APPENDIX A
CERTIFICATION LETTER

October 1, 2010
Brookhaven National Laboratory
Bldg. 817
Upton, N.Y. 11973
Attn: Mr. Martin Fallier
NSLS-II Conventional Facilities, Division Director

Re: Contract No 154182
Job Title: NSLS-II Laboratory Office Building Construction
Job No: N/A
Bldg. No: 741, 742, 743

Dear Mr. Fallier:
In conformance with the requirements of the construction documents for the above project, the following information is submitted on our company's construction safety program:

- Copy of the company's record of injuries and accidents (OSHA 300 logs for 2005-to date)
- Insurance experience modification rate for 2006-2009
- Environmental compliance records (if applicable) for past five years, including fines, Administrative Consent Orders, and Notices of Violations.
- The attached Construction Environment, Safety and Health Plan

We understand that Brookhaven National Laboratory is an ISO 14001 Registered Organization. All construction and environmental work shall conform to the applicable requirements of this program. ***E.W. Howell Co., LLC,*** its employees and subcontractors shall follow the BSA requirements listed in its Standards Based Management System (SBMS) https://sbms.bnl.gov/ pertaining to: Work Planning and Control for Operations, Emergency Response/Spill Response, Waste Management (radiological, hazardous, mixed, medical, industrial), Chemical Handling and Use (RCRA, OSHA), Land Use Restrictions (Wetlands, Pine Barrens, Endangered Species), Liquid Effluents.

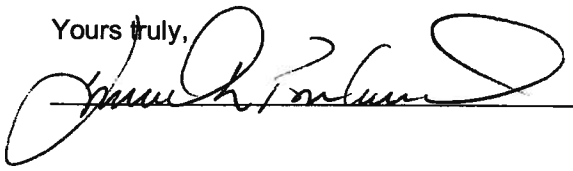
E.W. Howell Co., LLC, its employees and subcontractors shall comply with the applicable requirements established in the SBMS https://sbms.bnl.gov/ and the attached Environment, Sa fety and Health Pl an, Environment, Safety and Health Standards of the SBMS are located at:
https://sbms.bnl.gov/SBMSearch/LD/ld08/ld08t011.htm for review and use.
Where the requirements specified in the SBMS exceed the requirements of the OSHA standards, the BSA requirements shall take precedence.

BSA shall provide all appropriate permits required by these standards. ***E.W. Howell Co., LLC*** shall verify that these permits are current for the scope of work and updated, with appropriate approvals, to reflect any changes to the scope of work, and shall abide by the requirements of the permit.

This letter also certifies that ***E.W. Howell Co., LLC*** is aware of, understands and shall comply with the safety regulations of the OSHA Standard 29 CFR 1926 and 29 CFR 1910 and Department of Energy Standard 10 CFR 851.

In addition, ***E.W. Howell Co., LLC*** understands that the BSA Standards Based Management System (SBMS) is available, on line, for our review and use and we shall comply with applicable safety requirements for this project.

Yours truly,



Title: President

APPENDIX B
SAFETY INCENTIVE PROGRAM

E.W. Howell Safety Incentive

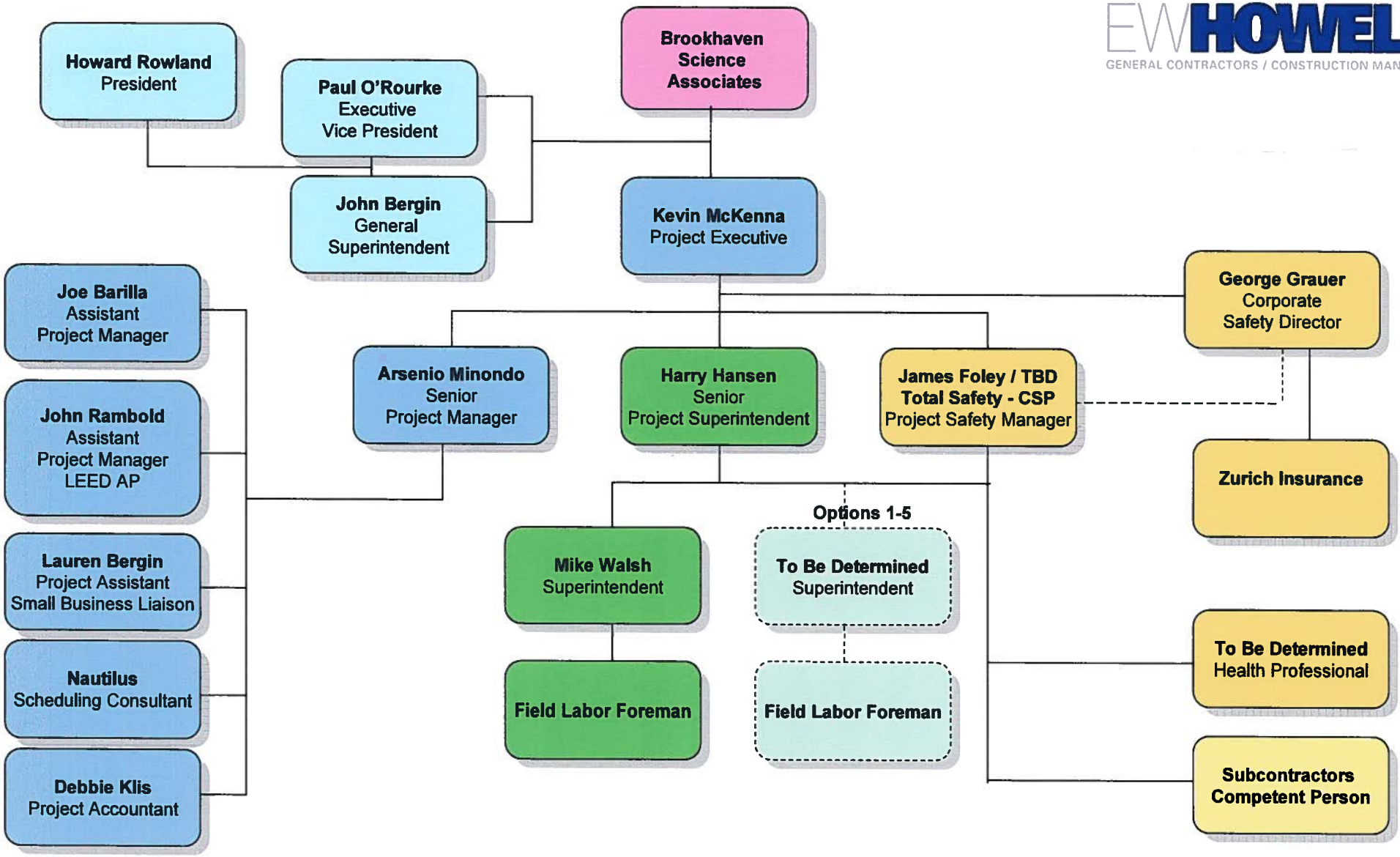
We would propose a two tier approach to the safety incentive.

Period Awards (75% of the Total Safety Incentive)
As stipulated in Addendum 2, 90% of the "Period Award" is to be passed down to the workers that were working on site during that period. We would flow down the award to the individuals as a percentage of their hours worked within the total hours worked for that period. Using the example provided in Table 1 of Addendum 2, the total (90%) safety award would be $14,456.25 to be passed down to the subs. Our approach would be for individual #1 that worked 640 hours of the total 19,500 hours or 3.3%, to receive 3.3% of $14,456.25 or $477.06.

Of the 10% remaining of the "Period Award" we would propose a field rewards program, providing safety reward lunches, prize giveaways, etc. as a method for maintaining high morale for the entire work force on site.

Final Award (25% of the Total Safety Incentive)
Also stipulated in Addendum 2 this award is at the discretion of the general contractor. We would propose an 80/20 split of this award between the subcontractors and the general contractor. For the 80% passed down to the subcontractors only those without any incidents during the entire course of the project would be eligible. Of those subs the total hours worked would be generated and individual subcontractor awards would be at the percentage of hours worked towards the total. For the 20% to E.W. Howell we would distribute to the field personnel and project management personnel most responsible for the success of the project's safety program.

APPENDIX C
ORGANIZATIONAL CHART


EW HOWELL
GENERAL CONTRACTORS / CONSTRUCTION MANAGERS
Howard Rowland
President
Paul O'Rourke
Executive
Vice President
Brookhaven
Science
Associates
John Bergin
General
Superintendent
Kevin McKenna
Project Executive
George Grauer
Corporate
Safety Director
Joe Barilla
Assistant
Project Manager
Arsenio Minondo
Senior
Project Manager
Harry Hansen
Senior
Project Superintendent
James Foley / TBD
Total Safety - CSP
Project Safety Manager
John Rambold
Assistant
Project Manager
LEED AP
Zurich Insurance
Options 1-5
Lauren Bergin
Project Assistant
Small Business Liaison
Mike Walsh
Superintendent
To Be Determined
Superintendent
Nautilus
Scheduling Consultant
To Be Determined
Health Professional
Field Labor Foreman
Field Labor Foreman
Debbie Klis
Project Accountant
Subcontractors
Competent Person

APPENDIX D
PROJECT ORIENTATION

EW HOWELL GENERAL CONTRACTORS / CONSTRUCTION MANAGERS

EMPLOYEE ORIENTATION CHECKLIST

Brookhaven National Laboratory

NSLS-II LOB

Job #03-10-28

Employer			
Employee		Orientation Date	

Areas to be Covered	Description	Completed (Initial Box)	
		Yes	No
Site Plan	An overview of the BNL Plan was provided, including locations of designated parking areas, meeting place, first aid, right to know center, contractor trailers, motor vehicle and pedestrian traffic flow, local Hospital/Medical Facilities, and restricted areas. • From a cell or pay phone dial 631-344-2222 • MSDS or Chemical Management System Dial 4935 • Delayed Opening 631-344-4636 • Discrimination or Harassment 631-344-3318 • Occupational Medicine Clinic 631-344-3670		
Company Safety Rules	I understand the safety rules specific to my company and trade as well as those specific to this project. All Safety Regulations must be obeyed. Any tradesman violating safety rules will be given a warning and must comply immediately. A second warning will result in a fine assessed against the subcontractor, and a third warning will be grounds for immediate dismissal of the tradesman from the site and an additional fine. If a tradesman does not immediately comply with a warning, this non-compliance may be grounds for immediate dismissal from the site.		
Company Policies	I understand that a complete copy of the health, safety and wellness policies are available for review and remain on site at the contractors' trailers. I understand that any questions I may have concerning these or other safety rules must be presented to my supervisor IMMEDIATELY		
CCIP	A "CCIP" or Contractor Controlled Insurance Program is a coordinated program providing certain coverage's for EW Howell and eligible Enrolled Parties performing Work At This Project Site. The subcontractor and its sub-subcontractors, of all tiers, are required to cooperate with EW Howell and its CCIP administrator in all aspects of CCIP operation and administration. All injuries, occupational-related illnesses or property damage are to be reported to your immediate supervisor and EW Howell's designated safety representative IMMEDIATELY. All parties will instruct		

	employees and other personnel to report, in writing, within 24 hours ***all*** Accidents and Occurrences of any type to EW Howell's designated safety representative or assigned person.		
Personal Protective Equipment (PPE)	I understand that failure to comply with PPE requirements may result in fines and/or dismissal. PPE includes hardhats, eye protection will be at all times (100 %), ear protection, work boots (ANSI & ASTM F2413 approved), shirts with sleeves, long pants (no shorts), high visibility vests at ALL times and Personal Fall Arrest Systems (when required).		
Glove Program	• Subcontractors will be required to use gloves as required by job task. • Some tasks require, Kevlar Gloves (cut resistant),some require material handling gloves (heavy Duty) Each subcontractor will be required to evaluate the proper gloves needed for the task at hand.		
Training	I understand that any questions I may have concerning training or any other safety-related matters MUST be presented to my supervisor IMMEDIATELY (and prior to performing any assigned task).		
Phase Hazard Analysis	• All subcontractor workers will review PHA's as needed and every week sign off that they review and understand it. • As job tasks change, the PHA will be revised. • Do you know what a Phase Hazard Analysis is?		
OSHA 10 & 30 Hour Safety Course	I understand that ALL subcontractor employees scheduled to work on the site MUST have completed the OSHA 10 or 30 Hour Safety Course and their certificate must be on file with EW Howell PRIOR to starting work on this site. Workers will not be allowed to work on this site without the certification on file .All Competent person must have OSHA 30.		
Potential Hazards	Be familiar with your work areas and discuss any/all associated work area hazards and safe work practices on a daily basis prior to the commencement of any job task. If I have any questions I will IMMEDIATELY notify my supervisor		
Tools	Never use defective tools or equipment. Be sure all equipment guards are in place and do not remove unless you are instructed to do so to oil, adjust or repair – in such a case, all equipment must be de-energized or otherwise disconnected from its power source		
Safety Devices	Any safety device (such as guardrails, warning tape, etc.) that must be removed to perform your work must also be reinstalled either upon completion of the work or while the area is under your supervision. Under no circumstance are you allowed to remove protection and leave the area unprotected, including during breaks and lunch. All protection will be installed upon completion of the workday, regardless of whether the work on hand requiring its removal has been completed or not. Failure to reinstall safety devices may result in immediate removal from the project		

Emergency Procedures	I am aware of the presence of the First Aid station. If I am unaware of the procedures necessary to successfully utilize any of the emergency supplies (for example, eyewash stations, fire extinguishers, etc.) I will as my supervisor for training prior to the commencement of my work. The evacuation procedures, including alarms, site exits, and muster points have been explained to me and are fully understood. As per BNL the muster point will be building 735 CFN. BNL Evacuation Procedures –If you hear a Continuous Siren, go immediately to your assembly area and wait for instructions. If you hear an intermittent siren, evacuate the BNL site immediately follow police directions. If you hear three five-second blast go immediately to your assembly area.		
Hazardous Materials	I am aware of where hazardous materials are to be used, stored or the nature by which they are to be disposed. If I have any questions, I am to IMMEDIATELY contact my supervisor who is to provide the necessary information and/or training as needed		
MSDS	The location of the Material Safety Data Sheets (MSDSs) is known to me. I am aware that I must review the MSDSs for all hazardous materials to be used by myself or nearby workers. I am aware of the hazardous material labeling requirements. Job specific training will be offered by my immediate supervisor when needed.		
In Case of Injury or Illness	I have been made aware of and had the opportunity to review the reporting procedures in the event of an injury and/or accident. Documentation of an incident is required as soon as possible. ALL injuries MUST be reported to my supervisor IMMEDIATELY and treated at once. I must provide the needed information to my supervisor so a NY State Worker's Compensation C-2 form can be completed and submitted to the insurance company no later than twenty-four (24) hours after the accident. The subcontractor shall also provide EW Howell with a list of witnesses, photographs and the name and address of each witness (I understand I am to assist in the identifying process). I am responsible for keeping my employer informed of follow-up treatment and back-to-work status		
Motor Vehicles and Mobile Equipment	I understand that operating motor vehicles or heavy equipment on site in an unsafe manner is strictly prohibited. Riding on the top of loads, on fenders, end gate sides of trucks or with your legs dangling over the end or sides of trucks is strictly prohibited. Operational backup alarms are required. Spotters should be used in congested areas to assist drivers backing with restricted visibility. Signage has been provided to protect pedestrian workers and construction vehicles within the work zone. All signage is there for your protection and is to be obeyed. All employers have		

	been trained and review the owner's manual on all equipment they will operate and follow MFG recommendations and complete daily check if required.		
Drugs / Illegal Substances	I understand that the possession of, or personnel under the influence of alcohol or drugs, are strictly prohibited on this project. Anyone found to be in violation of this requirement will be subject to disciplinary action, up to an including dismissal from the project. I have agreed and understand EWH's substance abuse program.		
Sanitary Facilities	I understand that the failure to use or the misuse of any of the sanitary facilities, as well as other facilities provided, is not permitted. EWH will provide 1 toilet for females with a outside lock And will distribute keys to them.		
General Rights and Responsibilities	I am aware that the Safety Orientation is not intended to replace the Subcontractor Safety Program, nor does it relieve the Subcontractor from obligations to follow applicable Federal, State and local requirements. It is intended to supplement these programs. In case of conflict, the more stringent standard applies. All unsafe acts or conditions must be reported immediately and corrected prior to the commencement of any further activity within the specific location. I understand that I can only work on one jobsite per day at Brookhaven National Laboratory unless pre-approved by EWH from your company in writing.		
Emergency Notification Form	I have completed the Emergency Notification form (attached). This form will be maintained and updated as needed. A copy will be maintained by EWH on this project.		
Document	I understand that this Safety Orientation is a brief synopsis of the information contained in the Environmental Health and Safety manual. I further understand that a complete copy of this orientation is maintained on site and a copy is available to me upon my request		

Employee Acknowledgement of Orientation
Employee Name (print):
Employee Name (sign):
Date:
Trainer's Signature/Employer:

EW HOWELL GENERAL CONTRACTORS / CONSTRUCTION MANAGERS

Personal Protection Equipment Statement

1. Hard Hats must be used at all times.
2. Safety Glasses (100 %)
3. Gloves as Needed for task at hand
4. Ear Protection over 85db
5. Work Boots ANSI & ASTM F2413
6. Approved/ Rain Gear as needed
7. Safety Vests must be used at all times
8. Safety Harness and Tie off Equipment in accordance with OSHA 1926 subpart -m

I have received the above equipment from my employer and have been instructed and trained on how to use it.

