safety glasses and face shields during work activities where there is a reasonable probability of eye injury (and on systems with 50 or more volts).	☐ Yes	☐ No	☐ NA
57.	Workers wear arc flash protective clothing, hoods, face shields, and gloves when working on live circuits greater than 50 volts (per NFPA 70E).	☐ Yes	☐ No	☐ NA

COMMENTS:

"Class I Locations"

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

A. Class I, Division 1 location is a location:

1. In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or

2. In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

3. In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

B. Class I, Division 2 location is a location:

1. In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

2. In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

3. That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

"Class II Locations"

Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

A. Class II, Division 1 location is a location:

1. In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

2. Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes, or

3. In which combustible dusts of an electrically conductive nature may be present.

B. Class II, Division 2 location is a location in which:

1. Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

2. Dust may be in suspension in the air as a result of infrequent malfunction of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

"Class III Locations"

Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

A. Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

B. Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture.

If there is a danger of:	**Then use the following:**
• Head injury from electric shock, or • Burns due to contact with exposed energized parts	• Nonconductive head protection – Type II, E nonconductive hard hat
Injury to the eyes or face from: • Electric arcs or flashes; or • Flying objectives resulting from electrical explosion	• Protective equipment for the eyes and face – face shield and safety glasses
• Shock to hands while handling energized wires	• Lineman's rubber insulated gloves rated for the voltage exposed to. Leather overgloves may be needed if exposure to abrasive surfaces is possible.
• Shock while working in areas where high voltage electrical systems are present, or • Shock when performing electrical repairs	• Non-conductive protective foot wear
Exposure to electric arcing or flashing from: • Circuits of more than 50 volts; • Opening or closing 2400 volt oil cutout switching devices; • Removing or installing links in high voltage able tap boxes; or • Removing or installing fuses in high voltage circuits.	• Protective arc flash clothing (levels 0-40 to address energy potential as specified in NFPA 70E).
IF	**THEN**
• Energized parts are exposed.	• Use nonconductive ropes and handlines near the exposed energized part.
• Working near exposed energized conductors or circuit parts.	• Use insulated tools or handling equipment if the tools or handling equipment might make contact with such conducts or parts.
• The insulating capability of insulated tools or handling equipment is subject to damage.	• Protect the insulating material.
• Removing or installing fuses when the fuse terminals are energized.	• Use fuse-handling equipment insulated for the circuit voltage.
• Working near exposed energized parts that might be accidentally contacted or where dangerous electric heating or arcing might occur.	• Use protective shields, protective barriers, or insulating materials to protect from shock, burns, or other electrically related injuries.
• Normally enclosed live parts are exposed for maintenance or repair.	• Guard the parts to protect unqualified persons from contact with the live parts.

OSHA (29 CFR 1926.404) requires that employers use either ground-fault circuit interrupters (GFCIs) or an Assured Equipment Grounding Conductor Program to protect employees on construction sites. This Plan consists of the two elements described below.

1. Ground-Fault Circuit Interrupters

All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites that are not part of the permanent wiring of the building or structure, and that are in use by employees will have approved GFCIs for personnel protection. *Temporary electrical service GFCIs will be tested weekly by depressing the "Test" button and ensuring receptacle functionality*.

Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5 kilovolts, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with GFCIs.

2. Assured Equipment Grounding Conductor Program

URS has established and implemented this Assured Equipment Grounding Conductor Program on construction sites covering all cord sets, receptacles that are not a part of the building or structure, and equipment connected by cord and plug that are available for use, or used by employees and volunteer construction workers.

Each cord set, attachment cap, plug, and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles that are fixed and not exposed to damage, ***must be visually inspected before each day's use*** for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective will not be used until repaired.

URS will designate one or more competent person at each construction site to implement this program. *"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.*

Tests

The following two tests will be performed on all cord sets, receptacles that are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded.

Continuity Test

The continuity test ensures that the equipment-grounding conductor is electrically continuous. Perform this test on all cord sets, receptacles that are not part of a building or structure's permanent wiring, and cord- and plug-connected equipment required to be grounded. Use a simple continuity tester, such as a lamp and battery, bell and battery, an ohmmeter, or a receptacle tester.

Terminal Connection Test

The terminal connection test ensures that the equipment-grounding conductor is connected to its proper terminal. Perform this test with the same equipment used in the first test.

Each receptacle and attachment cap or plug will be tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor will be connected to its proper terminal.

All required tests will be performed:

1. Before first use and visually inspected daily thereafter.
2. Before equipment is returned to service following any repairs.
3. Before equipment is used after any incident that can be reasonably suspected to have caused damage; such as when a cord set is run over, "pinched" in a doorway, or "crushed" in a window.
4. Perform monthly continuity tests.

The employer will neither make available nor permit any employees to use equipment that has not met the four requirements listed above.

Records will be kept of the tests performed, as required. These test records will identify each receptacle, cord set, and cord- and plug-connected equipment piece that passed the test, and will indicate the last date it was tested or the interval for which it was tested. This record will be kept by means of logs, color coding, or other effective means, and will be maintained until replaced by a more current record. The record will be made available on the job site for inspection by OSHA and any affected employee.

Part of the URS recordkeeping task, and the method preferable to OSHA, color coding is used for marking cord sets and cord- and plug-connected equipment. The table below lists a color code that is widely used. Colored plastic or vinyl electrical tape is placed on one or both ends of cords and cord- and plug-connected equipment to denote the month that the tests were performed.

Assured Equipment Grounding Conductor Program Color Code			
Month #	Month Tested	Color of tape(s) to apply to cord	
1	January	White	
2	February	White +	Yellow
3	March	White +	Blue
4	April	Green	
5	May	Green +	Yellow
6	June	Green +	Blue

Assured Equipment Grounding Conductor Program Color Code			
Month #	Month Tested	Color of tape(s) to apply to cord	
7	July	Red	
8	August	Red +	Yellow
9	September	Red +	Blue
10	October	Orange	
11	November	Orange +	Yellow
12	December	Orange +	Blue

To remember the color of tape to place on the newly tested cord, keep in mind the color for the start of each calendar quarter by season:

White → January →Winter
Green →April →Spring
Red →July →Summer, or the 4th of July
Orange →October →Fall, or pumpkin

Then add:
Yellow for the second month in each quarter
Blue for the third month of each quarter

URS SAFETY MANAGEMENT STANDARD

Excavation

1. Applicability

This standard applies to operations where URS Corporation and subsidiary companies perform trenching and excavation activities, and/or where URS employees are exposed to hazards associated with trenching and excavation activities.

2. Purpose and Scope

The purpose of this standard is to protect personnel from the hazards associated with excavation and trenching activities.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Competent Person

Where potential employee exposure to hazards associated with the excavation (e.g., entrapment, falls greater than 4 feet (1.2 meters), cave-ins, etc.) can reasonably be anticipated, an excavation-competent person must be on site. The excavation-competent person:

1. Has formal documentation of training as an excavation-competent person.
2. Must be physically located at the excavation site at all times while work is in progress.
3. Is responsible for conducting daily inspections of excavations, adjacent areas, and protective systems prior to each shift.
4. Is responsible for inspection after every rainstorm or other potentially hazard-producing event.
5. Must have knowledge of soils and soil classification.
6. Understands design and use of protective systems.
7. Understands the requirements of the applicable regulations.

8. Has authority to stop work and take corrective actions when conditions change.

9. Has the ability to recognize and test hazardous atmospheres.

10. If URS hires a subcontractor to perform excavation or trenching activities, the subcontractor will be required to assign an excavation-competent person to the project. Documentation of this person's qualifications will be maintained in the project safety file.

B. Preliminary Planning

1. Underground and aboveground utilities, adjacent structures or retaining walls, spoil layout, truck routes, and emergency procedures must be identified before work begins.

2. When the excavation or trench approaches the estimated location of underground utilities, the exact location will be determined by methods identified in SMS 034 – Utility Clearance and Isolation.

C. Access/Egress

1. Entry into an excavation or trench should not be made unless absolutely necessary.

2. If personnel enter an excavation or trench that is 4 feet (1.2 meters) deep or more, ladders, steps, ramps, or other safe means of access and egress must be provided, and located at intervals of 25 feet (7.6 meters) or less of lateral travel. If a ladder is used, the ladder must extend 3 feet (0.9 meter) above the original surface of the ground.

3. In excavations and trenches that employees may be required to enter, excavated or other material must be effectively stored and retained at least 2 feet (0.6 meter) or more from the edge of the excavation. As an alternative to this clearance requirement, barriers or other effective retaining devices may be used in lieu thereof in order to prevent excavated or other materials from falling into the excavation.

4. Surface crossing of trenches by personnel or vehicles should not be made unless absolutely necessary. When necessary, the following conditions must be met:

a. Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.

b. Walkways or bridges must have a minimum clear width of 20 inches (50.8 centimeters [cm]), be equipped with standard guardrails, and extend a minimum of 24 inches (61 cm) past the surface edge of the trench.

5. When performing excavation oversight or observation on an excavation/trench greater than 4 feet (1.2 meters) in depth, personnel must remain at least more than 2 feet (0.6 meter) from the leading edge of the excavation.

D. Soil Classification

When sloping, benching, or installed protective systems are used, soil classification of each rock and soil deposit must be classified by a competent person. Soil and rock will be classified as one of the following: stable rock, Type A soil, Type B soil, or Type C soil. The classification will be based on the results of at least one visual analysis and one manual analysis, such as soil plasticity dry strength, thumb penetration, pocket penetrometer, or hand-operated shear vane. In the event that soil classification requires additional technical expertise, the competent person will consult with a registered professional engineer. (See Supplemental Information A – Soil Classification.)

E. Protective Systems

1. Employees in excavations deeper than 4 feet (1.2 meters) must be protected by means of properly designed protective systems.

2. Protective systems for excavations or trenches deeper than 20 feet (6.1 meters) must be designed and stamped by a registered professional engineer.

3. Protective systems must have the capacity to resist all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

a. Sloping and Benching

- When personnel are required to work in trenches or excavated areas, all slopes must be excavated to at least the angle of repose, or otherwise safely supported to prevent cave-ins.

- The determination of the angle of repose and design of the supporting system must be based on careful evaluation of pertinent factors such as: depth of cut; possible variation in water content of the material while the excavation is open; anticipated changes in materials from exposure to air, sun, water, or freezing; loading imposed by structures, equipment, overlying material, or stored material; and vibration from equipment, blasting, traffic, or other sources. (See Supplemental Information B – Angles of Repose – Simple Slopes.)

- The slopes and configurations of sloping and benching systems for excavations 4 feet (1.2 meters) to 20 feet (6.1 meters) deep will be selected and constructed by the employer or his designee, and must be in accordance with the following requirements.

- Soil must be analyzed by a competent person to determine the soil or rock type. The maximum allowable slope for each soil or rock type is identified in the table below.

Soil or Rock Type	Maximum Allowable Slope (Horizontal: Vertical)
Stable Rock	Vertical 90°
Type A	¾:1 or 53°
Type B	1:1 or 45°
Type C	1½: 1 or 34°

- Soil classification is not required if 1½:1 (Horizontal:Vertical) or 34° slope is used. If this slope is greater than 1½:1 (Horizontal:Vertical) or 34°, a soil classification must be made. The excavation must comply with one of the following three options.

  - Option I – Maximum allowable slope, and allowable configurations for sloping and benching systems will be determined in accordance with the conditions and requirements in Supplemental Information A – Soil Classification; and Appendix B – Sloping and Benching.

  - Option II – Designs of sloping or benching systems will be selected by using tabulated data based on soil

conditions. These tables must be calculated and prepared by a registered professional engineer. The plan must be stamped by a registered professional engineer, and this information must be documented and filed on site.

– Option III – A registered professional engineer must design the sloping and benching system and stamp the plan. This information must be documented and filed on site.

Excavations with sloping and benching in excess of 20 feet deep must be designed and stamped by a registered professional engineer.

b. Timber and Aluminum Hydraulic Shoring for Trenches

Designs of support systems, shield system, and other protective systems will be selected and constructed by the employer or their designee, and must be in accordance with one of four options.

- Option I – Designs using Appendices A, C, and D (see 29 Code of Federal Regulations [CFR] 1926 Subpart P). Shoring in trenching will be determined using conditions and requirements of Supplemental Information A – Soil Classification; Appendix C – Timber Shoring; and Appendix D – Aluminum Hydraulic Shoring.

- Option II – Designs of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data will be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer (i.e., trench jacks, hydraulic). This information must be filed on site.

- Option III – Designs using other tabulated data. Designs of support systems, shield systems, or other protective systems will be selected from and be in accordance with tabulated data. This information must be filed on site.

- Option IV – Design by registered professional engineer. Support systems, shield systems, and other protective

systems not using Option I, II, or III must be approved and stamped by a registered professional engineer.

c. Alternatives to Timber Shoring

- Portable trench boxes or sliding trench shields may be used for the protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they must be designed, constructed, and maintained in a manner that will provide protection equal to or greater than the sheeting or shoring required for the trench.

- Trench boxes require placement using portable lifting equipment such as backhoes or other tractor-like devices. The job hazard analysis will consider the hazards of lifting and placement of the trench boxes, including the proper use of chains, stability of the mobile equipment, swing radius protection for load, and load rating for the lifting device.

- Trench shields and boxes must either be pre-manufactured with listed load ratings, or designed, stamped, and constructed under the direction of a registered professional engineer.

d. Protective systems designed to protect employees in excavations deeper than 20 feet (6.1 meters) must be designed and stamped by a registered professional engineer.

e. Excavations must be clearly identified and barricaded to keep unauthorized individuals out.

f. Walkways, runways, and sidewalks must be kept clear of excavated material or other obstructions, and no sidewalks should be undermined unless shored to carry a minimum live load of one 125 pounds (56.6 kilograms) per square foot.

g. If it is necessary to place heavy objects or operate heavy equipment on a level above and near any excavation, the side of the excavation must be sheet piled, shored, and braced as necessary to resist the extra pressure due to such superimposed loads.

F. Hazardous Atmospheres and Confined Spaces

1. In excavations or trenches greater than 4 feet (1.2 meters) deep where an oxygen deficient (<19.5 percent) or flammable (>10 percent Lower Explosive Limit [LEL]) or other potentially toxic environment could be expected to exist, the atmosphere of the excavation must be monitored before workers enter the excavation. Air monitoring must be conducted before personnel enter an excavation or trench, and then periodically to ensure that the atmosphere remains safe. Monitoring will be conducted at a minimum of three vertical depths of the excavation to detect potentially stratified gas layers (e.g., propane has a density 1.55 times that of normal air and will accumulate in the lower depths of an open trench).

2. The frequency of air monitoring will be increased if equipment used in or near the excavation or trench may alter the atmosphere where personnel are working. All air monitoring must be documented and maintained in the project safety files.

3. Attended emergency rescue equipment, such as a breathing apparatus, a safety harness and line, basket stretcher, etc., must be readily available where adverse atmospheric conditions may exist or develop in an excavation or trench.

4. Excavations or trenches may qualify as confined spaces. When this occurs, compliance with SMS 010 – Confined Spaces, is required.

G. Water Accumulation

1. Employees will not work in excavations where water is accumulating unless adequate precautions have been taken to protect employees. Personnel must exit excavations and trenches during rainstorms.

2. De-watering equipment must be installed and monitored by a competent person.

3. Diversion ditches, dikes, or other suitable means will be used to prevent water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation.

4. Excavations and trenches must be inspected by a competent person after each rain event and before personnel are permitted to re-enter the excavation or trench.

H. Excavation and Trenching Permit

1. An Excavation/Trenching Permit (Attachment 013-1 NA) must be completed prior to all excavation or trenching activities.

2. The Excavation and Trenching Permit must be completed and signed by all applicable parties as indicated on the permit.

3. Excavation and Trenching Permits may be valid for up to 1 week.

I. Daily Inspections

1. Daily inspections must be made (Attachment 013-2 NA) of excavations and trenches. Where potential employee exposure to hazards associated with the excavation (e.g., entrapment, falls greater than 4 feet (1.2 meters), cave-ins, etc.) can reasonably be anticipated, these inspections must be made by a competent person.

2. Inspections must be conducted daily before the start of work, after every rainstorm, after other events that would increase hazards such as snowstorm, thaw, earthquake, or dramatic change in weather, and when fissures, tension crack, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur.

3. If evidence of possible cave-ins or slides is apparent, all work in the excavation or trench must cease until the necessary precautions have been taken to safeguard the personnel.

J. Excavating at Potential MEC/UXO Sites

1. If the project site is suspected of munitions and explosives of concern (MEC) or unexploded ordinance (UXO) contamination, the UXO team will conduct a reconnaissance and MEC/UXO avoidance to provide clear access routes to each site before excavation crews enter the area.

2. MEC/UXO sites with planned excavation activities will not be conducted until a complete plan for the site is prepared and/or approved by the URS UXO Safety Officer. MEC/UXO avoidance

must be conducted during excavation operations on known or suspect MEC/UXO sites (SMS 039).

K. Training/Briefings

1. Conduct and document daily safety briefings for all employees associated with excavation activities. Discuss excavation hazards, protective measures, and work practices that will be applicable to the day's activities.

5. Documentation Summary

The following information will be maintained in the project file:

A. Competent person qualifications.

B. Excavation and Trenching Permit(s).

C. Daily inspections by an excavation-competent person.

D. Air monitoring records.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard Excavations 29 CFR 1926, Subpart P

1. Appendix B, Sloping and Benching
2. Appendix C, Timber Shoring
3. Appendix D, Aluminum Hydraulic Shoring
4. Appendix E, Alternatives to Timber Shoring

B. U.S. OSHA Technical Links – Trenching and Excavation

C. SMS 010 – Confined Space Entry

D. SMS 034 – Utility Clearance and Isolation

E. SMS 039 – Munitions Response / Munitions and Explosives of Concern

F. Attachment 013-1 NA – Excavation/Trenching Permit

G. Attachment 013-2 NA – Daily Excavation/Trench Inspection Form

7. Supplemental Information

A. Soil Classification

B. Angle of Repose – Simple Slopes

URS	Health, Safety and Environment **EXCAVATION / TRENCHING PERMIT**	Attachment 013-1 NA Issue Date: July 2000 Revision 6: March 2012

Authorization No.: _____ Date and Time Permit Valid: _____

Competent Person: _____ Date and Time Permit Expires: _____

Project Name: _____ Excavation/Trench Location: _____

Description or Job Special Procedures:

_____

_____

_____

ESTIMATED DIMENSIONS:

DEPTH = _____

TOP = W _____ L _____

BOTTOM = W _____ L _____

SOIL ANALYSIS METHOD(S) USED:

☐ Visual ☐ Manual ☐ Tabulated Data

SOIL TYPE:

☐ Stable Rock ☐ Type A

☐ Type B ☐ Type C

☐ Avg. Compression Strength _____ tsf

☐ Compressed Strength Data _____

SOIL CHARACTERISTICS:

☐ Cemented ☐ Cohesive ☐ Layered

☐ Fissured ☐ Granular ☐ Plastic

☐ Dry ☐ Moist ☐ Saturated ☐ Submerged

MANUAL TEST USED:

☐ Plasticity ☐ Dry Strength ☐ Ribbon

☐ Thumb Penetration ☐ Pocket Penetrometer

☐ Dry Testing ☐ Other

PROTECTIVE SYSTEMS:

Protective systems for excavations/trenches deeper than 20 feet (6.1 meters) must be designed and approved by a registered professional engineer.

SLOPING/BENCHING:

☐ **Vertical (90°)** ☐ **3/4 :1 (53°)** ☐ **1:1 (45°)**

☐ **1 ½:1 (34°)** ☐ **2:1 (26°)** ☐ **Other**

UTILITIES:

☐ One Call Service Notified

☐ Utilities Marked by Public Utilities

☐ Property Owner Contacted

☐ Utility Drawings Reviewed

☐ Private Utility Locater Utilized

SHORING:

☐ Timber

☐ Aluminum Hydraulic

☐ Trench Shield/Trench Box

LIST OF KNOWN OBSTRUCTIONS:

☐ Electrical ☐ Telephone ☐ Water

☐ Sewer ☐ Steam ☐ Alarm

☐ Drain ☐ Process ☐ Footings ☐ Pilings

☐ Concrete Encasement

☐ Other

OTHER:

☐ Means of Egress Required ☐

☐ Confined Space Permit Required ☐

SPECIAL INSTRUCTIONS and WORK INSTRUCTIONS

All unsafe conditions must be corrected prior to excavation entry. If any hazardous conditions are observed, the excavation must be evacuated immediately, and no one is allowed to re-enter until corrective action has been taken.

Signature and Dates

	Print Name	Signature	Date
Excavation Competent Person			
Client Representative (if applicable)			
Site Supervisor			
HSE Representative			
Registered Professional Engineer (if applicable)			
Project Manager			
Subcontractor Rep			
Equipment Superintendent			
Field Engineer			
Other			

URS	Health, Safety and Environment **DAILY EXCAVATION / TRENCH INSPECTION FORM**	Attachment 013-2 NA Issue Date: July 2000 Revision 6: March 2012

Competent Person: _____ Date: _____

Project Name: _____ Weather Conditions: _____

Excavation Location: _____ Rainfall Amounts 24 Hours Previous: _____

Access/Egress

Is access and egress located within 25 feet (7.6 meters) of entrants?	☐ Yes	☐ No	☐ Not Applicable
If ladders are used, do they extend 3 feet (0.9 meter) beyond the top of the excavation?	☐ Yes	☐ No	☐ Not Applicable

Soil Characteristics

Is any water seepage noted in trench walls or bottom?	☐ Yes	☐ No	☐ Not Applicable
Are pumps in place, or available if needed?	☐ Yes	☐ No	☐ Not Applicable
Is there evidence of significant fracture planes in soil or rock?	☐ Yes	☐ No	☐ Not Applicable
Are there any zones of unusually weak soils or materials not anticipated?	☐ Yes	☐ No	☐ Not Applicable
Have tension cracks been observed along the top on any slopes?	☐ Yes	☐ No	☐ Not Applicable
Are there any noted dramatic dips or bedrock?	☐ Yes	☐ No	☐ Not Applicable
Is there any evidence of caving or sloughing of soil since the last inspection?	☐ Yes	☐ No	☐ Not Applicable

Protective Systems

Are slopes cut at design angle of repose?	☐ Yes	☐ No	☐ Not Applicable
Is the shoring system installed in accordance with the design?	☐ Yes	☐ No	☐ Not Applicable
Is the shoring being used secure?	☐ Yes	☐ No	☐ Not Applicable
Does the design include an adequate safety factor for equipment being used?	☐ Yes	☐ No	☐ Not Applicable
Is traffic being adequately kept away from the excavation/trenching operation?	☐ Yes	☐ No	☐ Not Applicable
Are hydraulic shores pumped to design pressure?	☐ Yes	☐ No	☐ Not Applicable
Is vibration from equipment or traffic too close to the trenching operation?	☐ Yes	☐ No	☐ Not Applicable
Are trench box(s) certified?	☐ Yes	☐ No	☐ Not Applicable

Hazardous Atmosphere & Confined Spaces

Is the hazardous atmosphere testing being conducted on a regular basis?	☐ Yes	☐ No	☐ Not Applicable
Have rescue procedures been established, and is equipment immediately available?	☐ Yes	☐ No	☐ Not Applicable

Miscellaneous

Are utility markings in place?	☐ Yes	☐ No	☐ Not Applicable
Are trees, boulders, or other hazards located in the area?	☐ Yes	☐ No	☐ Not Applicable
Are barricades or covers in place and in good condition?	☐ Yes	☐ No	☐ Not Applicable
Is excavated material and equipment at least 2 feet (0.6 meter) from the edge of the excavation?	☐ Yes	☐ No	☐ Not Applicable
Are all short-term trench(es) covered within 24 hours?	☐ Yes	☐ No	☐ Not Applicable
Are GFCIs used on all temporary electrical cords?	☐ Yes	☐ No	☐ Not Applicable
Is the excavation within the original scope of the excavation permit?	☐ Yes	☐ No	☐ Not Applicable
Is a valid excavation permit executed for the excavation/trenching activity?	☐ Yes	☐ No	☐ Not Applicable

Notes:

_____

_____

_____

_____

_____

RESPONSIBILITY

"I hereby attest that the following conditions existed and that the following items were checked or reviewed during this inspection."

All unsafe conditions must be corrected prior to excavation entry. If any hazardous conditions are observed, the excavation must be immediately evacuated, and no one is allowed to re-enter until corrective action has been taken.

Daily Excavation/Trenching Inspection Completed By:

_____ _____

COMPETENT PERSON **Date**

"Type A" soils

Cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144kPa) or greater. Examples of cohesive soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A.

However, no soil is Type A if:

1. The soil is fissured;
2. The soil is subject to vibration from heavy traffic, pile driving, or similar effects;
3. The soil has been previously disturbed;
4. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V)or greater; or
5. The material is subject to other factors that would require it to be classified as a less stable material.

"Type B" soils

1. Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
2. Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
3. Previously disturbed soils except those which would otherwise be classed as Type C soil.
    a. Soil that Dry rock that is not stable; or
    b. Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

"Type C" soils

1. Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less;
2. Granular soils including gravel, sand, and loamy sand;
3. Submerged soil or soil from which water is freely seeping;
4. Submerged rock that is not stable, or
5. Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

Soil Texture	Visual detection of particle size and general appearance of the soil	Squeezed in hand and pressure released		Soil ribboned between thumb and finger when moist.
		When Air Dry	When Moist	
Sand	Soil has a granular appearance in which the individual grain sizes can be detected. It is free flowing when in a dry condition.	Will not form a cast and will fall apart when pressure is released.	Forms a cast, which will crumble when lightly touched.	Cannot be ribboned.
Sandy Loam	Essentially a granular soil with sufficient silt and clay to make it somewhat coherent. Sand characteristics predominate.	Forms a cast, which readily falls apart when lightly touched.	Forms a cast, which will bear careful handling without breaking.	Cannot be ribboned.
Loam	A uniform mixture of sand, silt and clay. Grading of sand fraction quite uniform from coarse to fine. It is mellow, has somewhat gritty feel, and yet is smooth and slightly plastic.	Forms a cast, which will bear careful handling without breaking.	Forms a cast, which can be handled freely without breaking.	Cannot be ribboned.
Silt Loam	Contains a moderate amount of the finer grades of sand and only a small amount of clay over half of the particles are silt. When dry it may appear quite cloddy which readily can be broken and pulverized to a powder.	Forms a cast, which can be freely handled. Pulverized it has a soft flour-like feel.	Forms a cast, which can be freely handled. When wet, soil runs together and puddles.	It will not ribbon but it has a broken appearance, feels smooth and may be slightly plastic.
Silt	Contains over 80% of silt particles with very little fine sand and clay. When dry, it may be cloddy, readily pulverizes to powder with a soft flour-like feel.	Forms a cast, which can be handled without breaking.	Forms a cast, which can freely be handled. When wet, it readily puddles.	It has a tendency to ribbon with a broken appearance, feels smooth.
Clay Loam	Fine textured soil breaks into hard lumps when dry. Contains more clay than silt loam. Resembles clay in a dry condition; identification is made on physical behavior of moist soil.	Forms a cast which can be handled freely without breaking.	Forms a cast, which can be handled freely without breaking. It can be worked into a dense mass.	Forms a thin ribbon, which readily breaks, barely sustaining its own weight.
Clay	Fine textured soil breaks into very hard lumps when dry. Difficult to pulverize into a soft flour-like powder when dry. Identification based on cohesive properties of the moist soil.	Forms a cast which can be freely handled without breaking.	Forms a cast, which can be handled freely without breaking.	Forms long, thin flexible ribbons. Can be worked into a dense, compact mass. Considerable plasticity.
Organic Soils	Identification based on the high organic content. Muck consists of thoroughly decomposed organic material with considerable amount of mineral soil finely divided with some fibrous remains. When considerable fibrous material is present, it may be classified as peat. The plant remains or sometimes the woody structure can easily be recognized. Soil color ranges from brown to black. They occur in lowlands. In swamps or swales. They have high shrinkage upon drying. Table 1. –Field Method for identification of soil texture			

ANGLE OF REPOSE

FOR SLOPING OF SIDES OF EXCAVATIONS LESS THAN 20 FEET DEEP

Note: Clays, Silts, Loams or Non-Homogenous Soils Require Shoring or Bracing

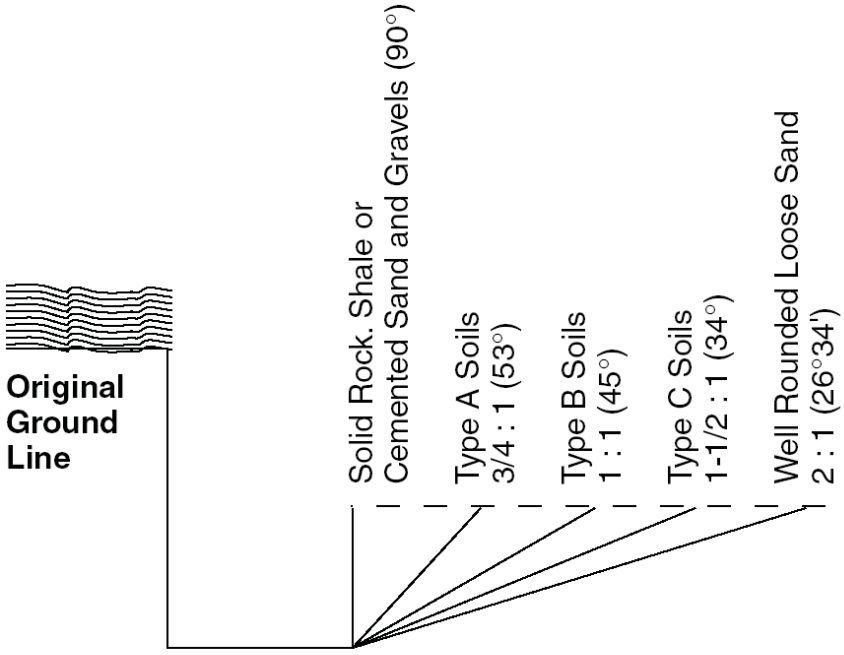
The Presence of Ground Water Requires Special Treatment

Examples*

Type A Soils:
Clay, silt clay, sandy clay clay loam, caliches, and hardpan

Type B Soils:
Angular gravel, silt, silt loam, sandy loam, unstable dry rock

Type C Soils:
Gravel, sand and loamy sand, submerged soil and rock, and layered soils



REFERENCE:
OSHA Safety and Health Standards 1926
Appendix A and B to Subpart P

URS SAFETY MANAGEMENT STANDARD

Fire Protection and Prevention

1. Applicability

This standard applies to URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to reduce/eliminate potential fire hazards in the workplace and to provide for a rapid, effective response should a fire occur.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location. At project sites controlled by contractors or building owners, some of these responsibilities may be covered by building/facility owners or owner agents.

4. Requirements

A. Fire Protection

1. A fire protection program will be developed and followed throughout all phases of work.

    a. Access to available firefighting equipment will be maintained at all times.

    b. Firefighting equipment will be inspected monthly and maintained in operating condition. Defective equipment will be immediately replaced.

    c. Fire extinguishers that out of service or discharged will be immediately tagged, removed from service, and replaced.

    d. Firefighting equipment will be conspicuously located and not obstructed from view in the workplace.

    e. Where and when required or necessary, the project manager will provide a trained and equipped firefighting organization (fire brigade) to assure adequate protection.

2. A temporary or permanent water supply (sufficient volume, duration, and pressure) required to properly operate the firefighting equipment will be made available as soon as combustible materials accumulate.

a. Where underground water mains are to be provided, they will be installed, completed, and made available for use as soon as practicable.

b. Fire Hose and Connections

   i. One hundred feet, or less, of 1.5-inch (3.75-cm) hose, with a nozzle capable of discharging water at 25 gallons (95 liters) or more per minute, may be substituted for a fire extinguisher rated not more than 2A 20BC in the designated area, provided the hose line can reach all points in the area.

   ii. If fire hose connections are not compatible with local firefighting equipment, the project manager will provide adapters or equivalent to permit connections.

   iii. During demolition involving combustible materials, charged hose lines supplied by hydrants, water trucks with pumps, or equivalent will be made available.

c. Fixed Firefighting Equipment

   i. Sprinkler Protection

      - Where URS is involved in the construction of a facility in which automatic sprinkler protection is required, the installation of the sprinklers will closely follow the construction, and sprinklers will be placed into service as soon as practicable.

      - Where URS is involved in the demolition or alteration of a facility, existing automatic sprinkler installations should be retained in service as long as reasonable. Only authorized persons will permit the operation of sprinkler control valves. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves will be checked daily, at the close of work/business, to ascertain that the protection is in service.

ii. Standpipes

In all structures requiring standpipes or where standpipes exist in structures being altered, they will be maintained to always be ready for fire protection use. Conspicuously marked standpipes will be provided with connections on the outside of the structure (at the street level). Each floor will be equipped with at least one standard hose outlet.

iii. Fire Alarm Devices

- An alarm system (e.g., telephone system, siren) will be established to alert both the employees on the site and the local fire department of an emergency.
- The alarm code and reporting instructions will be conspicuously posted at phones and at all employee entrances.

iv. Fire Cutoffs

- In new construction, firewalls and exit stairways required for the completed buildings will be given construction priority. Fire doors, with automatic closing devices, will be hung on openings as soon as practicable.
- Fire cutoffs will be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

d. Jobsite Requirements

i. Material storage areas will be equipped with fire extinguishers adequate for their size, construction, and the material stored therein.

ii. Welding, cutting, grinding, and burning will not be done within 25 feet (7.6 meters) of any material fuel storage area. Fire extinguishers will be provided at the site of welding operations.

iii. Flammable materials will be stored as far as possible from the working area, at least 25 feet (7.6 meters). Safety cans will be used when handling and transporting fuel, gas, and other flammables.

iv. Extinguishers are to be adequately maintained.

v. The telephone number of the nearest organized firefighting group is to be displayed at jobsite telephones.

3. Fire Extinguishing Equipment

a. Extinguisher Requirements

Use only UL-listed extinguishers. Mark extinguishers and extinguisher locations, indicating the suitability of each extinguisher for a particular classification of fire.

b. Building and Occupancy Hazard Protection

Requirements for fire extinguisher protection are divided into two categories: building protection and occupancy hazard protection. Provide for extinguishing equipment to protect both the building structure (if it is combustible) and the occupancy hazards inside it.

i. For building protection, provide fire extinguishers rated for Class A fires or greater, as required by applicable building codes.

ii. For protection against occupancy hazards, provide fire extinguishers rated for Class A, B, C, or other fire potential as appropriate. Requirements may vary from section to section within a single building. Determine the occupancy hazards, as well as the proper ratings of necessary fire extinguishers, of each room or section. Classify rooms or sections as light hazard, ordinary hazard, or extra hazard. See Supplemental Information B for additional details and assistance in determining extinguisher requirements.

c. Extinguisher Placement

i. Place extinguishers in conspicuous locations, along normal paths of travel, and near exits. If the extinguishers are not readily visible, use wall markings, signs, or lights to identify their locations.

ii. Ensure that extinguishers are readily accessible. Keep the space in front of and below extinguishers clear at all times. The floor area beneath extinguishers may be marked as a reminder to keep the area clear.

iii. Hang extinguishers on hangers, brackets, or other equipment furnished by the manufacturer, or place them on shelves. If an extinguisher weighs less than 40 pounds (18.1 kg), the top of the extinguisher will not be more than 5 feet (1.5 meters) above the floor. If an extinguisher weighs equal to or more than 40 pounds (18.1 kg), it will not be more than 3.5 feet (1.1 meters) above the floor. The clearance between the bottom of the extinguisher and the floor will never be less than 4 inches (10.2 cm).

iv. Provide the appropriate number and types of fire extinguishers for operations being performed. Refer to Supplemental Information A for guidance.

d. Inspection

Properly trained personnel will inspect extinguishers at least monthly. The monthly inspection will include the following items at a minimum:

i. Location.

ii. Rating.

iii. Access.

iv. Visibility.

v. Operating instructions.

vi. Seals.

vii. Tamper indicators.

viii. Fullness.

ix. Physical condition.

Attach inspection tags to each extinguisher indicating the dates of purchase, inspection, testing, and recharging, and the initials of the inspector. In addition to the tag, a colored tape may be used to indicate that an extinguisher has been inspected.

Fire extinguishers must be inspected annually by a qualified fire services contactor.

e. Testing and Maintenance

i. Establish periodic testing programs to ensure that extinguishers are in proper operating condition. Only properly trained personnel (preferably fire extinguisher vendors) should maintain extinguishers.

ii. At the conclusion of testing or maintenance work, attach a tag to the extinguisher showing the date and the signature of the person who performed the service.

f. Testing Intervals

i. Each year, recharge soda acid and foam extinguishers, and weigh others according to the manufacturer's instructions. Inspect the body, hose, and nozzle of the extinguisher, and examine the dry powder. Note: Testing is not necessary for stored pressure units unless a loss of pressure or other conditions indicates a need; however, units mounted in vehicles or otherwise subject to mechanical packing should have their powder examined.

ii. Every five years, test the pressure parts of all extinguishers except Halon 1301 extinguishers; dry chemical extinguishers with braised-brass, mild steel, or aluminum shells; and dry-powder extinguishers for metal fires.

iii. Every six years, empty dry-chemical, stored-pressure extinguishers and examine working parts for operability.

iv. Every 12 years, test the pressure parts of Halon 1301 extinguishers; dry-chemical extinguishers with braised-brass, mild steel, and aluminum shells; and dry-powder extinguishers for metal fires.

g. Employee Training

i. Where fire extinguishers are provided for employee use, training will be provided on general principles of portable fire extinguishers, including stages of fires and classes of fire extinguisher. The emphasis should be on hazards of fighting a fire during the initial phases of a fire.

ii. Personnel designated to use firefighting as part of a site Emergency Action Plan must have training in the use of appropriate equipment. Training must be conducted prior to initial assignment and annually thereafter or whenever there is a change in the Emergency Action Plan or new equipment is introduced.

B. Fire Prevention

1. General

a. Develop an Emergency Preparedness Plan as outlined in SMS 003 – Emergency Preparedness Plan.

b. Conduct evacuation drills at least annually.

c. Maintain good housekeeping to reduce fire hazards and to provide safe routes of egress should a fire occur.

d. Conduct periodic workplace inspections to identify fire hazards such as unnecessary accumulation of combustibles (including paper and boxes), unnecessary storage of flammables, and sources of ignition.

2. Ignition Hazards

a. Electrical wiring and equipment for light, heat, or power purposes will be properly installed.

b. Equipment powered by internal combustion will be located with the exhausts positioned away from combustible materials. When the exhausts are piped outside the building under construction, a clearance of at least 6 inches (15 cm) will be maintained between piping and combustible material.

c. Smoking is prohibited at or in the vicinity of operations that constitute a fire hazard. Such areas will be conspicuously posted as follows: "NO SMOKING OR OPEN FLAME."

d. Portable, battery-powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, will be approved for the hazardous locations. For more information, see SMS 015 – Flammable and Combustible Liquids and Gases.

e. The nozzles of air, inert gas, and steam lines or holes used in the cleaning or ventilation of tanks and vessels containing hazardous concentrations of flammable gases or vapors will be bonded to the tank or vessel shell. Bonding devices will not be attached or detached while hazardous concentrations of flammable gases or vapors exist.

3. Temporary Buildings

a. Temporary buildings will not be erected where the location adversely affects any means of employee exit.

b. Temporary buildings, located within another building or structure, will be of noncombustible construction or combustible construction having a fire resistance rating of not less than 1 hour.

c. Temporary buildings, located other than inside another building and not used for handling and storage of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, will be located at a distance of not less than 10 feet (3 meters) from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet (186 square meters) in total, will be considered a single temporary building.

4. Open Yard Storage

    a. Combustible materials will be stored with regard to the stability of piles and in no case higher than 10 feet (3 meters).

    b. Driveways between and around combustible storage piles will be at least 15 feet (4.6 meters) wide and maintained free of accumulations of rubbish, equipment, or other articles or materials. Driveways will be spaced to produce a maximum grid system unit of 50 feet (15.2 meters) by 150 feet (45.7 meters).

    c. The entire storage site will be kept free from accumulations of unnecessary combustible materials. Weeds and grass will be maintained, and procedures will be established for periodic cleanup of the entire area.

    d. The method of piling combustible materials will be solid and in orderly regular piles. No combustible material will be stored outdoors within 10 feet (3 meters) of a building or structure.

    e. Portable fire extinguishing equipment, suitable for the fire hazard involved, will be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A:20BC, will be placed to assure that the maximum travel distance to the nearest unit will not exceed 100 feet (30.5 meters).

5. Indoor Storage

    a. Storage will not obstruct, or adversely affect, means of exit.

    b. Materials will be stored, handled, and piled with regard to their fire characteristics.

    c. Noncompatible materials, which may create a fire hazard, will be segregated by a barrier having a fire resistance of at least 1 hour.

    d. Materials will be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling will be maintained at all times. Aisle space will be

maintained to safely accommodate the widest vehicle used within the building for firefighting purposes.

e. A clearance of at least 36 inches (90 cm) will be maintained between the top level of the stored material and the sprinkler deflectors.

f. Clearance will be maintained around lights and heating units to prevent ignition of combustible materials.

g. A clearance of 24 inches (60 cm) will be maintained around the fire door's path of travel, unless a barricade is provided, in which case no clearance is needed. Material will not be stored within 36 inches (90 cm) of a fire door.

C. Temporary Heating Devices

1. Ventilation

a. Fresh air will be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means of fresh air supply are inadequate, mechanical ventilation will be provided.

b. Heaters used in confined spaces necessitate that special care be taken to provide sufficient ventilation to ensure proper combustion, maintain the health and safety of workmen, and limit temperature increase in the area.

2. Clearance and Mounting

a. Temporary heating devices will be installed to provide clearance to combustible materials not less than the amount shown in the following table:

Minimum Clearance in inches (cm)			
Heating Appliance	Sides	Rear	Chimney Connector
Room heater, circulating type	12 (30)	12 (30)	18 (45)
Room heater, radiant type	36 (90)	36 (90)	18 (45)

b. Temporary heating devices that are listed for installation with lesser clearance than specified in the previous table must be

installed in accordance with the manufacturer's specifications.

c. Heaters not suitable for use on wood floors will not be set directly upon them or other combustible materials. When such heaters are used, they will rest on suitable heat-insulating material or concrete at least 1 inch (2.5 cm) thick or equivalent. The insulating material will extend beyond the heater 2 feet (60 cm) or more in all directions.

d. Heaters used near combustible tarpaulins, canvas, or similar coverings will be located at least 10 feet (3 meters) from the coverings. The coverings will be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

3. Stability

When in use, heaters will be set horizontally level, unless otherwise permitted by the manufacturer's instructions.

4. Solid Fuel Heaters

Solid fuel heaters are prohibited in buildings and on scaffolds.

5. Oil Fired Heaters

a. Flammable liquid-fired heaters will be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed will not be considered a primary safety control.

b. Heaters designed for barometric or gravity oil feed will be used only with integral tanks.

c. Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Emergency Action Plans.

B. Fire extinguisher inspection logs.

C. Employee training documentation.

D. Site audits.

E. Evacuation drills.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard – Means of Egress – 29 Code of Federal Regulations (CFR) 1910, Subpart E

B. U.S. OSHA Standard – Exit Routes, Emergency Action Plans, and Fire Prevention Plans – 29 CFR 1910.38

C. U.S. OSHA Standard – Fire Protection – 29 CFR 1910, Subpart L

D. U.S. OSHA Software – Fire Safety Advisor

E. U.S. OSHA Construction Standard – Fire Protection and Prevention – 29 CFR 1926.150, Subpart F

F. National Fire Protection Association – Standard for Portable Fire Extinguishers – NFPA 10

G. International Code Council – International Fire Code

H. SMS 003 – Emergency Preparedness Plan

I. SMS 015 – Flammable and Combustible Liquids and Gases

7. Supplemental Information

A. Fire Classifications

B. General Fire Extinguisher Requirements

A. Fire Classifications

Fires are classified as Class A, B, C, D, or Special, depending upon the types of materials involved. These classifications are defined as follows:

1. Class A – Fires in ordinary combustible materials such as wood, cloth, paper, trash, rubber, and plastic.

2. Class B – Fires in flammable liquid, oil, grease, tar, oil-base paint, lacquer, and flammable gas.

3. Class C – Fires involving energized electrical equipment or systems, resulting in the extinguishing media conducting electricity. When electrical equipment or systems are de-energized, extinguishers for Class A or B fires can be used safely.

4. Class D - Fires involving combustible metals such as magnesium, titanium, zirconium, lithium, potassium, and sodium. Specialized techniques, extinguishing agents, and extinguishing equipment have been developed to control and extinguish fires of this type. Generally, do not use normal extinguishing agents on metal fires. In such fires, there is the danger of increasing the intensity of the fire because of a chemical reaction between some extinguishing agents and the burning metal.

5. Special - Fires that involve certain combustible metals or reactive chemicals require, in some cases, special extinguishing agents or techniques.

B. Extinguisher Classifications and Ratings

All types of extinguishers are not equally effective against all classifications of fires. Therefore, extinguishers are rated according to the classification and size of the fires against which they are effective. Extinguisher ratings are found on the extinguisher label. A rating consists of a letter indicating the classification of fire on which the extinguisher is effective and a rating number indicating the relative extinguishing effectiveness. The significance of the rating number varies with the classification of fire for which the extinguisher is rated. The following rating criteria are used:

1. For extinguishers rated for Class A fires, the rating number indicates relative effectiveness, the higher the number, the more effective the extinguisher. The minimum recommended rating for extinguishers rated for Class A fires is 2A.

2. For extinguishers rated for Class B fires, the rating number represents the average size (in square feet) of the fire the extinguisher could put out.

3. No number is used for extinguishers rated for Class C fires, because Class C fires are essentially either Class A or B fires involving energized electrical wiring and equipment.

C. Hazard Classifications

The materials in a building or area present hazards of varying potential. These hazards are classified. As follows:

1. Light or Low Hazard – A room or area where, considering the amount of combustible material or flammable liquids present, fires of small size should be anticipated (e.g., change trailers, toilet trailers, and general storage).

2. Ordinary or Moderate Hazard – A location where, considering the amount of combustibles or flammable liquids present, fires of moderate size should be anticipated (e.g., temporary construction offices and most shops).

3. Extra or High Hazard – A location where, considering the amount of combustibles or flammable liquids present, fires of severe magnitude should be anticipated (e.g., carpenter shops and storage areas for flammable liquids and lumber).

1. Fire Extinguishers – General

The following are **minimum** requirements for fire extinguisher placement in office buildings, construction facilities, support buildings, and/or buildings under construction. In some cases, client requirements may be more stringent, in which case the client's requirements supersede the guidelines below.

Extinguisher Requirements for Class A Hazards

Rating Shown on Extinguisher	Maximum Travel Distance to Extinguishers in Feet (m)	Maximum Area to be Protected per Extinguisher		
		Light Hazard sq. ft. (m^2)	Ordinary Hazard sq. ft. (m^2)	Extra Hazard sq. ft. (m^2)
1-A	-	-	-	-
2-A	75 (23)	6,000 (557)	3,000 (279)	-
3-A	75 (22.9)	9,000 (836)	4,500 (418)	3,000 (279)
4-A	75 (22.9)	11,250 (1,045)	6,000 (557)	4,000 (372)
6-A	75 (22.9)	11,250 (1,045)	9,000 (836)	6,000 (557)
10-A	75 (22.9)	11,250 (1,045)	11,250 (1,045)	10,000 (929)
20-A	75 (22.9)	11,250 (1,045)	11,250 (1,045)	11,250 (1,045)
40-A	75 (22.9)	11,250 (1,045)	11,250 (1,045)	11,250 (1,045)

Extinguisher Requirements for Class B Hazards

Type of Hazard	Minimum Extinguisher Rating	Maximum Travel Distance to Extinguishers in Feet (m)
Light	**5-B**	**30 (9.1)**
	10-B	**50 (15.2)**
Ordinary	**10-B**	**30 (9.1)**
	20-B	**50 (15.2)**
Extra	**40-B**	**30 (9.1)**
	80-B	**50 (15.2)**

Extinguisher Requirements for Class C Hazards

Class C extinguishers are required wherever energized electrical equipment is located. Since a Class C fire itself is either Class A or Class B (involving ordinary combustible material, flammable liquids, or flammable gases), the extinguishers are sized and located as for a Class A or B hazard.

Types of Extinguishers Approved for Types of Hazards

Class A Hazards	Class B Hazards	Class C Hazards
Cartridge-operated water or antifreeze	Carbon dioxide*	Carbon dioxide
Stored pressure water or antifreeze	Dry chemical	Dry chemical
Wetting Agent Foam	Multipurpose dry chemical (ABC)	Multipurpose dry chemical (ABC)
Loaded stream	Halon 1301	Halon 1301
Multipurpose dry chemical (ABC)	Halon 1211	Halon 1211
Pump tank water or antifreeze (Halon 1211)		

*Certain sizes are not classified or acceptable to meet requirements.

