

Abridged Version - to view the
complete document visit the
document repository located at
the Buffalo & Erie County
Public Library Williamsville
Branch 5571 Main St

Health and Safety Plan for Brownfield Site Investigation

**Westwood Country Club
772 North Forest Road
Amherst, Erie County, New York**

Site ID # C915291

Prepared by



C&S Engineers, Inc.
141 Elm Street, Suite 100
Buffalo, New York 14203

February 2015

TABLE OF CONTENTS

	<i>page</i>
Section 1 – General Information	4
Section 2 - Health And Safety Personnel.....	5
2.0 Health and Safety Personnel Designations	5
2.1 Project Manager (PM).....	5
2.2 Health and Safety Manager.....	5
2.3 Health and Safety Officer (HSO).....	6
2.4 Emergency Coordinator	7
2.5 Site Workers.....	7
Section 3 - Pertinent Site Information	7
3.1 Site Location and General History.....	7
Section 4 - Hazard Assessment And Hazard Communication.....	9
Section 5 - Training	9
5.1 Site-specific Training.....	9
5.2 Safety Briefings	9
Section 6 - Zones	10
6.1 Exclusion Zone	10
6.2 Contamination Reduction Zone	10
6.3 Remediation Zone.....	11
6.4 Support Zone.....	12
Section 7 - Personal Protective Equipment.....	12
7.1 General.....	12
7.2 Personal Protective Equipment – Site Specific.....	13
Section 8 - Monitoring Procedures	14
8.1 Monitoring During Site Operations	14
8.1.1 Drilling Operations (Monitoring Well Installation and Subsurface Borings) and Test Pit Excavations	14
8.1.2 Interim Remedial Measures	14
8.2 Action Levels.....	14
8.3 Personal Monitoring Procedures.....	15
Section 9 - Communications	15
Section 10 - Safety Considerations For Site Operations.....	15
10.1 General.....	15
10.2 Field Operations.....	16
10.2.1 Intrusive Operations.....	16
10.2.2 Excavations and Excavation Trenching.....	16
Section 11 - Decontamination Procedures	17
Section 12 – Disposal Procedures	18
Section 13 - Emergency Response Procedures	18
13.1 Emergency Coordinator	18
13.2 Evacuation.....	19
13.3 Potential or Actual Fire or Explosion	19
13.4 Environmental Incident (spread or release of contamination).....	19

Health and Safety Plan

13.5	Personnel Injury	19
13.6	Personnel Exposure.....	20
13.7	Adverse Weather Conditions	20
13.8	Incident Investigation and Reporting.....	20
Section 14 -	Community Relations	20
14.1	Community Health and Safety Plan.....	20
14.1.1	Community Health and Safety Monitoring.....	20
14.1.2	Community Air Monitoring Plan.....	21
Section 15 -	Authorizations	21

FIGURES

Figure 1 Site Location

Figure 2 Site Aerial Photo

ATTACHMENTS

Attachment A – Map and Directions to Hospital

APPENDICES

Appendix A – Excavation/Trenching Guideline

Appendix B – Guidance on Incident Investigation and Reporting

SECTION 1 – GENERAL INFORMATION

The Health and Safety Plan (HASP) described in this document will address health and safety considerations for all those activities that personnel employed by C&S Engineers, Inc., may be engaged in during site investigation and remediation work at the Westwood Country Club Site located at 772 North Forest Road in Amherst, Erie County, New York (Site). Figure 1 shows the approximate location of the Site. This HASP will be implemented by the Health and Safety Officer (HSO) during site work.

Compliance with this HASP is required of all C&S personnel who enter this Site. The content of the HASP may change or undergo revision based upon additional information made available to the health, safety, and training (H&S) committee, monitoring results or changes in the technical scope of work. Any changes proposed must be reviewed by the H&S committee.

Responsibilities

Project Manager.....	Mark Colmerauer Phone: (716) 847-1630 Cell: (716) 570-3457
Site Health and Safety Officer.....	Cody Martin Phone: (716) 847-1630 Cell: (716) 864-3752
Emergency Coordinator.....	TBD
Health and Safety Manager.....	TBD

Emergency Phone Numbers

Emergency Medical Service.....	911
<u>Police</u> : Buffalo Police Department (NYPD)	911
<u>Hospital</u> : Buffalo General Hospital.....	(716) 859-5600
<u>Fire</u> : Buffalo Fire Department.....	911
National Response Center	(800) 424-8802
Poison Control Center	(800) 222-1222
Center for Disease Control.....	(800) 311-3435
NYSDEC Region 9 (Buffalo, New York)	(716) 851-7220
C&S Engineers.....	(716) 847-1630

SECTION 2 - HEALTH AND SAFETY PERSONNEL

2.0 Health and Safety Personnel Designations

The following information briefly describes the health and safety designations and general responsibilities for this Site.

2.1 Project Manager (PM)

The PM is responsible for the overall project including the implementation of the HASP. Specifically, this includes allocating adequate manpower, equipment, and time resources to conduct Site activities safely.

2.2 Health and Safety Manager

- ◆ Has the overall responsibility for coordinating and reporting all health and safety activities and the health and safety of Site Workers.
- ◆ Must have completed, at a minimum, the OSHA 30-Hour Construction Safety Training, and either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker that meets OHSA 29 CFR 1910.
- ◆ Must have completed the 8-Hour Site supervisor/manager's course for supervisors and managers having responsibilities for hazardous waste Site operations and management.
- ◆ Directs and coordinates health and safety monitoring activities.
- ◆ Ensures that field teams utilize proper personal protective equipment (PPE).
- ◆ Conducts initial on-site specific training prior to Site Workers commencing work.
- ◆ Conducts and documents daily and periodic safety briefings.
- ◆ Ensures that field team members comply with this HASP.
- ◆ Immediately notifies the Construction Manager (CM) Project Manager and Superintendent of all accident/incidents.

- ◆ Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.
- ◆ Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.
- ◆ Reports to the CM Project Manager and Superintendent to provide summaries of field operations and progress.
- ◆ Submits and maintains all documentation required in this HASP and any other pertinent health and safety documentation.

2.3 Health and Safety Officer (HSO)

- ◆ Must be designated to the Health and Safety Manager by each Subcontractor as a Competent Person having, at a minimum, the OSHA 30-Hour Construction Safety Training
- ◆ Must schedule and attend a Pre-Construction Safety Meeting with the Health and Safety Manager to discuss the Subcontractor Safety Requirements and must attend the Weekly Subcontractor Coordination Meeting.
- ◆ Responsible for ensuring that their lower tier contractors comply with project safety requirements.
- ◆ Must make frequent and regular inspections of their work areas and activities and ensure hazards that are under their control are corrected immediately and all other hazards are reported to the Construction Manager's Project Manager and Health and Safety Manager.
- ◆ Must report all work related injuries, regardless of severity, to the Construction Manager's Project Manager and the Health and Safety Manager within 24 hours after they occur.

2.4 Emergency Coordinator

- ◆ The Emergency Coordinator or his on-site designee will, in concert with Mensch Capital Partners, will implement the emergency response procedures whenever conditions at the Site warrant such action.
- ◆ The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of C&S personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

2.5 Site Workers

- ◆ Report any unsafe or potentially hazardous conditions to the Health and Safety Manager.
- ◆ Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.
- ◆ Comply with rules, regulations, and procedures as set forth in this HASP, including any revisions that are instituted.
- ◆ Prevent unauthorized personnel from entering work Site.

SECTION 3 - PERTINENT SITE INFORMATION

3.1 Site Location and General History

The 170-acre Site is located at 772 North Forest Road, 385 Maple Road and 391 Maple Road in the south-central portion of the Town of Amherst, Erie County, New York. The Site is bounded by Sheridan Drive (State Route 324) on the south; Maple Road (County Road 192) on the north; North Forest Road (County Road 294), Ellicott Creek, and the Audubon Par 3 Golf Course on the east; and Frankhauser Road and Fairways Boulevard on the west. Further information concerning the Site is presented below.

Site Description

The Site is relatively flat with some minor topographic relief commonly associated golf courses. The Site's fairways, greens, and rough remain visible although the Site has not been maintained as a golf course since 2014.

The Site contains areas developed with a number of structures consisting of the clubhouse and associated buildings in one area and maintenance buildings in another. An area in the center of the Site is undeveloped but appears to contain piles of soil and other materials likely generated during routine maintenance operations. Figure 3 shows the locations of the structures and the stockpile area.

Five ponds exist on-site. Rather than receiving rainwater run-off, water was often pumped into the ponds to create and maintain water features for the golf course. Each pond contains an overflow drain for heavy rain events which are connected via a network of underground pipes that discharge into Ellicott Creek. Figure 4 shows the locations of the ponds and the piping network.

Site History and Suspect Recognized Environmental Conditions

The Site was first developed as a golf course, including a clubhouse and golf course maintenance areas, in 1921 and has remained as such until 2014, when the course closed due to changes in market forces. Prior to 1921, land use was agricultural and residential.

As part of redevelopment efforts, 15 surface soil and 12 sediment samples were collected from the Site in 2014. The soil samples were analyzed for pesticides, herbicides, and arsenic, while the sediment samples were analyzed only for arsenic.

Known contaminants include arsenic associated with pesticide use at the Site during routine golf course maintenance operations across the BCP Site. NYSDEC Industrial Use SCOs were exceeded in 5 of the 15 surface soil sampling locations, and one sediment sample fell within the Class B category. However, further evaluation of the surface soil is needed.

Exposure pathway concerns with these contaminants are generally through skin absorption, ingestion and inhalation of airborne dust particles. Following guidelines described in this HASP will reduce exposure.

SECTION 4 - HAZARD ASSESSMENT AND HAZARD COMMUNICATION

Hazards to workers during a site work include typical construction-related hazards such as slip-trip-fall, equipment malfunction, faulty electrical grounding, and heat/cold/excessive noise exposure. In addition to those typical construction-related hazards, there is also the potential for chemical exposures associated with environmental conditions. The most likely routes of chemical exposure during site work tasks include skin adsorption and inhalation of airborne dust particles.

It is difficult to draw a correlation between the concentrations of contaminants found in one media and the potential for exposure to these contaminants to site workers. However, their potential presence indicates that the potential for exposure to these compounds exist, and the requirements for protective measures and monitoring of exposure is based on this potential.