I have also been instructed to wear construction work boots, long pants ,and a shirt (with at least 4 inch sleeves). I have been provided with fall protection training and the proper fall protection equipment as required by OSHA 1926 subpart-M and will use when working over 6 foot. I acknowledge and agree to use the above equipment.

Signed:_____ Date:_____

Print Name:_____

EW HOWELL GENERAL CONTRACTORS / CONSTRUCTION MANAGERS

Foreman:_____

Project:_____

EMERGENCY NOTIFICATION FORM

Job: 03-10-28

Employee Name (print):
Employer:
Employee Cell Phone:
Orientation Sticker Number:
Emergency Contact Name (primary):
Emergency Contact Phone (primary):
Primary Person Relationship to Employee: (wife, brother, sister, etc.)
Emergency Contact Name (secondary):
Emergency Contact Phone (secondary):
Secondary Person Relationship to Employee: (wife, brother, sister, etc.)
Home Address:
Employee Immediate Supervisor Name:
Supervisor Phone:
Speaking language of Primary Contact Person:

OFFENSE	FIRST	SECOND	THIRD
Class I • Creating or contributing to unsanitary conditions due to poor housekeeping • Posting or removing notices on bulletin boards without permission • Eating in unauthorized areas • Failure to report the use of prescription drugs • Unauthorized soliciting of contributions on NSLS-II Project • Smoking in unauthorized areas (Note: This may be upgraded to a Class V offense if in a hazardous area) For Fourth Offense, next step in Progressive Disciplinary Policy is 30-day suspension, followed by Access Denial for the Fifth Offense within a 365-day time period.	Verbal reprimand	Written reprimand	3-day suspension
Class II • Unauthorized use of equipment, tools, or machinery • Failure to observe traffic and parking rules on NSLS-II project • Horseplay For Fourth Offense within a 365-day time period, next step is Access Denial.	Written reprimand	3-day suspension	30-day suspension
Class III • Gambling on NSLS-II site • Disregard for safety rules (other than those mentioned elsewhere) • Failure to report an injury or accident	3-day suspension	30-day suspension	Access denied to site
Class IV • Threatening or intimidating other employees or supervisors	30-day suspension	Access denied to site	
Class V • Any violation of safety procedures that contribute to the potential for loss of life or limb (see Note 1 for examples) • Possession of weapons or firearms on company property, including site parking areas • Possession of drugs, alcohol, and related paraphernalia on company property, including site parking areas • Any other violations of the Drug Free Work Place policy • Theft of property from company, client or other employees • Assault on a supervisor or other employee	Access denied to site		
Note 1: Examples of Safety Violations • Failure to comply with Company 100% fall protection policy • Violation of confined space entry procedures			

NOTE: This policy is designed to set minimum standards and is not meant to supersede a subcontractor's policy or policies which may be more stringent.

Progressive Discipline Policy

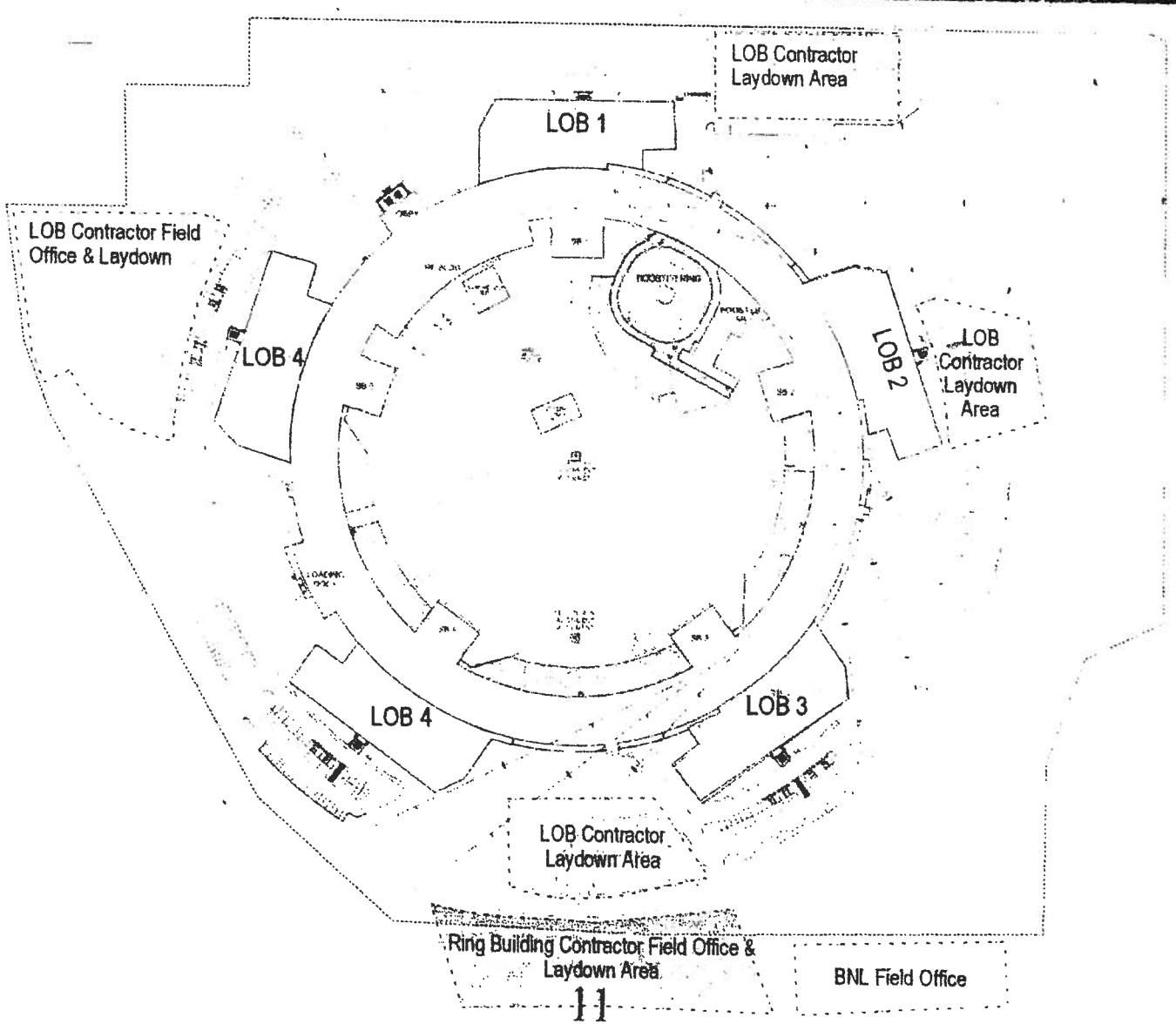
Acknowledgement:

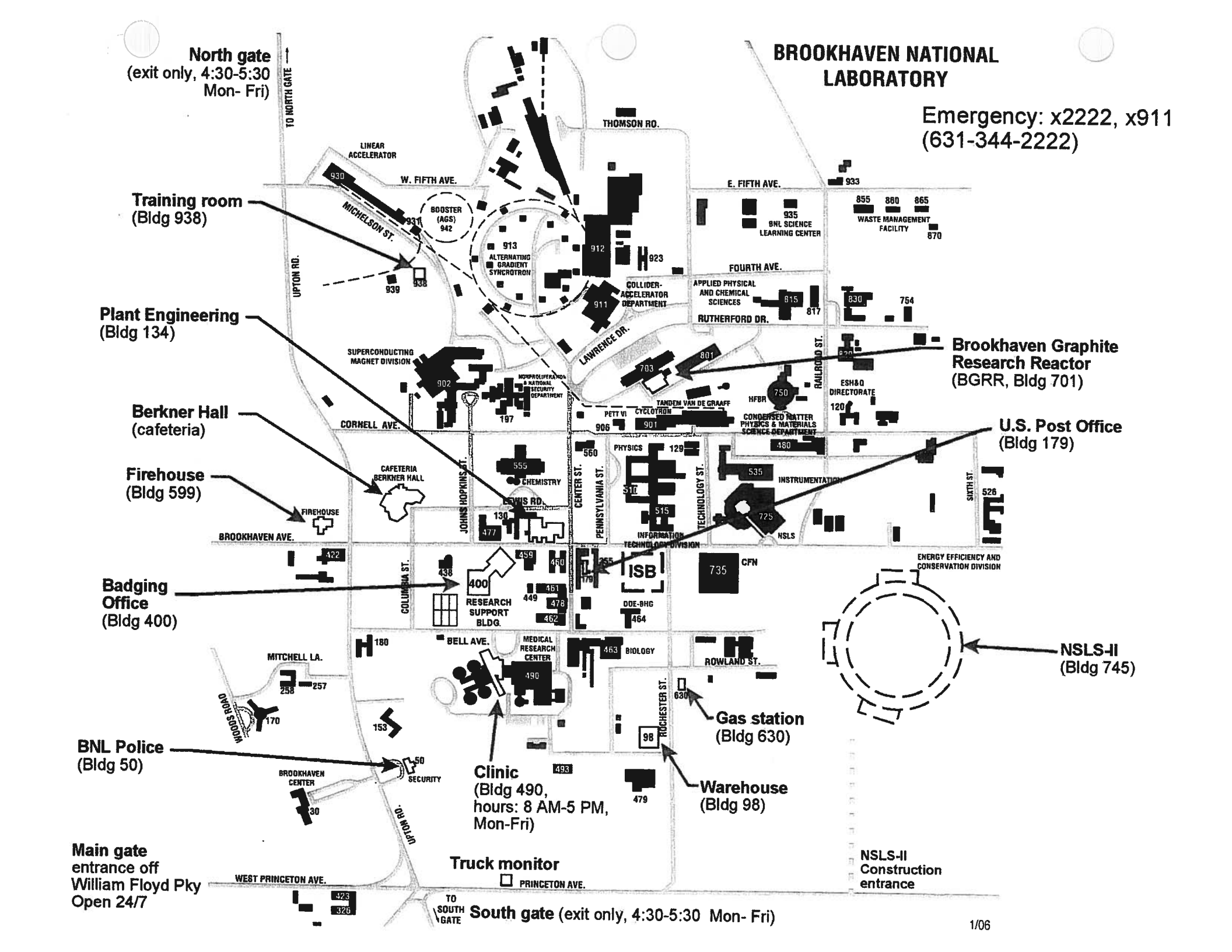
I have read and understand the Project policy on discipline. I further understand that not following the company or client's rules and regulations will result in disciplinary action up to and including denial of Project site access.

Print Name _____ Signature _____ Date _____

Witness _____ Date _____

LOB Construction Site




BROOKHAVEN NATIONAL LABORATORY
Emergency: x2222, x911 (631-344-2222)
North gate (exit only, 4:30-5:30 Mon- Fri)
Training room (Bldg 938)
Plant Engineering (Bldg 134)
Berkner Hall (cafeteria)
Firehouse (Bldg 599)
Badging Office (Bldg 400)
BNL Police (Bldg 50)
Main gate entrance off William Floyd Pky Open 24/7
Clinic (Bldg 490, hours: 8 AM-5 PM, Mon-Fri)
Truck monitor
Gas station (Bldg 630)
Warehouse (Bldg 98)
Brookhaven Graphite Research Reactor (BGRR, Bldg 701)
U.S. Post Office (Bldg 179)
NSLS-II (Bldg 745)
NSLS-II Construction entrance
South gate (exit only, 4:30-5:30 Mon- Fri)
TO NORTH GATE
THOMSON RD.
LINEAR ACCELERATOR
W. FIFTH AVE.
E. FIFTH AVE.
MICHELSON ST.
BOOSTER (AGS) 942
ALTERNATING GRADIENT SYNCHROTRON
COLLIDER-ACCELERATOR DEPARTMENT
FOURTH AVE.
BNL SCIENCE LEARNING CENTER
WASTE MANAGEMENT FACILITY
UPTON RD.
APPLIED PHYSICAL AND CHEMICAL SCIENCES
RUTHERFORD DR.
LAWRENCE DR.
SUPERCONDUCTING MAGNET DIVISION
NONPROLIFERATION & NATIONAL SECURITY DEPARTMENT
TANDEM VAN DE GRAAFF
HFBR
ESH&Q DIRECTORATE
CONDENSED MATTER PHYSICS & MATERIALS SCIENCE DEPARTMENT
CORNELL AVE.
PETT VI CYCLOTRON
RAILROAD ST.
CAFETERIA BERKNER HALL
CHEMISTRY
PHYSICS
INSTRUMENTATION
JOHNS HOPKINS ST.
CENTER ST.
PENNSYLVANIA ST.
TECHNOLOGY ST.
SIXTH ST.
FIREHOUSE
BROOKHAVEN AVE.
LEWIS RD.
INFORMATION TECHNOLOGY DIVISION
NSLS
ISB
CFN
ENERGY EFFICIENCY AND CONSERVATION DIVISION
COLUMBIA ST.
RESEARCH SUPPORT BLDG.
DOE-BHG
BELL AVE.
MEDICAL RESEARCH CENTER
BIOLOGY
ROWLAND ST.
MITCHELL LA.
WOODS ROAD
ROCHESTER ST.
BROOKHAVEN CENTER
SECURITY
UPTON RD.
WEST PRINCETON AVE.
PRINCETON AVE.
TO SOUTH GATE
1/06

APPENDIX E
DISCIPLINARY ACTION

Site Responsibilities-Progressive Disciplinary Procedure.

Each employer is responsible for their workers and further, each employee is responsible for their own actions. Both the employer and employee are also responsible to notify those in authority when conditions warrant corrective action to be taken that is beyond their own scope of responsibility. All work must stop or be controlled around any such unsafe conditions.

- Each subcontractor is responsible for fully safety training each and every employee fully in their work responsibilities.
- This program is designed to help ensure that employers come prepared to work safely at the site. We provide site orientation and require fully trained tradespersons, and place an even higher level of training on supervisory personnel. This policy applies for *the entire duration of the project* and does not reset over time; on an annual basis, for example.
- This procedure is based upon an employee's number of events, and *not* type of event. But the EH&S Manager, Project Manager or Superintendent can at his/her sole discretion, make reasonable adjustments if conditions are sufficiently different from prior events.
- The seriousness of an infraction, at the discretion of project management, does not limit the use of *any* form of professional disciplinary action. Employers can be penalized according to contract terms. For employees, items such as violation of the 6 foot fall protection rule, violence, drug or alcohol use, sabotage, or complete disregard for safety can be judged as reason for immediate and permanent removal from the site.
- Offenses will be categorized as Class I, II, III, IV or V. The Offense Guide will be referred to in the processing of the disciplinary action.
- 1st **event – Verbal Notification** When observations and/or accident or incident indicate work habits or practices that are contrary to the goals of this program the following will take place:
    - A full review of the training record of the employee
    - An unbiased evaluation of the incident for true, "root cause."
    - A record of determination, by the EH&S Manager and the employee supervisor, as to the need to warn the employee for a violation of safety rules. This verbal warning in the form of *Notice of Safety Violation* memorandum shall be distributed to the employer for processing with the employee, with documentation retained as part of the document control procedures.
    - The subcontractor must respond in writing to the EH&S Manager within 2 business days with specific action to prevent recurrence.
- 2nd **Event – Written Warning** When observations and/or accident or incident indicate work habits or practices that are contrary to the goals and requirements of this program the following will take place:
    - A full review of the training record and prior occurrence of the employee.
    - An unbiased evaluation of the incident for true, "root cause."