2. Hot Work

A minimum of one fire extinguisher, rated at least 20BC, must be provided for each hot work location. The extinguisher should be conspicuously positioned no more than 10 feet (3.04 meters) from the hot work. Refer to SMS 020- Hot Work".

3. Motorized Construction Equipment

At least one portable fire extinguisher, rated at least 20BC, must be provided on each piece of motorized construction equipment.

4. Temporary Construction/Work Trailer

A minimum of one fire extinguisher, rated at a minimum of 2A, must be provided for each temporary construction/work trailer.

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

1. Applicability

This standard applies to URS Corporation and its subsidiary companies in which hand tools and/or portable powered equipment, including chain saws; brush cutters, powder-actuated tools, and similar high-hazard implements are used.

2. Purpose and Scope

The purpose of this standard is to provide procedures for the safe use and handling of hand tools and portable powered equipment. SMS 064 – Hand Safety provides additional information on the safe use of hand tools.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site or project location.

4. Requirements

A. General

1. Keep hand and power tools in good repair and use them only for the task for which they were designed. Use tools only in accordance with the manufacturer's recommendations.

2. Remove damaged or defective tools from service. Affix a "Do Not Use" tag (or similar) to the tool until repairs are made or the tool is destroyed.

3. Provide employees using hand tools or portable powered equipment with personal protective equipment (PPE) and train employees in the use of PPE required for the operation being undertaken.

4. Keep surfaces and handles clean and free of excess oil and grease to prevent slipping.

5. Do not carry sharp tools in pockets; this practice may cause puncture wounds.

6. Clean tools and return to a suitable toolbox, room, rack, or other storage area upon completion of a job.

7. Before applying pressure, ensure that wrenches have a good bite.

a. Brace yourself by placing your body in the proper position so that that you will not fall in case the tool slips.

b. Make sure hands and fingers have sufficient clearance in the event the tool slips.

c. Always pull on a wrench, never push.

8. When working with tools overhead, place tools in a holding receptacle or secure when not in use to prevent them from falling.

9. Do not leave tools in or on passageways, access ways, walkways, ramps, platforms, stairways, or scaffolds where they can create a tripping hazard.

10. Do not throw tools from place to place or from person to person, or drop tools from heights.

11. Use nonsparking tools in atmospheres with fire or explosive characteristics.

12. Inspect all tools prior to start-up or use to identify any defects.

13. Powered hand tools should not be capable of being locked in the ON position, except as noted elsewhere in this standard.

14. Require that all power-fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.

15. Ensure that all portable powered tools designed to accommodate guards are equipped with such when in use.

16. Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.

17. Do not use cheater pipes.

18. Make provisions to prevent machines from automatically restarting upon restoration of power (see SMS 023 – Lockout and Tagout Safety).

19. Where URS issues tools to its employees, the supervisor is responsible for the safe condition of tools and equipment.

20. Where workers furnish their own tools, their tools must conform to the requirements demanded for safety and efficiency. The supervisor has the responsibility to regularly inspect these tools for defects.

B. Electrical Power Tools

1. Electric-power–operated tools will be either of the approved double-insulated type or grounded in accordance with the National Electric Code.

2. The use of the electric cord for hoisting or lowering electric tools is an unsafe practice and will not be permitted.

3. All handheld powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches (5.1 centimeters) in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools will be equipped with a momentary contact ON/OFF control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

4. All other handheld powered tools such as circular saws, chain saws, and percussion tools without positive accessory holding means will be equipped with a constant pressure switch that will shut off the power when the pressure is released (i.e., “dead man” switch).

C. Grinding Tools

1. Inspect work rests and tongue guards for grinders.

    a. Work rest gaps should not exceed ⅛ inch (3 mm).

    b. Tongue guard gaps should not exceed ¼ inch (6 mm).

2. Do not adjust work, guards, or tool rests while the grinding wheel is moving.

3. Inspect the grinding wheel for cracks, chips, defects, or excessive wear. Remove from service if any defects are found.

4. Wear goggles when grinding. A clear full face shield may be worn with the goggles.

5. Do not use the side of a grinding wheel unless the wheel is designed for side grinding.

6. Always stand to the side of the blade, never directly behind it.

7. Use grinding wheels only at their rated speed.

8. Grinding aluminum is prohibited.

9. For operations in the United Kingdom:

    a. No grinding wheels exceeding 55 mm are to be used.

    b. All wheels are to be marked with their safe maximum speed.

    c. Abrasive wheels will be operated only by personnel who have been specifically trained and specified competent by URS.

    d. Abrasive wheels will be operated only by persons specified as competent, under the abrasive wheel regulations.

    e. Abrasive wheels must be operated only if the manufacturer's guard is fitted and they are in good working order.

D. Power Saws

1. Require that circular saws are fitted with blade guards.

2. Inspect each day prior to use. Remove damaged, bent, or cracked saw blades from service immediately.

3. Require that table saws are fitted with blade guards and a splitter to prevent the work from squeezing the blade and kicking back on the operator.

4. Require guards that cover the blade to the depth of the teeth on hand-held circular saws. The guard should freely return to the fully closed position when withdrawn from the work surface.

E. Woodworking Machinery

1. Do not leave woodworking tools running when unattended.

2. Keep the operating table and surrounding area clear of debris.

3. Do not use compressed air to remove dust and chips from woodworking machinery.

4. Locate the ON/OFF switch to prevent accidental start-up. The operator must be able to shut off the machine without leaving the workstation. Safety goggles and kickback aprons should be provided for and worn by operators. Respirators or local exhaust ventilation may also be necessary based on the type of material being cut or sanded.

5. Guard planers and joiners to prevent contact with the blades throughout the full length of the cutting area.

6. Ensure that band saw blades are fully enclosed except at the point of operation.

7. Require that swing cut-off saws have a guard completely covering the upper half of the saw.

8. Require that circular cross-cut and rip saws are provided with a hood guard, splitter, and anti-kickback device. The hood should adjust itself automatically to the thickness of and remain in contact with the material being cut. All circular saws will be provided with a hood guard.

9. Ensure that exposed parts of the saw blade under the table are properly guarded.

10. Equip all swing cutoff and radial saws that are drawn across a table with limit stops to prevent the saw from traveling beyond the edge of the table.

11. Hold the material being cut firmly against a back guide or fence and cut with a single, steady pass.

12. Cut green or wet material slowly and with caution. Check all material being cut for nails, hard knots, etc.

13. Use a push stick when:

a. The cutting operation requires the hands of the operator to come close to the blade.

b. Small pieces are being machined.

14. When cutting long stock, provide extension tables and a helper to assist the operator.

15. Adjust saw blades so they clear only the top of the cut.

16. Automatic feed devices should be used whenever feasible.

17. When drills are used:

a. Take care to prevent clothing from being wound around the drill. Wear sleeves buttoned at the wrist or short-sleeved shirts.

b. Clamp or hold down material being drilled to prevent spinning with the drill.

c. If the bit is long enough to pass through the material, provide against damage and injury.

d. Secure magnetic drills with a chain or rope to prevent falling. Label cord connections to prevent unplugging.

18. When sanders are used:

a. Move sanders away from the body.

b. Because dust may create an explosion hazard, guard against open flames and sparks.

F. Pneumatic Tools and Equipment

1. Require that pneumatic tools have:

a. Tool retainers to prevent the tool from being ejected from the barrel during use.

b. Safety clips, chains, tie wires, or other retaining devices to secure connections between tool/hose/compressor to prevent whipping in case of disconnection or failure.

2. Do not lay hose in walkways, on ladders, or in any manner that presents a tripping hazard.

3. Never use compressed air to blow dirt from hands, face, or clothing.

4. Do not use compressed air for cleaning purposes unless the pressure is reduced to 30 pounds per square inch (psi) or less. This rule does not apply for concrete form, mill scale, green cutting, and similar cleaning operations. Proper respiratory, hand, eye, and ear protection must be worn.

5. Never raise or lower a tool by the air hose.

6. Shut off the pressure and exhaust from the line before disconnecting the line from any tool or connection.

G. Powder-Actuated Fastener Tools

1. Use powder-actuated tools that comply with the requirements of the American National Standards Institute (ANSI)/American Society of Safety Engineers (ASSE) Standard A10.3 – 2006 – Powder-Actuated Fastening Systems.

2. Assess local and state regulations governing the use of these tools to ensure compliance.

3. Use only individuals who have been trained by a manufacturer's representative and possess the proper license to operate, repair, service, and handle powder-actuated tools.

4. With each tool, the manufacturer or supplier should furnish a detailed instruction manual covering the application, operation, and maintenance of the tool. The manufacturer's recommendation for size of charge, stud unit, or pin, and for specific application must be followed explicitly by the operator.

5. Keep cartridges or shells in the original containers, in separate metal containers, or in the carrying case provided with the tool, and then stored in locked containers. Keep cartridges of varied charges or forces segregated from each other.

6. Take precaution, as defined by the manufacturer, in the event of a misfire.

7. Provide information from the manufacturer on the safe use, testing, and maintenance of each type of tool in each tool kit.

8. Never use a powder-actuated tool in a flammable or explosive atmosphere.

9. Require the use of goggles or a full face shield as well as safety glasses during operation of powder-actuated tools.

10. Use only tools that are provided with a shield or muzzle guard. This shield or guard should be of a size, design, and material that will effectively confine flying particles and prevent escape of ricocheting studs and pins.

11. Ensure that powder-actuated tools are not able to be fired unless the tool is pressed against the work surface.

12. Always handle powder-actuated tools like firearms, with hands clear of the muzzle and barrel pointed away from all persons, especially when the tool is being closed or assembled after loading.

13. Ensure that the tool is not able to fire if the tool is dropped when loaded.

14. Ensure that firing the tool requires two separate operations, with the firing movement being separate from the motion of bringing the tool to the firing position.

15. Provide signs and barricades when shooting into walls or floors with personnel working on the other side.

16. Never fire into easily pierced or soft substrates or into materials of unknown resistance to piercing. In these situations, there is potential for the fastener to penetrate and pass through, creating a flying projectile hazard. If penetration of these materials is required, the material should be backed with a box of wood or sand al least four inches (10 cm) thick and of adequate area.

17. Do not use powder-actuated tools in reinforced concrete if there is the possibility of striking the rebar.

18. Do not use powder-actuated tools on cast iron, high carbon, heat treated steel, or armor plate, thin slate, marble, glass, live rock, glazed brick or tile, terra cotta, or other brittle substances, or where the composition is unknown.

19. Do not fire studs closer than three inches (7.5 cm) from the edge or corner when being used on brick or concrete. Do not fire studs closer than ½ inches (1.25 cm) from the edge when being used on steel.

20. Never load and leave a powder-actuated tool unattended. It should be loaded only prior to its intended firing. Use only studs or pins specifically designed for the tool.

21. Test tools each day prior to loading by testing safety devices according to the manufacturer's recommended procedure.

22. Inspect, clean, and store powder-actuated tools in a safe place at the end of each day. No tool will be stored loaded. Store tools with the barrels removed or breech open.

23. At the manufacturer's recommended intervals, the tool will be completely dismantled and carefully inspected for wear on the safety devices by a qualified person familiar with the tool. Worn parts will be replaced before the tool is used again. It is recommended that factory-authorized service representatives be utilized for inspection, repair, and parts replacement, where possible.

H. Chain Saws

1. Approval by the HSE manager is required for all use of chain saws.

2. Inspect the saw prior to each use and periodically during daily use.

3. Never cut above chest height.

4. Require that the idle is correctly adjusted on the chain saw. The chain should not move when the saw is in the idle mode.

5. Start cutting only after a clear escape path has been made.

6. Shut the saw off when carrying through brush or on slippery surfaces. The saw may be carried no more than 50 feet (15 meters) while idling.

7. Require applicable protective gear. This will include, but is not limited to:

    a. Logger's safety hat.

    b. Safety glasses and face shield.

    c. Steel-toed boots.

    d. Protective leggings.

    e. Hearing protection.

    f. Work gloves.

8. Inspect saws to ensure that they are fitted with an inertia break and hand guard.

9. *Never* operate a chain saw when fatigued.

10. Do not allow others in the area when chain saws are operated.

11. Make sure there are no nails, wire, or other imbedded material that can cause flying particles.

12. Do not operate a chain saw that is damaged or improperly adjusted, or is not completely and securely assembled. Always keep the teeth sharp and the chain tight. Worn chains should be replaced immediately.

13. Keep all parts of your body away from the saw chain when the engine is running.

14. For all operations, only personnel specifically trained and certified as competent by URS may operate chain saws.

I. Hand-Operated Pressure Equipment

1. Direct pressure equipment such as grease guns, and paint and garden sprayers away from the body and other personnel in the area. The person operating any equipment

such as this, which has a potential for eye injury, must wear protective goggles.

2. The noise produced when using certain types of pressure equipment may require the use of hearing protection.

3. Never allow the nozzle of a pressurized tool to come in contact with any body parts while operating. There is potential for injection of a chemical directly into the user's body, resulting in severe injury or death.

J. Gasoline-Powered Tools

1. Never pour gasoline on hot surfaces.

2. Never fuel around an open flame or while smoking.

3. Shut down the engine before fueling.

4. Provide adequate ventilation when using in enclosed spaces.

5. Use only Underwriters Laboratories (UL) - or FM-approved safety cans to transport flammable liquids. The use of unapproved containers for gasoline is strictly prohibited.

6. Label gasoline containers in compliance with Hazard Communication requirements, indicating the chemical and physical hazards of the product.

K. Inspection

Inspect all hand tools on a regular basis. Immediately remove defective tools from service, and tag or destroy them to prevent further use.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Site briefings regarding tool use.

B. Records of tools removed from service.

C. Copies of powder-actuated tool licenses (as applicable).

D. Tool inspection documentation.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard – Hand and Portable Power Tools – 29 Code of Federal Regulations (CFR) 1910, Subpart P

B. U.S. OSHA Standard – Construction Tools – Hand and Power – 29 CFR 1926, Subpart I

C. American National Standards Institute (ANSI)/American Society of Safety Engineers (ASSE) Standard A10.3 – 2006 – Powder-Actuated Fastening Systems

D. National Association of Demolition Contractors

E. United Kingdom – 'Provision and Use of Work Equipment' Regulations 1998

F. Australia/New Zealand Standards – Powder-Actuated Handheld Fastening Tools - AS/NZS 1873.1:2003Australian/New Zealand Standards – Hand-held Motor-operated Electric Tools – AS/NZS 60745.1:2003

G. SMS 023 – Lockout and Tagout Safety

H. SMS 064 – Hand Safety

URS SAFETY MANAGEMENT STANDARD

Heat Stress

1. Applicability

This standard applies to URS Corporation and its subsidiary companies on projects where ambient (not adjusted) temperatures exceed 70 degrees Fahrenheit (^{o}F) (21 degrees Celsius [^{o}C]) for personnel wearing chemical-protective clothing, including semi-permeable or impermeable protective clothing such as Tyvek or Saranex coveralls, and 90^{o}F (32^{o}C) for personnel wearing normal permeable work clothes. Permeable clothing refers to clothes of standard cotton or synthetic materials. Note that certain governmental entities require heat stress prevention techniques be implemented at lower temperatures or whenever outdoor work is conducted. Always consult local regulations to determine if more stringent standards apply.

2. Purpose and Scope

The purpose of this standard is to protect project personnel from the effects of heat-related illnesses.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. The project Health and Safety Plan will address heat stress control when temperatures identified in Section 1 of this standard are anticipated.

This standard introduces two different means of monitoring for heat stress conditions: Wet Bulb Globe Temperature (WBGT) and physiological monitoring. These methods can be used separately or in conjunction. For employees wearing chemical-protective clothing, physiological monitoring (Section C) is the most effective approach, because evaporative cooling capability is limited.

B. Heat stress is influenced by air temperature, radiant heat, and humidity. The WBGT is a useful index of the environmental contribution to heat stress. Because WBGT is only an index of the environment, the contributions of work demands, clothing, and state of acclimatization must also be accounted for, as described in the following steps.

1. Monitor ambient temperatures and conduct heat stress monitoring in accordance with the project Health and Safety Plan. Revise the heat

stress monitoring and controls if there are any reports of discomfort due to heat stress.

2. Monitor temperatures in each unique environment in which workers perform work (e.g., take WBGT measurements inside truck cabs for truck drivers, and take separate WBGT measurements in the outdoor area where field employees work, etc.).

3. Determine if individual workers are acclimatized or un-acclimatized. Full heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the activity under those heat-stress conditions is discontinued, or when there is a sustained increase in temperatures of 10 °F (5.6 °C) or more, and a noticeable loss occurs after 4 days. A worker can be considered acclimatized for the purpose of this procedure when they have been exposed to the site conditions (including level of activity) for 5 of the last 7 days.

4. Determine the approximate workload of each worker or group of workers. The following examples can be used for comparison:

Table 1
Examples of Activities within Workload Categories

Categories	Example Activities
Resting	Sitting quietly
	Sitting with moderate arm movements
Light	Sitting with moderate arm and leg movements
	Standing with light work at machine or bench while using mostly arms
	Using a table saw
	Standing with light or moderate work at machine or bench and some walking about
Moderate	Scrubbing in a standing position
	Walking about with moderate lifting or pushing
	Walking on level at 6 Km/hr while carrying 3 Kg weight load
Heavy	Carpenter sawing by hand
	Shoveling dry sand
	Heavy assembly work on a non-continuous basis
	Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work)
Very Heavy	Shoveling wet sand

5. Determine the approximate proportion of work within an hour during a typical shift. Typically, the initial work schedule will be 60 minutes of work per hour (100 percent work) with a small break in the morning and afternoon, as appropriate, and a 30-minute lunch break mid-day.

6. Compare the WBGT values measured in 4.B.1 to the screening criteria values in the following table, using the determinations made in 4.B.3 through 4.B.5.

Table 2
SCREENING CRITERIA FOR HEAT STRESS EXPOSURE
(WBGT Values in ºF /ºC)

Work Cycle	Acclimatized				Unacclimatized			
	Light Work	Mod. Work	Heavy Work	Very Heavy Work	Light Work	Mod. Work	Heavy Work	Very Heavy Work
100% Work (60 min/ hour)	85.1/ 29.5	81.5/ 27.5	78.8/ 26.0	N/A	81.5/ 27.5	77.0/ 25.0	72.5/ 22.5	N/A

a. If the measured WBGT is *less than* the table value, there is little risk of excessive exposure to heat stress, and work can continue. Continue to monitor ambient conditions with the WBGT. However, if there are reports of the symptoms of heat-related disorders, then the analysis of little risk should be reconsidered.

b. If the measured WBGT is *greater than* the table value, institute heat stress controls, including a work-rest cycle, and perform physiological monitoring as described elsewhere in this standard.

c. Because of the physiological strain associated with very heavy work among less fit workers regardless of WBGT, values are not provided in Table 1 for continuous work. Physiological monitoring should always be implemented under these conditions.

d. For workers wearing semi-permeable or impermeable clothing, such as Tyvek or Saranex, the WBGT procedures cannot be used. For these situations, workers should begin physiological monitoring as soon as the temperature in the work area exceeds 70ºF (21°C).

C. Physiological Monitoring

Physiological monitoring provides a means to assess the effectiveness of the heat stress controls (training, hydration, work-rest cycles, etc.) that are in place. Based on the results of physiological monitoring and self-assessment, work-rest cycles can be adjusted to more effectively control heat stress by shortening the work period, or to allow for longer work periods if workers are recovering adequately during rest breaks.

1. Perform physiological monitoring as soon as the employee stops working and begins their break (rest). Perform *physiological monitoring at least*

every hour. Base rest breaks on the results of the monitoring, workers' self-assessment, and professional judgment.

a. Example 1: If the WBGT is 85°F (29.4°C) or less for acclimatized, light-duty workers, they can work 60 minutes per hour (100 percent work), and they need only take their regularly scheduled breaks.

b. Example 2: If the WBGT is greater than 85°F (29.4°C) for acclimatized, light-duty workers, physiological monitoring must be performed, and workers' work-rest cycles must be adjusted as described below.

2. Have workers assess themselves and their body's reaction to the heat and work conditions (self-assessment), and report any signs or symptoms of heat illness. These can include nausea or dizziness, heat cramps, extreme thirst, or very dark urine.

3. Based on the results of the physiological monitoring and on the workers' self-assessments, the work period may be adjusted as follows:

   a. The work period may be *increased* (generally, by 5- to 10-minutes intervals, up to a maximum of 4 hours) if the results of the first 2 hours of the physiological monitoring and the workers' self-assessments indicate that workers *are* recovering adequately (see below), and on the judgment of the Health and Safety Technician.

   b. The work period *must be decreased* if the results of the physiological monitoring and the workers' self-assessment indicate that workers are NOT recovering adequately (see below).

4. Perform physiological monitoring

   a. The worker or the Health and Safety Technician must measure and record body temperature and pulse rate as described below. Use SMS 018-1 NA – Heat Stress Monitoring Record as a tool.

5. Body Temperature Monitoring

   a. Monitor body temperature to determine if employees are adequately dissipating heat buildup. Ear probe thermometers which are adjusted to oral temperature (aural temperature) are convenient and the preferred method of measurement. Determine work/rest regimen as follows:

i. Measure oral body temperature at the end of the work period. Oral body temperatures are to be obtained prior to the employee drinking water or other fluids.

ii. If temperature exceeds 99.6°F (37.5°C), shorten the following work period by 1/3 without changing the rest period.

iii. If, at the next rest period, temperature still exceeds 99.6°F (37.5°C), the worker should not be allowed to continue work until repeated temperature measurements are in the acceptable range (i.e., less than 99.6°F). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.

iv. Do not allow a worker to wear impermeable PPE when his/her oral temperature exceeds 100.6°F (38.1°C).

b. Have employees assess themselves and their body's reaction to the heat and work conditions, and report any signs or symptoms of heat stress, including, but not limited to, feeling nauseous or dizzy, skin rash or skin irritation, muscle cramps, weakness or fatigue, extreme thirst, dizziness, blurred vision, headache, or very dark urine.

6. Pulse Rate Monitoring

a. Take the radial (wrist) pulse as early as possible in the rest period and determine the worker's heart rate in beats per minute. The heart rate is determined by counting the pulse for ten seconds and multiplying the number by 6 to get the beats per minute. Record this as P1.

b. Wait 2 minutes and repeat the pulse measurement. Record this as P2.

c. If P1 is greater than or equal to 110 beats per minute (bpm) and if (P1 – P2) is less than or equal to 10 bpm (indicating that workers are not recovering adequately), shorten the next work cycle by 1/3 without changing the rest period.

d. At the next rest period, if P1 is still equal to or greater than 110 bpm, and if (P1 – P2) is still less than or equal to 10 bpm, shorten the following work cycle by 1/3 without changing the rest period.

e. At the third rest period, if P1 is still equal to or greater than 110 bpm and (P1 – P2) is still less than or equal to 10 bpm, the worker should not be allowed to continue work until repeated pulse measurements are in the acceptable range (i.e., P1 is less than 110 bpm and (P1 –

P2) is greater than 10 bpm). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.

D. Record monitoring results and worker's self-assessments on Attachment 018-1 NA – Heat Stress Monitoring Record.

E. Investigate the use of auxiliary cooling devices in extreme heat conditions.

F. Conduct briefings for employees regarding health hazards and control measures associated with heat stress whenever conditions require the implementation of heat stress monitoring. Review the information provided in Supplemental Information A.

G. Provide cool water and electrolyte replacement drinks as described in Supplemental Information A.

H. Allow employees who are not accustomed to working in hot environments appropriate time for acclimatization, as described in Supplemental Information A.

I. Provide break areas as described in Supplemental Information A.

5. Documentation Summary

The following information will be maintained in the project file:

A. Heat Stress Monitoring Records

B. Employee Safety Briefing Verification Forms

6. Resources

A. NIOSH – Working in Hot Environments (Publication No. 86-112), 1986

B. NIOSH – Criteria for a Recommended Standard for Occupational Exposures to Hot Environments (Publication No. 86-113), 1986

C. ACGIH – Documentation of the Threshold Limit Values and Biological Indices, 2003

D. AFL-CIO Building Trades Division – Heat Stress in Construction

E. Attachment 018-1 NA – Heat Stress Monitoring Record

7. Supplemental Information

A. Heat Stress Informational Supplement

URS	Health, Safety and Environment **HEAT STRESS MONITORING RECORD**	Attachment 018-1 NA Issue Date: May 2001 Revision 6: August 2010

Date: _____ Safety Representative: _____

Worker's Name: _____ Subcontractor: _____

Work Activity/Equipment: _____

Time	Work-Rest Cycle	Aural Temp (ºF/ºC)	Pulse (BPM)			Comments
			P_1	P_2	P_1-P_2	

HEAT RASH

Heat rash (prickly heat) may result from continuous exposure to heat or humid air. It appears as red papules (elevated skin lesion), usually in areas where the clothing is restrictive, and gives rise to a prickly sensation, particularly as sweating increases. It occurs in skin that is persistently wetted by un-evaporated sweat. The papules may become infected unless treated.

First Aid for Heat Rash - To prevent heat rash, shower after work, dry off thoroughly, and put on clean, dry underwear and clothes. Try to stay in a cool place after work. If, in spite of this, you develop heat rash, see your physician.

HEAT CRAMPS

Heavy sweating with inadequate electrolyte replacement causes heat cramps. Signs and symptoms include:

- Muscle spasms.
- Pain in the hands, feet and abdomen.

First Aid for Heat Cramps - Leave the work area, and rest in a cool, shaded place.

Mild heat cramps can be treated by drinking beverages that contain salt or eating salty food. Severe heat cramps are treated with fluids and salts given intravenously.

Once the spasms disappear, you may return to work. Taking adequate breaks and drinking electrolyte replacement drink should prevent the cramps from returning.

HEAT EXHAUSTION

Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, moist skin.
- Heavy sweating.
- Dizziness.
- Nausea.
- Fainting.
- Headache.
- Blurred vision.
- Vomiting.

The key here is that the victim is still sweating, so the cooling system is still working; it's just under severe stress. The body core temperature may be elevated, but not higher than 104ºF (40ºC). It is important to recognize and treat these symptoms as soon as possible, as the transition from heat exhaustion to the very hazardous heat stroke can be quite rapid.

First Aid for Heat Exhaustion – Treatment involves replacing fluids (rehydration) and salts and removing the person from the hot environment. If symptoms are mild, sipping cool, slightly salty beverages every few minutes may be all that is needed. Removing or loosening clothing and applying wet cloths or ice packs to the skin also aid cooling.

HEAT STROKE

Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels, typically at or above 104ºF (40ºC). Immediate action must be taken to cool the body before serious injury and death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, usually dry skin.
- Lack of or reduced perspiration (lack of perspiration may be masked for those wearing chemical protective clothing since perspiration from earlier in the day will be present).
- Nausea.
- Vomiting.
- Dizziness and confusion.
- Strong, rapid pulse.
- Coma.

First Aid for Heat Stroke - THIS IS A MEDICAL EMERGENCY! SUMMON MEDICAL ASSISTANCE IMMEDIATELY!

While awaiting transportation to the hospital, a person should be wrapped in cold, wet bedding or clothing; immersed in a lake, stream, or cool bathtub; or cooled with ice. At the hospital, body cooling is usually accomplished by removing the clothes and covering the exposed skin with water or ice. To speed evaporation and body cooling, a fan may be used to blow air on the body. Body temperature is measured frequently, often constantly. To avoid overcooling, cooling is stopped when the body temperature is reduced to about 102°F (38ºC).

HEAT STRESS PREVENTION

The best approach to avoiding heat-related illness is through preventative heat stress management.

Rest areas - A relatively cool, shaded area must be provided for breaks when ambient temperatures exceed 70^{o}F (21°C) and workers are wearing chemical protective clothing (including uncoated Tyvek), or if temperatures exceed 80^{o}F (26°C) and workers are wearing "Level D" coveralls or work clothes. For hazardous waste sites, the rest area should be located in the support zone adjacent to the contamination reduction zone, situated so that part of it is in the decon area so workers can take breaks without going through full decon. If shade is not available, shaded areas shall be constructed. This same type of canopy can be set up to shade personnel performing various types of work in hot weather. Cooling measures other than shade (e.g., misting, air conditioned break areas, air conditioned

vehicles, etc.) can be used in lieu of shade provided it can be demonstrated that they are at least as effective in cooling employees. Employees should have access to these rest areas at break times and at any other time when suffering from heat illness or believing a preventive recovery period is needed.

Liquids - Encourage employees to drink plenty of cool plain water and electrolyte replacement drinks. Supplementing water with cool electrolyte replacement drinks, such as Gatorade, Squench or Quik-kick (drink), is helpful to employees who tend to sweat a lot. Do not use "community cups"; use paper cups. Employees should have access to potable drinking water equivalent to one quart of water per employee per hour during the shift. Less water can be available at the start of the shift provided it is effectively replaced when required.

Have workers drink 16 ounces (0.5 liters) of drink before beginning work, such as in the morning and after lunch. At each break, workers should drink 8 to 16 ounces (0.25 to 0.5 liters). Employees should not wait until they are thirsty to drink.

Discourage the use of alcohol during non-working hours, and discourage the intake of coffee during work hours, as these make heat stress control more difficult.

Acclimatization - This is the process by which your body "gets used to" hot work environments. This is achieved by slowly increasing workloads. Start at 50 percent capacity on day one, and increase by 10 percent per day; on day six, you'll be at 100 percent. You don't lose acclimatization over a weekend, but it'll start to decrease after three to four days. If you don't do hot work for a week, the acclimatization is gone. You don't have to do full shift hot work to achieve or retain acclimatization; a minimum of 100 minutes of continuous hot work exposure per day is adequate.

Auxiliary Cooling - Auxiliary cooling is usually obtained by providing workers with a specially-designed vest, which is worn under the protective clothing, but over any underclothing. These vests typically provide cooling via one of two methods: the use of ice or other frozen media, or the use of a vortex cooler. Each method has its advantages and disadvantages.

The frozen media vest requires a means for freezing the media, and the media (usually water or "blue ice") will melt, requiring replacement.

The vortex cooler tends to cool more uniformly. Instead of frozen media, this vest uses the expansion of compressed air to cool the wearer. The drawback is the compressed air requirement, but this is negated when the wearer is already using an airline respirator supplied by a compressor. A vortex cooler should not be supplied from air cylinders, as this will draw down the cylinders rapidly.

Auxiliary cooling should be considered when the following conditions exist:

- Ambient temperature over 80^{o}F (26°C).
- Workers are wearing impermeable garments (i.e., Tyvek, Saranex, Chemrel, etc.).
- It is desirable to have long work shifts with minimum interruption.

URS SAFETY MANAGEMENT STANDARD

Heavy Equipment Operations

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where heavy equipment is in operation by URS employees or subcontractors.

2. Purpose and Scope

The purpose of this standard is to require that heavy equipment is operated in a safe manner; that the equipment is properly maintained; and that ground personnel are protected. Heavy equipment includes construction and mining equipment such as backhoes, excavators, skid steers, graders, loaders, dozers, tractors, cranes, drills, and draglines.

In addition to this standard, refer to SMS 038 – Cranes and Derricks; and SMS 056 – Drilling Safety.

Military related vehicles and equipment (e.g., tanks) are not covered under this standard.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Authorized Operators

1. Evaluate operators through documented experience (resume), and as appropriate, a practical evaluation of skills. Supplemental Information A through G, or a similar method, may be used for evaluating operators.

2. Allow only qualified operators to operate equipment. Trainees may operate equipment under the direct supervision of a trainer.

3. Prohibit equipment from being operated by any personnel who have not been specifically authorized to operate it.

4. Maintain a list of operators for the project, and the specific equipment that they are authorized to operate.

5. Require operators to use seatbelts at all times in all equipment and trucks.

6. Except where allowed by the manufacturer, prohibit personnel other than the operator from riding in or on the equipment unless additional seating (with seatbelts) is provided by the manufacturer. In some cases, a trainer may ride in a cab not equipped with additional seating when training activities are being conducted.

7. Operators must maintain three points of contact whenever mounting and dismounting a piece of equipment.

8. Brief operators on the following rules of operation:

    a. Operators are in control of their work area.

    b. Equipment must be operated in a safe manner and within the constraints of the manufacturer's Operation Manual.

    c. Operators must stop work whenever unauthorized ground personnel or equipment enter their work area, and only resume work when the area has been cleared.

    d. Operators must not use mobile phones while operating heavy equipment.

B. Ground Personnel

1. Require that URS ground personnel or ground personnel interacting with URS heavy equipment operations have received training, and comply with the following rules of engagement:

    a. Wear high-visibility protective vests when in work areas with any operating equipment.

    b. Stay outside of the swing zone or work area of any operating equipment.

    c. No standing or working in the equipment operator’s blind spots.

    d. Ground personnel may only enter the swing or work area of any operating equipment when:

1. They have attracted the operator's attention and made eye contact.

2. The operator has idled the equipment down, placed it in neutral, grounded engaging tools, and set brakes.

3. The operator gives the ground personnel permission to approach.

e. Ground personnel must never walk, or position themselves between, any fixed object (e.g., working face, highwall) and operating equipment, or between two operating pieces of equipment.

C. Equipment

1. Maintain operation manuals at the site for each piece of equipment that is present on the site and in use.

2. Require that operators have read or been trained on the manual for the equipment, and operate the equipment within the parameters of the manual and this standard.

3. Require that all equipment is provided with roll-over protection systems (ROPS). Tracked excavators, road trucks, and drills are exempt from ROPS requirements, but must have a cab that provides protection from overhead hazards.

4. Verify that seatbelts are present and functional in all equipment.

5. Prohibit the use of equipment that has or had cab glass (per the manufacturer’s specifications) that is cracked, broken, or missing.

6. Require that backup alarms are functional on all trucks and equipment. Tracked excavators must have bi-directional alarms, or the operator must be provided with a spotter whenever tracking in either direction.

7. Require all extensions such as buckets, blades, forks, etc., to be grounded when not in use.

8. Require brakes to be set and wheels chocked or equivalent (when applicable) when not in use.

9. Require fire extinguishers to be placed on all vehicles or equipment as required, and inspected by the operator prior to each shift. Monthly inspection and service records will be maintained in the project office, if not kept on the extinguishing equipment.

10. Require that all haulage vehicles, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, has a cable shield and/or canopy adequate to protect the operator from shifting or falling material. If protection is not available for the operator, the operator must leave the vehicle and wait in a designated safe location until it is loaded.

11. Require that a locking device be provided that will prevent the accidental separation of towed and towing vehicles on every fifth-wheel mechanism and two-bar arrangement.

12. Require that trip handles for tailgates of dump trucks and heavy equipment be arranged so that when dumping, the operator will be in the clear.

13. Require that motors and engines are shut off during fueling or maintenance operations. Ensure proper grounding/bonding between equipment and fuel vehicle prior to fueling operations. During fueling operations, ensure the fuel nozzle remains in contact with the tank and no smoking or open flame is present in the immediate area.

D. Subcontractor Equipment

1. Require that no unsafe vehicles or equipment be allowed in construction areas. Where compliance is refused, the project manager or his or her designate should be notified immediately.

2. Require that subcontractor employees follow established safety procedures in operation, inspection, and maintenance of vehicles and equipment.

3. Require that URS supervisors visually observe the subcontractors' vehicles and equipment, and report any unsafe conditions or practices to the project manager. Equipment not in compliance with applicable safety standards is prohibited.

E. Safe Operation

1. All vehicles transporting material or equipment on public roads must comply with local laws pertaining to weight, height, length, and width. Obtain any permits required for these loads.

2. Prohibit operating Company-owned, leased, or rented vehicles or equipment while under the influence of alcohol or illegal drugs.

3. Require seatbelts to be worn for all operators, drivers, and passengers for company owned or leased vehicles and equipment.

4. Do not drive equipment into an unsafe area. This includes areas of construction where unnecessary tire, steering, or body damage could result, or where soil conditions are not adequate to support the equipment.

5. Do not smoke on, in, or within 50 feet (15 meters) of vehicles hauling fuel oils, gasoline, or explosives.

6. Do not ride with arms or legs outside of the truck body, in a standing position on the body, on running boards, or seated on side fenders, cabs, cab shields, rear of truck bed, or on the load.

7. Do not drive any vehicle at a speed greater than is reasonable and proper, with due regard for weather, traffic, intersections, width, and character of the roadway, type of motor vehicles, and any other existing condition.

8. Oilers, apprentices, and other operators will not be allowed to operate equipment unless authorized by the project manager or general superintendent.

9. Do not operate any equipment beyond its safe load or operational limits.

10. Keep all employees clear of loads about to be lifted, or suspended loads.

11. Outfit equipment operated in hazardous atmosphere environments with the proper safety equipment (e.g., spark arrestors).

12. Utilize equipment with enclosed cabs where feasible or accessible. Where use of equipment with enclosed cabs is not feasible or said equipment is not accessible, require that operators use eye protection in accordance with potential airborne hazards present.

F. Inspection and Maintenance

1. Require operators to inspect equipment daily (or before each shift), using Attachment 019-1 NA or equivalent.

2. Prohibit use of equipment deemed to be unsafe, as determined by daily inspection, until required repairs or maintenance has been completed.

3. Conduct maintenance as prescribed by the manufacturer in the Operation Manuals for each piece of equipment.

4. During maintenance and repair, require that:

   a. Motors are turned off, unless required for performing maintenance or repair.

   b. All ground-engaging tools are grounded or securely blocked.

   c. Controls are set in a neutral position.

   d. Brakes are set.

   e. Electrically driven equipment is installed with provision for tagging and locking out the controls while under repair.

   f. Manufacturer's requirements for maintenance and repair are followed.

5. Provide and use a safety tire rack, cage, or equivalent protection when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.

5. Documentation Summary

The following information will be maintained in the project file:

A. Operator qualifications.

B. Daily Equipment Inspection Logs, Attachment 019-1 NA, or equivalent.

C. Site briefing documentation for operator rules and ground personnel "rules of engagement".

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard – Motorized Vehicles and Mechanized Equipment – 29 Code of Federal Regulations (CFR) 1926, Subpart O

B. U.S. Mine Safety and Health Administration – 30 CFR 48 – Training and Retraining Miners

C. U.S. Mine Safety and Health Administration – 30 CFR 56 Subpart H – Loading, Hauling, and Dumping

D. U.S. Mine Safety and Health Administration – 30 CFR 56 Subpart M – Machinery and Equipment

E. U.S. Mine Safety and Health Administration – 30 CFR 77 Subpart E – Safeguards for Mechanical Equipment

F. U.S. Mine Safety and Health Administration – 30 CFR 77 Subpart K – Ground Control

G. U.S. Mine Safety and Health Administration – 30 CFR 77 Subpart Q – Loading and Haulage

H. National Association of Demolition Contractors – Safety Manual

I. SMS 038 – Cranes and Derricks

J. SMS 056 – Drilling Safety

K. Attachment 019-1 NA– Equipment Inspection Form

Note: The above regulatory resources are for U.S. operations only.

7. Supplemental Information

A. Backhoe Operator Skill Evaluation

B. Scraper Operator Skill Evaluation

C. Bulldozer Operator Skill Evaluation

D. Dump Truck Operator Skill Evaluation

E. Roller/Compactor Skill Evaluation

F. Front-End Loader Skill Evaluation

G. Grader Operator Skill Evaluation

URS	Health, Safety and Environment **DAILY HEAVY EQUIPMENT SAFETY INSPECTION CHECKLIST**	Attachment 019-1 NA Issue Date: June 1999 Revision 6: January 2011

Equipment ID No: _____ Inspector's Name: _____

Equipment Name: _____ Employee No.: _____

Beg. Hours: _____ End Hours: _____ Date: _____

INSTRUCTIONS: Each shift must inspect all applicable items indicated. If an unsatisfactory condition is observed, suspend operation of the equipment and report the unsatisfactory condition to the site supervisor immediately.

ITEM INSPECTED	CHECK IF SATISFACTORY	COMMENTS	CORRECTED BY	DATE
Equipment Operating Manuals Available	☐			
Falling Object Protective Structure (FOP)	☐			
Roll-Over Protection Structure (ROP)	☐			
Seat Belts	☐			
Operator Seat Bar(s)	☐			
Side Shields, Screens, or Cab	☐			
Lift-Arm Device	☐			
Grab Handles	☐			
Back-up Alarm – Working	☐			
Lights	☐			
Guards	☐			
Horn	☐			
Windshield Wipers	☐			
Glass, Mirrors	☐			
Anti-Skid Tread Clear of Mud	☐			
Safety Signs (i.e., counterbalance swing area)	☐			
Fire Extinguisher	☐			
General Condition	☐			
Fuel Connection	☐			
Oil (fuel and no leaks)	☐			
Clear of Extra Materials	☐			
Controls Function Properly	☐			
Hydraulic System (full and no leaks)	☐			
Parking Brake	☐			
Lift Arm and Bucket	☐			
Tires/Tracks	☐			
Steering	☐			
Breathing Air System	☐			
Blast Shields	☐			
Flammable Atmosphere Protective Equipment	☐			
Quantity of Fuel Added	☐			
Quantity of Oil Added	☐			

Operator Signature _____

URS	Health, Safety and Environment **BACKHOE OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information A Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

This equipment is used for primarily for excavation, although it may occasionally be used for other miscellaneous tasks for which crane or stick type equipment is required.

STEPS KEYPOINTS	SATISFACTORY
1) Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts, leaks; oil, hydraulic and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires if applicable g) Glass, wipers h) Gauges, including temperature, oil, and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2) Identification of equipment controls	☐ Yes ☐ No
3) Excavating techniques a) Benching, sloping b) Spoil removal from side wall c) Back filling operations d) Aware of surroundings and personnel near the swing radius of boom	☐ Yes ☐ No
4) Can arrange controls and boom for travel	☐ Yes ☐ No
5) Speed in relation to terrain (controlled speed)	☐ Yes ☐ No
6) Stock piling with front end bucket	☐ Yes ☐ No
7) Loading truck bed with bucket	☐ Yes ☐ No
8) Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Set all park brakes d) Lower bucket to ground e) Perform a general walk around looking for items for maintenance	☐ Yes ☐ No

URS	Health, Safety and Environment **SCRAPER OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information B Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Drives a tractor to pull a steel bowl-like or box-like scoop (scraper), mounted on wheels, which scrapes up earth and transports it to a designated place; manipulates a series of levers to lower cutting edge of the scraper into the ground, to raise cutting edge when scraper is full, and to empty scraper.

STEPS KEYPOINTS	SATISFACTORY
1. Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluids and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2. Identification of equipment controls	☐ Yes ☐ No
3. Loading techniques a) Use of apron b) Use of cutting edge c) Pump loading etc	☐ Yes ☐ No
4. Shifting and hauling	☐ Yes ☐ No
5. Rough cut and fill	☐ Yes ☐ No
6. Spreading material	☐ Yes ☐ No
7. Fine grading	☐ Yes ☐ No
8. Obtaining compaction	☐ Yes ☐ No
9. Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower apron d) Lower bowl to the ground e) Perform a general walk around looking for maintenance items	☐ Yes ☐ No

URS	Health, Safety and Environment **BULL DOZER OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information C Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Operates a large tractor with a concave steel blade or push block mounted in front of the chassis to level, distribute and push earth. This equipment may be used to push earth carrying equipment. At times a ripper attachment is used for ripping the earth prior to loading the scraper. Operator regulates height of blade or push block from ground and may help in necessary adjustments to equipment as needed.

STEPS KEYPOINTS	SATISFACTORY
1) Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tracks g) Glass, wipers h) Gauges, including temperature, oil, air and fuel i) Audible horn v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2) Identification of equipment controls	☐ Yes ☐ No
3) Pushing techniques a) Use of push blade b) Loading of push load equipment	☐ Yes ☐ No
4) Use of ripper shanks	☐ Yes ☐ No
5) Rough cut and fill	☐ Yes ☐ No
6) Spreading material	☐ Yes ☐ No
7) Fine grading	☐ Yes ☐ No
8) Obtaining compaction by tracking in material	☐ Yes ☐ No
9) Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower rippers d) Lower blade to the ground e) Perform a general walk around looking for maintenance items	☐ Yes ☐ No

URS	Health, Safety and Environment **DUMP TRUCK OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information D Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Drives a heavy-duty gasoline or diesel-powered truck used in hauling material to fill areas or dump sites. The truck is either a tandem rear axle type, or is a tractor truck, single or tandem axle, pulling a trailer. May service and make necessary adjustments for proper operation of equipment.

STEPS KEYPOINTS	SATISFACTORY
1) Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational (1) Brakes (2) Lights (3) Back-up alarms (4) Hand rails & ladders (5) Seat belts (6) Tires (7) Glass, wipers (8) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2) Identification of equipment controls	☐ Yes ☐ No
3) Truck Weighing a) Tare weights b) Gross Weights	☐ Yes ☐ No
4) Loading Techniques a) Parking into load patterns b) Bed preparation for material	☐ Yes ☐ No
5) Shifting and Hauling	☐ Yes ☐ No
6) Stockpiling	☐ Yes ☐ No
7) Backing with the use of mirrors	☐ Yes ☐ No
8) Dumping/Spreading Material a) Fill material b) Base course material c) Surface materials d) Asphalt e) Lowers truck bed (dump trucks) or dump chutes (belly dumps)	☐ Yes ☐ No
9) Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Use park brake d) Perform a general walk around looking for maintenance items	☐ Yes ☐ No

URS	Health, Safety and Environment **ROLLER / COMPACTOR OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information E Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Operates a self-propelled gasoline or diesel machine, which has steel wheels used to compact earth fills, flexible bases and all types of materials. Rollers are also used for compaction to achieve a desired or specified density. Rides on the machine platform and moves lever and pedals or throttles to control and guide machine.

STEPS KEYPOINTS	SATISFACTORY
1) Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires, if applicable g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2) Identification of equipment controls	☐ Yes ☐ No
3) Rolling techniques to obtain compaction a) Use of controls b) Vibratory controls c) Turns and maneuvers d) Aware of surroundings	☐ Yes ☐ No
4) Rolling patterns a) Staggered patterns with other rollers	☐ Yes ☐ No
5) Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Perform a general walk around looking for maintenance items	☐ Yes ☐ No

URS	Health, Safety and Environment **FRONT END LOADER OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information F Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Operates a rubber tire or crawler type tractor with an attached bucket on front end. Moves a lever to raise and lower and dump contents of bucket. Machine is used to load materials from stockpiles, excavation, loading trucks.

STEPS KEYPOINTS	SATISFACTORY
1) Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2) Identification of equipment controls	☐ Yes ☐ No
3) Loading techniques a) Use of bucket and controls b) Crowding the pile c) Pump loading, etc. d) Loading patterns e) Loading trucks f) Loading scrapers	☐ Yes ☐ No
4) Control handling of contaminated soils	☐ Yes ☐ No
5) Shifting and hauling	☐ Yes ☐ No
6) Stockpiling	☐ Yes ☐ No
7) Mixing and moisture conditioning	☐ Yes ☐ No
8) Feeding crusher	☐ Yes ☐ No
9) Rough cut and fill	☐ Yes ☐ No
10) Spreading material	☐ Yes ☐ No
11) Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower bucket to the ground d) Perform a general walk around looking for maintenance items	☐ Yes ☐ No

URS	Health, Safety and Environment **GRADER OPERATOR SKILL EVALUATION**	SMS 019 NA Supplemental Information G Issue Date: February 2009 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Rides in control cab of grader and moves levers and hand wheels to guide machine and regulate the scraper blade. Blade is mounted on a carrying and turning circle at the front of the machine. Equipment is used to level or mix soils and aggregates to grade and to lay asphalt and flexible base materials.

STEPS KEYPOINTS	SATISFACTORY
1) Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	☐ Yes ☐ No
2) Identification of equipment controls	☐ Yes ☐ No
3) Leveling and scraping techniques a) Use of levers b) Use of cutting edge c) Controlling front wheel tilt d) Controlling crab motion	☐ Yes ☐ No
4) Shifting and traveling with loaded moe board	☐ Yes ☐ No
5) Rough cut and fill	☐ Yes ☐ No
6) Spreading material	☐ Yes ☐ No
7) Fine grading	☐ Yes ☐ No
8) Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower moe board to the ground d) Perform a general walk around looking for maintenance items	☐ Yes ☐ No

URS SAFETY MANAGEMENT STANDARD

Lead in Construction

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where lead-containing materials are disturbed and occupational exposures may occur.

2. Purpose and Scope

The purpose of this standard is to protect personnel from occupational exposures to lead.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Determine whether any surface to be disturbed or altered contains lead or has a surface coating that contains lead.

