SWEATT CONSTRUCTION INCORPORATED
Ground Disturbance Program

Effect Date: September - 2008

Program Scope

This written program addresses and establishes procedures for the control of Ground Disturbance on all Sweatt Construction Incorporated (S.C.I.) locations. As well as any associates, customers, private, and public properties where S.C.I. personnel and/or equipment are located. **Ground Disturbance** includes **any** type of excavation and trenching activities. These procedures shall be implemented and enforced at all S.C.I. locations and facilities when and where excavation and trenching activities are performed.

Program Intent

- To enhance the safety of company and contractor personnel.
- To assist customer, subcontractor and S.C.I. personnel in planning and executing Ground Disturbance operations safely.
- To provide supervisory personnel with materials to use in training new employees, to share with new sub, contract personnel, and to maintain the awareness of all employees as well as customer representative.

**Ground Disturbance** is any man-made disturbance of the ground surface, which includes movements of soil, dirt, or rock.

General Requirements

- A customer representative or a customer designated representative, and the property owner (if different from customer) shall be advised by S.C.I. prior to beginning a ground disturbance.
- A S.C.I. supervisor shall notify a State Notification Center at least 48 hours prior to beginning an excavation on customer property.
- All S.C.I. employees shall observe the “Tolerance Zone” requirements while performing Ground Disturbance activities on any property.
- Employees who work in or around ground disturbances must be trained according to the work they are performing.
- Workers must wear any appropriate personal protective equipment deemed necessary to assure their protection.
- A Competent Person, (as defined by OSHA in 29 CFR 1926.650(b)) shall be placed in charge of all excavations greater than 4 feet in depth.
- The excavation or trench must either be sloped or supported as required to comply with OSHA requirements (29 CFR 1926.650-652).
- If the excavation is over 20 feet deep, a **registered professional engineer** in the state where the work will be performed must design it.
- Traffic around the site must be controlled, and barricades, signs, and/or flag persons used to control both vehicular and pedestrian traffic, if needed.
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• Pipelines, utilities and/or other lines on the site must be protected and suitable precautions taken if any pipeline, utility and/or other lines will be disturbed by the work.
• Any facility/equipment damage must be reported to the facility owner/operator immediately – do not repair or backfill.
• S.C.I. Shall designate a trained person(s) to handle One-Call requests including at least one backup person.
• Use of Inductive, Conductive, Electromagnetic Line finders; Enviro-Vac’s and Vac-Hoe’s Probes, hand digging or an appropriate combination of these devices shall be used to locate buried facilities prior to beginning mechanical excavation - (see Appendix C).
• When using mechanized excavation equipment, a spotter shall be used to assist the equipment operator in locating underground facilities. The spotter shall understand the use of proper hand signals and how to avoid causing a sidewall cave-in.
• If it is not possible to locate the exact location of underground facilities, the work must proceed with caution, provided detection equipment or other safe and acceptable means (e.g. using hand tools, pressure/vacuum equipment and/or probes) are used to locate underground facilities as the excavation is opened and each underground facility is viewable. Use proper Lock-Out Tag-Out and Try procedures for the closure of line valves and the de-activation of energized sources as applicable in the area of an excavation.
• Uniform Color Code for Location of Underground Facilities

In marking the location of underground facilities, an owner or operator shall use the following uniform color code:

A. blue for water
B. green for sewer
C. orange for communications/coaxial cable
D. pink for survey
E. purple for reclaimed water
F. red for electric
G. white for proposed excavation area
H. yellow for gas.

• Other Operators who are known to have underground facilities within 50 feet of the proposed excavation site (or who have signs posted in the area of the proposed excavation) shall be contacted directly and requested to locate their buried facilities.
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Requirements of Ground Disturbance Program

All ground disturbance activities performed at the request of/or by S.C.I. and sub contract workers must be conducted in accordance with this program, the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652 (OSHA’s standard on excavations) and any other regulatory requirement set forth by the state in which Ground Disturbance activities will be performed. Some excavations and trenches that are encountered during work activities may require further planning than is included in this program prior to work being allowed. For example, if an excavation is 4 feet deep or greater, it will require a confined space entry permit. Excavation work may involve safety hazards not addressed by this program, which would warrant additional consideration, protection, and permitting including, but not limited to:

- Work conducted on or around electrical installation systems.
- Work that may impact existing utilities and/or lines that may need to be locked and tagged out.
- Work conducted in areas where hazardous atmospheres or gases can accumulate or hazardous materials storage locations.
- Fall hazards.

Definitions:

Bell-Bottom pier hole – means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching – (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Competent Person – one who is capable of identifying existing and predictable hazards in the surroundings, or area working conditions, which are hazardous or dangerous to employees and contractors, and who has the authorization to take prompt corrective measures to correct them.

Ground Disturbance – means scraping, trenching, use of explosives or a motor, engine, hydraulic or pneumatically powered tool, or other mechanized equipment of any kind and includes auguring, backfilling, boring, compressing, digging, ditching, drilling, dragging, dredging, grading, mechanical probing, plowing-in, pulling-in, ripping, and tunneling to remove or otherwise disturb soil.
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Excavation – (as defined in the Texas One-Call Law) means to use explosives or a motor, engine, hydraulic or pneumatically powered tool, or other mechanized equipment of any kind and includes auguring, backfilling, boring, compressing, digging, ditching, drilling, dragging, dredging, grading, mechanical probing, plowing-in, pulling-in ripping, scraping, trenching, and tunneling to remove or otherwise disturb soil to a depth of 16 or more inches.