SECTION 5 - TRAINING

5.1 Site-specific Training

Training will be provided that specifically addresses the activities, procedures, monitoring, and equipment for the Site operations prior to going on site. Training will include familiarization with Site and facility layout, known and potential hazards, and emergency services at the Site, and details all provisions contained within this HASP. This training will also allow Site Workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

5.2 Safety Briefings

C&S project personnel will be given briefings by the HSO on a daily or as needed basis to further assist Site Workers in conducting their activities safely. Pertinent information will be provided when new operations are to be conducted. Changes in work practices must be implemented due to new information made available, or if Site or environmental conditions

change. Briefings will also be given to facilitate conformance with prescribed safety practices. When conformance with these practices is not occurring or if deficiencies are identified during safety audits, the project manager will be notified.

SECTION 6 - ZONES

Four types of Site activity zones are identified for the Brownfield investigation activities, including the Exclusion Zone, Contamination Reduction Zone, Remediation Zone and the Support Zone. Prior to commencement of field work a further definition of where these zones will be set up will be established.

6.1 Exclusion Zone

The area where the unexpected condition is discovered would be considered the Exclusion Zone (EZ). All excavation and handling of contaminated materials generated as a result of the discovery of an unexpected condition would take place within the EZ. This zone will be clearly delineated by hay bales, jersey barriers, and/or similar methods. Safety tape may be used as secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The Site Safety Manager/Director may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Site Workers will not be allowed in the EZ without:

- ◆ A buddy (co-worker);
- ◆ Appropriate PPE in accordance with OSHA regulations;
- ◆ Medical authorization; and
- ◆ Training certification in accordance with 29 CFR 1910.120.

6.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) will be established between the EZ and the property limits. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of Site equipment. The CRZ will be used for general Site entry and egress, in

addition to access for heavy equipment and emergency support services. Site Workers will not be allowed in the CRZ without:

- ◆ A buddy (co-worker);
- ◆ Appropriate PPE in accordance with OSHA regulations;
- ◆ Medical authorization; and
- ◆ Training certification in accordance with 29 CFR 1910.120.

In addition, the CRZ will include a Site Worker Cleaning Area that will include a field wash station for Site Workers, equipment, and PPE to allow Site Workers to wash their hands, arms, neck, and face after exiting areas of grossly contaminated soil or hazardous materials. All Site Workers will be required to pass through the Site Worker Cleaning Area and wash their hands and remove any loose fill and soils from their clothing and boots prior to exiting the CRZ.

6.3 Remediation Zone

A Remediated Zone (RZ) will be established in portions of the Site where the remediation has been completed and only general construction work will be performed. Setup of the RZ will consist of implementing several measures designed to reduce the risk of workers' exposure and prevent non-trained workers from entering the non-remediated zone. Non-trained workers will work only in areas where the potential for exposure has been minimized by removal of all hazardous materials. The remediated zone will then be separated from the non-remediated zone by installing and maintaining temporary plywood or other construction fences along the boundary between the two zones. If potentially impacted material is uncovered in the RZ, all non-trained workers will be removed and the Site Safety Manager/Director will assess the potential risks. If, at any other time, the risk of exposure increases while non-trained workers are present in the RZ, the non-trained workers will be removed. At all times, when non-trained workers are present in the RZ, air monitoring for the presence of VOCs will be conducted in the RZ, as well as at the fence line of the non-remediated zone.

6.4 Support Zone

The Support Zone (SZ) will be an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provide for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated equipment or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold.

SECTION 7 - PERSONAL PROTECTIVE EQUIPMENT

7.1 General

The level of protection to be worn by field personnel will be defined and controlled by the HSO. Depending upon the type and levels of material present or anticipated at the site, varying degrees of protective equipment will be needed. If the possible hazards are unknown, a reasonable level of protection will be taken until sampling and monitoring results can ascertain potential risks. The levels of protection listed below are based on USEPA Guidelines. A list of the appropriate clothing for each level is also provided.

Level A protection must be worn when a reasonable determination has been made that the highest available level of respiratory, skin, eye, and mucous membrane protection is needed. It should be noted that while Level A provides maximum available protection, it does not protect against all possible hazards. Consideration of the heat stress that can arise from wearing Level A protection should also enter into the decision making process. Level A protection includes:

- ◆ Open circuit, pressure-demand self-contained breathing apparatus (SCBA)
- ◆ Totally encapsulated chemical resistant suit
- ◆ Gloves, inner (surgical type)
- ◆ Gloves, outer, chemical protective
- ◆ Boots, chemical protective

Level B protection must be used when the highest level of respiratory protection is needed, but hazardous material exposure to the few unprotected areas of the body (e.g., the back of the neck) is unlikely. Level B protection includes:

- ◆ Open circuit, pressure-demand SCBA or pressure airline with escape air bottle
- ◆ Chemical protective clothing: Overalls and long sleeved jacket; disposal chemical resistant coveralls; coveralls; one or two piece chemical splash suit with hood
- ◆ Gloves, inner (surgical type)
- ◆ Gloves, outer, chemical protective
- ◆ Boots, chemical protective

Level C must be used when the required level of respiratory protection is known, or reasonably assumed to be, not greater than the level of protection afforded by air purifying respirators; and hazardous materials exposure to the few unprotected areas of the body (e.g., the back of the neck) is unlikely. Level C protection includes:

- ◆ Full or half face air-purifying respirator
- ◆ Chemical protective clothing: Overalls and long-sleeve jacket; disposable chemical resistant coveralls; coveralls; one or two piece chemical splash suit
- ◆ Gloves, inner (surgical type)
- ◆ Gloves, outer, chemical protective
- ◆ Boots, chemical protective

Level D is the basic work uniform. It cannot be worn on any site where respiratory or skin hazards exist. Level D protection includes:

- ◆ Safety boots/shoes
- ◆ Safety glasses
- ◆ Hard hat with optional face shield

Note that the use of SCBA and airline equipment is contingent upon the user receiving special training in the proper use and maintenance of such equipment.

7.2 Personal Protective Equipment – Site Specific

Level D with some modification will be required when working in the work zone on this Site. In addition to the basic work uniform specified by Level D protection, Nitrile gloves will be required when contact with soil or ground water is likely. Hearing protection will be worn when power equipment is used to perform subsurface investigation work. An upgrade to a higher level (Level C) of protection may occur if determined necessary by the HSO.

SECTION 8 - MONITORING PROCEDURES

8.1 Monitoring During Site Operations

All Site environmental monitoring should be accompanied by periodic meteorological monitoring of appropriate climatic conditions.

8.1.1 Drilling Operations (Monitoring Well Installation and Subsurface Borings) and Test Pit Excavations

Monitoring will be performed by the HSO or drilling observer during the conduct of work. A photoionization detector (PID) equipped with a 10.0 eV lamp will be utilized to monitor for the presence of volatile organic vapors within the breathing zone, the borehole, and subsurface samples upon their retrieval. Drill cuttings and excavation spoils will also be monitored by use of the PID. The PID will be field checked for calibration accuracy three times per day (morning, lunch, and end of day). If subsurface conditions warrant, a combustible gas indicator (CGI) with oxygen alarm may also be used to monitor the borehole for the presence of combustible gases. Similar monitoring of fluids produced during well development will also be conducted.

8.1.2 Interim Remedial Measures

If future Interim Remedial Measures (IRM) occurs, monitoring will be performed during excavation and sampling operations when C&S personnel are within the work zone. Although historical information previously obtained at the Site indicates low level of volatile organic vapors and compounds, a photoionization detector (PID) will be used during subsurface activities. If an IRM is performed, the remedial contractor will be required to employ dust control practices during work.

8.2 Action Levels

If readings on the PID exceed 10 ppm for more than fifteen minutes consecutively, then personal protective equipment should be upgraded to Level C. The air purifying respirator used with Level C protective equipment must be equipped with organic vapor cartridges. If readings on the explosive gas meter are within a range of 10%-25% of the LEL then continuous monitoring will be implemented. Readings above 25% of the LEL indicate the potential for an explosive condition. Sources of ignition should be removed and the Site should be evacuated.

8.3 Personal Monitoring Procedures

Personal monitoring shall be performed as a contingency measure in the event that VOC concentrations are consistently above the 10 ppm action level as detected by the PID. If the concentration of VOCs is above this action level, then amendments to the HASP must be made before work can continue at the Site.

SECTION 9 - COMMUNICATIONS

A phone will be located on Site to be utilized by personnel conducting investigation and IRM efforts. Cell phones will be the primary means of communicating with emergency support services/facilities.

SECTION 10 - SAFETY CONSIDERATIONS FOR SITE OPERATIONS

10.1 General

Standard safe work practices that will be followed include:

- ◆ Do not climb over/under drums, or other obstacles.
- ◆ Do not enter the work zone alone.
- ◆ Practice contamination avoidance, on and off-site.
- ◆ Plan activities ahead of time, use caution when conducting concurrently running activities.
- ◆ No eating, drinking, chewing or smoking is permitted in work zones.
- ◆ Due to the unknown nature of waste placement at the Site, extreme caution should be practiced during excavation activities.
- ◆ Apply immediate first aid to any and all cuts, scratches, abrasions, etc.
- ◆ Be alert to your own physical condition. Watch your buddy for signs of fatigue, exposure, etc.
- ◆ A work/rest regimen will be initiated when ambient temperatures and protective clothing create a potential heat stress situation.
- ◆ No work will be conducted without adequate natural light or without appropriate supervision.
- ◆ Task safety briefings will be held prior to onset of task work.

- ◆ Ignition of flammable liquids within or through improvised heating devices (barrels, etc.) or space heaters is forbidden.
- ◆ Entry into areas of spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment is prohibited.
- ◆ Any injury or unusual health effect must be reported to the Site health and safety officer.
- ◆ Prevent splashing or spilling of potentially contaminated materials.
- ◆ Use of contact lenses is prohibited while on site.
- ◆ Beards and other facial hair that would impair the effectiveness of respiratory protection are prohibited if respiratory protection is necessary.
- ◆ Field crew members should be familiar with the physical characteristics of investigations, including:
 - ◆ Wind direction in relation to potential sources
 - ◆ Accessibility to co-workers, equipment, and vehicles
 - ◆ Communication
 - ◆ Hot zones (areas of known or suspected contamination)
 - ◆ Site access
 - ◆ Nearest water sources
- ◆ The number of personnel and equipment in potentially contaminated areas should be minimized consistent with site operations.

10.2 Field Operations

10.2.1 Intrusive Operations

The HSO or designee will be present on-site during all intrusive work, e.g., drilling operations, excavations, trenching, and will provide monitoring to oversee that appropriate levels of protection and safety procedures are utilized by C&S Engineers, Inc., personnel. The use of salamanders or other equipment with an open flame is prohibited and the use of protective clothing, especially hard hats and boots, will be required during drilling or other heavy equipment operations.