B. All employees with the potential to be exposed to lead must:

1. Be enrolled in the URS Medical Surveillance Program (SMS 024 – Medical Screening and Surveillance).

2. Have received training as outlined in Item N.

C. Interim Protection Measures

Until the initial exposure assessment can be conducted, the following protective measures must be implemented:

1. Provide respiratory protection:

a. Provide half face air purifying respirators with high efficiency cartridges where lead coatings or paint is present and any of the following activities will occur:

- Manual demolition of structures.
- Manual scraping.
- Manual sanding.
- Heat gun applications.
- Power tool cleaning with dust collection applications.
- Spray painting with lead paint.

b. Provide full face air purifying or powered air purifying respirators with high efficiency filters, or full face supplied air respirator operated in a demand mode when performing tasks involving:

- Lead-containing mortar.
- Lead burning.
- Rivet busting.
- Power tool cleaning without dust collection systems.
- Cleanup activities where dry expendable abrasives are used.
- Abrasive blasting enclosure movement and removal.

c. Provide full face supplied air respirators operated in pressure demand or other positive pressure when performing tasks involving:

- Abrasive blasting.
- Welding.
- Cutting.
- Torch burning.

2. Provide coveralls or other similar full body covering.

3. Provide gloves, head coverings, shoes, or disposable shoe coverings.

4. Provide face shields, goggles, or other appropriate protective equipment.

5. Provide change areas and either hand washing or showering facilities.

6. Provide medical monitoring in accordance with SMS 024.

7. Provide training regarding hazard communication and the use of respiratory protection.

D. Initial Exposure Assessment

1. Contact a URS Health, Safety, and Environment Program Representative to determine whether historical air monitoring data are available that accurately represent exposure conditions for the initial determination for the project.

2. In the absence of representative historical data, conduct air monitoring in accordance with SMS 043 – Personal Monitoring.

E. Negative Initial Determination

1. Exposures to lead at or below an 8-hour time-weighted average of 30 µg/m^3 requires a written record that includes the following:

    a. Date of determination.

    b. Location within the job site.

    c. Name of each employee monitored.

    d. Monitoring results.

    e. Type of activity conducted during monitoring.

2. No further action regarding lead is required unless there has been a change of equipment, process, or control, or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level.

F. Exposures to lead above an 8-hour time-weighted average of 30 µg/m^3 and below 50 µg/m^3

All employees potentially exposed to lead must:

1. Be enrolled in the URS Medical Surveillance Program (SMS 024).

2. Have received training as outlined in Item N.

3. Utilize appropriate personal protection equipment (PPE) and personal hygiene procedures as outlined in the project-specific safety plan.

G. Potential exposures above the 8-hour time-weighted average Permissible Exposure Limit of 50 µg/m^3

1. Develop a Lead Compliance Plan which ensures that, through the use of engineering controls, administrative practices, and personal protective equipment, no employee will be exposed to airborne lead concentrations in excess of 50 µg/m^3 as an 8-hour time weighted average (TWA).

    a. The compliance plan must include the following topics:

i. Description of locations of lead containing materials and work activities that expose personnel to lead.

ii. Equipment to be used and procedures to be followed during lead exposure activities.

iii. Employee job responsibility and crew size during lead exposure activities.

iv. Maintenance practices to be followed for servicing and cleaning equipment and disposing of waste.

v. Specific instructions on how to set up engineering controls (ventilation, containment, etc.).

vi. Description of technology considered in meeting the permissible exposure limit.

vii. Air monitoring data from the initial determination.

viii. A detailed work schedule and supporting documentation (e.g., copies of purchase orders for equipment) for implementation.

ix. Description of the work practice program (e.g., protective work clothing and equipment, housekeeping, change areas, and other relevant work practices).

x. An administrative control schedule, if administrative controls are being used.

xi. Description of air monitoring to be performed to ensure the provisions of the Lead Compliance Plan is adequately limiting employee exposure. This shall include full-shift air monitoring indicative of the employees' regular daily exposure to airborne lead.

xii. Recordkeeping requirements.

xiii. A description of arrangements made among contractors on multicontractor sites with respect to informing affected employees of potential exposure to lead.

xiv. The name of the Competent Person for the site.

b. Appoint a Competent Person who will be responsible for performing regular inspections of the job site, materials, and equipment during the job.

c. Revise and update the Lead Compliance Plan at least annually to reflect the current status of the program.

2. Order the PPE specified in the Lead Compliance Plan.

3. Provide for the cleaning, laundering, and disposal of protective clothing and equipment.

4. Notify the URS Health, Safety, and Environment Program Representative whenever there is a change in the lead job that has not been addressed by the Lead Compliance Plan.

5. Perform air monitoring quarterly (every three months) and continue monitoring at the required frequency until at least two consecutive measures, take at least seven days apart, are at or below the permissible exposure limit.

H. Implement the engineering controls specified in the Lead Compliance Plan for the site. Require engineering controls to be on site and installed correctly before work begins.

I. Provide the following hygiene facilities:

1. A clean change room equipped with separate lockers for the storage of street clothes and work clothes.

2. Hand washing facilities.

3. Showering facilities, where feasible.

4. Eating facilities free from lead contamination.

J. Establish rules that will maintain proper housekeeping in the lead abatement area, specifically:

1. Prohibit contaminated clothing and equipment outside of lead work areas.

2. Require lead workers to shower (where feasible) and/or wash hands and face at the end of the shift, and to wash hands and face

before eating, drinking, smoking, or applying cosmetics outside the lead area.

3. Segregate dirty or contaminated equipment from clean work areas.

4. Vacuum all lead-contaminated surfaces using a high-efficiency particulate air (HEPA) filter.

K. Label Lead Hazard Areas and Equipment.

1. Mark lead hazard areas with boundary tape and signs as follows:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

2. Ensure that signs are illuminated and cleaned as necessary to assure visibility.

3. Mark lead-contaminated equipment and debris with labels warning of the lead hazard.

L. Notify Contractors and Subcontractors Before Work Begins.

Require contractors to know the location of lead at the job site. Even if contract workers are not directly exposed, they may still need to perform training required under the hazard communication standard.

M. Maintain Requirements of the Lead Compliance Plan throughout the job.

Direct the Competent Person to inspect the job site at least daily on those days when lead operations are performed.

N. Provide and document training for all employees subject to lead exposure at or above the action level on any day or subject to exposure to lead compounds that may cause skin or eye irritation (e.g., lead arsenate, lead azide). Prior to the job assignment and at least annually, assure that each employee is trained in the following:

1. The content of lead in construction standard, including appendices (29 CFR 1926.62).

2. The specific nature of the operations that could result in exposure to lead above the action level.

3. The purpose, proper selection, fitting, use, and limitations of respirators.

4. Compliance with all warning signs and labels is required. Lead materials will not be disturbed unless proper control measures are in place.

5. The purpose and description of the URS Medical Surveillance Program and medical removal protection, including information concerning the adverse health effects associated with excessive exposure to lead.

   Common symptoms of acute lead poisoning are loss of appetite, nausea, vomiting, stomach cramps, constipation, difficulty in sleeping, fatique, moodiness, headache, joint or muscle aches, anemia, and decreased sexual drive. Acute health poisoning from uncontrolled occupational exposures has resulted in fatalities. Long term (chronic) overexposure to lead may result in severe damage to the blood-forming, nervous, urinary, and reproductive systems.

6. The engineering controls and work practices associated with the employee's job assignment, including training of employees to follow relevant good work practices.

7. The contents of any Lead Compliance Plan and the location of regulated areas in effect.

8. Instructions to employees that chelating agents should not be routinely used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.

9. The employee's right to access records.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Physician's medical clearance for lead workers.

B. Proof of blood lead testing for personnel.

C. Exposure monitoring records.

D. Lead Compliance Plan (as necessary).

6. Resources

A. U.S. OSHA Standard – Lead – 29 CFR 1926.62

B. U.S. OSHA Expert System – Lead in Construction Advisor

C. U.S. OSHA Technical Links – Lead

D. U.K. – Lead at Work Regulations

E. Australian Standards AS4361.1-1995 – Guide to Lead Paint Management Part 1, Industrial Applications

F. Queensland Workplace Health and Safety – Type of Hazardous Substance – Lead

G. SMS 024 – Medical Screening and Surveillance

H. SMS 043 – Personal Monitoring

URS SAFETY MANAGEMENT STANDARD

Noise and Hearing Conservation

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where personnel may encounter noise exposures that may exceed 85 decibels, measured using an A-weighted scale (dBA), as an 8-hour time-weighted average (TWA).

2. Purpose and Scope

The purpose of this procedure is to protect employees from hazardous noise exposures and to prevent hearing loss.

3. Implementation

Implementation of this procedure is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. General

1. The use of hearing protectors is required in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. Whenever information indicates that any employee's exposure may equal or exceed an 8-hour TWA of 85 dBA, the project manager or location manager will be responsible for enforcing the proper use of hearing protectors.

2. Implement a hearing conservation program in accordance with 29 Code of Federal Regulations (CFR) 1910.95(c) when applicable. Work not applicable to 29 CFR 1910.95(c) will assess hazards of noise exposure on a task basis, and implement engineering or administrative controls to reduce employee noise exposure.

3. Hearing protectors will be used in the event that administrative or engineering controls are either not effective or not feasible, and the following criteria will be applicable to selection of hearing protection devices.

    a. Require that at least two types of hearing protectors are available to employees free of charge, and that the type of hearing protector is suitable to the task.

b. Require that hearing protectors are used in accordance with manufacturer's specifications to effectively protect hearing.

c. Evaluate the effectiveness of the hearing protectors chosen. The manufacturer's assigned noise reduction rating (NRR) for hearing protection devices can seldom be achieved in workplace conditions; therefore this rating must be attenuated for real world conditions and use. To do so, subtract 7 from the NRR of the protector provided by the manufacturer. Divide this result by 2, and then subtract the remained from the observed "A" scale sound level measurement collected in the employee's work area (see Section 4.B). If this number is below 85, the hearing protectors are adequate for use in the work area.

B. Noise Surveys

1. Noise surveys must be conducted in a manner that reasonably reflects the exposure of the affected employees. Surveys must be conducted under the supervision of a URS Health, Safety, and Environment (HSE) Representative.

2. Sound-level meters and audio dosimeters used to determine employee exposure to noise sources must be Type II (accurate to within +/- 2 dBA), operated in "slow" response, on the "A" scale, and be calibrated to factory guidelines (including periodic factory recalibration).

3. Attachment 026-1NA (Sound Level Survey) and Attachment 026-2NA (Noise Dosimetry Field Sheet) may be used to record noise surveys.

C. Noise Controls

Eliminate noise sources to the extent possible. Examples of controls that must be considered include:

1. Adding or replacing mufflers on motorized equipment.

2. Adding mufflers to air exhausts on pneumatic equipment.

3. Following equipment maintenance procedures to lubricate dry bearings and replace worn or broken components.

4. Isolating loud equipment with barriers.

5. Replacing loud equipment with newer and quieter models.

6. Using caution signs and Hearing Protection Required signs to designate noisy work areas.

7. Installing HPD-dispensing devices at the entrance to noisy work areas.

D. Audiometric Exams

1. Tests

a. Details on the medical surveillance program (including audiometric testing) are included in SMS 024 – Medical Screening and Surveillance.

b. Audiometric tests will be performed by a person meeting the requirements described in 29 CFR 1910.95(g)(3). Within 6 months of an employee's first exposure at or above the action level, a valid baseline audiogram will be established, against which subsequent audiograms can be compared. Testing to establish a baseline audiogram will be preceded by 14 hours without exposure to noise. Hearing protectors may be used as a substitute for the requirement that a baseline audiogram will be preceded by 14 hours without exposure to workplace noise. The medical surveillance provider will notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination. For multi-year projects, an annual audiogram will be obtained for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

c. Each employee's annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid, and if there is a standard threshold shift (STS). A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 hertz (Hz) in either ear. If the annual audiogram shows that an employee has suffered an STS, the employer will obtain a retest within 30 days, and consider the results in assessing an STS as the annual audiogram. The audiologist, otolaryngologist, or physician will review problem audiograms, and will determine whether there is a need for further evaluation. If an STS has occurred, the medical surveillance provider will notify the employee within 21 days of the determination.

E. Standard Threshold Shifts

If an employee's test results show a confirmed STS, their hearing protection will be evaluated and refitted, and a medical evaluation may be required.

F. Training

Verify that each employee who must work in a noisy environment is current on required Hearing Conservation Training. At a minimum, training shall be conducted before initial assignment and annually. Training must include the following topics:

1. The effects of noise on hearing.
2. The purpose of hearing protectors.
3. The advantages and disadvantages of various types of hearing protectors.
4. The attenuation of various types of hearing protection.
5. The selection, fitting, care, and use of hearing protectors.
6. The purpose of audiometric testing.
7. An explanation of the audiometric testing procedure.

5. Documentation Summary

The following documentation will be maintained:

A. Noise surveys, when applicable.

B. Training records.

C. Audiometric tests (must be maintained by the Company's medical record retention vendor (e.g., WorkCare)).

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard – Occupational Noise Exposure – 29 CFR 1910.95

B. U.S. OSHA Construction Standard – Occupational Noise Exposure – 29 CFR 1926.52 and 1926.101

C. U.S. MSHA – Occupational Noise Exposure 30 CFR 62

D. U.S. FRA – Occupational Noise Exposure 49 CFR 227

E. U.S. OSHA Technical Links – Noise and Hearing Conservation

F. American Industrial Hygiene Association: Protect Yourself from Noise-Induced Hearing Loss

G. National Hearing Conservation Association web site

H. SMS 024 – Medical Screening and Surveillance

I. Attachment 026-1NA – Sound Level Survey

J. Attachment 026-2NA – Noise Dosimetry Field Sheet

URS	Health, Safety and Environment **SOUND LEVEL SURVEY**	Attachment 026-1 NA Issue Date: August 2010

Location: _____ **Date:** _____

Conducted By: _____

Sound Level Meter: _____ **Serial #:** _____

Calibrator Model: _____ **Serial #** _____ **Class:** ☐1 ☐ 2

Battery Check Completed: ☐ **Date of Factory Calibration:** _____

Test No.	Description Location/Equipment	Distance	dBA	Hearing Protection Required?		Comments
				Yes	No	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	

Drawing of Equipment or Work Layout

Reference Numbers refer to the Test Numbers on Page 1

URS	Health, Safety and Environment **NOISE DOSIMETRY FIELD SHEET**	Attachment 026-2 NA Issue Date: August 2010

Sample Identification

Sample #: _____ Date: _____

Employee Monitored: _____ Employee #: _____

Job: _____ Location: _____

Dosimeter Information

Model: _____ Serial # _____

Criterion Level (in dBA): _____ Threshold (in dBA): _____ Exchange Rate (in dBA): _____

Calibration (in dBA): Initial _____ Final _____

Weighting: Fast ☐ Slow ☐

Calibrator Information

Model: _____ Serial #: _____ Class ☐ 1 ☐ 2

Battery Check Completed: ☐ Date of Factory Calibration: _____

Sample Information

Time On: _____ Time Off: _____ Total Run Time (in min): _____

Time Weighted Average (in dBA): _____ %Dose: _____ Est. %Dose: _____

Average Sound Level (L_{avg}): _____ Peak Sound Level (L_{pk}): _____

Maximum Sound Level (L_{max}): _____ Minimum Sound Level (L_{min}): _____

Workplace Conditions

Scheduled Hours per Shift: _____ Operations: Normal? ☐ Abnormal? ☐

Explain: _____

Hearing Protection: Type _____ % of Time Worn _____

Work Description/Comments

Sampled By: _____

URS Safety Management Standard

Personal Protective Equipment

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies where the use of personal protective equipment (PPE) is anticipated.

2. Purpose and Scope

The purpose of this standard is to provide information on recognizing those conditions that require PPE. PPE is designed to protect the employee from health and safety hazards that cannot be practically removed from the work environment.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Perform hazard assessments for those work activities that are likely to require the use of PPE.

   1. Use Attachment 029-1 NA to perform the assessment.

   2. Reevaluate completed hazard assessments when job conditions or duties change.

B. Eliminate the hazards identified in Attachment 029-1 NA, if possible, through engineering or administrative controls.

C. Select PPE that will protect employees if hazards cannot be controlled or eliminated.

   1. See Attachment 029-1 NA for recommended PPE.

   2. Review Material Safety Data Sheets for chemicals used for PPE recommendations.

   3. If needed, consult with the applicable safety representative for assistance in selecting PPE.

D. Provide required PPE to employees free of charge (excluding, in some instances, components of standard work attire such as steel-toed boots and prescription safety glasses), assuring proper fit and providing a choice

if more than one type of PPE is available. Where applicable, the local policy (office or project) regarding reimbursement for PPE will prevail.

E. Provide the employees with the appropriate PPE whenever a hazard is recognized and PPE is required. However, when PPE is not required and the employee elects to wear his or her own PPE, the manager directing activities must ensure that the employee is properly trained in the fitting, donning, doffing, cleaning, and maintenance of his or her employee-owned equipment.

F. Make employees of aware that they are responsible for PPE maintenance, care, and proper use. Employees must inform their supervisors when a need arises to use PPE for which the employee has not received training, or when a condition exists where adequate PPE is not available.

G. Conduct and document employee training.

1. Train all employees who are required to wear PPE.

2. Require that training includes:

    a. When PPE is to be worn.

    b. The type of PPE necessary for the task to be completed.

    c. How to properly don, doff, adjust, and wear PPE.

    d. Limitations of PPE.

    e. Proper care, maintenance, useful life and disposal of PPE.

3. Conduct training before PPE is assigned.

4. Provide refresher training when:

    a. The workplace changes, rendering previous PPE and training obsolete.

    b. New types of PPE are assigned to the worker.

    c. The worker cannot demonstrate competency in PPE use.

5. Keep written records of the employees trained and type of training provided, including the date of training.

H. PPE Specific Information

1. Head Protection

a. Use hard hats in areas where there is the possible danger of head injury from the impact of falling or flying objects, striking against objects, electrical shock and/or burns, or any combination of these hazards. Hard hats will be worn when required by site safety procedures, client/site requirements, or when posted as an entry requirement.

b. Adjust the hard hat suspension to fit the wearer and to keep the shell a minimum of 1.25 inches (3.2 cm) above the wearer's head. Do not store materials in the suspension. Cold weather liners and perspiration control bands may be utilized within the hart hat unless specifically excluded by the manufacturer.

c. Wear hard hats in the forward position unless written verification and instructions from the hard hat manufacturer indicate your hard hat model has been tested and found to be compliant when worn backwards.

d. Type 1 helmets are designed to protect the employee from impact and penetration caused by objects hitting the top of the head; Type II helmets extend this protection to the sides of the head as well.

e. Class G (General) helmets provide protection against impact, penetration, and limited electrical hazards up to 2,200 volts. Class E (Electrical) helmets meet the same criteria, but electrical protection is increased to 20,000 volts. Class C (Conductive) helmets only provide impact and penetration protection.

f. Do not use bump caps as protection against head injury, except when the only potential hazard is striking against objects and the use has been approved a Business, Country, Group, Regional Business Unit (RBU), or Strategic Business Unit (SBU) Health, Safety and Environment Manager.

g. Do not alter hard hats in a way that will downgrade their efficiency. Typical prohibited alterations include painting,

drilling holes in shell, application of metal jewelry, etc. Replace hats with these alterations or with excessive scratches.

h. Wear integral chinstraps when working in high-wind conditions or near helicopters.

i. Inspect hard hats before use and remove from service if any of the following are observed: cracking, tearing, fraying, chalking, and flaking.

j. Remove hard hats and their components from service and replace as recommended by the manufacturer. Hard hats must be replaced after no more than 5 years.

2. Hearing Protection

a. Provide hearing protection in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. Each task in the work area will be evaluated for potential worker noise exposure as required.

b. Review SMS 026 – Noise and Hearing Conservation – for additional information.

3. Eye and Face Protection

a. Use eye and/or face protection when machines or operations create the risk of eye and/or face injuries due to physical, chemical, and/or radiation sources. Safety glasses will be worn when required by site safety procedures, client/site requirements, or when posted as an entry requirement.

b. Provide safety glasses that can be worn over corrective spectacles for employees whose vision requires the use of corrective lenses. Employees will consult with the applicable safety representative or project managers for policies on reimbursement for prescription safety glasses.

c. Do not use of sunglasses in place of required safety glasses. Heavily tinted safety glasses will only be used in outdoor areas with suitable lighting. Colored or lightly tinted or gradient lenses may be used indoors as appropriate to the work conditions.

d. Tasks involving potential projectiles (e.g., chipping, grinding and cutting) will require face shields over safety goggles. Tasks requiring power washing or handling corrosive chemicals will require a face shield over safety goggles. For welding tasks, refer to Supplemental Information B for lens selection criteria.

e. Consult Supplemental Information A for additional information on types of eye and face protection and their various uses.

4. Hand Protection

a. Wear gloves when the hands are exposed to hazards such as, but not limited to, chemical absorption, cuts or lacerations, abrasions, punctures, chemical burns, thermal burns, vibration, or temperature extremes.

b. Gloves must always be provided to workers for tasks with potential hand hazards.

c. Identify hand hazards during job or task hazard analysis. A supply of appropriate gloves in various sizes must be provided to workers assigned to work on that task.

d. Inspect chemical gloves for degradation or tears prior to use. Do not remove chemical gloves from the work area if it is visibly contaminated. Chemical gloves may be decontaminated or disposed of according to specified procedures. In some cases, inner disposable chemical gloves (e.g., nitrile) will be required for protection of hands during removal of contaminated gloves.

e. Select chemical-resistant gloves using manufacturer's hazard-based selection programs or other published guides that identify compatibility of glove material with chemical hazards. Selection must also consider physical requirements of the task with regard to puncture resistance and need for flexibility and dexterity in performing the task.

f. Review SMS 064 – Hand Safety – for additional information.

5. Foot Protection

    a. Wear appropriate specialized protective footwear in the following environments:

        i. Using harmful corrosive substances or processes.

        ii. Having a high probability of puncture or crushing injuries.

        iii. Performing regular assembly or disassembly of heavy system components.

        iv. Working in wet conditions.

        v. Working in extreme cold.

        vi. Working around exposed electrical wires or connections.

        vii. When using hand-operated compactors, snow blowers, pressure washers, or steam cleaners.

        viii. Other activities or areas as designated by supervisors or safety personnel.

    b. Employees assigned to field projects who are not required to wear specified protective footwear (e.g., steel-toed boots, metatarsal protection, rubber boots, insulated boots, etc.) will wear substantial leather, high-sided work boots. Shoes (leather, canvas, tennis, deck, or other types of material), sandals, high-heeled shoes, etc., are not allowed on field project sites.

I. Maintain Protective Equipment

1. Check PPE for damage, cracks, and wear prior to each use. Replace or repair equipment not found in good condition.

2. Decontaminate non-disposable PPE with appropriate cleaner, as necessary, to prevent degradation of the equipment. Staff will remove any non-impermeable PPE/clothing that becomes contaminated with hazardous substances. These instructions are reiterated in the emergency decontamination procedures in the Health and Safety Plans.

J. Periodically inspect worksites where employees are using PPE using Attachment 029-2 NA. Regularity of inspections should be determined by the project manager and/or site safety representative.

5. Documentation Summary

The following information will be maintained in the project file:

A. Completed Hazard Assessment Certification Forms (Attachment 029-1 NA).

B. Completed Personal Protective Equipment Inspection Sheet (Attachment 029-2 NA).

C. Documentation of employee training.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standards – Personal Protective Equipment – 29 Code of Federal Regulations (CFR)1910, Subpart I

B. U.S. OSHA Construction Standard - Personal Protective Equipment – 29 CFR 1926 Subpart E

C. U.S. OSHA Technical Links – Personal Protective Equipment

D. American National Standards Institute – ANSI Z89.1-2003, Protective Headwear

E. American National Standards Institute – ANSI Z87.1-2003 – Eye and Face Protection

F. American National Standards Institute /International Safety Equipment Association, ANSI/ISEA 107 - 2004 – Standard for High-Visibility Safety Apparel

G. American National Standards Institute – ANSI Z41-1991, Protective Footwear Requirements, American Society for Testing and Materials, ASTM F-2414-2005, Standard Test Methods for Foot Protection, ASTM F-2413-2005, Standard Specification for Performance Requirements for Protective Footwear

H. American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) – 105-2011 – American National Standard for Hand Protection Selection Criteria"

I. *Quick Selection Guide to Chemical Protective Clothing,* K Forsberg and S.Z. Mansdorf, Wiley Interscience, 2002

J. Best Manufacturing Co. http://www.bestglove.com/. Information on chemical resistant gloves.

K. SMS 040 – Fall Protection

L. SMS 026 – Noise and Hearing Conservation

M. SMS 064 – Hand Safety

N. Attachment 029-1 NA – Hazard Assessment Form

O. Attachment 029-2 NA – Personal Protective Equipment Inspection Form

7. Supplemental Information

A. Welding Lens Selector

B. Traffic Control Class Guidelines and Scenarios

URS	Health, Safety and Environment **HAZARD ASSESSMENT CERTIFICATION FORM**	Attachment 029-1 NA Issue Date: July 2000 Revision 9: March 2012

Location: _____ **Job No.:** _____

Date: _____ **Assessment conducted by:** _____

Specific tasks performed at this location: _____

If any of the indicated hazards are present, eliminate the hazard or use the indicated PPE.

Overhead Hazards

1.	Suspended/elevated loads, beams, or objects that could fall or strike head	☐ **Yes**	☐ **No**	Hard hat, ANSI Z89, Class G, E or C
2.	Flying objects that could strike head	☐ **Yes**	☐ **No**	Hard hat, ANSI Z89, Class G, E or C
3.	Energized wires or equipment that could strike head	☐ **Yes**	☐ **No**	Hard hat, ANZI Z89, Class G or E (dependent on potential voltage)
4.	Sharp objects or corners at head level	☐ **Yes**	☐ **No**	Hard hat, ANSI Z89, Class G, E or C

Eye Hazards

5.	Chemical splashes or irritating mists	☐ **Yes**	☐ **No**	See Supplemental Information A for additional information
6.	Excessive dust	☐ **Yes**	☐ **No**	Safety glasses or goggles
7.	Smoke and/or fumes	☐ **Yes**	☐ **No**	Safety goggles
8.	Welding operations	☐ **Yes**	☐ **No**	Welding goggles; See Supplemental Information A and B for additional information
9.	Lasers/optical radiation	☐ **Yes**	☐ **No**	Have URS HSE Representative assist you in proper selection
10.	Projectiles	☐ **Yes**	☐ **No**	Safety goggles plus face shield
11.	Sawing, cutting, chipping, and/or grinding	☐ **Yes**	☐ **No**	Safety goggles plus face shield; See Supplemental Information A for additional information

Face Hazards

12.	Chemical splashes or irritating mists	☐ **Yes**	☐ **No**	Safety goggles; See Supplemental Information A for more information; add face shield if irritating or corrosive
13.	Welding operations	☐ **Yes**	☐ **No**	Welding goggles or welding helmet; see Supplemental Information A and B for additional information
14.	Projectiles	☐ **Yes**	☐ **No**	Safety goggles plus face shield

Hand Hazards

15.	Chemical exposure	☐ **Yes**	☐ **No**	Use chemical-resistant gloves specific to hazard; consult MSDS, chemical hazard guide, or HSE Representative
16.	Sharp edges, splinters, etc.	☐ **Yes**	☐ **No**	Leather or Kevlar gloves
17.	Temperature extremes – heat	☐ **Yes**	☐ **No**	Leather gloves, welder's gloves, hot mill gloves

If any of the indicated hazards are present, eliminate the hazard or use the indicated PPE.

18.	Temperature extremes – cold	☐ **Yes**	☐ **No**	Insulated gloves
19.	Blood, fungus, biological agents	☐ **Yes**	☐ **No**	Nitrile gloves
20.	Exposure to live electrical currents	☐ **Yes**	☐ **No**	Electrical gloves; consult HSE representative
21.	Sharp tools, machine parts, etc.	☐ **Yes**	☐ **No**	Leather or Kevlar gloves
22.	Material handling	☐ **Yes**	☐ **No**	Leather gloves

Foot Hazards

23.	Heavy materials (greater than 50 pounds) handled by employees	☐ **Yes**	☐ **No**	Safety shoes or boots
24.	Potential to crush whole foot	☐ **Yes**	☐ **No**	Safety shoes or boots with metatarsal guard
25.	Sharp edges or points (puncture risk)	☐ **Yes**	☐ **No**	Safety shoes or boots
26.	Exposure to electrical hazards	☐ **Yes**	☐ **No**	Safety shoes or boots with: Conductive - Protects the wearer in an environment where the accumulation of static electricity on the body is a hazard. Static dissipative - Reduces the accumulation of excess static electricity by conducting body charge to ground while maintaining a sufficiently high level of resistance. Electrical hazard - Provides a secondary source of protection against accidental contact with live electrical circuits, electrically energized conductors, parts or apparatus, and is manufactured with non-conductive electrical shock resistant soles and heals.
27.	Slippery conditions	☐ **Yes**	☐ **No**	Rubber-soled boots or grips
28.	Chemical contamination	☐ **Yes**	☐ **No**	Rubber, PVC, or polyurethane boots or boot covers with puncture and protective toe if task required
29.	Wet conditions	☐ **Yes**	☐ **No**	Rubber boots or boot covers
30.	Construction/demolition	☐ **Yes**	☐ **No**	Safety boots with metatarsal guard if foot-crushing hazard exists

Fall Hazards

31.	Elevations above 4 feet (general industry) or 6 feet (construction) without guardrails	☐ **Yes**	☐ **No**	ANSI A-10.14 Type 1 full-body harness
32.	Suspended scaffolds, boatswain's chairs, float scaffolds, or suspended staging	☐ **Yes**	☐ **No**	ANSI A-10.14 Type 1 full-body harness
33.	Working in trees	☐ **Yes**	☐ **No**	ANSI A-10.14 Type 1 full-body harness
34.	Working in vehicle-mounted elevating work platforms (e.g., bucket trucks, aerial lifts)	☐ **Yes**	☐ **No**	ANSI A-10.14 Type 1 full-body harness

Water Hazards

35.	Working on or above water where a risk of drowning exist	☐ **Yes**	☐ **No**	U.S. Coast Guard approved personal floatation device; Type I, II, or III

Excessive Heat or Flame

36.	Full body chemical protective clothing in temperatures greater than 80 °F	☐ **Yes**	☐ **No**	Cooling vest
37.	Work around molten metal or flame	☐ **Yes**	☐ **No**	Nomex or heat reflective clothing
38.	Welding activities	☐ **Yes**	☐ **No**	Welding leathers for those areas that are exposed to flame, spark, or molten metal

Respiratory Hazards

39.	Airborne particulates, gases, vapors, or mists in excess of established exposure limits	☐ **Yes**	☐ **No**	Refer to SMS 042 or URS HSE Representative for respirator selection guidance

Excessive Noise

40.	Exposure to noise	☐ **Yes**	☐ **No**	Ear plugs, muffs or both

Body and Leg Protection

41.	Chemical exposure	☐ **Yes**	☐ **No**	Contact URS HSE Representative for assistance in proper selection
42.	Using chainsaw, cutting brush	☐ **Yes**	☐ **No**	Chainsaw chaps
43.	Exposure to snakes	☐ **Yes**	☐ **No**	Snake chaps
44.	Exposure to vehicle traffic or heavy equipment	☐ **Yes**	☐ **No**	See SMS 032 and SMS 029 NA – Supplemental Information C for additional guidance

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards present on: _____

Name _____ Signature _____

URS	Health, Safety and Environment **PERSONAL PROTECTIVE EQUIPMENT INSPECTION SHEET**	Attachment 029-2 NA Issue Date: July 2000 Revision 9: March 2012

Name of Inspector _____ **Date Inspected** _____

Hard Hats		
1.	The brim or shell does not show signs of exposure and excessive wear, loss of surface gloss, chalking, or flaking.	☐ **Yes** ☐ **No**
2.	Suspension system in hard hat does not show signs of deterioration, including cracking, tearing, or fraying.	☐ **Yes** ☐ **No**
3.	The brim or shell is not cracked, perforated, or deformed.	☐ **Yes** ☐ **No**
4.	Employees use hard hats in marked areas.	☐ **Yes** ☐ **No**
5.	Areas requiring hard hat usage are marked.	☐ **Yes** ☐ **No**
Safety Shoes		
6.	Safety shoes used by employees do not show signs of excessive wear.	☐ **Yes** ☐ **No**
7.	Areas requiring safety shoes are marked.	☐ **Yes** ☐ **No**
Work Gloves		
8.	Gloves are available and worn when needed.	☐ **Yes** ☐ **No**
9.	Gloves are appropriate for the task.	☐ **Yes** ☐ **No**
10.	Gloves do not show signs of excessive wear such as cracks, scrapes, or lacerations, thinning or discoloration, or break-through to the skin.	☐ **Yes** ☐ **No**
Protective Clothing		
11.	Protective clothing (including traffic control apparel) is worn by employees when required.	☐ **Yes** ☐ **No**
Hearing Protection		
12.	Noise hazard areas are posted.	☐ **Yes** ☐ **No**
13.	Employees are using earplugs or muffs when using noise producing equipment or working in posted noise hazard areas.	☐ **Yes** ☐ **No**
Safety Glasses/Goggles		
14.	Eye hazard areas are marked or posted.	☐ **Yes** ☐ **No**
15.	Employees use safety glasses/goggles when working in eye hazard areas or working with equipment that produces an eye hazard.	☐ **Yes** ☐ **No**
16.	Face shields are used when required and worn over safety goggles.	☐ **Yes** ☐ **No**

REMARKS ***(All "No" answers indicate a hazard which needs to be fixed.)***

Operations	Electrode Size (1/32”)	Arc Current	Minimum Protective Shade
Shielded metal arc welding (SMAW)	Less than 3	Less than 60	7
SMAW	3 – 5	60 – 160	8
SMAW	5 – 8	160 – 250	10
SMAW	More than 8	250 – 550	11
Gas metal arc welding and flux cored arc welding		Less than 60	7
Gas metal arc welding and flux cored arc welding		60 - 160	10
Gas metal arc welding and flux cored arc welding		160 – 250	10
Gas metal arc welding and flux cored arc welding		250 - 500	10
Gas tungsten arc welding		Less than 50	8
Gas tungsten arc welding		50 – 150	8
Gas tungsten arc welding		150 - 500	10
Air carbon arc cutting	(light)	Less than 500	10
Air carbon arc cutting	(heavy)	500 – 1000	11
Gas tungsten arc welding		Less than 20	8
Gas tungsten arc welding		20 – 100	8
Gas tungsten arc welding		100 – 400	10
Gas tungsten arc welding		400 – 800	11
Plasma arc cutting	(light)	Less than 300	8
Plasma arc cutting	(medium)	300 – 400	9
Plasma arc cutting	(heavy)	400 -800	10
Torch blazing			3
Torch soldering			2
Carbon arc welding			14
Gas welding			5 – 6
Oxygen cutting			3 - 5

A. Class 1 Safety Apparel

1. Class 1 safety apparel provides the minimum amount of required material to differentiate the wearer from the work environment.
2. At a minimum, this shall include 217 square inches (in^2), or 0.14 square meters (m^2), of fluorescent yellow-green, orange-red, or red background materials combined with 155 in^2 (0.10 m^2) retro-reflective material. As an alternative, the apparel can have 310 in^2 (0.20 m^2) of combined-performance material (i.e., materials that are both retro-reflective and fluorescent).
3. Class 1 safety apparel typically consists of a sleeveless traffic vest with retro-reflective bands no less than 0.98 inches (25 mm) in width.
4. Those occupational activities under which Class 1 safety apparel is typically used:
    a. Permit full and undivided attention to approaching traffic;
    b. Provide ample separation of the pedestrian worker from conflicting vehicle traffic; and
    c. Permit optimum conspicuity in backgrounds that are not complex with vehicle and moving equipment speeds not exceeding 25 miles per hour (mph), or 40 kilometers per hour (kph).
5. Examples of pedestrian workers who could work in these situations may include:
    a. Workers directing vehicle operators to parking/service locations;
    b. Workers exposed to the hazards of warehouse equipment traffic;
    c. Roadside “right-of-way” or sidewalk maintenance workers; and
    d. Delivery vehicle drivers.

B. Class 2 Safety Apparel

1. Class 2 safety apparel provides superior visibility for the wearers by the additional coverage of the torso and is more conspicuous than Class 1.
2. At a minimum, this shall include 775 in^2 (0.50 m^2) of fluorescent yellow-green, orange-red, or red background materials combined with 201 in^2 (0.13 m^2) retro-reflective material. Combined-performance materials may not be used without background materials in Class 2.
3. Class 2 safety apparel typically consists of a full-torso sleeveless traffic vest with retro-reflective bands no less than 1.38 inches (35 mm) in width.
4. Those occupational activities under which Class 2 safety apparel is typically used:
    a. Greater visibility is desired during inclement weather conditions;
    b. Complex backgrounds are present;
    c. Employees are performing tasks which divert attention from approaching vehicle traffic;

d. Work activities take place in close proximity to vehicle traffic; and

e. Vehicle and moving equipment speeds exceed 25 mph (40 kph).

5. Examples of pedestrian workers who could work in these situations may include:

   a. Roadway construction workers;

   b. Utility workers;

   c. Survey crews;

   d. Railway workers;

   e. Forestry workers;

   f. Parking and/or toll gate personnel;

   g. Airport baggage handlers/ground crew;

   h. Emergency response personnel;

   i. Law enforcement personnel; and

   j. Accident site investigators.

C. Class 3 Safety Apparel

1. Class 3 safety apparel offers greater visibility to the wearer in both complex backgrounds and through a full range of body movements. Visibility is enhanced beyond Class 2 by the enhancement of background and reflective materials to the arms and/or legs.
2. At a minimum, this shall include 1240 in^2 (0.80 m^2) of fluorescent yellow-green, orange-red, or red background materials combined with 310 in^2 (0.20 m^2) retro-reflective material. Combined-performance materials may not be used without background materials in Class 3.
3. Class 3 safety apparel typically consists of a coveralls, jumpsuits, long or short-sleeved jackets, or long-sleeved shirts with retro-reflective bands no less than 1.97 inches (50 mm) in width. A sleeveless garment or vest alone shall not be considered Class 3 apparel.
4. Those occupational activities under which Class 3 safety apparel is typically used:

   a. Workers are exposed to significantly high vehicle speeds and/or reduced sight distances (note that several sources have interpreted the vehicle speed requirements as 50 mph (80 kph) or more);

   b. The worker and vehicle operator have high task loads, clearly placing the worker in danger; or

   c. The wearer must be conspicuous through a full range of body motions at a minimum of 1280 feet (390 m) and must be identifiable as a person.

5. Examples of pedestrian workers who could work in these situations may include:

   a. Roadway construction personnel;

   b. Utility workers;

c. Survey crews;

d. Emergency response personnel; and

e. Flagging crews.

D. Class E Safety Apparel

1. Class E apparel includes trousers or shorts which are part of a Class 3 apparel ensemble. Frequently a Class 2 vest is paired with Class E trousers, creating an overall ensemble which meets Class 3 apparel requirements. Class E garments are not intended to be worn without Class 2 or 3 garments.
2. At a minimum, Class E trousers shall have 465 in^2 (0.30 m^2) of fluorescent yellow-green, orange-red, or red background materials combined with 108 in^2 (0.07 m^2) retro-reflective material. Retro-reflective material shall encircle each leg (360° of visibility) and be placed not less than 1.97 inches (50 mm) above the bottom leg of the trouser.
3. At a minimum, Class E shorts shall have 465 in^2 (0.30 m^2) of fluorescent yellow-green, orange-red, or red background materials combined with 108 in^2 (0.07 m^2) retro-reflective material. Retro-reflective material shall encircle each leg.

E. Headwear

1. Headwear is considered an important accessory and compliments the overall visibility of the wearer. High-visibility headwear enhances visibility to the head of a moving worker in daylight and helps define the shape of the human form during nighttime exposures.
2. At a minimum, high-visibility headwear shall have 78 in^2 (0.05 m^2) of fluorescent yellow-green, orange-red, or red background materials combined with 10 in^2 (0.0065 m^2) retro-reflective material. As an alternative, the headwear can have 78 in^2 (0.05 m^2) of combined-performance material.

URS SAFETY MANAGEMENT STANDARD
Sanitation

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to provide employees with appropriate personal hygiene facilities, including toilets, wash rooms, and eating facilities, to protect employees from unsanitary conditions.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility or site.

4. Requirements

A. Prior to the start of site activities, ensure the availability of adequate toilet and wash facilities. Note: Mobile crews having transportation readily available (within 5 minute travel time) to nearby toilet facilities need not be provided with facilities.

1. Flush toilets will be used where available.
2. For job sites without flush toilets readily available, one of the following must be provided:
    a. Chemical toilets.
    b. Combustion toilets.
    c. Recirculation toilets.
3. Other than construction sites, toilets will be provided for employees of each sex at sites according to the following ratio:

Number of Employees	Minimum # of toilets (1)
1 to 15	1
16 to 35	2
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	(2)

Notes:
(1) Where toilet facilities will not be used by women, urinals may be provided instead of the minimum specified.
(2) One (1) additional fixture for each additional 40 employees.

B. A means for washing hands must be provided next to or near toilet areas.

C. For facilities under URS control:

1. Maintain toilets and toilet area in good repair and in a clean and sanitary condition. Refer to SMS 021 – Housekeeping.

2. Provide paper towels and soap or other suitable sanitizing material for washing hands.

3. Construct toilets so that the interior is lighted, by artificial or natural light, adequate ventilation is provided, and all windows and vents are screened.

D. Maintain availability and cleanliness of drinking (potable) water.

1. Use backflow prevention devices, testing, and administrative controls for all potable water supply branches. Maintain backflow prevention devices in a sanitary condition.

2. Keep water coolers and water dispensers in a sanitary condition and filled only with potable water. Clearly mark potable drinking water containers as “Drinking Water.”

3. Clean and sanitize water containers daily. Tightly close, seal, date, and mark containers as to the contents. Provide containers with a tap, and refill daily.

4. Provide fountain-type dispensers or one-use cups at each water dispenser. Provide a waste receptacle where disposable cups are used.

5. Do not use common drinking cups.

6. Conspicuously post outlets for non-potable water such as water for industrial or firefighting purposes (e.g., Danger – Water Unfit for Drinking, Washing, or Cooking).

7. Laboratory-test drinking water obtained from streams, wells, or other temporary sources in accordance with federal, state, or local regulations, or often enough to ensure it is suitable for consumption. Maintain records of testing reports and results.

E. Eating Facilities

1. Operate and maintain food dispensing facilities established by URS in compliance with applicable health and sanitation regulations.

2. Ensure that buildings housing these facilities are floored completely, painted, well lighted, heated, ventilated, fly proof, and sanitary. Equip doors and windows with screens.

3. Use microwave ovens for food only.

4. Use refrigerators designated for food storage for food only (i.e., no chemical or samples storage).

5. Prohibit workers from eating or storing foods in areas where there is a potential for contamination.

6. Take positive control measures for protection against vermin, insects, and rodents.

7. Provide an ample supply of hot and cold water at all times in mess halls.

8. Clean break rooms /lunchrooms periodically. Refer to SMS 021 – Housekeeping.

F. Washing Facilities

1. Maintained each washing facility in a sanitary condition, and provide adequate water, soap, individual towels of cloth or paper, and covered receptacles for disposal of waste.

2. Provide emergency showers and eyewash facilities as required. Refer to SMS 065 – Injury Management.

3. Provide at least one shower for each 30 employees in construction camps. The use of a common towel is prohibited.

G. Waste Management:

1. Release sanitary sewage into sanitary sewer lines or to other proper disposal channels.

2. Do not dispose of garbage, refuse, or sewage in lakes, reservoirs, rivers, streams, or ditches.

3. Do not discharge hazardous waste into the sanitary sewer or storm sewer system.

4. Collect garbage and trash daily.

    a. Provide lids for garbage containers located outside buildings, and keep them closed. Transport garbage offsite at least weekly.

    b. Remove garbage from the site daily at remote field sites where wild animals are a hazard. Do not let garbage remain on site overnight.

H. Change Rooms

Provide heated and ventilated change rooms for changing, hanging, and/or drying clothing for operations subjecting workers to prolonged wetting or contact with hazardous materials.

I. Sleeping Facilities

1. Keep temporary sleeping quarters heated, ventilated, lighted, and clean. Screen all doors and windows.

2. Keep clean and sanitary, and periodically disinfect bunkhouses, bedding, and furniture.

J. Notify property manager of sanitation issues for sites not under URS control.

K. Personal Hygiene

Wash hands and face before eating, drinking, smoking, and using facilities.

L. Inspect work sites periodically in accordance with Attachment 030-1 NA.

5. Documentation Summary

The following information will be maintained in the project file:

A. Completed inspection sheets.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Construction Standard – Sanitation – 29 Code of Federal Regulations (CFR) 1926.51

B. U.S. OSHA General Industry Standard – Sanitation – 29 CFR 1910.141

C. SMS 021 - Housekeeping

D. SMS 065 – Injury Management

E. Attachment 030-1 NA - Sanitation Inspection Sheet

URS	Health, Safety and Environment **SANITATION INSPECTION SHEET**	Attachment 030-1 NA Issue Date: June 1999 Revision 3: February 2009

Location: _____ **Job No:** _____

Date Inspected: _____ **Name of Inspector:** _____

Toilets

1. Are there an adequate number of toilets on site? ☐ Yes ☐ No ☐ NA
   - 1 to 15 employees = 1 toilet
   - 16 to 35 employees = 2 toilets
   - 36 to 55 employees = 3 toilets
   - 56 to 80 employees = 4 toilets
   - 81 to 110 employees = 5 toilets
2. Toilets are in clean condition. ☐ Yes ☐ No ☐ NA
3. Toilet paper is provided. ☐ Yes ☐ No ☐ NA
4. Toilet areas are clean and sanitary. ☐ Yes ☐ No ☐ NA

Hand Washing Facilities

5. Hand washing facilities are provided near toilets. ☐ Yes ☐ No ☐ NA
6. Paper towels and soap are provided. ☐ Yes ☐ No ☐ NA

Drinking Water

7. Drinking water is provided on site. ☐ Yes ☐ No ☐ NA
8. Disposable cups are provided or fountain-type dispenser is provided. ☐ Yes ☐ No ☐ NA
9. Drinking water containers are kept clean and tightly closed or covered. ☐ Yes ☐ No ☐ NA

Break Rooms

10. Break rooms or eating areas are kept clean. ☐ Yes ☐ No ☐ NA
11. Microwaves are used for food only. ☐ Yes ☐ No ☐ NA
12. Microwave ovens are kept clean. ☐ Yes ☐ No ☐ NA
13. Refrigerators are kept clean. ☐ Yes ☐ No ☐ NA
14. Refrigerators are used to store food only. ☐ Yes ☐ No ☐ NA

Vermin

15. Rats, mice, and other vermin are not living within buildings. ☐ Yes ☐ No ☐ NA
16. Cockroaches and fleas are not thriving within buildings. ☐ Yes ☐ No ☐ NA

Employee Compliance

17. Employees only eat/drink in areas free from contamination. ☐ Yes ☐ No ☐ NA
18. Employees wash hands/face prior to eating, drinking, smoking. ☐ Yes ☐ No ☐ NA

REMARKS:

URS SAFETY MANAGEMENT STANDARD

Work Zone Traffic Control

1. Applicability

This standard applies to those activities of URS Corporation and its subsidiary companies involving work performed on roads, highways, and similar areas where motor vehicles may be a hazard, and where URS is responsible for traffic control.

2. Purpose and Scope

This standard is intended to protect personnel from the hazards associated with work performed on or next to highways and roads.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Review the project in the planning phase to determine if any work will be performed on or adjacent to any road that will disrupt normal traffic flow.

B. Where project operations will be performed on or adjacent to roadways, plan work to interfere as little as possible with traffic, and to provide and maintain ingress and egress for all residences and places of business that may be impacted.

C. When required by local regulations or when there is a potential to disrupt traffic, a traffic control plan, in detail appropriate to the complexity of the project, must be prepared by a competent person and understood by all responsible parties before activities begin. Any changes in the traffic control plan should be approved by an official trained in safe traffic control practices.

1. Competent persons are those who are knowledgeable about the fundamental principles of temporary traffic control and the work activities to be performed, and who have the authority to propose and implement corrective measures to eliminate hazardous situations associated with temporary traffic control.

2. Design traffic control plans to meet requirements set forth in Part 6 of the *Manual on Uniform Traffic Control Devices* (MUTCD), as well as those rules set by state, county, and cities in which work is

performed. At a minimum, the plan will include information on the following, as needed:

a. Pedestrian and worker safety;

b. Temporary traffic control elements, including (but not limited to) temporary traffic control zones, advance warning zones, transition areas, activity areas, termination areas, tapers, buffers, detours, etc.;

c. Flagger controls, including high-visibility safety apparel, hand-signaling devices, and flagger procedures;

d. Temporary traffic control zone devices, including (but not limited to) signs, illuminated/flashing panels, warning devices, channelizing devices, drums, barricades, pavement markings; and

e. Temporary traffic control zone activities, including scope of work, duration, location, and portions of the roadway/shoulder affected.