Excavation – (as defined in the New Mexico One-Call Law) means the movement or removal of earth using mechanical excavating equipment or blasting and includes auguring, backfilling, digging, ditching, drilling, grading, plowing in, pulling in, ripping, scraping, trenching, tunneling and directional boring.

Excavation Tolerance Zone – the excavator observes a tolerance zone or a no-dig zone which is comprised of the width of the facility plus a minimum of 18” on either side of the outside edge of the underground facility on a horizontal plane.

Protective Systems – a method of protecting employees and contractors from cave-ins, from material that could fall or roll from an excavation, or from the collapse of adjacent structures. Protective systems include support systems (shoring), sloping and benching systems, shield systems, and other systems that provide necessary protection.

A Secured Facility – means a parcel of land used for commercial or industrial purposes that is surrounded entirely by a fence or other means of preventing access, including a fence with one or more gates that are locked at all times or monitored by an individual who can prevent unauthorized access.

Shield – (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields are sometimes referred to as “trench boxes” or “trench shields.”

Sloping – (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Underground Utility or Facility – means any pipeline system, wire, conduit, cable or structure which is buried for use with storage, conveyance, or transmission of electronics communication systems, telephone or telegraph systems, fiber optic systems, electric, energy, oil, natural gas, hazardous liquids, steam, water, or sewer systems.
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Program Summary
1. Employees and sub, contractors should provide the safest possible conditions under which Ground Disturbance Program operations can be carried out and must ensure all Ground Disturbance Program operations are in accordance with these program guidelines.

2. Employees and sub, contractors must thoroughly understand the Ground Disturbance program and its requirements.

3. Compliance and ongoing execution of these program guidelines are the responsibility of all S.C.I. employees and contractors.

4. Each S.C.I. location will be responsible for ensuring that all personnel, company and subcontract, involved in Ground Disturbance activities are appropriately trained. (See Training on page 24). Competent Person personnel should be able to demonstrate their knowledge and competency of excavation and trenching activities.

5. A pre-job planning session will be held to review training documentation and discuss the hazards specific to the upcoming excavation or trenching operation. Higher risk, non-routine jobs will require more detailed planning than lower risk, routine excavation or trenching work.

Pre-Excavation Notification Requirements

Note: Effective April 13, 2007, the Federal Communications Commission (FCC) has designated a national 811, “Call Before You Dig” number. When dialing the 811 number, the caller will be connected to nearest State One-Call Notification Center. The 800 numbers for the Texas and New Mexico One-Call Notification Centers will remain active following the establishment of the FCC 811 number.

• Some other operators (including local water and sewer utilities) may not be required to participate in the Statewide One-Call program, so they should be contacted directly. White is the color to be used when marking the location of the proposed excavation, also known as white lining

• Specific geographic areas or processes may be excluded from these notification requirements by approval of a written variance by the customers Director of Operations.

• If driving directions to an excavation site are given to the One-Call Notification Center, the directions must be accurate. In addition to driving direction, it is recommended to provide GPS coordinates to the One-Call Notification Center.
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The New Mexico One Call Process must be utilized if the excavation, regardless of depth, occurs within a production lease in New Mexico that is within a populated area, on jurisdictional pipelines, or within an established easement or right of way located on the lease. Populated areas include a city, town, village or municipality, or designated residential or commercial area such as a subdivision, business or shopping center or community development.

- Notification can be made by utilizing the Statewide One-Call system. In New Mexico, call 811 or (800) 321-2537. A listing of other operators notified can be found at the top of the facsimile notification received from the One-Call Center.

- Every person who prepares engineering plans for excavation or who engages in excavation shall:
  
  A. Determine the location of any underground facility in or near the area where the excavation is to be conducted, including a request to the owner or operator of the underground facility to locate the underground facility pursuant to Section 62-14-5 NMSA 1978;
  
  B. Plan the excavation to avoid or minimize interference or damage to underground facilities in or near the excavation area;
  
  C. Provide telephonic advance notice of the commencement, extent and duration of the excavation work to the one-call-notification system operating in the intended excavation area, or the owners of any existing underground facility in and near the excavation area that are not members of the local one-call notification center, in order to allow the owners to locate, and mark the location of the underground facility described in Section 62-14-5 NMSA 1978 prior to the commencement of work in the excavation area and shall request reaffirmation of line location every ten working days after the initial locate request;
  
  D. Prior to initial exposure of the underground facility maintain at least an estimated clearance of eighteen inches between existing underground facilities for which the owners or operators have previously identified the location and the cutting edge or point of any mechanical excavating equipment utilized in the excavation and continue excavation in a manner necessary to prevent damage;
  
  E. Provide such support for existing underground facilities in or near the excavation area necessary to prevent damage to them;
  
  F. Backfill all excavations in a manner and with materials as may be necessary to prevent damage to and provide reliable support during and following
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backfilling activities for pre-existing underground facilities in or near the excavation area;

G. Immediately notify by telephone the owner/operator of any underground facilities which may have been damaged or dislocated during the excavation work; and

H. Do not move or obliterate markings made pursuant to Chapter 62, Article 14 NMSA 1978, or fabricate markings in an unmarked location for the purpose of concealing or avoiding liability for a violation of or noncompliance with the provisions of Chapter 62, Article 14 NMSA 1978.

