# Program Development
# Best Practices Guide
# For
# Trenching & Excavation

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# Introduction

Trenching & excavations are a common part of municipal and quasi-municipal operations in most communities. Public works, water, sanitary treatment & sewer maintenance, are the different entities whose operations may be covered under this particular set of guidelines. In most of these workplaces trenching and excavation is not a daily occurrence, so it is even more critical that guidelines are developed. This written program must specify the components that are necessary to prevent employee injuries and fatalities, as well as to comply with OSHA regulations.

Municipal departments and Quasi-municipal organizations that have jobsites where road and utility work is performed - especially those involved in trenching and excavating operations - have a significant risk of injuries to employees that should be carefully considered. Anytime an employee is working adjacent to traffic, the potential hazards are serious and although trench cave-ins do not occur on a highly frequent basis, when they do occur, the result is often one or more fatalities. 37% of all trenching incidents occur at depths less than 5 feet and most fatalities occur in trenches 5 - 15 feet deep. Frequently those that die from a trench collapse are not involved in the initial cave-in; they are the would-be rescuers. It is critically important for all employees involved in this type of operation to receive training which stresses the fact that the unstable conditions that caused the initial cave-in often can and do cause a second or even third cave-in. By understanding the hazards, providing adequate work zone traffic control, utilizing protective equipment such as trench boxes, shoring, or using techniques such as sloping or benching, having a competent person on site at all times to monitor the trenching operations, and having a good written program that emphasizes planning, prevention and training, excavation-related injuries and fatalities can be prevented.

# Scope

This information was prepared as an outline to assist you in developing your Trenching & Excavation Program. As is the case with all safety plans, to be effective, they must relate to YOUR operations, exposures, and hazards. The information and forms provided are samples. They are intended as guides for YOUR Trenching & Excavation program development. There are specific laws, standards, rules, and regulations that pertain to this topic. We suggest that you consult them, as well as local and state public safety officials, for additional assistance.

# OSHA Requirements

The OSHA standard Subpart P-Excavations (29 CFR 1926.650-652 with appendices) in place since 1989, is the construction standard which covers the hazards and related requirements of this type of operation. The standard states that as an employer, you are responsible for having a specific set of written documentation as well as one or more

designated and trained “competent” persons to ensure that employees involved in these operations are adequately protected against serious injury or death. It requires that each excavation and trenching project be evaluated, prior to any work being started, to determine the specific hazards that may occur at that jobsite. This standard states that your first goal should be to set up a process in advance where each hazard is evaluated and actions taken to minimize them prior to any workers being exposed. Obviously, because of the emergency nature of some jobsites (e.g., a pipe breaking in the middle of the night), the need for a specific procedure in place that can be easily adapted in emergency situations is critical. One example might be having a truck or trailer set up with the necessary equipment such as a trench box, barricades, ladders, and pumps that can be easily hauled to the jobsite on short notice.

Your written documentation must state clearly what the “usual” hazards are for your operations (i.e. Is most of your trenching four feet or less with an occasional large project or do you have a greater variety of situations that your employees may be exposed to on a given day.). The written procedures should then be as specific as possible relating to “typical” and jobsite specific road and shoulder widths, pipe locations, soil conditions, traffic flow, and equipment available. A written excavation permit is a good way to record the necessary information (see sample).

With specific regards to Flagging & Traffic Control operations at a trenching jobsite, there is also a State of Maine law - Title 23 MRSA, Chapter 13, Section 707 - that covers construction flagger’s minimum training standards. This law encourages municipalities to provide training for flaggers on construction worksites that is consistent with the standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways. Such training can be done internally, or by having employees attend workshops such as those presented by the Maine Department of Transportation’s Maine Local Roads Center.

## Steps to Develop Your Program

1. **Identify your Trenching & Excavation Hazards -** The first step is to understand and identify the trenching and excavation operations that your department or organization usually undertakes in a “typical” work year. Do you perform this type of operation daily? Weekly? Or only occasionally? Do you do most of your trenching and excavating during the summer months? Or are you prone to emergency repair work at other times of the year? Are the trenches that you dig consistent in depth? Or do they vary from just below the surface to ten or more feet deep? Are the soil conditions fairly consistent throughout the area where you are responsible for performing this type of work (i.e. sandy gravel or hard clay)? Or are there a variety of soil conditions with which you must contend? How high is the water table in your general area? Are you working in a previously excavated area? Are there overhead hazards such as utilities?