D. Submit the traffic control plan to the applicable road authority for approval.

E. A Worksite Traffic Control Supervisor, certified by the American Traffic Safety Services Association (ATSSA) or an equivalent organization will be responsible for initiating, installing, and maintaining all traffic control devices. The Worksite Traffic Control Supervisor will also directly supervise all project flaggers.

1. Certified flaggers must attend an 8-hour work-zone traffic control course as taught by an ATSSA certified instructor (or equivalent).

F. Execute the traffic control plan developed for the job site.

G. Require all personnel exposed to the risks of moving roadway traffic or construction equipment to wear hardhats, safety glasses, sleeved shirts, long pants, work boots, and the appropriate class of high-visibility safety apparel. Safety apparel background material must be either fluorescent orange-red or fluorescent yellow-green, with accompanying reflective material of orange, yellow, white, silver, or yellow-green, or fluorescent versions of these colors.

H. Wear high-visibility clothing as follows:

1. Class 1 safety apparel (as defined by American National Standards Institute/International Safety Equipment Association [ANSI/ISEA]) for activities that permit the worker:

    a. Full and undivided attention to approaching traffic;

    b. Ample separation between the worker and vehicle traffic; and

    c. Optimum visibility in uncomplicated backgrounds where vehicle and equipment speeds do not exceed 25 miles per hour (mph) (40 kilometers per hours [kph]).

2. Wear Class 2 safety apparel for activities where:

    a. Greater visibility is required due to bad weather;

    b. There are complicated backgrounds;

    c. Employees are performing tasks that draw their attention away from approaching traffic;

    d. Vehicle speeds exceed 25 mph (40 kph); and

    e. Work activities take place closer to the vehicle traffic.

3. Wear class 3 safety apparel for activities where:

    a. Workers are exposed to higher vehicle speeds (generally 50 mph [80 kph] or more) or reduced sight distances;

    b. The worker and vehicle operators have a high task load; and

    c. The worker must be visible through the full range of body motions as a person at a minimum of 1,280 feet (390 meters).

4. Refer to SMS 029 – Personal Protective Equipment, for additional information on high-visibility clothing requirements, including suggested apparel for each class.

F. Perform inspection and maintenance of the Traffic Control devices using Attachment 032-1 NA daily, or at the beginning of each shift.

5. Documentation Summary

The following information will be maintained in the project file:

A. Copies of traffic control plans used on site.

B. Training certificates for Traffic Control Supervisors and flaggers.

C. Inspection records (Attachment 032-1 NA).

6. Resources

A. Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition

B. American Traffic Safety Services Association

C. ATTSA Flagger Train-the-Trainer Program

D. ANSI/ISEA 107-2004 – Standard for High-Visibility Safety Apparel

E. SMS 029 – Personal Protective Equipment

I. Attachment 032-1 – Traffic Control Device Inspection Checklist

URS	Health, Safety, and Environment **TRAFFIC CONTROL DEVICE INSPECTION CHECKLIST**	Attachment 032-1 NA Issue Date: June 1999 Revision 3: December 2009

Project Name: _____

Project Number: _____

Location Inspected: _____

Are any devices missing ☐ Yes ☐ No

Do any devices need repair? ☐ Yes ☐ No

Were all replaced or repaired? ☐ Yes ☐ No

Notes:

Are any lights flashers, etc not f nctioning ☐ Yes ☐ No

Were they all replaced or repaired? ☐ Yes ☐ No

Notes:

Are any devices improperly placed ☐ Yes ☐ No

Were all positions corrected? ☐ Yes ☐ No

Notes:

Do any devices need cleaning ☐ Yes ☐ No

Were all devices cleaned? ☐ Yes ☐ No

Notes:

Are flaggers certified and flagging appropriately ☐ Yes ☐ No

Notes:

Additional Comments:

_____

_____

_____

_____

The above check was completed by: _____

Date: _____ Time: _____

URS SAFETY MANAGEMENT STANDARD

Utility Clearances and Isolation

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where personnel may encounter subsurface or overhead utilities.

2. Purpose and Scope

Many field activities are conducted near aboveground and underground utilities. The primary purpose of this standard is to establish operating requirements that will permit employees to work safely in the vicinity of electrical, natural gas, fuel, water, and other utility systems and installations. The secondary purpose is to prevent economic damage to utility systems from operations associated with project-related activities.

The term *utility clearance* includes the following:

A. The positive locating of utility systems in or near the work area.

B. A signed statement by an appropriate representative attesting to the location of underground utilities and/or the positive de-energizing (including lockout) and testing of electrical utilities.

In some cases, utility representatives may deem it appropriate or necessary to use insulating blankets to isolate a power line. This is an acceptable alternative to positive de-energizing; however, only utility representatives can make the determination.

"Contact" with overhead power lines is considered to occur when equipment is closer to power lines than permitted by the criteria in the table in Section 4.C.2.b. (See note for operations in the United Kingdom).

On-site utilities, including emergency shut-off locations, shall be depicted on a utility drawing or plot plan. Emergency shut-off locations shall be verified before work activities commence.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Time for Completion

Complete utility clearances prior to the start of any work in the area of the utility that could feasibly result in contact with or damage to that utility.

B. Local Regulations

Research local and state codes and regulations regarding utility locating and isolation requirements. Utility companies and locating services are among the appropriate resources.

C. Overhead Power Lines

1. Proximity to Power Lines

No work is to be conducted within 50 feet (15 meters) of overhead power lines without first contacting the utility company to determine the voltage of the system and the height (at the lowest point) of the line has been measured. No aspect of any piece of equipment is to be operated within 50 feet (15 meters) of overhead power lines without first making this determination.

An exclusion zone shall be created at ground level beneath and 50 feet (15 meters) perpendicular to the overhead power lines on each side. This exclusion zone shall be demarcated with visual indicators (e.g., signage, flagging, paint, cones). No equipment shall enter the exclusion zone without approval from URS site management.

2. Operations adjacent to overhead power lines are *prohibited* unless one of the following conditions is satisfied:

a. Power has been shut off, positive means (such as lockout) have been taken to prevent the lines from being energized, lines have been tested to confirm the outage, and the utility company has provided a signed certification of the outage.

b. The minimum clearance from energized overhead lines is presented in the following table, or the equipment will be repositioned and blocked so that no part, including cables, can come within the minimum clearances listed in the table.

Minimum Distances from Power Lines	
Nominal System (kilovolt, kV)	Minimum Required Distance
0–50	10 feet (3 meters)
51–100	12 feet (3.6 meters)
101–200	15 feet (4.6 meters)
201–300	20 feet (6.1 meters)
301–500	25 feet (7.6 meters)
501–750	35 feet (10.7 meters)
751–1000	45 feet (13.7 meters)

Note: For operations in the United Kingdom, the specific safe distance is determined by the utility company.

c. The power line(s) has been isolated through the use of insulating blankets, which have been properly placed by the utility. If insulating blankets are used, the utility will determine the minimum safe operating distance; get this determination in writing with the utility representative's signature.

3. All inquiries regarding electric utilities must be made in writing and a written confirmation of the outage/isolation must be received by the appropriate URS representative prior to the start of the task that may impact the utility.

D. Underground Utilities

1. Do not begin subsurface work (e.g., trenching, excavation, drilling, etc.) until a check for underground utilities and similar obstructions has been conducted. The use of as-built drawings must be confirmed with additional geophysical or other surveys.

2. Contact utility companies or the state/regional utility protection service at least two (2) working days prior to excavation activities to advise them of the proposed work and to ask them to establish the location of the underground utility installations prior to the start of actual excavation. One Call utility location service is available throughout the United States by calling 811. Where these services are unavailable (e.g., private properties), contract with an independent utility locating service to perform an evaluation of subsurface utilities.

3. Obtain utility clearances for subsurface work on both public and private property. Clearances are to be in writing and signed by the party conducting the clearance.

4. Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, the URS representative must notify the utility company, utility protection service, or the utility locating service to inform them that the markings have been destroyed.

5. Do not conduct mechanical-assisted subsurface work (e.g., work using a powered drill rig, mechanical excavator, etc.) within five (5)

feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure. Confirm minimum distances for mechanical-assisted subsurface work with the utility owner, as distances beyond this five-foot minimum may be required.

6. Nondestructive clearance techniques (e.g., vacuum extraction or other hand clearing means) are required prior to drilling/excavating in higher risk locations, including chemical plants, retail service stations, or other locations with complex underground utility systems.

7. Subsurface work within five feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure must be done by nondestructive clearing techniques to the point where the obstruction is visually located and exposed. Once the obstruction location is confirmed in this manner, mechanical-assisted work may begin.

8. Reference SMS 013 – Excavation Safety for additional information regarding subsurface operations.

E. Utility Strikes

1. Utility strikes (unplanned contact with utilities resulting in damage to the utility or its protective coating) shall be reported in accordance with SMS 049 – Injury/Illness/Incident Reporting & Notifications.

2. All damaged utilities shall be repaired by a qualified and/or licensed professional.

F. Training

Conduct a briefing for site employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Documents requesting utility clearance.

B. Documents confirming utility clearance.

C. Training/briefing documentation of each isolation.

6. Resources

A. Utility Locating Services (typically under "Utility" in the Yellow Pages)

B. National Institute for Occupational Safety and Health (NIOSH) Alert – Preventing Electrocutions from Contact Between Cranes and Power Lines

C. One Call Utility Locating List

D. National Utility Locating Contractor's Association

E. United Kingdom – Health and Safety Executive GS6

F. SMS 013 – Excavation Safety

G. SMS 049 – Injury/Illness/Incident Reporting

URS SAFETY MANAGEMENT STANDARD

Fall Protection

1. Applicability

This standard applies to operations of URS Corporation and its subsidiary companies where personnel could be exposed to fall hazards of 6 feet (2 meters) or greater in the construction, mining, and demolition industry, and 4 feet (1.2 meters) or greater in other industries (General Industry). The standard also addresses steep slope work where the work surface angle is greater than 30 degrees from horizontal.

2. Purpose and Scope

The purpose of this standard is to provide criteria for the recognition and control of fall hazards.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Fall Protection – General

1. A competent person will:

    a. Be properly trained by a competent authority.

    b. Ensure that one or more fall protection or prevention systems outlined in this standard is provided at all locations where fall hazards exist.

    c. Ensure that all personnel working with and around fall hazards and fall protection systems are properly trained.

    d. Ensure that access controls to areas with fall hazards are effective.

    e. Ensure that safety monitoring systems or warning line systems are properly implemented, with trained staff as monitors.

2. Fall hazards generally fall into three categories for URS employees;

    a. General Industry – application where fall hazards greater than 4 feet (1.2 meters) exist, including:

i. Workers are conducting inspection of existing facilities not under construction

ii. Working in environmental remediation activities where no construction activities are occurring

iii. Working in manufacturing operations

iv. Working in vehicle and aircraft maintenance, and repair operations

v. Working in warehouses

vi. Working on towers, poles, or other elevated structures.

b. Construction/mining – These activities require fall protection when fall hazards exceed 6 feet (2 meters). Activities include maintenance, mining, demolition, renovation, and construction support inspections and surveying.

c. Steep Slope – Fall protection measures must be used whenever the slope angle exceeds 30 degrees from horizontal (note that this excludes roofing applications, which are covered under Construction activities). Activities include the inspection of dams, environmental surveys of timbered slopes, or other applications where traditional fall protection systems are impractical.

3. Fall hazards include, but are not limited to, excavations, highwalls, unprotected elevations, ladders, scaffolds, floor holes, wall openings, formwork, rebar tying, inspection of dams, working on top of vehicles, equipment, or airframes, working over operating machinery, working above hazardous substances, and all other locations and operations where potential fall hazards exist.

4. Fall hazards must be addressed by one of five means (for additional information, see Attachment 040-1 NA – Fall Protection Checklist):

a. Elimination or substitution controls such as moving planned work to ground level or substitution of a process, sequence, or procedure so that employees are no longer exposed to a fall hazard;

b. Passive fall protection such as isolating or separating employees from the fall hazard through the use of guardrails or covered floor openings;

c. Fall restraint, which includes securing an employee to an anchor using a lanyard that is short enough to prevent the employee's center of mass from reaching the actual fall hazard;

d. Fall arrest, which includes systems to stop an employee's fall after it has begun (e.g., personal fall arrest systems, safety nets, etc.);

e. Administrative controls, including safety observers and boundary markings (i.e., tape, cable, or barricades) located 6 feet or more from an exposed edge.

5. Note that in some places, the standards for fall protection are required at different elevations than specified in this standard. Where this is the case, the more conservative elevation will be used in defining when fall protection systems are required.

6. In each instance where employees are exposed to fall hazards, the designed fall protection program must define a strategy to protect the employee. ***All fall protection plans must be approved by the appropriate HSE Manager*** before work commences. Ensure that rescue procedures are included as a part of the fall protection plan.

B. Training

1. Designate a competent person to provide training in fall hazard recognition to each employee who may be exposed to falls. The competent person must be qualified in the following areas:

a. The nature of fall hazards in the work area.

b. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.

c. The use and operation of guardrail, personal fall arrest, safety net, warning line, and safety monitoring systems, controlled access zones, and other protection to be used.

d. The role of each employee in the safety monitoring system, when used.

e. The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs.

f. The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection.

g. The role of employees in fall protection plans.

h. The standards contained in 29 Code of Federal Regulations (CFR) 1926 Subpart M or other applicable regulations/standards.

2. Prepare a written certification record that includes the name of the employee trained, the date(s) of training, and the signature of the person who conducted the training.

3. Provide re-training when one of the following situations occur:

a. Changes in the workplace render previous training obsolete.

b. Changes in the types of fall protection systems or equipment to be used render previous training obsolete.

c. Inadequacies in affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

C. Guardrail Systems

1. Guardrail systems are used in Construction, Mining, and General Industry activities. The guardrail requirements apply in these setting at different heights: 6 feet (2 meters) in construction; and 4 feet (1.2 meters) in general industry:

a. Provide guardrail systems, when feasible, at all locations where a fall hazard exists. Where guardrail systems are impractical, an alternative form of fall protection must be provided, as outlined elsewhere in this Standard.

b. Require that guardrail systems meet the following criteria:

i. Install toprails 42 inches (1.1 meters) above the walking/working surface capable of withstanding, without failure, a minimum force of 200 pounds (91 kilograms) in any outward or downward direction with no more than 3 inches (7.6 centimeters) of deflection.

ii. Install midrails 21 inches (53 centimeters) above the walking/working surface capable of withstanding, without failure, a minimum force of 150 pounds (68 kilograms) in any outward or downward direction.

iii. Space posts not more than 8 feet (2.5 meters) apart on centers.

c. Require that there are no openings more than 19 inches (48 centimeters) wide in any guardrail system.

d. Do not use plastic or steel banding as toprail or midrail.

e. Provide toprails and midrails of at least one-quarter inch (6 millimeters) nominal thickness or diameter, and smoothly surfaced to prevent cuts and punctures.

f. Erect guardrails on all sides when using guardrail systems around holes.

g. When guardrails are used around holes that are used for access, such as ladderways, provide a gate or offset the guardrail so that a person cannot walk directly into the hole.

h. When guardrails are used at hoisting areas, place a chain, gate, or removable guardrail section across the access point when hoisting operations are not taking place.

i. Provide guardrail systems at *all* locations above dangerous equipment, regardless of height above the danger.

j. Provide guardrails at all wall openings where the outside bottom edge of the opening is 6 feet (2 meters) or more above lower levels, and the inside bottom edge of the wall opening is less than 39 inches (1 meter) above the walking/working surface.

k. Erect guardrail systems on all unprotected sides or edges of ramps and runways when such systems are used.

l. Where wire rope is used for construction of guardrail systems:

i. Ensure the wire rope used for construction of the guardrail system is a minimum of ¼ inch (0.6 centimeters) in diameter.

ii. Flag the toprail with high-visibility material every 6 feet (2 meters).

iii. Attach wire rope to existing structures, equipment, or other wire ropes using Crosby clips of the U-Bolt and saddle type. Examples of this can be found in URS SMS 041 – Rigging, and Supplemental Information C to URS SMS 041.

iv. Never clip two straight lengths of wire rope together. Instead, form an eye in each length and connect the eyes together.

v. Never use fewer than the number of clips recommended.

vi. Always use new clips; re-used clips will not develop the proper efficiency.

vii. Use a thimble when creating an eye to prevent the rope from wearing the eye, and to provide a safer connection.

viii. Check the tension of the rope an hour after installation. Retighten as necessary, and check for tightness at frequent intervals thereafter.

D. Personal Fall Arrest Systems (General Industry and Construction)

1. Provide and require the proper use of personal fall arrest systems on all unprotected elevations 6 feet (2 meters) or higher for Construction activities, and 4 feet (1.2 meters) or higher for General Industry applications. Where these systems are impractical, an alternative form of fall protection must be provided, as outlined elsewhere in this Standard.

2. All aspects of personal fall protections systems must be designed, installed, and used under the supervision of a competent person.

3. Maintain a safety factor of at least 2 in all components of a personal fall protection system (i.e., the static strength of the system should be at least two times the maximum required arresting force).

4. *Safety belts (body belts) are prohibited as a means of fall protection, although they may have application as a positioning device.*

5. Use only full-body harnesses, shock-absorbing lanyards, lifelines, and anchorage points that meet the following criteria:

    a. Body harness design and construction must meet the specifications set forth in 29 CFR 1926.500-.503 (or equivalent) and ANSI Z359.1.

    b. All snaphooks must be of the locking type and must be able to withstand a force of 3,600 pounds (1,633 kilograms) in all directions of potential loading to the gate.

    c. All hardware must be dropforged or pressed steel with a corrosion-resistant finish. Surfaces must be smooth and free of sharp edges. D-rings and snaphooks must have a minimum tensile strength of 5,000 pounds (2,270 kilograms).

    d. Ropes and webbing used in lanyards, lifelines, and body harnesses must be made of synthetic fibers.

    e. The attachment point (D-ring) of a body harness should be located in the center of the wearer's back near shoulder level, or above the wearer's head. *Note that front-mounted D-rings are allowed if the personal fall arrest system is designed to restrict free fall distances to 2 feet (60 centimeters) or less and limit the maximum fall arrest loads to 900 pounds (410 kilograms) of force or less.*

    f. Horizontal lifelines must be designed, installed, and used under the supervision of a competent person, and be capable of supporting at least 5,000 pounds (2,270 kilograms) of force per employee attached.

    g. Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds (2,270 kilograms).

h. Self-retracting lifelines and lanyards that limit free-fall to 2 feet (60 centimeters) or less must be capable of sustaining a minimum tensile load of 3000 pounds (1,360 kilograms) in the fully extended position.

i. Self-retracting lifelines and lanyards that do not limit free fall to 2 feet (60 centimeters) or less, ripstitch, and other shock-absorbing lanyards must be capable of sustaining a minimum tensile load of 5,000 pounds (2,270 kilograms) in the fully extended position.

j. Protect lifelines against being cut or abraded.

k. Anchorage points for personal fall protection systems must be independent of any anchorage point being used to support or suspend platforms and must have a static strength of at least 5,000 pounds (2,270 kilograms) per employee attached.

l. Anchorage points for work positioning systems (systems designed to support a worker on a vertical system while working with hands free) and rescue systems must have a static strength of at least 3,000 pounds (1,365 kilograms).

m. Anchorage points for worker restraint systems (systems designed to limit a worker's travel in such a manner that he/she cannot reach a fall hazard zone) must have a static strength of at least 1,000 pounds (455 kilograms). Worker restraint systems are only to be used on walking or working surfaces with a slope of less than 18.4°.

n. Personal fall arrest systems, when stopping a fall, must:

    i. Limit arresting force on an employee to 1,800 pounds (820 kilograms) when used with a body harness;

    ii. Be rigged such that an employee can neither free fall more than 6 feet (1.8 meters) nor contact any lower level;

    iii. Bring an employee to a complete stop and limit maximum acceleration distance an employee travels to 3.5 feet (1.1 meters); and

iv. Have sufficient strength to withstand twice the potential impact energy of an employee free-falling a distance of 6 feet (1.8 meters), or the free-fall distance permitted by the system, whichever is less.

6. Inspect all fall protection components for wear, damage, and deterioration prior to each use. The Fall Protection PPE Checklist (Attachment 040-2 NA) should be used.

7. Require employees to be familiar with the fitting and donning of body harnesses; proper tie-off techniques; and suitable anchorage points.

8. Where feasible, tie-off points should be above the employee's shoulders to limit potential fall length.

9. Never tie off to guardrail systems or hoists.

10. Require employees to remain tied off 100 percent of the time at or above 6 feet (2 meters) for Construction applications, or above 4 feet (1.2 meters) for General Industry applications, by means of horizontal lifelines, vertical lifelines, a double-lanyard system, or other suitable means.

11. Remove from service any component of a personal fall protection system that has been subjected to impact loading, and do not use it again until it is inspected by a competent person, and determined to be undamaged and suitable for reuse.

12. Make provisions for the prompt rescue of personnel in the event of a fall, or require that employees are capable of self-rescuing team members. Prompt rescue means getting to the rescue subject within 6 minutes of the accidental fall. Methods of rescue will be addressed in the fall protection plan.

13. If an in-house rescue team is to be used, ensure team members are trained and equipped for the task. Develop action plans and instructions for the team, and provide them with the opportunity to simulate a rescue.

14. If an outside rescue team is to be used, ensure that a documented plan of approach is completed, and that written confirmation of the plan is provided by the rescue agency.

15. Provide separate vertical lifelines for each employee using a vertical lifeline. For lifeline use, 5/8-inch (16-millimeter) nylon rope is recommended.

16. Ensure each employee working from a swing scaffold, bosun's chair, or other suspended work platform is provided with a lifeline separate from the suspended work platform.

17. Protect lanyards and lifelines against cuts and abrasions. Where tools are used that have the potential to sever, abrade, or burn lanyards, lifelines, or safety straps, replace synthetic materials with wire rope or wire-cored manila rope of equal strength.

18. Use rope grabs to attach to vertical lifelines—never use knots.

E. Safety Net Systems (Construction Applications)

1. Provide safety net systems at locations where a fall hazard of 6 feet (2 meters) or greater exists, and other forms of fall protection are not feasible. Where safety net systems are impractical, an alternative form of fall protection as outlined elsewhere in this standard must be provided.

2. Require that safety net systems meet the criteria set forth in 29 CFR 1926.500 – 503.

3. Install safety nets as close as possible under the walking/working surface on which employees are working, but never more than 30 feet (9 meters) below this level.

4. Require that the potential fall area from the walking/working surface to the net is unobstructed.

5. Install safety nets with enough clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified below.

6. Extend the outer edge of the net 8 feet (2.5 meters) from the edge of the working surface when the vertical distance from the working level to the net is 5 feet (1.5 meters) or less.

7. Extend the outer edge of the net 10 feet (3 meters) from the edge of the working surface when the vertical distance from the working level to the net is 5 to 10 feet (1.5 to 3 meters).

8. Extend the outer edge of the net 13 feet (4 meters) from the edge of the working surface when the vertical distance from the working level to the net is greater than 10 feet (3 meters).

9. Conduct a drop test of the safety net after installation and before being used as a fall protection system; whenever relocated; after major repair; and at 6-month intervals if left in one place.

10. Conduct the drop test by dropping a 400 pound (180 kilograms) sandbag, 30 inches (76 centimeters) in diameter, into the net from at least 42 inches (107 centimeters) above the highest walking/working level at which employees are exposed to a fall.

11. Inspect safety nets at least once a week (and after any occurrence that could affect the integrity of the system) for wear, damage, and deterioration. Remove defective nets and components from service.

12. Remove all materials, scrap, equipment, and tools that have fallen into the net as soon as possible, but at least before the next work shift.

F. Hole Covers

1. Provide covers in roadways and vehicle aisles that are capable of supporting at least twice the maximum axle load of the largest vehicle expected to cross over the cover.

2. Provide walking/working surface hole covers that are capable of supporting at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.

3. Secure covers at the time of installation to prevent displacement by the wind, equipment, or employees.

4. Color code or mark all hole covers with the word "HOLE" or "COVER" to provide warning of the hazard.

G. Safety Monitoring Systems, Warning Line Systems, and Controlled Access Zones

1. These control measures must be approved by the competent person prior to performing any roofing, overhand bricklaying, leading edge, or other elevated work that may require the use of one or more of these systems.

H. Protection from Falling Objects (Construction Applications)

1. Install toe-boards along the edge of the overhead walking/working surface.

2. Require that toe-boards are a minimum of 3½ inches (9 centimeters) in height; that they are capable of withstanding at least 50 pounds (22 kilograms) of force applied in any downward or outward direction; and that there is no more than a ¼-inch (6-millimeter) clearance between the toe-board and the walking/working surface.

3. Install paneling or screening from the top of the toe-board to the top rail or mid-rail when tools, equipment, or materials are piled higher than the top of the toe-board.

4. Provide sidewalk sheds or canopies as appropriate. For additional information, see SMS 011 – Demolition.

I. Alternative Fall Protection Plans (General Industry)

1. When traditional fall protection systems are impractical, an HSE Manager may authorize an alternative method of fall protection. Typically, this is intended to include steep slope (>30 degrees from horizontal) work along graded roads, on the face of dams, and in other remote or inaccessible steep work areas. This may include rope access systems on vertical or nearly vertical surfaces. This does not include roofing applications, because appropriate equipment and regulatory guidance exists in those cases.

2. The Fall Protection Plan must address the following areas thoroughly:

    a. Fall protection strategy and application.

    b. Protective system and equipment, in detail.

    c. Methods and procedures, including limitations of the system, and the required numbers of trained workers.

    d. Rescue capability and procedures.

    e. Training required, in detail, for all workers.

    f. Responsibilities of key personnel, including the supervisor.

g. Controlled access zones.

h. The use of motor vehicles as an anchoring point is prohibited.

5. Documentation Summary

Place in the Project Safety Files:

A. Competent Person Qualifications

B. Employee Training Documents

C. Fall Protection Plan (when developed)

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1926, Subpart M – Fall Protection

B. U.S. OSHA Technical Links – Fall Protection

C. U.S. Mine Safety and Health Administration, 30 CFR 56.15000

D. U.K. – Construction (Health, Safety and Welfare) Regulations 1996

E. ANSI Z359-2007 – Fall Protection Code

F. ANSI A10.11-1989 – Safety Nets Used During Construction, Repair, and Demolition Operations

G. ANSI 1264.1-1995 – Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems

H. SMS 011 – Demolition

I. SMS 041 - Rigging

J. Attachment 040-1 NA – Fall Protection Checklist

K. Attachment 040-2 NA – Fall Protection PPE Checklist

URS	Health, Safety and Environment **FALL PROTECTION CHECKLIST**	Attachment 040-1 NA Issue Date: June 1999 Revision 5: December 2009

NOTE: Employees must review the requirements of this Fall Protection Checklist prior to starting work activities. This plan must be available at the work site during work activities.

JOB LOCATION/DESCRIPTION

1. **Fall hazard identified:**
   Identify all areas where fall hazards of at least 6 feet or more exist in construction areas, and at least 4 feet or more exist in other industries:

   ☐ Unprotected edge ☐ Floor openings ☐ Scaffold

   ☐ Ladder ☐ Stairway ☐ Wall Openings

   ☐ Other (list): _____

2. **Method of all protection to be provided:**
   Each method of fall protection requires approval of the Site Safety Representative.

   ☐ Guardrails ☐ Fall Arrest ☐ Fall Restraint

   ☐ Safety Nets ☐ Hole Covers ☐ Monitoring Systems

   ☐ Other (list): _____

3. **Describe the method(s) for assembly, maintenance, inspection, and disassembly of the fall protection system used:**

4. **Describe method(s) for handling, storing, and securing tools and materials:**

5. **Describe the method(s) for prompt, safe removal of injured workers:**
   ☐ Initiate fall rescue plan

   ☐ Initiate facility emergency response (911 or _____)

   ☐ Other (list) _____

Approved by: _____ _____
Superintendent Site Safety Representative

Date: _____

URS	Health, Safety and Environment **FALL PROTECTION PPE CHECKLIST**	Attachment 040-2 NA Issue Date: June 1999 Revision 5: December 2009

Name of Inspector: _____ **Date Inspected:** _____

	Check if OK	Comments
Training – Is each worker exposed to fall hazards properly trained by a competent person in hazard recognition, fall protection processes and equipment, and site-specific conditions?	☐	
Harness – Inspect the entire surface of webbing for damage. Beginning at one end, bend the webbing in an inverted "U." Holding the body-side of the belt toward you, grasp the belt with your hands 6 to 8 inches apart. This surface tension makes the damaged fibers or cuts easier to see. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns, and chemical damage.	☐	
Buckles – Note any unusual wear, frayed or cut fiber, or distortion of the buckles. Inspect the buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.	☐	
Straps – The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted, or broken grommets. The webbing should not have any additional punched holes. Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. The roller should turn freely on the frame. Check for distortion or sharp edges.	☐	
Lanyards – General: **Snaps –** Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose without binding, and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper locks must prevent the keeper from opening when the keeper closes.	☐	
Thimbles – The thimble must be firmly seated in the eye of the splice, and the splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.	☐	
Web Lanyard – While bending the webbing over a curved surface such as a pipe, observe each side of the webbed lanyard: this will reveal any cuts or breaks. Examine the webbing for swelling, discoloration, cracks, or burns. Observe closely for any breaks in the stitching.	☐	
Rope Lanyard – Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken, or cut fibers. Weakened areas from extreme loads will appear as a noticeable change from the original diameter. The rope diameter should be uniform throughout, following a short break-in period. Make sure the rope has no knots tied in it. Knots can reduce the strength of the rope by up to 60 percent.	☐	
Shock-Absorbing Lanyard – Shock-absorbing lanyards should be examined as a web lanyard; however, also look for signs of deployment. If the lanyard shows signs of having been put under load (e.g., torn out stitching), remove it from service.	☐	
Hardware – Check "D" rings for distortion, cracks, breaks, and rough or sharp edges. The "D" ring should pivot freely. "D" ring back pads should also be inspected for damage.	☐	
Anchorage – Check that the anchor point is properly located above the work area; positioned to minimize swing in the event of a fall; and capable of supporting 5,000 pounds (2,270 kilograms) for each attached employee.	☐	

URS SAFETY MANAGEMENT STANDARD

Respiratory Protection

1. Applicability

This standard applies to URS Corporation and its subsidiary companies that may require the use of respiratory protection, including Immediately Dangerous to Life and Health (IDLH) and emergency conditions. This program also addresses the voluntary use of respirators.

2. Purpose and Scope

The purpose of this standard is to protect those employees performing operations for which exposures cannot be controlled by use of conventional engineering or administrative controls, and prior to establishing a negative air exposure assessment, and to require that respiratory protective equipment is selected, used, maintained, and stored in accordance with acceptable practices. This procedure establishes the minimum standard for respirator training, selection, and use during the performance of all work requiring such protection.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Before assigning hazardous jobs to employees, determine if respirators are required.

1. Assign a project-specific Respiratory Protection Program administrator. This position shall be manned by a competent industrial hygienist or other technically qualified person who knowledgeable of the requirements of the URS and project-specific programs, have appropriate training in the principles and application of respiratory protection, and have the authority to conduct program evaluations.

2. If the potential for respiratory hazards exists for any portion of a job, complete Attachment 042-1 NA – Identifying When A Respirator Is Needed.

3. Contact a local Health, Safety, and Environment (HSE) Manager, Regional or Strategic Business Unit (RBU/SBU) HSE Manager, or URS Certified Industrial Hygienist (CIH) for assistance, as needed, if any of the questions in Attachment 042-1 are checked "yes."

4. Follow instructions in Attachment 042-2 NA – Voluntary Use or Respirators – for employees who wish to wear respirators on a voluntary basis when not required to by URS or a regulatory agency.

5. Follow all the requirements of this standard for employees who wish to voluntarily use tight-fitting (e.g., air purifying) respirators.

6. Required respirators will be paid for by URS and will be provided without cost to the employee.

7. Control worker's exposure to air contaminants, where practicable, by engineering or administrative controls, or by substitution of process materials with less-toxic substances. Use respirators only when engineering or administrative controls are not feasible or completely effective.

B. Select the proper respirator for the job.

1. Contact the appropriate HSE Manager or CIH for assistance in respirator selection for those jobs identified in Attachment 042-1 NA.

2. Contact the appropriate HSE Manager for follow up if there are any problems implementing the recommendations made.

C. Require employees who will use respirators to be medically qualified by a project medical consultant (PMC) before fit-testing and assigning them a respirator. The PMC should preferably be an occupational physician; however, the Occupational Safety and Health Administration (OSHA) allows any physician or licensed health care professional (PLHCP) to conduct evaluations of respiratory protection medical forms. The PMC, where required, will determine the physiological and psychological status that is relevant to wearing different types of respirators. The PMC will review all questionnaires and test results and verify in writing that workers are physically and psychologically able to perform work while using respiratory protective devices. These determinations will be made using guidelines established by the PMC.

1. For program details, refer to SMS 024 – Medical Screening and Surveillance.

2. Require that employees have a current and accurate Medical Surveillance form (Attachment 024-2).

3. Obtain a copy of the employee's Health Status Medical Report from the Office Health and Safety Representative. The consulting occupational

physician of the medical service provider following each work-related examination issues the Health Status Medical Report. Employees cannot be assigned respirators unless they are medically cleared for respirator use.

D. Require respirator users to receive appropriate training.

1. All respirator users must be trained:

    a. Before they are assigned a respirator.

    b. Annually thereafter.

    c. Whenever a new hazard or job is introduced.

    d. Whenever employees fail to demonstrate proper use or knowledge.

2. Document training in accordance with the requirements of SMS 055 – Training.

3. Training must address, at a minimum, the following:

    a. Why the respirator is necessary, and what conditions can make the respirator ineffective.

    b. What the limitations and capabilities of the respirators are.

    c. How to inspect, put on and remove, and check the seals of the respirator.

    d. What the respirator maintenance and storage procedures are.

    e. How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.

    f. The engineering and administrative controls being used and the need for respirators.

    g. The hazards and consequences of improper respirator use.

    h. How to recognize and handle emergency situations.

E. Require respirator users to be fit tested.

1. Any employee who has been assigned a reusable respirator must be fit tested on an annual basis (no more than 1 year may elapse between fit tests), or when the employee is assigned a respirator of a different make, type, or size from that previously tested.

2. Qualitative or quantitative fit testing can be performed by contract or in-house personnel.

3. Obtain a signed, written copy of the fit-test results. The fit-test results should include:

    a. Employee's name and employee identification number.

    b. Respirator brand, model, and size fitted for.

    c. Date fit tested.

    d. Method of fit testing used.

    e. Name and signature of fit tester.

    f. Manufacturer and serial number of fit-testing apparatus (if used).

    A fit test results form is available as Attachment 042-3 NA.

F. The project-specific Respiratory Protection Program administrator will issue respirators to persons who must wear respirators for protection against harmful atmospheres should be given adequate training to ensure that the correct respirator is issued for each application. This training should include, but not necessarily be limited to, the following:

1. Establishment of a working knowledge of the specific types of respirators to be issued, their limitations, and the importance of issuing only the respirators for which each user is specifically approved.

2. Familiarization with the respirator maintenance and repair program in order to be able to identify any respirator that is improperly cleaned or needs repair.

3. Familiarization with the procedures for respirator issue. Only persons trained to ensure that proper respirators are issued will be permitted to issue respirators to persons needing them.

G. Where required by Section 2.C of SMS 043 – Personal Monitoring, conduct initial exposure assessments for contaminants of concern. Record collected air-monitoring data. Respiratory protection must be worn until such

assessments have been conducted, and it is determined that respiratory protection is not warranted.

H. Provide qualified employees with respirator(s) and adequate amounts of parts and cartridges.

1. Assign employees whose duties require respirators their own respirator for which they have been fit tested.

2. Provide special eyeglass inserts designed for the respirator if an employee must wear eyeglasses with a full-facepiece respirator. Contact lenses may be worn when wearing a full-facepiece respirator.

3. Respirators and cartridges must be approved by the National Institute for Occupational Safety and Health (NIOSH). Military-issue respirators are approved under Military Standard AR 11-34.

I. Require respirators to be used properly.

1. Prohibit facial hair where the respirator-sealing surface meets the wearer's face.

2. Require employees to perform a positive and negative fit check every time the respirator is put on.

3. Employees will leave the area where respirators are being used:

    a. Before removing the facepiece for any reason.

    b. To correct any respirator malfunction.

    c. To change the respirator and/or respirator cartridges.

    d. The employee becomes ill (dizziness, nausea, etc.).

    e. If any of the following is detected:

        1. Vapor or gas breakthrough

        2. Leakage around the facepiece

        3. Increased breathing resistance.

4. Use cartridges with End-of-Service-Life indicators, or determine the respirator cartridge change-out schedule. See Supplemental Information A for guidance.

J. Require respirators to be cleaned and stored properly.

1. Clean and disinfect respirators after each use.

2. Store respirators in a plastic bag or case and in a clean location.

3. Inspect respirators before use and after each cleaning.

K. Address issues associated with special-use respirators (self-contained breathing apparatus; air-supply respirators; emergency escape respirators).

1. Self-Contained Breathing Apparatus

   Inspect self-contained breathing apparatus monthly and after each use in accordance with manufacturer's instructions.

2. Air-Supplied Respirators

   a. Air used for atmosphere-supplying respirators must meet or exceed the requirements for Type 1 – Grade D breathing air. Never use oxygen.

      1. A certificate of analysis must accompany bottled air.

      2. Compressors used to supply breathing air must:

         i. Prevent entry of contaminated air into the air supply.

         ii. Minimize moisture content.

         iii. Have suitable in-line sorbent beds and filter to provide appropriate air quality.

         iv. Have a high–carbon-monoxide alarm that sounds at 10 part per million (ppm).

   b. Couplings on air-hose lines must be incompatible with other gas system.

3. Emergency Escape Respirators

   a. Emergency escape respirators intended to be used only for emergency exit. This may include situations where IDLH atmospheres and oxygen-deficient conditions exist. These respirators may be used as stand-alone protection or in conjunction with air-supplied respirators.

L. Require follow-up training and medical surveillance to be provided as directed.

1. Provide follow-up physical examinations as directed by the SMS 024-3 NA – Medical Screening and Surveillance Exam Protocol table.

2. Provide follow-up physicals as directed by the Occupational Health Manager.

3. Provide annual refresher training.

4. Provide annual fit testing.

5. Conduct regular evaluations to determine the effectiveness of the program's implementation. This should include interviews with employees regarding such topics as respirator selection, fit, and maintenance.

M. Where required, implement procedures for dealing with entry into areas with IDLH conditions.

1. Ensure at least one employee or attendant is located outside the area with the IDLH atmosphere. This person must be equipped with:

   a. Pressure demand or other positive pressure self-contained breathing apparatus (SCBA), or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

   b. Appropriate retrieval equipment to removing the employee within the IDLH atmosphere, or

   c. Equivalent means of rescue.

2. Maintain communication between the employee(s) in the area with the IDLH environment and the employee(s) or attendant(s) outside the area. Communication may include visual, voice, or signal lines.

3. In an emergency situation, the manager overseeing operations must be notified before employee(s) outside the area with the IDLH atmosphere enter the space.

5. Documentation Summary

All Respiratory Protection Program documentation must be protected by the Privacy Act of 1974 (PL-93-579), and confidential medical information not required by OSHA may be protected under the Health Insurance Portability Accountability Act of 2003 (HIPAA).

The following information will be maintained in the office/project file by the Project Manager:

1. Identifying When A Respirator Is Needed – Attachment 042-1 NA.
2. Voluntary Use of Respirators – Attachment 042-2 NA.
3. Fit Test Record – Attachment 042-3 NA.
4. Employee Health Status Medical Report, including clearance for respirator use.
5. Employee Respirator Training Records.

6. Resources

A. U.S. OSHA Standard - Respiratory Protection – 29 Code of Federal Regulations (CFR) 1910.134

B. U.S OSHA Technical Links – Respiratory Protection

C. ANSI Z88.6-2006 – Respirator Use – Physical Qualifications for Personnel

D. AIHA, The Occupational Environment – Its Evaluation and Control

E. NIOSH Respirator Decision Logic

F. NIOSH Guide to Industrial Respiratory Protection

G. SMS 024 – Medical Screening and Surveillance Program

H. SMS 055 – Health and Safety Training

I. Attachment 042-1 NA – Identifying When a Respirator is Needed

J. Attachment 042-2 NA – Voluntary Use of Respirators

K. Attachment 042-3 NA – Fit Test Record

L. Attachment 042-4 NA – Respirator Standard Operating Procedure

7. Supplemental Information

A. Respirator Cartridge Change Schedule

B. Hazard Analysis for Respirator Use

C. Fit Testing Guidance

D. Respirator Selection Guidance

E. Inspection, Cleaning, and Storage Guidance

URS	Health, Safety and Environment **IDENTIFYING WHEN A RESPIRATOR IS NEEDED**	Attachment 042-1 NA Issue Date: July 2000 Revision 6: March 2012

Site Location: _____ Date: _____

Name of Person Performing Evaluation: _____

Project: _____

Answer the questions below for the jobs you are to perform on site. If a 'Yes' response is checked, consult with an HSE Manager or a URS Certified Industrial Hygienist (CIH) to determine if a respirator is truly needed for the job; and if so, the type of respirator needed.

It is important to be aware of the respiratory protection requirements for any chemicals you are exposed to; these can be found on the Material Safety Data Sheets or chemical labels.

Material Used or Process to be Performed			Notes
Abrasive Blasting			
• Abrasive blasting (with any type of grit or material) will be performed	☐ Yes	☐ No	_____
• Employee will fill abrasive blasting pots or perform clean-up activities	☐ Yes	☐ No	_____
• Employee will be in a contained area where abrasive blasting is taking place	☐ Yes	☐ No	_____
Acids			
• Liquid or powder acids will be used in a situation where acid vapors, mists, or dust may be breathed	☐ Yes	☐ No	_____
Adhesives			
• Aerosols-propelled adhesives are to be used in areas where there is insufficient or no local exhaust ventilation	☐ Yes	☐ No	_____
• Two-part adhesives (mix part one with two, let set, then use) are to be used in areas where there is limited ventilation	☐ Yes	☐ No	_____
Alkalis/Bases/Caustics			
• Powdered alkalis will be used in a situation where an airborne dust may be breathed	☐ Yes	☐ No	_____
Asbestos Abatement			
• Asbestos will be removed, repaired, or sampled	☐ Yes	☐ No	_____
• Employees will be inspecting or overseeing areas where asbestos will be removed or disturbed	☐ Yes	☐ No	_____
Cleaning Compounds			
• Degreasers or carbon removers will be used in areas where local exhaust ventilation is not provided	☐ Yes	☐ No	_____
• Aerosol-propelled cleaning compounds will be used in areas where there is no local exhaust ventilation	☐ Yes	☐ No	_____
• Entry into a vault, tank, silo, sewer, or other confined space that has been used for chemical storage, recently painted, or where inert gases may have been used without ventilation	☐ Yes	☐ No	_____
• Degreasers or carbon removers will be used in voids, tanks, or other confined spaces	☐ Yes	☐ No	_____
Corrosion-Preventive Compounds			
• Corrosion-prevention compounds, including chemical conversion compounds and corrosion inhibitors, will be used in areas where there is no local exhaust ventilation	☐ Yes	☐ No	_____
Detergents/Soaps			
• Ammonia-based detergents will be used in large quantities (more than 5 gallons) in areas where local exhaust ventilation cannot be provided	☐ Yes	☐ No	_____

Material Used or Process to be Performed			Notes
• Large quantities (5- or 55-gallon containers) of high pH powder detergent/soap will be used in a situation where dust may be breathed	☐ Yes	☐ No	
Fuels (including regular or unleaded gasoline, kerosene, diesel fuel, JP-5)			
• Employees will be inside unventilated fuel cells or other confined spaces containing fuels	☐ Yes	☐ No	
Grinding, Cutting, Sanding			
• Cutting, grinding, or sanding surfaces that have coatings containing beryllium, cadmium, chromium, lead, or zinc	☐ Yes	☐ No	
• Cutting, grinding, or sanding surfaces that are concrete or glass without use of ventilation or water	☐ Yes	☐ No	
Hazardous Waste Sites			
• Employees will be performing tasks on a hazardous waste site that requires the use of respirator (as indicated in the site health and safety plan)	☐ Yes	☐ No	
• Employees will be performing site assessments on potential hazardous waste sites	☐ Yes	☐ No	
Hydraulic Fluids (including petroleum-based fluids, synthetic fire-resistant fluids, and water-based fire-resistant fluids)			
• Hydraulic fluids and the vapors generated will not be exhausted using local exhaust ventilation	☐ Yes	☐ No	
• Synthetic fire-resistant fluids or water-based fire-resistant fluids will be used in an area where the air is contaminated with visible mist or spray from hydraulic fluids	☐ Yes	☐ No	
Inspection Penetrants (including Flouro-finder, water-indicating pastes, and penetrant removers)			
• An aerosol-propelled inspection penetrant will be used in an area where local exhaust ventilation cannot be provided, or in a situation where the solvent vapors can be breathed	☐ Yes	☐ No	
Lead Abatement Activities			
• Lead-containing materials will be disturbed, removed, or sampled	☐ Yes	☐ No	
• Employees will be inspecting or overseeing areas where lead will be removed or disturbed	☐ Yes	☐ No	
Lubricants/Oils			
• Aerosol lubricants or oils will be sprayed with no immediate exhaust ventilation	☐ Yes	☐ No	
Oxidizers (materials that give off oxygen, including chlorine laundry bleach, calcium hypochlorite, calcium oxide, oxygen candles, lithium hydroxide, hydrogen peroxide, and sodium dichromate)			
• Oxidizers containing organic chlorine will be used in a situation where the dusts or vapors may be breathed	☐ Yes	☐ No	
• Powdered oxidizers will be used in a situation where airborne dust may be breathed	☐ Yes	☐ No	
Paint Materials (including paints, primers, thinners, enamels, lacquers, strippers, coatings, and varnishes)			
• Paint materials will be spray-applied in areas where there is no local exhaust ventilation	☐ Yes	☐ No	
• Two-part (mix part a with part b, let set, then apply) polyurethane or epoxy polyamide paints will be brush- or spray-applied	☐ Yes	☐ No	
• Paints containing beryllium, cadmium, chromium, lead, or zinc (refer to the MSDS)	☐ Yes	☐ No	

Material Used or Process to be Performed			Notes
• Paint materials will be applied in confined spaces	☐ Yes	☐ No	_____
Solvents (including hydrocarbon solvents such as acetone, methyl ethyl ketone, toluene, xylene, and alcohols, as well as mixed solutions like antifreeze, heat-transfer fluid, turpentine, pipe-dope, and naphtha thinner)			
• Local exhaust ventilation will not be provided and work will involve breathing solvent vapors	☐ Yes	☐ No	_____
• Solvents will be used within confined spaces	☐ Yes	☐ No	_____
• Solvents will be applied using aerosols	☐ Yes	☐ No	_____
Thermal Insulation (including asbestos and non-asbestos materials like pipe lagging, fiberglass insulation, boiler insulation, packing materials, and floor or ceiling tiles)			
• Insulation will be disturbed, removed, or sampled	☐ Yes	☐ No	_____
Water-Treatment Chemicals (includes corrosive chemicals such as tri-sodium phosphate, hardness buffer, titrating solution, morpholine, caustic soda, citric acid, and nitric acid, as well as toxic chemicals such as mercuric nitrate, hydrazine, EDTA, and sodium nitrate)			
• Morpholine, EDTA, or harness buffer/titrating solution is to be used in poorly ventilated spaces	☐ Yes	☐ No	_____
• Powdered water-treatment chemicals will be used in a situation where chemical dusts may be breathed	☐ Yes	☐ No	_____
Welding/Brazing/Cutting			
• Welding will be performed in confined spaces	☐ Yes	☐ No	_____
• Welding galvanized metal or stainless steel	☐ Yes	☐ No	_____
• Brazing with cadmium or lead	☐ Yes	☐ No	_____
• Torch-cutting on coated/painted materials	☐ Yes	☐ No	_____
For Any of the Above-Listed Activities			
• An employee will be in the immediate area – within 10 feet of the job or operation; or	☐ Yes	☐ No	_____
• Employee will be inside confined space where activities are taking place; or	☐ Yes	☐ No	_____
• Employee will be inside a "controlled area" such as found in asbestos abatement, lead abatement, radiation control area, or a hazardous waste site	☐ Yes	☐ No	_____
Other			
• A chemical process procedure (e.g., hydrogen sulfide in refineries, ammonia as a refrigerant, chlorine in water disinfection, inert gas systems) required the use of a respirator or emergency escape respirator	☐ Yes	☐ No	_____
• Mine operations require issuance of an emergency escape respirator	☐ Yes	☐ No	_____
• Emergency response plan requires issuance of respirators to first responders	☐ Yes	☐ No	_____
• Radiological controls require use of a respirator	☐ Yes	☐ No	_____
• Laboratory Chemical Hygiene plan requires issuance of respirators	☐ Yes	☐ No	_____
• Exposure to airborne mold	☐ Yes	☐ No	_____

Instructions: Have the employee that is opting to use a respirator for non-overexposure conditions read this page, and then sign on the bottom of the page. Maintain a copy in the employee's training file.