10.2.2 Excavations and Excavation Trenching

Guidance relating to safe work practices for C&S employees regarding excavations and excavating/trenching operation is presented in Appendix A of this HASP.

SECTION 11 - DECONTAMINATION PROCEDURES

Decontamination involves physically removing contaminants and/or converting them chemically into innocuous substances. Only general guidance can be given on methods and techniques for decontamination. Decontamination procedures are designed to:

- ◆ Remove contaminant(s).
- ◆ Avoid spreading the contamination from the work zone.
- ◆ Avoid exposing unprotected personnel outside of the work zone to contaminants.

Contamination avoidance is the first and best method for preventing spread of contamination from a hazardous site. Each person involved in site operations must practice the basic methods of contamination avoidance listed below. Additional precautions may be required in the HASP.

- ◆ Know the limitations of all protective equipment being used.
- ◆ Do not enter a contaminated area unless it is necessary to carry out a specific objective.
- ◆ When in a contaminated area, avoid touching anything unnecessarily.
- ◆ Walk around pools of liquids, discolored areas, or any area that shows evidence of possible contamination.
- ◆ Walk upwind of contamination, if possible.
- ◆ Do not sit or lean against anything in a contaminated area. If you must kneel (e.g., to take samples), use a plastic ground sheet.
- ◆ If at all possible, do not set sampling equipment directly on contaminated areas. Place equipment on a protective cover such as a ground cloth.
- ◆ Use the proper tools necessary to safely conduct the work.

Specific methods that may reduce the chance of contamination are:

- ◆ Use of remote sampling techniques.
- ◆ Opening containers by non-manual means.
- ◆ Bagging monitoring instruments.
- ◆ Use of drum grapplers.
- ◆ Watering down dusty areas.

Equipment which will need to be decontaminated includes tools, monitoring equipment, and personal protective equipment. Items to be decontaminated will be brushed off, rinsed, and

dropped into a plastic container supplied for that purpose. They will then be washed with a detergent solution and rinsed with clean water. Monitoring instruments may be wrapped in plastic bags prior to entering the field in order to reduce the potential for contamination. Instrumentation that is contaminated during field operations will be carefully wiped down. Heavy equipment, if utilized for operations where it may be contaminated, will have prescribed decontamination procedures to prevent contaminant materials from potentially leaving the Site. On-site contractors, such as drillers or backhoe operators, will be responsible for decontaminating all construction equipment prior to demobilization.

SECTION 12 – DISPOSAL PROCEDURES

All discarded materials, waste materials, or other objects shall be handled in such a way as to reduce or eliminate the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary and segregated for proper disposal. All contaminated waste materials shall be disposed of as required by the provisions included in the contract and consistent with regulatory provisions. All non-contaminated materials shall be collected and bagged for appropriate disposal. Investigation derived waste will be managed consistent with the work plan for this Site and DER-10 Technical Guidance for Site Investigation and Remediation dated May 2010.

SECTION 13 - EMERGENCY RESPONSE PROCEDURES

As a result of the hazards at the Site, and the conditions under which operations are conducted, there is the possibility of emergency situations. This section establishes procedures for the implementation of an emergency plan.

13.1 Emergency Coordinator

Emergency Coordinator:TBD.....Work Phone: TBD

The Emergency Coordinator or his on-site designee will, in concert with Mensch Capital Partners will implement the emergency response procedures whenever conditions at the Site warrant such action. The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of C&S personnel as

necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

13.2 Evacuation

In the event of an emergency situation, such as fire, explosion, significant release of toxic gases, etc., all personnel will evacuate and assemble in a designated assembly area. The Emergency Coordinator or his on-site designee will have authority to contact outside services as required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The Emergency Coordinator or his on-site designee must see that access for emergency equipment is provided and that all ignition sources have been shut down once the emergency situation is established. Once the safety of all personnel is established, the Fire Department and other emergency response groups will be notified by telephone of the emergency.

13.3 Potential or Actual Fire or Explosion

Immediately evacuate the Site and notify local fire and police departments, and other appropriate emergency response groups, if LEL values are above 25% in the work zone or if an actual fire or explosion has taken place.

13.4 Environmental Incident (spread or release of contamination)

Control or stop the spread of contamination if possible. Notify the Emergency Coordinator and the Project Manager. Other appropriate response groups will be notified as appropriate.

13.5 Personnel Injury

Emergency first aid shall be applied on-site as necessary. Then, decontaminate (en route if necessary) and transport the individual to nearest medical facility if needed. The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. The directions to the hospital are shown in Section 1 of this HASP and a map is shown in Attachment A.

13.6 Personnel Exposure

- ◆ *Skin Contact:* Use copious amounts of soap and water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention. Eyes should be thoroughly rinsed with water for at least 15 minutes.
- ◆ *Inhalation:* Move to fresh air and/or, if necessary, decontaminate and transport to emergency medical facility.
- ◆ *Ingestion:* Decontaminate and transport to emergency medical facility.
- ◆ *Puncture Wound/Laceration:* Decontaminate, if possible, and transport to emergency medical facility.

13.7 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO will determine if work can continue without sacrificing the health and safety of field workers.

13.8 Incident Investigation and Reporting

In the event of an incident, procedures discussed in the Medical Emergency/Incident Response Protocol, presented in Appendix B of this HASP, shall be followed.

SECTION 14 - COMMUNITY RELATIONS

14.1 Community Health and Safety Plan

14.1.1 Community Health and Safety Monitoring

As part of the site work, three general types of efforts are scheduled, including, non-intrusive reconnaissance tasks, sampling or monitoring tasks (monitoring point sampling), and intrusive tasks (test trenching, subsurface borings, monitoring well installation). During completion of general reconnaissance and sampling or monitoring tasks, potential for health and safety risks to off-site landowners or the local community are not anticipated.

During completion of intrusive efforts at or adjacent to the Site, health and safety monitoring efforts will be concentrated on the area or areas in which intrusive efforts are being completed. Since the air pathway is the most available and likely avenue for the release of potential contaminants to the atmosphere at or near the Site, in addition to limiting public or community

access to the areas in which intrusive efforts are completed, health and safety measures will primarily consist of monitoring the air pathway for worker exposure.

14.1.2 Community Air Monitoring Plan

Efforts will be taken to complete field work in a manner which will minimize the creation of airborne dust or particulates. Under dry conditions, work areas may be wetted to control dust. During periods of extreme wind, intrusive field work may be halted until such time as the potential for creating airborne dust or particulate matter as a result of investigation activities is limited. Periodic monitoring following the guidelines of the site's Community Air Monitoring Plan (attached) will be implemented during all non-intrusive Site investigation activities, including surface soil and sediment sampling, and collection of groundwater samples from groundwater monitoring wells.

During completion of Site investigation, a community air monitoring plan meeting the requirements of the site's Community Air Monitoring Plan (attached) will be implemented for the duration of intrusive activities. These additional air monitoring activities will include establishment of background conditions, continuous monitoring for volatile organic compounds and/or particulates at the downwind work area (exclusion zone) perimeter, recording of monitoring data, and institution and documentation of Response Levels and appropriate actions in accordance with NYSDOH guidance.

SECTION 15 - AUTHORIZATIONS

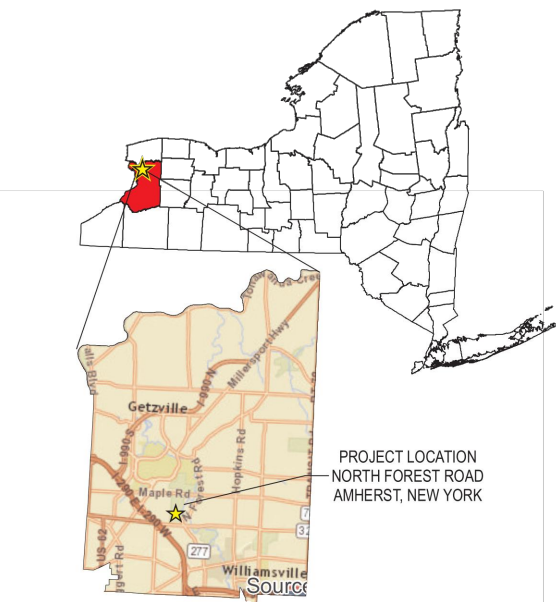
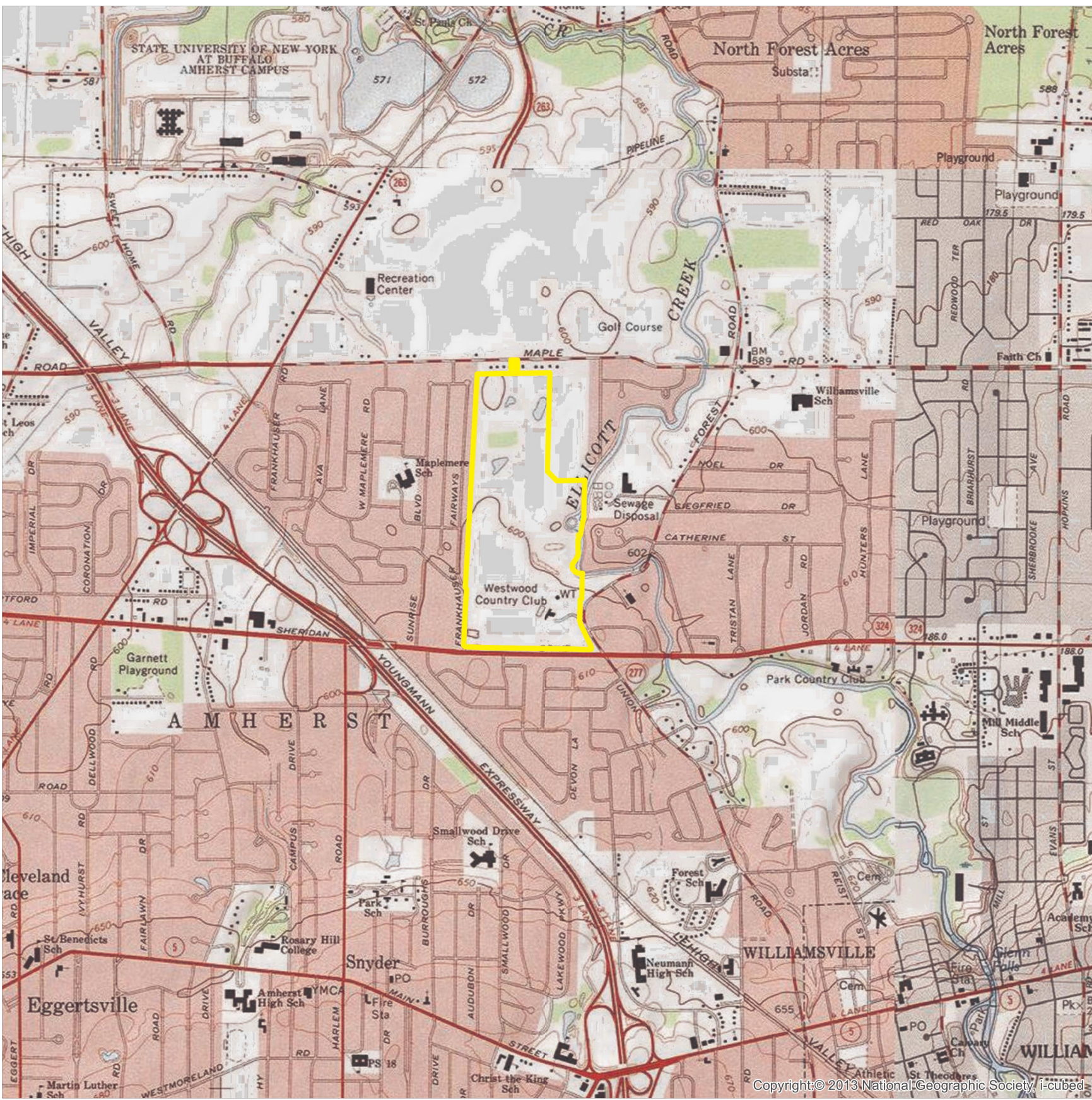
Personnel authorized to enter the Site while operations are being conducted must be approved by the HSO. Authorization will involve completion of appropriate training courses, medical examination requirements, and review and sign-off of this HASP. No C&S personnel should enter the work zone alone. Each site visitor should check in with the HSO or Project Manager prior to entering the work zones.

