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ORLANDO FL
9/7/1995
NAVFAC SOUTHERN



Site Specific Health and Safety Plan
**Long Term Monitoring Services and Operations &
Maintenance**
OU-1, OU-2, OU-3, SA-36, SA-39, & Bldg 2273
Former Naval Training Center
Orlando, Florida
Revision: 01
Contract No. N62467-02-G-0352 / CTO 0004

Submitted to:
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Southern Division
Naval Facilities Engineering Command
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3	Chemical-Specific Training Form
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Acronyms

°F	degrees Fahrenheit
ALARA	as low as reasonably achievable
APR	air-purifying respirator
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dba	decibel A-rated
DOT	Department of Transportation
FA	first aid
FID	flame ionization detector
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
lb	pound
LEL	lower explosive limit
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm ²	milliwatt per square centimeter
NAS	Naval Air Station
NDG	nuclear density gauge
NSC	National Safety Council
NWIRP	Naval Weapons Industrial Reserve Plant
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SHSS	Site Health and Safety Specialist
SOP	standard of practice
STEL	short-term exposure limit
SZ	support zone
TBD	to be determined
TMCC	truck-mounted crash cushion
TSDF	treatment, storage, and disposal facility

This health and safety plan (HSP) will be kept on the site during field activities and will be reviewed and updated as necessary. The Site Health and Safety Specialist (SHSS) is to be familiar with the content of this plan. Site personnel must sign **Attachment 1**. In addition, this plan adopts procedures in the work plan for the project.

1.0 Project Information and Description

Client or Owner: Department of the Navy, Southern Division

Project No: N62467-02-G-0352 CTO0004

Terraine Program Manager: Mr. Paul M. Shipp

Site Name: Former Naval Training Center, Orlando, FL

Date Health and Safety Plan Prepared: May-June 2003

Date(s) of Initial Visit: May 2003

Site Description: The former Naval Training Center Orlando (NTC Orlando) project consists of six (6) separate sites, which include:

Operable Unit 1 (OU-1) – Former Landfill on the Main Base

Operable Unit 2 (OU-2) – Former Landfill located at the southern end of McCoy Annex

Operable Unit 3 (OU-3) – Study Area 8 (former Greenskeeper Storage Storage Area) and Study Area 9 (former Pesticide Handling and Storage Area)

Study Area 36 (SA-36) – located south of the former Langley Street and west of the former Grace Hopper Avenue on the Main Base

Study Area 39 (SA-39) – located in the southwest corner of the Main Base at the Naval Training Center

Building 2273 (Bldg 2273) – former NTC Supply Bulk Fuel Storage Facility

2.0 Project Organization and Tasks to be performed under this Plan

2.1 Project Organization

Client: SOUTHNAVFACENGCOM Southern Division

Terraine:

Program Manager: Mr. Paul M. Shipp

Project Manager: Mr. James L. Young

Field Staff: Refer to **Section 4.0**

Contractors and Subcontractors: Refer to **Section 4.2.**

2.2 Description of Tasks

Refer to project documents (i.e., work plan) for detailed task information. A health and safety risk analysis has been performed for each task and is incorporated in this HSP through task-specific hazard controls and requirements for monitoring and protection (**Table 2-1**). Tasks in addition to those listed below require an approved amendment to this plan before additional work begins. Refer to **Section 10.2** for procedures related to tasks that do not involve hazardous waste operations and emergency response (HAZWOPER).

2.2.1 HAZWOPER-Regulated Tasks

HAZWOPER-regulated tasks include:

- Collection of groundwater samples from groundwater monitoring wells located at all 6 separate sites
- Collection of biogenic gases samples from groundwater monitoring wells located at site OU-2

2.2.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state HAZWOPER regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-HAZWOPER-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste/hazardous materials sites.**

Potential Hazards	Groundwater Monitoring
Electrical	
Fire Protection	
Hand and Power Tools	X
Heavy Equipment	
Lockout / Tagout	
Manual Lifting	X
Noise >85dBa	
Traffic Control	X
Visible Lighting	X

2.2.3 Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. **Table 2-2** lists safe work practices and control measures used to reduce or eliminate potential hazards for the activities associated with this project. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. Terraine employees and subcontractors must remain aware of the hazards affecting them regardless of the party responsible for controlling the hazards. Terraine employees and subcontractors who do not understand any of these provisions should contact the SHSS for clarification.

In addition to controls specified in this section, an activity Self-Assessment Checklist is provided in **Attachment 5**. This checklist is to be used to assess the adequacy of Terraine and its subcontractor's site-specific safety requirements. Objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing gaps. A Self-Assessment Checklist will be completed bi-weekly and returned to the Senior Project Manager, with a copy to HSM.