One of the most important steps in avoiding cave-ins is the preplanning of excavation operations. Some of the questions that must be answered prior to digging by the Competent Person are:

- What types of soil will be found?
- What are the soil moisture conditions?
- Has the soil previously been disturbed?
- How large will the excavation be?
- How long will the excavation be open?
- What kinds of weather can we expect?
- What kinds of equipment will be on the job?
- Will the excavation be near structures?
- Is traffic/pedestrian control needed near the excavation?
- What sources of vibration will be nearby?
- Will water be a problem?
- What kind of shoring is needed? How much?
- Underground utility installation locations, where are they?
- Has a proper ground layout been completed before contacting Dig Safe?
- Will equipment and materials be hoisted in and out of excavation? Rigging inspected? Critical Lift Plan needed? No employees under suspended loads?
- What is our emergency action plan for the site?

2. Identify your Designated Trenching & Excavation “Competent” Person(s)

**Competent Person Responsibilities**

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

A **competent person** is required to:

- Have a complete understanding of the applicable safety standards and any other data provided.
- Assure the proper locations of underground installations or utilities, and that the Dig Safe non- participating utility companies have been contacted.
- Conduct soil classification tests such as visual, thumb penetration, ribbon, thread, soil sedimentation, dry strength, penetrometer, or share vane testing and reclassify soil after any condition changes.
- Determine adequate protective systems (sloping, shoring, or shielding systems) for employee protection.
- Conduct air and site monitoring for potential hazardous atmospheres.
- Conduct daily and periodic inspections of excavations and trenches.
- Approve design of structural ramps, if used.

3. Identify the Hazard Control Methods that you will use under typical conditions.

The **Competent Person** should identify **hazards** which can include and not be limited to Electrocution both below grade and overhead, Gas Explosion, Entrapment, Struck by equipment, Suffocation, potential destabilization of surrounding structures, and Atmospheric Conditions.

Before any work is performed and before employees enter the excavation, a number of items must be inspected:

- Before any excavation, underground utility installation locations must be determined. This can be accomplished by contacting Dig Safe (811) and or non-participating Dig Safe members directly. Contact with Dig Safe and non-participating members is required not only for excavation/trenching operations but whenever disturbing the ground with mechanical means such as grading, post hole boring, roto tilling, etc. is planned. All underground utility locations must have proper ground layout and overhead hazards above and around the excavation area must be removed or supported to reduce or eliminate hazard exposures.
- Excavations over 20 feet deep, must be evaluated by a registered professional engineer for design and protective soil support systems or if shoring devices are used in a manner that differs from OSHA requirements. A copy of this documentation must remain on site.
- Adequate protective systems will be utilized to protect employees. This can be accomplished through sloping, shoring, or shielding.
- The worksite must be evaluated to design adequate protection systems and prevent cave-ins.
- Evaluate and properly support all utilities exposed during site excavation.
- Workers must be supplied appropriate levels of personal protective equipment deemed necessary to assure their protection.
- All spoil piles will be stored a minimum of two (2) feet from the sides of the excavation, further away is better and not negatively impact means of employee egress, pedestrian egress, motor vehicle traffic, or add additional weight stress to the excavation supportive system. Also, keep unnecessary heavy equipment away from trench edges.
- If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders will be used as a safe means of access and egress. For trenches, the employee must not have to travel more than 25 feet of lateral travel to reach the stairway, ramp, or ladder. Any ramp used must be designed by a competent person with structural qualifications.
- No employee will work in an excavation where water is accumulating unless adequate measures are used to protect the employees, dewatering systems and soil monitoring shall be conducted and constantly monitored under these conditions.
- Excavations and trenches 4 feet or deeper that have the potential for toxic substances or hazardous atmospheres will be tested at least daily. If the

atmosphere is inadequate, protective systems will be utilized such as confined space entry requirements.

- If work is in or around traffic, employees must be supplied with and wear high visible reflective vests (ANSI Class II/Class III). Signs and barricades must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians in accordance with MUTCD requirements.
- A competent person will inspect and document all excavations, trenches and adjacent areas daily, prior to employee entry, and after any rainfall, soil change, or any other time needed during the shift. The competent person must take prompt measures to eliminate any and all hazards.