• All Third Party Damages must be reported to the New Mexico Public Regulation Commission, Pipeline Safety Bureau on Form 18 NMAC 60.2.9 (attachment – Appendix D).

Marking of Facilities (New Mexico)

• Requests to locate/spot a facilities line should be directed to operations personnel within the area who are knowledgeable of the location of the lines to insure that proper identification is made.

• Lines identified in the immediate vicinity of planned excavation shall be properly and clearly marked as to the type and service of the line. The following details, if known, should be included when marking the location of operators underground facilities: the outside diameter size, material of pipe (Poly, Fiberglass, or Steel), operating pressure, and the depth of the line.

• Every person owning or operating an underground facility shall, upon the request of a person intending to commence an excavation and upon advance notice, locate and mark on the surface the actual horizontal location, within twelve inches by some means of location, of the underground facilities in or near the area of the excavation so as to enable the person engaged in excavation work to locate the facilities in advance of and during the excavation work.

• If the owner or operator of the underground facility finds he has no underground facilities in the proposed area of excavation, the owner or operator shall contact the appropriate one-call notification center or mark in the appropriate color code as specified in Section 62-14-5.1 NMSA 1978 the area as "Clear" or "No Underground Facilities." If the area is not marked "Clear" or "No Underground Facilities," the excavator shall contact the one-call notification system operating in the intended excavation area or the owners or operators of any existing underground facility in and near the excavation area that are not members of the
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local one-call notification center in order to verify the area as "Clear" or "No Underground Facilities."

- If the owner or operator fails to correctly mark the underground facility after being given advance notice and such failure to correctly mark the facility results in additional costs to the person doing the excavating, then the owner or operator shall reimburse the person engaging in the excavation for the reasonable costs incurred.

- An owner of an underground facility shall not move or obliterate markings made pursuant to the New Mexico Excavation Law, or fabricate markings in an unmarked location for the purpose of concealing or avoiding liability for a violation of or noncompliance with the provisions of New Mexico Excavation Law.

*Note: If the operator of the line locator is unsure of the quality of signal being received by the locator device, it is recommended to use multiple locating devices with varying frequency ranges.*

**Exception In Case of Emergency (New Mexico)**

- The facilities Operations Team Leader or designee may authorize excavations for the purpose of emergency response to a situation that endangers life, health, or property. This emergency excavation does not require 48 hours notice, but a One-Call Center should be notified as soon as reasonably possible.

- Every person who engage in emergency excavation shall take all necessary and reasonable precaution to avoid or minimize interference with or damage to existing underground facilities in and near the construction area and shall notify as promptly as possible the owners of underground facilities located in and near the emergency excavation area. In the event of any damage to or dislocation of any underground facility caused by the emergency excavation work, the person responsible for the excavation shall immediately notify the owner of the underground facility.

**Liability for Damage to Underground Facilities (New Mexico)**

A. If any underground facility is damaged by any person who failed to make reasonable efforts to determine its location as required by the New Mexico Excavation Law, that person shall reimburse the owner of the underground facility for the actual cost of damage to the underground facility, including the cost of restoration of services. The person engaging in the excavation may also be liable to the owner or operator of the underground facility for the comparative negligence of the person
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engaging in the excavation which results in damage to the facility for an additional amount not to exceed three hundred thousand dollars ($300,000) for each occurrence.

B. If any underground facility is damaged by any person who has made reasonable efforts to determine its location and the damaged underground facility was correctly located by the owner or operator of the underground facility as provided by New Mexico Excavation Law, then that person causing the damage shall be liable to the owner or operator of the underground facility for only the actual cost of damage to the underground facility, including the cost of restoration of service.

C. If any underground facility is damaged by any person who has made reasonable efforts to determine its location and damage to the underground facility is caused by the failure of the owner or operator to correctly locate that underground facility as provided in New Mexico Excavation Law, then the person engaging in the excavation shall have no liability for the damage to that facility.

D. It is not the intent of New Mexico Excavation Law, Chapter 62 Article 14 NMSA 1978 to impose civil liability to any person beyond that provided in this section.

Summary of One-Call Requirements – When Initiating a One-Call Notification:

1. Flag, stake, mark or paint the area to be excavated, with proper color.
2. The Excavator must notify the One-Call Center 48 hours prior to excavating,
3. Prior to excavating, the Excavator must insure that all facilities are marked or “Cleared”.

Use of Qualified Contractors

• Each S.C.I. location shall use only those employees who are experienced in, knowledgeable and familiar with excavation and trenching work.

• Employees working at S.C.I. sites are required to conduct excavation work in compliance with all applicable State, Local and Federal requirements. In addition, employees are required to comply with the requirements of S.C.I. Ground Disturbance Program safety procedures.

The Texas One-Call Process must be utilized if Excavation occurring in Texas is 16” deep or greater, unless the buried facility is inside a “Secured Facility” or customer has an “approved waiver” for that pipeline segment or segments. Notification can be made by utilizing the Statewide One-Call system. Call 811 or (800) 344-8377. A listing of other operators notified can be found at the top of the facsimile notification from the One-Call Center.