TABLE 2-2
Activity Hazard Analysis: System Operation & Maintenance

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Hazards	Reduce general safety hazards found at most sites.	<ul style="list-style-type: none"> • Site work will be performed during daylight hours whenever possible. Work conducted during hours of darkness will require enough illumination intensity to read a newspaper without difficulty. • Hearing protection worn in areas where you need to shout to hear someone within 3 feet. • Good housekeeping must be maintained at all times in project work areas. • Common paths of travel established and kept free from accumulation of materials. • Provide slip-resistant surfaces, ropes, and /or other devices to be used. • Specific areas should be designated for the proper storage of materials. • Tools, equipment, materials, and supplies will be stored in an orderly manner. • As work progresses, scrap and unessential materials must be neatly stored or removed from the work area. • Containers should be provided for collecting trash and other debris and will be removed at regular intervals. • Spills will be cleaned up. Oil and grease will be cleaned from walking/working surfaces.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Hazard Communication	Comply with the Hazard Communication Standard informing workers about the chemicals to which they may be exposed; reference 29 CFR 1926	<ul style="list-style-type: none"> • Complete an inventory of chemicals brought on site by Terraine using the Project-Specific Chemical Hazard Communication Form provided in Attachment 2. • Confirm inventory of chemicals brought on site by Terraine subcontractors is available. • Confirm locations of Material Safety Data Sheets (MSDSs) from client, contractors, and subcontractors for chemicals to which Terraine employees potentially are exposed. • Before or as the chemicals arrive onsite, obtain an MSDS for each hazardous chemical. • Label chemical containers with the identity of the chemical and with hazard warnings, and store properly. • Give employees required chemical-specific HAZCOM training using the Chemical-Specific Tracking Form provided in Attachment 3.
Energized Electrical	Reduce the hazards when dealing with energized electrical circuits; reference in 29 CFR 1926.400	<ul style="list-style-type: none"> • Only qualified personnel permitted to work on unprotected energized electrical systems. • Electrical wiring and equipment will be de-energized prior to conducting work unless it can be demonstrated that de-energizing introduces additional or increased hazards or is unfeasible due to equipment design or operational limitations. • Electrical systems will be considered energized until lockout/tagout procedures are implemented. • The Energized Electrical Work permit provided in Attachment 4 of this plan must be completed prior to working on unprotected energized electrical systems. • Follow control measures & procedures identified on Energized Electrical Work permit.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Fire Protection	To reduce the incidents of fires and provide resources to fight fires; reference in 29 CFR 1926.150	<ul style="list-style-type: none"> • Fire extinguishers will be provided so travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must: 1) be maintained in a fully charged and operable condition, 2) be visually inspected each month, and 3) undergo a maintenance check each year. • The area in front of extinguishers must be kept clear. • Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations. • Combustible materials stored outside should be at least 10 feet from any building. • Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site. • Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.
Lockout/Tagout	Reduce the hazards of machine startups while out of service as referenced in 29 CFR 1910.147, 29 CFR 1926. 417	<ul style="list-style-type: none"> • Do not work on equipment when the unexpected operation could result in injury, unless lockout/tagout procedures are implemented. • Staff working under a lockout/tagout procedure must complete the TERRAINE Lockout/Tagout training course. Project-specific training may also be required on site-specific lockout/tagout procedures. • Standard lockout/tagout procedures include the following six steps: • Notify all personnel in the affected area of the lockout/tagout, • Shut down the equipment using normal operating controls, • Isolate all energy sources, • Apply individual lock and tag to each energy isolating device, • Relieve or restrain all potentially hazardous stored or residual energy, and • Verify that isolation and de-energization of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin. • All safe guards must be put back in place, all affected personnel notified that lockout/tagout has been removed, and controls positioned in the safe mode prior to lockout/tagout removal. • Do not remove another person’s lock or tag.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Machine guards	Reduce the hazards when working with machines with pinch points or other hazardous moving parts	<ul style="list-style-type: none"> • All machine guards must remain affixed unless equipment is locked out / tagged out. • Machine guards shall not be removed for maintenance unless equipment is locked out / tagged out. • Belts and pulleys on pumps and blowers must be properly guarded before operation.
Manual Lifting	Reduce hazards encountered when lifting loads	<ul style="list-style-type: none"> • Proper lifting techniques must be used when lifting any object. • Plan storage and staging to minimize lifting or carrying distances. • Split heavy loads into smaller loads. • Use mechanical lifting aids whenever possible. • Have someone assist with the lift especially for heavy or awkward loads. • Ensure that the path of travel is clear prior to the lift.
Muriatic Acid Handling	Reduce hazards associated with handling acids	<ul style="list-style-type: none"> • Confirm training in Hazard Communications. • Confirm presence of proper PPE (see Table 5-1) • Exercise extreme caution when transferring muriatic acid from storage container to equalization tank. • Vigilantly utilize all required PPE during any acid recirculation event throughout the entire duration of the event, until the acid wash has been removed into a vacuum truck.
Noise	Reduce the exposure to noise as referenced by 29 CFR 1926.101 and 29CFR 1910.95	<ul style="list-style-type: none"> • Noise areas will be evaluated at the start of the project and at any time new machinery is added to the process. • Hearing protection will be worn whenever levels in excess of 85 dBA are exceeded as in areas where you must raise your voice to communicate at a distance of 3 feet or less. • Personnel will be trained in the proper installation techniques for ear protection that fits in the ear canal. • Hearing protective devices will be kept clean and sanitary between uses. • Noise measurements may be required by the SSHA to determine protection areas. These areas need to be posted with appropriate warning signs.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Traffic Control	Reduce hazards related to control of traffic and impacts	<ul style="list-style-type: none"> • Exercise caution when exiting traveled way or parking along street; avoid sudden stops, use flashers, etc. • Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier. • All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests. • Eye protection should be worn to protect from flying debris. • Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc. • Always remain aware of an escape route – behind an established barrier, parked vehicle, guardrail, etc. • Always pay attention to moving traffic – never assume drivers are looking out for you • Work as far from traveled way as possible to avoid creating confusion for drivers. • When workers must face away from traffic, a “buddy system” should be used, where one worker is looking towards traffic. • When working on highway projects, obtain copy of the contractor’s traffic control plan. • Work area should be protected by a physical barrier such as a K-rail or Jersey barrier.

3.0 Hazard Evaluation and Control

3.1 Heat and Cold Stress

3.1.1 Preventing Heat Stress

The following guidelines relate to heat stress prevention:

- Drink 16 ounces of water before beginning work, such as in the morning or after lunch. Disposable (e.g., 4-ounce) cups and water maintained at 50 to 60 degrees Fahrenheit (°F) should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons per day. Take regular breaks in a cool, preferably air-conditioned, area. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours. Monitor for signs of heat stress.
- Acclimate to site work conditions by slowly increasing workloads; e.g., do not begin site work with extremely demanding activities.
- Use cooling devices, such as cooling vests, to aid natural body ventilation. The devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- During hot weather, conduct field activities in the early morning or evening if possible.
- Provide adequate shelter to protect personnel against radiant heat (sun, flames, hot metal), which can decrease physical efficiency and increase the probability of heat stress.
- In hot weather, rotate shifts of workers.
- Maintain good hygiene standards by frequently changing clothing and by showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should consult medical personnel.

3.1.2 Symptoms and Treatment of Heat Stress

The symptoms of heat stress are listed in Table 3-1.

TABLE 3-1
Symptoms and Treatment of Heat Stress

	Heat Syncope	Heat Rash (<i>miliaria rubra</i>, "prickly heat")	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

3.1.3 Heat-Stress Monitoring

For field activities part of ongoing site work activities in hot weather, the following procedures should be used to monitor the body's physiological response to heat and to estimate the work-cycle/rest-cycle when workers are performing moderate levels of work. These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (greater than 50 percent), or when the workers exhibit symptoms of heat stress.

The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute or 20 beats per minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats per minute or 20 beats per minute above resting pulse.

3.1.4 Preventing Cold Stress

Working in cold environments can be dangerous. Prolonged exposure to freezing or cold temperatures can result in health problems such as trench foot, frost bite and hypothermia. When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death can occur. To help protect workers in cold environments:

- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help workers.
- Train workers about cold-induced injuries and illnesses.
- Encourage workers to wear proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Be sure that workers take frequent short breaks in warm dry shelters to allow the body to warm up.
- Try to schedule work for the warmest part of the day.
- Drink warm, sweet beverages (sugar water, sports drinks) and avoid drinks with caffeine (coffee, tea, sodas, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods such as hot pasta dishes.

3.1.5 Symptoms and Treatment of Cold Stress

The symptoms and treatment of cold stress are listed in Table 3-2.

**TABLE 3-2
Symptoms and Treatment of Cold Stress**

	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Pale, waxy-white skin color; skin becomes hard and numb; usually affects the fingers, hands, toes, feet, ears, and nose.	Normal body temperature drops below 95°F; fatigue or drowsiness; uncontrolled shivering; cool bluish skin; slurred speech; clumsy movements; irritable; irrational or confused behavior.
Treatment	Seek medical treatment immediately.	Move person to a warm dry area; remove wet or tight clothing; do not rub the affected area; gently place the affected area in a warm water bath and monitor the water temperature to slowly warm the tissue; when normal feeling, movement, and skin color have returned, dry and wrap the affected area; seek medical attention as soon as possible.	Call for emergency help; move person to a warm dry area; remove any wet clothing and replace with warm, dry clothing or wrap person in blankets; have person drink warm, sweet drinks; avoid caffeine; have person move their arms and legs.

3.2 Locating Buried Utilities

3.2.1 Local Utility Mark-Out Service

The Utilities Locator Service on Base will be responsible for marking utilities.

3.2.2 Procedures for Locating Buried Utilities

Procedures for locating buried utilities are listed as follows:

- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural-gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary, clear locations with a utility-locating instrument (e.g., metal detector).
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually. Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SHSS should confirm that arrangement.

3.3 Biological Hazards and Controls

Biological hazards and controls are listed in **Table 3-3**.

**TABLE 3-3
Biological Hazards and Controls**

Hazard and Location	Control Measures
<p>Snakes typically are found in underbrush and tall grassy areas. May be present in well vaults.</p>	<p>Use leather gloves when opening well vaults. Observe interior of well vaults from a discreet distance prior to inserting any part of body. If you encounter a snake on ground level, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. DO NOT apply ice, cut the wound, or apply a tourniquet. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the type of snake: note color, size, patterns, and markings.</p>
<p>Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas.</p>	<p>Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.</p>
<p>Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with medical or other potentially infectious material, or when coming into contact with landfill waste or waste streams containing such infectious material.</p>	<p>Training is required before a task involving potential exposure is performed. Exposure controls and personal protective equipment (PPE) are required as specified in TERRAINE SOP HS-36, <i>Bloodborne Pathogens</i>. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.</p>
<p>Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Spiders may be present in well vaults</p>	<p>Use leather gloves when opening well vaults. After opening, inspect underside of vault lid for spiders. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SHSS and/or the buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.</p>

TABLE 3-3
Biological Hazards and Controls

Other potential biological hazards	None anticipated.
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3.4 Tick Bites

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size.