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for employees. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the employee.

Sometimes employees may wear respirators to avoid exposures to hazards, even if the amount of the hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your own voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not pose a hazard.

1. Read and follow all instructions provided by the manufacture on use, maintenance, cleaning, and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH (the National Institute for Occupational Safety and Health) certifies respirators in the U.S. A label or statement of certification should appear on the respirator or respirator packaging; it will tell you what the respirator is designed for and how it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants against which your respirator is not designed to protect. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, fumes, smoke, or very small solid particles.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
5. If you have any health conditions (asthma; high blood pressure; emphysema; heart disease) that could be aggravated by using a respirator, you should check with your doctor before using one.

I have read and understand this information: Date: _____

Employee's Name (Please Print):

Employee's Signature:

URS	Health, Safety and Environment **FIT TEST RECORD**	Attachment 042-3 NA Issue Date: July 2000 Revision 6: March 2012

Employee Name _____ Employee Number _____

Office/Project _____ Last Medical Exam _____

Fit Test Date _____ Corrective Lenses Needed Yes ☐ No ☐

Medically qualified to wear respirator? Yes ☐ No ☐

Briefed on fundamental principles of respiratory protection, use, selection, inspection, cleaning, maintenance, and storage of equipment? Yes ☐ No ☐

Test agent recognition: Yes ☐ No ☐ N/A ☐

	RESPIRATOR 1	**RESPIRATOR 2**	**RESPIRATOR 3**
Equipment Type			
Manufacturer's Name			
Model			
Size			
Facepiece Composition (Rubber/Silicone)			

TEST PERFORMED	**RESPIRATOR 1**	**RESPIRATOR 2**	**RESPIRATOR 3**
Negative Pressure Test:	Pass ☐ Fail ☐	Pass ☐ Fail ☐	Pass ☐ Fail ☐
Positive Pressure Test:	Pass ☐ Fail ☐	Pass ☐ Fail ☐	Pass ☐ Fail ☐
Isoamyl Acetate Test:	Pass ☐ Fail ☐	Pass ☐ Fail ☐	Pass ☐ Fail ☐
Irritant Smoke Test:	Pass ☐ Fail ☐	Pass ☐ Fail ☐	Pass ☐ Fail ☐
Bitrex:	Pass ☐ Fail ☐	Pass ☐ Fail ☐	Pass ☐ Fail ☐
Saccharin:	Pass ☐ Fail ☐	Pass ☐ Fail ☐	Pass ☐ Fail ☐
Generated Aerosol Quantitative Fit:	P ☐ F ☐ Fit Factor _____	P ☐ F ☐ Fit Factor _____	P ☐ F ☐ Fit Factor _____
Ambient Aerosol Quantitative Fit:	P ☐ F ☐ Fit Factor _____	P ☐ F ☐ Fit Factor _____	P ☐ F ☐ Fit Factor _____
Controlled Negative Pressure Quantitative Fit:	P ☐ F ☐ Fit Factor _____	P ☐ F ☐ Fit Factor _____	P ☐ F ☐ Fit Factor _____

Examiner's Name (Please Print) **Examiner's Signature** **Date**

Employee's Signature **Date**

Job Task Reviewed: _____

Date Reviewed: _____

Task Review by: _____

ADMINISTRATIVE PROCEDURES

1. All respirator users must be medically qualified to use respirators.
2. Respirator users must be trained annually in respirator use, and must be fit-tested annually.
3. The respirator will be used only by the person to whom it was issued.
4. Persons using glasses who are required to use a full-face respirator may use contact lenses or eyeglass inserts designed for the respirator.

GUIDANCE FOR SELECTION OF RESPIRATOR AND CARTRIDGES/FILTERS

1. Respirators are currently being issued and used for the following job activities:

   _____

   _____

2. The respirator will be equipped with the following cartridges/filters:

   _____

3. Filters are to be changed when the breathing resistance increases.

4. Cartridges are to be changed _____ (frequency), or when the contaminant you are protecting yourself from can be smelled or tasted.

FIT TESTING & FIT CHECKING

1. Fit testing is required annually. To arrange for fit testing, call your local, project, or regional safety representative or qualified industrial hygienist.
2. Respirator users will "fit check" the respirator every time the respirator is put on:
   - **Negative Check** – Cover filters/cartridges with palms of hands and breathe in: leakage should not be detected around the face seal of the respirator. Do not use if leakage is detected.
   - **Positive Check** – Cover the exhalation valve cover with palm of hand and blow out slightly: leakage should not be detected around the respirator seal.
   - **For Air Supply Respirators** – Kink or close off air supply hose and breathe in: leakage should not be detected around the face seal of the respirator.

CLEANING AND MAINTENANCE OF RESPIRATOR

1. Clean and disinfect respirator after every use.
2. Inspect respirator at the end of work every day in use to ensure parts are not missing. Replace missing parts from stock supply.
3. Store clean respirator in labeled plastic bag out of direct sunlight.
4. Do not alter respirator in any way.

A cartridge change schedule must be developed for cartridges or canisters used with air purifying respirators that do not have an End of Service Life Indicator (ESLI). The purpose of this is to prevent contaminants from breaking through the respirator's sorbent cartridge(s), and thereby over-exposing employees. NIOSH has approved ESLIs for only four cartridges or canisters (mercury vapor, carbon monoxide, ethylene oxide, and hydrogen sulfide). Historically we have relied on the warning properties (odor, irritation) of a contaminant to dictate cartridge change. OSHA no longer allows this as the sole basis for changing respirator cartridges. In developing a change schedule the following factors should be considered:

- Contaminants
- Concentration
- Frequency of use (continuously or intermittently throughout the shift)
- Temperature and humidity
- Work rate
- The presence of potentially interfering chemicals.

The worst-case conditions should be assumed to avoid early breakthrough. This must be documented in the project health and safety plan or, in the cases of office or labs, in the site specific Respiratory Protection Program.

Sources of Help

OSHA provides assistance in developing respirator cartridge change schedules on its website at http://www.osha.gov/SLTC/etools/respiratory/change_schedule.html.

Most cartridge manufacturers maintain on-line interactive cartridge service life programs that can be used to evaluate the service life against many contaminants. Typically, these do not evaluate the service life against mixtures (multiple contaminants).

Because of the complexity in evaluating mixtures, OSHA offers the following guidance:

- When the individual compounds in the mixture have similar breakthrough times (i.e., within one order of magnitude), service life of the cartridge should be established assuming the mixture stream behaves as a pure system of the most rapidly migrating component with the shortest breakthrough time (i.e., sum up the concentration of the components).
- Where the individual compounds in the mixture vary by 2 odors of magnitude or greater, the service life may be based on the contaminant with the shortest breakthrough time.

Rule of Thumb *("The Occupational Environment" - Its Evaluation and Control)*

- If the chemical's boiling point is >70 °C and the concentration is less than 200 ppm, you can expect a service life of 8 hours at a normal work rate.
- Service life is inversely proportional to work rate.
- Reducing concentration by a factor of 10 will increase service life by a factor of 5.
- Humidity above 85% will reduce service life by 50%.

OSHA Interpretation

The OSHA inspection procedures for the respiratory protection standard specifies that where contaminant migration is possible, respirator cartridges/canisters should be changed after each work shift where exposure occurs unless there is objective data to the contrary (description studies) showing the performance in the conditions and schedule of use/non-use found in the workplace.

A. A hazard analysis of the workplace must be performed before selecting respirators. The analysis must consider inhalation hazards under routine and foreseeable emergency conditions. Other factors to consider when choosing respirators include skin and eye exposure, the effects of heat or cold, use of protective clothing, employee conditioning, and workload.

B. Respiratory hazards that must be identified include:

1. Oxygen Deficiency
2. Air Contaminants
3. Particulates
4. Toxic Gases

C. Evaluating Exposures

There are several options on how to evaluate exposures:

1. One option is to rely on personal monitoring data of employees. Representative exposure data provided by industry or laboratory studies is acceptable as long as it applies to similar tasks and conditions at the worksite.
2. The professional judgment provided by the Business, RBU, SBU, Office, or Project HSE Manager and/or as recommended by a qualified industrial hygienist or safety professional may be employed for the task.
3. If the exposure cannot be identified or estimated, then the atmosphere is considered immediately dangerous to life or health (IDLH). Atmospheres with levels of oxygen below 19.5% are also defined as IDLH.
4. Trained and qualified technical personnel shall perform assessment of the degree of respiratory hazard through sampling and testing of the work environment. Problems requiring special respiratory protection should be discussed with the Business or Regional HSE Manager or qualified industrial hygienist.
5. The Project HSE Manager shall establish procedures to control respiratory hazards through engineering or administrative controls, product/material substitution, respiratory protective devices, or a combination of these methods.
6. He/she shall also perform annual evaluations of the effectiveness of the project's respiratory protection program. These evaluations shall be documented.
7. The Project HSE Manager shall select and provide adequate respiratory protective devices for use on the project. This selection shall be based upon the specific type of air contaminant(s), the concentration of the contaminants(s) or oxygen deficiency in the work environment.
8. Establish a change schedule for air-purifying respirators based upon objective information or data that will ensure that cartridges are changed before the end of their useful life. OSHA has mandated that reliance on warning properties is no longer valid

A. A quantitative fit-test provides the most accurate information; qualitative fit testing depends on the respirator wearer's sense of smell and taste (subjective response). OSHA's standard requires fit-testing for any face mask (full or half) designed to have a tight seal along the face, whether it is used in a positive or negative pressure mode, and whether it is disposable or not. If the required fit factor is greater than 100, then a quantitative fit-test must be performed.

B. Each person will have a qualitative or quantitative fit test when first required to wear a respirator, every 12 months when respirators will be worn thereafter, or as hazards or respiratory needs change.

C. Each person will have a qualitative or quantitative fit test for each specific make(s) and model(s) of respirator(s) for which the worker may wear.

D. Under no circumstances shall a worker be allowed to use any respirator if the results of the qualitative fit test indicate that the worker is unable to obtain a satisfactory seal.

E. The eight exercises required by OSHA under the respiratory protection standard, 29 CFR 1910.134, Appendix A, are as follows (note that these are not required controlled negative pressure (CNP) quantitative fit testing):

    1. normal breathing
    2. deep breathing
    3. head side to side
    4. head up and down
    5. talking out loud
    6. grimacing (quantitative only)
    7. bending
    8. normal breathing

F. Qualitative and quantitative fit testing must be performed in negative pressure mode for all tight fitting respirators, whether the respirator is positive or negative pressure demand.

G. Qualitative and quantitative fit testing must be conducted according to one of the protocols found in 29 CFR 1910.134, Appendix A.

H. Employees using respirators when not required under the standard (i.e., dust masks or comfort masks for nuisance type dust without a specified exposure level) must be aware of the potential hazards of using a respirator. See Attachment 042-2 of this standard or Appendix D of 29 CRF 1910.134 for information program requirement.

A. Physical characteristics, functional capabilities, and performance limitations of various types of respirators shall be considered in the selection process.

B. Specifics regarding hazard classification, descriptions of respirator types and modes of operation, and the capabilities and limitations of respirators are listed in ANSIZ88.2-1992.

C. To select the correct respirator, the hazards must first be identified in the workplace and then follow these steps:

    1. Determine if the environment is IDLH.

        a. All oxygen deficient atmospheres shall be considered IDLH.

        b. If the employee exposure cannot be reasonably estimated, the atmosphere must be considered IDLH.

    2. Identify the contaminant(s) present in the atmosphere and answer the following questions:

        a. What is the concentration?

        b. Are they gaseous or particulate?

        c. Are the contaminants IDLH?

    3. After completing the above steps select the appropriate respirator for the particular hazard(s).

        a. IDLH – Provide a full facepiece NIOSH certified pressure demand SCBA with a minimum service life of 30 minutes or a full facepiece pressure demand airline respirator with an auxiliary self-contained air supply.

        b. Non-IDLH – A respirator must be provided that is appropriate for the contaminant(s) identified.

    4. For protection against gases and vapors, <u>either</u> an atmosphere-supplying respirator or an air-purifying respirator equipped with a NIOSH certified end-of-service-life indicator (ESLI) for the contaminant must be used. In lieu of an ESLI, a change schedule for cartridges based on objective information or data may be used to ensure cartridges are changed before the end of their service life occurs (see Supplemental Information A). In most cases, respirator cartridge manufacturers provide a product specific on-line or CD-ROM based “Service Life Calculator” that allows determination of useful service life of a cartridge based on expected concentration and environmental and work conditions. If neither an ESLI or change schedule is available, a supplied air respirator must be used.

    5. For protection against particulates, an atmosphere-supplying respirator or an air-purifying respirator equipped with a NIOSH-certified high-efficiency particulate air (HEPA) filter under 30 CFR 11 or an air-purifying respirator equipped with a NIOSH certified filter for particulates under 42 CFR 84 must be used.

6. There are three classes of filters under NIOSH (N, R, and P series) with three levels of filter efficiency in each class – 95%, 99%, and 99.97% (classified as 100). All filters can be used regardless of aerosol size. The new filters are classified as follows:
    a. N – For solid particulates and non-oil aerosols that do not degrade filter performance.
    b. R – For solid particulates and degrading oil-based aerosols. R filters have "use limitations."
    c. P – For solid particulates and degrading oil-based aerosols. P filters generally have no "use limitations" other than those normally associated with particulate filters. The P100 filter is the replacement for the HEPA filter.

E. Particulate filters are tested with 200 mg of loading but in many cases, these filters may exceed this capacity. Filtration efficiency may actually increase as the filter cake develops on the filter. Increased resistance to breathing or obvious taste or odor in the respirator would be cause to examine, re-evaluate and replace the filter cartridge

A. Inspection

Routinely used air-purifying and airline respirators should be checked as follows before and after each use:

1. Examine the facepiece for:
    a. Excessive dirt.
    b. Cracks, tears, holes or physical distortions of shape from improper storage.
    c. Inflexibility of rubber facepiece (stretch and knead to restore flexibility).
    d. Cracked or badly scratched lenses in full facepieces.
    e. Incorrectly mounted full facepiece lenses, or broken or missing mounting clips.
    f. Cracked or broken air-purifying element holder(s), badly worn threads or missing gasket(s) if required.
2. Examine the head straps or head harness for:
    a. Breaks.
    b. Loss of elasticity.
    c. Broken or malfunctioning buckles and attachments.
    d. Excessively worn serrations on head harness, which might permit slippage (full facepieces only).
3. Examine the exhalation valve for the following after removing its cover:
    a. Foreign material, such as detergent residue, dust particles or human hair under the valve seat.
    b. Cracks, tears or distortion in the valve material.
    c. Improper insertion of the valve body in the facepieces.
    d. Cracks, breaks or chips in the valve body, particularly in the sealing surface.
    e. Missing or defective valve cover.
    f. Improper installation of the valve in the valve body.
4. Examine the air-purifying element for:
    a. Incorrect cartridge, canister, or filter for the hazard.
    b. Incorrect installation, loose connections, missing or worn gasket or cross threading in the holder.
    c. Expired shelf-life date on the cartridge or canister.
    d. Cracks or dents in the outside case of the filter, cartridge or canister, indicated by the absence of sealing material, tape, foil, etc., over the inlet.
5. If the device has a corrugated breathing tube, examine it for:

a. Broken or missing and connectors.

b. Missing or loose hose clamps.

c. Deterioration, determined by stretching the tube and looking for cracks.

6. Examine the harness of a front-or back-mounted gas mask for:

a. Damage or wear to the canister holder, which may prevent its being held in place.

b. Broken harness straps for fastening.

B. Self Contained Breathing Apparatus (SCBA)

Follow manufacturer specifications for storage, maintenance and cleaning of SCBA systems.

C. Manual Cleaning

A generalized cleaning procedure is typically found in the manufacturer's manual. Read the respirator manual and follow the manufacturer's recommendations.

1. Remove canisters, filters, valves, straps and speaking diaphragms from the facepiece.
2. Wash facepiece and accessories in warm soapy water or a commercially available cleaner, following the manufacturer's instructions. Gently scrub the respirator.
3. Rinse parts thoroughly in clean water.
4. Air dry in a clean place or wipe dry with a lint less cloth.

D. Machine Cleaning

Machines may be used to expedite the cleaning, sanitizing, rinsing, and drying of large numbers of respirators. Read the machine-cleaning manual and follow manufacturer's recommendations.

1. Extreme care must be taken to ensure against excessive tumbling and agitation, or exposure to temperatures above those recommended by the manufacturer (normally 120°F maximum), as these conditions are likely to result in damage to the respirators.
2. Ultrasonic cleaners, clothes-washing machines, dishwashers, and clothes dryers have been specially adapted and successfully used for cleaning and drying respirators.

E. Disinfection

1. Disinfection is required when more than one person uses the respirator. Recommended NIOSH disinfection procedures include immersion of the respirator body for two minutes in a 50 ppm chlorine solution (about 2 ml bleach to 1 liter of water). Rinse thoroughly in clean water and dry.

a. Immersion times have to be limited to minimize damage to respirators. The solutions can age rubber and rust metal parts. Caution must be

taken to thoroughly rinse the respirator after cleaning and disinfection to prevent dermatitis.

b. An alternate method is to purchase a commercially prepared solution for disinfection/decontamination and follow the directions recommended by the manufacturer.

2. Each person wearing a respirator shall examine the respirator before use in accordance with the training and instruction provided during fit testing.

3. After cleaning and sanitizing, each respirator shall be examined to determine if it is in proper working condition, if it needs replacement of parts or repairs, or if it should be discarded. Respirator inspection shall include, when applicable, a check for tightness of connections; for the condition of the respiratory inlet covering, head harness, valves, connecting tubes, harness assemblies, filters, cartridges, canisters, end-of-service life indicator, and shelf life date(s), and for the proper function of regulators, alarms, and other warning systems.

4. Each rubber or other elastomeric part shall be inspected for pliability and signs of deterioration. Each air and oxygen cylinder shall be inspected to ensure that it is fully charged according to the manufacturer's instructions.

F. Repair

Only persons trained in proper respirator assembly and correction of possible respirator malfunctions and defects shall do replacement of parts or repairs. Replacement parts shall be only those designed for the specific respirator being repaired. Reducing or admission valves, regulators, and alarms shall be returned to the manufacturer for repair or adjustment. The valve, regulator, or alarm manufacturer must approve instrumentation for valve, regulator, and alarm adjustments and tests.

G. Storage

Respirators shall be stored in a convenient, clean and sanitary location. The purpose of good respirator storage is to ensure that the respirators will function properly when used. Respirators shall be stored in a manner that will protect them against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators shall be stored to prevent distortion of rubber or other elastomeric parts. This can be done by storing the respirators in hermetically sealed plastic bags, or plastic bags capable of being sealed. Emergency and rescue use respirators that are placed in work areas shall be quickly accessible at all times, and the storage cabinet or container in which they are stored shall be clearly marked.

URS SAFETY MANAGEMENT STANDARD

Personal Monitoring (Industrial Hygiene)

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where employees may be exposed to airborne concentrations of hazardous air contaminants potentially exceeding permissible limits. Note that this standard does not cover monitoring for asbestos operations (SMS 008 – Asbestos Operations), hexavalent chromium (SMS 083 – Chromium (VI) Inhalation Exposure Protections), confined spaces (SMS 010 – Confined Space), heat stress (SMS 018 – Heat Stress), or noise (SMS 026 – Noise and Hearing Conservation).

2. Purpose and Scope

The purpose of this standard is to assist and provide guidance to URS personnel who need to conduct personal industrial hygiene monitoring. Monitoring will be conducted to evaluate the exposures of URS employees to concentrations of toxic particulates, fibers, gases, vapors, mists, radionuclides, pathogens, hazardous biological agents, or to oxygen-deficient atmospheres.

Personal monitoring must be conducted under the following conditions:

A. Where directed by a facility or site-specific health and safety plan.

B. Where employees are exposed to known or suspected human carcinogens (e.g., beryllium, vinyl chloride, etc.).

C. Where regulations require "initial exposure assessments” (e.g., lead, asbestos, methylene chloride, hexavalent chromium). The only exception to conducting an "initial exposure assessment" where there is a regulatory requirement to do so is when similar exposure assessments have been conducted under similar site conditions within 1 year prior to the start of work on the current project or site.

D. When directed by a client or required by contract.

E. At the direction of a Health, Safety, and Environment (HSE) Manager in response to employee concerns or incidents involving chemical exposure.

F. Co-sampling during regulatory inspections.

G. Routine monitoring in compliance with regulatory requirements.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Procedures for Personal Industrial Hygiene Monitoring

1. Calibrate sampling equipment in accordance with the manufacturer's recommendations and the approved sampling methodology.

2. Collect samples using the most current applicable methodologies established by either the National Institute for Occupational Safety and Health (NIOSH) *Manual of Analytical Methods*, U.S. Department of Labor – Occupational Safety and Health Administration (OSHA) *Sampling and Analytical Methods*, or applicable guidelines for the host country.

3. Select an analytical laboratory accredited by the American Industrial Hygiene Association (AIHA), or equivalent host country certification, licensing, or accreditation, to analyze the personal air samples.

   Note: There are several programs under which a laboratory may receive AIHA accreditation. The laboratory must be currently accredited for the specific program, scope category, and field of testing for the analysis that will be performed, not merely hold AIHA accreditation.

4. Require the selected laboratory to use the applicable analytical methodologies and document quality control procedures.

5. Ensure equipment is maintained, serviced, and calibrated in accordance with manufacturer's recommendations.

6. Document personal monitoring activities using the appropriate URS Industrial Hygiene Monitoring Form; require that all laboratory chain-of-custody forms be properly completed; and ensure samples are sealed and secured according to Quality Assurance procedures.

7. Ensure workers are being protected (e.g., engineering controls, respiratory protection, PPE) during the monitoring phase. Determine whether medical surveillance is required.

B. Evaluation of Personal Monitoring Results

1. Where feasible, require that a URS Certified Industrial Hygienist (CIH) approved by an HSE Manager evaluate the analytical results.

2. Obtain a written evaluation report from the HSE manager. If exposures exceed the Action Level and/or Permissible Exposure Limit for the air contaminant(s) of concern, a verbal report is to be made to the senior facility, project, or site manager immediately, and the evaluation report will include required corrective actions.

3. Complete evaluation reports within 5 working days of the receipt of the analytical results.

C. Procedures for Direct-Read Air Monitoring

1. Direct-read air monitoring instruments are used primarily as screening tools to provide real-time evaluations of hazardous airborne contaminants at a project site.

2. Select an appropriate air monitor for the air contaminant to be measured.

3. Calibrate monitor in accordance with manufacturer's recommendations. Dates of full instrument calibration will be recorded on the direct-read instrument and on any associated calibration data sheets. If full instrument calibrations are not performed daily, then bump tests (exposure to a known concentration of contaminant) will be performed to verify calibration and ensure alarms are working appropriately.

4. Conduct air monitoring using techniques identified by the instrument manufacturer.

5. Ensure equipment is maintained, serviced, and calibrated in accordance with manufacturer's recommendations.

6. Document personal monitoring activities using the appropriate URS Industrial Hygiene Monitoring Form.

7. Ensure workers are being protected (e.g., engineering controls, respiratory protection, PPE) during the monitoring phase. Determine whether medical surveillance is required.

8. Where required by client request or by unique or high hazard areas, individual portable direct-read monitors shall be used.

D. Evaluation of Personal Monitoring Results

1. Compare measured results with project-specific Action Levels and/or published Permissible Exposure Limits. If exposures exceed the Action Level and/or Permissible Exposure Limit for the air contaminant(s) of concern, take corrective actions as identified in the site-specific health and safety plan. Where questions exist about the results, contact a CIH approved by an HSE Manager to evaluate the analytical results.

E. Communication of Sample Results and Evaluation

1. Provide copies of the evaluation report to the employee(s) monitored and to employees working in the area for which the exposures could be representative, within 5 days of receipt of lab results.

2. Provide a copy of the evaluation report and monitoring data to the manager directing activities of the facility or site for filing purposes.

3. Personal identifiers (e.g., name, address, employee number) or information which could reasonably be used to identify specific employees (e.g., exact age, height, weight, race, sex, date of initial employment, job title), must be removed from analysis reports before access to the exposure data is provided.

F. Corrective Actions

Implement required corrective actions immediately. If workers are being exposed above the PEL, respiratory protection should be worn in accordance with SMS 042 – Respiratory Protection. Engineering controls should be used to reduce exposures to the extent possible

G. Exposure Records

1. Exposure records include workplace monitoring, biological monitoring, material safety data sheets and chemical inventories. Sampling results, the collection methodology (sampling plan), a

description of the analytical and mathematical methods used, and a summary of other background data relevant to interpretation of the results obtained, must retained for at least thirty (30) years.

5. Documentation Summary

The following documents will be maintained in the project profile:

A. Calibration data.

B. Completed IH Monitoring Form(s).

C. Evaluation Report with sample results (provide copy to affected employee as well).

D. Relevant prior initial exposure assessments.

6. Resources

A. OSHA Sampling and Analytical Methods

B. OSHA Chemical Sampling Information

C. American Industrial Hygiene Association – The Occupational Environment: Its Evaluation and Control

D. American Conference of Governmental Industrial Hygienists – Air Sampling Instruments for Evaluation of Atmospheric Contaminants

E. NIOSH Manual of Analytical Methods

F. SMS 008 – Asbestos Operations

G. SMS 010 – Confined Space

H. SMS 018 – Heat Stress

I. SMS 026 – Noise and Hearing Conservation

J. SMS 042 – Respiratory Protection

K. SMS 050 – Toxic and Hazardous Substances

L. Attachment 043-1 NA – General Industrial Hygiene Survey Form

M. Attachment 043-2 NA – Industrial Hygiene Sample Field Sheet

N. Attachment 043-3 NA – Total Dust Industrial Hygiene Sample Field Sheet

O. Attachment 043-4 NA – Respirable Dust Industrial Hygiene Sample Summary

P. Attachment 043-5 NA – Detector Tube Industrial Hygiene Sample Summary

Q. Attachment 043-6 NA – Gas/Vapor/Fume/Mist Industrial Hygiene Sample Summary

R. Attachment 043-7 NA – Combustible Gas Monitor Industrial Hygiene Sample Summary

S. Attachment 043-8 NA – PID/FID Monitoring Report

URS	Health, Safety and Environment **GENERAL INDUSTRIAL HYGIENE SURVEY FORM**	Attachment 043-1 NA Issue Date: June 1999 Revision 5: January 2011

Location: _____ **Prepared By:** _____ **Date Prepared:** _____ **Page** _____ **of** _____

Job Description	No. of Hours Per Day Worked On This Job	Dust, Fume, or Mists	Control Methods	Gases	Vapors	Other	Control Methods	Noise	Control Methods	Radiation, UV Vibration, IR, etc.	Control Methods	Comments

URS	Health, Safety and Environment **INDUSTRIAL HYGIENE SAMPLE FIELD SHEET**	Attachment 043-2 NA Issue Date: June 1999 Revision 5: January 2011

Sample ID Date: _____

Material of Interest (MOI) in Dust: _____

Site: _____ Sample I.D. No. _____

Person Sampled or Area: _____ Employee No. _____

Job/Area: _____

Sample Type

Personal: ☐ Area: ☐ Resp. Dust: ☐ Total Dust: ☐ Other: _____

Pump Type:		Pump No		Time On:		Time Off:	
Total Time (min):		Cassette No:		Initial Flow:		Final Flow:	
Average Flow:		Volume:		Calibrator Model:		Calibrator Serial No:	

Workplace Conditions

Operations: Normal ☐ Abnormal ☐ Explain _____

Respirator Use: Type _____ % of Time Worn _____

Ventilation: Type _____

Normal ☐ Abnormal ☐ Explain _____

Weather Conditions

Approximate Temperature: _____ °F _____ °C

Sky:	Precipitation	☐	Cloudy	☐	Partly Cloudy	☐	Clear ☐
Wind:	Calm	☐	Light	☐	Medium	☐	High ☐

Work Description/Comments: Scheduled Hours per Shift: _____

_____

_____

_____

Sampled By: _____

URS	Health, Safety and Environment **TOTAL DUST INDUSTRIAL HYGIENE SAMPLE SUMMARY**	Attachment 043-3 NA Issue Date: June 1999 Revision 5: January 2011

MATERIAL OF INTEREST (MOI) IN DUST: _____ **Page** _____ **of** _____

IDENTIFICATION **SAMPLE TYPE** **Exposure Limit:** **OSHA PEL: DUST** _____ **mg/m^3** **MOI** _____

Prepared By: _____ **Personal:** _____ **ACGIH TLV: DUST** _____ **mg/m^3** **MOI** _____

Date Prepared: _____ **Area:** _____ **Location:** _____ **Scheduled Hours Per Shift:** _____

Date	Name or Area	Job Class	Resp Type	Pump Type	Time		Sam Time (min)	Flow (lpm)	Vol (m^3)	Filter Wt.		MOI %	Concentration		Shift TWA		% PEL or % TLV	
Sample No.	Employee No.	Equipment	% Use	ID No.	On	Off				Dust mg	MOI mg		Dust mg/m^3	MOI mg/m^3	Dust mg/m^3	MOI mg/m^3	Dust mg/m^3	MOI mg/m^3

URS	Health, Safety and Environment **RESPIRABLE DUST INDUSTRIAL HYGIENE SAMPLE SUMMARY**	Attachment 043-4 NA Issue Date: June 1999 Revision 5: January 2011

MATERIAL OF INTEREST (MOI) IN DUST: _____ **Page** _____ **of** _____

IDENTIFICATION **SAMPLE TYPE** **Exposure Limit:** **OSHA PEL: DUST** _____ **mg/m^3** **MOI** _____

Prepared By: _____ **Personal:** _____ **ACGIH TLV: DUST** _____ **mg/m^3** **MOI** _____

Date Prepared: _____ **Area:** _____ **Location:** _____ **Scheduled Hours Per Shift:** _____

Date	Name or Area	Job Class	Resp Type	Pump Type	Time		Sam Time (min)	Flow (lpm)	Vol (m^3)	Filter Wt.		MOI %	Concentration		Shift TWA		% PEL or % TLV	
Sample No.	Employee No.	Equipment	% Use	ID No.	On	Off				Dust mg	MOI mg		Dust mg/m^3	MOI mg/m^3	Dust mg/m^3	MOI mg/m^3	Dust mg/m^3	MOI mg/m^3

URS	Health, Safety and Environment **DETECTOR TUBE INDUSTRIAL HYGIENE SAMPLE SUMMARY**	Attachment 043-5 NA Issue Date: June 1999 Revision 5: January 2011

GAS/VAPOR: _____ **Page** _____ **of** _____

IDENTIFICATION

Prepared By: _____ **Date:** _____

DETECTOR TUBE

Brand: _____ **Type:** _____

Batch No.: _____ **Exp. Date:** _____

Pump Type: _____ **Serial No.:** _____

EXPOSURE LIMIT

Basis: ACGIH TLV _____ **OSHA PEL** _____

Location: _____

Scheduled Hours Per Shift: _____

SAMPLE TYPE

Area _____

Personal _____

Survey _____

Sequential _____

Leak Test Yes ☐ No ☐

Time	Name or Area	Job Class	Resp Type	Sampling Conditions			Pump Strokes	Air Concentration			Comments
Sample No.	Employee No.	Location	% Use	Temperature	R.H.	Atm. Pres.		Tube ( )	Corrected ( )	%PEL or %TLV	

URS	Health, Safety and Environment **GAS / VAPOR / FUME / MIST** **INDUSTRIAL HYGIENE SAMPLE SUMMARY**	Attachment 043-6 NA Issue Date: June 1999 Revision 5: January 2011

SAMPLE DEVICE

Page _____ of _____

Brand: _____ **Type:** _____ **Batch No.:** _____ **Exp. Date:** _____

IDENTIFICATION

SAMPLE TYPE

Prepared By: _____ **Personal:** _____ **Location:** _____

Date Prepared: _____ **Area:** _____ **Scheduled Hours Per Shift:** _____

Date / Sample No.	Name or Area / Employee No.	Job Class / Location	Resp Type / % Use	Pump Type / ID No.	Time On	Time Off	Sample Time (min)	Flow (lpm)	Vol (m^3)	Lab Results	Air Concentration	Shift TWA	Exposure Limit PEL/TLV	%PEL or %TLV	MOI

URS	Health, Safety and Environment **COMBUSTIBLE GAS MONITOR** **INDUSTRIAL HYGIENE SAMPLE SUMMARY**	Attachment 043-7 NA Issue Date: June 1999 Revision 5: January 2011

PERMISSIBLE EXPOSURE LIMITS

Carbon Monoxide (CO)

Shift TWA: _____

Ceiling: _____

STEL: _____

Hydrogen Sulfide (H_2S)

Shift TWA: _____

Ceiling: _____

STEL: _____

Basis:

ACGIH ☐ **OSHA** ☐ **ACGIH** ☐ **OSHA** ☐

WORKPLACE CONDITIONS

Site: _____

Operations: **Normal** ☐ **Not Normal** ☐ **Explain** _____

Ventilation Type: _____

Normal ☐ **Not Normal** ☐ **Explain** _____

Instrument Type: _____ **Serial No.:** _____

Date	Location	Resp Type	Weather	Carbon Monoxide			Oxygen %	Hydrogen Sulfide			LEL %	Time (Hr)	Comments
Sampled By	Conditions	% Use		Real Time	Shift TWA %TLV/%PEL	STEL %TLV/%PEL		Real Time	Shift TWA %TLV/%PEL	STEL %TLV/%PEL			

URS	Health, Safety and Environment **PID / FID MONITORING REPORT**	Attachment 043-8 NA Issue Date: June 1999 Revision 5: January 2011

Location: _____ **Page** _____ **of** _____

Prepared By: _____ **Calibration:** _____

Model: _____ **Span Gas:** _____ **Lamp Voltage:** _____

Serial No.: _____ **Zero Gas:** _____

Date	Location and Conditions	Event No.	Sample Time hour: min	Min (ppm)	AVG (ppm)	Max (ppm)	Alarm		Comments
							Level (ppm)	Status	

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

1. Applicability

This standard is applicable to subcontractors retained by the Infrastructure & Environment and Federal Services businesses of URS Corporation and its subsidiary companies that perform:

- Intrinsically higher-risk construction-related activities (e.g., drilling, excavation, surveying, demolition, electrical contracting, steel erection etc.).
- Significant building or infrastructure alteration, demolition, and/or repair activities using their own workforce or equipment.
- Activities on hazardous waste sites.
- Activities in government services operations (e.g., aviation repair, vehicle repair, warehousing, facility operations, and maintenance) where the annual cost of the subcontract exceeds $1,000,000.
- An activity where URS Corporation does not supervise the day-to-day activities and work efforts of subcontractor workers, ***and*** the subcontractor has a designated Supervisor on the work site.

This procedure is applicable to the operations of subcontractors and sub-subcontractors of any tier.

This procedure does not apply to third-party contractor operations where there is no subcontract relationship between the contractor and URS. Health, Safety, and Environment issues regarding third-party contractor operations are governed by project-specific contracts, and are not covered by this standard.

2. Purpose and Scope

This procedure provides requirements on the pre-evaluation of subcontractor safety programs; contractual risk management; subcontractor safety performance on the job site; and the responsibilities of the Project Manager with respect to subcontractor jobsite safety performance.

Each URS subcontractor must be evaluated at least annually using Attachment 046-1 NA, “Subcontractor Safety Evaluation Form,” or equivalent client or URS International Operations form, in order to perform work on any new URS projects.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Pre-qualification of Subcontractor – The Project Manager will complete the following procedures for all subcontractors retained on projects covered by this standard (the PM should also require subcontractors to follow these procedures with respect to pre-qualification of sub-subcontractors of any tier):

1. Request all subcontractor candidates to complete the attached Subcontractor Safety Evaluation Form (Attachment 046-1 NA).

2. Conduct an assessment of each subcontractor's qualifications with respect to the subcontractor health and safety evaluation criteria contained in Attachment 046-2 NA.

3. If the subcontractor does not meet the criteria established in Attachment 046-2 NA, and URS must retain the contractor, the Subcontractor Variance Form (Attachment 046-3 NA) must be completed and approved by a Regional, or Strategic Business Unit (SBU) Health, Safety, and Environment (HSE) Manager.

4. Verify that subcontractors meet the insurance requirements as stated in URS' agreement with the subcontractor, or as approved by URS Legal Counsel or Contracting Manager/Officer.

5. If the subcontractor has been successfully evaluated within the last 12 months, that evaluation may be substituted.

6. For long-term operations, update this evaluation within 12 months of the previous evaluation.

B. Contractual and Risk Management Requirements of Subcontractors

1. Ensure that the subcontractor is contractually bound to comply with applicable client and URS HSE Program requirements.

2. Ensure that subcontractor is contractually bound to develop additional safety procedures for work that is exclusive to their activities on the site, and for which they may have superior knowledge.

3. Assess compliance of subcontractor's insurance with the URS Corporation subcontract requirements (including, but not limited to, necessary types and amounts of coverage, URS Corporation additional insured endorsement, etc.).

4. Ensure that URS has the right in its subcontract, without liability to URS, to stop the subcontractor's work in the event of any violations of the applicable Health and Safety Plan.

C. Subcontractor Safety Representative

1. Require each subcontractor to appoint a Subcontractor Safety Representative (SSR) who:

   a. Is knowledgeable of the subcontractor's activities.

   b. Understands the safety requirements of the subcontractor's activities.

   c. Has the ability to recognize and the authority to correct safety deficiencies and execute a stop work order should an imminent danger arise.

   d. Has the responsibility for the administration of the subcontractor Health and Safety Program.

   e. Will serve as the direct contact with URS Corporation regarding resolution of health and safety issues.

D. Communication

1. Provide the SSR with information regarding Site Safety Program including but not limited to:

   a. Client Requirements

   b. URS HSE Program

   c. Site Hazard Communication Program

   d. Site Emergency Action Plan

   e. Any additional safety information from other contractors or subcontractors working on the site.

2. Provide the SSR with the name of the URS project or site contact and alternate for addressing site health and safety issues.

3. Require the participation of subcontractors in all Site Safety Briefings.

4. Require subcontractor compliance with all safety directives and/or stop work orders issued by the URS site representatives.

5. Require the subcontractor to notify the URS project or site manager when they will utilize short service employees (i.e., employees with less than six months of experience) to perform on-site activities. The URS project or site manager must approve the use of any short service employees by the subcontractor prior to mobilization. Site management will interact with the short service employee to verify their level of competency.

E. Subcontractor Safety Performance

1. To the extent reasonable in light of URS' scope of work under the client contract, visit the site and periodically observe subcontractor's operations (i.e., conduct spot checks) to assess whether subcontractor appears to be conducting their operations in accordance with applicable health and safety requirements. Periodically review any required subcontractor health and safety written documentation for compliance with applicable requirements.

2. In the event that unsafe acts or unsafe conditions are observed, immediately stop work, and bring them to the attention of the SSR for resolution.

3. Investigate all injuries/illnesses related to subcontractor operations to identify causes and effect corrective actions.

4. In the event of serious and/or continuing subcontractor breaches of applicable health and safety requirements, contact legal counsel to assess whether formal contractual action is appropriate under the subcontract.

5. Once a job is completed, a subcontractor's safety performance should be reviewed and feedback provided to subcontractor management.

F. Subcontractor Database

1. A database is available to store Attachment 046-1 NA completed by subcontractors. The database is available to all URS Lotus Notes users.

2. A RBU or Regional HSE Manager can upload completed Attachment 046-1 NA. Contact your Office HSE Representative or Regional HSE Manager for information on how to access the database.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Subcontractor Health and Safety Evaluation Form (Attachment 046-1 NA)

B. Applicable and current Insurance Certificates

C. Names and telephone numbers of SSR for each subcontractor

D. Verification of Health and Safety documents transmitted to subcontractors and received from subcontractors

E. Identified safety deficiencies as applicable for subcontractors and verification of correction of conditions

F. All other safety related documentation between URS and subcontractor such as training certifications, etc.

G. Subcontractor safety plan, incident reports, and resolution reports.

6. Resources

A. “Occupational Injury and Illness Rates by SIC,” Bureau of Labor Statistics, U. S. Department of Labor (http://www.bls.gov/iif/oshsum.htm)

B. Managing Subcontractor Safety, Prepared by The Construction Industry Institute, Safety Task Force, Publication 13-1, The University of Texas at Austin, Austin, Texas, 1991 (http://www.construction-institute.org/)

C. American National Standard Construction and Demolition Operations—Safety and Health Program Requirements for Multi-Employer Projects, ANSI A10.33-1992, National Safety Council, Itasca, Illinois 60143-3201 (http://www.nsc.org)

D. "Liability, OSHA, and the Safety of Outside Contractors," Professional Safety, American Society of Safety Engineers, January 1993 (http://www.asse.org)

E. "Proactive Construction Management; Dealing With the Problem of Subcontractor Safety," Professional Safety, American Society of Safety Engineers, January 1990 (http://www.asse.org)

F. Attachment 046-1 NA – Subcontractor Safety Evaluation Form

G. Attachment 046-2 NA – Subcontractor Evaluation Criteria

H. Attachment 046-3 NA – Subcontractor Variance Form

URS	Health, Safety and Environment **SUBCONTRACTOR SAFETY EVALUATION FORM**	Attachment 046-1 NA Issue Date: July 1999 Revision 8: September 2011

It is the policy of URS to provide a safe and healthful environment for all of its employees through the prevention of occupational injuries and illnesses. As such, URS considers safety as paramount and requests the following information of all subcontractors.

Company Name: _____ Date: _____

Address: _____ Contact Name: _____

_____ Title: _____

City: _____ Telephone: _____

State/Province: _____ Fax: _____

Zip/Postal Code: _____ Email: _____

Type of services performed: _____

Has your company previously performed work as a subcontractor to URS? ☐ Yes ☐ No

If "Yes" explain the nature of the work, project location, and project date, and URS Project Manager and telephone number.

_____

_____

_____

_____

_____

_____

How many years has your organization been in business under your firm's name? _____

If applicable, what was your organization's previous name(s)? _____

1. WORKERS' COMPENSATION EXPERIENCE INFORMATION

(United States Only)

Insurance Carrier(s): _____

Contact for Insurance Information: _____

Title: _____ Telephone: _____ Fax: _____

A. For U.S. operations - List your firm's Interstate Worker Compensation Experience Modification Rate (EMR) for the three most recent years: (Information is available from your workers compensation insurance carrier.)

   For international operations - List the applicable performance rating (e.g., NEER Performance Index in Canada) for your company.

Year	EMR Interstate (or international equivalent)
_____	_____
_____	_____
_____	_____

B. We require verification of your EMR (or international equivalent). Please attach the endorsement page from your policy listing your rating, or have your insurance carrier or broker provide this information on their letterhead.

C. If your rating exceeds 1.0 for any one or more years above, please explain:

Comments: _____

_____

_____

_____

2. SAFETY PERFORMANCE

A. Please consolidate your firm's injury and illness data for the last 3 years and complete the table below. The information provided must be for your company as a whole, not an individual office location. **For U.S. operations, provide copies of your OSHA 300 and 300A logs for the last 3 years.**

	YEAR	YEAR	YEAR
A. Average Number of Employees			
B. Number of Fatalities			
C. Number of cases that involved days away from work, or cases with job transfer or restriction, or both			
D. Other Recordable Cases – Medical Only (Number of cases without lost or restricted workdays)			
E. Total Recordable Cases			
F. Total hours worked			
G. Total Recordable Incident Rate $\frac{\text{(E above) x 200,000}}{\text{Employee Hours Worked (Given Year)}}$			
H. Lost Workday Case Incident Rate $\frac{\text{(C above) x 200,000}}{\text{Employee Hours Worked (Given Year)}}$			

B. For each fatality, please attach a description of the accident, including cause, lessons learned, actions taken resulting from that fatality, actions taken to prevent future fatalities, and corporate management summary of their actions and attitudes.

C. Has your company been issued any health and safety related citations/orders from any federal, state, province, or local regulatory agency during the past 3 years? ☐ Yes ☐ No

If "Yes", please explain the nature of the citation/order, classification, and final fine (if applicable) in an attachment to your evaluation form submittal.

3. RISK MANAGEMENT / INSURANCE DATA

A. Are you able to provide URS with insurance certificates naming URS, and if requested, URS' client as an additional insured? ☐ Yes ☐ No

B. Please provide proof of current Workers' Compensation and Employer's Liability Insurance coverage or proof of exemption. (For U.S. operations, *attach certificate naming URS as Additional Insured*).

4. HEALTH AND SAFETY PROGRAM

A. Does your company maintain a written Health and Safety program? ☐ Yes ☐ No
If "Yes," please include a copy of the Table of Contents.

B. Is your company capable of preparing safety procedures specific to the work proposed for this project? ☐ Yes ☐ No

C. Does your firm have a safety officer? ☐ Yes ☐ No
If "Yes," please provide name and telephone number.

Name: _____ Telephone: _____

D. Do you hold jobsite safety meetings?

1. How Often?

Daily ☐ Weekly ☐ Bi-Weekly ☐ Monthly ☐ Less Often, As needed ☐

2. Are the health and safety meetings documented? ☐ Yes ☐ No

E. Does your firm have the following policies/procedures? *If "Yes," please provide copies of the policies/procedures.*

1. Stop Work? ☐ Yes ☐ No
2. Short Service Employee? ☐ Yes ☐ No
3. Fitness for Duty? ☐ Yes ☐ No

F. Is a program in place for the reporting and correction of workplace hazards? ☐ Yes ☐ No

G. Are workers encouraged to intervene when unsafe conditions are observed? ☐ Yes ☐ No

H. Have the safety and health hazards associated with your job activities been identified? ☐ Yes ☐ No

1. Has a risk assessment been performed on these hazards? ☐ Yes ☐ No

5. ACCIDENT/INCIDENT REPORTING, INVESTIGATION, AND INJURY MANAGEMENT

A. Does your company have a process in place for immediate reporting, investigation, and follow-up of incidents, near-misses and occupational injuries? ☐ Yes ☐ No

If "Yes," who receives copies of the report? (Job Title) _____

(Job Title) _____

(Job Title) _____

B. Who is responsible for investigation and completion of your incident report forms? (Job Title) _____

Please provide your company's incident reporting procedures.

Please provide a copy of an investigation report conducted within the last year.

C. Does your company have an injury management procedure? ☐ Yes ☐ No
If "Yes," provide a copy of the injury management procedure.

D. Does your injury management procedure include the use of occupational clinics (for non-critical injuries) as a preferred method of medical care? ☐ Yes ☐ No

E. Does your company have a nurse or doctor on staff? ☐ Yes ☐ No

F. Does your company use a third party to provide medical advice to injured employees? ☐ Yes ☐ No

If "Yes," which third-party company is used? _____

6. HEALTH AND SAFETY TRAINING

A. Do you have or provide company paid safety/health training to your employees? ☐ Yes ☐ No

B. Does your company have a formal safety orientation program for new employees? *If "Yes," submit a copy for evaluation.* ☐ Yes ☐ No

Are records kept? ☐ Yes ☐ No

If "Yes," who conducts the orientation? (Job Title) _____

If "No," how are new employees informed of safety policies and procedures and expectations?

C. Do you have additional safety and health training for newly hired or promoted foremen/superintendents? ☐ Yes ☐ No

Topics Covered:

D. Do you maintain a record of all employees' training? ☐ Yes ☐ No

E. Are your employees enrolled in a Defensive Driving Training Program? ☐ Yes ☐ No

If "Yes," describe the training, including the training provider, who receives the training, and course length.

Please provide a copy of training records from a recent HSE training course.

7. MEDICAL / DRUG TESTING

A. Does your company have a Drug/Alcohol policy or program? ☐ Yes ☐ No

If "Yes," does your drug and alcohol program include the following:

Pre-employment testing ☐ Yes ☐ No

Testing for Cause ☐ Yes ☐ No

Post-accident testing ☐ Yes ☐ No

Random testing ☐ Yes ☐ No

B. Does your company have an ongoing medical surveillance program as required by applicable governmental regulations? ☐ Yes ☐ No

Do you conduct medical examinations for:

Pre-employment ☐ Yes ☐ No

Pre-placement Job Capability	☐ Yes ☐ No
Hearing Function (Audiograms)	☐ Yes ☐ No
Pulmonary	☐ Yes ☐ No
Respiratory	☐ Yes ☐ No

8. COMPLIANCE ASSURANCE

A. Does your company conduct job site safety inspections? ☐ Yes ☐ No

1. How often? _____
2. Who conducts the inspection? (Job Title) _____
3. Who receives the reports? (Job Title) _____
4. Are inspections documented? *If "Yes," provide an example.* ☐ Yes ☐ No

Comment on any other areas of your company's safety program and policies that you think will be appropriate in our evaluation.