- **A record of determination, by the site safety representative, as to the need to warn the employee in writing, and, if necessary, the supervisor, for a violation of safety rules by a *Direction to Warn in Writing* memorandum. This warning shall** be distributed to the employer for processing with the employee(s), with documentation retained as part of the document control procedures. The employer must respond in writing to the EH&S Manager within 2 business days with copies of written warnings to the employee.

- **3rd Event – Three Day Suspension** When observations and/or accident or incident indicate work habits or practices that are contrary to the goals and requirements of this program the following will take place:
    - A full review of the training record and prior occurrence of the employee.
    - An unbiased evaluation of the incident for true, "root cause."
    - A record of determination will be initiated by the EH&S Manager as to the need to have the employer suspend the employee for a violation of safety rules. This *Direction to Suspend* memorandum shall be distributed to the employer for processing with the employee(s), with documentation retained as part of the document control procedures.

OFFENSE	FIRST	SECOND	THIRD
Class I • Creating or contributing to unsanitary conditions due to poor housekeeping • Posting or removing notices on bulletin boards without permission • Eating in unauthorized areas • Failure to report the use of prescription drugs • Unauthorized soliciting of contributions on NSLS-II Project • Smoking in unauthorized areas (Note: This may be upgraded to a Class V offense if in a hazardous area) For Fourth Offense, next step in Progressive Disciplinary Policy is 30-day suspension, followed by Access Denial for the Fifth Offense within a 365-day time period.	Verbal reprimand	Written reprimand	3-day suspension
Class II • Unauthorized use of equipment, tools, or machinery • Failure to observe traffic and parking rules on NSLS-II project • Horseplay For Fourth Offense within a 365-day time period, next step is Access Denial.	Written reprimand	3-day suspension	30-day suspension
Class III • Gambling on NSLS-II site • Disregard for safety rules (other than those mentioned elsewhere) • Failure to report an injury or accident	3-day suspension	30-day suspension	Access denied to site
Class IV • Threatening or intimidating other employees or supervisors	30-day suspension	Access denied to site	
Class V • Any violation of safety procedures that contribute to the potential for loss of life or limb (see Note 1 for examples) • Possession of weapons or firearms on company property, including site parking areas • Possession of drugs, alcohol, and related paraphernalia on company property, including site parking areas • Any other violations of the Drug Free Work Place policy • Theft of property from company, client or other employees • Assault on a supervisor or other employee	Access denied to site		
Note 1: Examples of Safety Violations • Failure to comply with Company 100% fall protection policy • Violation of confined space entry procedures			

NOTE: This policy is designed to set minimum standards and is not meant to supersede a subcontractor's policy or policies which may be more stringent.

Progressive Discipline Policy

Acknowledgement:

I have read and understand the Project policy on discipline. I further understand that not following the company or client's rules and regulations will result in disciplinary action up to and including denial of Project site access.

Print Name _____ Signature _____ Date _____

Witness _____ Date _____

APPENDIX F
EQUIPMENT INSPECTION

Plant Engineering Inspection Form for Contractor Equipment

The BNL inspection of this equipment is solely for the purpose of allowing the equipment on the BNL site. The operators of the equipment are responsible to maintain and operate the equipment in the safe manner and in accordance with the equipment operator's manual and the appropriate OSHA standard.

General Contractor: _____ CEIR#:_____
Sub-Contractor: _____ BNL Contact: _____
Job #:_____ Site Location: _____ Equipment:_____
Hour Meter: _____ S.N.:_____ 48 Hour Notice Given:_____

Item:	**Item:**
General Appearance:	**Carrier:**
Cab:	Outriggers:
Fire Extinguisher:	Boom Type:
Glass:	Anti-Two Block Device:
Operator's Manual:	Hook Latch:
Load Charts/Capacity Plates:	Wire Rope:
Inspection Records:	Tires/Tracks:
Operating Condition:	**Rigging Equipment:**
Operating Controls:	BTH Lifting Devices:
Cooling System:	Chain Hotels:
Oil Leaks:	Slings:
Engine Instruments:	Shackles:
All Guards in Place:	
Back-up Alarm:	**Certification:**
Lights:	Operators License:
Mirrors:	Training Records:
Seat Belts:	Other:
Hoses:	

NDF= No Defects Found SR=Service Required N/A=Not Available

Comments:_____
_____
_____
_____

Inspected by:_____

cc: Project Enigneer_____ Date_____
Contractor Safety Rep _____
BNL Contact: _____

APPENDIX G
EMERGENCY ACTION PLAN

E.W.Howell's Emergency Evacuation Plan

Job: BNL NSLS-11 LOB's
Address: Building 741, 742, 743
Date:

This is supplemental information to provide specific emergency procedures. Refer to the Employee Safety Handbook for additional safety information.

In the event of site, evacuation in which may include fire, emergency, cave-ins, natural disasters or any hazardous situations requiring emergency response ACTIVATE THE FIRE ALARM PROCEDURES AND CALL 911.

BNL Evacuation Procedures –If you hear a Continuous Siren go to your , go immediately to your assembly area and wait for instructions.

If you hear an intermittent siren, evacuate the BNL site immediately.

If you hear three five-second blast go immediately to your assembly area.

EMERGENCY PHONE NUMBERS

Police 911 or 631-344-2222

Fire 911 or 631-344-2222

Ambulance 911 or 631-344-2222

Site Safety Manager (Abdul Azeez) 347-723-6389

EWH Office 516-921-7100

Super (Harry Hansen) 516-369-4087

CALL UP & CALMLY STATE

- Your name
- The location of the emergency
- The nature of the emergency – fire, chemical spill, etc.
- Whether injuries have occurred
- Hazards present which may affect responding emergency personnel
- A phone number near the scene where you can be reached.

BUILDING EVACUATION

Upon hearing the fire alarm or announcement begin evacuation procedures

- Keep yourself and others calm
- Quickly proceed outside the building (or to the announced "safe location") using the planned evacuation route.
- Close windows and doors as you leave.
- Help those that need special assistance.
- Report immediately to the designated "safe area" located **NSLS-II Building 735/ EWH assembly area**. Check in with **EWH** or _____ who will be taking a head count.
- Wait for instructions from emergency response personnel. Do not re-enter the building until told it is safe to do so.

BUILDING SAFETY SYSTEMS

The building at **NSLS-II (Build 745)** has the following safety systems:

Locate the emergency equipment in your area and know how to use it.

Alarms – The fire alarm system in the building is activated by

E.W.H Employer_____

Automatic Fire System Yes_____ No_____

Smoke and heat detectors – Yes_____ No _____

Automatic Sprinkler System –Yes_____ No _____

Emergency Lighting –Yes _____ **No**_____ A flashlight is recommended to aid in emergencies.

Fire Extinguishers – Yes _____ **No**_____ Only trained personnel should use fire extinguishers. Always notify Fire or Police, from a safe location, after using a fire extinguisher. Never block or obstruct extinguishers with furniture or equipment.

First Aid Kit – Location _____, for minor injuries not requiring medical attention.

Fire Doors- Must be kept shut at all times to provide a safe means of egress in stairways and corridors, unless releasing devices close doors upon alarm activation.

EVACUATION PERSONNEL

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

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Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

EVACUATION PERSONNEL

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

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Subcontractor: _____

Name of: _____ **Phone:** _____

EVACUATION PERSONNEL

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

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Name of: _____ **Phone:** _____

Subcontractor: _____

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Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

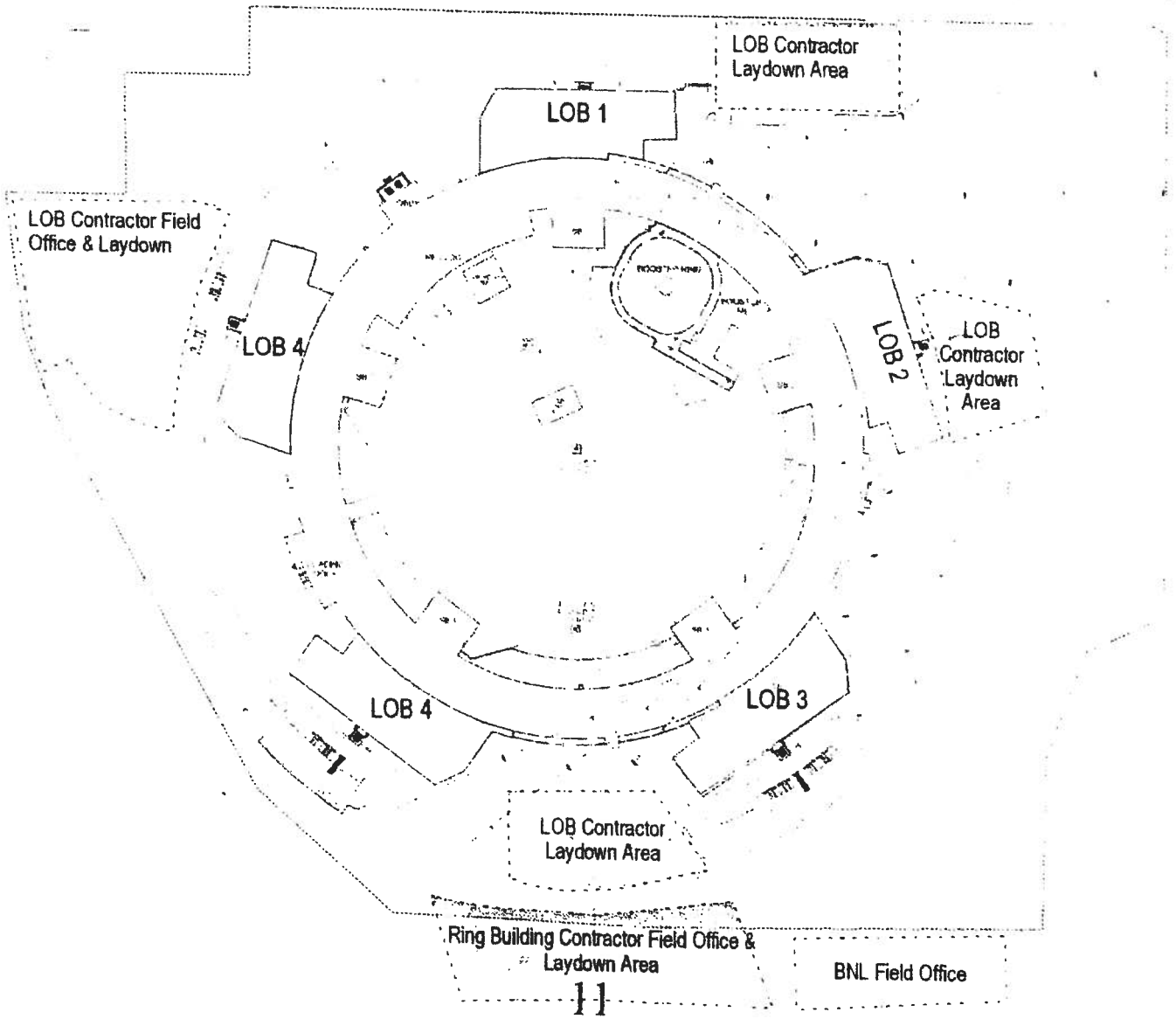
Subcontractor: _____

Name of: _____ **Phone:** _____

Subcontractor: _____

Name of: _____ **Phone:** _____

LOB Construction Site



Jobsite Safety Talks

GBC Safety and Construction Services Inc., 6 Airline Drive, Albany, New York 12205 518-869-2207

Company: _____ **Project:** _____

Super/Foreman: _____ **Date:** _____

Topic: _____

Upcoming Jobsite Activities Discussed

Material Safety Data Sheet(s) Reviewed
Other Items Discussed

PRINT SIGN

Attendance:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
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21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____
29. _____
30. _____

Jobsite Safety Talks

GBC Safety and Construction Services Inc., 6 Airline Drive, Albany, New York 12205 518-869-2207

Emergency Site Evacuation

Construction sites can be dangerous places to work. Therefore, it is imperative that all employees know what to do in the event of an emergency if the site must be quickly evacuated. There are many reasons that a work site might have to be evacuated, including fires, explosions and explosion potential, cave-ins, bomb threats, and natural disasters. The key to safety in the event of an emergency site evacuation is planning and information. The supervisors must have a plan in place for the evacuation and the employees have to be informed of what to do and where to go during the emergency.

Pre-Planning for an Emergency

- An emergency evacuation plan should be developed at the start of the job. It should include the following:
  - ➢ A system to announce to the employees that the site is being evacuated.
  - ➢ A meeting place for all personnel to gather during the evacuation.
  - ➢ A method of determining that all employees have been evacuated. Crew foremen should know who is on the job and should be able to account for their whereabouts during the evacuation. If any employees are missing, emergency response personnel will need to know for their rescue efforts.

During the Evacuation

- **Do not panic.**
- Announce to the site employees that the site should be evacuated immediately.
- Call the main office and let them know that there is an emergency.
- As instructed by the main office, call the proper authorities to deal with the emergency.
- Account for all the employees' whereabouts and let emergency response personnel know of any missing people.
- **Do not return** to the site until the emergency is over.

Post-Evacuation Investigation

- Determine the cause of the emergency.
- Find ways to prevent the reoccurrence of the same incident in the future.
- Let other employees know what happened and what is being done to prevent it from happening again.

Note: For additional information covering this topic, refer to OSHA 29 CFR Standards 1926.35 or contact **GBC Safety and Construction Services.**

Return to Master List

(h) **Exit marking.** Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to the occupants.

(i) **Maintenance and workmanship.** Means of egress shall be continually maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

[58 FR 35083; June 30, 1993]

§1926.35

Employee emergency action plans

(a) **Scope and application.** This section applies to all emergency action plans required by a particular OSHA standard. The emergency action plan shall be in writing (except as provided in the last sentence of paragraph (e)(3) of this section) and shall cover those designated actions employers and employees must take to ensure employee safety from fire and other emergencies.

(b) **Elements.** The following elements, at a minimum, shall be included in the plan:

(1) *Emergency escape procedures* and emergency escape route assignments;

(2) *Procedures to be followed* by employees who remain to operate critical plant operations before they evacuate;

(3) *Procedures to account for* all employees after emergency evacuation has been completed;

(4) *Rescue and medical duties* for those employees who are to perform them;

(5) *The preferred means of reporting fires and other emergencies; and*

(6) *Names or regular job titles* of persons or departments who can be contacted for further information or explanation of duties under the plan.

(c) **Alarm system.**

(1) *The employer shall establish* an employee alarm system which complies with §1926.159.

(2) *If the employee alarm system* is used for alerting fire brigade members, or for other purposes, a distinctive signal for each purpose shall be used.

(d) **Evacuation.** The employer shall establish in the emergency action plan the types of evacuation to be used in emergency circumstances.

(e) **Training.**

(1) *Before implementing* the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(2) *The employer shall review the plan* with each employee covered by the plan at the following times:

(i) *Initially when the plan is developed;*

(ii) *Whenever the employee's responsibilities* or designated actions under the plan change; and

(iii) *Whenever the plan is changed.*

(3) *The employer shall review* with each employee upon initial assignment those parts of the plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review. For those employers with 10 or fewer employees the plan may be communicated orally to employees and the employer need not maintain a written plan.

[58 FR 35083; June 30, 1993]

§1926 Subpart C

Authority for 1926 Subpart C

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (40 U.S.C. 333); secs. 4, 6, and 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), or 6-96 (62 FR 111), as applicable; and 29 CFR part 1911.

[61 FR 9227, March 7, 1996; 61 FR 31427, June 20, 1996; 63 FR 33450, June 18, 1998]

APPENDIX H
ACCIDENT INVESTIGATION

EW HOWELL
GENERAL CONTRACTORS / CONSTRUCTION MANAGERS

CLAIMS REPORTING SUMMARY

Personal Injury to Howell Employee - Documents are in small white envelope

1. Immediately call Lynn or Paul or John Bergin. Open the small white envelope in the Claims Kit labeled "Injured Worker Treatment Authorization Packet" and follow the directions outlined on the top card. Complete all forms, make a copy for yourself and return the originally executed forms to Lynn Dommin.

Personal Injury to Anyone Not Employed by Howell- White Sheet

Witness Sheet - Yellow

1. When an incident occurs to one of our subcontractors or a pedestrian or any 3rd party, contact John Bergin, George Grauer or Marilyn Maher via radio and provide information and discuss the severity of the incident.
2. Complete the Report of Incident Form and attach Witness Sheet, Property Loss Fact Sheet if there was property damage. If there are any witnesses, ask the witnesses to complete the yellow Witness Sheet. When possible have the injured worker or person who was injured complete the Injured Person-Worker Fact Sheet.
3. Download pictures to the CD that is enclosed in your accident kit and send to Marilyn Maher with the completed Report of Incident Form
4. Using the large white envelope in the back of the claims kit, enclose all original documents and complete the outside of the envelope showing the documents you are enclosing. Send the envelope to Marilyn Maher in Woodbury Office.