Prevention against tick bites includes avoiding tick areas; wearing tightly woven light-colored clothing with long sleeves and wearing pant legs tucked into boots or socks; spraying only outside of clothing with insect repellent containing permethrin or permethrin, and spraying skin with DEET; and checking yourself frequently for ticks and showering as soon as possible. To prevent chemical repellents from interfering with sample analyses, exercise care while using repellents during the collection and handling of environmental samples.

If bitten by a tick, carefully remove the tick with tweezers, grasping the tick as close as possible to the point of attachment while being careful not to crush the tick. After removing the tick, wash your hands and disinfect and press the bite area. The removed tick should be saved. Report the bite to human resources personnel.

Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF): Lyme - a rash that looks like a bullseye with a small welt in the center; RMSF - a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, bone pain may develop. If symptoms appear, seek medical attention.

3.5 Hazards Posed by Chemicals Brought on the Site

3.5.1 Hazard Communication

The project manager is to request MSDSs from the client or from the contractors and the subcontractors for chemicals to which Terraine employees potentially are exposed. The SHSS is to do the following:

- Give employees required site-specific hazard communication (HAZCOM) training.
- Confirm that inventory of chemicals brought on the site by subcontractors is available.
- Before or as chemicals arrive on the site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with identity of chemical and with hazard warnings, if any.

The chemical products listed in **Table 3-4** will be used on the site. Refer to Attachment 2 for MSDSs.

TABLE 3-4
Chemical Hazards

Chemical	Quantity	Location
Alconox/Liquinox (detergent)	< 1 liter, powder/liquid	Support/Decontamination Zone

3.5.2 Shipping and Transportation of Chemical Products

Chemicals brought to the site may be considered hazardous materials by the DOT. All staff who ship materials or transport them by road must receive the Terraine training in shipping dangerous goods. Hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.6 Potential Routes of Exposure

Potential routes of exposure include:

- **Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in **Section 5.0**.
- **Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in **Sections 5.0** and **6.0**, respectively.
- **Injection:** Potential for injection as a result of cuts from contaminated surfaces (e.g. sharp edges). This route of exposure should not be present if safe work practices are employed.
- **Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before eating, drinking, or smoking).

4.0 Personnel

4.1 Terraine Employee Medical Surveillance and Training

The employees listed in **Table 4-1** are enrolled in the Terraine Comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SHSS" have received 8 hours of supervisor and instrument training and can serve as SHSS for the level of protection indicated. A SHSS with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and cardiopulmonary resuscitation (CPR). The employees listed below are currently active in a medical surveillance program that meet state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

TABLE 4-1
Project Personnel Safety Certifications

Employee Name	Office	Responsibility	SHSS/FA-CPR
Paul M. Shipp	Knoxville, TN	Program Manager	
James L. Young	Miami, FL	Project Manager	
Karen Baer	Miami, FL	Site Superintendent/Field Team	
Michael Pressley	Charlotte, NC	Health and Safety Manager	

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client

Representative:

Southern Division NAVFACENGCOM
Attn: Barbara Nwokike
Dept. of Navy
PO Box 190010
North Charleston, SC 29419-9010

4.2.2 Terraine

Project Manager:

James L. Young
2622 NW 97th Avenue
Miami, FL 33172

Health and Safety Manager:

Michael J. Pressley
600 Towne Centre Blvd, Suite 308
Pineville, NC 28134

Site Superintendent:

Karen Baer
2622 NW 97th Avenue
Miami, FL 33172

Site Health and Safety Specialist: N/A

The Site Superintendent will assume the responsibilities of the SHSS and will be responsible for contacting the project manager. In general, the project manager either will contact or will identify the client contact. The HSM should be contacted as appropriate. The SHSS or the project manager must notify the client and the HSM when a serious injury or a death occurs or when health and safety inspections by OSHA or other agencies are conducted. Refer to **Sections 10** through **12** for emergency procedures and phone numbers.

4.2.3 Subcontractors

When specified in the project documents (e.g., contract), this plan may cover Terraine subcontractors. However, this plan does not address hazards associated with tasks and equipment that the subcontractor has expertise in (e.g., operation of drill rig). Specialty subcontractors are responsible for health and safety procedures and plans specific to their work. Specialty subcontractors are to submit plans to Terraine for review and approval before the start of fieldwork. Subcontractors must comply with the established health and safety plan(s). Terraine must monitor and enforce compliance with the established plan(s).

General health and safety communication with subcontractors contracted with Terraine and covered by this plan is to be conducted as follows:

- Request that the subcontractor, if a specialty subcontractor, submit a safety or health plan applicable to their expertise (e.g., drill-rig safety plan or nuclear density gauge [NDG] health plan); attach the reviewed plan.
- Supply subcontractors with a copy of this plan, and brief them on its provisions.
- Direct health and safety communication to the subcontractor-designated safety representative.
- Notify the subcontractor-designated representative if a violation of the plan(s) is observed. Specialty subcontractors are responsible for mitigating hazards in which they have expertise.
- If a hazard condition persists, inform the subcontractor. If the hazard is not mitigated, stop affected work as a last resort and notify the project manager.
- When an apparent imminent danger exists, promptly remove all affected personnel. Notify the project manager.
- Make clear that consistent violations of the health and safety plan by a subcontractor may result in termination of the subcontract.

5.0 Personal Protective Equipment

5.1 PPE Specifications

PPE specifications are listed in **Table 5-1**.

**TABLE 5-1
PPE Specifications^a**

Task	Level	Body	Head	Respirator^b
General Work Uniform when no Chemical Exposure is anticipated	D	Work clothes; steel-toe, steel-shank leather work boots; work gloves	Hardhat ^c Safety glasses Ear protection ^d	None required
Groundwater Sample Collection	Modified D	BOOTS: leather work boots GLOVES: Inner surgical-style nitrile glove		None required
Biogenic Gases Sample Collection	Modified D	BOOTS: leather work boots GLOVES: Inner surgical-style nitrile glove		None required

^a Modifications are as indicated. Terraine will provide PPE to only Terraine employees.

^b No facial hair that would interfere with respirator fit is permitted.

^c Hardhat and splash-shield areas are to determined by the SHSS.

^d Ear protection should be worn while working around noise-producing equipment or when conversations cannot be held at distances of 3 feet or less without shouting. Refer to Section 6 for other requirements.

5.2 Upgrading or Downgrading Level of Protection

The reasons for upgrading or downgrading the PPE level are as follows:

- Upgrade
 - Request from individual performing task
 - Change in work task that will increase contact or potential contact with hazardous materials
 - Occurrence or likely occurrence of gas or vapor emission
 - Known or suspected presence of dermal hazards
 - Instrument action levels (Section 6) exceeded
- Downgrade
 - New information indicating that situation is less hazardous than originally thought
 - Change in site conditions that decreases the hazard
 - Change in work task that will reduce contact with hazardous materials

Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been specified in Section 5.0 and an SHSS who meets the requirements specified in Section 4.1 is present.

6.0 Air Monitoring Specifications

Air Monitoring is not anticipated for this contract.

6.1 Calibration Specifications

As no ambient air monitoring is required, no use of instruments or their calibration will be necessary.

6.2 Air Sampling

Sampling may be required by other OSHA regulations where exposure to certain contaminants may exist. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. These airborne hazards are not anticipated. Contact the HSM immediately if these contaminants are encountered.

6.2.1 Method Description

Real time air monitoring will not be performed.

6.2.2 Personnel and Areas

Not applicable.