VERIFICATION OF DATA

Please have an officer of the Company sign below certifying that the information provided in this document is current and correct. Misrepresentation of data requested is grounds for immediate termination of contracts and disqualification from future consideration.

Name _____ Title _____

Signature _____ Date _____

REQUIRED INFORMATION SUBMITTAL

Please provide copies of the following documents with the completed evaluation form. **If the following information is not included, provide a written reason for the failure to do so.**

- ☐ EMR documentation, or international equivalent, from your insurance carrier
- ☐ U.S. Only - OSHA 300 and 300A Logs (Past 3 Years) – *Employee names must be removed.*
- ☐ Description for any fatalities (if applicable)
- ☐ Insurance Certificate(s) – *Naming URS as Additional Insured*
- ☐ Safety, Health, and Environmental Program (Table of Contents)
- ☐ Stop Work, Short Service Employee, Fitness for Duty Policies/Procedures
- ☐ Accident/Incident Reporting Procedure
- ☐ Example of an Investigation Report conducted within the past year
- ☐ Injury Management Procedure
- ☐ Safety, Health & Environmental Orientation for New Hires (Outline)
- ☐ Example of Safety, Health and Environmental Training Records
- ☐ Example of Job Site Safety Inspection conducted within the past year

THIS PAGE IS TO BE COMPLETED BY URS CORPORATION.

Subcontractor Name: _____

Project or Site Manager Evaluation:

Pass ☐ Subcontractor meets the criteria established in Attachment 046-2 NA, and no further action is required.

Fail ☐ Subcontractor does not meet the criteria established in Attachment 046-2 NA. If a unique business need exists, then a subcontractor variance must be initiated using Attachment 046-3 NA. The variance must be submitted to a Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager for evaluation.

Project or Site Manager Name: _____

Signature: _____

Date: _____

Prior to engaging a subcontractor on a project, Project Managers are required to ensure that the contractor has an effective safety program, is capable of conducting its operations in a safe manner, and has appropriate insurance coverage. The following criteria shall be followed in determining whether the subcontractor may be used on a URS Corporation project.

Note: Some questions/answers (Sections 4 through 8) from Attachment 046-1 NA are not discussed in the evaluation criteria below. These questions are asked and the answers are intended to help the Project Manager understand the safety culture and/or safety priority of the subcontractor.

GENERAL INFORMATION

If subcontractor has performed work for URS previously, check safety performance history with previous URS Corporation Project Manager.

The numbers in this section directly correspond to the questions in Attachment 046-1 NA.

WORKERS' COMPENSATON EXPERIENCE INFORMATION

1.A. For any EMR, or international equivalent, listed as greater than 1.0, the contractor has failed the sub-evaluation. Further consideration may not occur without referral to a URS Regional, or Strategic Business Unit (SBU) Health, Safety, and Environment (HSE) Manager in your Region for further assessment.

If all EMRs listed are 1.0 or below, continue with the evaluation.

SAFETY PERFORMANCE

2. For any Total Recordable Incident Rate (line G in table) listed as greater than 4.0, the subcontractor has failed the evaluation. Further considerations may not occur without referral to a URS Regional or SBU HSE Manager in your Region for further assessment.

If the Total Recordable Incident Rates are at or below 4.0, continue with the assessment.

2.B. If the contractor has had a fatality, further consideration may not occur without referral to a URS Regional or SBU HSE Manager in your Region.

2.C. In the U.S., determine the subcontractor's citation history at http://osha.gov/pls/imis/establishment.html. Query Case Status Open and Closed. Compare the published data to the subcontractor questionnaire. The subcontractor must explain any discrepancies.

For international operations, consult a URS Regional or SBU Manager to evaluate citations/orders a subcontractor has disclosed.

Look for willful, serious, and repeat violations. If they suggest a problem, request information and refer to a URS Regional or SBU HSE Manager in your Region for further assessment.

RISK MANAGEMENT/INSURANCE DATA

3.A. The ability to provide Insurance Certificates naming URS Corporation as an additional insured is required. Refer any questions to the URS Legal Department.

3.B Proof of Workers' Compensation Insurance (or proof of exemption) is required. Refer any questions to the URS Legal Department.

HEALTH AND SAFETY PROGRAM

For Sections 4 through 8, if a subcontractor answers 'No' to any of the questions, the Project Manager needs to consider the type of work the subcontractor will be performing (e.g. HAZWOPER work required medical surveillance exams) to determine if the answer is acceptable.

4.A. A "No" answer should be referred to a URS Regional or SBU HSE Manager in your Region for further assessment. For small subcontractors, a 'No' answer may be acceptable with good incident and insurance rate statistics. Generally, some minimal program is expected depending on the breadth and complexity of the work. Contact a URS Regional or SBU HSE Manager in your Region for further assessment if you have any questions or doubts.

4.B. It is expected that a subcontractor being hired to perform services on the project site should be the best prepared to address safety issues for their operations, especially when specialty work is being conducted, or for work in which the subcontractor possesses superior knowledge of their operations.

A "No" answer should be referred to a URS Regional or SBU HSE Manager in your Region for further assessment.

Exception:

If the subcontractor does not meet the other requirements outlined above, the decision will be that the subcontractor will not be used. However, if a unique business need exists (e.g., subcontractor is a specialty subcontractor), the Project Manager should initiate a Subcontractor Variance (Attachment 046-3 NA). The Subcontractor Variance must be approved by a Regional or SBU HSE Manager.

URS	Health, Safety and Environment **SUBCONTRACTOR VARIANCE FORM**	Attachment 046-3 NA Issue Date: July 1999 Revision 8: September 2011

Subcontractor Name: _____

Project or Site Location: _____

Description of Work to be Performed:

_____

_____

_____

_____

_____

Explain any of the following conditions that apply to the subcontractor:

- EMR greater than 1.0
- TRIR greater than 4.0
- Fatalities within the past 3 years
- Willful, serious, or repeat OSHA citations

_____

_____

_____

_____

_____

_____

_____

_____

Why should we use this subcontractor?

_____

_____

_____

_____

_____

_____

_____

Have other similar subcontractors been evaluated? If so, please explain.

Mitigations by URS to manage the risks.

Review:

Project or Site Manager Requesting Variance	**HSE Manager Approval**
Name:	
Date:	
Signature:	

URS SAFETY MANAGEMENT STANDARD

Injury / Illness / Incident Reporting & Notifications

1. Applicability

This standard applies to the operations of the Infrastructure & Environment and Federal Services businesses of URS Corporation (URS) and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to provide guidance for the timely reporting of work-related injuries, illness, and incidents. This procedure also defines incident notification procedures for URS employees. For incidents involving motor vehicles, the reporting and notification requirements of SMS 057 – Vehicle Safety Program – may also apply.

For significant incidents (e.g., fatality, serious injury, injury to members of the public), SMS 066 – Incident Investigation – is also required.

Note that this standard will also be used for investigation of critical injuries as defined by Canadian provincial regulations. See Supplemental Information A for definitions of critical injuries.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Reporting: All employees must immediately notify their appropriate level of management (line, project, and/or office) of a reportable incident. A reportable incident includes the following:

1. An injury or illness to any URS employee or subcontractor, even if the injury does not require medical attention.
2. An injury to a member of the public, or clients, occurring on a URS-controlled work site.
3. Illness resulting from suspected chemical exposure.
4. Chronic or re-occurring conditions such as back pain or cumulative trauma disorders (e.g., carpal tunnel syndrome).
5. Fire, explosion, or flash.

6. Any vehicle accidents occurring on site, while traveling to or from client locations, or with any company-owned, rented, or leased vehicle (including personal vehicles used for company business). If the vehicle accident involves injury, complete both 049-1 NA and 057-1 NA. If the vehicle accident does not involve injuries, complete 057-1 NA.

7. Property damage resulting from any URS or subcontractor activity.

8. Structural collapse or potential structural hazards.

9. Unexpected release or imminent release of a hazardous material.

10. Unexpected chemical exposures to workers or the public.

11. A safety-related complaint from the public regarding URS activities.

12. Incidents that could result in adverse public media interest concerning URS or a URS project.

13. Any incident that could or does result in an actual investigation by state, federal, provincial, or local regulatory or law enforcement agencies.

14. Any other significant occurrence that could impact safety, including a near-miss.

    Note: A near-miss is defined as an incident having the potential to cause significant injury or property damage as listed above, but did not. Examples of a near-miss include:

    a. A worker steps off a ledge, falls 3 feet (1 meter) to the floor, and is uninjured.

    b. A crane drops a 1,000-pound (454-kilogram) beam during a lift. Nobody is hurt, and no equipment is damaged.

    c. A work crew is conducting a survey along the highway. A vehicle leaves the roadway (driver asleep) and the vehicle enters the survey area at 50 miles per hour (80 kilometers per hour). The vehicle misses an employee by 3 feet (1 meter); the driver recovers control of the vehicle and leaves the area.

B. Actions: The following actions will be taken following a reportable incident:

1. Employees:

a. If necessary, suspend operations and secure and/or evacuate the area.

b. Immediately notify your supervisor and/or project manager.

c. Contact appropriate emergency services and obtain appropriate medical attention, as required or directed by your supervisor. For additional information, refer to SMS 065 – Injury and Claims Management.

d. Record information pertaining to the incident (e.g., time, date, location, name and company of person(s) involved, witnesses, description of event, and actions taken) and initiate Attachment 049-1 NA – Incident Report Form for the appropriate business (i.e., Infrastructure & Environment or Federal Services). (Note: The international operations of the Infrastructure & Environment business will complete an on-line Incident Report instead, using the appropriate Health, Safety, and Environment (HSE) and Quality Improvement database. Federal Services will submit the report in G-SMART.)

e. Infrastructure & Environment employees shall submit 049-1 NA to the URS Occupational Health Manager (OHM) within 24 hours of the incident. Federal Services shall enter the incident into G-SMART within 24 hours of the incident.

f. Assist with incident investigation as directed by management. Investigations shall be completed within 7 days of an incident.

g. Implement corrective actions as directed by management.

h. *Do not* discuss the incident with members of the news media or legal representatives (except URS legal counsel or your personal legal advisor) unless directed to do so by URS management.

i. *Do not* make statements pertaining to guilt, fault, or liability.

2. Line/Project Management Responsibilities (U.S. and Mexico Operations)

   a. For instances involving employee or subcontractor death or hospitalization, or equipment damage to Company or

customer equipment valued at more than $100,000 (USD), immediately notify by telephone or other direct means URS Operations and the HSE team in the order listed below. If any level of contact is unsuccessful, continue down the list in sequence. After notification has been made, a detailed follow-up, via email, is required.

i. Appropriate corporate leadership for the affected program up to the Regional Business Unit (RBU) or Strategic Business Unit (SBU) Vice President for the affected Operations.

ii. The URS OHM.

iii. Appropriate RBU and SBU HSE Manager for the affected Operation.

Follow-up notification should be made by forwarding Attachment 049-1 NA to the OHM within 24 hours. See Attachment 049-1 NA for methods of distribution. Also, assure copies of the report are distributed as outlined on the form. For the international operations of the Infrastructure & Environment business, this follow-up notification is not required.

Business Vice President/Director of HSE (or designee) will make notification to federal and state authorities as appropriate.

b. For minor incidents involving only first aid treatment, minor damage to vehicle or equipment, etc., make notifications to a supervisor and OHM immediately and submit Attachment 049-1 NA. See Attachment 049-1 NA for methods of distribution. Also, assure copies of the report are distributed as outlined on the form.

c. For a near-miss incident, complete an on-line near miss report, using the appropriate Health, Safety, and Environment (HSE) database. If needed, contact the Regional/SBE/SBU HSE Manager to determine which database is appropriate.

d. Within 7 days of an incident, review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.

e. Discuss with department or project staff the circumstances surrounding the incident and corrective actions taken.

3. Line/Project Management Responsibilities (Canadian Operations)

   a. If notified of an incident that is a critical injury (see Supplemental Information A for definition), serious accident, or other significant consequence:

      i. Immediately contact URS Canada Human Resources at (905) 882-4401.

      ii. Review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.

      iii. Follow up notification by completing, signing, and delivering/faxing Attachment 049-1 NA to URS Canada Human Resources within 24 hours.

      iv. URS Canada Human Resources will make notification to provincial authorities as appropriate.

   b. If notified of an incident that is not a critical injury, nor a serious accident or other significant consequence:

      i. Review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.

      ii. Complete, sign, and deliver/fax Attachment 049-1 NA to URS Canada Human Resources within 24 hours.

      iii. URS Canada Human Resources will make notification to provincial authorities as appropriate.

   c. If notified of a near-miss incident:

      i. Review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.

ii. Complete an on-line near miss report, using the appropriate Health, Safety, and Environment (HSE) database. If needed, contact the Regional/SBE/SBU HSE Manager to determine which database is appropriate.

d. Discuss with department or project staff the circumstances surrounding the incident and corrective actions taken.

4. Local Office, Project, and/or Certified HSE Representative

   a. Assist with incident evaluation.

   b. With management, identify cause(s) of incident and identify corrective actions needed to avoid recurrence.

   c. Review injury/incident report or the near-miss report for completeness and accuracy. Ensure the reports are distributed properly.

   d. Ensure notifications are made in a timely manner.

   e. Ensure that the injured employee is properly counseled/advised as directed by SMS 065 – Injury and Claims Management. Communicate with the OHM.

   f. Note that “Certified” HSE Representatives are those who have received special training in occupational safety and health and have been certified by the Ontario Workplace Safety and Insurance Board. Certified HSE Representatives should be used at larger Canadian project sites where joint worker/employer safety committees are developed.

5. Occupational Health Manager

   a. Report work-related injuries and illness to workers’ compensation carrier.

   b. Ensure that the employee’s injury is managed in accordance with SMS 065 – Injury and Claims Management. Provide guidance for the affected office, project, and/or Certified HSE Representative.

6. URS Human Resources (Canadian Operations Only)

   a. Receive incident notifications from staff.

b. For incidents involving critical injuries, serious accidents, or other significant consequences:

    i. Verbally notify the Office Manager immediately, via cell phone if necessary.

    ii. Notify the Certified HSE Representatives (management and worker) as soon as possible (where necessary).

    iii. Notify the OHM as soon as possible. Notification to the OHM should in no case occur later than the end of the work shift.

    iv. Follow up notification by receiving from staff and forwarding Attachment 049-1 NA to the OHM within 24 hours. Also, assure copies of the report are distributed as outlined on the form.

c. For minor incidents involving only first aid treatment, minor damage to vehicle of equipment, etc.:

    i. Notify the OHM as soon as reasonable during normal business hours.

    ii. Receive from staff and forward Attachment 049-1 NA to the OHM within 24 hours.

    Ensure copies of the report are distributed as outlined on the form.

d. Report work-related injuries and illness to the Workplace Safety and Insurance Board or appropriate workers' compensation carrier and other provincial or federal authorities as appropriate.

e. Ensure, in conjunction with the Office HSE Representative, that the employee's injury is managed in accordance with SMS 065 – Injury and Claims Management. Provide guidance for the affected Certified or Project HSE Representative.

7. Business HSE Management

    a. Notify URS management of any significant occurrence, including lost-time injuries, deaths, or other serious result or circumstance.

    b. The OHM will review all reported incidents to determine OSHA reporting and recording requirements with input from the appropriate Business HSE Manager. For a determination of recordability in those infrequent instances where there is not a clear answer, the Business Vice President/Director HSE will make the final determination. All decisions will be based strictly on current U.S. Occupational Safety and Health Administration (OSHA) regulations.

    c. Official records (including required reports and logs for all reported incidents) will be maintained at one central location by the OHM.

    d. Where an incident has resulted in an injury or illness and that injury or illness is determined to be recordable in accordance with OSHA recordkeeping requirements, the OHM shall enter pertinent information related to the case into URS' recordkeeping documents no later than seven days after the event.

    e. Each January, the OHM will prepare and distribute the appropriate government injury/illness reports to each URS establishment. These reports will summarize all required government information for incidents that occurred during the preceding calendar year. Reports, where required by regulation, will be signed by an officer of the company.

8. If an incident occurs on a client-controlled site, Project Management will ensure that appropriate client notifications are made within the required time frames. These notification requirements will be documented in project-specific planning documents.

9. All notifications to external agencies (e.g., OSHA) will be made by the Business Vice President/Director HSE (or designee) in accordance with regulatory requirements.

5. Documentation Summary

File Attachment 049-1 NA in the appropriate safety files. Note: The international operations of Infrastructure & Environment will use the appropriate HSE and Quality Improvement database.

6. Resources

A. Occupational Health Managers (OHMs)

Infrastructure & Environment	Federal Services
Jeanette Schrimsher, RN COHN-S	**BJ Heinrich, RN, COHN-S/CM, STS**
(866) 326-7321 (Toll Free-U.S.)	(877) 878-9525 (Toll Free)
(512) 656-0203 (Cell)	(512) 656-8502 (Cell)
(512) 419-6413 (Confidential Fax)	(512) 419-5252 (Confidential Fax)

B. SMS 057 – Vehicle Safety Program

C. SMS 065 – Injury and Claims Management

D. SMS 066 – Incident Investigation

E. Attachment 049-1 NA IE – Infrastructure & Environment Incident Report Form

F. Attachment 049-1 NA FS – Federal Services Incident Report Form

URS	Health, Safety and Environment **INFRASTRUCTURE & ENVIRONMENT INCIDENT REPORT FORM**	Attachment 049-1 NA IE Issue Date: May 2001 Revision 10: January 2011

ADMINISTRATIVE INFORMATION

Database Office ID:

Group: ☐ East ☐ West ☐ International

Region:

Client Sector:

NOTIFICATION / LOCATION DATA

Site or Office:		Customer/Client Name:
Date of Event:	Time of Event:	Time Employee Started Work:
Date Supervisor Notified:	Time Supervisor Notified:	Name of Employee Submitting Report:
Client Notification Completed (if required)? ☐ Yes ☐ No		Project/Order Number:

TYPE OF EVENT (Check all applicable items)

Illness (Check one)
- ☐ Employee
- ☐ Subcontractor
- ☐ Other

Injury (Check one)
- ☐ Employee
- ☐ Subcontractor
- ☐ Other

NAME of Injured/Ill Employee:

_____

Property Damage (Check one)
- ☐ Company (owned, leased, rented)
- ☐ Client/Customer
- ☐ Other

Vehicular Accident (Check one)
- ☐ Company (owned, leased, rented)
- ☐ Client/Customer
- ☐ Other

- ☐ Fire
- ☐ Explosion
- ☐ Flash
- ☐ Other (describe): _____

EVENT SUMMARY

Briefly state the facts contributing to the event. Attach additional pages and supporting information, as necessary. Avoid use of employees' names. *If this is an injury or illness, supply additional information as required on Page 2.*

ROOT CAUSE DETERMINATION

Root Cause (State the root or primary cause, then select the most appropriate cause category from Page 4):

CONTRIBUTING FACTORS

Contributing Causes (Describe any contributing causes, then select the applicable cause categories from Page 4):

CORRECTIVE ACTIONS

List methods of preventing/avoiding this type of incident in the future. There must be one or more corrective actions for each root cause.

FOR INJURIES/ILLNESS ONLY

Employee Information

What was the employee's location when the injury/illness occurred (include city and state)?

What was the employee doing when the injury/illness occurred? Describe the activity as well as the tools, equipment, or material you were using.

What happened? Describe how the injury/illness occurred.

What was the injury or illness? Describe the part of the body that was affected and how it was affected. Use the Incident Pick List on Page 4 to aid in your description.

What level of medical treatment was received? ☐ First Aid ☐ Clinic/Physician ☐ Emergency Room ☐ Refused/None

List witnesses and/or other employees involved. Attach statements where applicable.

Do you feel URS provided you with the proper safety instructions (including PPE usage) for the task you were performing at the time of the incident? ☐ Yes ☐ No (Explain below)

How do you think this type of incident could be prevented or avoided in the future?

Mark all PPE being used when the incident occurred:

☐ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Safety Shoes
☐ Half-face Respirator	☐ Full-face Respirator	☐ Protective Gloves	☐ Chemical Gloves
☐ Hard Hat	☐ Hearing Protection	☐ Other (describe):	

Injured/Ill Employee Signature: _____ Date: _____

Name of Injured/Ill Employee (Please print clearly): _____

Employee Number: Contact Phone Number:

Additional Sheets Attached? ☐ Yes ☐ No (Include photos, maps, and/or diagrams when possible.)

Supervisor Information

Describe any additional/different details other than those provided on the previous page. Avoid use of employees' names, where possible. Attach additional sheets, drawings, or photos, as needed.

Were the required tools available at the time of the injury? ☐ Yes ☐ No (Explain below)

At the time of the injury, was the employee using the correct tools for the task? ☐ Yes ☐ No (Explain below)

Was the employee sent for substance screening? ☐ Yes ☐ No (Explain below)

How do you think this type of incident could be prevented or avoided in the future?

Supervisor Signature: _____ Date: _____

Supervisor Name (Please print clearly):

Project Manager Comments

Signature: _____ Date: _____

Project Manager Name (Please print clearly):

HSE Representative Comments

Signature: _____ Date: _____

HSE Representative Name (Please print clearly):

Site/Office Manager Comments

Signature: _____ Date: _____

Site/Office Manager Name (Please print clearly):

ROOT CAUSE CATEGORIES

Check all cause categories that apply to the incident, then choose the root cause (or causes) category from the boxes checked. Enter where indicated on Page 1.

PHYSICAL/ENVIRONMENT

- ☐ Extreme cold/ice
- ☐ Extreme heat
- ☐ Working/walking surface unfavorable
- ☐ Inadequate lighting
- ☐ Excessive noise
- ☐ Chemical exposure
- ☐ Biological hazards (animal/plant)
- ☐ Other weather
- ☐ Other

SYSTEMS

- ☐ Inadequate training/instruction
- ☐ Inadequate management system
- ☐ Missing or incorrect procedures or planning
- ☐ Inadequate management emphasis on safety
- ☐ Corporate/operations procedures not communicated
- ☐ Other

PHYSICAL/EQUIPMENT, TOOLS, and PPE

- ☐ Failure due to improper maintenance
- ☐ Failure due to improper design
- ☐ Other

HUMAN

- ☐ Failure to adequately recognize hazards
- ☐ Failure to follow procedures
- ☐ Failure to recognize condition change
- ☐ Impaired state (drug, alcohol, other)
- ☐ Physical/psychological limitation for task
- ☐ Inadequate communications (i.e., supervisor/employee)
- ☐ Carelessness by affected person(s)
- ☐ Carelessness by other person(s)
- ☐ Improper selection of equipment/tool/PPE
- ☐ Improper use of equipment/tool/PPE
- ☐ Other

INCIDENT PICK LIST

NATURE OF INJURY/ILLNESS

- ☐ Amputation
- ☐ Burn
- ☐ Concussion
- ☐ Contusion/Abrasion
- ☐ Corneal Abrasion
- ☐ Dental
- ☐ Dermatitis
- ☐ Fatality
- ☐ Fracture
- ☐ Hearing Loss
- ☐ Heat-Related Illness
- ☐ Hernia
- ☐ Insect Bite
- ☐ Laceration/Puncture
- ☐ Other
- ☐ Respiratory Disorder
- ☐ Sprain/Strain

BODY PART

- ☐ Ankle/Foot
- ☐ Arm/Elbow
- ☐ Back
- ☐ Eyes
- ☐ Head
- ☐ Hip/Groin
- ☐ Internal Organs/Blood
- ☐ Leg/Knee
- ☐ Multiple Body Parts
- ☐ Neck/Cervical
- ☐ Respiratory
- ☐ Shoulder
- ☐ Trunk
- ☐ Wrist/Hand

DIRECT CAUSE

- ☐ Animal/Insect Contact
- ☐ Biological Agent
- ☐ Caught Between
- ☐ Ergonomics/Repetitive Trauma
- ☐ Exposure To
- ☐ Miscellaneous
- ☐ Motor Vehicle Wreck
- ☐ Overexertion
- ☐ Poisonous Plant
- ☐ Slips/Trips/Falls
- ☐ Struck Against
- ☐ Struck By

DISTRIBUTION

NOTE: *The preferred method of distribution of this report is by e-mail attachment either in Word, or scanned to PDF. Forward URS incident reports to the OHM at incidentreport@urscorp.com. Alternatively, reports may be faxed to 512.419.6413. Initial reports must be submitted to the OHM within 24 hours of incident. More detailed follow-up reports may be submitted later.*

Additional Distribution: ☐ Program/Client Sector Manager ☐ Regional HSE Manager ☐ Office HSE Representative

Name of Injured Employee:		Name of Individual Providing Statement:	
Date of Injury:		Approximate Time of Injury:	
Body Part(s) Injured:		This is a statement from:	☐ Injured Employee ☐ Supervisor ☐ Witness

Describe the incident in as much detail as possible (attach additional pages if needed).

Signature of Individual Providing Statement:		Printed Name of Individual Providing Statement:	
Date:		Contact Phone Number:	

DISTRIBUTION

E-mail to *incidentreport@urscorp.com* or fax to *512.419.6413.*

Per the Ontario Occupational Health and Safety Act, R.R.O. 1990, Regulation 834, a Critical Injury is defined as an injury of a serious nature that:

a. Places life in jeopardy;

b. Produces unconsciousness;

c. Results in substantial loss of blood;

d. Involves the fracture of a leg or arm but not a finger or toe;

e. Involves the amputation of a leg, arm, hand or foot, but not a finger or toe;

f. Consists of burns to a major portion of the body; or

g. Causes the loss of sight in an eye.

Per the British Columbia Workers Compensation Act, RSBC 1996, Chapter 492, a Critical Injury is defined as injury of a serious nature that includes the following:

a. Any incident that kills, causes risk of death, or seriously injures a worker;

b. Any blasting accident that results in injury, or unusual event involving explosives;

c. A diving incident that causes death, injury, or decompression sickness requiring treatment;

d. A major leak or release of a dangerous substance;

e. A major structural failure or collapse of a structure, equipment, construction support system or excavation; and any serious mishap.

URS SAFETY MANAGEMENT STANDARD

Hand Safety

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where the potential for hand injuries is present.

Appropriate gloves must be worn when persons work with materials or equipment that presents the potential for hand injury due to sharp edges, corrosives, flammable and irritating materials, extreme temperatures, splinters, etc.

2. Purpose and Scope

This standard is intended to protect employees from activities that may expose them to injury. This standard provides information on recognizing those conditions that require personal protective equipment (PPE) or specific work practices to reduce the risk of hand injury.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Hazard Assessment

1. Perform hazard assessments for those work activities likely to require PPE.

   a. Use the PPE Hazard Assessment Certification Form – Attachment 029-1 NA to perform the assessment. The Hazard Assessment Certification Form will accompany URS personnel at jobsites for use in the event of a job or task change.

   b. Reevaluate completed hazard assessments when the job or task changes.

2. If possible, eliminate the hazards identified through engineering or administrative controls. Examples of controls are chemical substitution, machine guarding, and use of different tools.

3. Select PPE that will protect employees if hazards cannot be eliminated.

   a. Review Material Safety Data Sheets for project or task-specific chemicals to determine appropriate PPE. If needed, consult with a URS safety representative for assistance.

b. Review glove manufacturer recommendations for both physical and chemical protection.

c. Obtain gloves of the correct size for project field staff.

d. When both chemical and physical protection is of concern, wear the chemical protection gloves (e.g., nitrile) inside the physical protection gloves (e.g., leather, Kevlar®).

e. Latex gloves are not recommended for chemical protection.

f. Do not wear metal or metal-reinforced gloves when working with electrical equipment or on electrical services. Proper leather and/or rubber gloves designed and tested for this purpose should be used.

4. Follow glove requirements in the project-specific safety plan.

B. Guidelines for Working With and Around Equipment (Hand Tools, Portable Powered Equipment)

1. General

a. Employees should be trained in the use of all tools.

b. Keep hand and power tools in good repair and use them only for the task for which they were designed.

c. Inspect tools before use and remove damaged or defective tools from service.

d. Operate tools in accordance with manufacturer's instructions.

e. Do not remove or bypass a guarding device for any reason.

f. Keep surfaces and handles clean and free of excess oil to prevent slipping.

g. Wear proper PPE, including gloves, as necessary.

h. Do not carry sharp tools in pockets.

i. Clean tools and return to the toolbox or storage area upon completion of a job.

j. Before applying pressure, ensure that wrenches have a good bite.

i. Brace yourself by placing your body in the proper position so you will not fall if the tool slips.

ii. Make sure hands and fingers have sufficient clearance in the event the tool slips.

iii. Always pull on a wrench, never push.

k. When working with tools overhead, place tools in a holding receptacle when not in use.

l. Do not throw tools from place to place or from person to person, or drop tools from heights.

m. Inspect all tools prior to start-up or use to identify any defects.

n. Powered hand tools should not be capable of being locked in the ON position.

o. Require that all power-fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.

p. Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.

q. Do not use cheater pipes.

r. Make provisions to prevent machines from restarting through proper lockout/tagout (refer to SMS 023 – Lockout and Tagout Safety).

2. Cutting Tools

a. Always use the specific tool for the task. Tubing cutters, snips, self-retracting knives, concealed blade cutters, and related tools are task specific and minimize the risk of hand injury. For more information about cutting tools, see Supplemental Information A.

b. Fixed open-blade knives (FOBK) are prohibited from use. Examples of fixed open-blade knives include pocket knives, multitools, hunting knives, and standard utility knives.

c. When utilizing cutting tools, personnel will observe the following precautions to the fullest extent possible:

i. Use the correct tool and correct size tool for the job.

ii. Cut in a direction away from yourself and not toward other workers in the area.

iii. Maintain the noncutting hand and arm toward the body and out of the direction of the cutting tool if it were to slip out of the material being cut.

iv. Ensure that the tool is sharp and clean; dirty and dull tools typically cause poor cuts and more hazard than a sharp, clean cutting tool.

v. Store these tools correctly with covers in place or blades retracted, as provided by the manufacturer.

vi. On tasks where cutting may be very frequent or last all day (e.g., liner samples), consider Kevlar® gloves in the PPE evaluation for the project.

vii. Do not remove guards on paper cutters.

3. Moving/Rotating Equipment

a. General Requirements for Rotating Equipment (feed augers, chippers, conveyors, etc.)

i. Never place hands, fingers, or extremities near hoppers and operational areas of machinery.

ii. When the equipment is rotating, stay clear of the rotating components and only operate equipment with proper machine guarding in place.

iii. Never clean a jammed piece of equipment unless the transmission is in neutral and the power source or the engine is off, and the moving parts of the equipment have stopped rotating. Refer to SMS 023 – Lockout and Tagout Safety.

4. Other Physical Hazards

a. Activities such as drum handling, fencing, work near razor wire, manhole cover removal, and demolition also pose hazards to hands.

b. Plan work to avoid pinch points for hands when moving drums, moving manhole covers into position, and handling other heavy objects.

c. Work handling scrap metal or other sharp edges requires proper hand PPE (Kevlar® or leather gloves).

C. Ergonomics – Hand and Wrist Care

1. Keep your wrist in neutral. Avoid using your wrist in a bent (flexed), extended, or twisted position for long periods of time. Instead try to maintain a neutral (straight) wrist position. Ergonomic tools may be needed for long-term work.

2. Watch your grip. Gripping, grasping, or lifting with the thumb and index finger can put stress on your wrist. When practical, use the whole hand and all the fingers to grasp an object.

3. Minimize repetition. Even simple, light tasks may eventually cause injury. If possible, avoid repetitive movements or holding an object in the same way for extended periods of time.

4. Reduce speed and force. Reducing the speed with which you do a forceful, repetitive movement gives your wrist time to recover from the effort. Using power tools helps reduce the force.

5. Rest your hands. Periodically give your hands a break by letting them rest briefly. Or you may be able to alternate easy and hard tasks, switch hands, or rotate work activities.

D. Biological Impacts

1. Poisonous Plants

   a. Personnel in regions where there is the potential for contact with poisonous plants should be aware of the hazard.

      i. Avoid contact with poisonous plants.

      ii. Wear appropriate PPE.

      iii. Clean hands thoroughly after contact before performing additional work tasks.

2. Further information can be obtained from SMS 047 – Biological Hazards.

E. Cleaning Hands

1. Avoid contamination of hands by proper use of gloves when contact with physical, chemical, or biological hazards is possible.

2. Use soap and water for normal hand cleaning. Do not use solvents for cleaning as they remove essential oils in the skin and may cause dermatitis. Do not use pressure washers for hand cleaning.

3. If the hands contact a corrosive (e.g., nitric acid), wash the area with water for fifteen minutes and then seek medical attention.

4. Use antibiotic ointment and skin protection on minor breaks/scratches of the skin.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Hand tool training records, as applicable.

6. Resources

A. U.S. OSHA Regulation - 29 Code of Federal Regulations (CFR) 1910.138 – Hand Protection

B. Chemical resistant glove selection: http://www.bestglove.com/

C. SMS 016 – Hand Tools and Portable Equipment

D. SMS 023 – Lockout and Tagout Safety

E. SMS 029 – Personal Protective Equipment

F. SMS 047 – Biological Hazards

G. SMS 054 – Office Ergonomics

H. SMS 056 – Drilling Safety Guidelines

7. Supplemental Information

A. Safer Alternative Tools

Types of safety knives or alternative cutting tools:

Self-retracting utility knives (brands – OLFA, Martor, Allway Tools)

Guarded utility knives (brands – The Safety Knife Co., Martor)

Shears, snips, scissors (brands – Ridgid, Craftsman, Wolfcraft)

Concealed blade cutters (brands – The Safety Knife Co., Martor)

Pipe cutters (brands – Ridgid, Empire)

Specialty cutter (brand – Geoprobe)

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

This standard is designed to ensure that employees receive appropriate, immediate, and high-quality health care services that will minimize disability, promote rapid recovery, and save lives.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility, site, or project location.

4. Requirements

A. Pre-Injury Management

The following proactive plans and procedures will be in place before an injury or illness occurs.

1. Work Site Evaluation

Project and office locations will evaluate their location for first aid and medical requirements. The following factors should be considered:

a. Types of accidents that could reasonably occur.

b. Location of local clinics and hospitals.

c. Response time for external emergency services.

d. If corrosive or hazardous materials are in use.

e. Any industry specific requirements.

f. Types of training for employees and first aid responders.

g. What first aid supplies should be available.

2. First Aid Services

   a. First Aid Responders

      There will be a sufficient number (but not less than one) of employees on each shift trained in first aid to provide adequate first response medical care available at the work site if either of these conditions exist:

         i. If life-threatening injuries can reasonably be expected, trained personnel must be available within 3 to 4 minutes. This generally means that community emergency medical services cannot be relied on since their response time is usually greater than 3 minutes.

         ii. If no life-threatening injuries can reasonably be expected, the response time for trained personnel is extended to 15 minutes.

      The trained first aid responders should be designated so that the other employees know who they are and how to contact them. The trained responders must have a current first aid certificate and be trained in Bloodborne Pathogens (see SMS 051 – Bloodborne Pathogens).

      For certain long-term, heavily staffed, or high hazard projects, URS may opt to establish a first aid station on site. It should be staffed with a person who is a nurse, Emergency Medical Technician (EMT), or Emergency Medical Technician Paramedic (EMT-P) who may practice limited treatment under the direction of a physician.

      Where clients provide the services of a first aid station, the project manager will determine the specific services provided and the administrative procedures involved. Employees requiring first aid treatment by a client-provided facility must obtain prior approval from the project manager.

   b. First Aid Kits

         i. Each site will maintain a first aid kit in accordance with Attachment 065-8 – First Aid Kit Supply List. The contents of the first aid kit will be checked prior to being sent out to each site/project and periodically thereafter to ensure that the expended items are replaced.

ii. First aid kits will be maintained in readily accessible locations on each job site. For mobile or vehicle-based operations in remote locations, first aid kits may be necessary in vehicles.

iii. Kits will be inspected prior to being sent to a work location and weekly while in use. Any items not approved for the kit will be removed during inspection.

iv. At no time will over-the-counter medications such as antacids, aspirin, cold or cough drops, or other sundry items be stored in the kits without the approval of the URS Occupational Health Nurse or a URS-approved health care professional.

c. Emergency Services

The project Health, Safety, and Environment (HSE) Representative, in conjunction with the project manager, will identify emergency service providers, including ambulance and hospital services. Each location will post a current list of emergency telephone numbers and maps to access local medical emergency providers (SMS 003 – Emergency Preparedness Plans). Advance contact with ambulance services to ensure they are familiar with location, access routes, and hospital locations is advised.

d. Eyewash and Safety Shower Facilities

A corrosive material is a highly reactive substance that causes obvious damage to living tissue. Corrosives act either directly by chemically destroying the part (oxidation) or indirectly by causing inflammation. A hazardous material is any substance or compound (including corrosives) that has the capability of producing adverse effects on the health and safety of humans. Review material safety data sheets for the health effects of compounds being used at the site to determine whether they meet the criteria defined previously.

If corrosive or otherwise hazardous materials are used, eyewash and body flush facilities must be provided. Where possible, these facilities should provide large quantities of clean water. The water source must be pressure controlled and clearly identified. Portable eyewash stations must contain a minimum of 1 gallon of potable water. See Supplemental Information A for additional guidance on eyewash and shower facilities.

e. Identification of Medical Facilities

The field and office location will identify a suitable local clinic, preferably specializing in occupational medicine, to treat nonemergency injuries and illnesses. In addition, a local hospital emergency room will be identified for treatment of life-threatening or after hours injuries. The URS Occupational Health Nurse, the Workers' Compensation Administrator, or the workers' compensation insurance carrier representative should be contacted to provide a listing of recommended medical facilities.

The project HSE Representative should visit the medical facility and meet with the medical provider to establish expectations. Clinics should be conveniently located, clean, professionally staffed, offer multiple services, and be supportive of early return to work practices.

Field/construction projects will make appropriate arrangements with local ambulance/emergency service providers prior to the start of work activities to ensure that appropriate transportation can be provided in the event of an emergency. These arrangements include establishment of an identifiable project address and emergency access point (i.e., location to meet emergency personnel).

The project HSE Representative will communicate the following with the designated hospitals/clinics:

i. Physical requirements for each trade.

ii. Policies regarding availability of suitable work for partially disabled employees.

iii. Procedures for reporting of treatment diagnosis and treatment plans to the company and its workers' compensation insurance carrier.

iv. Requirements for alcohol and substance abuse testing per company and/or client-required substance abuse policies (as needed).

B. Post-Injury Management

1. Transportation

When employees require urgent medical attention as the result of a work-related injury/illness, transportation will be provided to the doctor's office, clinic, or hospital. Employees should not be permitted to drive unless it is safe to do so.

2. Emergency Injury/Illness Treatment

   In all cases, critical injuries must be immediately referred for professional medical attention. The manner in which the referral is accomplished, and the person responsible for the referral, should be clearly defined in either a project safety plan and/or an office Emergency Preparedness Plan (SMS 003). Critical injuries/illnesses include, but may not be limited to, the following:

   a. Loss of consciousness.

   b. Unexplained chest pain.

   c. Breathing difficulty.

   d. Uncontrolled bleeding.

   e. Fractured bones.

   f. Suspected internal injuries.

   g. Suspected exposure to chemical/biological hazard.

   h. Second or third degree thermal or chemical burns (i.e., blistering).

   i. Electrocution.

   j. Unexplained change in mental state following an injury (may indicate shock or other internal injuries).

3. Nonemergency Injury/Illness Treatment

   When a work-related incident results in a noncritical injury/illness, the primary objective is to provide appropriate medical services to diagnose and treat the injury/illness. Options available to the employee and project/office management in these situations include the following:

   a. First aid treatment and/or review by a qualified first aid responder.

b. First aid treatment and/or review by a qualified first aid responder followed by a referral to an occupational health clinic.

Additional support for the employee and managers in these situations can also be obtained from a URS HSE professional.

Attachment 065-1 NA – Injury Management Procedures Flow Chart provides a flow chart to assist employees and managers in determining the most appropriate option for obtaining medical services for nonemergency injuries/illnesses.

Note: Some states allow injured workers to choose their own initial medical provider. Employees are to be cautioned that not all medical providers accept workers' compensation insurance and coverage should be verified prior to treatment if an employee lives in a state that permits him/her to elect to see their personal doctor rather than the URS-recommended physician.

C. Workers' Compensation Case Management

1. Health and Safety

a. Occupational Health Nurse/Workers' Compensation Administrator will

i. Evaluate and file workers' compensation claims for cases covered by the URS insurance program. Evaluate and provide consultation for injuries occurring in monopolistic states (Ohio, Washington, North Dakota, and Wyoming). Energy & Construction workers' compensation claims are filed by site personnel.

ii. Provide date of injury support to employees and supervisors, including monopolistic state claims.

iii. Coordinate regular follow-up of all cases, including monopolistic state claims, to ensure effective case management.

iv. Offer pre-injury consultation for offices and project sites.

v. Provide training and communication regarding the workers' compensation process.

b. The HSE Representatives will assist with the early return to work program by interfacing with the supervisor and employee to evaluate whether appropriate and safe temporary transitional work is available.

c. HSE Representatives will

i. Provide support to ensure that the requirements of this SMS are in place.

ii. Provide training on this SMS.

iii. Ensure proper reporting of incidents in accordance with SMS 049 – Injury/Illness/Incident Reporting and Notification.

iv. Ensure that requirements of this SMS are incorporated into all project health and safety plans.

2. Human Resources

Human Resources will

a. The HR Representatives will forward any external communication (e.g., clinic bills, monopolistic state forms) to the Occupational Health Nurse or Workers' Compensation Administrator upon receipt.

b. Assist with the return-to-work process, if needed.

3. Supervisor

The Supervisor (or HR or HSE Representative) will

a. For initial medical treatment, escort employee to medical treatment provider.

The supervisor (or designated HSE or HR representative) will accompany the employee to the medical treatment provider. This reduces the risk of the employee driving while injured, ensures the injured employee is treated by the correct medical provider, coordinates alcohol and drug testing when applicable, and allows for another person to describe to the medical provider how the injury occurred, the type of work activities the injured person performs, and URS' return-to-work program.

b. Sign the Medical Treatment Referral form (Attachment 065-2 NA) prior to the employee leaving the site for medical treatment (this will not be necessary in an emergency). The employee will also be given the Medical Authorization Form (Attachment 065-3 NA) to be signed with copy provided to the employee, health care provider, and Occupational Health Nurse or Workers' Compensation Administrator.

c. Provide transitional job assignments, with consultation and approval of the office manager, whenever possible to enable an injured worker to return to work (Return to Work Policy Attachment 065-4 NA). Transitional employment is defined as temporary modified or light duty work that covers the time from the injury until the release to full duty from the doctor. The return to work hierarchy includes the following:

i. Return to own job.

ii. Return to own job with accommodations/modifications.

iii. Return to another job at URS with or without accommodations/modifications.

iv. Placement in alternate jobs through telecommuting or other job assignments determined case by case.

c. Provide, when requested by the treating physician or insurance carrier, the Description of Employee's Job Duties form (Attachment 065-5 NA).

d. Maintain regular contact with employees who are temporarily disabled (contact at least weekly by phone or email).

4. Employee

The employees will

a. Report injuries immediately to their supervisors. Employees are encouraged to contact their supervisor and/or the Occupational Health Nurse or Workers' Compensation Administrator prior to seeking any medical services for nonemergency injuries and illnesses.

b. Review and comply with Attachment 065-6 – Employee's Responsibilities.

D. URS will follow the recordability requirements of U.S. Occupational Safety and Health Administration (OSHA) (29 CFR 1904 and 1952) for both U.S. and international operations.

1. For Infrastructure & Environment and Federal Services, the Occupational Health Nurse will maintain OSHA 300 logs for U.S. locations. For Energy & Construction, the Business Group HSE Managers will maintain OSHA 300 logs for U.S. locations. The OSHA 300A forms and 300 logs will be distributed to the U.S. locations each January. 300 A forms will be posted from February 1 to April 30 in a location conspicuous to all employees.

The posted 300A form must not be altered, defaced, or covered by any other materials.

2. Sites working under the U.S. Mine Safety and Health Administration (MSHA) recordkeeping requirements will meet MSHA requirements, as well as track injuries using OSHA criteria for use in company HSE statistics.

3. For Infrastructure & Environment and Federal Services, the Occupational Health Nurse will make the initial decision on recordability of an injury/illness. For Energy & Construction, the Business Group HSE Manager will make the decision on recordability of an injury/illness.

4. For Infrastructure & Environment, a recordability review committee will be appointed by the Vice President HSE to review the recordable cases on a monthly basis. The review committee (based on OSHA regulations and information regarding the case) will make the final decision on recordability.

5. The injury/illness statistics (e.g., Total Recordable Incident Rate) will be calculated monthly and reported to URS management.

6. Completed logs of recordable cases, including any regulatory required forms (OSHA 300 logs, incident report forms, etc.) will be retained at least five years following the end of the calendar year these records cover.

5. Documentation

A. The following documents will be maintained in the office/project safety file:

1. Posting of medical services providers and emergency phone numbers.

2. List of qualified first aid providers.

3. Documentation of coordination between URS and emergency service providers for field/construction projects.

4. Completed Injury/Illness/Incident Report Form (Attachment 049-1).

5. Description of Employee's Job Duties form.

6. Medical Treatment Referral form.

7. Medical Authorization Form.

B. The following documents will be maintained by the HR Representative and copied to the Occupational Health Nurse or Workers' Compensation Administrator.

1. Physician's First Report of Injury and follow-up reports.
2. Medical Treatment Referral form.
3. Medical Authorization Form.
4. Description of Employee's Job Duties form.