• Underground facility owners, when contacted by a One-Call Notification Center, shall mark the approximate location of its underground facilities at or near the site.
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of the proposed excavation if the operator believes that marking the location is necessary.

- Not later than the 48th hour after the time the excavator gives to the notification center notice of intent to excavate, an operator contacted by the notification center shall notify the excavator of the operator's plans to not mark the proximate location of an underground facility at or near the site of the proposed excavation, the operator must provide the notification by e-mail or facsimile or by another verifiable electronic method.

- The operator must provide the notification by e-mail or facsimile or by another verifiable electronic method approved by the State One-Call Board of Texas.

- Additional calls should be placed to the One-Call Notification Center if the work period extends beyond 14 days of advance notice, unless it is emergency repair work.

Marking of Facilities (Texas)

- If the facility operator elects not to send locators (i.e., if facility operator as no buried facilities in the area), a facsimile or email notification must be sent to the excavator communicating this fact.

- Requests to locate/spot facilities lines should be directed to operations personnel within the area who are knowledgeable of the location of the lines to insure that proper identification is made.

- Underground Facilities identified in the immediate vicinity of planned excavation shall be properly and clearly marked as to the type and service of the line. The following details, if known, should be included when marking the location of operator’s underground facilities: the outside diameter size, material of pipe (Poly, Fiberglass, or Steel), Operating pressure, and the depth of the line.

- An underground facility operator contacted by the notification system shall mark the approximate location of its underground facilities at or near the site of the proposed excavation if the operator believes that marking the location is necessary.

- An operator shall refer to the American Public Works Association color coding standards when marking.

- An excavator who has fully complied with this chapter may not be liable for damage to an underground facility that was not marked in accordance with the One-Call rules.
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Note: If the operator of the line locator is unsure of the quality of signal being received by the locator device, it is recommended to use multiple locating devices with varying frequency ranges.

Exception In Case of Emergency (Texas)
- Provisions to provide normal marking for an underground facility does not apply to an emergency excavation that is necessary to respond to a situation that endangers life, health, or property or a situation in which the public need for uninterrupted service and immediate re-establishment of service if service is interrupted compels immediate action.

- The excavator may begin emergency excavation immediately and shall take reasonable precautions to protect underground facilities.

- When an emergency exists, the excavator shall notify a notification center as promptly as reasonably possible.

Excavation Damage (Texas)
- If an excavation operation results in damage to an underground facility, the excavator shall immediately contact the underground facility operator to report the damage.

- If the excavator is not certain of the operator's identity, the excavator shall contact the notification center to report the damage.

- Immediately on receiving notification, the notification center shall contact each member operator that has underground facilities in or near the area in which the damage occurred.

- Only the operator or a person authorized by the operator may perform repairs, and the repairs must be made in an expeditious manner.

- An excavator shall delay backfilling in the immediate area of the damage until the damage is reported to the operator and a repair schedule is mutually agreed to by the excavator and the operator.

- If damage endangers life, health, or property because of the presence of flammable material, the excavator shall keep sources of ignition away.

- When an operator’s pipeline receives “Third Party Damage”, the operator and the excavator are required to submit an electronic Third Party Damage Report to the Railroad Commission, Pipeline Safety Division within 10 days of discovering the pipeline damage. See Appendix D.
**Pre-Job Planning**

- A S.C.I. supervisor shall contact the employees, and all sub contracted personal and communicate to them the extent of any known potential hazards that may be encountered prior to authorizing commencement of work.
- The Competent Person in charge of the excavation shall conduct a tailgate/pre-job safety session with all employees involved in the excavation prior to commencing the excavation. *(A Competent Person shall be placed in charge of all excavations greater than 4 feet in depth.)* Additional tailgate sessions should be conducted at the discretion of anyone involved in the excavation, as they deem necessary.
- If the trench or excavation is 4 feet in depth or greater, it is a confined space and all applicable OSHA and Company regulations.
- A Daily Inspection Checklist shall be maintained by the Competent Person to document inspections and corrective actions taken at the work site. *(Required when excavation depth is greater than 4 feet.)* *(Appendix B is provided as an example of an Excavation Site Inspection Checklist.)*

**Surface Hindrances**

- All equipment, materials, supplies, permanent installations, trees, brush, boulder, and other objects at the surface that could present a hazard to employees working in the excavation area must be removed or supported, as necessary, to protect employees.
- Consult Hot Work, Electrical, Lock/Tag/Try policies for the need to de-energize nearby power sources. The location of overhead power lines and associated guy wires should be considered when using mechanized equipment that could come in contact with this type of facilities.