The hazard control equipment may include, but is not limited to:

- Signs, barricades, and cones- traffic control devices for both motor vehicles and pedestrian traffic
- Stop/Slow paddles, flags, or signs for flagging operations
- Soil Testing Equipment
- Dewatering Equipment
- Mud Mats for soil stabilization under equipment.
- Trench boxes and/or shoring
- Ladders of multiple lengths
- Atmospheric Monitoring Devices
- Respiratory equipment
- Ventilation Equipment
- Confined Space Entry Equipment
- Lockout/Tagout Equipment
- Fall Protection
- Personal Protective Equipment such as hard-hats, safety eyewear, reflective vests, gloves, and waterproof footwear.

Each of these pieces of equipment should be listed with the quantity available and should be included as an equipment inventory with your written program. If you have an Emergency Response Trailer, these items should be inventoried on the trailer and ready for emergency use at any time.

4. **Create Written Procedures for Trenching & Excavation Operations -** Trenching and excavation operations are the safest when every employee on the jobsite knows exactly what to do under both typical and emergency conditions. The best way to ensure this is to have a written set of procedures describing your typical and emergency trench work. Written procedures are a set of step-by-step instructions that allow all employees to perform an operation repeatedly with a consistent, positive end result - the road and/or utility is placed or repaired and no employee injuries or fatalities have occurred. In addition to being important for job efficiency and employee safety, the availability of a description of the design of protective systems to be used for each jobsite (including necessary tabulated data) is a requirement of the OSHA excavation and trenching standard.

5. **Provide Training and Keep Records of Training Sessions -** The best way to make sure employees avoid trenching hazards in your workplace is by conducting training. The OSHA standard requires that everyone who will be exposed to this type of operation be properly trained. This training must cover:

- How trench collapses can and do occur.
- Soil Types and jobsite conditions, which are high hazards.
- Traffic conditions and the role of the flaggers in controlling traffic.
- Protective methods and equipment--sloping, trench boxes, etc.
- The likelihood that once a cave-in occurs fatalities will result.
- Identification of Utilities (Dig Safe Color Code)

All employee training relative to trenching & excavation operations and other roadwork should be documented in a central training file. If the project is a long one (more than a few days), then copies of training records should also be maintained at the jobsite, along with trench box Tabulated Data information, or engineer's trench design specs. Training documentation should include the topic and a brief program description, the name(s) of the instructor(s), the date, time and location of each session, and the name of each employee who attended the program.

## Key Elements

To be effective, YOUR program needs to clearly identify the following:

- Key personnel (including “competent persons”) who have responsibility for each segment of the program.
- Methods that your operations will utilize to prevent cave-ins.
- Traffic control methods and flagger responsibilities.
- How and when training will be conducted.
- How records will be kept.
- Procedures to evaluate and update the program.
- Methods used to locate possible underground utilities before you dig.
- Location of possible underground utilities before you dig.
- Open discussions with your local emergency services regarding hazards associated with Excavation rescue so they understand the hazards.

# Definitions

**BENCHING** - 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. Not to be used for material storage or employee egress.

**CAVE-IN** - The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by failing or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

**COMPETENT PERSON** - One who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. **Stop Work Authority**.

**EXCAVATION** - Any man-made cut, trench, or depression in an earth surface, formed by earth removal.

**HAZARDOUS ATMOSPHERE** - An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

**PROTECTIVE SYSTEM** - A method of protecting employees from cave-ins, from material that could fall or roll in to an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide necessary protection.

**SHIELD** - A structure that is capable of withstanding the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. All shields must be in accordance with 29 CFR 1926.652(c)3 or (c)4.

**SLOPING** - A method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences such as soil type, length of exposure, and application of surcharge loads.

**SURCHARGE LOAD**S - Generated by the weight of anything in proximity to the excavation, push starts for a cave-in (anything up top pushing down). Common surcharge loads:

- weight of spoil pile
- Weight of nearby buildings, poles, pavement, or other structural objects.
- weight of material and equipment

**TRENCH** - A narrow excavation below the surface of the ground, less than 15 feet wide, with a depth no greater than the width.

**UNDERMINING** - Undermining can be caused by such things as leaking, leaching, caving or over-digging. Undermined walls can be very dangerous.

**VIBRATION** - A force that is present on construction sites and must be considered. The vibrations caused by backhoes, dump trucks, compactors and traffic on job sites can be substantial.