7.0 Decontamination

The SHSS must monitor the effectiveness of the decontamination procedures, when applicable. Decontamination procedures found to be ineffective will be modified by the SHSS.

7.1 Decontamination Specifications

Decontamination specifications are listed in **Table 7-1**.

TABLE 7-1
Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
PPE-disposal method Non-hazardous municipal solid waste	Not Applicable	Not applicable
Water-disposal method Store in drums staged at WWTP until tested. When deemed non-hazardous, dispose at WWTP.		

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SHSS should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

8.0 Spill Prevention and Control Plan

This Spill Prevention and Control Plan establishes minimum site requirements. Subcontractors are responsible for spill prevention and control related to their operations. Subcontractors written spill prevention and control procedures must be consistent with this plan. Spills must be reported to your supervisor, the site manager, and the Contract Manager.

8.1 Spill Prevention

No fuel and chemical storage areas will be necessary for the performance of this contract.

Incidental chemical products must be properly stored, transferred, and used in a safe manner. Should chemical product use occur outside areas equipped with spill control materials, adequate spill control materials must be maintained.

8.2 Spill Containment and Control

Spill control materials will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly. Spilled materials must be immediately contained and controlled. Spill response procedures include:

- Immediately warn any nearby personnel and notify the work supervisor.
- Assess the spill area to ensure that it is safe to approach.
- Activate site evacuation signal if spill presents an emergency.
- Ensure any nearby ignition sources are immediately eliminated.
- If it can be done safely, stop the source of the spill.
- Establish site control for the spill area.
- Use proper PPE in responding to the spill.
- Contain and control spilled material through the use of sorbent booms, pads, or other materials.

8.3 Spill Cleanup and Removal

Spilled material, contaminated sorbent, and contaminated media will be cleaned up and removed as soon as possible. Contaminated spill material will be drummed, labeled, and properly stored until material is disposed of. Contaminated material will be disposed of according to applicable federal, state, and local requirements. Contact the regulatory compliance person for the project or the program for assistance.

9.0 Confined-Space Entry

Confined-space entry requires special health and safety procedures and training. When planned activities include confined-space entry, permit-required confined spaces accessible to Terraine personnel are to be identified before the task begins. The SHSS will confirm that permit spaces are properly posted or that employees are informed of their locations and informed of their hazards.

10.0 Site Control Plan

10.1 Site Control Procedures

The following site control procedures will be implemented for this CTO:

- SHSS will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of health and safety plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- SHSS records attendance at safety briefings in logbook and documents topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location at sites where project field offices, trailers, or equipment storage boxes are established. Posters can be obtained by calling either 800/548-4776 or 800/999-9111.
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Determine wind direction.
- Establish work zones: support, decontamination, and exclusion zones. Delineate work zones with flags or cones as appropriate. The support zone (SZ) should be upwind of the site.
- Establish decontamination procedures, including respirator-decontamination procedures, and test the procedures.
- Use access control at the entry and exit from each work zone.
- Store chemicals in appropriate containers.
- Make MSDSs available for onsite chemicals to which employees are exposed.
- Establish onsite communication consisting of the following:
 - Line-of-sight and hand signals
 - Air horn
 - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Establish procedures for disposing of material generated on the site.
- Initial air monitoring is conducted by the SHSS in appropriate level of protection.
- SHSS is to conduct periodic inspections of work practices to determine the effectiveness of this plan

10.2 HAZWOPER Compliance Plan

The following procedures are to be followed when certain activities do not require 24- or 40-hour training. Note that prior approval from the HSM is required before these tasks are conducted on regulated hazardous waste sites.

- Certain parts of the site work may be covered by state or federal HAZWOPER standards and therefore require training and medical monitoring. Anticipated tasks must be included in Section 2.2.1.
- Air sampling must confirm that there is no exposure to gases or vapors before non-HAZWOPER-trained personnel are allowed on the site. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to **Sections 3.8** and **6.2** for contaminant data and air sampling requirements, respectively.
- Non-HAZWOPER-trained personnel must be informed of the nature of the existing contamination and its locations, the limits of their access, and the emergency action plan for the site. Non-HAZWOPER-trained personnel also must be trained in accordance with other state and federal OSHA requirements, including 29 CFR 1910.1200 (HAZCOM). Refer to **Section 3.7.1** for hazard communication requirements.
- Air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-HAZWOPER-trained personnel (e.g., in an adjacent area) are not exposed to volatile contaminants. Non-HAZWOPER-trained personnel should be monitored whenever the belief is that there may be a possibility of exposure (e.g., change in site conditions), or at some reasonable frequency to confirm that there is no exposure. Refer to **Section 6.1** for air monitoring requirements.
- Treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the HAZWOPER standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only HAZWOPER-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-HAZWOPER-trained personnel must leave the site.

If HAZWOPER-regulated tasks are conducted concurrently with non-regulated tasks, non-HAZWOPER-trained subcontractors must be removed from areas of exposure. If non-HAZWOPER-trained personnel remain on the site while a HAZWOPER-regulated task is conducted, the contaminant/exposure area (exclusion zone) must be posted, non-HAZWOPER-trained personnel must be reminded of the locations of restricted areas and the limits of their access, and real-time monitoring must be conducted. Non-HAZWOPER-trained personnel at risk of exposure must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.

11.0 Emergency Response Plan

11.1 Pre-Emergency Planning

SHSS performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with the facility and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Locate the nearest telephone; determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Identify and communicate chemical, safety, radiological, and biological hazards.
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Post site map marked with locations of emergency equipment and supplies, and post OSHA job-site poster. The OSHA job-site poster is required at sites where project field offices, trailers, or equipment-storage boxes are established. Posters can be obtained by calling either 800/548-4776 or 800/999-9111.
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Evaluate capabilities of local response teams where applicable.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, chemical and vapor releases.
- Review notification procedures for contacting Terraine's medical consultant and team member's occupational physician.
- Rehearse the emergency response plan once before site activities begin, including driving the route to the hospital.
- Brief new workers on the emergency response plan.
- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

11.2 Emergency Equipment and Supplies

The SHSS should mark the locations of emergency equipment on the site map and should post the map. Emergency equipment and its location are listed in **Table 11-1**.

TABLE 11-1
Emergency Equipment

Emergency Equipment and Supplies	Location
20 lb (or two 10-lb) fire extinguisher (A, B, and C classes)	In Field Vehicle
First aid kit	In Field Vehicle
Eye wash	In Field Vehicle
Potable water	In Field Vehicle
Bloodborne-pathogen kit	In Field Vehicle
Additional equipment (specify)	

11.3 Emergency Medical Treatment

Emergency medical treatment procedures are as follows:

- Notify appropriate emergency response authorities listed in **Sections 11.9** and **11.11** (e.g., 911).
- During a time of no emergency, contact Terraine's medical consultant for advice and guidance on medical treatment.
- The SHSS will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Notify the field team leader and the project manager of the injury.
- Make certain that the injured person is accompanied to the emergency room.
- Notify the health and safety manager.
- Notify the injured person's human resources department within 24 hours.
- Prepare an incident report. Submit the report to the corporate director of health and safety and the corporate human resources department within 48 hours.
- When contacting the medical consultant, state that you are calling about a Terraine matter, and give your name, your telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

11.4 Non-emergency Procedures

The procedures listed above may be applied to non-emergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the Terraine medical consultant.

When contacting the medical consultant, state that the situation is a Terraine matter, and give your name, your telephone number, the name of the injured person, the extent of the injury or exposure, and the name

and location of the medical facility where the injured person was taken. Follow these procedures as appropriate.