**Excavation Precautions**

- Excavation work will be conducted in a manner that does not endanger underground installations or employees engaged in the work. Lines or other underground installations left in place must be protected by barricades, shoring, suspension, or other means as necessary to protect employees.
- Any change in circumstances shall require the employee to consult a S.C.I. supervisor.
- When other operators’ lines are uncovered by S.C.I. working on behalf of the customer. The customer personnel should allow the other operator the opportunity to determine the condition of their coatings and the integrity of their pipe, prior to back filling. Immediately report all leaks to the appropriate facility owner/operator.
Tolerance Zone - No Mechanized Equipment Area**

AS PER NEW MEXICO EXCAVATION LAW: Prior to initial exposure of the underground facility, maintain at least an estimated clearance of eighteen inches between existing underground facilities for which the owners or operators have previously identified the location and the cutting edge or point of any mechanical excavating equipment utilized in the excavation and continue excavation in a manner necessary to prevent damage

(The following example is applicable to New Mexico Excavation Law)

AS PER TRRC RULE 18: When excavation is to take place within the specified tolerance zone, an excavator shall exercise such reasonable care as may be necessary to prevent damage to any underground pipeline in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include hand digging when practical, soft digging, vacuum excavation methods, pneumatic hand tools. Other mechanical methods or other technical methods that may be developed may be used with the approval of the underground pipeline operator. Hand digging and non-invasive methods are not required for pavement removal. {This is also a National Common Ground Alliance “Best Practice”}
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Access and Egress

• If a trench or excavation is 4 feet or deeper in depth, stairways, ramps, or ladders must be provided and used as a safe means of access and egress. The worker must not have to travel no more than 25 feet of lateral travel to reach the stairway, ramp, or ladder.

Vehicular Traffic

• Employees exposed to vehicular traffic must be supplied with, and wear warning vests or other suitable garments marked with or made of re-flectorized or high-visibility material.
• Signs and barricades must be utilized to ensure the safety of workers, vehicular traffic and pedestrians.

Falling Loads

• No employee is permitted underneath loads handled by lifting or digging equipment.
• Employees are required to stand away from any vehicle being loaded or unloaded.
• Vehicle operators may remain in the cabs of vehicles being loaded or unloaded when the vehicle provides adequate protection for the operator during loading and unloading operations.

Mobile Equipment

• When mobile equipment is operated adjacent to the edge of an excavation, a warning system will be used when the operator does not have a clear and direct view of the edge of the excavation.
• The warning system may consist of barricades, hand or mechanical signals, or stop logs/barriers.
• If possible, the surface grade will slope away from the excavation.

Hazardous Atmospheres

• Atmospheric testing must be conducted in excavations 4 feet deep, deeper where hazardous atmospheres exist, or where the potential for hazardous atmospheres may exist (near landfill areas, near hazardous substance storage, oil and gas pipelines, sewer lines). **Note: If the trench or excavation is 4 feet in depth or greater it is a confined space and all applicable OSHA and Company regulations and requirements will be followed.**
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- Adequate precautions will be taken to prevent employee exposure to atmospheres containing less than 19.5% oxygen or other hazardous atmospheres. These precautions include, but are not limited to,
  - Appropriate respiratory protection; or
  - Forced ventilation.

- Forced ventilation or other effective means will be used to prevent exposure to an atmosphere containing a flammable gas in excess of 10% of the lower flammable limit.

- Atmospheric testing will be performed using a properly calibrated direct reading instrument.

- Monitoring will be continuous where controls are used to reduce the level of atmospheric contaminants.

- Monitors are to be tested prior to use and maintained and calibrated in accordance with manufacturer’s specifications.

Water Accumulation

- No employee or contractor will work in an excavation containing water or where water is accumulating unless adequate measures have been taken to protect the workers from hazards posed by water accumulation. Precautions taken can include:
  - Special support or shield systems to protect from cave-in.
  - Water removal to control the level of accumulating water.
  - Use of safety harnesses and lifelines.

- If water is controlled or prevented from accumulating by the use of water removal equipment, the equipment and operation must be monitored by a person trained in the use of the equipment to ensure proper operation.

- If excavation work interrupts the natural drainage of surface water, diversion ditches, dikes, or other suitable means will be used to prevent surface water from entering the excavation.

- Precautions must also be taken to provide adequate drainage of the area adjacent to the excavation.

- Excavations subject to runoff from heavy rains must be re-inspected by the Competent Person to determine if additional precautions should be taken.

- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in the excavation.

- Employees entering bell-bottom pier holes, or similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.
Adjacent Structures

- Support systems will be used to assure stability of structures and the protection of employees where excavation operations could affect the stability of adjoining buildings, walls, or other structures.
- Excavation below the level of the base or footing of any foundation or retaining wall that could reasonably be expected to pose a hazard to employees will not be permitted except when:
  - A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
  - The excavation is in stable rock; or
  - A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
  - A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

- Sidewalks, pavements and appurtenant structures shall not be undermined unless a support system or other method of protection is provided to protect employees from the possible collapse of such structures.
- When review or approval of a support system by a registered professional engineer is required, the location will secure this review and approval before the work is begun.