FIGURE 1

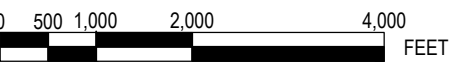
SITE LOCATION MAP



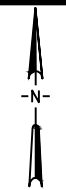
F:\Project\076 - Mensch Capital Partners\076001\001 - Westwood Sampling\Planning-Study\CADD\Sheet Files\FIGURE 1 SITE LOCATION.dwg



LEGEND
[Yellow Outline] BROWNFIELD CLEANUP PROGRAM ("BCP") BOUNDARY AND PROJECT LIMITS



C&S Engineers, Inc.
141 Elm Street
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com



**WESTWOOD COUNTRY CLUB
BROWNFIELD CLEANUP PROGRAM
REMEDIAL INVESTIGATION
AMHERST, NEW YORK**

MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO:	076.001.001	
DATE:	FEBRUARY 3, 2015	
DRAWN BY:	C. MARTIN	
DESIGNED BY:	C. MARTIN	
CHECKED BY:	M. COLMERAUER	
NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW		

SITE LOCATION

FIGURE 1

FIGURE 2

SITE AERIAL PHOTO



ATTACHMENT A

MAP TO HOSPITAL



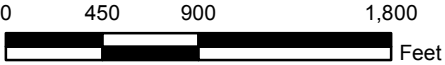


Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Esri, HERE, DeLorme, TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

MASH Urgent Care
Dent Tower
3980 Sheridan Drive
Amherst, NY 14226

- Head toward Morgan Parkway on N. Forest Road (CR-294) 374 ft
- Turn Right onto Sheridan Drive (RT-324) 0.9 mi
- Destination is on the right on Sheridan Drive - MASH urgent care in Dent Tower

Total Distance: 1.0 mile
Total Time: 2 minutes





C&S Engineers, Inc.
141 Elm Street
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com



**DRIVING DIRECTIONS TO
MASH URGENT CARE IN
DENT TOWER
AMHERST, NEW YORK**

MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO: 076.001.001		
DATE: 2/9/2015		
DRAWN BY: A. DEMARCHI		
DESIGNED BY: A. DEMARCHI		
CHECKED BY: DAN RIKER		
NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW		

Appendix A

EXCAVATION/TRENCHING GUIDELINE



**C&S ENGINEERS, INC. HEALTH & SAFETY GUIDELINE #14
EXCAVATION/TRENCHING OPERATIONS**

TABLE OF CONTENTS

1.0	PURPOSE	1
2.0	SCOPE	1
3.0	DEFINITION.....	1
4.0	RESPONSIBILITY	1
5.0	GUIDELINES	1
5.1	Hazards Associated With Excavation/Trenching.....	1
5.2	Procedures Prior to Excavation	2
5.3	Procedures For Doing The Excavation	2
5.4	Entering the Excavation	3
6.0	REFERENCES	3
7.0	ATTACHMENTS.....	3

C&S ENGINEERS, INC.

EXCAVATION/TRENCHING OPERATIONS

1.0 PURPOSE

To establish safe operating procedures for excavation/trenching operations at C&S work sites.

2.0 SCOPE

Applies to all C&S activity where excavation or trenching operations take place.

3.0 DEFINITIONS

Excavation — Any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation.

Trench — A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

4.0 RESPONSIBILITY EMPLOYEES

Employees — All employees must understand and follow the procedures outlined in this guideline during all excavation and trenching operations.

Health and Safety Coordinator/Officer (HSC/HSO) - The HSC/HSO is responsible for ensuring that these procedures are implemented at each work site.

5.0 GUIDELINES

5.1 Hazards Associated With Excavation/Trenching

The principal hazards associated with excavation/trenching are:

- Suffocation, crushing, or other injury from falling material.
- Damage/failure of installed underground services and consequent hazards.
- Tripping, slipping, or falling.
- Possibility of explosive, flammable, toxic, or oxygen-deficient atmosphere in excavation.

5.2 Procedures Prior to Excavation

1. Underground Utilities

- Determine the presence and location of any underground chemical or utility pipes, electrical, telephone, or instrument wire or cables.
- If the local DigSafely NY is unable to locate private/domestic or plant utilities, then an independent utility locating service must be contacted and mobilized to the site.
- Identify the location of underground services by stakes, markers or paint.
- Arrange to de-energize or isolate underground services during excavation. If not possible, or if location is not definite, method of excavation shall be established to minimize hazards by such means as:
 - a) Use of hand tools in area of underground services.
 - b) Insulating personnel and equipment from possible electrical contact.
 - c) Use of tools or equipment that will reduce possibility of damage to underground services and hazard to worker.

2. Identify Excavation Area — Areas to be excavated shall be identified and segregated by means of barricades, ropes, and/or signs to prevent access of unauthorized personnel and equipment. Suitable means shall be provided to make barriers visible at all times.
3. Surface Water Provide means of diverting surface water from excavation.
4. Shoring/Bracing — Shoring or bracing that may be required for installed equipment adjacent to the excavation shall be designed by a competent person.
5. Structural Ramps — Structural ramps that are used solely by employees as a means of access to or egress from the excavation shall be designed by a competent person.

5.3 Procedures For Doing The Excavation

1. **Determine the need for shoring/sloping** — the type of soil will establish the need for shoring, slope of the excavation, support systems, and equipment to be used. The soil condition may change as the excavation proceeds. Appendices A, B, C, D, E, and F of the OSHA Excavation Regulation, 29 CFR 1926 Subpart P, are to be used in defining shoring and sloping requirements.
2. **Mobile equipment** — For safe use of mobile industrial equipment in or near the excavation, the load carrying capacity of soil shall be established and suitable protection against collapse of soil provided by the use of mats, barricades, restricting the location of equipment, or shoring.
3. Excavated material (spoil) shall be stored at least two (2) feet from the edge of the excavation.
4. All trench (vertical sides) excavations greater than five (5) feet deep shall be shored.

5. The excavation shall be inspected daily for changes in conditions, including the presence of ground water, change in soil condition, or effects of weather such as rain or freeze. A safe means of continuing the work shall be established based on changes in condition. Typically test trench excavations made as part of an environmental subsurface investigation are made and backfilled the same day.
6. Appropriate monitoring for gas, toxic, or flammable materials will be conducted to establish the need for respiratory equipment, ventilation, or other measures required to continue the excavation safely.
7. Adequate means of dewatering the excavation shall be provided by the contractor as required.
8. A signal person shall be provided to direct powered equipment if working in the excavation with other personnel.
9. A signal person shall be provided when backfilling excavations to direct powered equipment working in the excavation with other personnel.
10. Warning vests will be worn when employees are exposed to public vehicular traffic.
11. Employees shall stand away from vehicles being loaded or unloaded, and shall not be permitted underneath loads handled by lifting or dragging equipment.
12. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available if hazardous atmospheric conditions exist or may be expected to develop. The specifics will be determined by the HSC/HSM.
13. Walkways or bridges with standard guardrail shall be provided where employees or equipment are required or permitted to cross over excavations.

5.4 Entering the Excavation

No C&S Engineers, Inc., employee shall enter an excavation which fails to meet the requirements of Section 5.3 of this guideline.

6.0 REFERENCES

29 CFR 1926, Subpart P - Excavations

7.0 ATTACHMENTS

29 CFR 1926 Subpart P - Appendices A, B, F



UNITED STATES
DEPARTMENT OF LABOR

Occupational Safety & Health Administration

[A to Z Index](#) | [En Español](#)

OSHA Home

[RSS Feeds](#) [Print This](#)

[Regulations \(Standards - 29 CFR\) - Table of Contents](#)

• Part Number:	1926
• Part Title:	Safety and Health Regulations for Construction
• Subpart:	P
• Subpart Title:	Excavations
• Standard Number:	1926 Subpart P App A
• Title:	Soil Classification

(a) Scope and application - (1) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets for requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set for 1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations designed as a method of protection from cave-ins in accordance with appendix C to subpart P of part 1926, and when aluminum shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected from data prepared in accordance with the requirements set forth in 1926.652(c), and the use of the data is predicated on the soil classification system set forth in this appendix.

(b) Definitions. The definitions and examples given below are based on, in whole or in part, the following; American Society for Testing and Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System; The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

"Cemented soil" means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

"Cohesive soil" means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

"Dry soil" means soil that does not exhibit visible signs of moisture content.

"Fissured" means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

"Granular soil" means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

"Layered system" means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

"Moist soil" means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

"Plastic" means a property of a soil which allows the soil to be

deformed or molded without cracking, or appreciable volume change.

"Saturated soil" means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

"Soil classification system" means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

"Stable rock" means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

"Submerged soil" means soil which is underwater or is free seeping.