Automobile Accident - Blue

1. Automobile claims consist of any accident involving an insured owned/leased vehicle, ,pedestrian, object or property of others.
2. Obtain all information to complete the Acord form of MV 104. Notify Marilyn Maher immediately and Fax copy to Cathi McGrath at Tannenbaum. **Use the fax coversheet that is provided.**
3. Do not have damages to your company car repaired until it is inspected by Tokio Marine & Fire Insurance Company and have received a claims number.
4. Should a claimant contact you, please refer them to Marilyn Maher. If she is unavailable, contact Cathi McGrath at Tanenbaum Harbor 516-414-8931. Do not admit any responsibility and do not promise anything to anyone.
5. If you have incurred property damage to your car or caused property damage, complete the property damage form attached to the automobile accident report.

Property Damage Loss Sheet- Pink

1. When an incident occurs contact John Bergin, George Grauer or Marilyn Maher via radio and provide information and discuss the severity of the incident.
2. Take as many pictures as is necessary to document the damage.
3. Review the Claim Reporting Procedures in the Property Damage Section of the Claims Kit. (Pink Form)

Equipment/Evidence - Green

1. When equipment such as ladders, electric tools, etc. cause an accident, we would prefer to take possession of the equipment and replace the equipment for the subcontractor.
2. When a worker is injured from equipment, contact John Bergin, George Grauer or Marilyn Maher to discuss severity of the incident. It may be decided the equipment will need to be tagged and stored.
3. Take pictures of the equipment. Properly tag and store the equipment until it is determined whether the insurance company will want to take possession of the equipment.

EW HOWELL

[NOTE: This form should not be used for an incident involving a Howell employee or when there is property damage. This form is to be used for injury of a subcontractor's employee or a visitor to the project site or injury to a pedestrian]

REPORT OF INCIDENT

Job Number	**Project Name**	**Project Address**
Date of Incident	**Date Reported to Howell Superintendent**	**Who Reported the incident to Superintendent?** **[Provide name of person and their employer]**
Weather Conditions on the date of incident	**Was equipment involved in incident? (Fill out Equipment Report and attach to this Report)** **Did you take the equipment? ☐ Yes ☐ No** **Did you tag the equipment? ☐ Yes ☐ No**	**Does Howell have outside Safety Company on site? ☐ Yes ☐ No** **Were they on site the date of incident? ☐ Yes ☐ No** **Name of Safety Rep:**
Location of incident within the site :	**Were there any witnesses: Yes No** **Did you obtain witness statements? Yes No (attach statements to this report)**	**Did you witness the incident? ☐ Yes ☐ No** **If yes, complete witness statement report and attach.** **Did you take Pictures: Yes No** **Did you attach CD pictures to this report? Yes No**

CLAIMANT INFORMATION

Name:	**Age and Gender:**	**Social Security No.**
Address:	**Employed by :**	**Home Telephone #** **Cell Number/Work Number**
Union Claimant Belongs to:	**Name of Claimant's Foreman**	**Tele/Cell No. of Claimant's Foreman :**
Did injured worker go to Hospital? ☐ Yes ☐ No ☐ N/A **What hospital did the injured worker go to?**	**Did anyone from Howell go to the hospital with injured worker? ☐ Yes ☐ No** **If yes, who went?**	**Injured worker return to work? ☐ Yes ☐ No** **If yes, what date?** **Did you take pictures of him working when he returned to work ? Yes No**
Was the police called? ☐ Yes ☐ No **If yes, provide name of Policeman and copy of report/ badge number, etc.**	**Was the fire department called? ☐ Yes ☐ No** **Did OSHA come to jobsite? ☐ Yes ☐ No**	**EMS Response ? ☐ Yes ☐ No** **Name:**

Turn Page Over and Complete Report

INJURED WORKER FACT SHEET

To be filled out by the person who was injured

Date	Time	Name of Project
Name (first	Middle	Last
Address:	State	Zip Code
Home Telephone	Cell Phone	Other
Date of Birth	SSN	What Union do you belong to?
Did you receive First Aid ? Yes No **Did you want First Aid ?** Yes No	First Aid Provided by:	Police Response Yes No Shield No.
Name and Address of Employer	Telephone No. :	Name of Supervisor
Supervisor's Telephone No.	How long have you worked for this employer?	Were there any witnesses: Yes No
Names of Witnesses:	Telephone No.	Did he fill out Witness Statement? Yes No
Names of Witness #2 :	Telephone No.	Did he fill out Witness Statement? Yes No

Turn Page Over

Page 2- Injured Worker Fact Sheet continued….

Name:	Name of Project

Description of What Happened:

Signature Date:
Print Name:

WITNESS SHEET

Date	
Jobsite :	
Location within Jobsite where accident occurred : What is the weather temperature outside? Describe	
Your Name : (please print)	
Your Address :	
Telephone and Cell Numbers	Telephone # Cell #
Your Employer :	
Employers Address : Employers Telephone Number	
Union You Belong to :	
What Equipment (ladder,saw, scaffolding, lift, etc) was Involved? Was injured worker wearing safety equipment? What equipment was he wearing?	☐ **Yes** ☐ **No** ☐ **Yes** ☐ **No**
If yes, type of equipment, model, etc.	
Who owns equipment ? : Where is the equipment now ?	
Description of what happened : **(If you run out of room turn page over)**	
Were there any other Witnesses?	☐ **Yes** ☐ **No**
If Yes, print name (s) and who they worked for	

_____ Date: _____

Witness Signature

_____

Howell Superintendent Signature Date: _____

Witness Sheet continued…
Any Additional Information:
Re: Incident that happened on: _____

Signature Date:

E.W.HOWELL CO., LLC.

PROPERTY INSURANCES – CLAIM REPORTING PROCEDURES

Radio John Bergin, George Grauer or Marilyn Maher . Report any type of property damage. Send Property Loss Fact Sheet to Marilyn J. Maher (Fax: 516-921-0119) of E.W. Howell and Cathie McGrath at:

TANENBAUM-HARBER CO., INC.
1055 Franklin Avenue
Suite 200
Garden City, NY 11530
Attn: Cathie McGrath
Fax No. 516-414-8974
Telephone No. 516-414-8931 Cell No. 917-318-5686

Please do not wait for estimates to be completed. Insurance Company adjusters must have the opportunity to conduct inspections in a timely manner, and before repairs are made.

Complete the Pink Form " Property Loss Fact Sheet" . Provide the following data, if available:

- Date and time of loss
- Location of occurrence
- Identify property involved
- Supply name and telephone number of on site E.W. Howell Co., LLC. representative in charge of coordinating restoration/repairs
- Provide estimates as soon as possible
- Identify measures taken to minimize loss exposure (i.e., separate damage from undamaged property, emerge repairs, etc.)
- Identify subcontractor who caused the damage (include address, telephone # as well as name of superintendents.)

Turn page over

Capture and Identify Costs

- Take as many pictures of the damaged property as needed
- Assign separate work orders for clean-up and repair of damage, include name of subcontractor and its superintendent.
- Contact Dan Williams regarding accounting I.D. number to be set-up to capture expenses
- Schedule all in-house labor costs by job category, hours, rate, etc.
- Separate straight time from over time labor
- Compile material invoices for each work order category.
- Take pictures of completed repair work.
- Provide name and address of property owner.
- Have owner of property provide permission for repairs

Losses will be handled by a personal visit and inspection from an insurance company staff adjuster or an independent adjuster retained by the insurance carrier, or our Broker Tanenbaum-Harber co., Inc.

Should you have any questions regarding property claim reporting, please contact Marilyn J. Maher or Cathie McGrath at the telephone numbers shown above.

Page two of Incident Report

Name of Injured Worker	Date of Incident

Provide Detailed Explanation of Incident :

What Subcontractors were working in the same area?

Check the box showing what you are attaching to this report:

☐ **Pictures on CD** ☐ **Property Damage Report** ☐ **Evidence/Equipment Report** ☐ **Witness Statements**

Signature of Howell Superintendent: **Date:**

PROPERTY LOSS FACT SHEET

Date Reported: _____ Project No. : _____

Reported By: _____ Title: _____

Name of Project:

Property is Owned By:	
Address of Owner:	
Telephone Number of Owner	
General Description of Property that was damaged : (location, where it happened, model number, type of fixture, etc.)	
How did the loss occur? Witnesses?	
Was the property damage caused by one of our Subcontractors? If yes, Name of Sub and Contact person and telephone number	☐ **Yes** ☐ **No**
If no, who caused the damage ? Contact info.	
Was the Police Contacted ? If yes, name of officer/badge No.	☐ **Yes** ☐ **No**
Was Fire Department Contacted ?	☐ **Yes** ☐ **No**
Was anyone else contacted ? If yes, who else was contacted ?	☐ **Yes** ☐ **No**
Was anyone injured?	☐ **Yes** ☐ **No**
If yes, name of person injured and contact information/address/tele	
How did the injury occur?	

APPENDIX I
SITE INSPECTION FORM

SAFETY INSPECTION REPORT

Company Name: _____ **Date:** _____

Project Name: _____ **Completed By:** _____

Job Number: _____ **Reviewed By:** _____

INSTRUCTIONS:

For items in compliance, leave boxes blank. For items not in compliance, indicate with an 'X'. For items not applicable at time of review, mark 'N/A'. For items marked, "not in compliance", provide detail in 'Comments' section. Identify corrective action taken and date of same in 'Corrective Actions' section.

	S	M	T	W	T	F	S
Date:							
1. Personal Protective Equipment							
a) Hard Hats							
b) Respiratory Protection							
c) Hearing Protection							
d) Eye Protection							
2. Project Housekeeping:							
a) Stairs & Exits Clear							
b) Rubbish Removal							
c) Street Cleaning							
d) Material Stacked Properly							
e) Portable Chemical Toilets							
3. Perimeter Fall Protection:							
a) Fall Protection for Perimeters							
b) Roof Perimeter							
c) Roof & Floor Openings							
d) Steel Erection Plan							
e) Safety Caps for Rebar							
4. Ladders and Stairs:							
a) Ladders 3' Above Landing							
b) Ladders Secured Properly							
c) Condition of Ladders							
d) Temporary Stair Tower							
e) Pan Filled Stairs & Handrails							
5. Scaffolds:							
a) Railings							
b) Tied into Building							
c) Plans & Platforms							
d) Baker Type Scaffold							
e) Suspension Scaffolds							
6. Electrical:							
a) Ground Fault Interrupters							
b) Temporary Lighting							
c) Assured Ground Program							
d) Circuit Verification for Demo							
e) Cords, Plugs & Receptacles							
7. Fire Prevention:							
a) Fire Extinguishers							
b) Standpipe							
c) Storage of Flammable Liquids							
d) Temporary Heat							
e) Nightwatch							
f) Gas Cylinders							
g) Water Barrels							

	S	M	T	W	T	F	S
Date:							
8. Public Protection							
a) Construction Fence							
b) Sidewalk Canopy							
c) Board-Up Protection							
d) Flagman							
9. First Aid							
a) Emergency Numbers Posted							
b) Stretcher							
c) Emergency Plan							
d) First Aid Kit							
10. Excavation & Trenches:							
a) Sloped Excavation							
b) Shored Excavation							
c) Trench Excavations							
d) Competent Person							
11. Administrative:							
a) Certificate of Insurance							
b) HazCom Documents							
c) OSHA & Safety Signage							
d) Project Safety Regulations							
e) Weekly Tool Box Meetings							
f) Project Safety Plan							
12. Special Hazard							
a) Masonry Limited Access Zone							
b) Masonry Bracing							

CORRECTIVE ACTION:

Item:	Corrective Action Taken:	Date Corrected:

Comments:

APPENDIX J
PHASE
HAZARD
ANALYSIS

EWH- BNL NSLS II- LOB
Phase Hazard Analysis

Date_____

Company _____ Subcontractor_____ Author _____

Reviewed by EWH_____ Date_____
Reviewed by BNL_____ Date_____

PHA Scope Description (of work) _____

TASK	ACTIVITY	HAZARDS	MITIGATION/REDUCTION	COMMENTS

EWH- BNL NSLS II- LOB
Phase Hazard Analysis

Date_____

Company _____ Subcontractor_____ Author _____

Reviewed by EWH_____ Date_____
Reviewed by BNL_____ Date_____

PHA Scope Description (of work) _____

TASK	ACTIVITY	HAZARDS	MITIGATION/REDUCTION	COMMENTS

APPENDIX K
CONFINED SPACE ENTRY

EW HOWELL

GENERAL CONTRACTORS / CONSTRUCTION MANAGERS

Confined Space Program

for

E. W. Howell and Subcontractors

Confined Space Program
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I Objective
II Background
III Assignment of Responsibility
- A. Employer
- B. Program Manager
- C. Entry Supervisors
- D. Attendants
- E. Rescue Team
- F. Entrants/Affected Employees

IV. Training
- A. Training Frequency
- B. General Training
- C. Specific Training
- D. Verification of Training

V. Identification of Hazards and Evaluation of Confined Spaces
- A. Survey
- B. Hazard Reevaluation
- C. Pre-Entry Hazard Assessment
- D. Hazard Controls

VI. Entry Permits
- A. Key Elements of Entry Permits
- B. Permit Scope and Duration

VII. Entry Procedures
- A. Prior to Entry
- B. Opening a Confined Space
- C. Atmospheric Testing
- D. Isolation and Lockout/Tagout Safeguards
- E. Ingress/Egress Safeguards
- F. Warning Signs and Symbols

VIII. Emergency Response
- A. Emergency Response Plan
- B. Retrieval Systems and Methods of Non-Entry Rescue

IX Attachments:
- A. Confined Space Decision Flow Chart
- B. OSHA 1910.146
- C. Confined Space Power Point
- D. Confined Space Entry Evaluation Checklist
- E. Sample Confined Space Entry Permit
- F. Sample Atmospheric Testing Procedures

Confined Space Program
For
E. W. Howell Co., LLC

I. OBJECTIVE

The purpose of ***E. W. Howell's*** Confined Space Program is to set procedures that will ensure workers safe entry into confined spaces and permit-required confined spaces to perform routine tasks associated with their employment. This procedure is designed to provide the minimum safety requirements in accordance with the Occupational Safety and Health Administration's (OSHA) Confined Space Standard, 29 CFR 1910.146, 29 CFR 1926.21(6)(i) and the BNL Subject Area Confined Spaces. Subcontractors must take and pass BNL's Confined Space training. All Subcontractors will be required to comply with requirements of this program.

II. BACKGROUND

A confined space is defined as any location that has limited openings for entry and egress, is not intended for continuous employee occupancy, and is so enclosed that natural ventilation may not reduce air contaminants to levels below the threshold limit value (TLV). Examples of confined spaces include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, hoppers, vaults, service boxes and bins. Entry into confined spaces without proper precautions could result in injury, impairment, or death due to:

A. an atmosphere that is flammable or explosive;
B. lack of sufficient oxygen to support life;
C. contact with or inhalation of toxic materials; or
D. general safety or work area hazards such as steam or high pressure materials.

A confined space can be a:

- Class 1 non-permitted confined space.
- Class 2A non-permitted confined space.
- Class 2B non-permitted confined space.
- Class 2C permit required confined space.

A Class 2C (permit required) Confined Space Entry Permit Form is used for Class 2C entries.

A Class 2A & 2B Confined Space Pre-Entry Certification Form is used for Class 2A and Class 2B entries.

A Confined Space Classification Form is used to document hazard evaluations on Class 2A and 2B confined spaces and acts as a reminder to users that the introduction of hazards into Class 1 exempt spaces automatically changes the classification to a Class 2 and needs further evaluation.

III. ASSIGNMENT OF RESPONSIBILITY

A. Employer

In administering this Confined Space Program, ***E. W. Howell*** will:

1. Monitor the effectiveness of the program.
2. Preview and update the program on at least an annual basis or as needed.
3. Ensure the Subcontractor employs the PPE defined in the PHA
4. Ensure atmospheric testing is performed as applicable to work at hand.