11.5 Incident Response

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down Terrain operations and evacuate the immediate work area.
- Account for personnel at the designated assembly area(s).
- Notify appropriate response personnel.
- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

11.6 Evacuation

Evacuation procedures are as follows:

- Evacuation routes will be designated by the SHSS before work begins.
- Onsite and offsite assembly points will be designated before work begins.
- Personnel will leave the exclusion zone and assemble at the onsite assembly point upon hearing the emergency signal for evacuation.
- Personnel will assemble at the offsite point upon hearing the emergency signal for a site evacuation.
- SHSS and a "buddy" will remain on the site after the site has been evacuated (if possible) to assist local responders and advise them of the nature and location of the incident.
- SHSS accounts for all personnel in the onsite assembly zone.
- A person designated by the SHSS before work begins will account for personnel at the offsite assembly area.
- The SHSS will write up the incident as soon as possible after it occurs and will submit a report to the corporate director of health and safety.

11.7 Evacuation Routes and Assembly Points

Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map posted at the site.

11.8 Evacuation Signals

Evacuation signals are listed in **Table 11-2**.

Table 11-2
Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency—help me
Thumbs up	OK; understood
Grasping buddy's wrist	Leave area now
Continuous sounding of horn	Emergency; leave site now

11.9 Emergency Response Telephone Numbers

Emergency response telephone numbers are listed in **Table 11-3**.

TABLE 11-3
Emergency Response Telephone Numbers

	Site Address:	Phone
Police:	Orange County Sheriff	Phone: 911
Fire:	Orange County Fire Department	Phone: 911
Ambulance:	Orange County EMS	Phone: 911
Hospital:	Orlando Regional Healthcare 1414 Kuhl Ave # Mp41 Orlando, FL 32806	Phone: (407) 841-5111

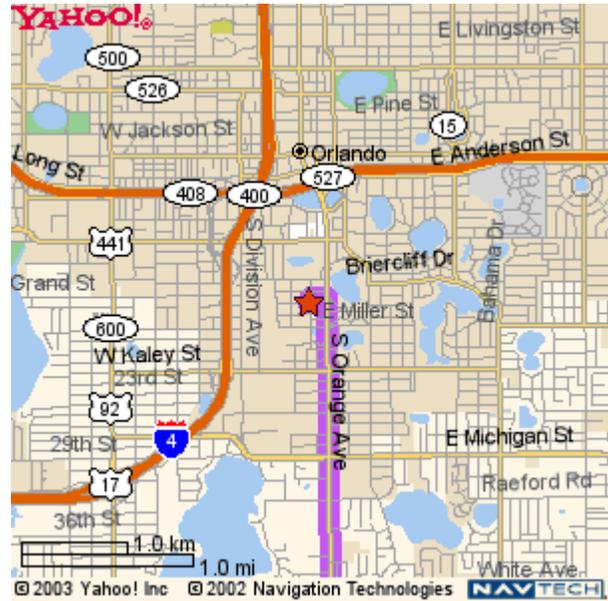
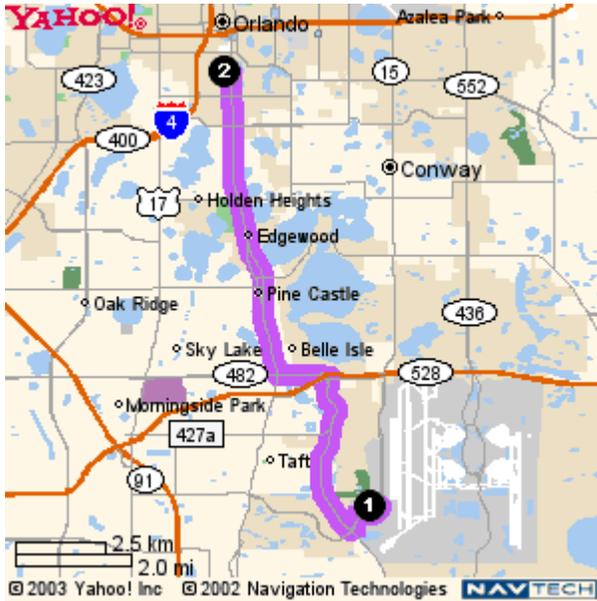
*When using a cellular phone outside the telephone's normal calling area, exercise caution in relying on the cellular phone to activate 911. When the caller is outside the normal calling area, the cellular service carrier should connect the caller with emergency services in the area where the call originated, but this may not occur. Telephone numbers of backup emergency services should be provided if a cellular phone is relied on to activate 911.

Starting from:	① Freezone Street, Orlando, FL 32827		
Arriving at:	② Orlando Regional Healthcare 1414 Kuhl Ave # Mp41, Orlando, FL 32806 (407) 841-5111		
Distance:	10.1 miles	Approximate Travel Time:	22 mins

Directions	Miles	
1. Start on FREEZONE ST	0.2	↑
2. Turn Right on TRADEPORT DR	0.7	↘
3. Turn Right on BOGGY CREEK RD	3.2	↘
4. Continue on MCCOY RD	0.6	↑
5. Turn Right on S ORANGE AVE	1.2	↘
6. Continue on HANSEL AVE	1.2	↘
7. Continue on S ORANGE AVE	2.9	↑
8. Turn Left on W COPELAND DR	0.1	↙
9. Turn Left on KUHL AVE	0.0	↙
10. Turn Right on W COPELAND DR	0.0	↘

Distance: 10.1 miles Approximate Travel Time: 22 mins

When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.



11.10 Government Agencies Involved in Project

Federal Agency and Contact Name: Naval Facilities Engineering Command

Contact the project manager. Generally, the project manager will contact relevant government agencies.

11.11 Emergency Contacts

If an injury occurs, notify the injured person's personnel office as soon as possible after obtaining medical attention for the injured person. Notification **MUST** be made within 24 hours of the injury, including the Southern Division NAVFAC HQ Safety Office. Emergency contacts are listed in **Table 11-4**.

TABLE 11-4
Emergency Contacts

Site Safety and Health Specialist (SHSS) TBD	Southern Division NAVFAC HQ Safety Office John Berard 843/820-7466
Client Barbara Nwokike, RPM - Southern Division Naval Facilities Engineering Command (843) 820-5566	Program Manager Paul M. Shipp – Terraine, Inc. 800-531-1242 Office 865-300-4633 Cell Phone
	Project Manager James L. Young – Terraine, Inc. 305-513-4901 Office 305-490-7702 Cell Phone

12.0 Approval

This site-specific health and safety plan has been written for use by Terraine only. Terraine claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

13.0 Distribution

Distribution for this plan is listed in **Table 13-1**.

TABLE 13-1
Distribution List

Name	Office	Responsibility	Number of Copies
Michael J. Pressley	Terraine, Inc. Charlotte, NC	Health and Safety Manager/Approver	1
Paul M. Shipp	Terraine, Inc. Knoxville, TN	Program Manager	1
Karen Baer	Terraine, Inc. Miami, FL	Site Superintendent/Field Team	1
Barbara Nwokike	Dept of Navy Southern Divison NAVFACENGCOM North Charleston, SC	Remediation Project Manager	1
James L. Young	Terraine, Inc. Miami, FL	Project Manager	1

Attachment 1
Employee Signoff

Attachment 2

Project Specific Chemical Product Hazard Communication Form

Project-Specific Chemical Product Hazard Communication Form

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SSC will verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to Terrain and subcontractor personnel. Labeling and MSDS systems will also be explained.

Project Name: LTM, NTC Orlando, FL

Project Number: N62467-02-G-0352/CTO0004

MSDSs will be maintained at the following location(s): Support Vehicle
Terraine Office

Hazardous Chemical Products Inventory

Chemical	Quantity	Location	MSDS Available	Container Labels	
				Identity	Hazard
Alconox/Liquinox	< 1 liter	Support/Decon Zones			

Attachment 3
Chemical-Specific Training Form

TERRAINE CHEMICAL-SPECIFIC TRAINING FORM

Location:	LTM, NTC Orlando, FL	Project #: N62467-02-G-0352/CTO0004
SSHS:	Trainer:	

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

The HCC will use the product MSDS to provide the following information concerning each of the products listed above.