"Type A" means cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

- (i) The soil is fissured; or
- (ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- (iii) The soil has been previously disturbed; or
- (iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- (v) The material is subject to other factors that would require it to be classified as a less stable material.

"Type B" means:

- (i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- (ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- (iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
- (iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
- (v) Dry rock that is not stable; or
- (vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

"Type C" means:

- (i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- (ii) Granular soils including gravel, sand, and loamy sand; or
- (iii) Submerged soil or soil from which water is freely seeping; or
- (iv) Submerged rock that is not stable; or
- (v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

"Unconfined compressive strength" means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

"Wet soil" means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) Requirements - (1) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(3) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properties, factors, and conditions affecting the classification of the deposits.

(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer shall be classified individually where a more stable layer lies under a less stable layer.

(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) Acceptable visual and manual tests. - (1) Visual tests. Visual analysis is conducted to determine qualitative information regarding an excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not form clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tensile cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moisture in the ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope away from the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seepage, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch diameter thread can be held on one end without tearing, the soil is cohesive.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (a combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil is considered unfissured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soil. This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure)." Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type B soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practical after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (flooding), the classification of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or using a hand-operated shearvane.

(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has a high cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive. If they pulverize easily into very small fragments, the material is granular.

 [Next Standard \(1926 Subpart P App B\)](#)

 [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

[Freedom of Information Act](#) | [Privacy & Security Statement](#) | [Disclaimers](#) | [Customer Survey](#) | [Important Web Site Notices](#)

U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, DC 20035
Telephone: 800-321-OSHA (6742) | TTY: 877-889-5627

[www.OSHA.gov](http://www.osha.gov)



UNITED STATES
DEPARTMENT OF LABOR

Occupational Safety & Health Administration

[A to Z Index](#) | [En Español](#)

[OSHA Home](#)

[RSS Feeds](#) [Print This Page](#)

[Regulations \(Standards - 29 CFR\) - Table of Contents](#)

• Part Number:	1926
• Part Title:	Safety and Health Regulations for Construction
• Subpart:	P
• Subpart Title:	Excavations
• Standard Number:	1926 Subpart P App B
• Title:	Sloping and Benching

(a) **Scope and application.** This appendix contains specifications for sloping and benching when used as methods of protecting working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective is to be performed in accordance with the requirements set forth in § 1926.652(b)(2).

(b) **Definitions.**

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site conditions for protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) **Requirements -- (1) Soil classification.** Soil and rock deposits shall be classified in accordance with appendix A to subpart I of 1926.

(2) **Maximum allowable slope.** The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) **Actual slope.** (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1/2H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.651(i).

(4) **Configurations.** Configurations of sloping and benching systems shall be in accordance with Figure B-1.

**TABLE B-1
MAXIMUM ALLOWABLE SLOPES**

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK	VERTICAL (90°)
TYPE A (2)	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

Footnote(1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angle rounded off.

Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).

Footnote(3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

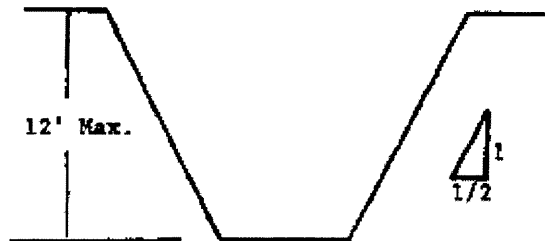
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



SIMPLE SLOPE -- GENERAL

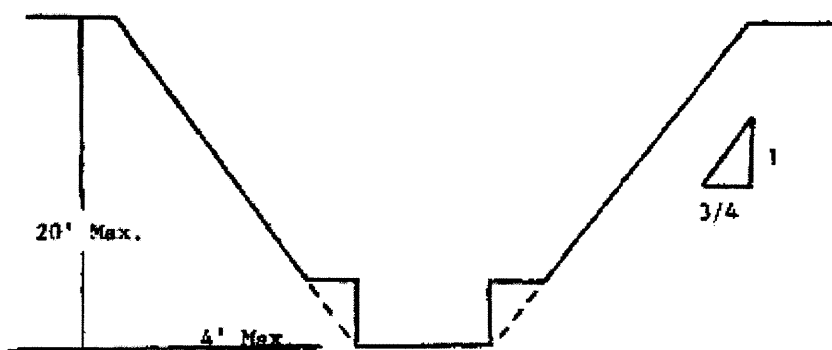
Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have maximum allowable slope of 1/2:1.



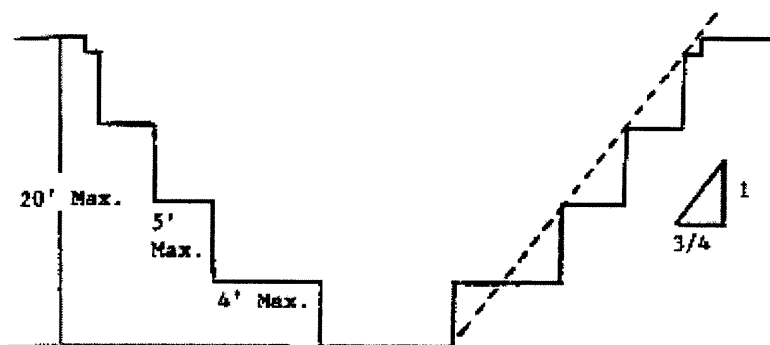
SIMPLE SLOPE -- SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions

follows:

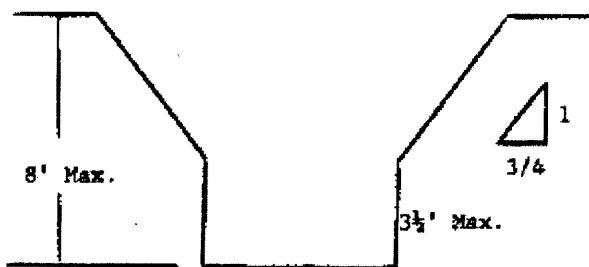


SIMPLE BENCH



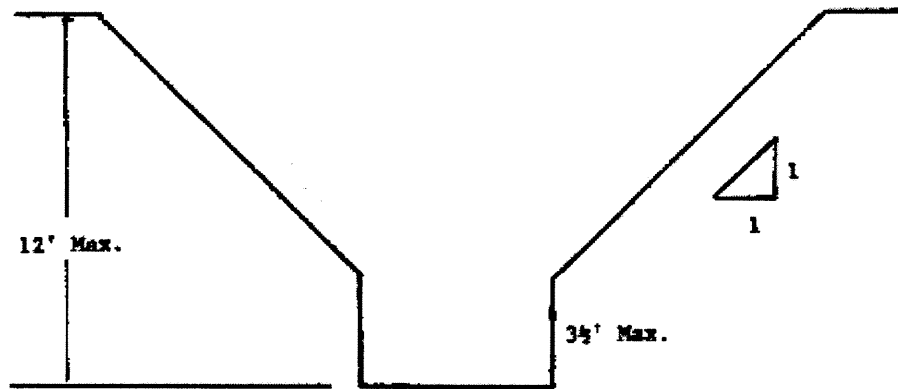
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 8 feet.



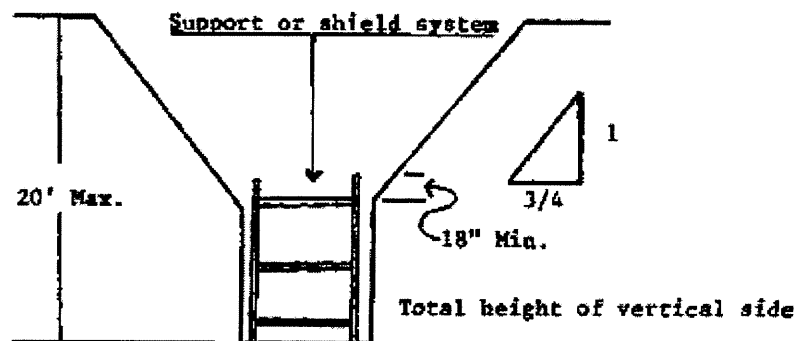
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 8 FEET IN DEPTH)

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 12 FEET IN DEPTH)

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of $\frac{3}{4}$:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

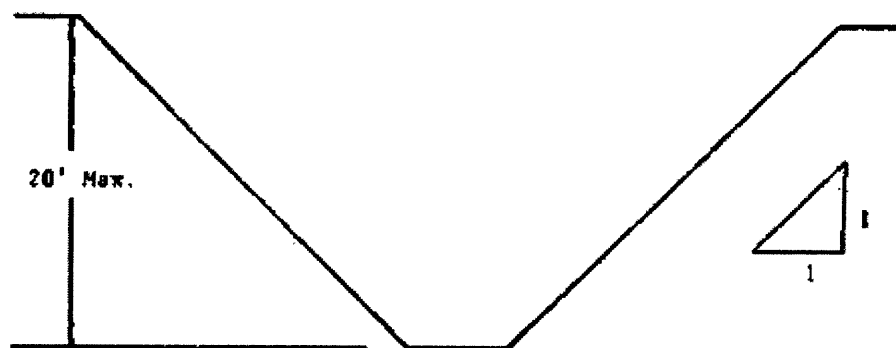


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

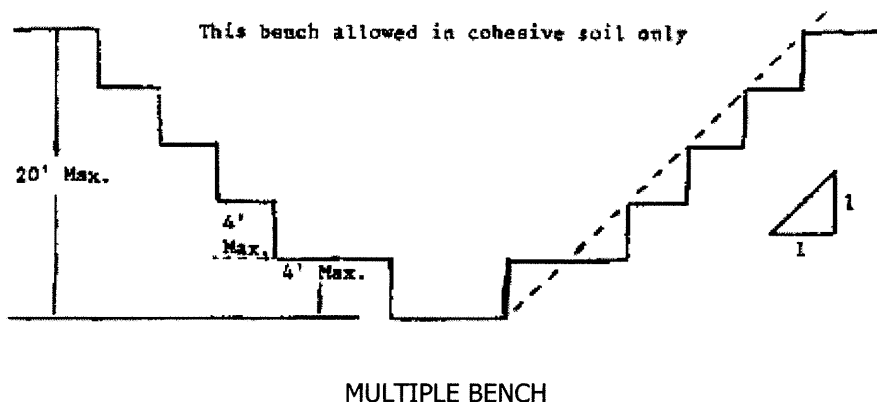
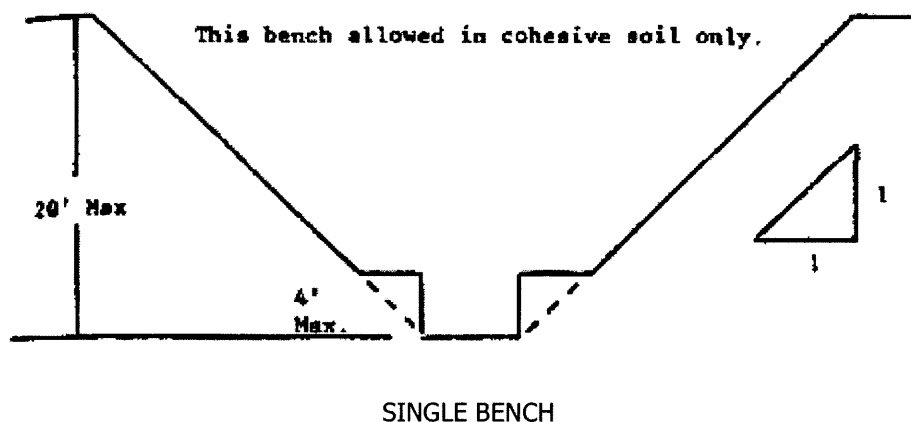
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