B. Program Manager

George Grauer is responsible for managing the Confined Space Program, and shall:

1. Ensure that a list of confined spaces at all ***E. W. Howell*** worksites is maintained.
2. Ensure that canceled permits are reviewed for lessons learned.
3. Ensure training of personnel is conducted and documented.
4. Coordinate with outside responders.
5. Ensure that equipment is in compliance with standards.
6. Ensure that ***E. W. Howell*** will oversee all confined space work, and shall:
   a. Determine the type of confined space.
   b. Ensure requirements for entry have been completed before entry is authorized.
   c. Ensure confined space monitoring is performed by personnel qualified and trained in confined space entry procedures.
   d. Ensure a list of monitoring equipment and personnel qualified to operate the equipment is maintained by the Safety and Occupational Health Office.
   e. Ensure that the rescue team (BNL) has simulated a rescue in a confined space within the past twelve (12) months.
   f. Know the hazards that may be faced during entry, including the mode (how the contaminant gets into the body), signs or symptoms, and consequences of exposure.
   g. Ensure that the subcontractor filled out a permit or pre-entry certification form.
   h. Determine the entry requirements.
   i. Require a permit review and signature from the authorized Entry Supervisor.
   j. Notify all involved employees of the permit or pre-entry certification requirements.
   k. Post the permit or pre-entry certification in a conspicuous location near the job.
   l. Renew the permit or have it reissued as needed (a new permit is required every shift).

m. Determine the number of Attendants required to perform the work.
n. Ensure all Attendant(s) know how to communicate with the entrants and how to obtain assistance.
o. Post any required barriers and signs.
p. Remain alert to changing conditions that might affect the conditions of the permits (i.e., require additional atmospheric monitoring or changes in personal protective equipment).
q. Change and reissue the permit, or issue a new permit or pre-entry certification form as necessary.
r. Ensure periodic atmospheric monitoring is done according to permit or pre-entry certification form requirements.
s. Ensure that personnel doing the work and all support personnel adhere to permit or pre-entry certification form requirements.
t. Ensure the permit is canceled when the work is done.
u. Ensure the confined space is safely closed and all workers are cleared from the area.

C. Entry Supervisors

Specific Subcontractor shall serve as the Entry Supervisor(s), and shall be qualified and authorized to approve confined space entry permits or pre-entry certification forms. The Entry Supervisor(s) shall be responsible for:

1. Classifying the confined space as a Class 1, Class 2A, Class 2B or Class 2C.
2. Determining if conditions are acceptable for entry.
3. Authorizing entry and overseeing entry operations.
4. Terminating entry procedures as required.
5. Serving as an Attendant, as long as the person is trained and equipped appropriately for that role.
6. Ensuring measures are in place to keep unauthorized personnel clear of the area.
7. Checking the work at least twice a shift to verify and document permit requirements are being observed (more frequent checks shall be made if operations or conditions are anticipated that could affect permit requirements).
8. Ensuring that necessary information on chemical hazards is kept at the worksite for the employees or rescue team.
9. Ensuring a rescue team is available and instructed in their rescue duties (i.e., an onsite team or a prearranged outside rescue service).
10. Ensuring the rescue team members have current certification in first aid and cardiopulmonary resuscitation (CPR).
11. Ensuring all documentation is complete and approved.

D. Attendants

Specific Subcontractor shall function as an Attendant(s) and shall be stationed outside of the confined workspace. The Attendant(s) shall:

1. Be knowledgeable of, and be able to recognize potential confined space hazards.
2. Maintain a sign-in/sign-out log with a count of all persons in the confined space, and ensure all entrants sign in and out.
3. Monitor surrounding activities to ensure the safety of personnel.
4. Maintain effective and continuous communication with personnel during confined space entry, work, and exit.
5. Monitors the confined space for atmosphere hazards and records the results on a permit or certification form. When working in the space with a residual or introduced chemical with an OSHA Permissible Exposure Limit or ACGIH Threshold Limit Value, exposure monitoring is required to determine if the exposure levels exceed these limits.
6. Order personnel to evacuate the confined space if he/she:

    a. observes a condition which is not allowed on the entry permit;
    b. notices the entrants acting strangely, possibly as a result of exposure to hazardous substances;
    c. notices a situation outside the confined space which could endanger personnel;
    d. notices a hazard within the confined space that has not been previously recognized or taken into consideration;
    e. must leave his/her work station; or

7. The attendant immediately calls extension 2222 or 631-344-2222 for rescue services, if there is an emergency or if the authorized entrants need rescue assistance.
8. Immediately summon the Rescue Team if crew rescue becomes necessary.
9. Keep unauthorized persons out of the confined space, order them out, or notify authorized personnel of an unauthorized entry.

E. Rescue Team

The Rescue Team members shall:

1. Respond immediately to rescue calls from the Attendant or any other person recognizing a need for rescue from the confined space.
2. In addition to emergency response training, receive the same training as that required of the authorized entrants.
3. Have current certification in first aid and CPR.
4. Provides retrieval systems and trained staff to facilitate non-entry rescue.
5. Coordinates with the BNL Emergency Services Division Fire Rescue Group by calling extension 2222 or 631-344-2222.
6. Stops entry into Class 2C spaces if the Fire Rescue Group is not available due to other response activities.

F. Entrants/Affected Employees

Employees who are granted permission to enter a confined space shall:

1. Read and observe the entry permit or pre-entry certification requirements.
2. Remain alert to the hazards that could be encountered while in the confined space.
3. Properly use the personal protective equipment that is required by the permit.
4. Immediately exit the confined space when:

    a. they are ordered to do so by an authorized person;
    b. they notice or recognize signs or symptoms of exposure;
    c. a prohibited condition exists; or
    d. the automatic alarm system sounds.

5. Alert Attendant(s) when a prohibited condition exists and/or when warning signs or symptoms of exposure exist.

IV. TRAINING

E. W. Howell will verify that training will be provided to all employees whose work is regulated by this Confined Space Program acquire the understanding, knowledge, and skills necessary for the safe performance of their duties in confined spaces.

A. Training Frequency

Responsible Person shall provide training to each affected employee:

1. before the employee is first assigned duties within a confined space;
2. before there is a change in assigned duties;
3. when there is a change in permit space operations that presents a hazard for which an employee has not been trained; and
4. when ***E. W. Howell*** has reason to believe that there are deviations from the confined space entry procedures required in this program, or that there are inadequacies in the employee's knowledge or use of these procedures.

The training shall establish employee proficiency in the duties required in this program, and shall introduce new or revised procedures, as necessary, for compliance with this program.

B. General Training

All employees who will enter confined spaces shall be trained in entry procedures. Personnel responsible for supervising, planning, entering, or participating in confined space entry and rescue shall be adequately trained in their functional duties prior to any confined space entry. Training shall include:

1. Explanation of the general hazards associated with confined spaces.
2. Discussion of specific confined space hazards associated with the facility, location, or operation.
3. Reason for, proper use, and limitations of personal protective equipment and

other safety equipment required for entry into confined spaces.

4. Explanation of permits and other procedural requirements for conducting a confined space entry.
5. A clear understanding of what conditions would prohibit entry.
6. Procedures for responding to emergencies.
7. Duties and responsibilities of the confined space entry team.
8. Description of how to recognize symptoms of overexposure to probable air contaminants in themselves and co-workers, and method(s) for alerting the Attendant(s).

Refresher training shall be conducted as needed to maintain employee competence in entry procedures and precautions.

V. IDENTIFICATION OF HAZARDS AND EVALUATION OF CONFINED SPACES

A. Survey

E. W. Howell Site Safety Representative shall ensure a survey of the worksite is conducted to identify confined spaces. This survey can be partially completed from initial and continuing site characterizations, as well as other available data (i.e., blueprints and job safety analyses). The purpose of the survey is to develop an inventory of those locations and/or equipment at ***E. W. Howell*** that meet the definition of a confined space. This information shall be communicated to personnel, and appropriate confined space procedures shall be followed prior to entry. The initial surveys shall include air monitoring to determine the air quality in the confined spaces. The potential for the following situations shall be evaluated by ***E. W. Howell or Subcontractor Competent Person:***

1. flammable or explosive potential;
2. oxygen deficiency; and
3. presence of toxic and corrosive material.

B. Hazard Reevaluation

E. W. Howell Site Safety Representative shall identify and reevaluate hazards based on possible changes in activities or other physical or environmental conditions that could adversely affect work. A master inventory of confined spaces shall be maintained. Any change in designation of a confined space will be routed to all affected personnel.

C. Pre-Entry Hazard Assessment

A hazard assessment shall be completed by the ***Subcontractor*** prior to any entry into a confined space. The hazard assessment should identify:

1. the sequence of work to be performed in the confined space;
2. the specific hazards known or anticipated; and
3. the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level.

No entry shall be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity. Personnel who are to enter confined spaces shall be informed of known or potential hazards associated with said confined spaces.

D. Hazard Controls

Hazard controls shall be instituted to address changes in the work processes and/or working environment. Hazard controls must be able to control the health hazards by eliminating the responsible agents, reduce health hazards below harmful levels, or prevent the contaminants from coming into contact with the workers.

The following order of precedence shall be followed in reducing confined space risks.

1. Engineering Controls

Engineering controls are those controls that eliminate or reduce the hazard through implementation of sound engineering practices.

Ventilation is one of the most common engineering controls used in confined spaces. When ventilation is used to remove atmospheric contaminants from a confined space, the space shall be ventilated until the atmosphere is within the acceptable ranges. Ventilation shall be maintained during the occupancy if there is a potential for the atmospheric conditions to move out of the acceptable range. When ventilation is not possible or feasible, alternate protective measures or methods to remove air contaminants and protect occupants shall be determined by the ***Competent Safety Person*** prior to authorizing entry.

When conditions necessitate and can accommodate continuous forced air ventilation, the following precautions shall be followed:

a. Employees shall not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.
b. Forced air ventilation shall be directed so as to ventilate the immediate areas where an employee is or will be present within the space.

c. Continuous ventilation shall be maintained until all employees have left the space.
d. Air supply or forced air ventilation shall originate from a clean source.

2. Work Practice (Administrative) Controls

Work practice (administrative) controls are those controls which eliminate or reduce the hazard through changes in the work practices (i.e., rotating workers, reducing the amount of worker exposure, and housekeeping).

3. Personal Protective Equipment (PPE)

If the hazard cannot be eliminated or reduced to a safe level through engineering and/or work practice controls, PPE should be used. ***Subcontractor Competent Safety Representative*** shall determine the appropriate PPE needed by all personnel entering the confined space, including rescue teams. PPE that meets the specifications of applicable standards shall be selected in accordance with the requirements of the job to be performed. PPE will be defined in the Subcontractor's PHA for Confined Space work.

VI. ENTRY PERMITS AND PRE-ENTRY CERTIFICATION FORMS

The Confined Space Entry Permit or pre-entry certification form is the most essential tool for assuring safety during entry in confined spaces with known hazards, or with unknown or potentially hazardous atmospheres. The entry process guides the supervisor and workers through a systematic evaluation of the space to be entered. The permit or certification should be used to establish appropriate conditions. Before each entry into a confined space, an entry permit or pre-entry certification form will be completed by the ***Subcontractor***. The ***Subcontractor*** will then communicate the contents of the permit or pre-entry certification form to all employees involved in the operation, and post the permit conspicuously near the work location.

A. Key Elements of Entry Permits and Pre-Entry Certification Forms

A standard entry permit or pre-entry certification form shall contain the following items:

1. Space to be entered.
2. Purpose of entry.
3. Date and authorized duration of the entry.
4. Name of authorized entrants within the space.
5. Means of identifying authorized entrants inside the space (i.e., rosters or tracking systems).
6. Name(s) of personnel serving as Attendant(s) for the duration.
7. Name of individual serving as Entry Supervisor, with a space for the signature or initials of the Entry Supervisor who originally authorized the entry.

8. Hazards of the space to be entered.
9. Measures used to isolate the space and to eliminate or control space hazards before entry (i.e., lockout/tagout of equipment and procedures for purging, ventilating, and flushing permit spaces).
10. Acceptable entry conditions.
11. Results of initial and periodic tests performed, accompanied by the names or initials of the testers and the date(s) when the tests were performed.
12. Rescue and emergency services that can be summoned, and the means of contacting those services (i.e., equipment to use, phone numbers to call).
13. Communication procedures used by authorized entrants and Attendant(s) to maintain contact during the entry.
14. Equipment to be provided for compliance with this Confined Space Program (i.e., PPE, testing, communications, alarm systems, and rescue).
15. Other information necessary for the circumstances of the particular confined space that will help ensure employee safety.
16. Additional permits, such as for hot work, that have been issued to authorize work on the permit space.

B. Class 2C Permit Scope and Duration

A Class 2C permit is only valid for one shift. For a Class 2C permit to be renewed, the following conditions shall be met before each reentry into the confined space:

1. Atmospheric testing shall be conducted and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits, precautions to protect entrants against the hazards should be addressed on the permit and should be in place.
2. ***Subcontractor Competent Safety Person*** shall verify that all precautions and other measures called for on the permit are still in effect.
3. Only operations or work originally approved on the permit shall be conducted in the confined space.

A new Class 2C permit shall be issued, or the original permit will be reissued if possible, whenever changing work conditions or work activities introduce new hazards into the confined space. ***Subcontractor Competent Safety Person*** shall retain each canceled entry permit for at least one (1) year to facilitate the review of the Confined Space Entry Program. Any problems encountered during an entry operation shall be noted on the respective permit(s) so that appropriate revisions to the confined space permit program can be made.

VII. ENTRY PROCEDURES

When entry into a confined space is necessary, either the Entry Supervisor or ***Subcontractor Competent Safety Person*** may initiate entry procedures, including the completion of a confined space entry permit. Entry into a confined space shall follow the standard entry procedure below.

A. Prior to Entry

All appropriate documentation for confined space entry shall be completed before a standard entry. Entry shall be allowed only when all requirements are met and it is reviewed and signed by an Entry Supervisor. The following conditions must be met prior to standard entry:

1. Affected personnel shall be trained to establish proficiency in the duties that will be performed within the confined space.
2. The internal atmosphere within the confined space shall be tested by ***Subcontractor Competent Safety Person*** with a calibrated, direct-reading instrument.
3. Personnel shall be provided with necessary PPE as determined by the Entry Supervisor.
4. Atmospheric monitoring shall take place during the entry. If a hazardous atmosphere is detected during entry:

    a. personnel within the confined space shall be evacuated by the Attendant(s) or Entry Supervisor until the space can be evaluated by ***Subcontractor Competent Safety Person*** to determine how the hazardous atmosphere developed; and
    b. controls shall be put in place to protect employees before reentry.

B. Opening a Confined Space

Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed. When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent anyone from falling through the opening. This barrier or cover shall protect each employee working in the space from foreign objects entering the space. If it is in a traffic area, adequate barriers shall be erected.

C. Atmospheric Testing

Atmospheric test data is required prior to entry into a confined space. Atmospheric testing is required for two distinct purposes: (1) evaluation of the hazards of the permit space, and (2) verification that acceptable conditions exist for entry into that space. If a person must go into the space to obtain the needed data, then Standard Confined Space Entry Procedures shall be followed. Before entry into a confined space, ***Subcontractor Competent Safety Person*** shall conduct testing for hazardous atmospheres. The internal atmosphere shall be tested with a calibrated, direct-reading instrument for oxygen, flammable gases and vapors, and potential toxic air contaminants, in that order.

Testing equipment used in specialty areas shall be listed or approved for use in such areas by ***Subcontractor Competent Safety Person.*** All testing equipment shall be approved by a nationally recognized laboratory, such as Underwriters Laboratories or Factory Mutual Systems.

1. Evaluation Testing

The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity. The analysis shall identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data and development of the entry procedure should involve a technically qualified professional (i.e., consultant, certified industrial hygienist, registered safety engineer, or certified safety professional).

2. Verification Testing

A confined space that may contain a hazardous atmosphere shall be tested for residues of all identified or suspected contaminants. The evaluation testing should be conducted with specified equipment to determine that residual concentrations at the time or testing and entry are within acceptable limits. Results of testing shall be recorded by the person performing the tests on the permit. The atmosphere shall be periodically retested (frequency to be determined by ***Subcontractor Competent Safety Person*** to verify that atmospheric conditions remain within acceptable entry parameters.

3. Acceptable Limits

The atmosphere of the confined spaces shall be considered to be within acceptable limits when the following conditions are maintained:

a. oxygen: 19.5 percent to 23.5 percent;
b. flammability: less than 10 percent of the Lower Flammable Limit (LFL); and
c. toxicity: less than recognized American Conference of Governmental Industrial Hygienists (ACGIH) exposure limits or other published exposure levels [i.e., OSHA Permissible Exposure Limits (PELs) or National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs)].