## Sample Program

The attachments provided are intended to help you develop YOUR program. Each of the program elements is covered by one or more of the appendices. Each organization will need to carefully analyze their potential exposures to properly determine how in-depth their own program needs to be.

Attachments:

- Trench Inspection and Entry Authorization Form
- Sample Excavation Checklist
- Sample Daily Trenching Log
- Critical Lift Plan

## Sources of Additional Help

OSHA Standards: 29 CFR 1926.650-652 with Appendices https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926SubpartP

Dig Safe 811 www.digsafe.com

American Traffic Safety Services Association (703) 898-5400 https://www.atssa.com/

Maine Department of Labor (207) 624-6460
https://www.maine.gov/labor/workplace_safety/index.html

Maine DOT, Maine Local Roads Center, (207) 287-2152
https://www.maine.gov/mdot/mlrc/

Manual on Uniform Traffic Control Devices (MUTCD)
https://mutcd.fhwa.dot.gov/kno_2009r1r2.htm

Maine PUC https://www.maine.gov/mpuc/dig_safe/

OSHA https://www.osha.gov/Publications/trench_excavation_fs.html

CDC https://www.cdc.gov/niosh/topics/trenching/default.html

MMA Training - Please call your Loss Control Consultant at (800) 590-5583

# Sample – Trench Inspection and Entry Authorization Form

| | | | | | |
|---|---|---|---|---|---|
| LOCATION: | | | | DATE: | |
| TIME OF INSPECTION(S) | | | | | |
| WEATHER CONDITIONS: | | | | APPROX. TEMP.: | |
| CREW LEADER | | | | SUPERVISOR: | |
| DIMENTIONS: | DEPTH = | | | | |
| | TOP = | W | L | ❑ ❑ | Surface drainage |
| | BOTTOM = | W | L | ❑ ❑ | Below water table |
| | | | | ❑ ❑ | Bulging wall(s) |
| ❑ Solid rock, shale | ❑ Yes | | | ❑ ❑ | Floor heaving |
| ❑ Average soil | ❑ No | | | ❑ ❑ | Frozen soil |
| ❑ Fill material | | | | ❑ ❑ | Super-imposed loads |
| ❑ Loose sand | | | | ❑ ❑ | Vibration |
| | | | | ❑ ❑ | Wet soil |
| | | | | | |
| (Walls MUST be vertical-NO voids) | | | | ❑ ❑ Spoils at least 2 feet from edge of trench | |
| | | | | ❑ ❑ Spoils not increasing super-imposed load | |
| ❑ Timber | | | | ❑ ❑ | Backhoe at end of trench |
| ❑ Pneumatic | | | | ❑ ❑ | Compressor, etc. at remote location |
| ❑ Hydraulic | | | | | |

| | |
|---|---|
| ❑ Screw Jacks | ❑ ❑ Ladder Located in protected area |
| ❑ Trench Shield | ❑ ❑ Within 25 feet of safe travel |
| | ❑ ❑ Secured |
| ❑ Trench box | ❑ ❑ Extends 36 inches above the landing |
| Sloping:<br>❑ 1:1 (45°)<br>❑ 1 1/2:1 (34°) | ❑ ❑ Leads to safe landing |
| | |
| ❑ ❑ Gas detector used? | ❑ ❑ Shoring equip. & mats inspected prior to use? |
| ❑ ❑ Confined space permit issued? | ❑ ❑ Is trench SAFE to enter? |
| COMMENTS: | |
| | |
| | |
| | Work Order # |
| All unsafe conditions must be corrected prior to trench entry. If any hazardous conditions are observed, the trench must be immediately evacuated and no one allowed to re-enter until corrective action has been taken. | TO BE FILLED OUT BY EHS PERSONNEL<br><br>Excavation Entry Authorized By:<br>EHS Inspector |

# Sample – Excavation Checklist (Sheet 1 of 3)

(To be completed by a Competent Person)

| | | | |
|---|---|---|---|
| SITE LOCATION: | | | |
| DATE: | TIME: | COMPETENT PERSON: | |
| SOIL TYPE: (See attached form): | | | |
| SOIL CLASSIFICATION: | EXCAVATION DEPTH: | EXCAVATION WIDTH: | |
| TYPE OF PROTECTIVE SYSTEM USED: | | | |