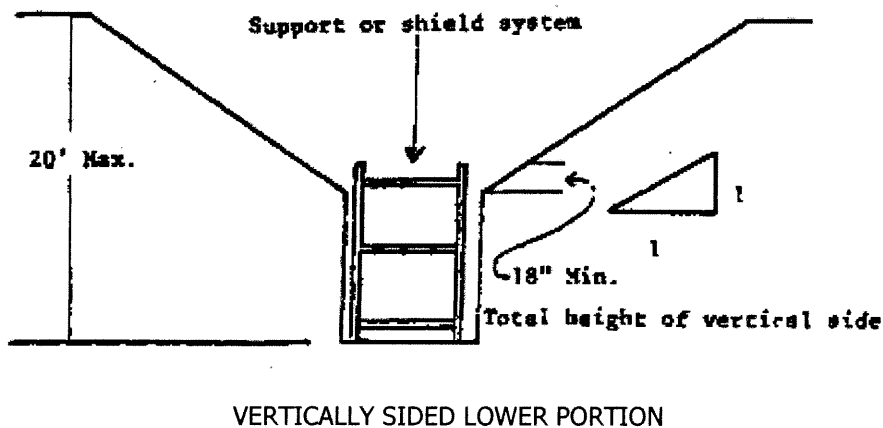


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions



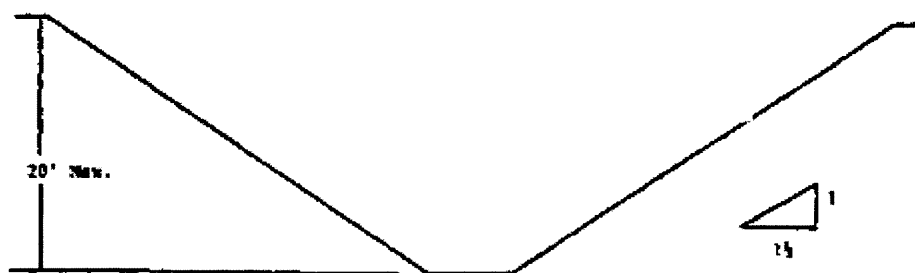
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

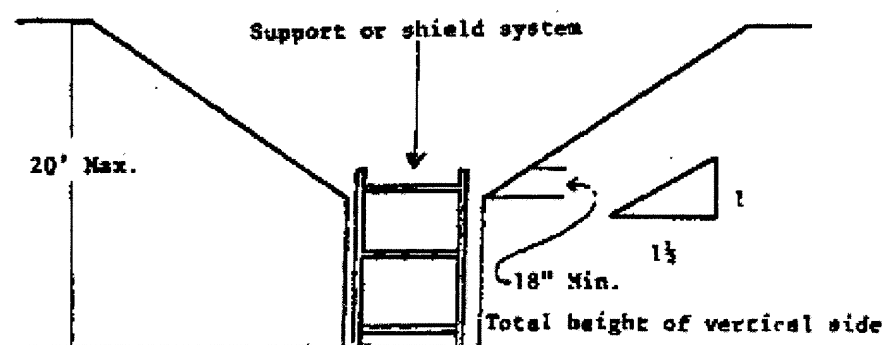
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of $1\frac{1}{2}:1$.

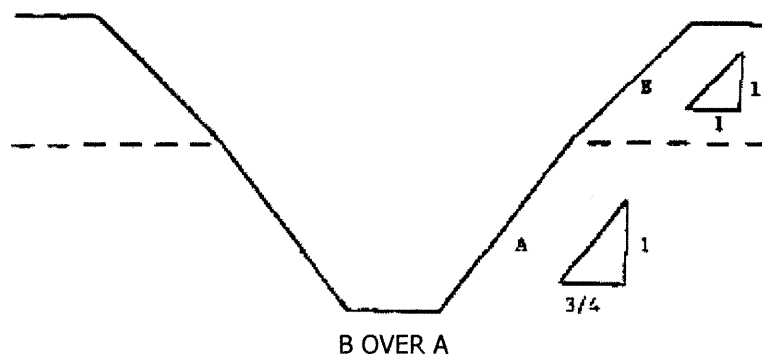


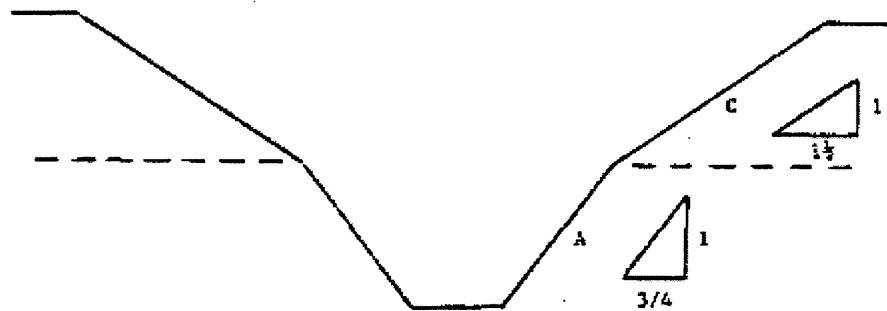
VERTICAL SIDED LOWER PORTION

3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

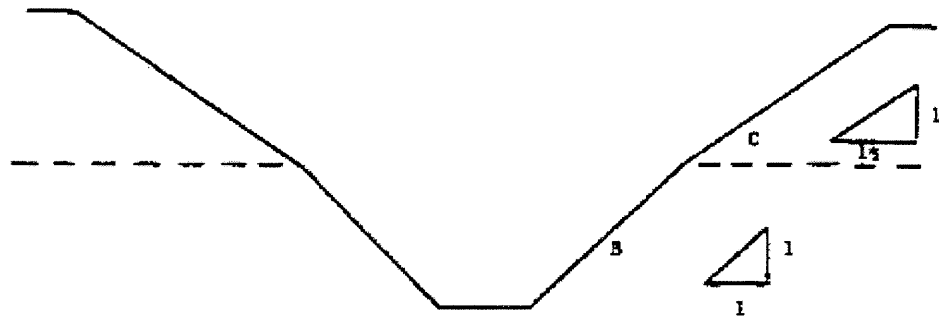
B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.

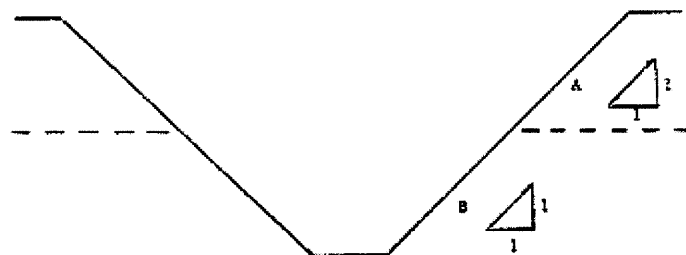




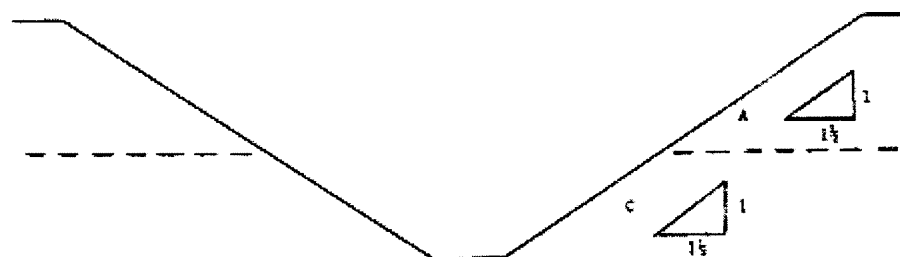
C OVER A



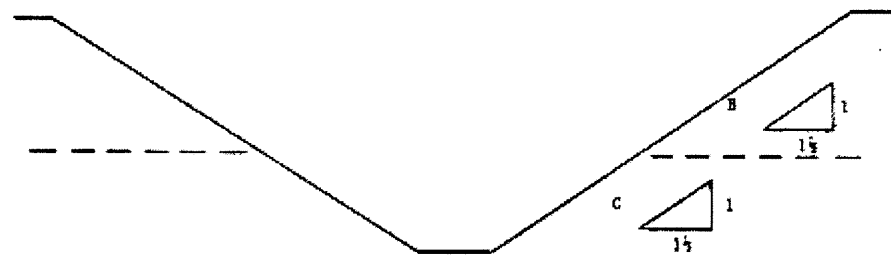
C OVER B



A OVER B



A OVER C



B OVER C

2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

◀ [Next Standard \(1926 Subpart P App C\)](#)

◀ [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

[Freedom of Information Act](#) | [Privacy & Security Statement](#) | [Disclaimers](#) | [Customer Survey](#) | [Important Web Site Notices](#)

U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, DC
Telephone: 800-321-OSHA (6742) | TTY: 877-889-5627

www.OSHA.gov



UNITED STATES
DEPARTMENT OF LABOR

Occupational Safety & Health Administration

[A to Z Index](#) | [En Español](#) | [Feedback](#)

[OSHA Home](#)

[RSS Feeds](#) [Print This Page](#)

[Regulations \(Standards - 29 CFR\) - Table of Contents](#)

• Part Number:	1926
• Part Title:	Safety and Health Regulations for Construction
• Subpart:	P
• Subpart Title:	Excavations
• Standard Number:	1926 Subpart P App F
• Title:	Selection of Protective Systems

The following figures are a graphic summary of the requirements contained in subpart P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with 1926.652(b) and (c).