D. Isolation and Lockout/Tagout Safeguards

All energy sources that are potentially hazardous to confined space entrants shall be secured, relieved, disconnected, and/or restrained before personnel are permitted to enter the confined space. Equipment systems or processes shall be locked out and/or tagged out as required by the ***Subcontractor Competent Safety***

Person Lockout/Tagout Program [which complies with OSHA's 29 CFR 1910-147 and American National Standards Institute (ANSI) Z244.1-1982, Lockout/Tagout of Energy Sources] prior to permitting entry into the confined space. In confined spaces where complete isolation is not possible, ***Subcontractor Competent Safety Person*** shall evaluate the situation and make provisions for as rigorous isolation as practical. Special precautions shall be taken when entering double-walled, jacketed, or internally insulated confined spaces that may discharge hazardous material through the vessel's internal wall.

Where there is a need to test, position, or activate equipment by temporarily removing the lock or tag or both, a procedure shall be developed and implemented to control hazards to the occupants. Any removal of locks, tags, or other protective measures shall be done in accordance with the Subcontractor approved Lockout/Tagout Program. Said program will be in accordance with OSHA and BNL SBMS Safety.

E. Ingress/Egress Safeguards

Means for safe entry and exit shall be provided for confined spaces. Each entry and exit points shall be evaluated by ***Subcontractor Competent Safety Person*** to determine the most effective methods and equipment that will enable employees to safely enter and exit the confined space.

Appropriate retrieval equipment or methods shall be used whenever a person enters a confined space. Use of retrieval equipment may be waived by the ***Subcontractor Competent Safety Person*** if use of the equipment increases the overall risks of entry or does not contribute to the rescue. A mechanical device shall be available to retrieve personnel from vertical confined spaces greater than five (5) feet in depth.

F. Warning Signs and Symbols

All confined spaces that could be inadvertently entered shall have signs identifying them as confined spaces. Signs shall be maintained in a legible condition. The signs shall contain a warning that a permit is required before entry. Accesses to all confined spaces shall be prominently marked.

VIII. EMERGENCY RESPONSE

A. Emergency Response Plan

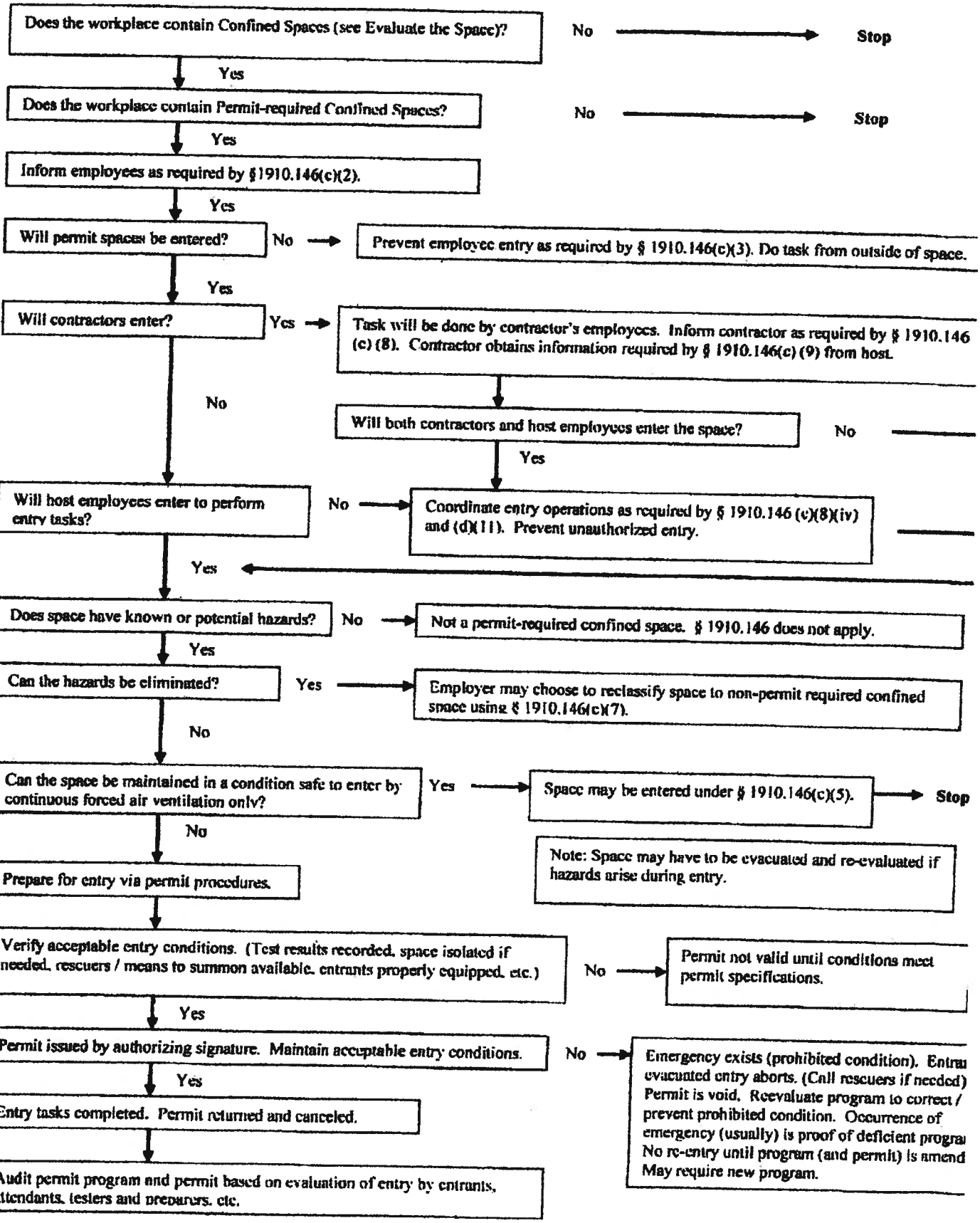
Subcontractor Competent Safety Person shall maintain a written plan of action that has provisions for conducting a timely rescue of individuals within a confined space, should an emergency arise. The written plan shall be kept onsite where the confined space work is being conducted. All affected personnel shall be trained on the Emergency Response Plan.

B. Retrieval Systems and Methods of Non-Entry Rescue

Retrieval systems shall be available and ready when an authorized person enters a permit space, unless such equipment increases the overall risk of entry, or the equipment would not contribute to the rescue of the entrant. Retrieval systems shall have a chest or full-body harness and a retrieval line attached at the center of the back near shoulder level or above the head. If harnesses are not feasible, or would create a greater hazard, wristlets may be used in lieu of the harness. The retrieval line shall be firmly fastened outside the space so that rescue can begin as soon as anyone is aware that retrieval is necessary. A mechanical device shall be available to retrieve personnel from vertical confined spaces more than five (5) feet deep.

Attachment A

Permit-Required Confined Space Decision Flow Chart



UNITED STATES DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

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Regulations (Standards - 29 CFR)

Permit-required confined spaces - 1910.146

Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** J
- **Subpart Title:** General Environmental Controls
- **Standard Number:** 1910.146
- **Title:** Permit-required confined spaces
- **Appendix:** A, B, C, D, E, F

1910.146(a)

Scope and application. This section contains requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces. This section does not apply to agriculture, to construction, or to shipyard employment (Parts 1928, 1926, and 1915 of this chapter, respectively).

1910.146(b)

Definitions.

"Acceptable entry conditions" means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

"Attendant" means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

"Authorized entrant" means an employee who is authorized by the employer to enter a permit space.

"Blanking or blinding" means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

"Confined space" means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have

limited means of entry.); and

(3) Is not designed for continuous employee occupancy.

"Double block and bleed" means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

"Emergency" means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

"Engulfment" means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

"Entry" means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

"Entry permit (permit)" means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (f) of this section.

"Entry supervisor" means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

"Hazardous atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, section 1910.1200 of this Part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

"Hot work permit" means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

"Immediately dangerous to life or health (IDLH)" means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

NOTE: Some materials -- hydrogen fluoride gas and cadmium vapor, for example -- may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

"Inerting" means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

"Isolation" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

"Line breaking" means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

"Non-permit confined space" means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

"Oxygen deficient atmosphere" means an atmosphere containing less than 19.5 percent oxygen by volume.

"Oxygen enriched atmosphere" means an atmosphere containing more than 23.5 percent oxygen by volume.

"Permit-required confined space (permit space)" means a confined space that has one or more of the following characteristics:

(1) Contains or has a potential to contain a hazardous atmosphere;

(2) Contains a material that has the potential for engulfing an entrant;

(3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or

(4) Contains any other recognized serious safety or health hazard.

"Permit-required confined space program (permit space program)" means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

"Permit system" means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

"Prohibited condition" means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

"Rescue service" means the personnel designated to rescue employees from permit spaces.

"Retrieval system" means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

"Testing" means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

1910.146(c)

General requirements.

1910.146(c)(1)

The employer shall evaluate the workplace to determine if any spaces are permit-required confined spaces.

NOTE: Proper application of the decision flow chart in Appendix A to section 1910.146 would facilitate compliance with this requirement.

1910.146(c)(2)

If the workplace contains permit spaces, the employer shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.

NOTE: A sign reading DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER or using other similar language would satisfy the requirement for a

sign.

1910.146(c)(3)

1910.146(c)(3)

If the employer decides that its employees will not enter permit spaces, the employer shall take effective measures to prevent its employees from entering the permit spaces and shall comply with paragraphs (c)(1), (c)(2), (c)(6), and (c)(8) of this section.

1910.146(c)(4)

If the employer decides that its employees will enter permit spaces, the employer shall develop and implement a written permit space program that complies with this section. The written program shall be available for inspection by employees and their authorized representatives.

1910.146(c)(5)

An employer may use the alternate procedures specified in paragraph (c)(5)(ii) of this section for entering a permit space under the conditions set forth in paragraph (c)(5)(i) of this section.

1910.146(c)(5)(i)

An employer whose employees enter a permit space need not comply with paragraphs (d) through (f) and (h) through (k) of this section, provided that:

1910.146(c)(5)(i)(A)

The employer can demonstrate that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;

1910.146(c)(5)(i)(B)

The employer can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry;

1910.146(c)(5)(i)(C)

The employer develops monitoring and inspection data that supports the demonstrations required by paragraphs (c)(5)(i)(A) and (c)(5)(i)(B) of this section;

1910.146(c)(5)(i)(D)

If an initial entry of the permit space is necessary to obtain the data required by paragraph (c)(5)(i)(C) of this section, the entry is performed in compliance with paragraphs (d) through (k) of this section;

1910.146(c)(5)(i)(E)

The determinations and supporting data required by paragraphs (c)(5)(i)(A), (c)

(5)(i)(B), and (c)(5)(i)(C) of this section are documented by the employer and are made available to each employee who enters the permit space under the terms of paragraph (c)(5) of this section or to that employee's authorized representative; and

1910.146(c)(5)(i)(F)

Entry into the permit space under the terms of paragraph (c)(5)(i) of this section is performed in accordance with the requirements of paragraph (c)(5)(ii) of this section.

NOTE: See paragraph (c)(7) of this section for reclassification of a permit space after all hazards within the space have been eliminated.

1910.146(c)(5)(ii)

The following requirements apply to entry into permit spaces that meet the conditions set forth in paragraph (c)(5)(i) of this section.

1910.146(c)(5)(ii)(A)

Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.

..1910.146(c)(5)(ii)(B)

10.146(c)(5)(ii)(B)

When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.

1910.146(c)(5)(ii)(C)

Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. Any employee who enters the space, or that employee's authorized representative, shall be provided an opportunity to observe the pre-entry testing required by this paragraph.

1910.146(c)(5)(ii)(C)(1)

Oxygen content,

1910.146(c)(5)(ii)(C)(2)

Flammable gases and vapors, and

1910.146(c)(5)(ii)(C)(3)

Potential toxic air contaminants.

10.146(c)(5)(ii)(D)

There may be no hazardous atmosphere within the space whenever any employee is inside the space.

1910.146(c)(5)(ii)(E)

Continuous forced air ventilation shall be used, as follows:

1910.146(c)(5)(ii)(E)(1)

An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;

1910.146(c)(5)(ii)(E)(2)

The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;

1910.146(c)(5)(ii)(E)(3)

The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

10.146(c)(5)(ii)(F)

The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing required by this paragraph.

1910.146(c)(5)(ii)(G)

If a hazardous atmosphere is detected during entry:

1910.146(c)(5)(ii)(G)(1)

Each employee shall leave the space immediately;

1910.146(c)(5)(ii)(G)(2)

The space shall be evaluated to determine how the hazardous atmosphere developed; and

1910.146(c)(5)(ii)(G)(3)

Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

.146(c)(5)(ii)(H)

The employer shall verify that the space is safe for entry and that the pre-entry measures required by paragraph (c)(5)(ii) of this section have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification shall be made before entry and shall be made available to each employee entering the space or to that employee's authorized representative.

1910.146(c)(6)

When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the employer shall reevaluate that space and, if necessary, reclassify it as a permit-required confined space.

..1910.146(c)(7)

1910.146(c)(7)

A space classified by the employer as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

1910.146(c)(7)(i)

If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.

1910.146(c)(7)(ii)

If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under paragraphs (d) through (k) of this section. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. Paragraph (c)(5) covers permit space entry where the employer can demonstrate that forced air ventilation alone will control all hazards in the space.

1910.146(c)(7)(iii)

The employer shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee entering the space or to that employee's authorized representative.

1910.146(c)(7)(iv)

If hazards arise within a permit space that has been declassified to a non-permit space under paragraph (c)(7) of this section, each employee in the space shall exit the space. The employer shall then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with

other applicable provisions of this section.

1910.146(c)(8)

When an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

1910.146(c)(8)(i)

Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section;

1910.146(c)(8)(ii)

Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

1910.146(c)(8)(iii)

Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;

1910.146(c)(8)(iv)

Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of this section; and

..1910.146(c)(8)(v)

1910.146(c)(8)(v)

Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

1910.146(c)(9)

In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

1910.146(c)(9)(i)

Obtain any available information regarding permit space hazards and entry operations from the host employer;

1910.146(c)(9)(ii)

Coordinate entry operations with the host employer, when both host employer

personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of this section; and

1. 146(c)(9)(iii)

Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

1910.146(d)

Permit-required confined space program (permit space program). Under the permit space program required by paragraph (c)(4) of this section, the employer shall:

1910.146(d)(1)

Implement the measures necessary to prevent unauthorized entry;

1910.146(d)(2)

Identify and evaluate the hazards of permit spaces before employees enter them;

1910.146(d)(3)

Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:

1910.146(d)(3)(i)

Specifying acceptable entry conditions;

1910.146(d)(3)(ii)

Providing each authorized entrant or that employee's authorized representative with the opportunity to observe any monitoring or testing of permit spaces;

1910.146(d)(3)(iii)

Isolating the permit space;

1910.146(d)(3)(iv)

Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;

1910.146(d)(3)(v)

Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards; and

1910.146(d)(3)(vi)

Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.

146(d)(4)

Provide the following equipment (specified in paragraphs (d)(4)(i) through (d)(4)(ix) of this section) at no cost to employees, maintain that equipment properly, and ensure that employees use that equipment properly:

..1910.146(d)(4)(i)

1910.146(d)(4)(i)

Testing and monitoring equipment needed to comply with paragraph (d)(5) of this section;

1910.146(d)(4)(ii)

Ventilating equipment needed to obtain acceptable entry conditions;

1910.146(d)(4)(iii)

Communications equipment necessary for compliance with paragraphs (h)(3) and (i)(5) of this section;

1910.146(d)(4)(iv)

Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;

1910.146(d)(4)(v)

Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency;

1910.146(d)(4)(vi)

Barriers and shields as required by paragraph (d)(3)(iv) of this section;

1910.146(d)(4)(vii)

Equipment, such as ladders, needed for safe ingress and egress by authorized entrants;

1910.146(d)(4)(viii)

Rescue and emergency equipment needed to comply with paragraph (d)(9) of this section, except to the extent that the equipment is provided by rescue services; and

1910.146(d)(4)(ix)

Any other equipment necessary for safe entry into and rescue from permit spaces.