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.151 – Medical Services and First Aid

B. OSHA 29 CFR 1910.1030 – Bloodborne Pathogens

C. OSHA 29 CFR 1926.50 – Medical Services and First Aid

D. OSHA 29 CFR 1904 – Recording and Reporting Occupational Injuries and Illnesses

E. OSHA 29 CFR 1952 – Approved State Plans for Enforcement of State Standards

F. American National Standards Institute (ANSI) Z358.1-2004 – Emergency Eyewash and Shower Equipment

G. OSHA Instruction CPL 2-2.53 – Guidelines for First Aid Programs

H. OSHA Safety and Health Topics: Medical and First Aid

I. Red Cross Health and Safety Services – www.redcross.org/services/hss/

J. SMS 003 – Emergency Preparedness Plans

K. SMS 024 – Medical Screening and Surveillance

L. SMS 049 – Injury/Illness/Incident Reporting and Notifications

M. SMS 051 – Bloodborne Pathogens

N. Medical Services Provider – WorkCare™ 1-800-455-6155

O. Contacts

Infrastructure & Environment	Federal Services	Energy & Construction
Occupational Health Manager	Occupational Health Nurse Workers' Compensation Manager	Claims Manager
Jeanette Schrimsher, RN COHN-S (866) 326-7321 (Toll Free-U.S.) (512) 656-0203 (Cell) (512) 419-6413 (Confidential Fax)	**BJ Heinrich, RN, COHN-S/CM, STS** (877) 878-9525 (Toll Free) (512) 656-8502 (Cell) (512) 419-5252 (Confidential Fax)	**Terry Sower, CPCU, AIC, CWCP** (208) 386-6038 (Office) (208) 890-3843 (Cell) (208) 386-5462 (Confidential Fax)

P. Attachment 065-1 NA – Injury Management Procedures Flow Chart

Q. Attachment 065-2 NA – Medical Treatment Referral form

R. Attachment 065-3 NA – Medical Authorization Form

S. Attachment 065-4 NA – Return to Work Policy

T. Attachment 065-5 NA – Description of Employee's Job Duties

U. Attachment 065-6 NA – Employee's Responsibilities

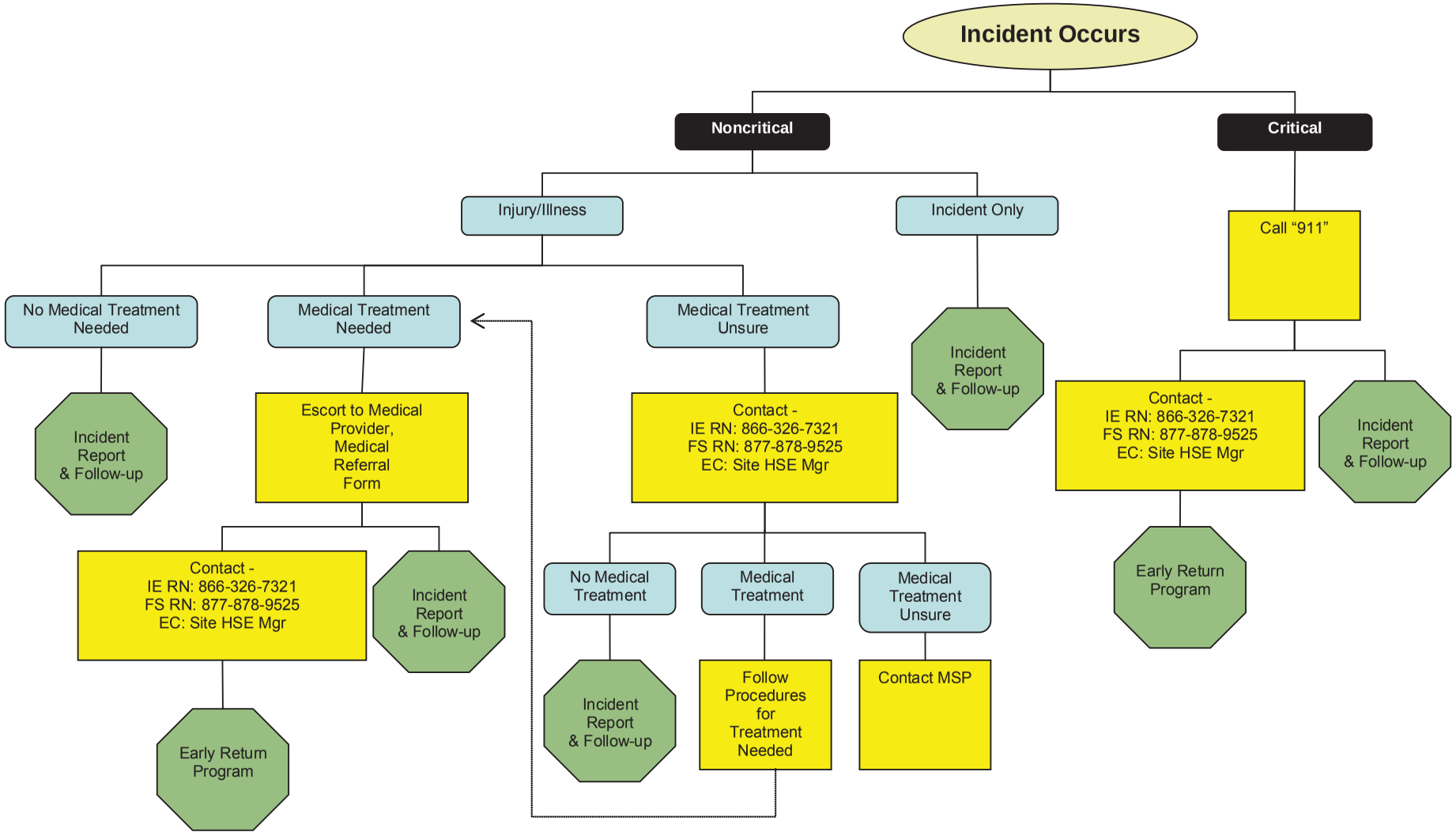
V. Attachment 065-7 NA – Injury Management Checklist

W. Attachment 065-8 NA – First Aid Kit Supply List

7. Supplemental Information

A. Emergency Eyewash and Shower Equipment

URS	Health, Safety and Environment **INJURY MANAGEMENT PROCEDURES FLOW CHART**	Attachment 065-1 NA Issue Date: January 2003 Revision 6: March 2012



IE – Infrastructure & Environment / FS – Federal Services / EC – Energy & Construction

URS	Health, Safety, and Environment **MEDICAL TREATMENT REFERRAL**	Attachment 065-2 NA Issue Date: January 2003 Revision 6: March 2012

Date _____ Site Phone Number _____

URS Site Contact _____

Employee Name _____ Social Security # _____

Employee Signature _____

Brief Job Description _____

Date of Injury _____ Body Part Injured _____

Place of Injury _____

Post-accident drug and/or alcohol test required? Yes ☐ No ☐

Medical Provider:

Name _____ Phone _____

Address _____

_____

Employee Transported to Medical Provider by: _____

Workers' Compensation Claims Administrator: **Sedgwick CMS (see attached billing locations)** (except for: Washington, Ohio, North Dakota, Wyoming)

For questions, please contact:

Infrastructure & Environment	Jeanette Schrimsher, RN	(866) 326-7321
Federal Services	BJ Heinrich, RN	(877) 878-9525
Energy & Construction	Terry Sower	(208) 386-6038

Early Return-to-Work and Transitional Employment Policy

To Medical Providers: URS Corporation values its employees and believes that it is helpful to an injured worker's recovery to return to work as soon as medically approved. Please contact us if you have any questions regarding releasing the employee to work either in a modified/light duty status or full duty clearance. Please send a work status report to the site contact listed above following the initial medical evaluation and each follow-up appointment.

Supervisor Name _____ Supervisor Signature _____

Providers: Send medical bills to Sedgwick CMS at the office address indicated for the state where the claim is filed.

URS Corporation & Sedgwick Claims Management Services, Inc.

Workers' Compensation Claims Handling Offices

Albuquerque, NM	Anchorage, AK	Baltimore, MD	Boise, ID
States Serviced NM	**States Serviced** AK	**States Serviced** DC, DE, MD, PA	**States Serviced** ID
Office Information Sedgwick CMS P.O. Box 14489 Lexington, KY 40512-4489 Toll-Free: 800-255-4349 Tel: 505-255-0437 Fax: 505-256-1412	**Office Information** Sedgwick CMS PO Box 14518 Lexington, KY 40512-4518 Toll-Free: 866-853-0048 Tel: 907-868-2787 Fax: 907-868-3042	**Office Information** Sedgwick CMS P.O. Box 14491 Lexington, KY 40512-4491 Toll-Free: 800-285-3258 Tel: 410-773-4200 Fax: 410-773-4221	**Office Information** Sedgwick CMS P.O. Box 14543 Lexington, KY 40512-4543 Toll-Free: 866-253-1074 Tel: 208-388-3200 Fax: 208-388-3210
Charleston, WV	**Columbia, SC**	**Dallas, TX**	**Denver, CO**
States Serviced WV	**States Services** AL, GA, KY, MS NC, SC, TN, VA	**States Serviced** LA, OK, TX	**States Serviced** AZ, CO
Office Information Sedgwick CMS P.O. Box 14490 Lexington, KY 40512-4490 Toll-Free: 877-393-0022 Tel: 304-347-9600 Fax: 304-347-9610	**Office Information** Sedgwick CMS P.O. Box 14480 Lexington, KY 40512-4480 Toll-Free: 800-426-9218 Tel: 803-772-1111 Fax: 803-750-2885	**Office Information** Sedgwick CMS P.O. Box 14497 Lexington, KY 40512-4497 Toll-Free: 888-899-4694 Tel: 214-922-0600 Fax: 214-922-0650	**Office Information** Sedgwick CMS P.O. Box 14493 Lexington, KY 40512-4493 Toll-Free: 800-507-9656 Tel: 303-713-6000 Fax: 303-713-6056
Portland, ME	**Helena, MT**	**Honolulu, HI**	**Las Vegas, NV**
States Serviced CT, MA, ME NH, RI, VT	**States Serviced** MT	**States Serviced** HI	**States Serviced** NV
Office Information Sedgwick CMS P.O. Box 14492 Lexington, KY 40512-4492 Toll-Free: 800-526-3721 Tel: 207-874-9100 Fax: 207-874-9199	**Office Information** Sedgwick CMS P.O. Box 14544 Lexington, KY 40512-4544 Toll-Free: 866-458-4737 Tel: 406-442-2202 Fax: 406-442-2865	**Office Information** Sedgwick CMS P.O. Box 14541 Lexington, KY 40512-4541 Toll-Free: 866-580-6674 Tel: 808-523-3200 Fax: 808-523-3250	**Office Information** Sedgwick CMS P.O. Box 14483 Lexington, KY 40512-4483 Toll-Free: 888-713-1112 Tel: 702-568-3800 Fax: 702-240-1962
Memphis, TN	**Omaha, NE**	**Portland, OR**	**Rochester, NY**
States Serviced AR	**States Serviced** IA, IL, IN, KS MI, MN, MO NE, SD, WI	**States Serviced** OR	**States Serviced** NJ, NY
Office Information Sedgwick CMS P.O. Box 14423 Lexington, KY 40512-4423 Toll-Free: 866-856-4805 Tel: 901-566-3300 Fax: 901-566-3415	**Office Information** Sedgwick CMS P.O. Box 14513 Lexington, KY 40512-4513 Toll-Free: 800-486-2152 Tel: 402-496-2000 Fax: 402-496-6511	**Office Information** Sedgwick CMS P.O. Box 14514 Lexington, KY 40512-4514 Toll-Free: 800-906-3147 Tel: 503-412-3900 Fax: 503-412-3990	**Office Information** Sedgwick CMS P.O. Box 14515 Lexington, KY 40512-4515 Toll-Free: 866-846-7757 Tel: 585-368-7700 Fax: 585-368-7710
Roseville, CA	**Salt Lake City, UT**	**Tampa, FL**	
States Serviced CA	**States Serviced** UT	**States Serviced** FL	
Office Information Sedgwick CMS P.O. Box 14433 Lexington, KY 40512-4433 Toll-Free: 866-274-6586 Tel: 916-771-2900 Fax: 916-771-2990	**Office Information** Sedgwick CMS P.O. Box 14485 Lexington, KY 40512-4485 Toll-Free: 866-814-8220 Tel: 801-258-9700 Fax: 801-258-9730	**Office Information** Sedgwick CMS P.O. Box 14437 Lexington, KY 40512-4437 Toll-Free: 888-390-9522 Tel: 813-287-8399 Fax: 813-282-6783	

WORKERS' COMPENSATION
EMPLOYEE AUTHORIZATION LETTER

To Whom It May Concern:

I, _____, hereby authorize any hospital,
Please Print Name
medical practitioner, clinic, other medical or medically related facility, pharmacy, or insurance company to furnish to URS Corporation or its subsidiaries or representatives (orally or in writing) information with respect to any work-related injury or illness, including treatments, consultations, prescriptions, and copies of applicable records that may be requested. I also authorize my employer to disclose information needed to process my workers' compensation claim.

The information provided to URS Corporation, its subsidiaries, or representatives is to be used solely for the administration of my workers' compensation claim.

A photocopy of this authorization is to be considered as valid as the original and is effective for the duration of the claim.

Signature: _____ Date: _____

Signed copies to:
- ☐ Employee
- ☐ Medical Provider
- ☐ URS Occupational Health Nurse/Workers' Compensation Administrator

Our primary goal in safety is the prevention of work-related injuries. When an injury does occur, it is the policy of URS to provide our employees with the best possible recovery program. A major component of any successful recovery program is returning the injured employee to the workforce as soon as medically possible. This type of Early Return Strategy has been shown to dramatically reduce the overall recovery time of injured workers, creating a benefit for the employee, his/her family, coworkers, and the firm.

As part of this policy, Operations; Human Resources; Health, Safety, and Environment; and our workers' compensation insurance carrier will work together with our employees and their treating physician to establish a recovery program that minimizes both the number of cases and total days away from work experienced by our employees. URS operations will accommodate transitional work (i.e., light duty or modified work) requirements for employees recovering from work related injuries, whenever possible. The work limits, as defined by the treating physician, will be strictly adhered to. Modified job assignments will be structured to meet the capacities and therapy needs of the injured employee.

URS	Health, Safety and Environment **DESCRIPTION OF EMPLOYEE'S JOB DUTIES**	Attachment 065-5 NA Issue Date: January 2003 Revision 6: March 2012

Print Name: _____

Location: _____ Phone: _____

Job Title: _____ No. Hours/Day:_____ No. Days/Week:_____

General Job Description: _____

1. Check the frequency and number of hours a day the activity is performed:

Activity	**Frequency**		**Number of Hours Per Day**									
	Continuous	Intermittent	0	1	2	3	4	5	6	7	8	9+
Sitting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Walking	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Standing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Bending	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Squatting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Climbing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kneeling	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Twisting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2. Hand manipulation required? (If yes, complete 2 a, b, c, d) Yes ☐ No ☐
   - 2a. Simple grasping? Yes ☐ No ☐ Right ☐ Left ☐
   - 2b. Power grasping? Yes ☐ No ☐ Right ☐ Left ☐
   - 2c. Pushing and pulling? Yes ☐ No ☐ Right ☐ Left ☐
   - 2d. Fine manipulation? Yes ☐ No ☐ Right ☐ Left ☐
3. Does the job require reaching at or above shoulder level? Yes ☐ No ☐
4. Does the job require use of the feet to operate foot controls? Yes ☐ No ☐
5. Are there special visual requirements? (Describe) Yes ☐ No ☐

6. Are there special hearing requirements? (Describe) Yes ☐ No ☐

7. Lifting and carrying (check weight lifted, frequency, and how far carried):

Weight	Frequency			Distance Carried
	Hourly	Daily	Weekly	
1-10 lbs.	☐	☐	☐	_____
11-25 lbs.	☐	☐	☐	_____
26-40 lbs.	☐	☐	☐	_____
41-60 lbs.	☐	☐	☐	_____
61-75 lbs.	☐	☐	☐	_____

8. Environmental conditions (check yes or no):

8a.	Work near dust, gas, vapors, or fumes?	Yes ☐	No ☐
8b.	Work in noisy environment?	Yes ☐	No ☐
8c.	Work in extremely hot temperature?	Yes ☐	No ☐
8d.	Work in extremely cold temperature?	Yes ☐	No ☐
8e.	Work at heights?	Yes ☐	No ☐
8f.	Walk on uneven surfaces?	Yes ☐	No ☐

9. Equipment operated (check yes or no):

9a.	Computer and mouse? If yes, hours per day _____ Type of work _____	Yes ☐	No ☐
9b.	Drive car, truck, or van?	Yes ☐	No ☐
9c.	Operate forklift or heavy equipment?	Yes ☐	No ☐
9d.	Other (please describe):		

_____

_____

_____

Print Name: Signature: Date:

Supervisor

_____ _____ _____

Medical Provider

_____ _____ _____

If an employee is injured at work or becomes ill due to a work-related issue, the employee must abide by the following:

1. Employee shall immediately notify their supervisor and HSE representative, even if the employee does not believe that they need medical attention.

2. With the assistance of their supervisor, the employee shall complete SMS 049-1 (in all cases), and SMS 065-3 (Medical Treatment Referral form) if medical attention is needed.

3. If it is perceived that medical attention is needed, an employee will be provided an opportunity for a telephonic consultation with the Occupational Health Nurse (OHN). During that consultation, if it is determined that an employee will need a physician evaluation, the OHN will contact the clinic with the necessary workers' compensation billing information. Unless it is an emergency, all employees are required to obtain approval from their supervisor and OHN. This ensures that URS, the workers' compensation carrier and the clinic are notified appropriately and timely medical treatment can be provided and follow-up given.

4. Provide the Medical Treatment Referral form to the treating physician. If employees are unable to obtain the form prior to being treated (i.e., onset of symptoms during non-work hours, work in remote locations), they must notify their supervisor as soon as possible on the next scheduled workday.

5. If an employee is treated by a physician, the employee is required to inquire if a consent form will need to be signed by the employee in order for medical records to be released to the URS Occupational Health Team. (Some clinics do not accept form SMS 065-3.) The employee will also need a work status form from the physician indicating if the employee can return to work, has restrictions or must be off work.

6. This work status form must be given to the employee's supervisor and/or HSE representative ***and*** emailed or faxed to URS Occupational Health Team immediately after the physician visit. Contact information for the URS Occupational Health Team is presented below.

Infrastructure & Environment	Federal Services	Energy & Construction
Occupational Health Manager	Occupational Health Nurse Workers' Compensation Manager	Claims Manager
Jeanette Schrimsher, RN, COHN-S	**BJ Heinrich, RN, COHN-S/CM, STS**	**Terry Sower, CPCU, AIC, CWCP**
Toll-Free U.S.: (866) 326-7321	Toll Free: (877) 878-9525	Office: (208) 386-6038
Cell: (512) 656-0203	Cell: (512) 656-8502	Cell: (208) 890-3843
Confidential Fax: (512) 419-6413	Confidential Fax: (512) 419-5252	Confidential Fax: (208) 386-5462
Email: jeanette.schrismher@urs.com	Email: bj.heinrich@urs.com	Email: terry.sower@urs.com

a. If a physician has indicated that a follow-up appointment is needed or the employee will need to schedule future follow-up appointments, the employee is required to attend the appointment regardless if the employee is feeling better or having no symptoms. There is a reason the physician felt like he/she needed to see the employee for that follow-up visit, and the visit is required to ensure proper recovery.

b. If an employee has been put on restrictions or is taken off work, once the employee is cleared to return to work the employee must receive a return to work without restrictions release from the physician. This updated work status report must be given to the employee's supervisor and/or HSE representative immediately. URS cannot return an employee to work without this release.

7. After every medical provider visit (whether the employee is off work/restricted work or is just having a follow-up) the employee is required to contact the URS Occupational Health Team. The employee shall provide an update as to the medical provider visit, plan of care, to ensure that the employee is getting the appropriate care in a timely manner, and to ensure that the physician is being reimbursed accordingly. The employee must also contact their supervisor and/or HSE representative to inform him/her of their work status.

8. Once the initial information of the employee's injury/illness is received by the URS workers' compensation insurance carrier, it is likely that the employee will be contacted by the workers' compensation carrier either by letter and/or by phone.

9. The claims adjuster, telephonic nurse case manager and/or field case manager may ask that the employee to communicate with them after every medical provider appointment as well. This would be <u>in addition</u> to the employee contacting the URS Occupational Health Team.

Off-Work or Restricted Work

It is URS' goal to return an employee back to work as quickly as possible to decrease an employee's healing time (as supported by medical studies that earlier return to work decreases complications), promote wellness, provide support to an employee during the recovery time, and to return the employee to full wage-earning capacity.

1. If an employee is placed off work by a physician for either personal medical reasons or work-related medical reasons, the employee is required to notify Human Resources, their supervisor, HSE representative and the URS Occupational Health Team. Human Resources may have additional requirements. For extended absences, an employee will want to discuss with Human Resources the necessary steps that an employee will need to take to maintain benefits that an employee has signed up for in active status (e.g., insurance premiums for personal medical insurance, short term disability, etc.).

2. For work-related incidents, once the workers' compensation carrier has determined that the case is accepted as a claim, the employee will begin receiving workers'

compensation payments up to a state-mandated weekly cap and after the state-mandated waiting period.

3. If an employee must be off work or is given restricted work for injury or illness of any kind, the employee is required to notify their supervisor immediately.

4. If an employee is absent for more than 3 days for personal illness or injury, an employee may be required to provide a physician note indicating the employee's work status and release to return to work. This will need to be provided to Human Resources and the employee's supervisor. For work-related illness or injury a physician's note is required for any absence due to an incident.

URS	Health, Safety, and Environment **INJURY MANAGEMENT CHECKLIST**	Attachment 065-7 NA Issue Date: January 2003 Revision 6: March 2012

Before an Injury

- ☐ Identify emergency care service providers.
- ☐ Identify clinic for non-emergency medical care – Occupational Health physicians (give preference to Board-Certified).
- ☐ Post instructions for reporting injuries, medical providers, contact info, and driving directions on safety bulletin board(s).
- ☐ Develop a bank of light-duty positions with descriptions that would accommodate different levels of restrictions.
- ☐ Develop a relationship with the physician and clinic staff (especially Office Manager):
  - Philosophy – most effective treatment, minimize OSHA recordability, minimize impact to employee, light duty always available
  - Visit clinic often to maintain relationship (quarterly)
  - Invite physician to visit site and work areas
  - Provide copies of light-duty position descriptions.
- ☐ Implement first aid treatment program – designate/train first aid responders, keep first aid supplies readily available, etc.
- ☐ Identify who will be responsible for contacting any employees with lost work days.
- ☐ Train employees on program requirements:
  - Immediate reporting as a company mandate
  - Potential delay of treatment for late reporting
  - First aid treatment
  - Advantage for using Company physicians
  - Potential benefit loss and disciplinary action for unauthorized non-emergency treatment
  - Waiting periods for workers' compensation benefits.

When an injury occurs

- ☐ CALL 911 (or equivalent) if this is an emergency situation.
- ☐ Provide first aid treatment (e.g., ice, over-the-counter ibuprofen, bandages, a place to rest).
- ☐ Initiate an immediate investigation to ensure work-related written reports (employee and witnesses); review for red flags.
- ☐ Notify the Occupational Health Department (OHD) before non-emergency medical care; do not take to a clinic unless medically necessary.

Infrastructure & Environment	Federal Services	Energy & Construction
Jeanette Schrimsher (866) 326-7321 (Toll Free)	BJ Heinrich (877) 878-9525 (Toll Free)	Site HSE Manager or Supervisor

- ☐ Influence (or control, depending on state law) choice of treating physician.
- ☐ Escort injured employee to and remain through medical treatment.
- ☐ Remind clinic personnel of transitional duty and OSHA-recordable sensitive treatment.
- ☐ Remind injured worker of transitional-duty benefits – part of the team, receive full pay, save their personal leave time.
- ☐ Notify HSE chain-of-command and follow site communication protocol.
- ☐ Coordinate post-incident drug and alcohol screen.
- ☐ Review return-to-work slip before departing facility. Review restrictions; if unreasonable or unclear, discuss with clinic. Seek alternative solutions to lost time if medically feasible.
- ☐ Accommodate any restrictions.
- ☐ Obtain a second opinion if initial provider's diagnosis (especially lost time) is unreasonable; work closely with OHD
- ☐ Require a return-to-work slip following **all** medical visits and provide a copy to the OHD.
- ☐ Ensure the employee makes any follow-up visits or referrals to another provider – need to ensure to close the loop on workers' compensation claims.
- ☐ Maintain regular and personal contact with the employee:
  - Ensure he/she shows up for work the next day
  - If on restrictions, visit regularly to ensure working within restrictions
  - If on lost time, call on a regular basis to check status (minimum weekly).

All first aid kits shall conform to the requirements of the ANSI Z308.1-2003, and shall contain the first aid items indicated below. The quantity, dimensions, or volume listed for each item is the **minimum** for compliance with this standard for Type I, II, or III kits.

- Type I kits are required to have a means for mounting in a fixed position and are generally not intended to be portable.
- Type II kits shall have a carrying handle.
- Type III kits shall have a carrying handle and shall provide a means to be mounted in a fixed position.

Required Contents:

- Absorbent Compress 32 sq in
- (16) Adhesive Bandages, 1X3 in
- Adhesive Tape - 3/8 in X 5 yd
- (10) Antiseptic 0.14 fl. oz. application
- (6) Burn Treatment, 1/32 oz. application
- Medical Exam Gloves
- Sterile pad - 3 X 3 in
- Triangular Bandage - 40 X 40 X 56 in

In addition to the required contents listed above, optional products and sizes may be included, depending on specific hazards, to augment a kit based upon the specific hazards existing in a particular work environment. Optional contents include:

- *Analgesic (Oral)* - Oral analgesics shall be packed in a single dose, tamper evident, package with full labeling as required by FDA regulations, and should contain no ingredients which are known to cause drowsiness.
- *Antibiotic Treatment* - Each antibiotic treatment shall be packaged in individual use applications containing at least 1/32 oz. of ointment. Each individual-use application shall not be reusable.
- *Bandage Compress* - Each compress shall consist of an absorbent, non-adherent pad substantially free from loose ends and raveling. The bandage shall be individually packaged, sealed and sterile.
- *Breathing Barrier* - The barrier shall be a single use disposable medical device for CPR use.
- *Burn Dressing* - Burn dressings shall be gel-soaked pad which is soluble in water and a single use.
- *Cold Pack* - Each cold pack shall be at least 4 X 5 in. and shall reach temperature within 10 seconds of activation. Cold packs shall activate under normal hand pressure and shall not leak under normal conditions of use.
- *Eye Covering* - Eye covering(s) shall have the ability to cover both eyes. Each eye covering shall be individually packaged, sealed, and sterile.
- *Eye Wash* - A minimum of 1 fl. oz. of a sterile isotonic buffered solution shall be contained in at least 0.5 fl. oz. individual use applications.
- *Roller Bandage* - Each bandage shall be at least 2 in. wide and at least 6 yd long. Each bandage shall be free from loose threads and raveling and individually packaged, and sealed.

A. Eyewash Equipment

Plumbed and self-contained eyewash units will meet the following specifications:

1. A controlled flow of flushing liquid will be provided to both eyes simultaneously at a velocity low enough so as to not cause injury to the user.

2. Spray nozzles will be protected from airborne contaminants. The removal of such protection during operation will not require a separate motion by the operator when activating the unit.

3. The eyewash will be designed and installed in such a manner that, once activated, it will not require the use of the operator's hands. The valve controlling the flow from the eyewash will remain open until it is intentionally closed.

4. Units will be constructed in such a manner that they will not corrode in the presence of the flushing fluid.

5. Stored flushing fluids will be protected against airborne contaminants.

6. Eyewash equipment will be capable of delivering flushing fluid to the eyes at a rate of not less than 0.4 gallons per minute (gpm), or 1.5 liters per minute (lpm), for 15 minutes.

7. The unit will be designed to provide sufficient room to allow the eyelids to be held open with the hands while the eyes are in the flushing stream.

8. The valve to open the eyewash flow will be simple to operate and will go from OFF to ON in 1 second or less.

9. The eyewash unit will be assembled and installed in accordance with the manufacturer's instructions.

10. The unit will be in an accessible location that requires no more than 10 seconds to reach. It will be on the same level as the hazard and the path of travel will be free of obstructions. For strong caustics or acids, the eyewash should be immediately adjacent to the hazard.

11. The unit will be located in an area identified with a highly visible sign positioned so that the sign will be visible within the area served by the eyewash. The area around the eyewash will be well lit.

12. The eyewash will deliver tepid flushing fluid.

13. Where the possibility of freezing conditions exists, equipment will be protected from freezing or freeze-protected equipment will be installed.

14. Plumbed eyewash equipment will be activated weekly to verify operation and ensure that flushing fluid is available. Self-contained eyewash equipment will be visually checked regularly to determine whether the flushing fluid needs to be changed or supplemented.

15. All eyewash units will be inspected annually for compliance with the requirements listed in this document.

16. Employees who may be exposed to hazardous materials will be instructed in the location and proper use of emergency eyewash units.

B. Shower Equipment

Plumbed and self-contained shower units will meet the following specifications:

1. A controlled flow of flushing liquid will be provided to both eyes simultaneously at a velocity low enough so as to not cause injury to the user.

2. The shower will be designed and installed in such a manner that, once activated, it will not require the use of the operator's hands. The valve controlling the flow from the eyewash will remain open until it is intentionally closed.

3. Units will be constructed in such a manner that they will not corrode in the presence of the flushing fluid.

4. Stored flushing fluids will be protected against airborne contaminants.

5. Shower equipment will be capable of delivering flushing fluid at a rate of not less than 20 gpm (75.7lpm) for 15 minutes.

6. The valve to open the eyewash flow will be simple to operate and will go from OFF to ON in 1 second or less.

7. The eyewash unit will be assembled and installed in accordance with the manufacturer's instructions.

8. The unit will be in an accessible location that requires no more than 10 seconds to reach. It will be on the same level as the hazard, and the path of travel will be free of obstructions.

9. The unit will be located in an area identified with a highly visible sign positioned so that the sign will be visible within the area served by the shower. The area around the eyewash will be well lit.

10. The shower will deliver tepid flushing fluid.

11. Where the possibility of freezing conditions exists, equipment will be protected from freezing or freeze-protected equipment will be installed.

12. Plumbed shower equipment will be activated weekly to verify operation and ensure that flushing fluid is available. Self-contained shower equipment will be visually checked regularly to determine whether the flushing fluid needs to be changed or supplemented.

13. All eyewash units will be inspected annually for compliance with the requirements listed in this document.

14. Employees who may be exposed to hazardous materials will be instructed in the location and proper use of emergency eyewash units.

C. Eye/Face Wash Equipment

Eye/face wash equipment will meet all the criteria outlined in Section A, except the equipment will be capable of delivering flushing fluid at a rate of not less than 3.0 gpm (11.4 lpm) for 15 minutes.

D. Combination Units

Combination units (eyewash and shower assemblies served by a single source of flushing fluid) will meet all the criteria outlined in Section B.

URS SAFETY MANAGEMENT STANDARD

Manual Material Handling

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where personnel perform manual handling of materials. For this procedure, manual material handling (MMH) is defined as the movement of items by lifting, lowering, pushing, pulling, carrying, holding, or restraining.

2. Purpose and Scope

The purpose of this standard is to prevent common injuries caused by the practice of MMH. Immediate or short-term effects include lacerations, bruises, and muscle fatigue. Long-term effects include chronic pain, frequently in the lower back but also in limb joints and ligaments.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project.

4. Requirements

A. General

1. Prior to lifting, lowering, pushing, pulling, carrying, holding, or restraining an object of any significant size or weight, employees must evaluate the object and the required task to determine whether they can handle the object safely.
2. If the employee has any doubt about whether he or she can safely move the object alone, the employee should obtain additional manual or mechanical help.
3. Healthy employees with no physician-imposed restrictions should be able to lift and carry a maximum of 50 pounds (23 kilograms) using proper lifting and carrying techniques. Physical and workplace factors may reduce this recommended weight limit (RWL) significantly and should be considered prior to attempting lifts of this magnitude. Examples of physical and workplace factors may include the following:
    a. Physical size of an object.
    b. Slippery container surface or poor grip ability.
    c. Sharp edges.
    d. Slippery floors or obstacles on the floor.
    e. Cold or hot objects surfaces.
    f. Distance and route of travel.

4. An employee's personal "safe" MMH capability is defined as the employee's personal capability to manually lift, carry, push, or pull an object alone. This "safe" limit must consider the employee's past experience and training with MMH, health status, and any other personal or environmental characteristics affecting the employee's ability to perform these tasks. An employee's "safe" MMH capability is typically at or below the calculated RWL. In some cases, a trained and physically conditioned employee may exceed the MMH capability limit, but only after a complete hazard review of the task has determined an acceptable risk for minimizing injury.
5. An MMH task that exceeds an employee's personal "safe" MMH capability or RWL should be brought to the attention of the applicable manager or safety supervisor for the project.
6. If, due to a medical or health condition, the employee's physician or the employee has set a personal "safe" MMH capability, then appropriate medical documentation must be provided to the applicable manager to define these limits. The manager and appropriate safety supervisor should evaluate the tasks to which that employee is assigned and recommend a specific course of action to limit the potential for injury. This should include periodic monitoring of the employee and his/her work environment.
7. A recommended RWL can be calculated using the factors described in Supplemental Information A. The weight limit derived from these calculations is considered to be a load that over 99% of men and over 75% of women can safely handle without application of engineering or administrative controls. **Implementation of the calculations in Supplemental Information A should be attempted only with the assistance of a safety professional knowledgeable in the application of these factors. The calculations are intended to determine RWLs for repetitive lifting scenarios rather than occasional lifts.**
8. Prior to any manual lift, it is suggested that the employee warm up his or her muscles and joints using a combination of stretching and flexing.

B. Preplanning

1. Where MMH will be a necessary function of the task, the manager and/or safety supervisor should perform a thorough evaluation of the activities to determine ergonomic solutions to reduce or eliminate conditions that can cause or contribute to MMH injuries.

2. If a heavy object is to be moved to another location, the safest transport route should be determined prior to the activity.
3. The area around the object and the route over which it will be transported should be checked for slip, trip, and fall hazards. Hazards should be removed prior to initiation of the task.
4. The object to be moved should be inspected for grasping or handling hazards, such as slivers, sharp edges, grease, water, etc. Eliminate or abate any identified hazards where possible. Safe grasping or handling points on the object should be determined. Whenever possible, containers with carrying handles should be used for objects because they increase the manual grip strength for holding the object, thus providing better control and reduced muscle fatigue.
5. The distance to be traveled and the length of time that a grip on the object must be maintained should be considered before moving objects. If the travel distance is greater than 10 feet (3 meters) at maximum RWL, the employee should consider using an alternative method, rather than manually carrying the object.

C. Lifting/Lowering Guidelines

1. Reduce or eliminate manual lifting and lowering tasks where possible. Determine whether there are ways to abate the safety and ergonomic hazards associated with manual lifting.
2. The recommended technique for two-handed manual lifting/lowering involves five maneuvers:
    a. Get a firm footing. Keep your feet apart for a stable base. Put one foot slightly in front of the other.
    b. Bend your knees. Do not bend at the waist. When grasping the object, a firm grip should be obtained before lifting/lowering.
    c. Lift/lower with your legs. Lift/lower the load slowly and in a straight line, avoiding sudden movements.
    d. Keep the load close to the body. Generally, the closer the load is to the body, the less force it exerts on your back.
    e. Keep your back straight, your head and shoulders up, and your stomach muscles tights. Do not add the weight of your body to the load. Avoid twisting.

3. When a turn or change of direction is necessary, the object should be lifted or lowered into a carrying position, then the whole body should be turned with the feet, avoiding any trunk twisting motion.
4. Objects to be lifted to shoulder height should first be lifted to waist height, then rested on a level surface so the grasping position can be changed prior to lifting to a higher level.
5. Employees should never lift a load above their head.

D. Carrying/Holding Guidelines

1. Manual carrying is an inefficient way of transporting materials in the work place. Where possible, reduce or eliminate manual carrying tasks.
2. Never carry a load above the head.
3. Carry an object close to the body using both hands. One-handed carries are awkward and tend to unbalance the employee.
4. Do not carry objects that are so large they will obstruct visibility.
5. Do not change grips on an object while carrying or holding an object. Rest the object on a secure surface prior to changing grip.
6. If an object is of a size, shape, or mass that it requires two people to carry, use two people of similar size and physique. Two-person lifts should be planned and coordinated before performing the lift. Lift the item in unison.
7. Avoid carrying objects on stairs, particularly where the line of sight may be obstructed or the object can interfere with leg movement. All travel on stairs requires use of a handrail at all times, so only carry objects that can be safely handled with one hand. Always maintain handrail contact when carrying an object up or down stairs.

E. Pushing/Pulling Guidelines

1. Check the condition of the floor, ground, or other surface prior to pushing or pulling an object across it.
2. Be aware of the “break out” force of the object; this is the force at which a push or pull overcomes the frictional force between the surface and object. Adjust posture to avoid losing balance when this point is reached.
3. Get assistance when moving or guiding a large load.
4. Where possible, always push rather than pull a load.

5. Never load the cart or load-carrying device in such a manner that visibility is obstructed in the path of travel.
6. When pushing or pulling an object on an inclined surface, be certain that you can control the load and direction of travel before proceeding. Obtain additional support to control the load if necessary.
7. Never leave carts or loads in an area that will present a hazard to other workers. Make sure carts or transport devices are secured in position before leaving them unattended.

F. Workplace Design

1. Store heavy or bulky materials at heights between the knee and shoulder to avoid the need to stretch or bend. Use step stools to access objects above shoulder height.
2. Pack or arrange items to be lifted to avoid shifting of weight in the package. If a box has hand cutouts (e.g., file archive boxes) do not load the box so full that the handles cannot be used for carrying the box.
3. Design work areas to avoid the need to lift, carry, push, or pull heavy or bulky materials for extended distances.
4. Design workplaces with the following in mind:
    a. Lifts from the floor should be avoided.
    b. The torso should never twist while handling loads.
    c. Asymmetrical or unbalanced one-handed lifts should be avoided.
    d. Loads should not be lifted with sudden movements.
    e. Loads should not be lifted over obstacles.
    f. Loads should not be lifted at extended forward or sideway reaches.
    g. Uncomfortable or static postures should not be necessary throughout the work cycle.
    h. Environmental factors (e.g., task lighting, dry work surfaces, heat or cold stress) should be considered.

G. Training

1. Personnel who may have MMH as part of their duties are required to receive training that includes the following topics:

a. Showing personnel how to avoid unnecessary physical stress and strain during MMH operations.

b. Teaching personnel to become aware of what they can comfortably handle without undue strain.

c. Instructing personnel on the proper use of equipment.

d. Teaching personnel to recognize potential hazards and how to prevent or correct them.

2. This training must be completed prior to an employee being assigned to a task that involves MMH activities.

3. Assistance with training or training materials is available through the HSE staff.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Training rosters.

B. Other proof of completion of MMH training.

6. Resources

A. National Institute for Occupational Safety and Health (NIOSH) – Work Practices Guide for Manual Lifting http://www.cdc.gov/niosh

B. Canadian Centre for Occupational Health and Safety http://www.ccohs.ca/oshanswers/ergonomics/

C. Oregon OSHA – Ergonomics of Manual Materials Handling http://www.cbs.state.or.us/external/osha/pdf/workshops/206w.pdf

D. North Carolina Department of Labor – A Guide to Manual Materials Handling and Back Safety http://www.nclabor.com/osha/etta/indguide/ig26.pdf

7. Supplemental Information

A. Recommended Weight Limit (RWL) Calculations

This lifting equation, developed by the National Institute for Occupational Safety and Health (NIOSH), takes into account the weight of an object plus several other variables in lifting tasks that contribute to the risk of injury. For example, if the situation requires frequent lifts or lifting loads far away from the body, there is an increased risk of injury. Under these conditions, the weight limit would be reduced from a baseline weight or "load constant" (LC) to a recommended weight limit (RWL). A "load constant" (LC) of 23 kg (about 51 pounds) has been established by NIOSH as a load that, under ideal conditions, is safe for 75% of females and 90% of males.

To calculate the RWL, you must first measure or assess several variables related to the lifting task. The six variables that are considered in determining the RWL are:

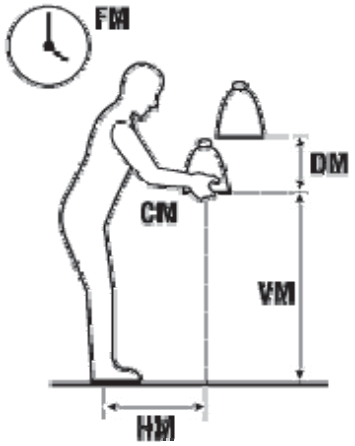
- The horizontal distance (H) the load is lifted (distance of hands from midpoint between ankles),
- The starting height of the hands from the ground (V),
- The vertical distance of lifting (D),
- The time between lifts or frequency of lifting (F),
- The angle of the load in relation to the body (e.g., straight in front of you or off to the side, A), and
- The quality of the grasp or handhold based on the type of handles available (hand-to-load coupling, C).

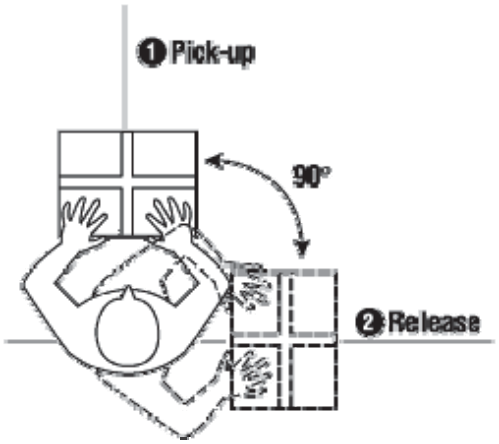
Each of these variables is then assigned a numerical value (multiplier factor) from look-up charts. The equation includes six multiplier factors to calculate the RWL:

$$RWL = LC \times HM \times VM \times DM \times FM \times AM \times CM$$

Where LC is the load constant (23 kg) and other factors in the equation are:

- HM, the "Horizontal Multiplier" factor,
- VM, the "Vertical Multiplier" factor,
- DM, the "Distance Multiplier" factor,
- FM, the "Frequency Multiplier" factor,
- AM, the "Asymmetric Multiplier" factor, and
- CM, the "Coupling Multiplier" factor.





Horizontal Multiplier is the distance the object is from the body. Measure (in centimeters) the distance from in between the person's ankles to their hands when holding the object. Write down this number. Next, look up the number on the accompanying chart and find the matching "multiplier factor". Use this factor in the lifting equation.

Vertical Multiplier is measured as the starting point of the lift and is the distance in centimeters of the hands up from the ground. Measure this distance and use the number to determine which value to use on the chart.

Distance Multiplier is the number of centimeters the load travels up (or down) from the starting position. Measure this distance and use the number to determine which value to use on the chart.

Frequency Multiplier is how often the lift is repeated within a certain time period. You need to determine if the lift is done while standing or stooping, for more or less than one hour (in total time for the shift), and how much time there is for rest between lifts.

Asymmetric Multiplier measures if the body must twist or turn during the lift. This measurement is done in degrees (with 360° being one complete circle).

Coupling Multiplier determines the "coupling" or type of grasp the person has on the container. It rates the type of handles as good (handles), fair (make-shift cut outs in cardboard boxes) or poor. You also need to know if the lift is done in a standing or stooping position.

When these multipliers are placed into the equation, determine the RWL. If the weight of the object to be lifted exceeds the RWL, the task is considered to be dangerous. Assess the relevant factors which contribute most to the risk (the lower the factor, the more it contributes to the risk) and redesign the handling task.

The lifting equation only applies in certain situations. It does not apply in situations where a person is lifting (or lowering):

- With one hand,
- For over 8 hours,
- While seated or kneeling,
- In a restricted work space,
- Objects that are unstable (such as buckets or containers of liquids),
- While pushing or pulling,
- With wheelbarrows or shovels,
- With high speed motion (faster than about 30 inches/second),
- Extremely hot or cold objects or in extreme temperatures, or
- With poor foot/floor coupling (high risk of a slip or fall).

This equation applies to most workers for:

- Two-handed lifting,
- Comfortable lifting postures, and
- Comfortable environments and non-slip floorings.

FACTORS USED IN RWL CALCULATIONS

Horizontal Multiplier (HM): Horizontal distance (H, in cm) from the midpoint between the ankles to the hands while holding the object.

H = Horizontal Distance (cm)	HM Factor
25 or less	1.00
30	0.83
40	0.63
50	0.50
60	0.42

Vertical Multiplier (VM): The vertical distance (V, in cm) of the hands from the ground at the start of the lift.

V = Starting Height (cm)	VM Factor
0	0.78
30	0.87
50	0.93
70	0.99
100	0.93
150	0.78
175	0.70
>175	0.00

Distance Multiplier (DM): The vertical distance (D, in cm) that the load travels.

D = Lifting Distance (cm)	DM Factor
25 or less	1.00
40	0.97
55	0.90
100	0.87
145	0.85
175	0.85
>175	0.00

Asymmetric Multiplier (AM): The twisting angle (A) of the body while lifting, measured in degrees.

A = Angle (degrees)	AM Factor
90°	0.71
60°	0.81
45°	0.86
30°	0.90
0°	1.00

Frequency Multiplier (FM): The frequency (F) of lifts and the duration of lifting (in minutes or seconds) over a work shift.

F = Time Between Lifts	FM Factor			
	Lifting While Standing		Lifting While Stooping	
	One Hour or Less	Over One Hour	One Hour or Less	Over One Hour
5 min	1.00	0.85	1.00	0.85
1 min	0.94	0.75	0.94	0.75
30 sec	0.91	0.65	0.91	0.65
15 sec	0.84	0.45	0.84	0.45
10 sec	0.75	0.27	0.75	0.27
6 sec	0.45	0.13	0.45	-
5 sec	0.37	-	0.37	-

Coupling Multiplier (CM): The quality of grasp (or coupling, C) classified as good, fair or poor and depends on the body position (either standing or stooping).

C = Grasp	CM Factor	
	Standing	Stooping
Good (handles)	1.00	1.00
Fair	1.00	0.95
Poor	0.90	0.90

URS SAFETY MANAGEMENT STANDARD
Behavior-Based Safety

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to describe the URS approach to implementing our behavior-based safety program.

Behavior-based safety is a process that provides a higher level of safety excellence by promoting proactive involvement, building ownership, and fostering communication that relates to employee safety. A primary concept is that most accidents are due to at-risk behavior, and behavioral changes may be made that significantly reduce accident potential.

3. Implementation

Implementation of this procedure is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Definitions

1. At-Risk Behavior: Individual actions that increase the chance of injury, despite knowledge of the hazard. An example is excessive speed while driving.

2. Activators: Items that are intended to produce desired behaviors. URS activators for safety include, but are not limited to, policy statements, safety management standards (SMS), training, safety slogans, posters and signs, health and safety plans, safe work plans, safety meetings, and rules and regulations.

3. Behaviors: Visible actions on the part of individuals and can be characterized as safe (following health and safety plans, using work practices that minimize risk, coaching others on safe behavior, having safety as a priority over speed and convenience, etc.), or at-risk.

4. Consequences: Result of safe and at-risk behaviors, and can therefore be positive or negative. Examples of consequences include self-approval, reprimand, peer approval, penalty, feedback, inconvenience, and comfort. The most effective consequences are positive, immediate, and certain.

B. Values of Behavior-Based Safety

1. Employees hold safety as a core value.

2. Each employee feels responsible for the safety of their coworkers as well as themselves, and takes action accordingly.

3. Each employee is willing and able to “go beyond the call of duty” on behalf of the safety of others.

C. Roles for Safe Behavior

1. Supervisor’s Role:

   a. Provide clearly defined safety expectations and encourage/reinforce the implementation of safety observations using the SMS 072-1 NA checklist or equivalent.

   b. Provide consequences for observed behaviors throughout the course of the work shift.

2. Co-Worker Role

   a. Intervene when observing at-risk behavior.

   b. Provide positive feedback for safe behavior.

   c. Volunteer to be observed.

C. Identification of At-Risk Behaviors

Observations and review of incident and near miss data will be used by URS Safety Officers to help identify at-risk behavior.

1. Employee observations.

   a. Observation checklists, either project-specific or Attachment 072-1 NA, will be used as a tool to help identify safe and at-risk behaviors and why the behavior(s) occurred.

   b. Employees will be instructed on using the checklists.

   c. Checklists will be included in the site-specific health and safety plan or the safe work plan.

   d. The checklists will include the expected safe behaviors.

e. Peers will complete the checklist for applicable work tasks.

f. Checklists may change throughout the project to include additional behaviors.

E. Feedback to Employees

1. Observers will immediately provide one-on-one feedback to the observed, noting both safe and at-risk behaviors.

2. Observer and observee will discuss the identified barriers to safe behavior, and potential solutions.

3. Near-Miss and Incident Reports will be reviewed to identify at-risk behaviors and corrective actions.

4. Management and Health, Safety, and Environment staff will verify compliance with this standard.

F. Feedback Follow-up

1. Observation checklists will be collected and discussed at periodic safety meetings.

2. The manager will review the trends for at-risk and safe behavior, and report the trends to the employees.

3. Project-specific trends are analyzed and areas of additional action are identified.

5. Documentation Summary

The following documentation will be maintained in the project file:

A. Behavior-Based Safety Checklists.

6. Resources

Attachment 072-1 NA – Behavior-Based Safety Checklist

URS	Health, Safety and Environment **BEHAVIOR BASED SAFET CHECKLIST**	Attachment 072-1 NA Issue Date: September 2003 Revision 2: February 2009

Job Location: _____ Date: _____

Task/Work Observed: _____ Observer: _____

	Safe	nsafe	Comments
Personal Protective E ipment			
Head	☐	☐	
Hand	☐	☐	
Feet	☐	☐	
Eyes/Face	☐	☐	
Skin	☐	☐	
Hearing	☐	☐	
Fall Protection	☐	☐	
E ipment Tools			
Proper tool for the job	☐	☐	
Condition	☐	☐	
Proper Use	☐	☐	
Body se Position			
Lifting	☐	☐	
Pinch Point	☐	☐	
Ladder / stairs	☐	☐	
Hand placement	☐	☐	
Travel path / speed	☐	☐	
Body position	☐	☐	
Work Practices			
Follow Safety Plan / Procedures	☐	☐	
Housekeeping	☐	☐	
Other			
_____	☐	☐	
_____	☐	☐	
_____	☐	☐	

* Use comment column when unsafe behavior / conditions were observed. Describe what was observed and why this occurred.

URS SAFETY MANAGEMENT STANDARD
Short Service Employees

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to provide direction for the mentoring and oversight of newly hired or transferred employees. It is understood that proportionally more incidents/injuries occur among less experienced staff members. The goal is to prevent incidents involving these employees, and to ensure they have a good understanding of the URS Health, Safety, and Environment (HSE) Program and Behavior-Based Safety (BBS) expectations.

3. Implementation

Implementation of this program is primarily the responsibility of the URS line and project managers.

A. Line Managers (e.g., Group Leaders, Unit Leaders, Hiring Managers, Supervisors) will be responsible for identifying Short-Service Employees (SSEs) in their groups, and for assigning a mentor to that person.

B. Project Managers (PMs) are responsible for working with a person's mentor to designate someone on the field team to provide additional supervision and guidance for all SSEs during the time they are considered an SSE.