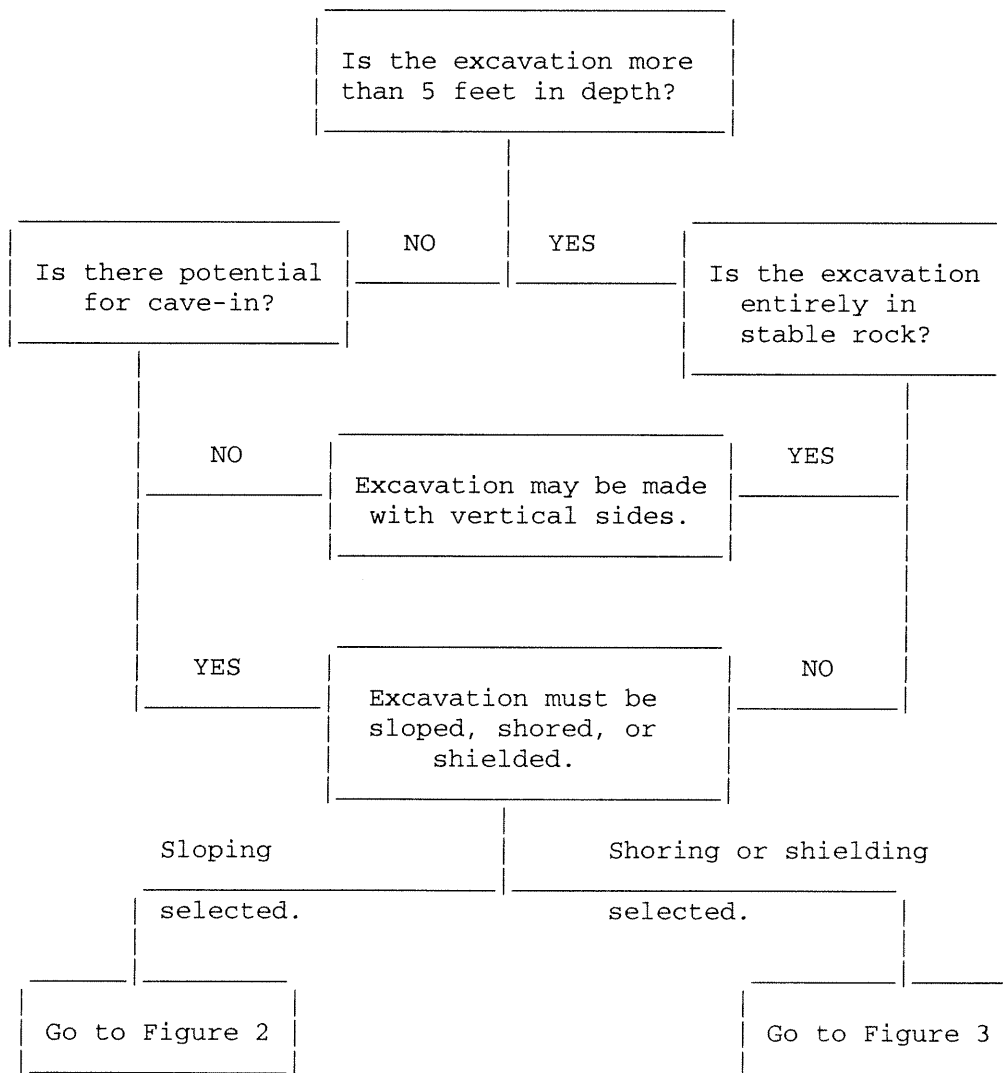


FIGURE 1 - PRELIMINARY DECISIONS

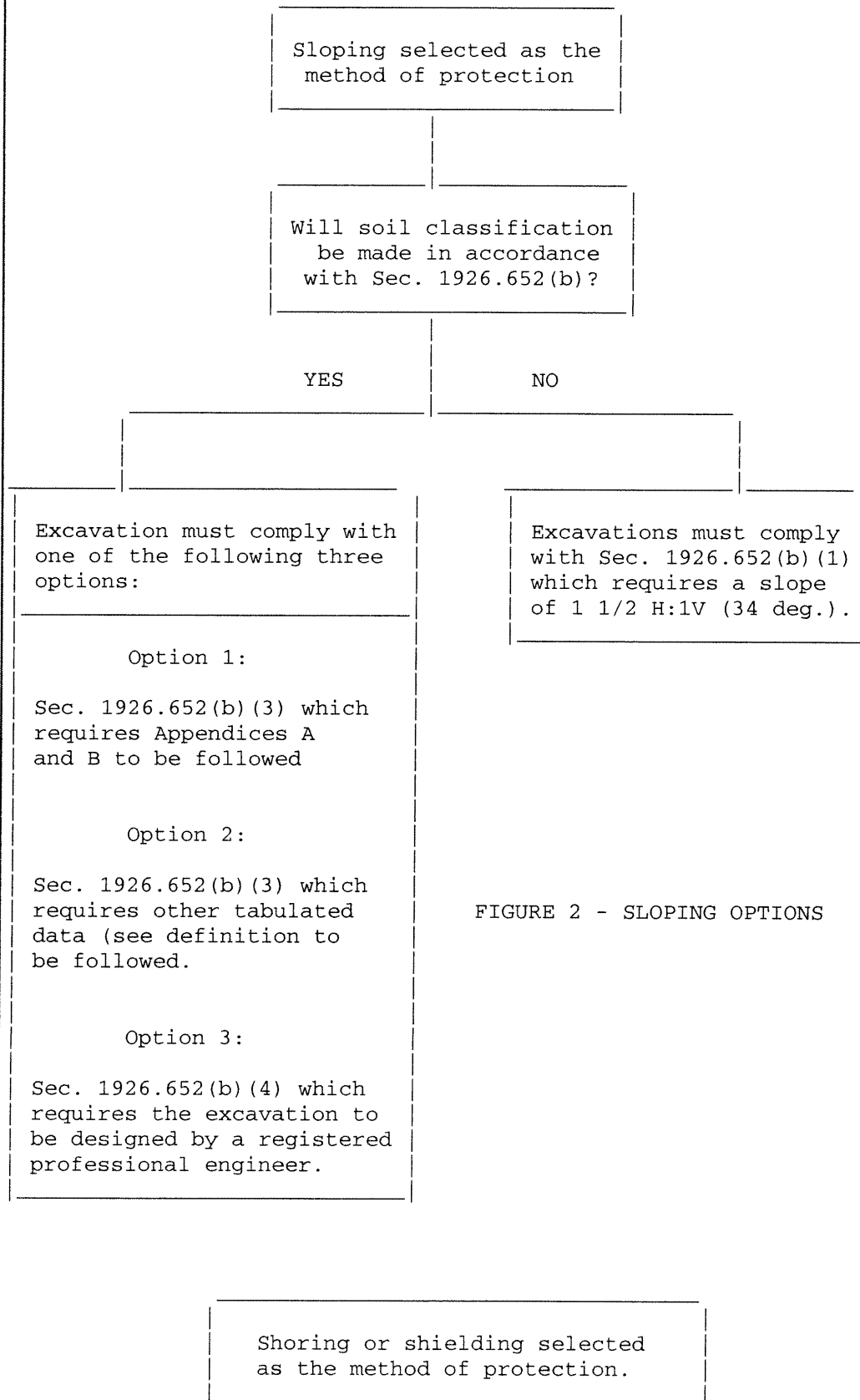


FIGURE 2 - SLOPING OPTIONS

Soil Classification is required when shoring or shielding is used. The excavation must comply with one of the following four options:

Option 1

Sec. 1926.652(c)(1) which requires Appendices A and C to be followed (e.g. timber shoring).

Option 2

Sec. 1926.652(c)(2) which requires manufacturers data to be followed (e.g. hydraulic shoring, trench jacks, air shores, shields).

Option 3

Sec. 1926.652(c)(3) which requires tabulated data (see definition) to be followed (e.g. any system as per the tabulated data).

Option 4

Sec. 1926.652(c)(4) which requires the excavation to be designed by a registered professional engineer (e.g. any designed system).

FIGURE 3 - SHORING AND SHIELDING OPTIONS

 [Next Standard \(1926 Subpart Q\)](#)

 [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

[Freedom of Information Act](#) | [Privacy & Security Statement](#) | [Disclaimers](#) | [Customer Survey](#) | [Important Web Site Notices](#) |

U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, DC 20334
Telephone: 800-321-OSHA (6742) | TTY: 877-889-5627

www.OSHA.gov

Appendix B

GUIDANCE ON INCIDENT INVESTIGATION

AND REPORTING



MEDICAL EMERGENCY/INCIDENT RESPONSE PROTOCOL

1.0 PURPOSE

From time to time employees of C & S Engineers, Inc. will sustain an injury while working on the job. While every effort is being made to prevent this, in the event of an injury or illness on the job, the following procedures will be implemented. This format may also be utilized in the event of a property damage incident.

2.0 SCOPE

This guideline applies to all C & S Engineers, Inc. job sites and employees.

3.0 GUIDELINES

Upon notification or awareness of an incident/accident with injuries or illness the Emergency Coordinator or his On-Site Designee will:

1. Ensure that the injured employee is receiving immediate first aid and medical care.
2. Notify Emergency Services (911) if injuries are severe.
3. Stabilize the work area; ensure that no one else can be injured.
4. Notify the Project Manager at the earliest possible convenience.
5. Notify the Owner/Client at the earliest possible convenience.

To assist the Health and Safety Manager in the root cause analysis, the Emergency Coordinator or his On-Site Designee will also make an attempt to:

1. Obtain the names and phone numbers of witnesses.
2. Preserve the accident scene if possible for analysis.

Injury Management

1. If the patient is stable with non-life threatening injuries, the foreman will ensure the employee is transported to Mount St. Mary's Hospital of Niagara Falls.

At no time will an injured employee drive themselves to medical care.

2. If the patient has serious or life threatening injuries, the emergency coordinator or his on-site designee will notify the emergency services for the area for treatment and transport to a hospital or emergency room. Serious injuries can be considered but not limited to head injuries, loss of consciousness, severe laceration or amputation, fractured bones, burns and eye injuries.

3. Following the treatment and care of the injured employee, the emergency coordinator or his on-site designee and the project manager will initiate the completion of the first injury report. The Health & Safety Manager will assist.

Project Manager

1. Upon notification of a personal injury or illness on the job site, will notify C & S Engineers, Inc, President and Corporate Legal and C&S Companies Health and Safety Manager.
2. Will report to the worksite to initiate the first injury report.
3. Will report to the treatment facility to check on the well being of the injured employee. The project manager will ensure that the treatment facility is aware that this is a workers compensation case.
4. Will assist the Health and Safety Manager in the analysis of the incident.