1910.146(d)(5)

Evaluate permit space conditions as follows when entry operations are conducted:

1910.146(d)(5)(i)

Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working;

1910.146(d)(5)(ii)

Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations; and

1910.146(d)(5)(iii)

When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.

1910.146(d)(5)(iv)

Provide each authorized entrant or that employee's authorized representative an opportunity to observe the pre-entry and any subsequent testing or monitoring of permit spaces;

1910.146(d)(5)(v)

Reevaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that the employer conduct such reevaluation because the entrant or representative has reason to believe that the evaluation of that space may not have been adequate;

1910.146(d)(5)(vi)

Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted in accord with paragraph (d) of this section.

NOTE: Atmospheric testing conducted in accordance with Appendix B to section 1910.146 would be considered as satisfying the requirements of this paragraph. For permit space operations in sewers, atmospheric testing conducted in accordance with Appendix B, as supplemented by Appendix E to section 1910.146, would be considered as satisfying the requirements of this paragraph.

1910.146(d)(6)

Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations;

NOTE: Attendants may be assigned to monitor more than one permit space provided the duties described in paragraph (i) of this section can be effectively performed for each permit space that is monitored. Likewise, attendants may be stationed at any location outside the permit space to be monitored as long as the duties described in paragraph (I) of this section can be effectively performed for each permit space that is monitored.

..1910.146(d)(7)

1910.146(d)(7)

If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under paragraph (i) of this section;

1910.146(d)(8)

Designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by paragraph (g) of this section;

1910.146(d)(9)

Develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue;

1910.146(d)(10)

Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this section;

1910.146(d)(11)

Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer;

1910.146(d)(12)

Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed;

1910.146(d)(13)

Review entry operations when the employer has reason to believe that the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent

entries are authorized; and

NOTE: Examples of circumstances requiring the review of the permit space program are: any unauthorized entry of a permit space, the detection of a permit space hazard not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.

1910.146(d)(14)

Review the permit space program, using the canceled permits retained under paragraph (e)(6) of this section within 1 year after each entry and revise the program as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

NOTE: Employers may perform a single annual review covering all entries performed during a 12-month period. If no entry is performed during a 12-month period, no review is necessary.

Appendix C to section 1910.146 presents examples of permit space programs that are considered to comply with the requirements of paragraph (d) of this section.

1910.146(e)

Permit system.

146(e)(1)

Before entry is authorized, the employer shall document the completion of measures required by paragraph (d)(3) of this section by preparing an entry permit.

NOTE: Appendix D to section 1910.146 presents examples of permits whose elements are considered to comply with the requirements of this section.

1910.146(e)(2)

Before entry begins, the entry supervisor identified on the permit shall sign the entry permit to authorize entry.

1910.146(e)(3)

The completed permit shall be made available at the time of entry to all authorized entrants or their authorized representatives, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

..1910.146(e)(4)

1910.146(e)(4)

The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with paragraph (f)

(2) of this section.

1910.146(e)(5)

The entry supervisor shall terminate entry and cancel the entry permit when:

1910.146(e)(5)(i)

The entry operations covered by the entry permit have been completed; or

1910.146(e)(5)(ii)

A condition that is not allowed under the entry permit arises in or near the permit space.

1910.146(e)(6)

The employer shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit-required confined space program required by paragraph (d)(14) of this section. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

1910.146(f)

Entry permit. The entry permit that documents compliance with this section and authorizes entry to a permit space shall identify:

1910.146(f)(1)

The permit space to be entered;

1910.146(f)(2)

The purpose of the entry;

1910.146(f)(3)

The date and the authorized duration of the entry permit;

1910.146(f)(4)

The authorized entrants within the permit space, by name or by such other means (for example, through the use of rosters or tracking systems) as will enable the attendant to determine quickly and accurately, for the duration of the permit, which authorized entrants are inside the permit space;

NOTE: This requirement may be met by inserting a reference on the entry permit as to the means used, such as a roster or tracking system, to keep track of the authorized entrants within the permit space.

1910.146(f)(5)

The personnel, by name, currently serving as attendants;

1910.146(f)(6)

The individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry;

1910.146(f)(7)

The hazards of the permit space to be entered;

1910.146(f)(8)

The measures used to isolate the permit space and to eliminate or control permit space hazards before entry;

NOTE: Those measures can include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

1910.146(f)(9)

The acceptable entry conditions;

1910.146(f)(10)

The results of initial and periodic tests performed under paragraph (d)(5) of this section, accompanied by the names or initials of the testers and by an indication of when the tests were performed;

0.146(f)(11)

1910.146(f)(11)

The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services;

1910.146(f)(12)

The communication procedures used by authorized entrants and attendants to maintain contact during the entry;

1910.146(f)(13)

Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this section;

1910.146(f)(14)

Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety; and (15) Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

1910.146(g)

Training.

1910.146(g)(1)

The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.

1910.146(g)(2)

Training shall be provided to each affected employee:

1910.146(g)(2)(i)

Before the employee is first assigned duties under this section;

1910.146(g)(2)(ii)

Before there is a change in assigned duties;

1910.146(g)(2)(iii)

Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;

1910.146(g)(2)(iv)

Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by paragraph (d)(3) of this section or that there are inadequacies in the employee's knowledge or use of these procedures.

1910.146(g)(3)

The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.

1910.146(g)(4)

The employer shall certify that the training required by paragraphs (g)(1) through (g)(3) of this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

1910.146(h)

Duties of authorized entrants. The employer shall ensure that all authorized entrants:

1910.146(h)(1)

1910.146(h)(1)

Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

1. .146(h)(2)

Properly use equipment as required by paragraph (d)(4) of this section;

1910.146(h)(3)

Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by paragraph (l)(6) of this section;

1910.146(h)(4)

Alert the attendant whenever:

1910.146(h)(4)(i)

The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

1910.146(h)(4)(ii)

The entrant detects a prohibited condition; and

146(h)(5)

Exit from the permit space as quickly as possible whenever:

1910.146(h)(5)(i)

An order to evacuate is given by the attendant or the entry supervisor,

1910.146(h)(5)(ii)

The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,

1910.146(h)(5)(iii)

The entrant detects a prohibited condition, or

1910.146(h)(5)(iv)

An evacuation alarm is activated.

1910.146(i)

Duties of attendants. The employer shall ensure that each attendant:

.146(i)(1)

Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

19 .146(i)(2)

Is aware of possible behavioral effects of hazard exposure in authorized entrants;

1910.146(i)(3)

Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under paragraph (f)(4) of this section accurately identifies who is in the permit space;

1910.146(i)(4)

Remains outside the permit space during entry operations until relieved by another attendant;

NOTE: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by paragraph (k)(1) of this section and if they have been relieved as required by paragraph (i)(4) of this section.

1910.146(i)(5)

Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under paragraph (i)(6) of this section;

..1910.146(i)(6)

1910.146(i)(6)

Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions;

1910.146(i)(6)(i)

If the attendant detects a prohibited condition;

1910.146(i)(6)(ii)

If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;

1910.146(i)(6)(iii)

If the attendant detects a situation outside the space that could endanger the authorized entrants; or

1910.146(i)(6)(iv)

If the attendant cannot effectively and safely perform all the duties required under paragraph (i) of this section;

1910.146(i)(7)

Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;

1910.146(i)(8)

Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

1910.146(i)(8)(i)

Warn the unauthorized persons that they must stay away from the permit space;

1910.146(i)(8)(ii)

Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and

1910.146(i)(8)(iii)

Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;

1910.146(i)(9)

Performs non-entry rescues as specified by the employer's rescue procedure; and

1910.146(i)(10)

Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

1910.146(j)

Duties of entry supervisors. The employer shall ensure that each entry supervisor:

1910.146(j)(1)

Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

1910.146(j)(2)

Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing

the permit and allowing entry to begin;

0.146(j)(3)

1910.146(j)(3)

Terminates the entry and cancels the permit as required by paragraph (e)(5) of this section;

1910.146(j)(4)

Verifies that rescue services are available and that the means for summoning them are operable;

1910.146(j)(5)

Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and

1910.146(j)(6)

Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

146(k)

Rescue and emergency services.

1910.146(k)(1)

An employer who designates rescue and emergency services, pursuant to paragraph (d)(9) of this section, shall:

1910.146(k)(1)(i)

Evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified;

Note to paragraph (k)(1)(i): What will be considered timely will vary according to the specific hazards involved in each entry. For example, §1910.134, Respiratory Protection, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) wearing respiratory protection while in work areas defined as IDLH atmospheres.

1910.146(k)(1)(ii)

Evaluate a prospective rescue service's ability, in terms of proficiency with rescue-related tasks and equipment, to function appropriately while rescuing entrants from the particular permit space or types of permit spaces identified;

.146(k)(1)(iii)

Select a rescue team or service from those evaluated that:

1910.146(k)(1)(iii)(A)

Has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified;

1910.146(k)(1)(iii)(B)

Is equipped for and proficient in performing the needed rescue services;

1910.146(k)(1)(iv)

Inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site; and

1910.146(k)(1)(v)

Provide the rescue team or service selected with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

Note to paragraph (k)(1): Non-mandatory Appendix F contains examples of criteria which employers can use in evaluating prospective rescuers as required by paragraph (k)(l) of this section.

1910.146(k)(2)

An employer whose employees have been designated to provide permit space rescue and emergency services shall take the following measures:

1910.146(k)(2)(i)

Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train affected employees so they are proficient in the use of that PPE, at no cost to those employees;

1910.146(k)(2)(ii)

Train affected employees to perform assigned rescue duties. The employer must ensure that such employees successfully complete the training required to establish proficiency as an authorized entrant, as provided by paragraphs (g) and (h) of this section;

1910.146(k)(2)(iii)

Train affected employees in basic first-aid and cardiopulmonary resuscitation (CPR). The employer shall ensure that at least one member of the rescue team or service holding a current certification in first aid and CPR is available; and

1910.146(k)(2)(iv)

Ensure that affected employees practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they

remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

..1910.146(k)(3)

1910.146(k)(3)

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.

1910.146(k)(3)(i)

Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the employer can establish presents a profile small enough for the successful removal of the entrant. Wristlets may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

1910.146(k)(3)(ii)

The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 m) deep

1910.146(k)(4)

If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required to be kept at the worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.

1910.146(l)

Employee participation.

1910.146(l)(1)

Employers shall consult with affected employees and their authorized representatives on the development and implementation of all aspects of the permit space program required by paragraph (c) of this section.

1910.146(l)(2)

Employers shall make available to affected employees and their authorized representatives all information required to be developed by this section.

[58 FR 4549, Jan. 14, 1993; 58 FR 34845, June 29, 1993; 59 FR 26115, May 19, 1994; 63 FR 66038, Dec. 1, 1998]

Next Standard (1910.146 App A)

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Occupational Safety & Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

CONFINED SPACE ENTRY

CONFINED SPACE STATISTICS

- 65% of all confined space fatalities are due to hazardous atmosphere
- In 139 deaths, there were no detectors nor ventilation
- One-third of all deaths were supervisors
- 60% were rescuers
- 25% of spaces were toxic before entry

IDENTIFICATION OF CONFINED SPACES

- Has limited opening(s) for entry and exit
- An actual or potential hazardous atmosphere exists
- Space not designed for continuous worker occupancy
- Entry is determined as soon as plane of opening is broken

OSHA REQUIREMENTS

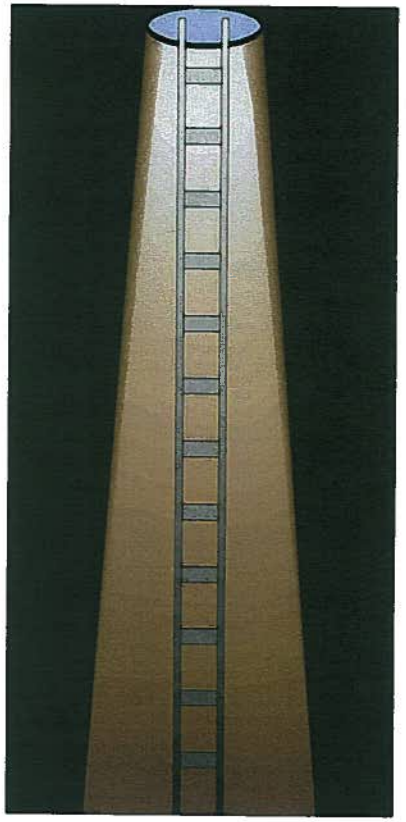
- Identify All Confined Spaces
- Treat All Confined Spaces As Hazardous Until Proven Otherwise
- If Possible, Identify All Hazards In Confined Space Before Entry
- Respond Appropriately To Hazards Before Entry

EXAMPLES OF CONFINED SPACES ON CAMPUSES

- Elevator shafts
- Boilers
- Pits
- Air handling units
- Small mechanical rooms
- Switch closets
- Basements

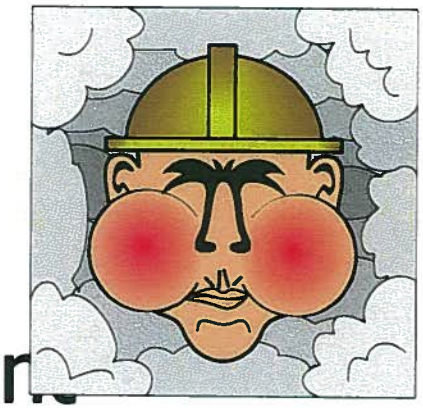
POTENTIAL HAZARDS

- Hazardous atmospheres
  - Toxic gases
  - Flammable gases
  - Oxygen rich or deficient
- Physical hazards
  - Slips, trips, or falls
  - Electrical
  - Gravity
- Chemical contact hazards
- Biological hazards



HAZARDOUS ATMOSPHERES

- Oxygen rich (greater than 23.5%)
- Oxygen deficient (less than 19.5%)
- Toxic
- Flammable
- Corrosive
- Other gas displacement



ATMOSPHERIC TESTING

- Assume all confined space requires an entry permit until testing is done. Test types are:
  - 1. Evaluative
  - 2. Verification
  - 3. Duration
  - 4. Stratified
  - 5. Periodic and continuous

ORDER OF TESTING

- First – Verify oxygen presence and amounts
- Second - Flammables
- Third – Toxics
  - Hydrogen Sulfide
  - Carbon Monoxide

PHYSICAL HAZARDS

- Potential for engulfing
- Hot work
- Sides/walls so configured that exit is prevented (sloping, covered, high, etc.)
- Airborne dusts or other substances
- Electrical hazards
- Poor housekeeping

CONFINED SPACE PROGRAM REQUIREMENTS

- Written program
- Hazard identification procedures
- Hazard abatement and control
- Permit system
- Employee training
- Proper equipment
- Adequate rescue plan
- Procedure for working with contractors

CONFINED SPACE ENTRY

- Survey workplace for confined space
- Test confined space to determine if permit or non-permit confined space
- Isolate confined space from other employees and non-employees
- Perform all activities according to written plan

NON-PERMIT ENTRY

- No hazards – Or:
  - Ventilate actual or potential hazards
  - Correct hazard source
  - Written supervisor approval for re-entry after hazard correction

PERMIT REQUIRED ENTRY

Written Plan (Permit) Required

- Isolate internal and external area
- Hazard identification and evaluation
- Prevention of unauthorized entry
- Develop and implement safe entry process
- Conditions (must include continuous testing and safe work conditions)
- Identify any needed equipment

PERMIT REQUIRED ENTRY

Written Plan (Permit) Required

- Describe barricades/barriers needed to protect pedestrians and others
- Describe rescue and emergency procedures
- Describe procedure for preparation, issuing, and cancellation of the confined space entry permit
- Describe coordinated entry operations
- Review and revise at least annually

EQUIPMENT REQUIRED

- Testing and monitoring
- Ventilating
- Communications
- Lighting, barriers, and shields
- Safe ingress and egress
- Rescue and emergency
- PPE
- Specific equipment needed

EXTERNAL CONTRACTOR

- Must comply with college's rules
- Entry supervisor to share information
- Entry supervisor must coordinate entry with contractor
- Contractor to inform supervisor of any hazard confronted or created in permitted space

WRITTEN PROGRAM

- Unauthorized entry measures
- How to identify and evaluate permit space hazards
- Means, procedures, and practices needed for safe entry
- Rescue and emergency operations
- Coordinated entry
- Review and revise at least annually

CONFINED SPACE PERMIT

- Specific space to be entered
- Purpose of entry
- Date and length of time of entry
- Authorized entrant, authorized attendant, and entry supervisor
- Actual hazards and potential hazards