- Physical and health hazards
- Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants will have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and Terraine’s written hazard communication program will be made available for employee review in the facility/project hazard communication file.

Attachment 4

Material Safety Data Sheets

Alconox®

MATERIAL SAFETY DATA SHEET

Alconox, Inc.
9 East 40th Street, Suite 200
New York, NY 10016

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 1998
Chemical Family:	Anionic Powdered Detergent

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO ₂ , foam
Special Firefighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO ₂ on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs readminister fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

Attachment 5

Self Assessment Checklist

JOBSITE SAFETY INSPECTION CHECKLIST

Revision.: 01

STANDARD OF PRACTICE HS-18 - HEALTH AND SAFETY CHECKLIST

Date:

Note: The following jobsite safety inspection checklist is to be used only at locations where TERRAINE controls the work. It is not to be used at locations where others control the work.

Project Name: <u>LTM, NTC Orlando, FL</u>	Project No.: <u>N62467-02-G-0352/CTO0004</u>
Location: <u>Orlando, FL</u>	Program Manager: <u>Paul M. Shipp</u>
Inspector: _____	Date: _____

This checklist has been divided into two sections. The first section (I through XXVI) are applicable to all projects. The second section (XXVII through XXIX) addresses specific situations such as hazardous waste, construction activities, and office trailers. There may be some duplication between the first and second sections.

If an item is not applicable, the column titled "N/A" should be checked. If an item is applicable but the auditor does not observe it during the inspection, the "N/O" column should be checked. For each deficiency noted, a Health and Safety Audit Finding Form must be completed. The Corporate Health and Safety Director must be copied on the results of all audits.

Check "Yes" for Items Completed	Yes	No	N/A	N/O
<i>I. JOBSITE OFFICE</i>				
1. Posters and safety signs in place:				
a. OSHA safety poster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Emergency Telephone Number Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Workers Compensation Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. First aid kit:				
a. Fully stocked/sufficient supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. First-aid administered by a person with a valid certificate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Bloodborne-pathogen kit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Accident/injury reporting:				
a. Employees briefed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Forms available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Injuries and illnesses reported and logged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Accidents investigated and properly followed up to prevent reoccurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Accident reports and logs submitted promptly as required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Job safety rules and regulations available/posted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>II. HAZARD COMMUNICATION</i>				
1. Employee training:				

- a. Employees' signed training certificates on file
- 2. Material safety data sheets (MSDSs):
 - a. MSDSs on file
 - b. Log assigned to competent person
 - c. Log complete and up to date
- 3. Written program on file

III. EMPLOYEE TRAINING

- 1. Safety indoctrination held for new employees
- 2. Sufficient instruction given in recognition and avoidance of job hazards; unsafe conditions; and job rules, regulations, and procedures
- 3. Sufficient instruction in proper use and maintenance of tools, equipment, and personal protective equipment
- 4. Employees instructed to report unsafe or hazardous conditions to proper job supervisor
- 5. Employees instructed to promptly report injury, illness, and aTerrainedents involving damage to equipment and materials
- 6. All site personnel have read the job safety rules and regulations and have signed the "Employee Signoff Sheet"

IV. JOBSITE LOGISTICS AND LAYOUT

- 1. Traffic routes around construction areas:
 - a. Warning signs, flagging in place
- 2. Utility ditches:
 - a. Flagged or barricaded
- 3. Trucks and heavy equipment:
 - a. Good mechanical conditions
 - b. Backup signals working
 - c. Seat belts installed and used

V. PUBLIC PROTECTION

- 1. Warning signs in place around site
- 2. After-hours hazards:
 - a. Open ditches protected
- 3. Hazard lights

VI. HOUSEKEEPING

- 1. Material storage yard:
 - a. Stacked neatly and properly
 - b. Aisles, walkways, roads clear
- 2. Check work areas for:
 - a. Loose and waste materials

- b. Vicinity of ladders, stairs, ramps, and machinery
- c. Empty bottles, containers, papers, trash, bands, brick-bats, etc.
- d. Trash cans, dumpsters available and emptied regularly

VII. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 1. Hard hats
- 2. Safety shoes/boots
- 3. Eye/face protection
- 4. Safety belts/lanyards
- 5. Ear protection:
 - a. Noise level areas of 90 dBA and above identified
 - b. Signs notifying personnel of "Hearing Protection Required" posted as
- 6. Specialized equipment:
 - a. Gloves
 - b. Chemical-Respirators (respirator use requires medical protocol, monitoring and training)
 - c. Chemical-resistant clothing
- 7. Tools:
 - a. Handles in good shape
 - b. Tool guards in place
 - c. Proper tools used for the job
 - d. Tools maintained in functional condition (hammer heads not mushroomed)

VIII. SANITATION

- 1. Temporary toilets:
 - a. Serviced regularly
 - b. Sufficient Quantity (20 or fewer employees - 1 required; 20 or more employees - 1 toilet and 1 urinal per 40 workers)
- 2. Potable Water:
 - a. Tightly closed containers
 - b. Equipped with tap
 - c. Paper cups available
 - d. Containers labeled "Drinking Water"

IX. FLOOR AND WALL OPENINGS GUARDS

XI. SCAFFOLDING**XII. ELECTRICAL**

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Cords/devices have current inspection color code tape installed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Frayed cords, broken plugs fixed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Temporary wiring: | | | | |
| a. Panels secured and GFCIs working | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Away from vehicle pathways | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Out of water/moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. No broken receptacles found | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Sufficient outlets for all crafts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Temporary lighting with cages | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Assured equipment grounding conductor program in place, if not using GFCIs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Lock-out or tag-out system used when necessary | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Electrical dangers posted and guarded | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Fire hazards checked, proper extinguishers available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Only qualified electricians work on electrical circuits and equipment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Cords passing through work areas must be covered or elevated to protect them from damage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Extension cords must be hard or extra-hard usage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XIII. TEMPORARY HEATERS**XIV. FIRE PROTECTION**

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Office fire extinguisher in working order and inspected regularly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. One extinguisher, 2A rating, for each 3,000 square feet of protected area | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. One extinguisher, 2A rating, on each floor adjacent to each stairway | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Trash, paper, other combustibles picked up | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Welders/roofers have extinguishers nearby and a fire watch is available if needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Fire alarm available/fire evacuation plan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. "No Smoking" signs posted and enforced where necessary | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8. Supervisors and employees trained in proper use of extinguishers

XV. MATERIAL STORAGE AND HANDLING

1. Neat storage area, clear passageways

2. Materials spotted to minimize rehandling and reduce transport distances

3. Power equipment used to handle heavy/awkward loads

4. Stacks on firm footing and all tier stacked materials secured against sudden movement

5. Storage platforms, skids, bins, shelves, etc. in good repair

XVI. DEMOLITION WORK

XVII. STEEL ERECTION

1. Safety nets used, if required

2. Hard hats, eye protection, safety belts, serviceable shoes, gloves, and full clothing used

3. Tag lines used for hoisting tools and material

4. Fire hazards checked at rivet force and welding operations

5. Ladders, stairs, or other safe access provided

6. Hoisting apparatus checked

7. Good housekeeping, welding, and rigging practices observed

XX. FLAMMABLE AND COMBUSTIBLE LIQUIDS

1. All containers clearly marked to show contents (gas cylinders, cans, drums, fuel tanks, etc.)

2. Proper storage practices observed:

a. Storage areas enclosed or protected from heat and mobile equipment exposure

b. Fire hazards checked

c. Sufficient fire extinguishers

d. UL approved safety cans for 1 to 5 gallons of flammable liquids

e. Approved cabinet for indoor storage of liquids in excess of 25-gallons, but not more than 120-gallon storage