Loose Rock or Soil

- Adequate protection must be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from the excavation face. Such protection will consist of:
  - Scaling to remove loose material;
  - Installation of protective barricades, such as wire mesh or timber, at appropriate intervals on the face of the slope to stop and contain falling material; or
  - Benching sufficient to contain falling material.
- Excavation personnel will not be allowed to work above one another where the danger of falling rock or earth exists.
- Employees must be protected from excavated materials, equipment or other materials that could pose a hazard by falling or rolling into excavations.
- All spoil piles and other materials and equipment will be stored a minimum of two (2) feet from the edge of the excavation. They must not block the safe means of egress. If the use of restraining devices is needed, these restraining devices should be sufficient to prevent materials and equipment from falling or rolling into excavations.
- The Competent Person may determine that materials and equipment need to be stored further than two (2) feet from the edge of the excavation if a hazardous loading condition is created on the face of the excavation.
- Materials piled, grouped or stacked near the edge of an excavation must be stable and self-supporting.
Fall Protection

- Barricades, walkways, lighting and posting must be provided as necessary prior to the start of excavation operations.
- Guardrails, fences, or barricades must be provided on excavations adjacent to walkways, driveways, and other pedestrian or vehicle thoroughfares. Warning lights or other illumination must be maintained as necessary for the safety of the public and employees from sunset to sunrise.
- Wells, holes, pits, shafts, and all similar excavations must be effectively barricaded or covered and posted as necessary to prevent unauthorized access. All temporary excavations of this type will be backfilled as soon as possible.
- Walkways or bridges protected by standard guardrails must be provided where employees and the public are permitted to cross over excavations. Where workers in the excavation may pass under these walkways or bridges, a standard guardrail and toe board must be used.

Competent Person Responsibilities

OSHA Standards require that the competent person must be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are hazardous or dangerous to employees or contractors, and have the authorization to take prompt corrective measures to eliminate them, and, if necessary, to stop the work.  

*Note: A Competent Person shall be placed in charge of all excavations greater than 4 feet in depth.*

A competent person is required to:
- Have a complete understanding of the applicable safety standards and any other data provided.
- Assure the proper location of underground lines and utilities, and that proper personnel have been contacted.
- Conduct soil classification tests and reclassify the soil after any condition changes.
- Analyze and determine the adequate protective systems that will be utilized (sloping, shoring, or shielding systems) to prevent cave-ins for worker protection.
- Conduct all air monitoring for potential hazardous atmospheres.
- Inspect the excavations and trenches daily, prior to worker entry, and after any rainfall, soil change, or any other time necessary. The competent person must take prompt measures to eliminate all hazards.
- Approve design of structural ramps if used.

For S.C.I. operating areas, all soil will be classified as a Type C soil (see Appendix A for Soil Classification) *unless* further soil analysis has been performed. In most cases, the protective system that will be utilized is sloping or benching which requires a slope of 34 degrees or 1 ½ horizontal to 1 vertical.
Sweatt Construction Inc. Ground Disturbance Program

Excavation Protection Systems

- Each employee in an excavation shall be protected from cave-ins by using either an adequate sloping and benching system or an adequate support or protective system.
- The three basic protective systems for excavations and trenches are sloping and benching, shoring, and shields.
- The protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied to or transmitted to the system. Every employee or contractor in an excavation shall be protected from cave-ins by an adequate protective system.

Exception to using protective systems:
- Excavations are made entirely in stable rock
- Excavations are less than 4 feet deep and are declared safe by a competent person.

Sloping and Benching Systems

There are four options for sloping:

- Slope to the angle required by the OSHA Standard for Construction (1926 Subpart P) for Type C soil, which is the unstable soil.
- The table in Appendix B of the OSHA Standard for Construction (1926 Subpart P) may be used to determine the maximum allowable angle (after determining the soil type).
- Tabulated data prepared by a registered professional engineer can be utilized.
- A registered professional engineer can design a sloping plan for a specific job.

Sloping and benching systems for excavations greater than four (4) feet to twenty (20) feet deep must be constructed under the instruction of a designated competent person.

Sloping and benching systems for excavations greater than twenty (20) feet must be designed and stamped by a registered professional engineer.

Sloping and benching specifications can be found in Appendix B of the OSHA Standard for Construction (1926 Subpart P).

Shoring Systems

Shoring is another protective system or support system. Shoring utilizes a framework of vertical members (uprights), horizontal members (whales), and cross braces to support the sides of the excavation to prevent a cave-in. Metal hydraulic, mechanical or timber shoring are common examples.
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The different examples of shoring are found in the OSHA Standard for Construction (1926 Subpart P) under these appendices:

- C – Timber Shoring for Trenches
- D – Aluminum Hydraulic Shoring for Trenches
- E – Alternatives to Timber Shoring

**Shield Systems (Trench Boxes)**

Shielding is the third method of providing a safe workplace. Unlike sloping and shoring, shielding does not prevent a cave-in. Shields are designed to withstand the soil forces caused by a cave-in and protect the workers inside the structure. Most shields consist of two flat, parallel metal walls that are held apart by metal cross braces.

Shielding design and construction is not covered in the OSHA Standards. Shields must be certified by a registered professional engineer and must have either a registration plate on the shield or registration papers from the manufacturer on file at the job-site office.

**Personal Protective Equipment**

It is S.C.I.’s policy that each person wear a hard hat, safety glasses with side-shields, and steel toe work boots/shoes on the job-site. Because of the hazards involved with excavations, other personal protective equipment may be necessary, depending on the potential hazards present.

**Inspections**

Daily inspections of excavations, the adjacent areas and protective systems shall be made by the competent person for evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions. *(A sample/example of an inspection checklist is provided in Appendix B.)*

- All inspections shall be conducted by the competent person prior to the start of work and as needed throughout the job.
- Inspections will be made after every rain or any other event that may change or increase on site hazards.