CONFINED SPACE PERMIT

- Measures used to isolate space
- Communications procedures
- Equipment needed
- Acceptable entry conditions
- Initial and periodic test results
- Rescue and emergency means
- Any other permits, e.g., hot work

Attachment D

Confined Space Entry Evaluation Checklist

Item	Requirements	Driver	Yes / No	Comments
1	Has the employer evaluated the workplace to determine if there are any permit-required confined spaces?	1910.146(c)(1)		
2	Are signs posted at each confined space to warn employees of the existence, location and danger posed by permit spaces?	1910.146(c)(2)		
3	If the employer decides that its employees will enter a permit space, has a written program been developed?	1910.146(c)(4)		
4	If a permit – required confined space is reclassified as a non-permit required space, are the following steps applied: • The space poses no actual or potential hazardous atmosphere • All other hazards can be eliminated without entry into the space • Tests and inspections show all hazards have been eliminated	1910.146(c)(7)(ii)		
5	Are contractors that are allowed to enter permit-required spaces provided with the following: • That the workplace does contain permit spaces • That entry into permit-required spaces is allowed only through a permit-required confined space entry authorized permit • Hazards which make the space a permit space and the host-employer's experience with the space • Coordination of entry operations if both host and contractor personnel are working in or near the permit space • Debriefing of contractors at the conclusion of the entry operation	1910.146(c)(8)		
6	Has the employer developed and implemented the means, procedures, and practices necessary for safe entry operations?	1910.146(d)(3)		
7	Are conditions in the space tested: • To determine if acceptable entry conditions exist before entry is authorized to begin? • If isolation of the space is infeasible, is pre-entry testing performed before entry is authorized? • If entry is authorized, are entry conditions continuously monitored in the areas where authorized entrants are working?	1910.146(d)(5)(i)		
8	Are tests for atmospheric hazards conducted in the following order: • First, for oxygen? • Second, for combustible gases and vapors?	1910.146(d)5)(iii)		

Item	Requirements	Driver	Yes / No	Comments
	• Third, for toxic gases and vapors?			
9	Is every authorized entrant and authorized attendant provided with an opportunity to observe pre-entry and any other testing or monitoring of the space?	1910.146(d)(5)(iv)		
10	Is the authorized attendant immediately provided with the results of any tests conducted on the space?	1910.146(d)(5)(vi)		
11	Has the employer provided at least one attendant outside of the space for the duration of the entry?	1910.146(d)(6)		
12	Have procedures been developed and implemented for the following: • Summoning rescue and emergency services? • Rescuing entrants from permit spaces? • Providing necessary emergency services to rescued employees? • Preventing unauthorized employees from attempting a rescue?	1910.146(d)(9)		
13	Does the employer review and revise the confined space program by reviewing the previous year's cancelled permits to ensure employees are protected from hazards when conducting entry operations?	1910.146(d)(14)		
14	Has the entry supervisor listed on the permit authorized entry by signing the permit?	1910.146(e)(2)		
15	Is the completed permit made available at the time of entry? • Is the permit posted by the entry portal or by other effective means so entrants can confirm pre-entry preparations have been completed?	1910.146(e)(3)		
16	Does the entry supervisor terminate entry and cancel the permit when entry operations covered by the permit are completed or when a condition not allowed by the permit arises in or near the space?	1910.146(e)(5)		
17	Are permits retained for at least one year to facilitate an annual review of the program?	1910.146(e)(6)		
18	Have all employees whose responsibilities are covered by this program received training on the understanding, knowledge, and skills necessary to safely perform their assigned duties?	1910.146(g)(1)		
19	Is training provided: • Before assignment • Before there is a change in permit space operations that presents a hazard about which an employee has not previously been trained • Whenever there is reason to believe that there are deviations from these procedures	1910.146(g)(2)		
20	Does the employer have certification that all affected employees have received required training? Does the certification include: • Employee's name • Signatures or initials of the trainers	1910.146(g)(4)		

Item	Requirements	Driver	Yes / No	Comments
	• Dates of training • Available for inspection			
21	Has the employer assured the following for all authorized entrants: • What hazards that may be faced during entry which includes information on the mode, signs or symptoms, and consequences of the exposure • How to properly use the entry operations equipment • How to communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space	1910.146(h)		
22	Has the employer assured the following for all authorized attendants: • What hazards that may be faced during entry which includes information on the mode, signs or symptoms, and consequences of the exposure • Awareness of the possible behavioral effects of hazard exposure in authorized entrants • How to communicate with the entrant(s) as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space	1910.146(i)(3)		
23	Do authorized attendants continuously maintain an accurate count of authorized entrants in the permit space?	1910.146(i)(3)		
24	Do authorized attendants remain outside the space during entry operations until relieved by another attendant?	1910.146(i)(4)		
25	Are rescue / emergency services summoned as soon as the attendant determines the entrant(s) may need assistance to escape the hazard(s) in the space?	1910.146(i)(7)		
26	Do attendants warn unauthorized persons that they must stay away from the permit space?	1910.146(i)(8)		
27	Do attendants perform non-entry rescues as specified by the employer's rescue procedure?	1910.146(i)(9)		
28	Do attendants perform no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants?	1910.146(i)(10)		
29	Does the entry supervisor know the hazards that may be faced during entry?	1910.146(j)(1)		
30	Has the prospective rescuer's ability to respond to a rescue summons in a timely manner been evaluated by the employer?	1910.146(k)(1)		
31	Is the rescue team or service capable to reach the victim(s) within an appropriate time frame for the permit space hazards identified?	1910.146(k)(1)		
32	Has the rescue team been informed of the hazards they may confront when called on to perform rescue at the site?	1910.146(k)(1)		
33	Have the employees designated to provide	1910.146(k)(2)		

Item	Requirements	Driver	Yes / No	Comments
	rescue and emergency services received training in first aid and cardiopulmonary resuscitation (CPR)? Are there records that show that at least one member of the rescue team has a current certification in first aid and CPR?			
34	Do the employees designated to provide rescue and emergency services practice rescues from the permit-required space or like spaces at least once every 12 months?	1910.146(k)(2)		
35	Are retrieval systems provided to facilitate non-entry rescues provided whenever there is entry into a permit-required space?	1910.146(k)(3)		
36	Do authorized entrants use a chest or full body harness with a retrieval line attached at the center of the entrant's back near shoulder level or above their head?	1910.146(k)(3)		
37	Are Material Safety Data Sheets readily available at the worksite for medical facility treatment of an injured entrant?	1910.146(k)(4)		
38	Does the employer consult with affected employees on the development and implementation of all aspects of the required permit space program?	1910.146(l)(1)		

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Suite 600
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CONFINED SPACE ENTRY PERMIT

INSTRUCTIONS (Nobody will enter a confined space until permit is complete.)**

1. Complete permit before entry begins. 2) Post permit and JSA at entrance to the confined space until work in the confined space is complete. 3) Send permit to safety representative for review within 24 hours of completion of the confined space.

GENERAL INFORMATION	Jobsite:
Permit Begins: Date: _____ Time: _____ AM/PM	Permit Expires: Date: _____ Time: _____ AM/PM
Location & Description of Confined Space:	
Purpose of Entry:	

NAMES OF AUTHORIZED INDIVIDUALS (Please print)

Authorized Person In Charge: _____ Will he/she Supervise Entry: YES NO

AUTHORIZED ATTENDANTS:	AUTHORIZED ENTRANTS:
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)
6)	6)
7)	7)

METHOD OF COMMUNICATION

Describe:

EQUIPMENT REQUIRED FOR ENTRY		
Hard Hats	YES	NO
Coveralls	YES	NO
Boots	YES	NO
Safety Glasses	YES	NO
Safety Goggles	YES	NO
Face Shield	YES	NO
Ear Protection	YES	NO
Encapsulated Suit	YES	NO
Gloves	YES	NO
Lighting (explosion Proof)	YES	NO
Lockout Devices	YES	NO
Ventilation (mechanical)	YES	NO
Warning Lights	YES	NO
Fire Extinguisher	YES	NO
Ventilation/Blower	YES	NO
Non-sparking Tools	YES	NO
Rescue equipment	YES	NO
Other:_____	YES	NO
Other:_____	YES	NO
Special Instructions	YES	NO
List:		

RESPIRATORS REQUIRED FOR ENTRY

ARE RESPIRATORS REQUIRED? YES NO

If YES What Type: _____

Have Employees Been Trained/Fit Tested/ Med. Evaluation? YES NO

AIR-PURIFYING: Half-Mask: _____ Full-Face: _____

Type of Filters: _____

AIR-SUPPLIED: _____ and/or _____ and/or _____

Air Bottles Compressor Egress Bottles

SELF-CONTAINED BREATHING APPARATUS (SCBA): _____

** NOTE: Air-supplied respirators with egress bottles or SCBA respirators are required for atmospheres that are Immediately Dangerous To Life or Health (IDLH)

RESCUE EQUIPMENT REQUIRED FOR ENTRY

SCBA	YES	NO
Harness/Lifeline	YES	NO
Wristlets	YES	NO
Tripod/Manlift	YES	NO
Winch	YES	NO
First-Aid Kit	YES	NO
Stretcher	YES	NO
Other:		

Emergency Services: _____

Identify _____

Method of Communication _____

Phone Number

ISOLATION REQUIRED (Please circle appropriate method, check YES or NO and Initial.)

	YES	NO	COMPLETED BY
ELECTRICAL. DISCONNECTED – LOCKOUT – TAGGED – OTHER:			
MECHANICAL MOVING PARTS: LATCH – CHAIN – CHOCK – BLOCK – OTHER:			
HYDRAULICS: BLANKED – BLEED – DISCONNECTED – OTHER:			
PIPELINES: BLANKED – BLEED – DISCONNECTED – TAG – OTHER:			
VALVES: LOCKED – DISCONNECTED – TAG – OTHER:			
BELT – CHAIN - SHAFT DRIVES: DISCONNECTED – TAG – OTHER:			
SPACE PURGED: INERT GAS – WATER – OTHER:			
OTHER:			
OTHER:			

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CONFINED SPACE ENTRY PERMIT
CONTINUED

ACCEPTABLE ENTRY CONDITIONS		
Oxygen:_____%	Flammables/Combustables_____% LEL	Other:
Hydrogen Sulfide _____PPM	Carbon Monoxide: _____PPM	Other:

TESTING AND MONITORING CHECKLIST

Make, Model & Serial # of testing Equipment:

Date Equipment Calibrated:	Intermittent Testing						Continuos Monitoring		
	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9
Date:									
Time:									
Oxygen	%	%	%	%	%	%	%	%	%
LEL	%	%	%	%	%	%	%	%	%
CO	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
H2S	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
Toxic:									
_____									
_____									
Tested By:									

CONFINED SPACE HAZARD CHECKLIST (Please check YES or NO.)

	YES	NO	If YES, How is the Hazard Controlled:
Oxygen Deficiency (<19.5%)			
Oxygen Enriched (>23.5%)			
Toxic Atmosphere			
Flammable/Combustible Atmosphere			
Electrical			
Mechanical			
Entrapment			
Pipelines			
Bacteria/Infectious			
Insects/Rodents			
Temperature			
Falls			
OTHER			
OTHER			

HOT WORK PERMIT

Is Hot Work Permit Required? YES NO | If YES, Is it attached to this Permit? YES NO

SIGNATURE OF ATTENDANTS AND ENTRANTS

The confined space and its safety aspects have been explained to us, and we have read and understood the above permit> We consider it safe to proceed with the confined space entry work (Please sign, date and Initial below)

Attendants	Date	Initial	Entrants	Date	Initial
1)			1)		
2)			2)		
3)			3)		
4)			4)		
5)			5)		

SIGNATURE OF PERSON AUTHORIZING ENTRY

Signature	Date:	Time:

CANCELLATION OF PERMIT
Cancelled By: (signature) **Date:** **Time:**
Reason Permit was Canceled

EVALUATION (Review within 24 hours of completion of work in the confined space.)
Evaluated By: (Signature) Date: Time:

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Plainview, New York 11803

CONFINED SPACE HOT WORK PERMIT

INSTRUCTIONS

**A hot Work Permit must be completed for all operations performed within a confined space that require workers to weld, cut or use other open-flame of spark producing device in a confined space. 1) Complete permit and JSA - eliminate or control all hazardous conditions before entry begins. 2) The person authorizing entry must sign the Hot Work Permit. 3) Attach signed permit to the Confined Space Entry Permit, JSA and post both permits at the entrance to the confined space. 4) Send permits to the safety representative for review within 24 hours of completion of the work in the confined space. 5) NOTE: DO NOT cut weld or use open flame or spark producing equipment until the proper precautions have been taken.

GENERAL INFORMATION	Jobsite:				
Permit Begins: Date: _____ Time: _____ AM/PM **Permit Expires:** Date: _____ Time: _____ AM/PM					
Location & Description of Confined Space:					
Purpose of Entry:					
Type of HOT WORK	**Cut**	**Weld**	**Grind**	**Repair**	**Other:**
Type of Equipment:					

PRECAUTIONS (Please Circle YES or NO)		
Is an air-sampling meter used to monitor the presence of flammables/combustibles?	YES	NO
Does the confined space contain a flammable/combustible material or atmosphere? (Flammables/combustibles must NOT exceed 10% Lower Explosive Limit (LEL).)	YES	NO
Does the confined space contain combustible dust or ignitable residue?	YES	NO
Have cutting, welding, and other flame/spark producing devices been inspected and are they in good condition?	YES	NO
Have flammable/combustible materials been purged from the confined space?	YES	NO
Is a fire extinguisher, or proper type, available and has it been inspected?	YES	NO
Is a fire watch posted?	YES	NO
Is electrical equipment intrinsically safe?	YES	NO
Have sewer and drain openings been covered?	YES	NO
Is general ventilation of sufficient capacity (6 air changes per minute) Provide and in use?	YES	NO
Is local ventilation for welding and cutting arranged so to remove fumes and smoke at the source?	YES	NO
Are respirators, of the proper type, available and in use when required?	YES	NO
Have precautions been taken to protect workers from electric shock? (GFCI protected)	YES	NO
Are welding machines and other equipment safely located, grounded and spark controlled?	YES	NO
Has everyone read and signed the JSA?	YES	NO

TRAINING (Please Circle YES or NO)		
Have all workers been trained to work safely?	YES	NO
Have all workers completed a pre-entry briefing?	YES	NO
Have all workers been trained in emergency procedures?	YES	NO
Have all workers been trained to use fire extinguishers?	YES	NO
Have all workers been instructed NOT to bring gas cylinders into the confined space?	YES	NO
Have all workers been instructed to remove welding hoses and leads from the confined space when not in use?	YES	NO
Have all workers been confined space trained?	YES	NO

FIRE WATCH (Please Print Names)
Name:

PERSON PERFORMING HOT WORK (Please Print names)	
1)	3)
2)	4)

SIGNATURE OF PERSON AUTHORIZING ENTRY		
Signature	**Date:**	**Time:**

CANCELLATION OF PERMIT		
Cancelled By: (signature)	**Date:**	**Time:**
Reason Permit was Canceled		

Attachment F

PROCEDURES FOR ATMOSPHERIC TESTING

Atmospheric testing is required for two distinct purposes: evaluation of the hazards of the permit space and verification that acceptable entry conditions exist in the permit space.

Evaluation Testing

The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity to identify and evaluate any hazardous atmosphere that may acceptable entry operations may be determined and reviewed by a technically qualified professional (e.g., OSHA consultation service, certified industrial hygienist, registered safety engineer, certified safety professional, certified marine chemist, etc.).

Verification Testing

The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing shall be recorded on the permit placed adjacent to the stipulated entry portal.

Duration of Testing

Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.

Test Stratified Atmospheres

When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

Order of Testing

A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested for next because the threat of fire or explosion is both more immediate and more life threatening. If tests for toxic gases and vapors are necessary, they are performed last.

Acceptable Atmospheric Limits

Entry into a permit space is prohibited whenever testing of the atmospheres indicates that levels of oxygen, flammability, or toxicity are outside of acceptable limits. Provided are the acceptable limits for oxygen, flammability, and toxicity.

- Oxygen – 19.5% to 23.5%
- Flammability – less than 10% of the Lower Explosive Limit (LEL)
- Toxicity – less than the recognized OSHA published 29 CFR 1910.1000 Subpart Z, permissible exposure limit (PEL) or the American Conference of Governmental Industrial Hygienist's (ACGIH) published threshold limit value (TLV). Refer to the Material Safety Data Sheet (MSDS) for further toxicity information.