Health & Safety Manager

1. Upon notification of the personal injury will determined if it is necessary to report to the treatment facility or the accident site, depending on the nature of the injuries and the circumstances of the accident.
2. Will report to the worksite to begin a root cause analysis investigation of the accident. The investigation may include interview of witnesses, field crew , and project manager, the photographing of the scene, reconstruction of the accident scene, using test instruments and taking measurements. The Health and Safety Manager may draw diagrams from the information learned.
3. The Health and Safety Manager will work with the owner/client as necessary to investigate the accident.
4. The Health & Safety manager will ensure that the site is safe to resume work.
5. The Health & Safety Manager shall initiate the New York State Compensation form requirements (C-2) and forward a copy of the C-2 to the C & S Engineers, Inc. controller for transmittal to the Compensation Carrier within 8 hrs of notification of the incident or by the end of the next business day.
6. The Health and Safety manager, upon completion of the investigation, will provide the Project Manager with a written investigative report (copy to the President)
7. The accident will be reviewed at the next Project Managers meeting with the intent to prevent further or similar events on other projects.
8. The Health & Safety Manager will assess the incident to determine OSHA record ability and make record if necessary on the OSHA 300 form, within five working days.

Incident Response

1.0 PURPOSE

To prevent the occurrence of accidents on C&S Engineers, Inc., work sites and to establish a procedure for investigation and reporting of incidents occurring in, or related to C&S work activities.

2.0 SCOPE

Applies to all incidents related to C&S Engineers, Inc. work activities.

3.0 DEFINITIONS

Accident - An undesired event resulting in personal injury and/or property damage, and/or equipment failure.

Fatality - An injury or illness resulting in death of the individual.

Incident - Any occurrence which results in, or could potentially result in, the need for medical care or property damage. Such incidents shall include lost time accidents or illness, medical treatment cases, unplanned exposure to toxic materials or any other significant occurrence resulting in property damage or in "near misses."

Incidence Rate - the number of injuries, illnesses, or lost workdays related to a common exposure base of 100 full-time workers. The rate is calculated as:

$$N/EH \times 200,000$$

N = number of injuries and illnesses or lost workday cases; EH = total hours worked by all associates during calendar year. 200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year).

Injury - An injury such as a cut, fracture, sprain, amputation, etc. which results from a work accident or from a single instantaneous event in the work environment.

Lost Workday Case - A lost workday case occurs when an injured or ill employee experiences days away from work beginning with the next scheduled work day. Lost workday cases do not occur unless the employee is effected beyond the day of injury or onset of illness.

Recordable Illness - An illness that results from the course of employment and must be entered on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses. These illnesses require medical treatment and evaluation of work related injury. For example, dermatitis, bronchitis, irritation of eyes, nose, and throat can result from work and non-work related incidents.

Recordable Injury - An injury that results from the course of employment and must be entered on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses. These injuries require medical treatment; may involve loss of consciousness; may result in restriction of work or motion or transfer to another job; or result in a fatality.

Near Miss - An incident which, if occurring at a different time or in a different personnel or equipment configuration, would have resulted in an incident.

4.0 RESPONSIBILITIES

Employees - It shall be the responsibility of all C&S Engineers, Inc. employees to report all incidents as soon as possible to the HSC, regardless of the severity.

Human Resources - has overall responsibility for maintaining accident/ incident reporting and investigations according to current regulations and recording injuries/ illness on the OSHA 300 log, and posting the OSHA 300 log.

Emergency Coordinator - It is the responsibility of the Emergency Coordinator to investigate and prepare an appropriate report of all accidents, illnesses, and incidents occurring on or related to C&S Engineers, Inc. work. The Emergency Coordinator shall complete Attachment A within 24 hours of the incident occurrence.

Health and Safety Manager (HSM) - It is the responsibility of the HSM to investigate and prepare an appropriate report of all lost time injuries and illnesses and significant incidents occurring on or related to C&S Companies. The HSM shall maintain the OSHA 300 form.

Project Managers (PM) - It shall be the PM's responsibility to promptly correct any deficiencies in personnel, training, actions, or any site or equipment deficiencies that were determined to cause or contribute to the incident investigated.

5.0 GUIDELINES

5.1 Incident Investigation

The Project Manager will immediately investigate the circumstances surrounding the incident and will make recommendations to prevent recurrence. The HSM shall be immediately notified by telephone if a serious accident/ incident occurs. The incident shall be evaluated to determine whether it is OSHA recordable. If the incident is determined to be OSHA 300 recordable, it shall be entered on the OSHA 300 form.

The Project Manager with assistance from the HSM must submit to the office an incident report form pertaining to any incident resulting in injury or property damage.

5.2 Incident Report

The completed incident report must be completed by the Project Manager within 12 hours of the incident and distributed to the HSM, and Human Resources. This form shall be maintained by Human Resources for at least five years for all OSHA recordable cases. This form serves as an equivalent to the OSHA 101 form.

5.3 Incident Follow-up Report

The Incident Follow-Up Report (Attachment B) shall be distributed with the Incident Report within one week of the incident. Delay in filing this report shall be explained in a brief memorandum.

5.4 Reporting of Fatalities or Multiple Hospitalization Accidents

Fatalities or accidents resulting in the hospitalization of three or more employees must be reported to OSHA verbally or in writing within 8 hours. The report must contain 1) circumstances surrounding the accident(s), 2) the number of fatalities, and 3) the extent of any injuries.

5.5 OSHA 300A Summary Form

Recordable cases must be entered on the log within six workdays of receipt of the information that a recordable case has occurred. The OSHA log must be kept updated to within 45 calendar days.

OSHA 300 forms must be updated during the 5 year retention period, if there is a change in the extent or outcome of an injury or illness which affects an entry on a log. If a change is necessary, the original entry should be lined out and a corrected entry made on that log. New entries should be made for previously unrecorded cases that are discovered or for cases that initially weren't recorded but were found to be recordable after the end of the year. Log totals should also be modified to reflect these changes.

5.5.1 Posting

The log must be summarized at the end of the calendar year and the summary must be posted from February 1 through May 31.

5.6 OSHA 300A

Facilities selected by the Bureau of Labor Statistics (BLS) to participate in surveys of occupational injuries and illnesses will receive the OSHA 300A. The data from the annual summary on the OSHA 300 log should be transferred to the OSHA 300A, other requested information provided and the form returned as instructed by the BLS.

5.7 Access to OSHA Records

All OSHA records (accident reporting forms and OSHA 300 logs) should be available for inspection and copying by authorized Federal and State government officials.

Employees, former employees, and their representatives must be given access for inspection and copying to only the log, OSHA No. 300, for the establishment in which the employee currently works or formerly worked.

6.0 REFERENCES

29 CFR Part 1904

7.0 ATTACHMENTS

Attachment A - Incident Investigation Form

Attachment B - Incident Follow-Up Report

Attachment C - Establishing Recordability

ATTACHMENT A
INCIDENT INVESTIGATION FORM

Accident investigation should include:

Location: _____

Time of Day: _____

Accident Type: _____

Victim: _____

Nature of Injury: _____

Released Injury: _____

Hazardous Material: _____

Unsafe Acts: _____

Unsafe Conditions: _____

Policies, Decisions: _____

Personal Factors: _____

Environmental Factors: _____

ATTACHMENT B

Date _____

Foreman: _____

INCIDENT FOLLOW-UP REPORT

Date of Incident: _____

Site: _____

Brief description of incident: _____

Outcome of incident: _____

Physician's recommendations: _____

Date the injured returned to work: _____

Project Manager Signature: _____

Date: _____

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM

ATTACHMENT C

ESTABLISHING RECORDABILITY

1. Deciding whether to record a case and how to classify the case.

Determine whether a fatality, injury or illness is recordable.

A fatality is recordable if:

- Results from employment

An injury is recordable if:

- Results from employment and
- It requires medical treatment beyond first aid or
- Results in restricted work activity or job transfer, or
- Results in lost work day or
- Results in loss of consciousness

An illness is recordable if:

- It results from employment

2. Definition of "Resulting from Employment"

Resulting from employment is when the injury or illness results from an event or exposure in the work environment. The work environment is primarily composed of: 1) The employer's premises, and 2) other locations where associates are engaged in work-related activities or are present as a condition of their employment.

The employer's premises include company rest rooms, hallways, cafeterias, sidewalks and parking lots. Injuries occurring in these places are generally considered work related.

The employer's premises EXCLUDES employer controlled ball fields, tennis courts, golf courses, parks, swimming pools, gyms, and other similar recreational facilities, used by associates on a voluntary basis for their own benefit, primarily during off work hours.

Ordinary and customary commute, is not generally considered work related.

Employees injured or taken ill while engaged in consuming food, as part of a normal break or activity is not considered work related. Employees injured or taken ill as the result of smoking, consuming illegal drugs, alcohol or applying make up are generally not considered work related. Employee injured by an authorized horseplay is generally not considered work related, however, an employee injured as a result of a fight or other workplace violence act, may be considered work related.

Associates who travel on company business are considered to be engaged in work related activities all the time they spend in the interest of the company. This includes travel to and from customer contacts, and entertaining or being entertained for purpose of promoting or discussing business. Incidents occurring during normal living activities (eating, sleeping, recreation) or if the associate deviates from a reasonably direct route of travel are not considered OSHA recordable.

3. Distinction between Medical Treatment and First Aid.

First aid is defined as any one-time treatment, and any follow up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care. Such one time treatment, and follow up visit for the purpose of observation, is considered first aid even though provided by a physician or registered professional personnel.

Medical Treatment (recordable)

- a) They must be treated only by a physician or licensed medical personnel.
- b) They impair bodily function (i.e. normal use of senses, limbs, etc.).
- c) They result in damage to physical structure of a non superficial nature (fractures).
- d) They involve complications requiring follow up medical treatment.

APPENDIX C
COMMUNITY AIR MONITORING PROGRAM

Community Air Monitoring Plan

for

**Westwood Country Club
772 North Forest Road
Amherst, Erie County, New York**

Site No. C915291

February 2015

Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Based on over 10 years of monitoring and investigation, this site contamination is known to be limited to petroleum VOCs.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment

should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate, such as isobutylene. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM₁₀) with the following minimum performance standards:

- (a) Objects to be measured: Dust, mists or aerosols;
- (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
- (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
- (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
- (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;
- (h) Logged Data: Each data point with average concentration, time/date and data point number;
- (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

- (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
- (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
- (l) Operating Temperature: -10 to 50°C (14 to 122°F); and
- (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record-keeping plan.

5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM-10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.