Indicate for each item: YES - NO - or N/A for not applicable

| | |
|---|---|
| 1. General Inspection of Jobsite: | |
| A.Excavations, adjacent areas, and protective systems inspected by a competent person daily before the start of work. | |
| B.Competent person has the authority to remove employees from the excavation immediately. | |
| C. Surface encumbrances removed or supported. | |
| D.Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the excavation. | |
| E. Hard hats, eye protection, reflective vests, gloves and water proof footwear worn by all employees. | |
| F.Spoils, materials, and equipment set back at least two feet from the edge of the excavation. | |
| G.Barriers provided at all remotely located excavations, wells, pits, shafts, etc. | |
| H.Walkways and bridges over excavations four feet or more in depth are equipped with standard guardrails and toe-boards. | |
| I.Warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic. | |

| | |
|---|---|
| J.Employees required to stand away from vehicles being loaded or unloaded. | |
| K.Warning system established and utilized when mobile equipment is operating near the edge of the excavation. | |
| L. Employees prohibited from going under suspended loads. | |
| M.Employees prohibited from working on the faces of slopes or benched excavations above other employees. | |
| 2. Utilities: | |
| A. Utility companies contacted and/or utilities located. | |
| B. Exact location of utilities marked. | |
| C.Underground installations protected, supported, or removed when excavation is open. | |
| 3. Means of Access and Egress: | |
| A.Lateral travel to means of egress no greater than 25 feet in excavations four feet or more in depth. | |
| B.Ladders used in excavations secured and extended three feet above the edge of the trench. | |
| C. Structural ramps used by employees designed by a competent person. | |
| | |

# Sample – Excavation Checklist (Sheet 2 of 3)

Indicate for each item: YES - NO - or N/A for not applicable

| | |
|---|---|
| Means of Access and Egress (Cont'd): | |
| D.Structural ramps used for equipment designed by a registered professional engineer (RPE). | |
| E.Ramps constructed of materials of uniform thickness, cleated together on the bottom, equipped with no-slip surface. | |
| F.Employees protected from cave-ins when entering or exiting the excavation. | |
| 4. Wet Conditions: | |
| A. Precautions take to protect employees from the accumulation of water. | |
| B. Water removal equipment monitored by a competent person. | |
| C.Surface water or runoff diverted or controlled to prevent accumulation in the excavation. | |
| D.Inspections made after every rainstorm or other hazard-increasing occurrence. | |
| 5. Hazardous Atmosphere: | |
| A.Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible or other harmful contaminant exposing employees to a hazard. | |
| B.Adequate precautions taken to protect employees from exposure to an atmosphere containing less than 19.5% oxygen and/or to other hazardous atmospheres. | |
| C.Ventilation provided to prevent employee exposure to an atmosphere containing flammable gas in excess of 10% of the lower explosive limit of the gas. | |
| D. Testing conducted often to ensure that the atmosphere remains safe. | |
| E.Emergency equipment, such as breathing apparatus, safety harness and lifeline, and/or basket stretcher readily available where hazardous atmospheres could or do exist. | |
| F.Employees trained to use personal protective and other rescue equipment. | |

| | |
|---|---|
| G.Safety harness and lifeline used and individually attended when entering bell bottom or other deep confined excavations. | |
| 6. Support Systems: | |
| A.Materials and/or equipment for support systems selected based on soil analysis, trench depth, and expected loads. | |
| B.Materials and equipment used for protective systems inspected and in good condition. | |
| C. Materials and equipment not in good condition have been removed from service. | |
| D.Damaged materials and equipment used for protective systems inspected by a registered professional engineer (RPE) after repairs and before being placed back into service. | |
| E.Protective systems installed without exposing employees to the hazards of cave-ins, collapses, or threat of being struck by materials or equipment. | |
| F. Members of support system securely fastened to prevent failure. | |
| G.Support systems provided in ensure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc. | |
| H.Excavations below the level of the base or footing supported, approved by an RPE. | |
| I.Removal of support systems progresses from the bottom and members are released slowly as to note any indication of possible failure. | |

# Sample – Excavation Checklist (Sheet 3 of 3)

Indicate for each item: YES - NO - or N/A for not applicable

| | |
|---|---|
| J. Backfilling progresses with removal of support system. | |
| K.Excavation of material to a level no greater than two feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth. | |
| L. Shield system placed to prevent lateral movement. | |
| M.Employees are prohibited from remaining in shield system during vertical movement. | |