C. Mentors are responsible for ensuring that SSEs understand what training they are required to take, and are familiar with the URS HSE program and how to access various resources. Mentors also need to be available to answer HSE-related questions and concerns from the SSEs they are mentoring. They will work with the field PMs to identify an experienced field team member to provide temporary mentorship, oversight and guidance to SSEs during field activities. NOTE: The mentor may fill this role when working on the same field project with the SSE. A mentor providing field guidance may not be assigned more than one SSE.

4. Requirements

A. General

1. SSEs are those who have been newly hired or transferred to a different position in the company (e.g., one with new and possibly unfamiliar hazards and safe operating procedures).

2. An employee will be designated as an SSE, and the requirements of this SMS will be applicable to that individual, based on the schedule provided in Section 4.A.3. Specific circumstances may warrant the extension of the SSE designation, or variance from the time schedule.

3. SSE Status Schedule

   a. 0- to 6-Month SSE Status – Field employees who are new to URS or who are new to their current job assignment (e.g., someone who has experience in groundwater monitoring who transfers to a unit that performs stack sampling).

   b. 0- to 3-Month SSE Status – All non-field employees who are new to URS. This requirement acknowledges that approximately one-third of URS incidents occur in an office, rather than a field environment.

   c. Former employees who return to URS within 12 months and are placed into the same job assignment will not be designated as SSEs.

   d. Attachment 078-1 NA – SSE Variance for Field Staff or 078-2 NA – SSE Variance for Office Staff will be used to document progress.

   e. Section H of this SMS provides variance/exemptions from this schedule.

B. SSEs working in the field should not be assigned to work alone. Additionally, crew sizes of five employees or fewer shall no more than one SSE assigned to the team.

C. SSEs must be able to be easily identified in the field environment. SSEs are required to wear an orange stripe around their hardhat or be clearly identified by some other system. In the event a client has an existing SSE program, URS will defer to the identification system required by the client.

D. The SSE status will be monitored by line management while performing field operations. The SSE status will be removed based on the schedule shown in Section 4.A.3 if the employee's mentor determines the SSE has worked safely, followed URS and client HSE requirements, and has not been involved in an incident involving an injury, property damage, or a significant business interruption. Attachment 078-1 NA or Attachment 078-2 NA will be used for documentation.

E. Line managers will notify the appropriate safety representative of employees who fall under the SSE designation, along with the end date

for the SSE status. They should also notify the representative of anyone whom they have exempted from this designation.

F. It is preferred that staff monitoring an SSE in the field will be assigned no more than one SSE at a time.

G. Mentors will be sure that SSEs assigned to them know:

1. How to access information on the URS Safety Management System and the appropriate Safety Management Standards for the work they will be assigned to do.

2. Their roles and responsibilities with respect to HSE.

3. What training they are required to have (e.g., computer-based training, classroom sessions, outside courses) and how to register for this training.

4. Who their local, regional, and corporate HSE resources are.

5. How to report an incident, near miss, at-risk behavior, or unsafe condition.

6. The basic principles of the URS Behavior-Based Safety Program.

7. How to prepare a basic job safety analysis.

H. Variance

1. In general, the SSE status schedule of Section 4.A.3 of this SMS will be followed.

2. Based on experience, knowledge of the URS HSE program, and the tasks to be performed, the line manager may recommend a variance from the full SSE time period. Attachment 078-1 NA or 078-2 NA must be used to document the exemption, and must be approved by the appropriate HSE representative.

3. Due to the wide variety of URS operations, a competency-based alternative system for SSE may be used. A competency-based system requires adequate training and safety skill demonstration for the specific tasks an individual is deemed competent to perform. An example of a competency-based system would be the project hiring of an experienced and well-trained heavy equipment operator.) Competency-based systems must be approved by the HSE Manager.

5. Documentation Summary

The following documentation will be maintained in the office or project safety file:

A. Attachment 078-1 or 078-2

6. Resources

A. Attachment 078-1 – SSE Variance for Field Staff

B. Attachment 078-2 – SSE Variance for Office Staff

URS	Health, Safety and Environment **SSE VARIANCE FOR FIELD STAFF**	Attachment 078-1 NA Issue Date: September 2005 Revision 4: August 2010

Employee Name: _____ Employee Number: _____

Manager Name: _____ Date: _____

Training:

☐ Yes ☐ No Employee HSE Orientation on-line module completed

☐ Yes ☐ No Vehicle Safety on-line module completed

☐ Yes ☐ No 4-Hour Field Safety class completed, ***or***

☐ Yes ☐ No HAZWOPER training

Manager / Mentor Assessment:

☐ Yes ☐ No Understands URS safety expectations and how to access the URS HSE website

☐ Yes ☐ No Demonstrates ability to prepare a proper Safe Work Plan or Health and Safety Plan (HASP)

☐ Yes ☐ No Demonstrated ability to prepare a basic Job Safety Analysis

☐ Yes ☐ No Complies with safety plan during field work

☐ Yes ☐ No Ability to conduct initial and daily safety briefings

☐ Yes ☐ No Demonstrated experience in Near Miss Reporting (Attachment 049-1 – Incident/Near Miss Report Form)

☐ Yes ☐ No Understands personal protective equipment (PPE) requirements and always wears correct PPE

☐ Yes ☐ No Willing to stop work if conditions do not appear safe

Field Experience:

Dates	**Type of Project**	**Hazards**

Comments:

Employee Statement:

I am familiar with the URS Safety Management system, the roles and responsibilities for HSE as outlined in that system, and the URS Behavior-Based Safety Program. I have been instructed on HSE resources available to me and how to access the program and associated information.

Employee Signature: _____ **Date:** _____

Manager Signature: _____ **Date:** _____

URS	Health, Safety and Environment **SSE VARIANCE FOR OFFICE STAFF**	Attachment 078-2 NA Issue Date: September 2005 Revision 4: August 2010

Employee Name: _____ Employee Number: _____

Manager Name: _____ Date: _____

Training:

☐ Yes ☐ No Employee HSE Orientation on-line module completed

☐ Yes ☐ No Vehicle Safety on-line module completed

☐ Yes ☐ No Ergonomics on-line module completed

Manager / Mentor Assessment:

☐ Yes ☐ No Understands URS safety expectations and how to access the URS HSE website

☐ Yes ☐ No Demonstrates the ability to work safely and correct observed safety hazards

☐ Yes ☐ No Understands local HSE requirements including the Emergency Action Plan and Incident Reporting

☐ Yes ☐ No Has conducted a self-ergonomic evaluation of workstation using SMS 054

☐ Yes ☐ No Demonstrated experience in Near Miss Reporting (Attachment 049-1 – Incident/Near Miss Report Form)

☐ Yes ☐ No Willing to stop work if conditions do not appear safe

Comments:

_____

_____

_____

Employee Statement:

I am familiar with the URS Safety Management system, the roles and responsibilities for HSE as outlined in that system, and the URS Behavior-Based Safety Program. I have been instructed on HSE resources available to me and how to access the program and associated information.

Employee Signature: _____ **Date:** _____

Manager Signature: _____ **Date:** _____

URS SAFETY MANAGEMENT STANDARD

Concrete

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where concrete is poured or handled. This standard also applies to Portland cement, mortar, stucco, and other applications of cementitious products.

2. Purpose and Scope

The purpose of this standard is to ensure the safety of URS Corporation personnel during the installation of concrete forms, pouring of new concrete structures, or installation of preformed concrete structures.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site or project location.

4. Requirements

A. General

1. Provide employees working more than 6 feet (1.8 meters) above any adjacent working surfaces, placing and tying reinforcing steel in walls, piers, columns, etc., with a safety harness or equivalent protective device in accordance with 29 Code of Federal Regulations (CFR) 1926.500 Subpart M.

2. No employees will be permitted to work above an impalement hazard (e.g., rebar) unless it has been protected to eliminate the hazard of impalement.

3. Prohibit riding of concrete buckets for any purpose. Keep vibrator crews out from under concrete buckets suspended from cranes or cableways.

4. Provide an employee with a whistle or other sound-producing device to watch for approaching buckets and warn employees to stand clear while the concrete is dumped.

5. Where practical, use tag lines to control and position suspended concrete buckets.

6. Provide PumpCrete™ or similar systems using discharge pipes with pipe supports designed for 100 percent overload. Provide compressed-air hoses in such systems with positive fail-safe joint connectors, or otherwise secure them to prevent separation of sections when pressurized.

7. All nozzle men applying cement, air, sand and water through a pneumatic or high-pressure hose must wear protective head, hand, and face equipment.

8. All concrete workers must wear protective clothing, including safety glasses; rubber boots, and gloves, to reduce the danger of concrete burns. Refer to SMS 029 – Personal Protective Equipment for additional information.

9. Wear appropriate personal protective equipment when using tools and equipment associated with concrete masonry work.

10. Finishers must wear safety glasses and face shields when chipping, wire brushing, or using power-impact or rotary tools in patching concrete.

11. In the pour area, or any area where dry Portland cement is being handled or mixed with water or aggregate, provide means to flush eyes (e.g., eyewash station, bottles) for 15 minutes. If the material contacts skin, wash skin with water and ph-neutral soap or mild detergent.

12. Provide temporary winter protection enclosures with adequate ventilation, lighting, and fire protection.

13. Equip pavers with a loud warning bell or horn that sounds when a paver moves ahead or the bucket is run out.

14. Provide conical or tapered bottoms with mechanical or pneumatic means of starting the flow of materials for bulk storage bins, containers, or silos.

15. Construct handles on bull floats used where they may contact energized electrical conductors of nonconductive material, or insulate with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

16. Do not extend handles of buggies beyond the wheels on either side of the buggy. Installation of knuckle guards on buggy handles is recommended.

17. Provide concrete buckets equipped with hydraulic or pneumatically operated gates with positive safety latches or similar safety devices installed to prevent premature or accidental dumping. The buckets will be designed to prevent excess aggregate and loose material from accumulating excessively on the top and sides of the bucket.

18. Block the wheels of ready-mix trucks and set the brakes to prevent movement when discharging on a slope.

19. Properly guard exposed gears, chains, and rollers of mixers.

20. Secure sections and ends of tremies, elephant trunks, and similar concrete conveyances with wire rope, chain, or similar safe fastener.

21. Equip powered and rotating-type concrete troweling machines that are manually guided with a control or dead-man switch that will automatically shut off the power whenever the operator removes his hands from the equipment handles.

22. The use of ready-mix concrete trucks may create traffic problems, which proper planning and care can lessen and/or eliminate. Control backing operations through the use of a properly trained and attired flag person/spotter who will be positioned so that they have a clear view of the area behind the truck, as well as be clearly visible to the truck driver. Route movement of personnel and project equipment away from this area so that they do not have to cross the truck's means of egress.

B. Forms and Shoring

1. The completed shoring setup should be a homogenous unit or units. For example, do not use tubular steel shoring in combination with adjustable wood or jack-type shoring.

2. Ensure that formwork and shoring are be designed, erected, supported, braced, and maintained so that they will safely support all vertical and lateral loads that may be imposed upon them during placement of concrete.

3. Ensure that drawings or plans showing the jack layout, formwork, shoring, working decks, and scaffolding are available at the jobsite.

4. Remove and stockpile stripped forms and shoring promptly after stripping in all areas in which persons are required to work or pass. Remove and dispose of adhered concrete from forms and planking before stacking when possible to prevent generation of concrete dust. Pull, cut, or remove by other means any protruding nails, wire ties, and other form accessories not necessary to subsequent work to eliminate the hazard.

5. Do not impose any construction loads on the partially completed structure unless such loading has been considered in the design and approved by the engineer-architect.

6. When temporary storage of reinforcing rods, material, or equipment on top of formwork becomes necessary, strengthen these areas to meet the intended loads.

7. Provide sills for shoring that are sound, rigid, and capable of carrying the maximum intended load.

8. Inspect all shoring equipment prior to erection to determine that it is as specified in the shoring layout. Do not use any equipment for shoring that is found to be damaged.

9. Inspect erected shoring equipment immediately prior to, during, and immediately after the placement of concrete. Immediately reinforce or re-shore any shoring equipment that is found to be damaged or weakened.

10. Provide re-shoring when necessary to safely support slabs and beams after stripping, or where such members are subjected to superimposed loads due to construction work done.

11. Build shoring or form systems in accordance with the URS SMS governing excavation procedures when working in excavations over 5 feet (1.5 meters) deep.

C. Tube and Coupler Shoring

1. Use tubular steel frames for shoring layouts in accordance with each manufacturer's recommended safe working load based on tests conducted according to the "Recommended Procedure for

Compression Testing Scaffolds and Shores" by the Scaffolding and Shoring Institute.

2. Prior to erection of steel frame shoring, conduct a thorough inspection to ensure material is not heavily rusted, bent, dented, or otherwise damaged or defective.

3. Provide final adjustment of adjustment screws prior to placement of concrete. Keep screw extensions to a minimum for maximum load carrying capacity.

4. Plan, design and construct any form, regardless of size, with an adequate factor of safety.

5. Do not use couplers (clamps) if they are deformed, broken, have defective or missing threads on bolts, or other defects.

6. Use material for the coupler (clamps) that is of a structural type such as drop forged steel, malleable iron, or structural grade aluminum. Do not use gray cast iron.

7. When checking the erected shoring towers with the shoring layout, confirm that the spacing between posts does not exceed that shown on the layout; check all interlocking of tubular members and tightness of couplings.

8. Confirm that all base plates, shore heads, extension devices, or adjustment screws are in firm contact with the footing sill and the form material, and are snug against the posts.

D. Vertical Slip Forms

1. Ensure that the steel rods or pipe on which the jacks climb or by which the forms are lifted are designed specifically for that purpose. Brace any rods not encased in concrete.

2. Position jacks and vertical supports in such a manner that the vertical loads are distributed equally and do not exceed the capacity of the jacks.

3. Provide the jacks or other lifting devices with mechanical dogs or other automatic holding devices to provide protection in case of failure of the power supply or the lifting mechanism.

4. Lift steadily and uniformly, and do not exceed the predetermined safe rate of lift.

5. Provide lateral and diagonal bracing of the forms to prevent excessive distortion of the structure during the jacking operation.

6. During jacking operations, the form structure must be maintained in line and plumb.

7. Provide all vertical lift forms with scaffolding or work platforms completely encircling the area of placement.

E. Pre-Stressed and Post-Stressed Concrete

1. Keep tools and strand devices clean and in good repair to prevent failure.

2. Do not permit employees to stand in line or directly over the jacking equipment during tensioning operations. Provide signs and barriers to prevent employees from working behind the jack. Shield all jacking equipment and attachment pieces to protect the workers performing the stressing operations.

3. Carefully stack stressed members on a level base.

4. Pre-stressed girders and beams are often unstable when tipped; brace during transportation and handle in such a way to keep the member upright.

5. Handle stressed members at pick points specifically designated on the manufacturer's drawings, and with the lifting devices recommended by the manufacturer or the engineer in charge.

6. Do not allow personnel under stressed members during lifting and erection.

7. Keep anchor(s) turned up close to the anchor plate during jacking operations of any tensioning element(s).

8. Frequently inspect pulling heads, bolts, and hydraulic rams for indication of fatigue, and the threads on bolts and nuts for diminishing cross section.

F. Pre-Cast Concrete and Tilt-Up Operations

1. Do not permit employees under pre-cast walls, panels, or sections while they are being lifted or tilted into position.

2. Use properly attached tag lines, especially if the load is to be lifted and moved into place.

3. Adequately brace pre-cast walls or vertical concrete panels during construction.

4. Securely attach braces or shores to the concrete member.

5. Ensure lifting inserts on or in tilt-up pre-cast concrete members are capable of supporting at least two (2) times the maximum intended load applied or transmitted to them.

6. Ensure lifting hardware can support at least five (5) times the maximum intended load applied or transmitted to the lifting hardware.

G. Masonry Work

1. Handle and store masonry building materials in accordance with URS Safety Management Standards for material handling; scaffolds for masonry construction must be built in accordance with the URS Safety Management Standard for scaffolding.

2. Equip power saws for cutting brick or stone with dust collectors or wet cutting methods to control dust. The exhausted dust will be directed away from vehicle or personnel traffic. If brick, stone, or mortar contains more than 1 percent crystalline silica, respirators may be required until air sampling determines that the task does not constitute a potential respiratory hazard.

3. Employees cutting brick or stone must wear approved safety goggles or face shields over safety glasses, and hearing protection as appropriate for the task noise levels.

4. Keep mortar tubs free from ragged edges that may cut the hands, legs, and arms of bricklayers.

5. Properly brace all walls or vertical surfaces during construction to withstand wind and other pressure.

6. Dried mortar will not be dropped from planks, crushed by vehicles, or otherwise handled in such a manner as to create a dust hazard.

7. Masons and other workers with dusty clothes must remove their outer clothing or otherwise remove masonry-generated dust from their clothes prior to leaving the work area for breaks or end of work. Do not use high-pressure air to remove dust.

5. Documentation Summary

The following documentation must be maintained:

A. Training of flagmen/spotters

B. Inspections of shoring equipment

C. Air sampling logs for crystalline silica, as needed

6. Resources

A. U.S. Occupational Safety and Health Administration (OSHA) Construction Standard – Concrete and Masonry Construction – 29 CFR 1926, Subpart Q

B. U.S. OSHA General Industry Standard – Toxic Substances – 29 CFR 1910.1000, Table Z-3

C. U.S. National Institute for Occupational Safety and Health (NIOSH) Alert, Publication 96-112 (1996) - Preventing Silicosis and Deaths in Construction Workers

D. OSHA Special Emphasis Program (SEP) for Silicosis, Memo from Joseph Dear, May 2, 1996

E. SMS 029 – Personal Protective Equipment

7. Supplemental Information

A. Health Effects of Exposure to Concrete Products

Powdered cement products are responsible for a wide variety of occupational health hazards, including inhalation, dermal, and eye hazards.

Dermal and Eye Hazards: Exposure to powdered cement products may cause drying of the skin and mild irritation, or more significant effects from the aggravation of other conditions. Wet cement is typically caustic (pH > 12) and dermal exposure may cause more severe skin effects, including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of chemical (caustic) burns. Eye exposures may cause immediate or delayed irritation or inflammation of the cornea. Eye contact with larger amounts of dry powder or splashes of wet cement may cause effects ranging from moderate eye irritation to chemical burns and blindness.

Some individuals who are exposed to cement may exhibit an allergic response, which can result in symptoms ranging from mild rashes to severe skin ulcers. Cement dermatitis may be irritant contact dermatitis induced by the alkaline, abrasive, and hygroscopic (water-absorbing) properties of cement.

Where these compounds are used, eyewash stations and drenching equipment should be staged in close proximity. OSHA requires that suitable facilities for quick drenching or flushing be provided within the work area for immediate use if an employee's eyes or body may be exposed to corrosive materials.

PPE: OSHA's general standards for personal protective equipment (PPE), 29 CFR 1910.132 for general industry and 29 CFR 1926.95 for construction, require employers to ensure that appropriate PPE is provided, effectively used, and maintained. Appropriate PPE should include boots and gloves, and may also include eye protection, such as safety glasses with side shields or goggles, in some circumstances. Such equipment must be maintained in a sanitary and reliable condition when not in use, and employees must be able to clean or exchange their equipment if it becomes ineffective or contaminated on the inside with cement. In addition to long-sleeved shirts and long pants, protective clothing such as coveralls may also be appropriate to prevent the skin from coming in contact with cement.

Sanitation: OSHA's Sanitation standard for general industry explicitly requires that lavatories with running water, hand soap, and individual hand towels or air-blowers be available in all places of employment (see 29 CFR 1910.141(d)(2)).

In construction operations where employees may be exposed to harmful contaminants, the sanitation standard requires employers to "provide adequate washing facilities in near proximity to the worksite [that must] be so equipped as to enable employees to remove such substances (29 CFR 1926.51(f)(1)).”

Inhalation Hazards/PELs: Inhalation of dry cement may cause irritation to the moist mucous membranes of the nose, throat and upper respiratory system, or may cause or aggravate certain lung diseases or conditions. Although powdered cement

products are not recognized as carcinogenic by NTP, OSHA, or IARC, they may contain small amounts of substances, such as crystalline silica and Cr(VI), which are recognized as carcinogens by these organizations.

OSHA's PELs for both cement and particulates not otherwise regulated (PNOR) are 15 mg/m^3 as total dust, and 5 mg/m^3 for the respirable fraction where listed. Because there are only trace amounts of Cr(VI) in portland cement, these PELs provide greater protection against Cr(VI) inhalation hazards than the new Cr(VI) PEL of 5 µg/m^3; that is, an employee exposed to 15 mg/m^3 of portland cement dust with a Cr(VI) concentration below 20 µg/g, will be exposed to less than 0.3 µg/m^3 of Cr(VI).

Compliance officers must confirm that concentrations of cement dust are at or below the 15 mg/m^3 PEL. If maintaining dust levels below 15 mg/m^3 is not feasible, exposed employees must wear respiratory protection in accordance with 29 CFR 1910.134. This would be most likely in construction operations such as terrazzo work, mixing mortar and jobsite mixing of concrete.

Training/Hazard Communication: Powdered cement is considered a hazardous chemical under OSHA's Hazard Communication standard; it should be included in the employer's Hazard Communication program. Employers whose employees are exposed to cement must provide appropriate training, maintain labels and copies of MSDS for cement products in their workplaces, and ensure that these documents are readily accessible during each work shift.

The Hazard Communication standard also requires chemical manufacturers and importers to assess the hazards of chemicals that they produce or import and disseminate information regarding those hazards. Among other information, each MSDS must identify the hazardous chemicals it pertains to, and the health hazards presented by those chemicals, "including signs and symptoms of exposure," as well as generally applicable precautions for safe handling and use and control measures.

Because powdered cement is a mixture, the Hazard Communication standard provides two ways in which the MSDS can list the hazardous chemicals it contains. If the mixture is tested as a whole to determine its hazards, the standard allows the MSDS to list only "the ingredients which contribute to these known hazards." For a mixture that has not been tested as a whole, the MSDS must include the ingredient(s) present in a concentration below 1% (0.1% for a carcinogens) - as is likely for the Cr(VI) in portland cement - "if there is evidence that the ingredients(s) could be released from the mixture in concentrations which could present a health risk to employees".

OSHA's general construction training standard, 29 CFR 1926.21(b), and the Hazard Communication training provision, 29 CFR 1910.1200(h), are applicable to operations with powdered cement exposure.

Further health and safety information on the concrete industry is available at the OSHA website.

URS SAFETY MANAGEMENT STANDARD
Management of Change

1. Applicability

This standard applies to operations of URS Corporation and its subsidiary companies.

Applicability of this standard is not required at operations meeting the following criteria:

- Client-mandated systems are in place and are not subject to change by their contractors (e.g., flight operations or ground operations);
- Activities of the URS work force are directed by an alternate site owner or manager (i.e., locations at which URS provides labor, but does not manage the workplace processes or systems); and
- Compartmentalized or classified client operations which limit the ability to discuss systemic or operational changes across functions.

At these operations, URS personnel should familiarize themselves with client requirements for management of change (MOC) and follow them accordingly.

2. Purpose and Scope

The purpose of this standard is to protect personnel from hazards caused by changes in the work environment. In any operation, situations may arise that were not foreseen or accounted for when the operating procedures or plans were developed. A change in the way the operations are conducted will be needed so that the work can be performed safely. The changes may be temporary or permanent. When managing change, the following must be considered:

- The reason for the change (i.e., technical, environmental, organizational, or personal);
- Impact of the change on health and safety risks;
- Modifications required to operating procedures or plans;
- Time period required to safely implement the change; and
- Authorizations required for the change.

The health, safety, security, environmental, technical, and other impacts of temporary and permanent changes are to be assessed, managed, documented, and approved. Employee participation in the process is critical, as regular observations on the part of URS employees drive the identification of work environment changes.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

Implementation of this standard is also the responsibility of any employee identifying changes in the work environment. Review of the implementation of this standard should be part of regular project reviews and office audits.

Definitions:

1. Affected Employee – An employee who is affected by temporary or permanent changes.

2. Authorizer – The individual responsible for authorizing the implementation of the change. The Authorizer is responsible for confirming that the MOC process has been followed appropriately.

3. Coordinator – The employee responsible for coordinating the evaluation and implementation of a change. Coordinators must understand the time commitment associated with the MOC process.

4. Reviewer – An individual whose expertise and experience qualifies him or her to be recognized as competent on the issues addressed by the MOC process.

5. Initiator – The employee who recognizes an opportunity for change and initiates the MOC process.

4. Requirements

A. Temporary Changes

1. Temporary changes are deviations from normal practice. They do not change the regular operating procedures. Examples of temporary changes are:

   a. Changing construction materials

   b. Using alternate or replacement equipment or machinery different from that specified in the work plan

   c. Working in changing weather or daylight conditions

   d. Changing site layout or characteristics

e. Temporarily removing equipment alarms and safety systems

f. Changing work scope daily

g. Using temporary electrical equipment and connections

h. Unexpectedly using subcontractors

i. Working without a full team or with substitute team members

j. Changing drilling or excavation locations

2. Temporary changes will be addressed in the following manner.

a. Identify the Change

i. Initiator advises the Supervisor of the change.

ii. The Supervisor verifies the conditions identified by the Initiator and determines whether change is warranted.

iii. If change is warranted, an MOC Coordinator is identified. In the case of a site project, this would typically be the Supervisor. In the office, this would typically be a senior professional or Project Manager.

b. Risk Analysis Review

i. The MOC Coordinator assigns an evaluation team and appropriate Reviewers.

ii. The evaluation team determines health, safety, environment**,** security, and operational risks of the change.

iii. Risk mitigation measures are identified.

c. Obtain Change Authorization

The MOC Coordinator obtains approval for the change and mitigating measures from the appropriate Authorizer. In the case of a site project, the Authorizer is typically the Project Manager. In an office the Authorizer is typically the Office Manager.

d. Implement the Change

i. Communicated change and its implications and timing to all affected employees.

ii. Provide necessary training.

iii. Modify or note documentation (e.g., job safety analysis, health and safety plans, safe work plans, permits, work orders), as appropriate.

iv. Implement change.

v. The MOC Coordinator verifies that the change took place as expected.

C. Permanent Changes

1. Permanent changes modify normal practices and may require revisions in standard operating procedures. Examples of permanent changes are:

a. Major changes to the project scope

b. Changes to regulatory requirements affecting the project

c. Changes in company structure

d. Changes in work teams/departments

e. Changes in client requirements

f. Changes to company standards or requirements

g. Selling new services or starting a new business line

2. Permanent changes shall be addressed in the following manner:

a. Identify the Change

i. The Initiator advises the Supervisor of the change.

ii. The Supervisor shall verify the conditions identified by the Initiator and determine whether change is warranted.

iii. If change is warranted, an MOC Coordinator is assigned.

b. Risk Analysis Review

i. The MOC Coordinator assembles an evaluation team representing all areas affected by the change.

ii. The Evaluation Team determines health, safety, environment, security, operational, legal, and financial risks of the change.

iii. The Evaluation Team determines the appropriate risk mitigation measures**.**

iv. The MOC Coordinator assembles an appropriate team of Reviewers representing all areas affected by the change to review the document.

v. The MOC Coordinator maintains a record of the evaluation with the Reviewers' signatures.

c. Obtain Change Authorization

i. The MOC Coordinator obtains approvals for the change and mitigating measures from the Authorizer(s). The Authorizer(s) could vary greatly depending on the magnitude of the change.

ii. The MOC Coordinator communicates the timeline for implementation with the appropriate Authorizer(s).

iii. The MOC Coordinator documents the process. Attachment 098-1 NA may be used for this purpose.

d. Implement the Change

i. Implement the change timeline.

ii. Revise the appropriate control documents as required to implement the change.

iii. Communicate change and its implications and timing to all Affected Employees.

iv. Provide necessary training.

v. Complete the change.

vi. The MOC Coordinator verifies that change took place as expected.

5. Documentation Summary

The following documentation will be maintained in the project or office file:

A. Attachment 098-1 NA or equivalent

6. Resources

A. Attachment 098-1 NA – Management of Change Authorization Form

URS	Health, Safety and Environment **MANAGEMENT OF CHANGE AUTHORIZATION FORM**	Attachment 098-1 NA Issue Date: April 2010

Description of the Change (include the scope of the change and affected employees):	
Risks Identified:	**Mitigation Measures:**
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

MOC Coordinator:		
Print Name	Signature	Date

Evaluation Team:		
Print Name	Signature	Date

Reviewers:		
Print Name	Signature	Date

Timeline for Implementation:

Comments/Conditions:

Authorizer Approvals:		
Print Name	Signature	Date

ATTACHMENT F

DAILY SAFETY TASK ANALYSIS FORM

Daily Project Review

Project Name/Number _____ **Date:** _____

Work Area _____ **Permits(s) required and attached** ☐ **YES** ☐ **NO**

Major Steps of Task:	Recognized/Unanticipated Hazards:	Safe Plan:	Tools *Required* to do the job safely:

Adjacent Work/Processes and/or co-occupancy ☐ **Yes** ☐ **No** ☐ **Notified them of our presence** ☐ **Coordinated with adjacent work supervisor/customer operator**

TEAM MEMBERS SIGNATURES

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

The signature of the Supervisor certifies the completion of the Project Review by the crew.

Supervisor's Signature: _____ Date _____

Instructions: 1. Write the name of the job or task in the space provided. 2. Conduct a walk-through survey of work area. 3. Write the steps of the task in a safe sequence. 4. List all possible hazards involved in each step as well as reaction to failure. 5. In the Safe Plan column, provide the corrective actions that will be taken to keep the hazard from becoming an accident or injury. 6. In Tools column list tools needed to do the job, additional safety equipment, etc. 7. Have each team member that helped develop and will use this form sign in the spaces provided at the bottom. 8. Review the form at the end of the task for improvements. **(NOTE:** THE WORK SHALL STOP IF CONDITIONS CHANGE, JOB CHANGES, OR DEFICIENCY IN PLAN IS NOTED.)

Review checklist on next page

Daily Project Review

Safe Plan of Action Checklist (Check the items that apply)

Permits/Clearances	Hazards	Safe Plan
☐ Utility Clearance Obtained		
☐ Confined Space	☐ Overhead Utilities	☐ Power de-energization required ☐ Insulation blankets required ☐ Wire watcher required ☐ Required clearance distance = _____ ft. ☐ Safe work zone marked
☐ Critical Lift		
☐ Hoisting & Rigging Safety Review	☐ Crane or other Lifting Equipment	☐ Signalman assigned ☐ Tag lines in use ☐ Area around crane barricaded ☐ Lifting equipment inspected ☐ Personnel protected from overhead load
☐ Boom Assembly and Breakdown		
☐ Boom Proximity	☐ Underground Utilities	☐ Reviewed as-builts ☐ Subsurface surveys ☐ Received dig permit ☐ Required clearance distance = _____ ft. ☐ Safe work zone marked
☐ Concrete Structure Penetration		
☐ Soil Excavation	☐ Electrical	☐ Lock Out/Tag Out/Try Out? ☐ Permit required ☐ Confirm that equipment is de-energized ☐ Reviewed electrical safety procedures ☐ Additional info below
☐ Pneumatic Test		
☐ Hot Work	☐ Excavations	☐ Permits ☐ Inspected prior to entering ☐ Proper sloping/shoring ☐ Barricades provided ☐ Access/egress provided ☐ Protection from accumulated water
☐ Scaffolding Erection Plan		
☐ Steel Erection/Decking/Flooring/ Grating Checklist	☐ Fire Hazard	☐ Permit ☐ Fire Extinguishers ☐ Fire watch ☐ Adjacent area protected ☐ Unnecessary flammable material removed ☐ Additional info below
☐ Request for Shutdown		
☐ Electrically Hazardous Work	☐ Vehicular Traffic or Heavy Equipment	☐ Traffic Barricades ☐ Cones ☐ Signs ☐ Flagmen ☐ Lane closure ☐ Communication with equipment operator ☐ Additional information below
☐ Radiation Work Permit for Visitors		
Required PPE	☐ Noise > 85 dB	Hearing protection is required: ☐ Ear plugs ☐ Ear muffs ☐ Both ☐ Additional info below
☐ Hard Hat	☐ Hand & Power Tools:	☐ Inspect general condition ☐ GFCI in use ☐ Identified PEP required for each tool
☐ Ear Plugs/Ear Muffs		☐ Reviewed safety requirements in operators manual(s) ☐ Guarding OK ☐ Additional info below
Eye Protection	☐ Hand Hazards	☐ List sharp tools, material, equipment
☐ Safety Glasses		
☐ Face Shield		☐ PPE gloves, etc. ☐ Protected sharp edges as necessary ☐ Additional info below
☐ Chemical Goggles	☐ Manual Lifting	☐ Reviewed proper lifting tech. ☐ Identified material requiring lifting equipment
☐ Welding Hood		☐ Hand protection required ☐ Back support belts ☐ Additional information below
Hand Protection	☐ Ladders	☐ Inspect general condition before use ☐ Ladder inspected within last quarter
☐ Cut Resistant Gloves		☐ Ladder tied off ☐ Proper angle and placement ☐ Reviewed ladder safety
☐ Welders Gloves	☐ Scaffolds	☐ Inspect general condition before use ☐ Tags in place ☐ Properly secured
☐ Nitrile Gloves		☐ Toe boards used ☐ Footings adequate ☐ Materials properly stored on scaffold
☐ Surgical Gloves	☐ Slips, Trips, Falls	☐ Inspect for trip hazards ☐ Hazards marked ☐ Tools & material properly stored
☐ Rubber Gloves		☐ Extension cords properly secured ☐ Work zone free of debris ☐ Additional information below
☐ Electrical Insulated Gloves	☐ Pinch Points	List potential pinch points:
☐ Arm Sleeves		
Foot Protection		☐ Working near operating equipment ☐ Hand/Body positioning ☐ Additional information below
☐ Safety Toe Boots	☐ Working w/Chemicals	☐ The task creates potential for direct contact with hazardous chemicals.
☐ Rubber Boots		☐ Reviewed MSDS hazards and precautions ☐ Have proper containers and labels
☐ Rubber Boot Covers		☐ Have identified proper PPE (respirators, clothing, gloves, etc.
☐ Dielectric Footware	☐ Heat Stress Potential	☐ Heat stress monitoring (>85º F; 29.4º C) ☐ Liquids available ☐ Cool down periods
Respiratory Protection		☐ Sun Screen ☐ Reviewed Heat Stress symptoms ☐ Additional info below
☐ Dust Mask (NIOSH)	☐ Cold Stress Potential	☐ Proper clothing (i.e., gloves, coat, coveralls) ☐ Wind chill (<32º F; 0º C)
☐ Air Purifying Respirator		☐ Reviewed Cold Stress symptoms ☐ Warm up periods ☐ Additional information below
☐ Supplied Air Respirator	☐ Environmental	☐ Air emissions ☐ Water discharge ☐ Hazardous wastes ☐ Other wastes
☐ SCBA		☐ Pollution prevention ☐ Waste minimization
☐ Emergency Escape Respirator	☐ Natural or Site Hazards	☐ Weather ☐ Terrain ☐ Adjacent operations or processes ☐ Biological hazards
Special Clothing		☐ Animals/reptiles/insects hazards
☐ Tyvek®	☐ Overhead Work	☐ Caution barricade tape required ☐ Danger barricade tape required
☐ Poly Coated Tyvek®		☐ Rigid railing required ☐ Covers over opening ☐ Warming signs required
☐ NOMEX®	**Additional Information**	
☐ Rain Suit		
Fall Protection		
☐ Harness		
☐ Double Lanyard Required		
☐ Anchorage Point Available		

ATTACHMENT G

CONSTRUCTION SAFETY ORDERS (LEAD)

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Subchapter 4. Construction Safety Orders
Article 4. Dusts, Fumes, Mists, Vapors, and Gases

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§1532.1. Lead, Appendix A

I. Substance Identification

A. Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

B. Compounds covered by the standard: The word "lead" when used in this standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

C. Uses: Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead-containing materials are present; removal or encapsulation of lead-containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities.

D. Permissible exposure: The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 **µg**/m3) averaged over an 8-hour workday.

E. Action level: The standard establishes an action level of 30 micrograms of lead per cubic meter of air (30 **µg**/m3) averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

II. Health Hazard Data

A. Ways in which lead enters your body. When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through

your skin. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

B. Effects of overexposure to lead.

(1) Short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(2) Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead

also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood. (3) Health protection goals of the standard. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be maintained at or below forty micrograms per deciliter of whole blood (40 **µg**/dl). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 **µg**/dl to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms (ug) of lead (1 mg=1000 mg) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometime BLLs are expressed in the form of mg% or mg%. This is a shorthand notation for 100g, 100 ml, or dl. (Reference to BLL measurements in this standard are expressed in the form of **µg**/dl.)

BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs about 40 **µg**/dl, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 **µg**/dl. Other studies have shown other forms of diseases in some workers with BLLs well below 80 **µg**/dl. Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases -- both short term and long term -- is to maintain your BLL below 40 **µg**/dl. The provisions of the standard are designed with this end in mind.

Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his or her actions.

(4) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.

NOTE

Authority cited: Sections 142.3 and 6717, Labor Code. Reference: Sections 142.3 and 6717, Labor Code.

HISTORY

1. New section filed 9-28-93; operative 11-4-93 pursuant to Labor Code section 142.3(a)(4) (Register 93, No. 40). This section is identical to the interim final rule adopted by the federal Occupational Safety and Health Administration on 5-4-93 and is exempt from OAL review. Pursuant to Labor Code section 142.3(a)(4)(c), this section shall remain in effect until 5-4-94 unless readopted for an additional 6 months or superceded by permanent regulations.

2. Change without regulatory effect amending opening paragraph filed 10-18-93 pursuant to title 1, section 100, California Code of Regulations (Register 93, No. 43).

3. New section refiled 4-28-94 with amendments; operative 5-4-94 pursuant to Labor Code section 142.3(a)(4) (Register 94, No. 17). This section is identical to the interim final rule adopted by the Federal Occupational Safety and Health Administration on 5-4-93 and is exempt from OAL review. Pursuant to Labor Code section 142.3(a)(4)(C), this section shall remain in effect for six months unless superseded by permanent regulations.

4. Amendment of section and amendment of Appendices headings and text filed 10-19-94; operative 10-19-94. Submitted to OAL for printing only pursuant to Labor Code section 142(a)(3) (Register 94, No. 42). 5. Change without regulatory effect amending Appendix A heading filed 2-16-95 pursuant to section 100, title 1, California Code of Regulations (Register 95, No. 7).

6. Editorial correction of subsection (d)(2)(E)5. (Register 95, No. 36).

7. Amendment of section, Appendix B and Note filed 2-5-97; operative 3-7-97 (Register 97, No. 6).

8. Amendment of former subsections (f)(1)-(f)(4)(C) including subsection renumbering and relettering resulting in newly designated subsections (f)(1)-(f)(3)(B)2., amendment of F, subsection IV, and amendment repealing appendix D and adding editorial reference filed 8-25-98; operative 11-23-98 (Register 98, No. 35).

9. Change without regulatory effect amending subsection (a) filed 2-16-2000 pursuant to section 100, title 1, California Code of Regulations (Register 2000, No. 7).

10. Amendment of subsection (f)(3)(B)2. (Table I) filed 5-24-2000; operative 6-23-2000 (Register 2000, No. 21).

Title 8 Section 1532.1
Appendix B
Appendix C
Appendix D

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§1532.1. Lead, Appendix B

This appendix summarizes key provisions of the standard for lead in construction that you as a worker should become familiar with.

I. Permissible Exposure Limit (PEL) - subsection (c)

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air (50 **µg**/m3), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40 **µg**/m3.

II. Exposure Assessment - Subsection (d)

If lead is present in your workplace in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level (30 **µg**/m3 averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless he or she has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid. Objective data for surfaces and materials that is less than 0.06% lead dry weight (600 ppm) is indicative of materials that will not give lead concentrations above the action level. Lead analysis must be performed for each unique surface coating or material. Surface coating or material objective data cannot be used to replace air monitoring for exposure assessments required for the lead-related tasks listed in subsection (d)(2). Objective data may be compiled from various sources,

e.g., insurance companies and trade associations and information from suppliers or exposure data collected from similar operations. Objective data may also comprise previously-collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past 12 months, he or she may use these results, provided they are applicable to the same employee tasks and exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions.

If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination.

If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level, your employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead at your workplace. In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he or she must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represent full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions.

The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL. Objective data cannot be used to replace air monitoring for this exposure assessment.

If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure. Your exposure must be rechecked by monitoring, at least every six months if your exposure is at or over the action level but below the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every six months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your workplace which may result in new or additional exposure to lead, your employer must perform additional monitoring.

III. Methods of Compliance - Subsection (e)

Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that can be accomplished by these means and then supplemented with appropriate respiratory protection. Your employer must establish a regulated area that includes the work area where airborne exposure to lead is above the PEL, or where the lead-related tasks listed in subsection (d)(2) are performed.

Your employer is required to develop and implement a written compliance program prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirators, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.

The written compliance program must be made available, upon request, to affected employees and their designated representatives, the Chief and NIOSH.

Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

IV. Respiratory Protection - Subsection (f)

Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level is not above the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

Your employer is required to select respirators from the types listed in Table I of the Respiratory Protection section of the standard (section 1532.1(f)). Any respirator chosen must be approved by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 42 CFR part 84. This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long

periods of time. The standard provides that you can obtain a PAPR upon request.

Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. In order to assure that your respirator fits properly and that facepiece leakage is minimized, your employer must give you either a qualitative fit test or a quantitative fit test as specified in Appendix A of the Respiratory Protection standard located at section 5144.

You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

V. Protective Work Clothing and Equipment - Subsection (g)

If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 **µg**/m3. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.

The standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work
1. Change into work clothing and shoe covers in the clean section of the designated changing areas;

2. Use work garments of appropriate protective gear, including respirators before entering the work area; and

3. Store any clothing not worn under protective clothing in the designated changing area.

Workers should follow these procedures upon leaving the work area:

1. HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air;

2. Remove shoe covers and leave them in the work area;

3. Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust.

4. Remove respirators last; and

5. Wash hands and face.

Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

1. Where applicable, place disposal coveralls and shoe covers with the abatement waste;

2. Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room.

3. Clean protective gear, including respirators, according to standard procedures;

4. Wash hands and face again. If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair.

VI. Housekeeping - Subsection (h) Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the reentry of lead into the workplace.

VII. Hygiene Facilities, Practices and Regulated Areas - Subsection (i)

The standard requires that hand washing facilities be provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.

Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

All of the facilities and hygiene practices just discussed are essential to minimize additional sources of

lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Therefore, employers shall establish regulated areas, where access is controlled by the supervisor for work areas where employees are exposed to lead at or above the PEL or performing the specific tasks that require air monitoring, as required by subsection (d)(2). Any employee that enters the regulated area must be provided with protective equipment. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

VIII. Medical Surveillance - Subsection (j)

The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have affectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers (1) who have high body burdens of lead acquired over past years, (2) who have additional uncontrolled sources of non-occupational lead exposure, (3) who exhibit unusual variations in lead absorption rates, or (4) who have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia). In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability-regardless of whether you are a man or woman.

All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts -- periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 **µg**/dl. Initial medical surveillance consisting of blood sampling and analysis for lead and zinc protoporphyrin must be provided to all employees exposed at any time (1 day) above the action level.

Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 **µg**/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity.

If your BLL exceeds 40 **µg**/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive BLLs indicate a blood lead level below 40 **µg**/dl. Each time your BLL is determined to be over 40 **µg**/dl, your employer must notify you of this in writing within five working days of his or her receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 **µg**/dl. (See Discussion of Medical Removal Protection-Subsection (k).) Anytime your BLL exceeds 50 **µg**/dl your employer must make available to you within two weeks of receipt of these test results a second follow-up BLL test to confirm your BLL. If the two tests both exceed 50 **µg**/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 **µg**/dl at any time during the preceding year and you are being exposed above the

airborne action level of 30 **µg**/m3 for 30 or more days per year. The initial examination will provide information to establish a baseline to which subsequent data can be compared.

An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See Part IX, below.)

The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include (1) a detailed work history and medical history; (2) a thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator; (3) a blood pressure measurement; and (4) a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you are dissatisfied with an examination by a physician chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard - unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers. The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes (1) the standard and its appendices, (2) a description of your duties as they relate to occupational lead exposure, (3) your exposure level or anticipated exposure level, (4) a description of any personal protective equipment you wear, (5) prior blood lead level results, and (6) prior written medical opinions concerning you that the employer has. After a medical examination or consultation the physician must prepare a written report which must contain (1) the physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead, (2) any recommended special protective measures to be provided to you, (3) any blood lead level determinations, and (4) any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

The medical surveillance program of the interim lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that OSHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for OSHA to make you aware of this.

The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, (Ca Na2 EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be "safe". It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

IX. Medical Removal Protection - Subsection (k)

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this

program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires.

You may also be removed from exposure even if your blood lead level is below 50 **µg**/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accompanied in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternately, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

In all of these situation, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be

used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to lay-off with MRP benefits. X. Employee Information, Training and Certification - Subsection (l)

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

The California Department of Health Services requires the certification of employees and supervisors performing lead related construction activities in residential and public buildings, as defined in Title 17, California Code of Regulations, Division 1, Chapter 8. Lead related construction work is defined in Title 17 as any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead containing material or soil, may result in significant exposure of adults or children to lead. "Public building" means a structure which is generally accessible to the public, including but not limited to, schools, daycare centers, museums, airports, hospitals, stores, convention centers, government facilities, office buildings and any other building which is not an industrial building or a residential building. Where training certification is required, the training must be given by a training provider accredited by the California Department of Health Services.

XI. Signs - Subsection (m)

The standard requires that the following warning sign be posted in each regulated area or work areas where the exposure to lead exceeds the PEL:

WARNING

LEAD WORK AREA

POISONNO

SMOKING OR EATING

These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

XII. Recordkeeping - Subsection (n)

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years. Your employer is also required to keep all records of biological monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and a copy of the results of the

examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than one year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment.

Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLL's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

XIII. Observation of Monitoring - Subsection (o)

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

XIV. Effective Date - Subsection (p) The standard's effective date was November 4, 1993. Employer obligations under the standard begin as of that date with full implementation of engineering controls as soon as possible but no later than within 4 months, and all other provisions completed as soon as possible, but no later than within 2 months from the effective date.

XV. For Additional Information

A. A copy of the standard for lead in construction can be obtained free of charge by calling or writing your local Cal/OSHA Office.

B. Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest Cal/OSHA Office listed in your telephone directory.

NOTE

Authority cited: Sections 142.3 and 6717, Labor Code. Reference: Sections 142.3 and 6717, Labor Code.

HISTORY

1. New section filed 9-28-93; operative 11-4-93 pursuant to Labor Code section 142.3(a)(4) (Register

93, No. 40). This section is identical to the interim final rule adopted by the federal Occupational Safety and Health Administration on 5-4-93 and is exempt from OAL review. Pursuant to Labor Code section 142.3(a)(4)(c), this section shall remain in effect until 5-4-94 unless readopted for an additional 6 months or superceded by permanent regulations.

2. Change without regulatory effect amending opening paragraph filed 10-18-93 pursuant to title 1, section 100, California Code of Regulations (Register 93, No. 43).

3. New section refiled 4-28-94 with amendments; operative 5-4-94 pursuant to Labor Code section 142.3(a)(4) (Register 94, No. 17). This section is identical to the interim final rule adopted by the Federal Occupational Safety and Health Administration on 5-4-93 and is exempt from OAL review. Pursuant to Labor Code section 142.3(a)(4)(C), this section shall remain in effect for six months unless superseded by permanent regulations.

4. Amendment of section and amendment of Appendices headings and text filed 10-19-94; operative 10-19-94. Submitted to OAL for printing only pursuant to Labor Code section 142(a)(3) (Register 94, No. 42). 5. Change without regulatory effect amending Appendix A heading filed 2-16-95 pursuant to section 100, title 1, California Code of Regulations (Register 95, No. 7).

6. Editorial correction of subsection (d)(2)(E)5. (Register 95, No. 36).

7. Amendment of section, Appendix B and Note filed 2-5-97; operative 3-7-97 (Register 97, No. 6).

8. Amendment of former subsections (f)(1)-(f)(4)(C) including subsection renumbering and relettering resulting in newly designated subsections (f)(1)-(f)(3)(B)2., amendment of F, subsection IV, and amendment repealing appendix D and adding editorial reference filed 8-25-98; operative 11-23-98 (Register 98, No. 35).

9. Change without regulatory effect amending subsection (a) filed 2-16-2000 pursuant to section 100, title 1, California Code of Regulations (Register 2000, No. 7).

10. Amendment of subsection (f)(3)(B)2. (Table I) filed 5-24-2000; operative 6-23-2000 (Register 2000, No. 21).

Title 8 Section 1532.1
Appendix A
Appendix C
Appendix D

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