f. Sign labeled "Flammable - Keep Fire Away" posted on cabinet

XXI. FLAMMABLE GAS (Oxygen/Acetylene)

1. Cylinders:

a. Away from heat

b.	Stored upright (secured)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Valves closed on empty cylinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Valve protection caps in place if cylinder not in use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	Valve key wrench available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f.	Portable rack with bottles secured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g.	Instruct project staff to never drag or slide bottles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h.	Designated storage area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i.	“No Smoking” signs posted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j.	Oxygen bottles stored 20’ from acetylene bottles or 1/2-hour fire barrier installed between them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Gauges/valves/hoses:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a.	Good condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Fire arresters installed (both hoses)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Eye protection available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Ventilation adequate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	When in use, gas lines properly located to prevent tripping and falling hazard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	All burning torches bled and free of oxygen and acetylene and/or other gases during lunch breaks and other extended periods of time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
XXII. WELDING OPERATIONS					
1.	Performed by qualified personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Screens, shields, or eye protection provided and used to protect employees from welding operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Employees wear sufficient clothing and PPE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Equipment checked before use and in operative conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Electrical equipment grounded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Power cables protected and in good repair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Power cables properly located to prevent tripping and falling hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 8. Dry chemical fire extinguisher within 30 feet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Exposed combustible materials removed to safe location or properly protected from sparks and slag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Valid hot work permit required or provided | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Overhead protection provided where required | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. "Danger - No Smoking, Matches or Open Lights" signs posted when required | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Adequate lighting and ventilation provided | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Machines turned off at end of shift or when not in use for extended periods | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXIII. HOISTS

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Material hoists: | | | | |
| a. Designed by licensed professional engineer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. With tower enclosed for full height on all sides with 1/2-inch by 18--inch Gauge screen mesh, except for landing for landing access | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. With tower not enclosed, hoist platform or car will be totally enclosed enclosed on all sides for the full height between floor and overhead covering with 1/2-inch x 14-inch gauge mesh | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Operation rules poster "No Riders Allowed" posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Hoisting entrances guarded by substantial gate or bars | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Vertical gates of sufficient height to prevent anyone from looking over over them into shaft | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Competent person assigned to inspect daily | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Weekly inspections logged | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I. Annual inspection available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j. Fire extinguisher in place and inspected | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| k. Load chart posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

XXIV. BLASTING

XXV. HAZARDOUS WASTE

Certification and Training of TERRAINE Personnel

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Medical exam within last 12 months | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. 40-hour initial training, 3 days supervised field activities, 8-hour annual Refresher | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. First aid and CPR certification | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 4. Quantitatively fit tested (preferred method per NIOSH Publication 87-116, 87-116, Appendix B.3)
- 5. Attend pre-entry safety meeting
- 6. Site Safety Coordinator with appropriate training

Certification and Training of Subcontractor Personnel

- 1. Medical exam within last 12 months
- 2. 40-hour initial training, 3 days supervised field activities, 8-hour Annual refresher
- 3. First aid and CPR certification
- 4. Quantitatively fit tested (preferred method per NIOSH Publication 87-116, (Appendix B.3)
- 5. Attend pre-entry safety meeting

Site Safety Documentation

- 1. Site health and safety plan (HSP) prepared and approved
- 2. HSP onsite
- 3. All personnel onsite identified in HSP
- 4. Documentation of safety briefing
- 5. Hospital map posted
- 6. Phone numbers posted
- 7. Emergency vehicle identified
- 8. Material Safety Data Sheets (MSDSs) onsite
- 9. Work zones delineated (How? _____)
- 10. Wind direction flags in use
- 11. Documentation of calibration of monitoring equipment in Clean environment
- 12. Monitoring conducted and recorded as specified in HSP _____) (Frequency? _____)
- 13. Monitoring for heat/cold stress
- 14. Buddy system in use
- 15. Decontamination procedures established as specified in HSP

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 16. No eating, drinking, or smoking in exclusion and contamination
Reduction zones | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Toilet facilities provided | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. No contact lenses | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Work conducted during daylight hours only | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Safety Briefing

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. All personnel attended (including new personnel) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Documentation of meetings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Chemical hazards and toxicology reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Physical hazards reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Biological hazards reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Heat/cold stress information reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Air monitoring requirements | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Levels of protection reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Work zones reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Decontamination procedures reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Emergency response procedures reviewed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Site communications | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Personal Protective Equipment (PPE)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Levels of protection being worn as specified in HSP | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. All appropriate PPE available onsite | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Hard hats being worn | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Appropriate hand protection being used
(What? _____) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Appropriate body protection being used
(What? _____) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Appropriate eye protection being used
(What? _____) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 7. Appropriate ear protection being used
- 8. Appropriate respirator protection being used
- 9. Respirators donned correctly
- 10. TLD badges being used
- 11. If air purifying respirators (APRs) are being used, correct cartridges (Type? _____)

- 12. If self contained breathing apparatuses (SCBAs) are being used, is grade D air being used
- 13. If SCBAs are being used, are cylinders stored correctly
- 14. If PPE is not onsite, prepared to halt work
- 15. Disposal methods in place for disposable PPE

Decontamination Procedures

- 1. Decontamination procedure established as specified in the HSP
- 2. Decontamination zone clearly defined
- 3. PPE properly decontaminated (How? _____)
- 4. Sampling equipment properly decontaminated (How? _____)
- 5. Monitoring equipment properly decontaminated (How? _____)
- 6. Heavy equipment properly decontaminated (How? _____)
- 7. Samples properly decontaminated (How? _____)
- 8. Decontamination fluids appropriately disposed of

- XXVI. CONSTRUCTION INSPECTIONS** _____
- XXVII. OFFICE TRAILERS/BUILDINGS** _____
- XXIII. CONFINED SPACE ENTRY** _____
- XXIX. STAIRWAYS AND LADDERS** _____
- XXX. FALL PROTECTION** _____
- XXXI. EXCAVATIONS** _____
- XXXII. DRILLING** _____

Personnel Safe Work Practices. (3.1)

- 1. Only authorized personnel operating drill rig.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 2. Personnel cleared during rig startup. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Personnel clear of rotating parts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Personnel not positioned under hoisted loads. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Loose clothing and jewelry removed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Personnel instructed not to approach equipment that has become electrically energized. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Smoking is prohibited around drilling operation. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Personnel wearing appropriate PPE, per HSP. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>General (3.2.1)</u> | | | | |
| 9. Daily safety briefing/meeting conducted with crew. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Daily inspection of drill rig and equipment conducted before use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Drill Rig Placement (3.2.2)</u> | | | | |
| 11. Location of underground utilities identified. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Safe clearance distance maintained from overhead powerlines. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Drilling pad established, when necessary. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Drill rig leveled and stabilized. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Drill Rig Travel (3.2.3)</u> | | | | |
| 15. Rig shut down and mast lowered and secured prior to rig movement. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Tools and equipment secured prior to rig movement. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Only personnel seated in cab are riding on rig during movement. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Safe clearance distance maintained while traveling under overhead powerlines. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Backup alarm or spotter used when backing rig. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Drill Rig Operation (3.2.4)</u> | | | | |
| 20. Kill switch clearly identified and operational. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. All machine guards are in place. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Rig ropes not wrapped around body parts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Pressurized lines and hoses secured from whipping hazards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Drill operation stopped during inclement weather. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Air monitoring conducted per HSP for hazardous atmospheres. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 26. Rig placed in neutral when operator not at controls.
- Drill Rig Maintenance (3.2.5)**
- 27. Defective components repaired immediately.
- 28. Lockout/tagout procedures used prior to maintenance.
- 29. Cathead in clean, sound condition.
- 30. Drill rig ropes and wire lines in clean, sound condition
- 31. Fall protection used for exposures > 6'.
- 32. Rig in neutral and augers stopped rotating before cleaning.
- 33. Good housekeeping maintained on and around rig.
- Drilling at Hazardous Waste Sites (3.2.6)**
- 34. Waste disposal according to HSP and Environmental Protection Plan.
- 35. Appropriate decontamination procedures followed, per HSP>