CORRECTIVE ACTIONS AND REMARKS:

# Sample – Daily Trenching Log

| | |
|---|---|
| DATE: | SIGNATURE: |
| WEATHER: | PROJECT: |

Was Dig Safe contacted: Yes ☐ No ☐

Utilities are located and marked: Yes ☐ No ☐

Protective system: ☐ Trench shield (box) ☐
Wood shoring
☐ Sloping ☐
Other

Purpose of trenching: ☐ Drainage
☐ Water
☐ Sewer ☐
Gas
Other

Were visual soil tests made: Yes ☐ No ☐

If yes, what type?

Were manual soil tests made: Yes ☐ No ☐

If yes, what type?

Type of soil: ☐ Stable Rock ☐
Type A ☐ Type B ☐
Type C

Surface encumbrances: Yes ☐ No ☐

If yes, what type?

Water conditions: ☐ Wet ☐
Dry ☐ Submerged

| |
|---|
| Possible hazardous atmosphere exists: Yes ☐ No ☐<br>(If yes, follow confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es)). |
| Is trenching or excavation exposed to public vehicular traffic (exhaust emission): Yes ☐ No ☐<br>(If yes, refer to confined space entry procedures; complete Confined Space Entry Permit; monitor for toxic gas(es)). |
| Measurements of trench: Depth Length Width |
| Is ladder within 25 feet of all workers: Yes ☐ No ☐ |
| Is excavated material stored two feet or more from edge of excavation: Yes ☐ No ☐ |
| Are employees exposed to public vehicular traffic: Yes ☐ No ☐<br>(If yes, warning vests required) |
| Are other utilities protected: Yes ☐ No ☐<br>(Water, sewer, gas or other structures) |
| Are sewer or natural gas lines exposed: Yes ☐ No ☐<br>(If yes, refer to confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es)). |
| Periodic inspection:<br>Yes ☐ No ☐ |
| Are employees trained in excavating: Yes ☐ No ☐ |
| Were employees briefed on hazards of this job: Yes ☐ No ☐ |

# Critical Lift Plan

CRITICAL LIFT CHECKLIST

Load to be hoisted: _____

Date/ Time of Lift _____

Load Dimensions:_____ Alignment Dimensions:_____

_____

Load Weight:

*How was the weight obtained?*

*Ice, snow, mud etc. removed?*

From Crane Load Chart, determine allowable maximum radius using given boom length and pick weight.

Weight of Rigging:

(Slings, wire rope, shackles, lift beams, etc.)

**Approved pick points:**

Weight of Crane Components

below & beyond boom point:

(load line, block, jib, rooster sheave, etc.)

**A+B+C =Total weight of lift:**

**Crane Specifications**

Length of boom.

Pick weight – multiply **Total weight of lift**

by 1.25.

A)___
_____
_____lbs.

B)_____ lbs.

C)___
_____
_____ lbs

_____**lbs**

_____ feet

_____
_____
_____ lbs

_____
_____Max. radius.

**Required Rigging**

**Type**
**Size**
**Capacity**

**Slings:**

_____
_____
_____

**Shackles:** _____

_____
_____

Hoist Block: _____

_____
_____

**(No. of parts)**

Lift Beam: _____

_____
_____

**Special Instructions:** ***(Orientation of boom/accessories)***

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

**Outriggers fully extended/pads in place?**

**Tag lines in place?**

**Warning horn operational?**

**All personnel removed from path of load?**

**Flagman / police detail present?**

**High Voltage Lines/electrical equipment, underground utilities?**

**Correct Load Chart present & used?**

**Crane radius & boom angle appropriate?**

**Weather Conditions good?**

**Does sufficient load clearance exist?**

**Correct operators manual present?**

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Lift Supervisor

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Operator

**Swing Protection in place?**

**Pre Lift Meeting between Super/Operator/Craft?**

**Inspection of crane by a competent person?**

**Rigging Inspected by competent person?**

**Crane footing - firm & level?**

**How many hours has operator been working during shift?**

**Communication between operator and flagman?**

**LMI – over ride key in off position?**

**Lighting conditions acceptable?**

**Current valid annual inspection sticker present?**

_____**Plan Reviewer**