- All documented inspections will be kept on file in the job-site safety files.
- Where the competent person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmosphere, or other hazardous conditions, exposed employees shall be removed from the hazardous area until precautions have been taken to insure their safety.
Training

The Competent Person must be trained in accordance with the OSHA Excavation Standard, and all other programs that apply (examples – Hazard Communication, Confined Space, Lockout/Tagout, etc), and must demonstrate a thorough knowledge of the programs and the hazards associated.

All other employees and contractors working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating. Training is to be provided prior to the employee beginning work at the site.

All workers on site should be trained and have knowledge of the following:
• Safe work practices related to excavation work;
• Hazards relating to excavation work;
• Methods of protection for excavation hazards;
• Use of Personal Protective Equipment;
• Procedures and safe practices regarding hazardous atmospheres;
• Emergency and non-entry rescue procedures; and
• 29 CFR 1926.650, .651, .652 Subpart P – Excavations

All S.C.I personnel who have the responsibility to locate underground facilities using electronic locating equipment will be trained in the use of the equipment. A recognized and competent industry expert should provide training

Reference Sources:

✓ Basic requirements of OSHA’s Excavation - Standard References:
  29 CFR 1926.650, .651, .652 Subpart P – Excavations
  
  ➢ http://www.rrc.state.tx.us/divisions/gs/pls/damageprevention/MainPage/TEXASUTILITIESCODE-Chapter251.html

  ➢ http://www.rrc.state.tx.us/divisions/gs/pls/damageprevention/Chapter18/rules.htm

  ➢ http://www.nmonecall.org/law_state.htm

  ➢ http://ubsinfo.com/co.html


Appendix A
For S.C.I. operating areas, all soil will be classified as a Type C soil (see Appendix A for Soil Classification) unless further soil analysis has been performed. In most cases, the protective system that will be utilized is sloping or benching which requires a slope of 34 degrees or 1 ½ horizontal to 1 vertical.

Soil Classification and Identification

The OSHA Standards define soil classification within the Simplified Soil Classification Systems, which consists of four categories: Stable rock, Type A, Type B, and Type C. Stability is greatest in stable rock and decreases through Type A and B to Type C, which is the least stable. Appendix A of the OSHA Standard provides soil mechanics terms and types of field tests used to determine soil classifications.

Type C soil is defined as:
- Cohesive soil with an unconfined compressive strength of 0.5 TSF or less
- Granular soils including gravel, sand and sandy loam.
- Submerged soil or soil from which water is freely seeping.
- Submerged rock that is not stable.

The competent person will perform several tests of the excavation to obtain consistent, supporting data along its depth and length. The soil is subject to change several times within the scope of an excavation and the moisture content will vary with weather and job conditions. The competent person must also determine the level of protection based on what conditions exist at the time of the test, and allow for changing conditions.
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Appendix B

DAILY EXCAVATION SITE INSPECTION CHECKLIST

The Competent Person in Charge of the excavation should complete this form as necessary at excavation sites where the depth of the excavation is greater than 4 feet.

Date: ____________ Site Name______________________________________

Competent Person In Charge of Excavation: _________________________________________________

Work Type: Trenching_____ or Excavation_____ Time of Inspection: _________

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Was proper notification to other operators of underground installations made?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are locations of underground installations clearly and properly marked?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Have personnel on site been provided with the proper PPE?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is Proper Personal Protective Equipment being utilized by employees?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are potential sources of hazardous energy releases locked out and tagged?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is the Competent Person in charge of excavation on-site?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are spoils and other equipment set back at least 2 feet from edge of excavation?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Employees kept out of excavation while heavy equipment is digging?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is excavation 4 feet or deeper?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are there adequate means of access or egress?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is excavation properly benched, shored or shielded?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are employees prohibited from working, walking below suspended loads?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are surface encumbrances supported or removed?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Are precautions taken to protect employees from accumulations of water?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Does mobile equipment use warning system utilized when working near edge?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is atmospheric testing being conducted as necessary?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is excavation a confined space subject to customers the confined space requirements?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is soil testing required and if so, is documentation kept by Competent Person?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is there evidence of cracks or cracking in close proximity to the excavation site?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is the slope adequate for the soil type?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Has the soil type changed?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Is there evidence cracks or cracking in banks and sides of slope or bench?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>If shoring and shielding is being used, is it in place and functioning properly?</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
<td>Have weather conditions (rain, overnight freezing, etc) affected excavation site?</td>
</tr>
</tbody>
</table>

Corrective Actions Taken by Competent Person in charge of excavation:

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

To be signed by Competent Person in charge of excavation

Printed name of Competent Person in charge of excavation

Sweatt Construction Inc. Ground Disturbance
Appendix C

Status of Technology – Equipment used to locate underground facilities (note- approved training must be included & documented prior to using the following devices/equipment, to include those requirements from the manufacturer, or industry-recognized experts.)

**Passive Mode** – this means of searching requires the detector to pick up an electrical or radio frequency that is normally being emitted from the buried facility. This method does not require the attachment of a transmitter, but should only be relied upon to detect very low frequency energy reradiated by buried cables or lines. This is the least reliable means of detection, but helps to get a general indication of congestion in a large area.