XXXIII. EARTHMOVING EQUIPMENT

XXXIV. DEMOLITION

XXXVI. HAND AND POWER TOOLS

SAFE WORK PRACTICES (3.1)

- 1. All tools operated according to manufacture's instructions.
- 2. All hand and power tools maintained in a safe condition and inspected before each use.
- 3. Defective tools are tagged and removed from service until repaired.
- 4. PPE is selected and used according to tool-specific hazards.
- 5. Power tools are not carried or lowered by cord or hose.
- 6. Tools are disconnected from energy sources when not in use.
- 7. Safety guards remain installed or are promptly replaced after repair.
- 8. Tools are stored properly.
- 9. Cordless tools and recharging units conform to electrical standards.
- 10. Tools used in explosive environments are rated for such use.
- 11. Knife or blade hand tools are used with the proper precautions.
- 12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stresses.

General (3.2.1)

- 13. PPE is selected and used according to tool-specific hazards anticipated.
- 14. Tools are tested daily to assure safety devices are operating properly.
- 15. Damaged tools are removed from service until repaired.
- 16. Power operated tools designed to accommodate guards and used.
- 17. Rotating or moving parts on tools are properly guarded.
- 18. Machines designed for fixed locations are secured or anchored.
- 19. Floor and bench-mounted grinders are provided with work rests.
- 20. Guards are provided at point of operation, nip points, rotating parts.
- 21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.

Electric-Powered Tools (3.2.2)

- 22. Electric tools are double insulated or grounded according to SOP HS-23.
- 23. Electric cords are not used for hoisting or lowering tools
- 24. Hand-held tools are equipped with appropriate on/off controls.
- 25. Electric tools used in damp/wet locations are approved or use GFCI.
- 26. Portable, power-driven circular saws are equipped with proper guards.

Abrasive Wheel Tools (3.2.3)

- 27. Employees using abrasive wheel tools are wearing eye protection.
- 28. Grinding machines are supplied with sufficient power to maintain spindle speed.
- 29. Abrasive wheels are closely inspected and ring-tested before use.
- 30. Grinding wheels are properly installed.
- 31. Cup-type wheels for external grinding are protected by proper guard.
- 32. Portable abrasive wheels used for internal grinding are protected by safety flange.
- 33. Safety flanges are used only with wheels designed to fit the flange.
- 34. Safety guards on abrasive wheel tools are mounted properly.

Pneumatic-Powered Tools (3.2.4)

- 35. Tools are secured to hoses or whip by positive means to prevent disconnect.

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| 36. Safety clips or retainers are installed to prevent attachments being expelled. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Safety devices are installed on automatic fastener feed tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Compressed air is not used for cleaning unless reduced to <30 psi, with PPE and guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Manufacturer's safe operating pressure for hoses, pipes, valves, are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Hoses >1/2 inch diameter have safety device at source to reduce pressure upon hose failure. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Airless spray guns have required safety devices installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Blast cleaning nozzles are equipped with operating valves, which are held open manually. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Supports are provided for mounting nozzles when not in use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Air receivers drains, handholes, and manholes are easily accessible. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Air receivers are equipped with drainpipes, and valves for removal of Accumulated oil and water. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Air receivers are completely drained at required intervals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Air receivers are equipped with indicating pressure gauges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Safety valves are tested at regular intervals for assure good operating condition. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Safety, indicating, and controlling devices are installed as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Liquid Fuel-Powered Tools (3.2.5)</u> | | | | |
| 50. Liquid fuel-powered tools are stopped when refueling, servicing, or for maintenance. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. Liquid fuels are stored, handled, and transported in accordance with SOP HS-21. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Safe operating pressures of hoses, valves, pipes, filters, and other Fittings are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Jacking Tools (3.2.6)</u> | | | | |
| 54. Rated capacities are legibly marked on jacks and not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 55. Jacks have a positive stop to prevent over-travel. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Base of jacks are blocked or cribbed to provide a firm foundation. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Wood blocks are placed between the cap and load to prevent slippage. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. After load is raised, it is cribbed, blocked, or otherwise secured Immediately. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 59. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.
- 60. Jacks are properly lubricated.
- 61. Jacks are inspected as required.
- 62. Repair or replacement parts are examined for possible defects.
- 63. Jacks not working properly are removed from service and repaired.
- Hand Tools(3.2.7)**
- 64. Wrenches are not used when jaws are sprung to the point of slippage.
- 65. Impact tools are kept free of mushroomed heads.
- 66. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.

XXXV. CONCRETE AND MASONARY

Safe Work Practices (3.1)

- 1. Personnel on areas where concrete is being poured are wearing PPE.
- 2. Protruding rebar is adequately guarded to control impalement hazards.
- 3. Personnel do not ride concrete buckets or position themselves in lifting areas.
- 4. Personnel maintain safe distance from formwork, shoring, percast, and lift-slab operations.
- 5. Personnel do not enter limited access zones during masonry wall work.
- 6. Personnel are not permitted under loads being lifted or walls being jacked.
- 7. Personnel access is limited in areas where post-tension operations are performed.
- 8. Scaffolding conforms to the requirements of SOP HS-73 prior to use.
- 9. Excavations conform to the requirements of SOP HS-32 prior to entry.
- 10. Lifting and rigging devices conform to the requirements of SOP HS-44.

General (3.2.1)

- 11. Concrete structures where loads to be placed, inspected.
- 12. Protruding rebar, guarded.
- 13. No employees permitted behind jack during tensioning unless directly involved in the operation
- 14. Signs/barriers are erected to limit employee access to post tension areas.

Tools, Materials, and Equipment

- 15. Requirements for confined space entry and lockout/tagout are met.

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| 16. Concrete mixers have cleaning devices and guards installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Portable/rotating concrete troweling machines have shutoff devices. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Concrete buggy handles do not extend beyond the wheels on either side. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Concrete pumping systems using discharge pipes are supported. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Concrete buckets w/hydraulic or pneumatic gates have positive lock. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Employees not permitted under concrete buckets during lifts and lowers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Elevated concrete buckets are routed around employees. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Employees do not ride concrete buckets. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Sections of tremies or similar concrete conveyances are secured with wire rope. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Bull float handles were contact with electrical lines, are nonconductive. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Masonry saws are guarded with a semicircular enclosure over the blade. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Employees applying concrete through a hose are wearing PPE. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <u>Formwork and Shoring (3.2.3)</u> | | | | |
| 28. Formwork is capable of supporting loads that may be reasonably anticipated to be applied. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Drawings and plans required to be at the jobsite are available. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Shoring equipment is inspected prior to erection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Damaged shoring equipment is not used. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Erected shoring is inspected prior to, during, and immediately after concrete placement. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Sills from shoring are sound, rigid, and capable of carrying the maximum intended load. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Base plates, shore heads, extension devices, and adjustment screws are installed correctly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Eccentric loads on shore heads and similar are prohibited unless designed for such loads. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Whenever single-post shores are tiered, shoring is designed and inspected | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Tiered single-post shores are vertically aligned and adequately braced. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Adjustment of single-post shores to raise framework is not made after placement of concrete. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Re-shoring is erected when concrete is required to support loads in | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- excess of its capacity
40. Forms/shores are only removed when concrete has gained sufficient strength as needed.
41. Re-shoring is not removed until concrete being supported has attained adequate strength to support its weight and all loads placed upon it.
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XXXVI. AERIAL LIFTS