**Inductive** – this method requires the use of a detector system equipped with a transmitter. The transmitter is generally stationary (preferably directly above known buried equipment) and it produces a frequency that is picked up and carried by the buried equipment. As the detector passes over the buried equipment, it detects the frequency and the loudspeaker (or headphones) is used to pinpoint the location of the line. The detector must be a short distance away from the transmitter to avoid interference, and the signal decreases as the receiver is used further away from the transmitter, so it is necessary to move the transmitter. Induction is generally useful to only 6 foot deep, and does not work if the line is below reinforced concrete.

**Active detection** – This method of inductive detection requires two persons; one to monitor the transmitter and one to use the detector. Active detection requires the users to operate both pieces of equipment at various locations as the process is completed. The transmitter is placed into service, and then the detector is used in a grid pattern. The transmitter is then moved and the process is done again. This method is used to obtain a high level of confidence in the inductive use of the equipment.

**Conductive** – this means of detection requires that the transmitter must be directly connected to the buried equipment, introducing a signal that is transmitted through the pipe and detected by a receiver that is carried over the surface to pick up the induced signal. This method requires that the transmitter be physically attached to the buried line, which in turn may require that electrical power be turned off (to prevent shocking the user when attaching the transmitter). A “double ended connection” requires a continuous loop, attaching the transmitter to both ends of the buried equipment. This avoids any potential crossing over of the frequency, as the receiver is used over the line. This method improves the accuracy of detection to within inches, and is recommended if working in smaller areas, or highly congested areas, such as plant yards.
Status of Technology – Equipment used to locate underground facilities (continued)

**Ground Penetrating Radar** – this method is similar to 3D seismic; a transmitter sends radar waves into the soil and a receiver is used to measure the dielectric constants for differing soil zones. When the data is interpreted, a three dimensional chart can be printed to illustrate the changes in the soil conductivity. The user must be able to identify which anomalies may represent buried pipe or previous excavation. In order to work properly, it is very important that the surface is flat, to provide a steady rate of motion as the detector is moved across the area. Due to soil composition in West Texas and Eastern New Mexico, this device is not recommended for use in that area.

**Thermal Imaging** – By slowly flying over an area and using thermal imaging, expert interpreters can identify changes in soil composition (similar to Ground Penetrating Radar) and thermal attributes. When transported under pressure, fluids will often have a different temperature than surrounding soils. The data is interpreted in a manner similar to 3D seismic, therefore the experience and training of the person doing the interpretation is critical to the success of this type of detection.

**Probing** – If the general location of buried facilities is known, but precise accuracy is important, a probe can be inserted in the soil to validate the exact location of buried equipment. Great care must be taken not to damage the coatings or the equipment itself when inserting any type probe to validate the location of buried equipment. Types of probes vary from steel rods to jet boring instruments.

**Vacuum Excavation** – An Enviro-Vac or Vac-Hoe can be used to probe holes up to eight feet deep, with very little environmental damage to the area. This type of equipment generally uses pressurized air or water to extract soil by vacuum; creating a 6-inch diameter hole, up to 8 feet deep. Caution should be taken when using a probe to avoid puncturing the buried lines; especially when using a rod to probe. *A hand pick should not be used for this purpose.*
Appendix D

In New Mexico, use this form when “Third Party” pipeline damage has occurred:

(Double Click To Open Form)

In Texas, use this link to access the Railroad Commission, Third Party Damage Report

Appendix E

The following is an excerpt of DOT’s expectations. An Advisory Bulletin was issued to pipeline operators, published in the Federal Register on January 17, 2006. (For information only)

- Use safe locating excavation practices. Follow your procedures and processes for excavation and backfill. When constructing a new pipeline, honor the marking of existing pipelines.

- Locate and mark pipelines accurately before locating excavation begins. Do not rely solely on maps, drawings, or other written materials to locate pipelines.

- Make sure that individuals locating and marking the pipelines have the knowledge, skills, and abilities to read and understand pipeline alignment and as-built drawings, and that they know what other buried utilities exist in the construction area.

- Make sure that individuals locating and marking the pipelines have up-to-date pipeline alignment and as-built drawings.

- Make sure that individuals locating and marking the pipelines are familiar with state and local requirements on marking.

- Mark all pipelines, including laterals. This is especially important in areas where there is a considerable amount of new pipeline and utility construction.

- Consider environmental conditions such as rain and snow when selecting marking methods.

- In areas where the pipelines are curved or make sharp bends to avoid other utilities or obstructions, consider the visibility and frequency of markers.

- Confirm the accuracy of pipe locating before locating excavation begins. This applies when the pipeline operator conducts the excavation using its own employees, a contractor, or a third party.

- Use qualified personnel for locating and marking pipelines. At a minimum, they should have received appropriate training such as that outlined in the National Utility Locating Contractors Association locator training standards and practices.

- Make sure excavators have sufficient information about underground pipelines at the construction site to avoid damage to the pipeline. Facilitate communication during the construction activity.

- Calibrate tools and equipment used for line locating and make sure they are in proper working order.

- Individually mark pipelines located within the same trench where possible.
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Ground Disturbance Program

Effective Date: September - 2008

- Follow the best practices on locating and marking pipelines developed by the Common Ground Alliance.

- When pipelines are hit or almost hit during excavation, evaluate the practices and procedures in use before continuing the construction activity.

- Operators should use the full range of safe locating excavation practices. In particular, pipeline operators should ensure the use of qualified personnel to accurately locate and mark the location of its underground pipelines.